

# STRATEGIC ENVIRONMENTAL ASSESSMENT ENVIRONMENTAL REPORT

---

FOR THE

## TRANSPORT STRATEGY FOR THE GREATER DUBLIN AREA 2016-2035

**for: National Transport Authority**

Dún Scéine,  
Iveagh Court,  
Harcourt Lane,  
Dublin 2



**by: CAAS Ltd.**

2<sup>nd</sup> Floor, The Courtyard,  
25 Great Strand Street,  
Dublin 1



**DECEMBER 2015**

# Table of Contents

<b>List of Abbreviations .....</b>	<b>v</b>
<b>Glossary.....</b>	<b>vi</b>
<b>Section 1 SEA Introduction and Background.....</b>	<b>1</b>
1.1 Introduction and Terms of Reference .....	1
1.2 SEA Definition .....	1
1.3 SEA Directive and its transposition into Irish Law .....	1
1.4 Implications for the Strategy .....	1
<b>Section 2 The Strategy.....</b>	<b>2</b>
2.1 Introduction.....	2
2.2 Dublin Transport Authority Act .....	2
2.3 Layout.....	2
2.4 Relationship with other relevant Plans and Programmes .....	3
<b>Section 3 SEA Methodology .....</b>	<b>4</b>
3.1 Introduction to the Iterative Approach .....	4
3.2 Hierarchy of Planning and Environmental Assessment.....	6
3.3 Schemes within the Strategy .....	7
3.4 Appropriate Assessment and Integrated Biodiversity Impact .....	7
3.5 Screening .....	10
3.6 Scoping .....	10
3.7 Environmental Report .....	11
3.8 SEA Statement .....	12
<b>Section 4 Relevant aspects of the current state of the Environment.....</b>	<b>14</b>
4.1 Introduction.....	14
4.2 Likely Evolution of the Environment in the Absence of a new Strategy .....	14
4.3 Air and Climatic Factors .....	15
4.4 Population and Human Health .....	20
4.5 Biodiversity and Flora and Fauna .....	22
4.6 Material Assets.....	27
4.7 Water.....	27
4.8 Landscape .....	32
4.9 Cultural Heritage .....	35
4.10 Soil .....	38
4.11 Overall Environmental Sensitivities and Opportunities/ Robustness .....	38
<b>Section 5 Strategic Environmental Objectives .....</b>	<b>42</b>
<b>Section 6 Description of Alternatives .....</b>	<b>46</b>
6.1 Introduction.....	46
6.2 Alternative 1: Orderly Provision of Transport.....	46
6.3 Alternative 2: Uneven Provision of Transport .....	47
6.4 Alternative 3: Under Provision of Transport.....	47

<b>Section 7</b>	<b>Evaluation of Alternatives.....</b>	<b>48</b>
7.1	Introduction.....	48
7.2	Methodology.....	48
7.3	Cumulative Effects.....	50
7.4	Detailed Evaluation of Alternatives.....	52
7.5	Alternatives by Corridor .....	61
<b>Section 8</b>	<b>Evaluation of Strategy Provisions.....</b>	<b>75</b>
8.1	Overall Findings .....	75
8.2	Methodology.....	77
8.3	Appropriate Assessment.....	79
8.4	Potential and Residual Adverse Effects .....	79
8.5	Interrelationship between Environmental Components.....	79
8.6	Detailed Evaluation of Plan Provisions .....	81
<b>Section 9</b>	<b>Mitigation Measures.....</b>	<b>98</b>
<b>Section 10</b>	<b>Monitoring Programme.....</b>	<b>106</b>
10.1	Introduction.....	106
10.2	Indicators and Targets.....	106
10.3	Sources .....	106
10.4	Reporting .....	106
10.5	Thresholds.....	106
<b>Appendix I: Relationship with Legislation and Other Plans and Programmes</b>	<b>.....</b>	<b>132</b>
<b>Appendix II: Non-Technical Summary.....</b>	<b>Separately bound</b>	

## List of Figures

Figure 3.1 Overview of Plan/SEA/AA Process .....	5
Figure 3.2 Hierarchy of Planning and Environmental Assessment.....	6
Figure 4.1 Journeys by car taken as a percentage of all journeys taken (2011 base year).....	17
Figure 4.2 Population Density.....	21
Figure 4.3 Natura 2000 sites within 15 km of the Strategy Area and River Basin Districts .....	25
Figure 4.4 Potential Habitat Sensitivity: Natural Heritage Areas (NHAs), proposed NHAs and areas likely to contain Annex I Habitats .....	26
Figure 4.5 Overlay of Potential Water Sensitivity .....	31
Figure 4.6 Potential Landcover Sensitivity Mapping .....	34
Figure 4.7 Potential Cultural Heritage Sensitivity .....	37
Figure 4.8 Overall Potential Environmental Sensitivity.....	40
Figure 4.9 Overall Potential Environmental Opportunities/Robustness .....	41

## List of Tables

Table 3.1 Rail Schemes and Planning Status.....	8
Table 3.2 Transport Strategy Bus Schemes and Planning Status.....	8
Table 3.3 Transport Strategy Cycle Scheme and Planning Status.....	8
Table 3.4 Transport Strategy Road Schemes and Planning Status.....	9
Table 3.5 Checklist of Information included in this Environmental Report .....	13
Table 4.1 Water Sensitivity Layers and Weighting .....	29
Table 4.2 Environmental Sensitivity Layers and Weighting .....	39
Table 4.3 Environmental Opportunities/Robustness Layers and Weighting.....	39
Table 5.1 Strategic Environmental Objectives, Indicators and Targets.....	43
Table 7.1 Strategic Environmental Objectives .....	49
Table 7.2 Criteria for appraising the effect of Alternatives on SEOs.....	49
Table 7.3 Potentially Significant Adverse Effects common to all Alternatives .....	52
Table 7.4 Evaluation of Alternatives against SEOs .....	56
Table 7.5 Effects Arising from Alternative developed as the Strategy .....	58
Table 7.5 Evaluation by Corridor.....	62
Table 8.1 Strategic Environmental Objectives .....	78
Table 8.2 Criteria for appraising the effect of Strategy provisions on SEOs .....	78
Table 8.3 Presence of Interrelationships between Environmental Components.....	80
Table 9.1 Provisions contained in the Strategy main body.....	98
Table 9.2 Provisions referred to in Transport Strategy Section 8.6.....	102
Table 10.1 Selected Indicators, Targets and Monitoring Sources .....	108

## List of Abbreviations

<b>AA</b>	Appropriate Assessment
<b>ACA</b>	Architectural Conservation Area
<b>CFRAM</b>	Catchment Flood Risk Assessment and Management
<b>CSO</b>	Central Statistics Office
<b>DAHG</b>	Department of Arts, Heritage and the Gaeltacht
<b>DCENR</b>	Department of Communications, Energy and Natural Resources
<b>DEHLG</b>	Department of the Environment, Heritage and Local Government
<b>DECLG</b>	Department of the Environment, Community and Local Government
<b>EIA</b>	Environmental Impact Assessment
<b>EPA</b>	Environmental Protection Agency
<b>EU</b>	European Union
<b>GSI</b>	Geological Survey of Ireland
<b>NHA</b>	Natural Heritage Area
<b>NTA</b>	National Transport Authority
<b>NSS</b>	National Spatial Strategy
<b>OPW</b>	Office of Public Works
<b>PAS</b>	Priority Action Substance
<b>RAL</b>	Remedial Action List
<b>RBD</b>	River Basin District
<b>RMP</b>	Record of Monuments and Places
<b>RPA</b>	Register of Protected Areas
<b>RPS</b>	Record of Protected Structures
<b>RPGs</b>	Regional Planning Guidelines
<b>RBMP</b>	River Basin Management Plan
<b>SAC</b>	Special Area of Conservation
<b>SEA</b>	Strategic Environmental Assessment
<b>SEO</b>	Strategic Environmental Objective
<b>SI No.</b>	Statutory Instrument Number
<b>SPA</b>	Special Protection Area
<b>WFD</b>	Water Framework Directive
<b>WMU</b>	Water Management Unit

# Glossary

## Appropriate Assessment

The obligation to undertake Appropriate Assessment derives from Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC. AA is a focused and detailed impact assessment of the implications of a strategic action (such as a plan or programme) or project, alone and in combination with other strategic actions and projects, on the integrity of a Natura 2000 site in view of its conservation objectives.

## Biodiversity and Flora and Fauna

Biodiversity is the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems' (United Nations Convention on Biological Diversity 1992).

Flora is all of the plants found in a given area.

Fauna is all of the animals found in a given area.

## Environmental Problems

Annex I of Directive 2001/42/EC of the European Parliament and of the Council of Ministers, of 27<sup>th</sup> June 2001, on the assessment of the effects of certain Plans and programmes on the environment (the Strategic Environmental Assessment Directive) requires that information is provided on 'any existing environmental problems which are relevant to the plan or programme', thus, helping to ensure that the proposed strategic action does not make existing environmental problems worse.

Environmental problems arise where there is a conflict between current environmental conditions and ideal targets. If environmental problems are identified at the outset they can help focus attention on important issues and geographical areas where environmental effects of the plan or programme may be likely.

## Environmental Vectors

Environmental vectors are environmental components, such as air, water or soil, through which contaminants or pollutants, which have the potential to cause harm, can be transported so that they come into contact with human beings.

## Mitigate

To make or become less severe or harsh.

## Mitigation Measures

Mitigation measures are measures envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing a human action, be it a plan, programme or project. Mitigation involves ameliorating significant negative effects. Where there are significant negative effects, consideration should be given in the first instance to preventing such effects or, where this is not possible, to lessening or offsetting those effects. Mitigation measures can be roughly divided into those that: avoid effects; reduce the magnitude or extent, probability and/or severity of effects; repair effects after they have occurred; and compensate for effects, balancing out negative impacts with other positive ones.

## **Protected Structure**

Protected Structure is the term used in the Planning and Development Act and Regulations (as amended) to define a structure included by a planning authority in its Record of Protected Structures. Such a structure shall not be altered or demolished in whole or part without obtaining planning permission or confirmation from the planning authority that the part of the structure to be altered is not protected.

## **Recorded Monument**

A monument included in the list and marked on the map which comprises the Record of Monuments and Places that is set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified. Any works at or in relation to a recorded monument requires two months' notice to the former Department of the Environment, Heritage and Local Government (now Department of Arts, Heritage and the Gaeltacht) under Section 12 of the National Monuments (Amendment) Act, 1994.

## **Scoping**

Scoping is the process of determining what issues are to be addressed, and setting out a methodology in which to address them in a structured manner appropriate to the plan or programme. Scoping is carried out in consultation with appropriate environmental authorities.

## **Strategic Actions**

Strategic actions include: *Policies/Strategies*, which may be considered as inspiration and guidance for action and which set the framework for Plans and programmes; *Plans*, sets of co-ordinated and timed objectives for the implementation of the policy; and *Programmes*, sets of projects in a particular area.

## **Strategic Environmental Assessment (SEA)**

Strategic Environmental Assessment (SEA) is the formal, systematic evaluation of the likely significant environmental effects of implementing a plan or programme before a decision is made to adopt it.

## **Strategic Environmental Objective (SEO)**

Strategic Environmental Objectives (SEOs) are methodological measures developed from policies which generally govern environmental protection objectives established at international, Community or Member State level and are used as standards against which the provisions of the Strategy and the alternatives can be evaluated in order to help identify which provisions would be likely to result in significant environmental effects and where such effects would be likely to occur, if - in the case of adverse effects - unmitigated.



# Section 1 SEA Introduction and Background

## 1.1 Introduction and Terms of Reference

This is the Strategic Environmental Assessment (SEA) Environmental Report for the Transport Strategy for the Greater Dublin Area 2016-2035. It has been undertaken by CAAS Ltd. on behalf of the National Transport Authority. The purpose of this report is to provide a clear understanding of the likely environmental consequences of decisions regarding the adoption and implementation of the Plan. The SEA is carried out in order to comply with the provisions of the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (Statutory Instrument Number (SI No. 435 of 2004) as amended. This report should be read in conjunction with the Strategy.

## 1.2 SEA Definition

Environmental assessment is a procedure that ensures that the environmental implications of decisions are taken into account before such decisions are made. *Environmental Impact Assessment*, or EIA, is generally used for describing the process of environmental assessment for individual projects, while *Strategic Environmental Assessment* or SEA is the term which has been given to the environmental assessment of plans and programmes, which help determine the nature and location of individual projects taking place. SEA is a systematic process of predicting and evaluating the likely significant environmental effects of implementing a proposed plan or programme, in order to insure that these effects are adequately addressed at the earliest appropriate stages of decision-making in tandem with economic, social and other considerations.

## 1.3 SEA Directive and its transposition into Irish Law

Directive 2001/42/EC of the European Parliament and of the Council of Ministers, of 27<sup>th</sup> June 2001, on the Assessment of the Effects of Certain Plans and Programmes on

the Environment, referred to hereafter as the SEA Directive, introduced the requirement that SEA be carried out on plans and programmes which are prepared for a number of sectors, including transport.

The SEA Directive was transposed into Irish Law through the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (Statutory Instrument Number (SI No. 435 of 2004) and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (SI No. 436 of 2004). Both sets of Regulations became operational on 21<sup>st</sup> July 2004. The Regulations have been amended by the European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 (SI No. 200 of 2011) and the Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011 (SI No. 201 of 2011).

## 1.4 Implications for the Strategy

Article 9 of the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004, as amended, sets out criteria for determining whether SEA should be undertaken on certain types of plans. Considering these criteria, the NTA concluded that an SEA was required for the Strategy, as it comprises a 'plan or programme' as defined by the SEA Directive which is likely to have significant environmental effects

The findings of the SEA are expressed in this Environmental Report, which accompanies the Strategy and has been updated in order to take account of recommendations contained in submissions and in order to take account of any changes which have been made to the Strategy on foot of submissions. The National Transport Authority have taken into account the findings of this report and other related SEA output during their consideration and finalisation of the Strategy. On finalisation of the Strategy an SEA Statement is prepared which summarises, inter alia, how environmental considerations have been integrated into the Strategy.

## Section 2 The Strategy

### 2.1 Introduction

The transport strategy (Strategy) provides a framework for the planning and delivery of transport infrastructure and services in the Greater Dublin Area (GDA) over the next two decades. It also provides a transport planning policy around which other agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, can align their investment priorities. It is, therefore, an essential component, along with investment programmes in other sectors, for the orderly development of the Greater Dublin Area over the next 20 years.

Land use planning in the Greater Dublin Area, which covers the counties of Dublin, Meath, Kildare and Wicklow, is guided by the Regional Planning Guidelines for the Greater Dublin Area 2010-2022 (Regional Planning Guidelines), which were adopted by the Dublin and Mid-East Regional Authorities in 2010. Recent legislation has replaced those authorities with the Eastern and Midland Regional Assembly (Assembly), who are tasked with preparing a Regional Spatial and Economic Strategy for the overall Assembly area. Pending the adoption of such a Regional Spatial and Economic Strategy by the Assembly, the above Regional Planning Guidelines continue to guide overall planning and development across the region.

### 2.2 Dublin Transport Authority Act

Under section 12 of the 2008 Dublin Transport Authority Act, the Authority is required to prepare a Transport Strategy for the Greater Dublin Area. Section 12 (3) states that the objective of the strategy shall be to provide a long-term strategic planning framework for the integrated development of transport infrastructure and services in the GDA and, in accordance with section 12 (4), shall consider the future development of the transport system in the GDA for a period of not less than 12 years and not more than 20 years.

Section 12 (5) states that when preparing a transport strategy the Authority shall have regard to:

1. the National Spatial Strategy;
2. the regional planning guidelines in force for the GDA;
3. the development plans in force in the GDA, the Dublin Docklands Development Authority's master plan and the Grangegorman Development Agency's strategic plan;
4. Transport 21 or any subsequent capital investment framework for transport published by the Minister or Government;
5. the Department of Transport's sectoral plan under the Disability Act 2005 or any subsequent sectoral plan under that Act;
6. demographic, economic, social, travel and transport trends in the GDA;
7. existing, planned and projected land use developments;
8. trends and requirements of persons travelling from outside the GDA into the GDA, and vice versa, and the demand for such travel;
9. any proposals received from public transport authorities and operators, and
10. such other matters as may be prescribed by the Minister or as the Authority considers appropriate.

The Transport Strategy must also be reviewed every 6 years.

### 2.3 Layout

The Strategy is set out over 9 chapters as detailed below:

- Chapter 1 - Introduction and Context
- Chapter 2 - Policy Review
- Chapter 3 – Transport in the Greater Dublin Area
- Chapter 4 - The Development of the Strategy
- Chapter 5 - The 2035 Transport Network
- Chapter 6 - Transport Services and Integration

- Chapter 7 - Land Use and Behavioural Change
- Chapter 8 - Environmental Protection and Management
- Chapter 9 – Summary of Outcomes

Various appendices including this SEA Environmental Report and an AA Natura Impact Statement accompany the Strategy.

## **2.4 Relationship with other relevant Plans and Programmes**

The Strategy sits within a hierarchy of strategic actions such as plans and programmes, including those listed below and detailed in Appendix I <sup>1</sup> (see also Section 4, Section 5 and Section 9). The Strategy must comply with relevant higher level strategic actions and may, in turn, guide lower level strategic actions.

The Strategy is subject to a number of high level environmental protection policies and objectives with which it must comply, including those which have been identified as Strategic Environmental Objectives in Section 5. Examples of Environmental Protection Objectives include the aim of the EU Habitats Directive - which is to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of Member States - and the purpose of the Water Framework Directive - which is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which, among other things, prevents deterioration in the status of all water bodies and protects, enhances and restores all waters with the aim of achieving good status by 2015.

---

<sup>1</sup> Appendix I is not intended to be a full and comprehensive review of EU Directives, the transposing regulations or the regulatory framework for environmental protection and management. The information is not exhaustive and it is recommended to consult the Directive, Regulation, Plan or Programme to become familiar with the full details of each.

## Section 3 SEA Methodology

### 3.1 Introduction to the Iterative Approach

Figure 3.1 provides an overview of the integrated Strategy preparation, SEA and AA processes. The preparation of the Strategy, SEA and AA have taken place concurrently and the findings of the SEA and AA have informed the Strategy.

Taking into account the content of SEA scoping submissions from environmental authorities and continuous scoping of the SEA, environmental impacts have been predicted, evaluated and mitigated. The findings of this assessment is presented in this SEA Environmental Report which accompanies and should be read in conjunction with the Strategy.

A Stage 2 Appropriate Assessment (AA) Natura Impact Statement also accompanies the Strategy. The Strategy and associated SEA and AA documents were prepared in an iterative manner whereby multiple revisions of each document were prepared, each informing subsequent iterations of the others.

Submissions made on the Strategy have been responded to and the Strategy has been updated as appropriate. On finalisation of the Strategy, an SEA Statement, which includes information on how environmental considerations have been integrated into the Strategy, is prepared. The Strategy will be implemented and environmental monitoring – as well as lower tiers of environmental assessment – will be undertaken.

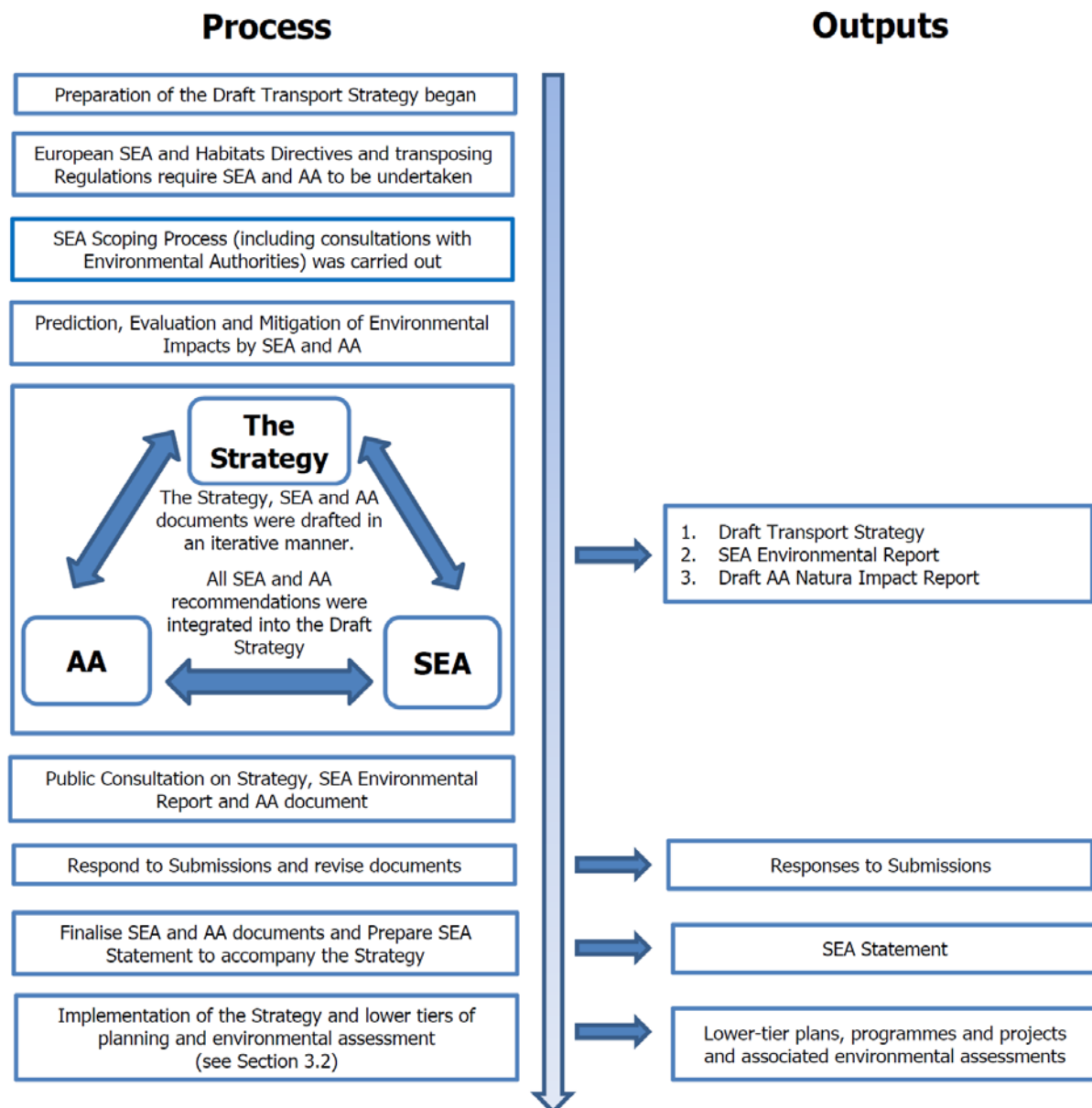


Figure 3.1 Overview of Plan/SEA/AA Process

## 3.2 Hierarchy of Planning and Environmental Assessment

The hierarchy of planning and environmental assessment in which the Transport Strategy is situated is detailed on Figure 3.2 below.

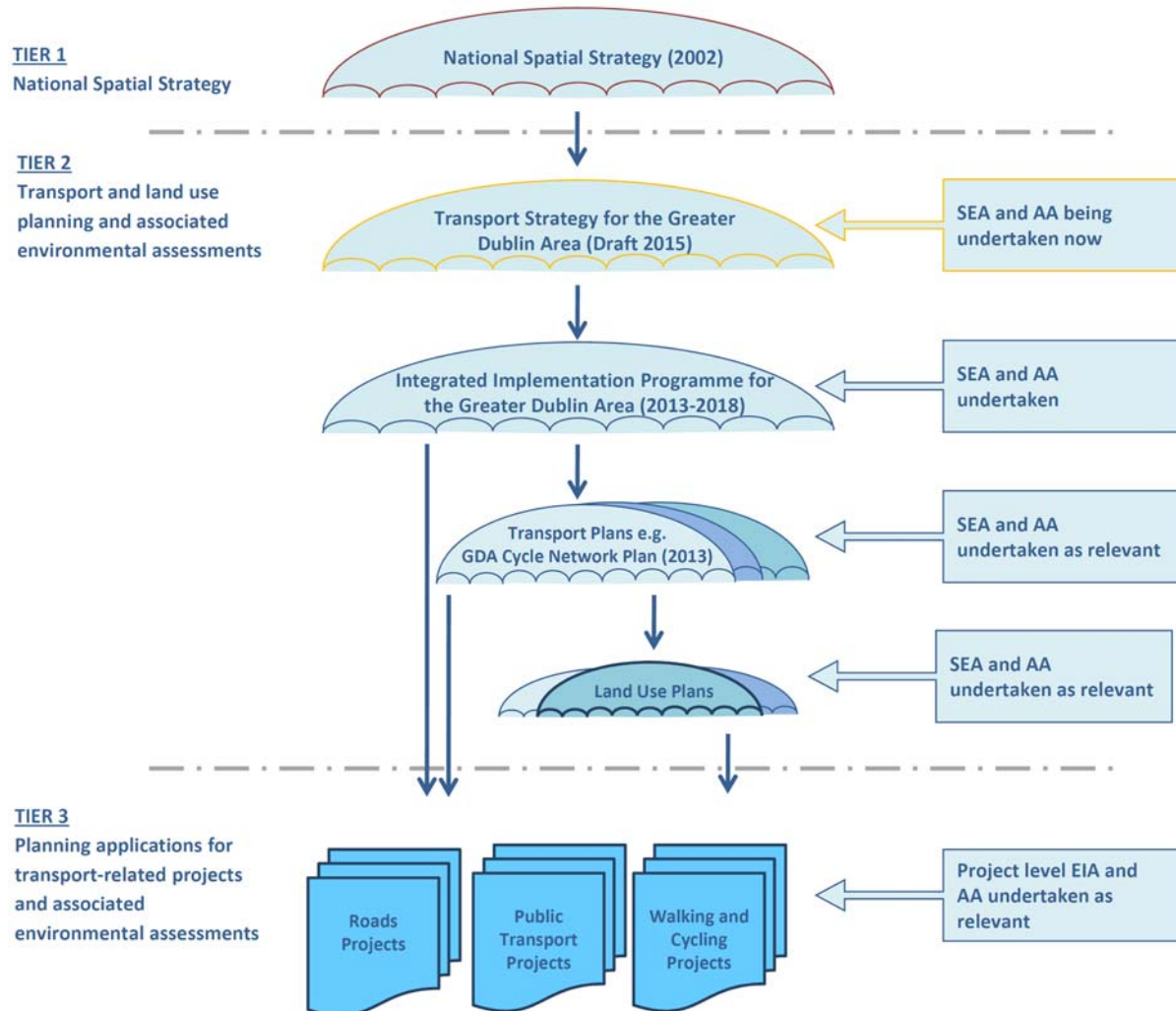


Figure 3.2 Hierarchy of Planning and Environmental Assessment

### **3.3 Schemes within the Strategy**

The Transport Strategy includes, inter alia, a number of different schemes grouped under four main modes; rail, bus, cycle and road.

With regard to their current planning status, these schemes can be classified as follows:

1. Existing – the schemes are built or no planning application is required
2. Permitted – planning permission has already been granted
3. In planning – the schemes are already under consideration by An Bórd Pleanála or local authority
4. Not Started – the schemes are not started, no planning application has been lodged
5. Not applicable – underlying infrastructure is in place or has already been the subject of an SEA e.g. the NTA's Cycle Network.

Using the above numbering, Table 3.2 to Table 3.4 classify the schemes contained in the Strategy according to their planning status.

Scheme Name	Planning Status 1 = Existing; 2 = Permitted; 3 = In planning; 4 = Not Started; 5 = Not applicable
1. Heavy Rail	
a. Phoenix Park Tunnel	1
b. DART Underground	2
c. DART Expansion	
i. Electrification of Maynooth to Connolly Line	4
ii. Electrification of Northern Line to Drogheda	4
iii. Capacity Enhancements to Northern Rail Line	4
iv. Electrification of Hazelhatch to Docklands Line	2
v. Capacity Enhancements on Southern Line (passing loop)	4
2. Light Rail	
a. LUAS Cross City	2
b. Lucan to City Centre	4
c. Extension Red Line to Poolbeg	4
d. Green Line Extension to Bray	4
e. Luas Cross City Extension to North Finglas	4
3. Metro	
a. Metro North	2
b. Green Line Upgrade to Metro to Cherrywood	4

**Table 3.1 Rail Schemes and Planning Status**

Scheme Name	Planning Status 1 = Existing; 2 = Permitted; 3 = In planning; 4 = Not Started; 5 = Not applicable
1. BRT	
a. Swords to City Centre	4
b. Blanchardstown to UCD	4
c. Clongriffin to Tallaght	4
2. Metropolitan Radial Bus	
16 Routes	5
3. Regional Express Buses	
16 Routes	5
4. Orbital Bus Route	
Inside M50	5
Outside M50	5

**Table 3.2 Transport Strategy Bus Schemes and Planning Status**

Scheme Name	Planning Status
GDA Cycle Network	5

**Table 3.3 Transport Strategy Cycle Scheme and Planning Status**



Scheme Name	Local Authority	Planning Status  1 = Existing; 2 = Permitted; 3 = In planning; 4 = Not Started; 5 = Not applicable  Note that "not started" road schemes have been published in various levels of detail in Development Plans, Local Area Plans and some early public consultation exercises
Dublin Tunnel South Port Link Road	DCC	4
M50 Third Lane (Sandyford to M11)	DLRCC	4
Glenamuck District Distributor Road	DLRCC	4
Glenamuck Local Distributor Road (including Ballychorus Link)	DLRCC	4
Leopardstown Link Road Phase 2	DLRCC	4
Loughlinstown Roundabout	DLRCC	4
N3N4: Barnhill to Leixlip Interchange	FCC	4
N3 Upgrade: Littlepace to M50	FCC	4
R107 Malahide Road Realignment, Balgriffin Bypass	FCC	4
Porterstown Distributor Link Road	FCC	4
N3-N4 Link: Ongar to Barnhill	FCC	4
N3 Castaheany Interchange Upgrade	FCC	4
East-West Distributor Road: Malahide Road to Stockhole Lane	FCC	4
R126 Donabate Relief Road: R132 to Portrane Demesne	FCC	4
Oldtown-Mooretown Western Distributor Link Road	FCC	4
Swords Relief Road at Lord Mayors	FCC	4
ORR - Extension from Blanchardstown - Airport (East West Distributor Road: Stockhole Lane to Cherryhound)	FCC	4
ORR - Extension to Blanchardstown	FCC	4
Third lane in each direction along the M7 / N7	KCC	2
M2/ Slane Bypass	MCC	3
North-South Road west of Adamstown SDZ linking N7 to N4 and on to Fingal	SDCC	4
Capacity Increase - N7/M7	SDCC	4
Provision of free flow junctions at the Killarney Road interchange	WCC	4
N11 Upgrade (including widening to three lanes) between the County boundary and Kilmacanogue / Glen Of The Downs	WCC	4
Removal of Herbert Rd & Silver Bridge junctions by the provision of a collector road between Dargle Rd & Killarney Rd (N11)	WCC	4
M11 - Wicklow - Arklow	WCC	2

**Table 3.4 Transport Strategy Road Schemes and Planning Status**

### 3.4 Appropriate Assessment and Integrated Biodiversity Impact Assessment

#### 3.4.1 Appropriate Assessment

A Stage 2 Appropriate Assessment (AA) has been undertaken alongside the preparation of the Strategy.

The requirement for AA is provided under the EU Habitats Directive (Directive 1992/43/EEC).

The AA concluded that the Strategy will not affect the integrity of the Natura 2000 network<sup>2</sup>.

The preparation of the Strategy, SEA and AA has taken place concurrently and the findings of the AA have informed both the Strategy and the SEA. All recommendations made by the AA were integrated into the Strategy.

#### 3.4.2 Integrated Biodiversity Impact Assessment

Many elements of Integrated Biodiversity Impact Assessment as detailed in the EPA's (2013) Practitioner's Manual have been aligned with in the undertaking of the SEA for the Strategy. These include:

##### Scoping

- Biodiversity-relevant issues were identified for consideration at scoping stage and these are now detailed in Section 4.
- Reference to a zone of influence is provided, including at Section 4.

##### Current State of the Environment

- Biodiversity data sources relevant for this regional level assessment have been identified.
- Designated sites and other habitats and species of ecological value are identified.
- AA information has been incorporated into the SEA.

##### Alternatives

- Impacts upon biodiversity are considered under each of the alternatives and certain potential conflicts can be mitigated.

##### Impact assessment

- Effects on biodiversity are identified and assessed and the AA gives consideration to the interrelationship between biodiversity and potential effects on European sites.

##### Mitigation and monitoring

- Taking into account all measures contained within the Strategy, all the proposed mitigation measures deriving from the various processes were generally consistent and compatible.
- Indicators and associated targets have been included in SEA for monitoring European sites.

##### Reporting

- This SEA ER addresses all biodiversity-related considerations relevant for this level of assessment.
- This SEA ER contains all biodiversity-relevant information, data, figures and maps relevant for this level of assessment.
- This SEA ER has been informed by the AA findings.

##### Communication and consultation

- Submissions from various environmental authorities have been taken on board.
- The preparation of the Strategy, SEA and AA has taken place concurrently and the findings of the AA have informed both the Strategy and the SEA.

### 3.5 Screening

The determination as to whether or not an SEA is required to be carried out on the Strategy by virtue of the Strategy being likely to result in significant environmental effects is referred to as screening. The NTA concluded that an SEA was required for the Strategy, as it comprises a 'plan or programme' as defined by the SEA Directive which is likely to have significant environmental effects.

### 3.6 Scoping

#### 3.6.1 Introduction

The scope of environmental issues to be dealt with by the SEA together with the level of detail to which they are addressed was decided upon taking into account the level of detail included in the Strategy and submissions from environmental authorities. Scoping allowed the SEA to become focused upon key issues relevant to the environmental

<sup>2</sup> Except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:

(a) no alternative solution available;  
(b) imperative reasons of overriding public interest for the plan/programme/project to proceed; and  
(c) adequate compensatory measures in place.

components which are specified under the SEA Directive<sup>3</sup>.

As the Strategy is not likely to have significant effects on the environment in another Member State transboundary consultations as provided for by Article 7 of the SEA Directive were not undertaken.

### 3.6.2 Scoping Notices

Relevant environmental authorities<sup>4</sup> identified under the European Communities (Environmental Assessment of Certain Plans and Programmes), as amended, were all sent SEA scoping notices by the NTA indicating that submissions or observations in relation to the scope and level of detail of the information to be included in the environmental report could be made to the Authority.

### 3.6.3 Submissions

Submissions were made by the four following environmental authorities:

A submission from the Environmental Protection Agency (EPA) provided information/suggestions on topics including the following which have been taken into account by the relevant parts of this report:

- Air quality and climate change aspects
- Relationship with other plans/programmes
- Alternatives
- Assessment of likely significant effects
- Mitigation of significant effects
- Monitoring scoping process guidance / available resources / data sets

A submission from the Department of Arts, Heritage and the Gaeltacht (DAHG) provided information/suggestions on topics including the following which have been taken into account by the relevant parts of this report:

- Level of assessment/detail

<sup>3</sup> These components comprise biodiversity, fauna, flora, population, human health, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.

<sup>4</sup> These comprise: Environmental Protection Agency (EPA), Department of the Environment, Community and Local Government (DECLG), Department of Arts, Heritage and the Gaeltacht (DAHG), Department of Agriculture, Forestry and the Marine (DAFM), and Department of Communications, Energy and Natural Resources (DCENR).

- Alternatives
- SEA
- Integrated assessment
- Legislation and relevant Plans
- Baseline data
- SEOs
- Water issues and wetland habitats
- Indicators, targets and monitoring
- Appropriate Assessment
- Guidance
- Conservation objectives
- Integrated assessment
- Cumulative and ex-situ impacts of the Strategy
- Designated sites
- Protected species
- Roads
- Proposed greenways or blueways

A submission from the Department of Agriculture, Forestry and the Marine (DAFM) provided information/suggestions on topics including the following which have been taken into account by the relevant parts of this report:

- Relevant legislation, plans and policies
- Issues for consideration
- Potential impacts on sea-fisheries and aquaculture
- Sources of marine data
- Who to consult with

A submission from the Department of Communications, Energy and Natural Resources (DCENR) provided information/suggestions on topics including the following which have been taken into account by the relevant parts of this report:

- Geological Datasets
- Geological Heritage
- Data Updates.

## 3.7 Environmental Report

In this SEA Environmental Report, which accompanies the Strategy, the likely environmental effects of the Strategy and the alternatives are predicted and their significance evaluated. The Environmental Report provides the Department, stakeholders and the public with a clear understanding of the likely environmental consequences of the Strategy.

Mitigation measures to prevent or reduce significant adverse effects posed by the Strategy are identified in Section 9 - these have been integrated into the Strategy.

The Environmental Report has been updated in order to take account of recommendations contained in submissions and in order to take account of changes which have been made to the original Draft Strategy that was placed on public display.

The Environmental Report is required to contain the information specified in Schedule 2 of the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (SI No. 435 of 2004), as amended (see Table 3.1).

No significant difficulties have been encountered during the undertaking of the assessment.

### **3.8 SEA Statement**

On finalisation of the Strategy, an SEA Statement is prepared which will include information on:

- How environmental considerations have been integrated into the Strategy, highlighting the changes to the Strategy which resulted from the SEA process;
- How the SEA Environmental Report and consultations have been taken into account, summarising the key issues raised in consultations and in the Environmental Report indicating what action was taken in response;
- The reasons for choosing the Strategy in the light of other alternatives considered, identifying these alternatives, commenting on their potential effects and explaining why the final Strategy was selected; and
- The measures decided upon to monitor the significant environmental effects of implementing of the Strategy.

**Table 3.5 Checklist of Information included in this Environmental Report**

<b>Information Required to be included in the Environmental Report</b>	<b>Corresponding Section of this Report</b>
(A) Outline of the contents and main objectives of the plan or programme, and of its relationship with other relevant plans and programmes	Sections 2, 5 and 8
(B) Description of relevant aspects of the current state of the environment and the evolution of that environment without implementation of the plan or programme	Section 4
(C) Description of the environmental characteristics of areas likely to be significantly affected	Sections 4, 7 and 8
(D) Identification of any existing environmental problems which are relevant to the plan or programme, particularly those relating to European protected sites	Section 4
(E) List environmental protection objectives, established at international, EU or National level, which are relevant to the plan or programme and describe how those objectives and any environmental considerations have been taken into account when preparing the Plan	Sections 5, 7, 8 and 9
(F) Describe the likely significant effects on the environment	Sections 7 and 8
(G) Describe any measures envisaged to prevent, reduce and as fully as possible offset any significant adverse environmental effects of implementing the plan or programme	Section 9
(H) Give an outline of the reasons for selecting the alternatives considered, and a description of how the assessment was undertaken (including any difficulties)	Sections 6, 7 and 8
(I) A description of proposed monitoring measures	Section 10
(J) A non-technical summary of the above information	Non-Technical Summary
(K) Interrelationships between each environmental topic	Addressed as it arises within each Section

## Section 4 Relevant aspects of the current state of the Environment

### 4.1 Introduction

Reflecting the specifications in the SEA Directive, the relevant aspects of the current state of the environment for the following environmental components are identified in this section:

- Air and Climatic Factors;
- Population and Human Health;
- Biodiversity, Flora and Fauna;
- Material Assets;
- Soil;
- Water;
- Cultural Heritage;
- Landscape; and
- The interrelationship between the above factors.

Information which is relevant to lower tier planning and project development and associated environmental assessments is identified (note that Article 5 of the SEA Directive, in accordance with the established European principle of subsidiarity, requires that the Environmental Report includes the information that may reasonably be required taking into account, inter alia, the extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment).

The spatial scope of the Strategy generally corresponds to the jurisdictions of the seven local authorities of the Greater Dublin Area<sup>5</sup>. Given the potential for impacts beyond the boundary of the Greater Dublin Area, the spatial scope of the SEA will take into account the zone of influence (15km or greater where deemed appropriate) of the Strategy.

The temporal scope is from 2016-2035.

<sup>5</sup> Dublin City Council, Dún Laoghaire Rathdown County Council, Fingal County Council, South Dublin County Council, Kildare County Council, Meath County Council and Wicklow County Council in addition to an area of County Louth to take account of the Dublin to Drogheda rail line.

### 4.2 Likely Evolution of the Environment in the Absence of a new Strategy

The implementation of the Strategy is likely to give rise to the following residual adverse environmental effects:

- An extent of travel related greenhouse gas and other emissions to air. This has been mitigated by provisions which have been integrated into the Strategy, including those relating to sustainable mobility;
- Loss of an extent of non-protected habitats arising from the replacement of semi-natural land covers with artificial surfaces;
- Losses or damage to ecology (these would be in compliance with relevant legislation);
- Residual wastes (these would be disposed of in line with higher level waste management policies);
- Potential residual losses to public assets;
- Flood related risks remain due to uncertainty with regard to extreme weather events;
- Residual visual effects (these would be in compliance with landscape designation provisions);
- Potential alteration to the context and setting of designated cultural heritage however these will occur in compliance with legislation. Potential loss of unknown archaeology however this loss will be mitigated by measures integrated into the Strategy; and
- Loss of an extent of soil function arising from the replacement of semi-natural land covers with artificial surfaces.

In the absence of a new Strategy, none of the adverse effects detailed above would result due to the implementation of the Strategy. However lower-tier Plans would continue to be reviewed and implemented and applications for permission for new projects would continue to be made. Compliance with the mitigation measures outlined under Section 9 of this report would be necessary in order to help ensure that the following significant adverse environmental effects do not occur:

- Potential interactions with human health if effects upon environmental vectors such as air are not mitigated;
- Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites,

ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna;

- Habitat loss, fragmentation and deterioration, including patch size and edge effects;
- Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species and coastal squeeze;
- Effects in riparian zones where new crossings of waters, if any, are progressed;
- Potential effects upon ecology from transport emissions;
- Generation of construction waste;
- Loss or damage to public assets and infrastructure;
- Adverse impacts upon the status of water bodies and entries to the WFD Register of Protected Areas, arising from changes in quality, flow and/or morphology;
- Increase in the risk of flooding;
- Occurrence of adverse visual impacts and conflicts with the appropriate protection of statutory designations relating to the landscape;
- Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities; and
- Adverse impacts on the hydrogeological and ecological function of the soil resource as a result of construction of associated facilities/ infrastructure

In the absence of the Strategy, it is uncertain as to which projects would be progressed or prioritised. Lower-tier plans and projects would be less coordinated. It is uncertain as to whether the following positive effects (that would be facilitated by implementation of the Strategy) would be achieved:

In the absence of the Strategy and the investment in public transport, walking and cycling proposed, lower-tier plans and projects would be less coordinated and it is uncertain as to whether the following positive effects would be achieved:

- A shift from car to more sustainable and non-motorised transport modes;
- Management of traffic flows and associated effects on air quality;
- Reductions in travel related greenhouse gas and other emissions to air and energy usage; and
- The development of transport infrastructure and services in locations which will facilitate use by those living and working in urban/suburban areas;
- Reuse and regeneration of brownfield lands thereby contributing towards a higher efficiency of land utilisation, sustainable mobility and a reduction in the need to develop greenfield lands;
- Enhancement of cultural (archaeological and architectural) heritage and its context in urban areas and their surrounds as a result of replacing motorised modes with more sustainable and non-motorised modes of transport such as walking, cycling and light rail/metro.

## 4.3 Air and Climatic Factors

### 4.3.1 Climatic Factors

The key issue involving the assessment of the effects of implementing the Strategy on climatic factors relates to greenhouse gas emissions arising from transport.

The Strategy facilitates contributions towards improvements in sustainable mobility, thereby facilitating contributions towards reductions in and limiting increases of greenhouse gas emissions. Such emissions would occur otherwise with higher levels of motorised transport and associated traffic.

Ireland's emissions profile has changed considerably since 1990, with the contribution from transport more than doubling and the share from agriculture reducing since 1998. Travel is a source of:

1. Noise;
2. Air emissions; and
3. Energy use (39% of Total Final Energy Consumption in Ireland in 2012 was taken up by transport, the largest take up of any sector)<sup>6</sup>.

Between 2008 and 2011, Ireland's greenhouse gas emissions decreased across all sectors due to the effects of the economic downturn with emissions falling by 15.2% between 2008 and 2011. However, 2012 saw emissions rise by 1.2% when compared with 2011.<sup>7</sup>

Between 1990 and 2013, the Transport sector shows the greatest overall increase at 115.5%. Emissions increased by 2.1% in 2013, the first increase in Transport emissions since 2007. However, Transport emissions have decreased by 23.1% below peak levels in 2007 primarily due to the economic downturn, improving vehicle standards due to the changes in vehicle registration tax and the increase use in biofuels. The increase up to 2007 can be attributed to general economic prosperity, increasing population with a high reliance on private car travel as well as rapidly increasing road freight transport.<sup>8</sup>

<sup>6</sup> Sustainable Energy Ireland (2014) *Energy in Ireland 1990 – 2012*

<sup>7</sup> EPA (2013) Ireland's Greenhouse Gas Emissions in 2012

<sup>8</sup> EPA (2014) Ireland's Provisional Greenhouse Gas Emissions in 2013

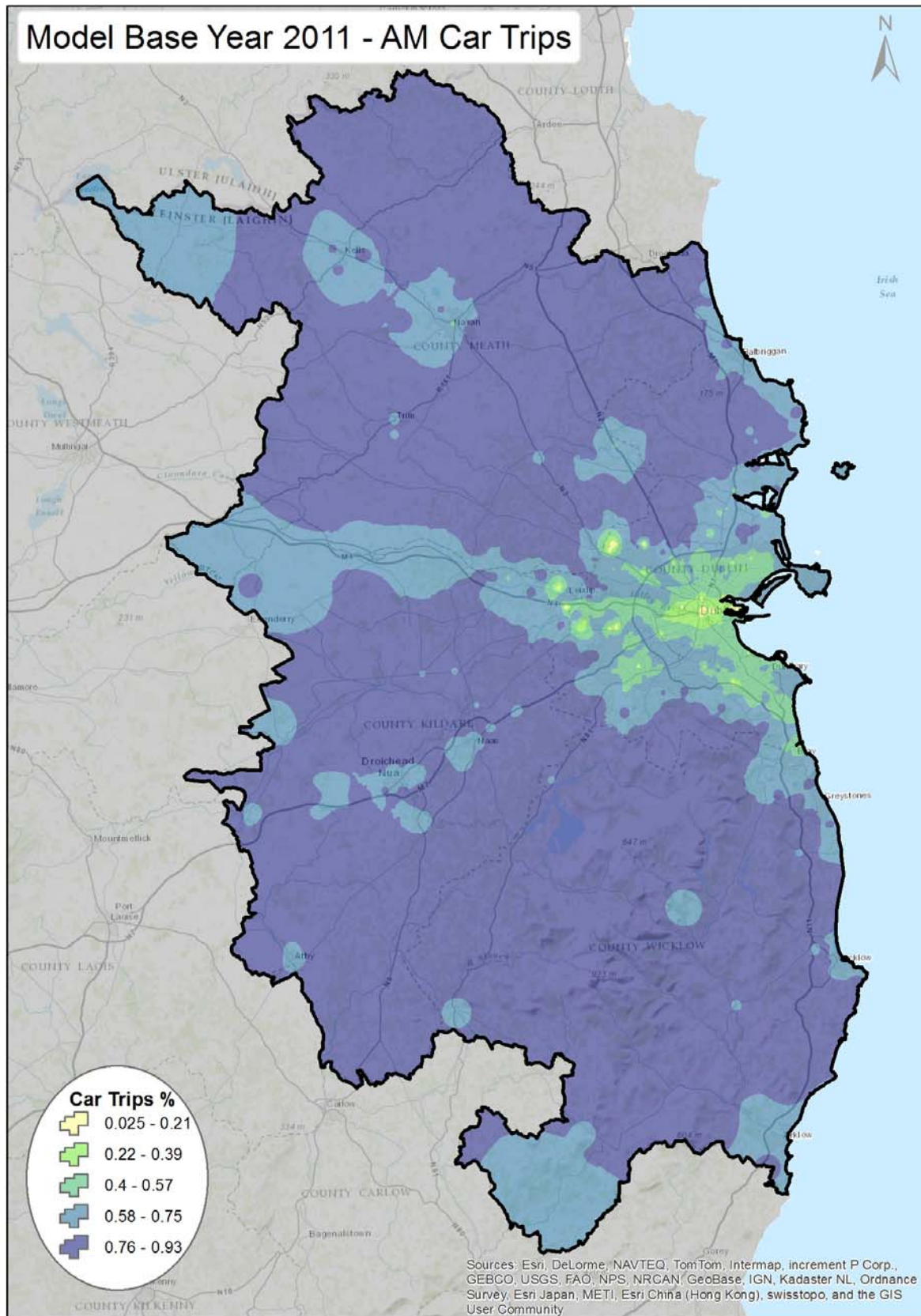
Maximising sustainable mobility will help Ireland meet its emission target for greenhouse gases under the 2020 EU Effort Sharing target which commits Ireland to reducing emissions from those sectors that are not covered by the Emissions Trading Scheme (e.g. transport, agriculture, residential) to 20% below 2005 levels.

The EPA 2015 publication *Ireland's Greenhouse Gas Emission Projections 2014-2035*, identifies that:

- Under the 'worst case' scenario, Ireland is projected to cumulatively exceed its obligations by 4 Mtonnes of CO<sub>2</sub>eq over the period 2013-2020.
- Under the 'best case' scenario, Ireland is projected to cumulatively meet its compliance obligations over the 2013-2020 period and meet its 2020 target. This takes into account the overachievement of the annual limits in the period 2013- 2017 which is banked and used in the years 2018-2020. The report identifies that achieving the outlook under the 'best case' scenario will require focus and effort which includes meeting renewable targets for transport and heat as well as energy efficiency targets.
- Transport emissions are projected to show strong growth over the period to 2020 with a 13%-19% increase on current levels depending on the level of policy implementation. Relative to 2005, transport emissions are projected to remain the same or, at best, decrease by 4% by 2020.

Figure 4.1 maps journeys by car taken as a percentage of all journeys taken (2011 base year) across the GDA. The lowest amount of journeys by car taken as a percentage of all journeys taken occur in areas in Dublin within the M50, in areas surrounding the M50 along the M4, M7, N81 and R156. The highest amount of journeys by car taken as a percentage of all journeys taken occur in more rural areas, away from settlements.





**Figure 4.1 Journeys by car taken as a percentage of all journeys taken (2011 base year)**

### 4.3.2 Ambient Air Quality

In order to protect human health, vegetation and ecosystems, EU Directives set down air quality standards in Ireland and the other Member States for a wide variety of pollutants. These pollutants are generated through fuel combustion, in space heating, traffic, electricity generation and industry and, in sufficient amounts, could affect the well-being of the areas inhabitants. The EU Directives include details regarding how ambient air quality should be monitored, assessed and managed.

The principles to this European approach are set out in the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) (which replaces the earlier Air Quality Framework Directive 1996 and the first, second and third *Daughter Directives*; the fourth *Daughter Directive* will be included in CAFE at a later stage).

The CAFE Directive:

- Sets new air quality objectives for PM<sub>2.5</sub> (fine particles) including the limit value and exposure related objectives;
- Accounts for the possibility to discount natural sources of pollution when assessing compliance against limit values; and
- Allows the possibility for time extensions of three years (PM<sub>10</sub>) or up to five years (NO<sub>2</sub>, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

The fourth Daughter Directive lists pollutants, target values and monitoring requirements for the following: arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.

The fourth Daughter Directive was transposed into Irish legislation by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58 of 2009).

The EPA manages the National Ambient Air Quality Network with air quality and assessments made at locations across the country.

The EPA's (2015) *Air Quality in Ireland 2014* identifies that, overall, air quality in Ireland compares favourably with other EU Member States and continues to be of good quality relative to other EU countries.

The report flags however that limit values may not be enough to mitigate the impacts from air quality and that the crucial challenge for Ireland, now and in the future is decreasing concentrations of particulate matter (PM<sub>10</sub>, PM<sub>2.5</sub>) to below those of the WHO air quality guideline value.

With regard to the transport sector the report identifies:

- That an economic recovery, back to levels in the mid-2000s, could potentially lead to increasing NO<sub>2</sub> concentrations, particularly if future technologies do not yield expected improvements and also if the Irish consumer chooses diesel as a vehicle fuel over alternatives.
- A need to advance policies that decouple economic growth from increased NO<sub>2</sub> levels in our cities and towns.
- That under the CAFE Directive, Ireland is required to reduce levels of PM<sub>2.5</sub> by 10% by 2020 - this will require an integrated approach across a number of sectors including industrial, transport and residential areas. The challenge will be to ensure follow through on sectoral policies to achieve and maintain this reduction.
- The complex relationship between a reduction in our carbon footprint and decreasing PM<sub>2.5</sub> concentrations needs to be tackled in the plans to implement the National Emissions Reduction Target (NERT) for 2020.

The Strategy facilitates contributions towards improvements in sustainable mobility, thereby facilitating contributions towards reductions in and limiting increases of emissions to air. Such emissions would occur otherwise with higher levels of motorised transport and associated traffic.

### 4.3.3 Noise

Noise is unwanted sound. The Noise Directive - Directive 2002/49/EC relating to the assessment and management of environmental noise - is part of an EU strategy setting out to reduce the number of people affected by noise in the longer term and to provide a framework for developing existing EU policy on noise reduction from source. The Directive requires competent authorities in Member States to:

- Draw up *strategic noise maps* for major roads, railways, airports and agglomerations, using harmonised noise indicators<sup>9</sup> and use these maps to assess the number of people which may be impacted upon as a result of excessive noise levels;
- Draw up action plans to reduce noise where necessary and maintain environmental noise quality where it is good; and,
- Inform and consult the public about noise exposure, its effects, and the measures considered to address noise.

The Directive does not set any limit value, nor does it prescribe the measures to be used in the action plans, which remain at the discretion of the competent authorities.

### 4.3.4 Existing Problems

Legislative objectives governing air and climatic factors were not identified as being conflicted with.

---

<sup>9</sup> [Lden (day-evening-night equivalent level) and Lnight (night equivalent level)]

## **4.4 Population and Human Health**

### **4.4.1 Population**

Most users of transport within the Greater Dublin Area will reside in and commute to and from urban/suburban areas.

Figure 4.2 shows population density across the Greater Dublin Area per Electoral Division. Population for each division has been classified into ten categories with an equal number of units in each category. The most populous divisions are generally concentrated within and surrounding the M50 motorway, along the coast of the GDA (as far south as Wicklow), in areas of Meath closest to Dublin and within North-East Kildare and along the M7 corridor. The uplands in County Wicklow, North-West and South Kildare and North County Meath are among the least populous divisions.

Locating transport infrastructure and services closer to urban/suburban areas (which have higher populations and densities) will allow for a greater number of journeys via sustainable transport modes and associated positive environmental effects on energy usage and air and noise emissions.

### **4.4.2 Human Health**

With regard to human health, impacts relevant to the SEA are those which arise as a result of interactions with environmental vectors (i.e. environmental components such as air, water or soil through which contaminants or pollutants, which have the potential to cause harm, can be transported so that they come into contact with human beings). Hazards or nuisances to human health can arise as a result of exposure to these vectors e.g. interactions with human health that could occur in urban locations that experience high levels of traffic congestion and associated particulate matter and noise emissions to air.

### **4.4.3 Existing Problems**

There is historic and predictive evidence of flooding within the Strategy area (see Section 4.7.3).

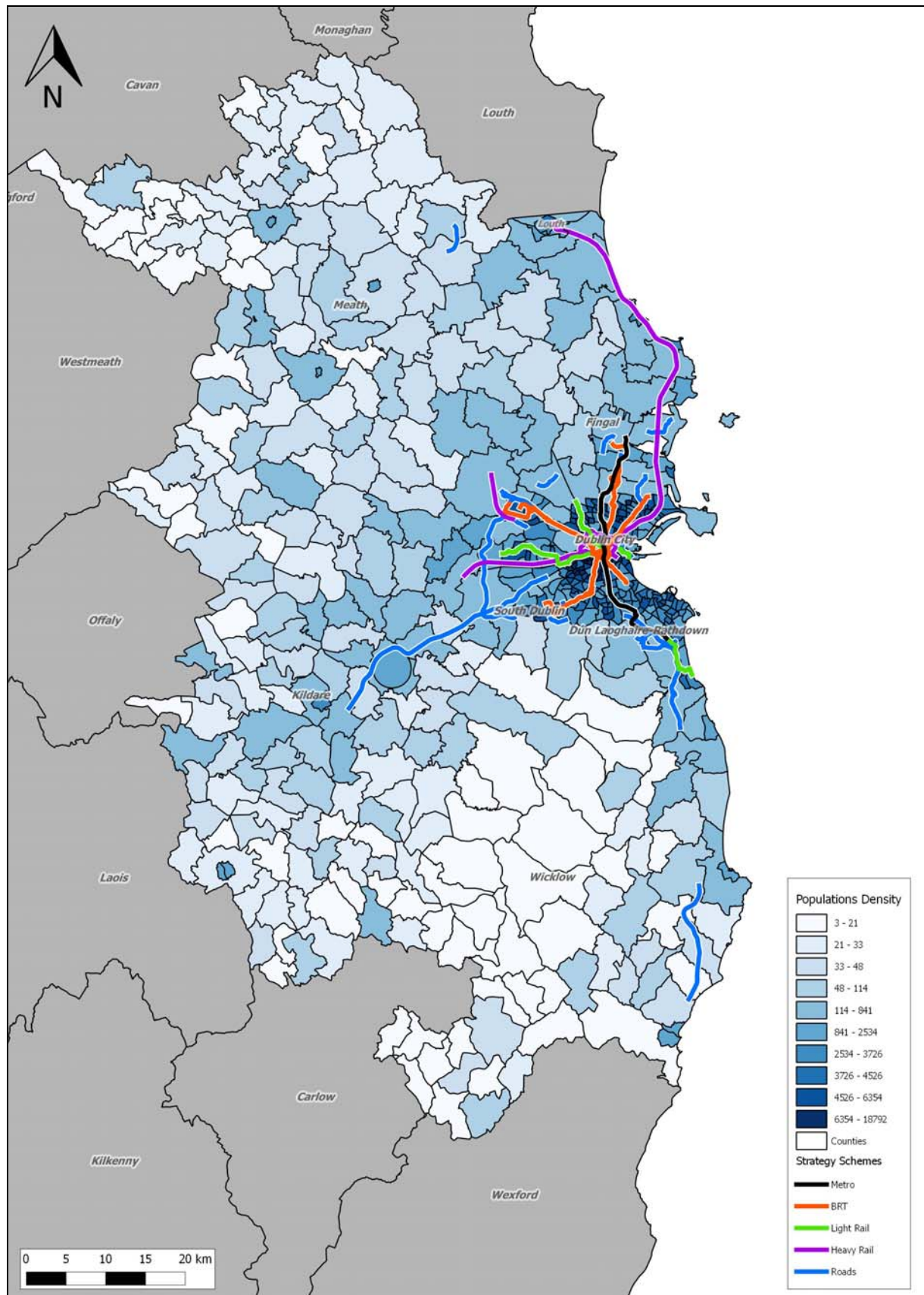


Figure 4.2 Population Density



## 4.5 Biodiversity and Flora and Fauna

Information on biodiversity and flora and fauna which is relevant to lower tier project planning and development and associated environmental assessment includes available information on designated ecological sites and protected species, ecological connectivity (including stepping stones and corridors) and non-designated habitats.

Areas containing the greatest extent of sensitive ecological features include coastal habitats (including intertidal flats, islands, sand and dunes) and those in the uplands of County Wicklow (including peat bogs and forests). In addition to coastal waters there are a number of rivers and lakes draining the area which provide habitats for sensitive species. Dublin has the least concentration of sensitive habitats, although Dublin Bay is heavily designated. Wicklow's sensitivities include peat bogs and forest areas, including those found in the uplands, and coastal areas. Kildare's sensitivities include peat bogs in the North-West of the County. Dispersed areas of marginal agricultural lands that may include ecological sensitivities generally occur in Counties Meath, Kildare and Wicklow.

Ecological designations include:

- Candidate Special Areas of Conservation<sup>10</sup> (cSACs) and Special Protection Areas<sup>11</sup> (SPAs);

<sup>10</sup> cSACs have been selected for protection under the European Council Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) by the DECLG due to their conservation value for habitats and species of importance in the European Union. The sites are *candidate* sites because they are currently under consideration by the Commission of the European Union. The Habitats Directive seeks to establish Natura 2000, a network of protected areas throughout the EU. It is the responsibility of each member state to designate SACs to protect habitats and species, which, together with the SPAs designated under the 1979 Birds Directive, form Natura 2000.

The European Communities (Birds and Natural Habitats) Regulations 2011 consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats) (Control of Recreational Activities) Regulations 2010. The Regulations have been prepared to address several judgments of the Court of Justice of the European Union (CJEU) against Ireland, notably cases C-418/04 and C-183/05, in respect of failure to transpose elements of the Birds Directive and the Habitats Directive into Irish law.

- UNESCO World Heritage and UNESCO Biosphere sites<sup>12</sup>;
- Ramsar Sites<sup>13</sup>;
- Salmonid Waters<sup>14</sup>;
- Shellfish Waters<sup>15</sup>;
- Freshwater Pearl Mussel catchments<sup>16</sup>;
- Flora Protection Order<sup>17</sup> sites;
- Wildlife Sites (including Nature Reserves<sup>18</sup>);
- Certain entries to the Water Framework Directive Register of Protected Areas<sup>19</sup>;

<sup>11</sup> SPAs have been selected for protection under the 1979 European Council Directive on the Conservation of Wild Birds (79/409/EEC) - referred to as the Birds Directive - by the DECLG due to their conservation value for birds of importance in the European Union.

<sup>12</sup> United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List comprises sites of outstanding universal value: cultural, natural or mixed. The UNESCO Biosphere Reserves List comprises areas of terrestrial and coastal ecosystems promoting solutions to reconcile the conservation of biodiversity with its sustainable use.

<sup>13</sup> Ramsar sites are designated and protected under the Convention of Wetlands of International Importance, especially as Water Fowl Habitat, which was established at Ramsar in 1971 and ratified by Ireland in 1984. Ireland presently has 45 sites designated as Wetlands of International Importance, with surface areas of 66,994 hectares. The objective of a Ramsar site is the conservation of wetlands for wildfowl. While Ireland ratified the Ramsar Convention in 1984 there is no legal backing for Ramsar sites unless they are also Nature Reserves or SPAs and as such are protected by the Wildlife Acts 1976 and 2000 or the Birds or Habitats Directives.

<sup>14</sup> Salmonid waters are designated and protected as under the European Communities (Quality of Salmonid Waters) Regulations 1988 (SI No. 293 of 1988). Designated Salmonid Waters are capable of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

<sup>15</sup> In order to protect existing shellfish waters and to ensure the future protection of these areas, the European Union introduced the Shellfish Waters Directive (2006/113/EC). The purpose of this Directive is to put in place concrete measures to protect waters, including shellfish waters, against pollution and to safeguard certain shellfish populations from various harmful consequences, resulting from the discharge of pollutant substances into the sea. The Directive applies to the aquatic habitat of bivalve and gastropod molluscs only (includes oysters, mussels, cockles, scallops and clams). It does not include crustaceans such as lobsters, crabs and crayfish.

<sup>16</sup> Freshwater pearl mussel is a globally threatened, long-lived and extremely sensitive species that can be impacted by many forms of pollution, particularly sediment and nutrient pollution and by hydrological and morphological changes, which may arise from developments, activities or changes in any part of the catchment.

<sup>17</sup> The current list of plant species protected by Section 21 of the Wildlife Act, 1976 is set out in the Flora (Protection) Order, 1999.

<sup>18</sup> A Nature Reserve is an area of importance to wildlife, which is protected under Ministerial order. There are currently 78 Statutory Nature Reserves. Most are owned by the State but some are owned by organisations or private landowners.

- Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs)<sup>20</sup>;
- Wildfowl Sanctuaries (see S.I. 192 of 1979)<sup>21</sup>; and
- Tree Preservation Orders (TPOs)<sup>22</sup>.

Protected Species include:

- Annex IV (Habitats Directive) species of flora and fauna, and their key habitats (i.e. breeding sites and resting places), which are strictly protected wherever they occur, whether inside or outside the above sites, e.g. Otter and bats;
- Other species of flora and fauna and their key habitats which are protected under the Wildlife Acts, 1976-2000, wherever they occur; and
- 'Protected species and natural habitats' as defined in the European Liability Directive (2004/35/EC) and European Communities (Environmental Liability) Regulations, 2008, including: Birds Directive – Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur) and Habitats Directive – Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places (wherever they occur).

<sup>19</sup> In response to the requirements of the Water Framework Directive a number of water bodies or parts of water bodies which must have extra controls on their quality by virtue of how their waters are used by wildlife have been listed on Registers of Protected Areas (RPAs). RPAs include those for Protected Habitats or Species, Shellfish, Salmonid, Nutrient Sensitive Areas, Recreational Waters and Drinking Water.

<sup>20</sup> NHAs are designated due to their national conservation value for ecological and/or geological/geomorphological heritage. They cover nationally important semi-natural and natural habitats, landforms or geomorphological features, wildlife plant and animal species or a diversity of these natural attributes. NHAs are designated under the Wildlife (Amendment) Act 2000. pNHAs were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats.

<sup>21</sup> Wildfowl Sanctuaries are areas that have been excluded from the 'Open Season Order' so that game birds can rest and feed undisturbed. There are 68 sanctuaries in the State. Shooting of game birds is not allowed in these sanctuaries.

<sup>22</sup> TPOs are a planning mechanism whereby individual trees or groups of trees can be identified as important and protected by a TPO.

The following information is relevant to ecological networks and connectivity and non-designated habitats:

- CORINE land cover mapping (including areas likely to contain a habitat listed in annex 1 of the Habitats Directive)<sup>23</sup>;
- Watercourses, wetlands and peatlands;
- Other relevant County Development Plan designations;
- The EPA's Framework National Ecological Network for Ireland<sup>24</sup>; and
- Other sites of high biodiversity value or ecological importance, e.g. BirdWatch Ireland's 'Important Bird Areas' (Crowe et al., 2009).

Ecological networks are important in connecting areas of local biodiversity with each other and with nearby designated sites so as to prevent islands of habitat from being isolated entities. They are composed of linear features, such as treelines, hedgerows and rivers/streams, which provide corridors or stepping stones for wildlife species moving within their normal range. They are important for the migration, dispersal and genetic exchange of species of flora and fauna particularly for mammals, especially for bats and small birds and facilitate linkages both between and within designated ecological sites, the non-designated surrounding countryside and urban areas.

Article 10 of the Habitats Directive recognises the importance of ecological networks as corridors and stepping stones for wildlife, including for migration, dispersal and genetic exchange of species of flora and fauna. The Directive requires that ecological connectivity and areas of ecological value outside the Natura 2000 network of designated ecological sites are maintained.

<sup>23</sup> The CORINE land cover mapping classifies land cover under various headings. This dataset allows for the identification of lands that are likely to be most valuable to biodiversity including those which are likely to contain a habitat listed in Annex 1 of the Habitats Directive e.g. natural grasslands, peat bogs, salt marshes. CORINE Land Cover (CLC) is a map of the European environmental landscape based on interpretation of satellite images. Land cover is the observed physical cover, as seen from the ground or through remote sensing, including for example natural or planted vegetation, water and human constructions which cover the earth's surface.

<sup>24</sup> The EPA's Framework National Ecological Network provides a classification of the relative importance of areas by virtue of the biodiversity and flora that they contain and the connectivity they provide. Many of the areas identified are corridors.

Ecological islands or areas of habitat that are not connected to surrounding ecologically valuable habitats can also be important.

#### 4.5.1 Further Detail

##### 4.5.1.1 Natura 2000 sites

Additional information on Natura 2000 sites is provided in the AA Natura Impact Statement which accompanies the Strategy and this Environmental Report.

Figure 4.3 maps Natura 2000 sites within 15km of the Strategy Area. The greatest extent of area designated within the GDA comprises the Wicklow Mountains. Lands at the coastal margins and coastal waters adjacent to the GDA are also designated. Other Natura 2000 designations within the GDA include river systems (e.g. River Boyne and Blackwater in West and North Meath, River Barrow and Nore in West and South Kildare and River Slaney in South Kildare) and patches of bog designations (primarily in West Kildare).

Also shown on Figure 4.3 are the borders of River Basin Districts, including those which are shared with adjoining counties.

The Zone of Influence of the Strategy with respect to potential impacts upon ecology via surface waters can be estimated to be all River Basin Districts either wholly within or partially within the study area, including estuarine and coastal water bodies.

##### 4.5.1.2 Natural Heritage Areas and Areas likely to contain Annex I Habitats

Natural Heritage Areas (NHAs), proposed NHAs and areas likely to contain habitats listed on Annex I of the Habitats Directive are illustrated on Figure 4.4. Where they occur, pNHA and NHA designations often overlap with Natura 2000 site boundaries and they include lakes, bog areas, the Grand and Royal Canals and coastal areas including islands and waters. Areas likely to contain Annex I Habitats comprise selected 2012 CORINE landcover mapping entries which are indicative of these areas: broad-leaved forest, peat bog, natural grassland, water bodies, coastal lagoons, mixed forests, moors and heaths, intertidal flats, beaches dunes sand, inland marshes, stream courses, estuaries, sparsely

vegetated areas, burnt areas, salt marshes, bare rocks, transitional woodland scrub and land principally occupied by agriculture with areas of natural vegetation. These areas cover much of the uplands and foothills of County Wicklow, the bogs in Kildare and smaller pockets elsewhere.

Also shown on Figure 4.4 are the borders of River Basin Districts, including those which are shared with adjoining counties.

#### 4.5.2 Existing Problems

Previous changes in land uses arising from human development have resulted in a loss of biodiversity and flora and fauna however legislative objectives governing biodiversity and fauna were not identified as being conflicted with.

The Department of Arts, Heritage and the Gaeltacht's Article 17 report on the Status of EU Protected Habitats and Species in Ireland (2013) identifies many Irish habitats to be of unfavourable status and many to be still declining, although it also identifies that a range of positive actions are underway. The report identifies that the majority of EU-protected species are, however, in "Favourable" status in Ireland, and stable, although a small number are considered to be in "Bad" status and continue to require concerted efforts to protect them.

The Transport Strategy includes robust measures to contribute towards the protection of biodiversity and flora and fauna.



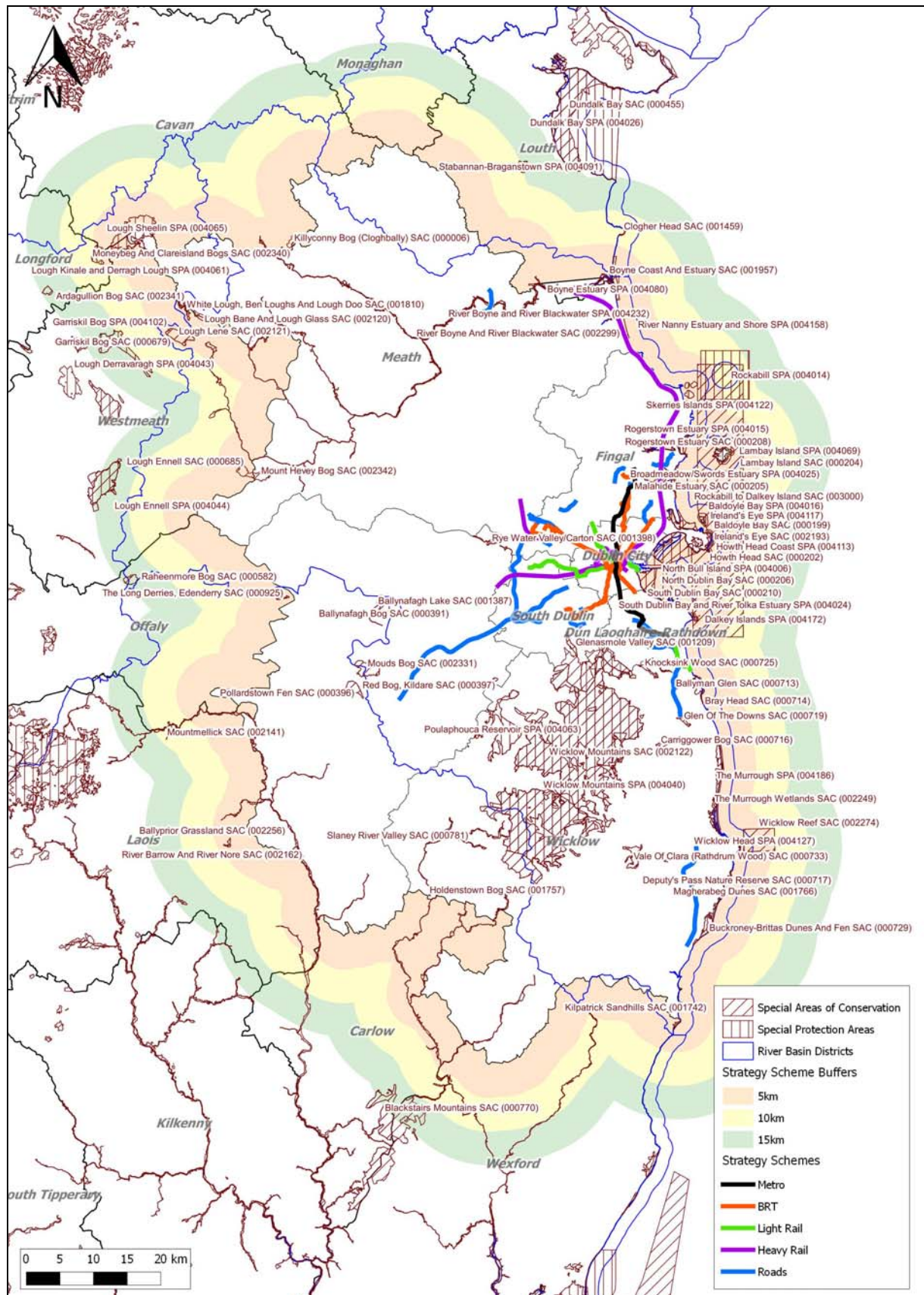
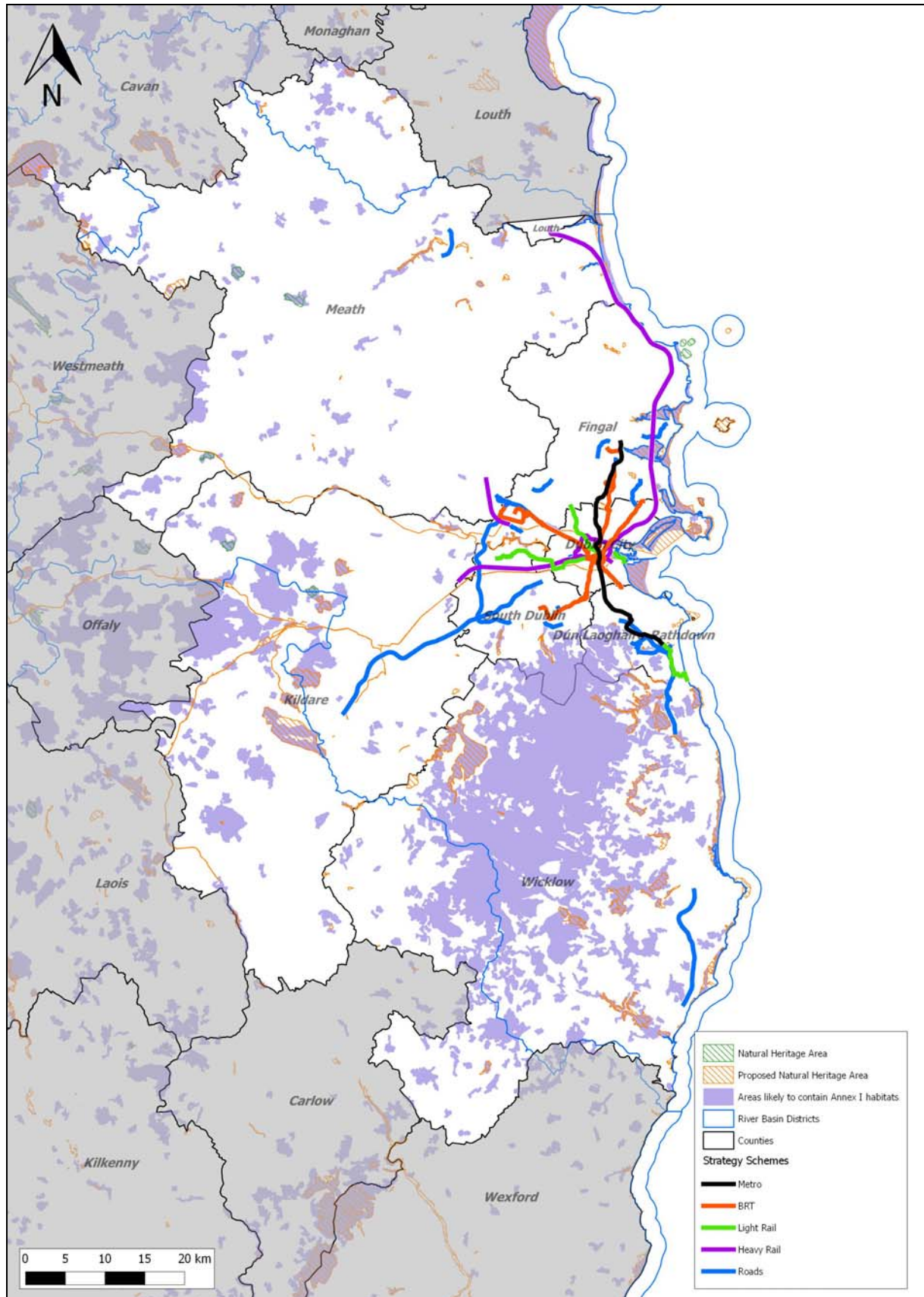


Figure 4.3 Natura 2000 sites within 15 km of the Strategy Area and River Basin Districts



**Figure 4.4 Potential Habitat Sensitivity: Natural Heritage Areas (NHAs), proposed NHAs and areas likely to contain Annex I Habitats**



## 4.6 Material Assets

### 4.6.1 Introduction

Resources that are valued and that are intrinsic to specific places are called 'material assets'. Material Assets relevant to this SEA include:

- Public assets and infrastructure;
- Land; and
- Waste management.

Other material assets covered by the SEA include archaeological and architectural heritage (see Section 4.9) natural resources of economic value, such as air and water (see Sections 4.3 and 4.7).

### 4.6.2 Public Assets and Infrastructure

Public assets and infrastructure which have the potential to be impacted upon by the development of transport infrastructure, if unmitigated, include 'on the ground' resources such as public open spaces, parks and recreational areas; public buildings and services; utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.). Within the Strategy area, these resources are generally located within the immediate outskirts of urban/suburban areas.

### 4.6.3 Land

The development of transport infrastructure and services has the potential to assist with the reuse and regeneration of brownfield sites thereby contributing towards sustainable mobility and reducing the need to develop greenfield lands and associated adverse environmental effects. Within the Strategy area, brownfield lands are generally located within urban/suburban areas.

### 4.6.4 Waste Management

Any construction waste arising from the development of infrastructure is required to be dealt with in compliance with relevant EU and National waste management policy, including that relating to the waste hierarchy of

prevention, recycling, energy recovery and disposal.

For the purposes of waste management planning, Ireland is now divided into three regions: Southern, Eastern-Midlands and Connacht-Ulster. The Strategy area is located within the Eastern-Midlands Region for which a new waste management plan has been adopted in 2015.

### 4.6.5 Existing Problems

No existing problems relevant to the SEA relating to material assets were identified by the assessment.

## 4.7 Water

### 4.7.1 The Water Framework Directive

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD requires that all Member States implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving "good status" by 2015. All public bodies are required to coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted and improve polluted water bodies to good status by 2015.

Article 4 of the WFD sets out various exemptions for deterioration in status caused as a result of certain physical modifications to water bodies. This is provided: all practicable mitigation measures are taken; there are reasons of overriding public interest or the benefits to human health, safety or sustainable development outweigh the benefits in achieving the WFD objective; there are no better alternatives; and the reasons for the physical modification are explained in the relevant river basin management plan.

The EU's Common Implementation Strategy Guidance Document No. 20 provides guidance on exemptions to the environmental objectives of the Water Framework Directive.

For the purpose of implementing the WFD, Ireland has been divided into eight River Basin

Districts (RBDs) or areas of land that are drained by a large river or number of rivers and the adjacent estuarine/coastal areas. Within each RBD - for the purpose of assessment, reporting and management - water has been divided into groundwater, rivers, lakes, estuarine waters and coastal waters which are in turn divided into specific, clearly defined water bodies. The Strategy area covers part of four of the eight WFD RBDs on the island of Ireland: the Eastern RBD; the South Eastern RBD; the Neagh Bann International RBD; and the Shannon International RBD.

River Basin Management Plans have been prepared for each RBD which are being implemented in order to help protect and improve all waters. The Management Plans provides specific policies for individual river basins in order to implement the requirements of the WFD.

## 4.7.2 Sources of Information

### 4.7.2.1 Status of surface and ground waters

The WFD Monitoring Programme in Ireland is undertaken by the EPA<sup>25</sup>. Overviews of the status for monitored waterbodies are published and made available online. In addition to providing overviews on the overall status of waters, the EPA monitors the quality of surface and groundwater across the country and periodically publishes reports on the findings of this monitoring on [www.epa.ie](http://www.epa.ie).

The most recent EPA assessment of water quality monitoring data in Ireland was undertaken in 2013. It also includes overall national statistics. The assessment presents and assesses the latest monitoring data with a focus on key issues that affect water quality.

For surface water, the WFD defines 'status' as the general expression of the status of a body of surface water, determined by the poorer of its ecological status and its chemical status. Thus, to achieve 'good surface water status' both the ecological status and the chemical status of a surface water body need to be at least 'good'.

Ecological status is an expression of the structure and functioning of aquatic ecosystems associated with surface waters.

Such waters are classified as of 'good ecological status' when they meet Directive requirements.

Chemical Status is a pass/fail assignment with a failure defined by a face-value exceedance of an Environmental Quality Standards (EQS) for one or more Priority Action Substances (PAS) listed in Annex X of the Water Framework Directive (WFD). The EQS values for individual PAS substances are set at European level. Good surface water chemical status means that concentrations of pollutants in the water body do not exceed the environmental limit values specified in the Directive.

Rivers within the Strategy area for which classifications have been provided are generally of good, moderate or poor status. Lakes within the Strategy area for which classifications have been provided are generally of good or moderate status.

For groundwater bodies, the approach to classification is different from that for surface water. For each body of groundwater, both the chemical status and the quantitative status must be determined. Both have to be classed as either *good* or *poor*. The WFD sets out a series of criteria that must be met for a body to be classed as good chemical and quantitative status. Groundwater status within the Strategy area is generally identified as being of good status however there are some areas which are identified as being of poor status.

### 4.7.2.2 WFD Registers of Protected Areas

The WFD requires that Registers of Protected Areas (RPAs) are compiled for a number of water bodies or part of water bodies which must have extra controls on their quality by virtue of how their waters are used by people and by wildlife.

The WFD requires that these RPAs contain: areas from which waters are taken for public or private water supply schemes; designated shellfish production areas; bathing waters; areas which are affected by high levels of substances most commonly found in fertilizers, animal and human wastes - these areas are considered nutrient sensitive; areas designated for the protection of habitats or species e.g. Salmonid areas; Special Areas of Conservation (SACs); and, Special Protection Areas (SPAs).

<sup>25</sup> [www.epa.ie](http://www.epa.ie)

#### 4.7.2.3 Bathing Waters

For bathing waters, Mandatory and Guide Values are set out for bathing waters in the 2006 EU Bathing Water Directive and transposing Regulations. Mandatory Values are values which must be observed if the bathing area is to be deemed compliant with the Directive. Compliance with Guide Values exceeds guidance with Mandatory Values and can be regarded as quality objectives which bathing sites should endeavour to achieve.

The most recent available data from the EPA shows that all bathing waters in the Strategy area except for one (Rush, South Beach) are identified as complying with Mandatory values.

#### 4.7.2.4 Potential Water Sensitivity Map

A potential water sensitivity map (see Figure 4.5) has been prepared as part of the SEA process. The purpose of the map is to indicate at a regional level where the main concentrations of water sensitivities might occur within and surrounding the GDA.

The map is prepared at the regional scale and different layers or weightings would produce different map outputs. Where the sensitivity mapping shows a concentration of water sensitivities there is an increased likelihood that development will conflict with this sensitivities and cause environmental deterioration, if mitigation is not applied. It is emphasised that the occurrence of water sensitivities does not preclude development; rather it flags at a strategic level that the mitigation measures - which have already been integrated into the Strategy - will need to be adhered to at lower tiers of decision making in order to ensure that the implementation of the Strategy contributes towards the objectives of the Water Framework Directive. It is emphasised that the map is a high scale, regional map and additional, local water sensitivities may become apparent during the consideration of projects at local level.

The potential water sensitivity map (Figure 4.5)) has been prepared by weighting layers relating to water sensitivity and overlaying them using GIS software. The layers and associated weightings are detailed on Table 4.1.

Layer	Weight
WFD River, Coastal, Transitional Waters of Moderate / Poor / Bad Status	10
WFD Groundwater of Poor Status	10
GSI Groundwater Vulnerability Extreme or Karst	10
GSI Groundwater Vulnerability High	5
WFD RPA Entries for Drinking Water (surface and ground), Bathing Waters, Shellfish Waters, Salmonid Rivers and Nutrient Sensitive Areas	10

**Table 4.1 Water Sensitivity Layers and Weighting**

On Figure 4.5, which also includes River Basin District boundaries, areas with higher water sensitivities are indicated by darker orange colours, areas with moderate water sensitivities are indicated by yellow colours and areas with lower water sensitivities are indicated with green colours.

Rivers throughout the region show up as being sensitive. Heightened sensitivities arising from groundwater data are found in much of County Wicklow, North-West and East Meath, Dublin County and central Kildare. Sensitivity is also attached to coastal areas. Figure 4.5 should be viewed alongside figures in Section 4.5 which provide information including ecological designations.

#### 4.7.3 Flooding

Flooding is an environmental phenomenon which, as well as causing economic and social impacts, could in certain circumstances pose a risk to human health. The existence of flood risk across the area is illustrated by the mapping of locations of historical flooding events - accessible from the Office of Public Works' (OPW), the lead Authority on flooding in the country, National Flood Hazard Mapping website. In addition to this historic mapping there is predictive, modelled Preliminary Flood Risk Assessment mapping available from the OPW. This mapping identifies flood risk at locations within the Strategy area from various sources, including fluvial, pluvial and coastal.

The OPW commenced a National Catchment Flood Risk Assessment and Management (CFRAM) programme in 2011. CFRAM studies are currently being carried out for all River Basin Districts and predictive, modelled CFRAM flood risk maps are expected to be finalised in 2015.

#### **4.7.4 Existing Problems**

Subject to exemptions provided for by Article 4 of the WFD<sup>26</sup>, based on available water data, certain surface and groundwater bodies will need improvement in order to comply with the objectives of the WFD. There is one location within the Strategy area which does not meet Mandatory bathing water values (Rush, South Beach).

There is historic and predictive evidence of flooding within and adjacent to the Strategy area.

---

<sup>26</sup> Article 4 of the WFD sets out various exemptions for deterioration in status caused as a result of certain physical modifications to water bodies. This is provided: all practicable mitigation measures are taken; there are reasons of overriding public interest or the benefits to human health, safety or sustainable development outweigh the benefits in achieving the WFD objective; there are no better alternatives; and the reasons for the physical modification are explained in the relevant river basin management plan.



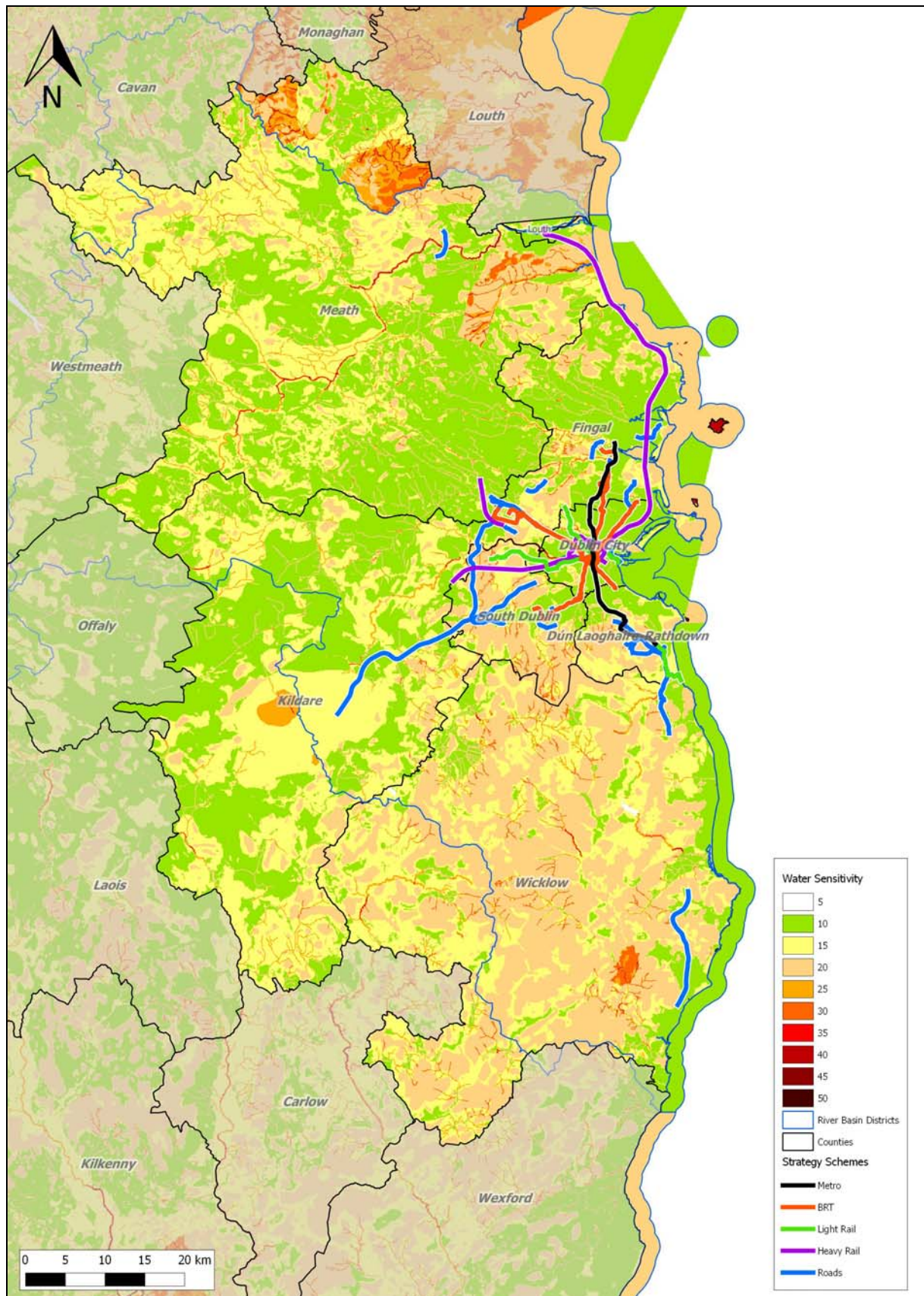


Figure 4.5 Overlay of Potential Water Sensitivity

## 4.8 Landscape

### 4.8.1 Introduction

Landscapes are areas which are perceived by people and are made up of a number of layers: landform, which results from geological and geomorphological history; landcover, which includes vegetation, water, human settlements, and; human values which are a result of historical, cultural, religious and other understandings and interactions with landform and landcover.

### 4.8.2 Designations

The importance of landscape and visual amenity and the role of its protection are recognised in the Planning and Development Act 2000 as amended, which requires that Development Plans include objectives for the preservation of the landscape, views and the amenities of places and features of natural beauty. These objectives and associated plan content often designate different aspects of the landscape such as the following:

- Landscape character areas;
- Landscape sensitivity and value areas;
- High amenity zones;
- Scenic views and prospects; and
- Land use objectives relating to landscape protection.

The European Landscape Convention - also known as the Florence Convention, - promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues. The Convention defines landscape as '*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*'. As a signatory of the Convention there is an obligation on Ireland to prepare a National Landscape Strategy.

Landcover (see below) is one factor which is taken into account in the designation of these aspects.

Such designations, which vary from local authority to local authority and change over time, should be taken into account by lower tier planning and environmental assessments.

In addition to the aforementioned landscape designations, planning authorities are

empowered (under section 202 of the Planning and Development Act 2000), to make a Special Amenity Area Order for reasons of outstanding natural beauty or an area's special recreational value and having regard to any benefits for nature conservation. The purpose of these Orders is to preserve/enhance landscape character and to prevent/limit development. Such areas should also be taken into account by lower tier planning and environmental assessments where/if relevant. There are four SAAOs in the Strategy area, three in County Dublin (North Bull Island, Howth Head and Liffey Valley) and one in County Wicklow (Bray Head).

### 4.8.3 Landcover

CORINE land cover mapping classifies land cover under various headings. This dataset allows for the identification of areas that are likely to be most visually sensitive and robust.

Land cover is the observed physical cover, as seen from the ground or through remote sensing, including for example natural or planted vegetation, water and human constructions which cover the earth's surface. The CORINE Land Cover map is based on interpretation of satellite images.

Three categories of potential landcover sensitivity have been identified within the GDA on Figure 4.6 by combining the following landcover layers:

#### Category 1 Robust Landcover

- Sport and leisure facilities
- Continuous urban fabric
- Discontinuous urban fabric
- Industrial or commercial units
- Road and rail networks
- Sea ports
- Airports
- Mineral extraction sites
- Dump
- Construction sites

#### Category 2 Normal Landcover

- Non-irrigated land
- Coniferous forest
- Complex cultivation patterns
- Pasture
- Transitional woodland scrub



- Land principally occupied by agriculture with areas of natural vegetation

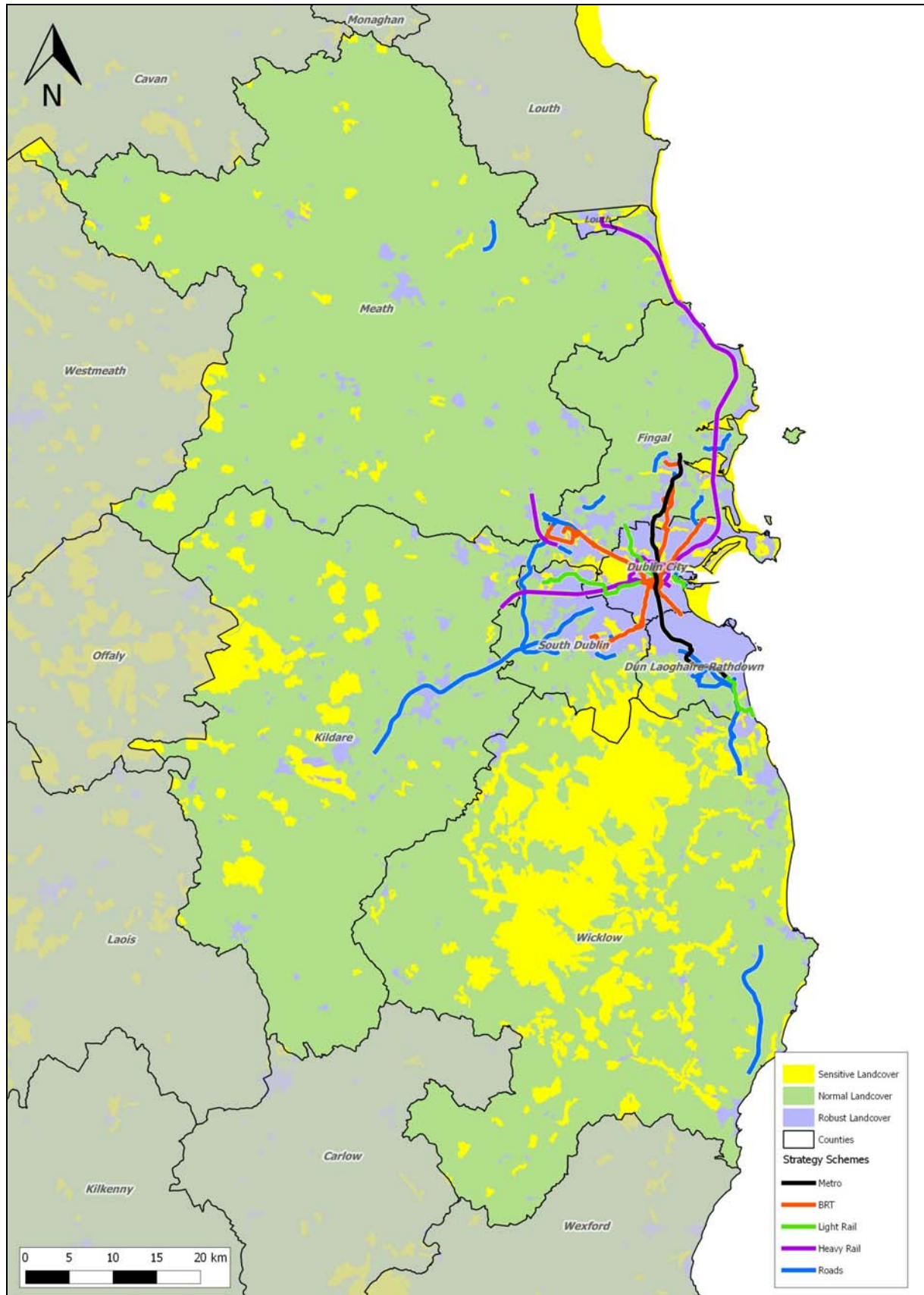
### **Category 3 Sensitive Landcover**

- Fruit trees and berry
- Green urban sites
- Broad-leaved forest
- Peat bog
- Natural grassland
- Water bodies
- Coastal lagoons
- Mixed Forests
- Moors and Heaths
- Intertidal Flats
- Beaches Dunes Sand
- Inland marshes
- Stream Courses
- Estuaries
- Sparsely Vegetated Areas
- Burnt Areas
- Salt Marshes
- Bare Rocks

Normal landcover is the predominant landcover type and is generally found throughout much of County Meath, County Kildare, County Wicklow and Dublin County. Robust landcover is found within and surrounding the M50 motorway and in pockets throughout the GDA. Sensitive landcover are most common in the Wicklow Mountain uplands/foothills, in bog areas in North-West Kildare and in coastal areas and parklands.

### **4.8.4 Existing Environmental Problems**

New developments have resulted in changes to the visual appearance of lands over time however legislative objectives governing landscape and visual appearance were not identified as being conflicted with.



**Figure 4.6 Potential Landcover Sensitivity Mapping**

## 4.9 Cultural Heritage

### 4.9.1 Archaeological Heritage

Archaeology is the study of past societies through the material remains left by those societies and the evidence of their environment. Archaeological sites and monuments vary greatly in form and date; examples include earthworks of different types and periods, (e.g. early historic ringforts and prehistoric burial mounds), megalithic tombs from the Prehistoric period, medieval buildings, urban archaeological deposits and underwater features.

The European Convention on Protection of the Archaeological Heritage known as the Valletta Convention of 1992. This was ratified by Ireland in 1997 and requires that appropriate consideration be given to archaeological issues at all stages of the planning and development process.

Archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997 and the Planning Acts.

The Record of Monuments and Places (RMP) is an inventory, put on a statutory basis by amendment to the National Monuments Act 1994, of sites and areas of archaeological significance, numbered and mapped. It is available from the National Monuments Service and at [archaeology.ie](http://archaeology.ie).

The term 'monument' includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. All monuments in existence before 1700 A.D. are automatically considered to be historic monuments within the meaning of the Acts. Monuments of architectural and historical interest also come within the scope of the Acts. Monuments include: any artificial or partly artificial building, structure or erection or group of such buildings, structures or erections; any cave, stone or other natural product, whether or not forming part of the ground, that has been artificially carved, sculptured or worked upon or which (where it does not form part of the place where it is) appears to have been purposely put or arranged in position; any, or any part of any, prehistoric or ancient tomb, grave or burial deposit, or, ritual, industrial or habitation site;

and any place comprising the remains or traces of any such building, structure or erection, any such cave, stone or natural product or any such tomb, grave, burial deposit or ritual, industrial or habitation site, situated on land or in the territorial waters of the State', but excludes 'any building or part of any building, that is habitually used for ecclesiastical purposes' (National Monuments Acts 1930-2004).

A recorded monument is a monument included in the list and marked on the map which comprises the RMP set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified.

Entries to the Record of Monuments and Places within the Strategy area are shown on Figure 4.7. A buffer of 250m (radius) has been applied to make these designations noticeable at the regional scale of the mapping produced. Where zones associated with the monuments have been provided by the National Monuments Service these have been used instead. Monuments are concentrated within urban/suburban areas and are less common in areas which are not settled, most noticeably much of the Wicklow Mountains.

### 4.9.2 Architectural Heritage

The term architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments Act 1999 as meaning all: structures and buildings together with their settings and attendant grounds, fixtures and fittings; groups of structures and buildings; and, sites which are of technical, historical, archaeological, artistic, cultural, scientific, social, or technical interest.

Records of Protected Structures are legislated for under Section 12 and Section 51 of the Planning and Development Act 2000 as amended. Protected Structures are defined in the Planning and Development Act 2000 as amended as structures, or parts of structures that are of special interest from an architectural, historical, archaeological, artistic, cultural, scientific, social or technical point of view.

In relation to a protected structure or proposed protected structure, the following are encompassed:

- (i) The interior of the structure;
- (ii) The land lying within the curtilage<sup>27</sup> of the structure;
- (iii) Any other structures lying within that curtilage and their interiors; and,
- (iv) All fixtures and features which form part of the interior or exterior of any structure or structures referred to in subparagraph (i) or (iii).

In addition to Protected Structures, the Planning and Development Act, 2000 provides the legislative basis for the protection of Architectural Conservation Areas (ACAs). An ACA is a place, area or group of structures or townscape which is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or contributes to the appreciation of protected structures, whose character it is an objective to preserve in a development plan. The ACA designation requires that planning permission must be obtained before significant works can be carried out to the exterior of a structure in the ACA which might alter the character of the structure or the ACA.

Entries from the Records of Protected Structures identified in the relevant planning authority Development Plan and at [myplan.ie](http://myplan.ie).

Entries from the Records of Protected Structures within the Strategy area are shown on Figure 4.7. A buffer of 250m (radius) has been applied to make these designations noticeable at the regional scale of the mapping produced. Similar to the general spatial spread of monuments, Protected Structures are concentrated within urban/suburban areas and are less common in areas which are not settled, most noticeably much of the Wicklow Mountains.

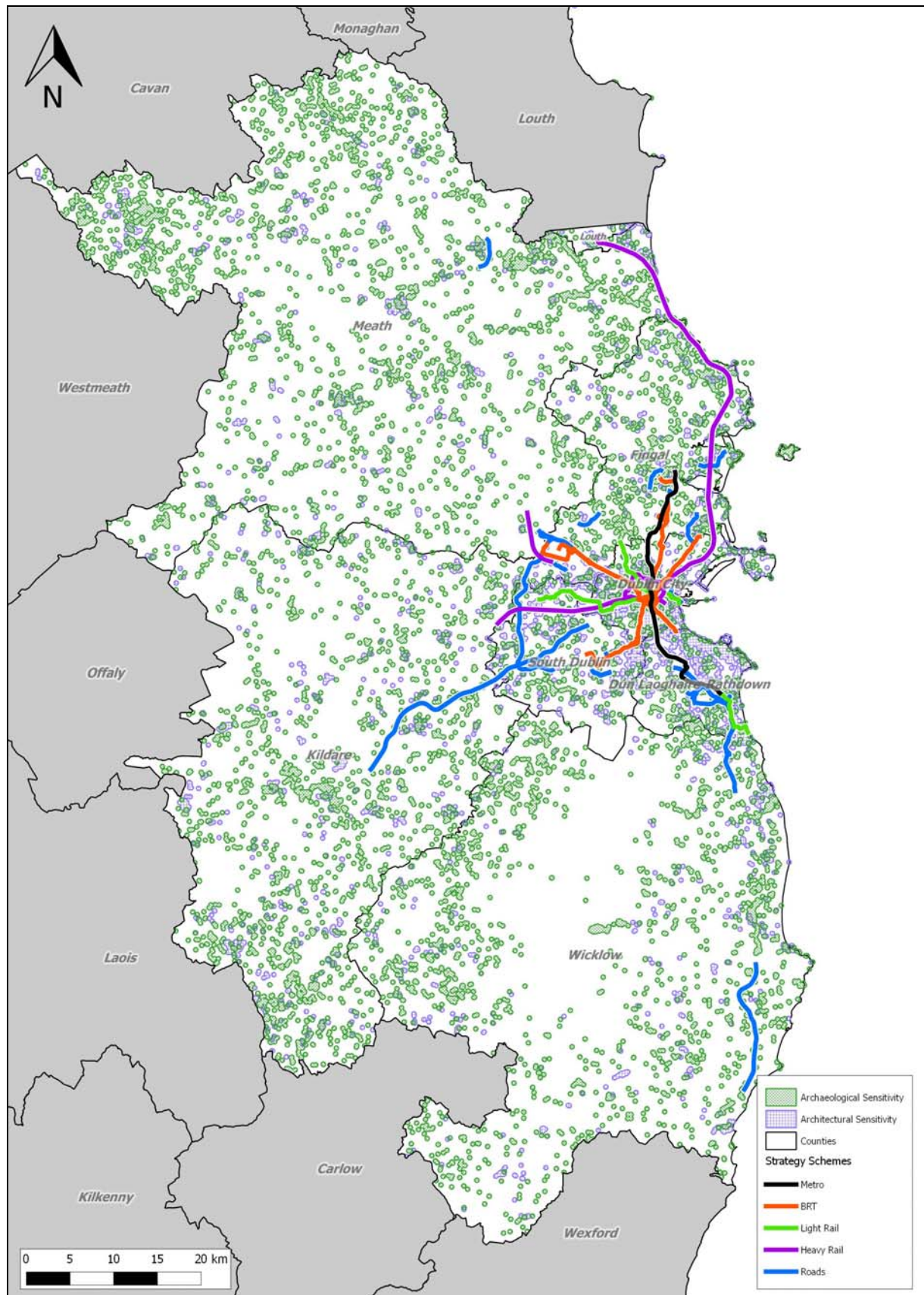
---

<sup>27</sup> Curtilage is normally taken to be the parcel of ground immediately associated with the Protected Structure, or in use for the purposes of the structure. Protection extends to the buildings and land lying within the curtilage. While the curtilage sometimes coincides with the present property boundary, it can originally have included lands, features or even buildings now in separate ownership, e.g. the lodge of a former country house, or the garden features located in land subsequently sold off. Such lands are described as being attendant grounds, and the protection extends to them just as if they were still within the curtilage of the Protected Structure.

### 4.9.3 Existing Problems

The context of archaeological and architectural heritage has changed over time however no conflicts with legislative objectives governing archaeological and architectural heritage have been identified.





**Figure 4.7 Potential Cultural Heritage Sensitivity**

## 4.10 Soil

Soil is the top layer of the earth's crust. It is formed by mineral particles, organic matter, water, air and living organisms. Soil can be considered as a non-renewable natural resource because it develops over very long timescales. It is an extremely complex, variable and living medium and performs many vital functions including: food and other biomass production, storage, filtration and transformation of many substances including water, carbon, and nitrogen. Soil has a role as a habitat and gene pool, serves as a platform for human activities, landscape and heritage and acts as a provider of raw materials. Such functions of soil are worthy of protection because of their socio-economic as well as environmental importance. Soils in any area are the result of the interaction of various factors, such as parent material, climate, vegetation and human action.

To date, there is no legislation which is specific to the protection of soil resources. However, there is currently an EU Thematic Strategy on the protection of soil which includes a proposal for a Soil Framework Directive which proposes common principles for protecting soils across the EU.

Information sources relevant to the environmental component of soil which may be used in lower tier planning and environmental assessments includes:

- Soil types (2006) published by Teagasc, Geological Survey of Ireland (GSI), Forest Service & EPA;
- Soils and Subsoils Class (2006) published by Teagasc, GSI, Forest Service & EPA (2006);
- Sites of Geological Interest which have been published for some counties and provisional information on same for other counties (both available from GSI);
- Other datasets published by and available from GSI including those relating to Bedrock Geology, Quaternary Geology, Mineral deposits, Groundwater Resources and Landslides; and
- Datasets on contaminated soils which may be kept by planning authorities (these occur most often in urban areas).

### 4.10.1 Existing Problems

Legislative objectives governing soil were not identified as being conflicted with.

## 4.11 Overall Environmental Sensitivities and Opportunities/Robustness

### 4.11.1 Overview

Some of the environmental information detailed under previous subsections has been weighted and mapped to show overall environmental sensitivity (see Figure 4.8) and overall environmental robustness (see Figure 4.9) with regard to the development of transport projects. The purpose of the map is to indicate at a regional level where the main concentrations of sensitivities might occur within and surrounding the GDA.

The maps are prepared at the regional scale and different layers or weightings would produce different map outputs. Where the sensitivity mapping shows a concentration of environmental sensitivities there is an increased likelihood that development will conflict with these sensitivities and cause environmental deterioration, if mitigation is not applied. It is emphasised that the occurrence of environmental sensitivities does not preclude development; rather it flags at a strategic level that the mitigation measures - which have already been integrated into the Strategy - will need to be adhered to at lower tiers of decision making in order to ensure that the implementation of the Strategy contributes towards environmental protection.

Where the robustness mapping shows a concentration of environmental robustness there is a decreased likelihood that development will conflict with the environment.

It is emphasised that the maps are high scale, regional maps and additional, local sensitivities and opportunities may become apparent during the consideration of projects at local level.

A weighting system applied through Geographical Information System (GIS)

software was used in order to calculate sensitivity and robustness.

The maps have been prepared by weighting layers relating to environmental sensitivity and robustness and overlaying them using GIS software. The layers and associated weightings are detailed on Table 4.2 and Table 4.3 below.

#### 4.11.2 Environmental Sensitivities

For the environmental sensitivity mapping shown on Figure 4.8 weightings were applied as per Table 4.2. On Figure 4.8, which also includes River Basin District boundaries, areas with higher environmental sensitivities are indicated by darker orange/red colours, areas with moderate environmental sensitivities are indicated by yellow colours and areas with lower environmental sensitivities are indicated with green colours. Heightened areas of sensitivity within the GDA include those in the uplands and foothills of the Wicklow Mountains, in the bog areas of west Kildare, in river valleys (e.g. the River Boyne in central and North Meath, the River Barrow in West and South Kildare and Slaney in South Wicklow) and at lakes. Lands at the coastal margins and coastal waters adjacent to the GDA are also sensitive, especially within and to the north of Dublin Bay. Lower levels of sensitivity occur elsewhere.

Layer	Weight
Any areas covered by SACs or SPAs (see Figure 3.2)	10
Any areas covered by NHAs (see Figure 4.4)	10
Any areas covered by pNHAs or potential Annex I landcovers (see Figure 4.4)	5
Sensitive Landcovers (see Figure 4.6)	10
Recorded Monuments and Protected Structures and associated 250m buffers (see Figure 4.7)	10
Highest Water Sensitivity (highest scores on Figure 4.5 from 35 to 50 inclusive)	15
Moderate Water Sensitivity (middle scores on Figure 4.5 from 20 to 30 inclusive)	10
Lowest Water Sensitivity lowest scores on Figure 4.5 from 5 to 15 inclusive)	5

**Table 4.2 Environmental Sensitivity Layers and Weighting**

#### 4.11.3 Environmental Opportunities/Robustness

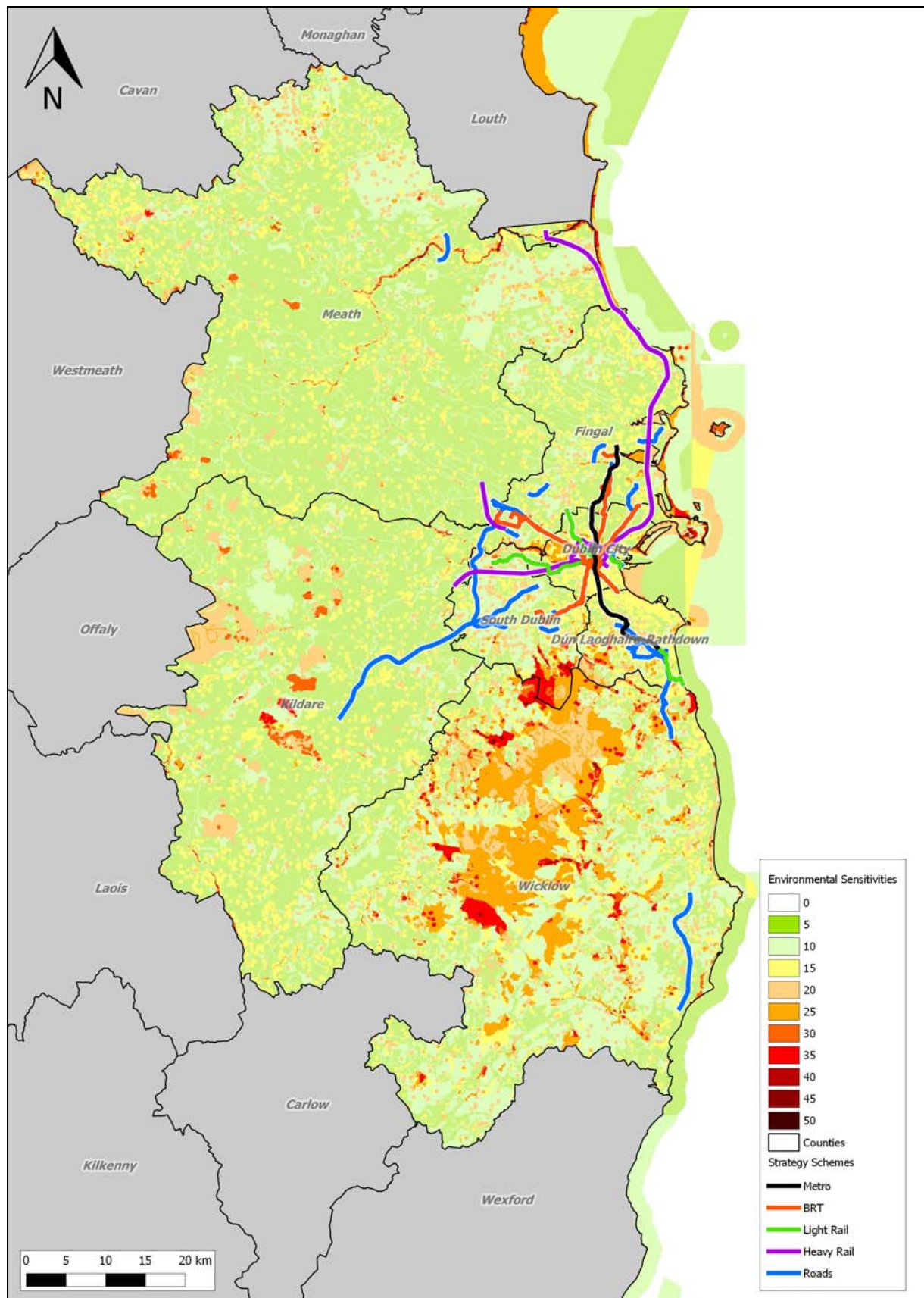
For the environmental robustness mapping shown on Figure 4.9, weightings were applied as per Table 4.3. On Figure 4.9, which also includes River Basin District boundaries, areas with higher environmental robustness are indicated by darker green colours, areas with moderate environmental robustness are indicated by yellow colours and areas with lower environmental robustness are indicated with red/pink colours.

Heightened areas of robustness within the GDA include those within and surrounding the M50 motorway, in much of County Meath, especially South and South-East Meath, in much of County Kildare, especially North-East Kildare, and in County Wicklow, between the Mountains and the coast. Lower levels of robustness occur elsewhere.

Layer	Weight
Any areas not covered by SACs or SPAs (see Figure 3.2)	10
Any areas not covered by NHAs, pNHAs or potential Annex I landcovers (see Figure 4.4)	10
Robust Landcovers (see Figure 4.6)	10
Normal Landcovers (see Figure 4.6)	5
Areas not covered by Recorded Monuments and Protected Structures and associated 250m buffers (see Figure 4.7)	10
Water Sensitivity High (lowest scores on Figure 4.5 from 5 to 15 inclusive)	15
Water Sensitivity Moderate (middle scores on Figure 4.5 from 20 to 30 inclusive)	10
Water Sensitivity Low (highest scores on Figure 4.5 from 35 to 50 inclusive)	5
Population Density High (highest 4 intervals on Figure 4.2)	15
Population Density Moderate (middle 3 intervals on Figure 4.2)	10
Population Density Low (middle 3 intervals on Figure 4.2)	5

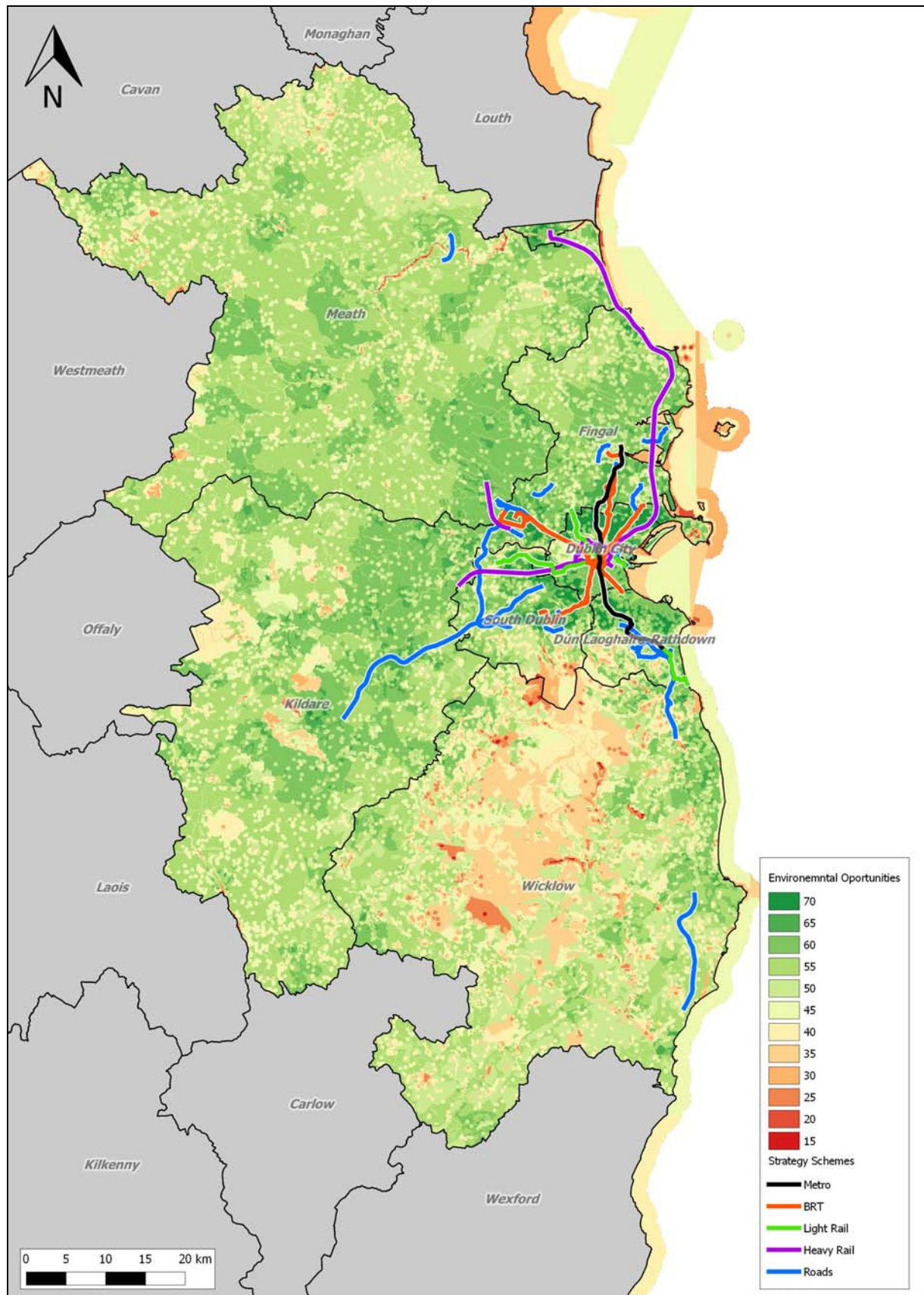
**Table 4.3 Environmental Opportunities/Robustness Layers and Weighting**





**Figure 4.8 Overall Potential Environmental Sensitivity**





**Figure 4.9 Overall Potential Environmental Opportunities/Robustness**

## Section 5 Strategic Environmental Objectives

Strategic Environmental Objectives (SEOs) are methodological measures developed from policies which generally govern environmental protection objectives established at international, Community or Member State level e.g. the environmental protection objectives of various European Directives which have been transposed into Irish law and which are required to be implemented.

The SEOs are set out under a range of topics and are used as standards against which the provisions of the Strategy and the alternatives are evaluated in order to help identify which provisions would be likely to result in significant environmental effects and where such effects would be likely to occur, if - in the case of adverse effects - unmitigated.

The SEOs are linked to indicators which can facilitate monitoring the environmental effects of the Strategy as well identifying targets which the Strategy can help work towards.

All SEOs, indicators and targets are provided on Table 5.1 overleaf while background to these measures is provided in the subsections below.

Further detail on legislation, plans and programmes are provided under Section 2 (and associated Appendix I "Relationship with Legislation and Other Plans and Programmes") and Section 4.

**Table 5.1 Strategic Environmental Objectives, Indicators and Targets**

<b>Environmental Component</b>	<b>Strategic Environmental Objectives</b>	<b>Indicators</b>	<b>Targets</b>
<b>Air and Climatic Factors</b>	C1: To facilitate a reduction in travel related emissions (including pollutants, noise and greenhouse gas emissions) to air	C1i: Compliance with legislation including the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive and the 4 <sup>th</sup> Daughter Directive and adherence to the principles of the Convention on Long Range Transport of Air Pollution C1ii: Greenhouse gas emissions from transport	C1i: To contribute towards compliance with legislative air quality limits and target values <sup>28</sup> C1ii: To facilitate a reduction in greenhouse gas emissions from transport
	C2: To encourage modal change from car to more sustainable forms of transport	C2: Percentage of population travelling to work, school or college by public transport or non-mechanical means	C2: An increase in the percentage of the population travelling to work, school or college by public transport or non-mechanical means
	C3: To facilitate a reduction in energy use by the transport sector	C3: Energy use by the transport sector as a percentage of Total Final Energy Consumption	C3: To facilitate a reduction in the percentage of energy use by the transport sector as a percentage of Total Final Energy Consumption
<b>Population and Human Health</b>	P1: To develop transport infrastructure and services closer to urban/suburban areas	P1: Extent of urban/suburban areas within the catchment of transport infrastructure and services	P1: To maximise the extent of urban/suburban areas within the catchment of transport infrastructure and services
	HH1: To protect populations and human health from exposure to incompatible landuses	HH1: Occurrence (any) of a spatially concentrated deterioration in human health arising from environmental factors resulting from development provided for by the Strategy, as identified by the Health Service Executive and Environmental Protection Agency	HH1: No spatial concentrations of health problems arising from environmental factors as a result of implementing the Strategy

<sup>28</sup> Information on air quality including standards is made available and kept up to date by the EPA at <http://www.epa.ie/air/quality/standards>.

Environmental Component	Strategic Environmental Objectives	Indicators	Targets
<b>Biodiversity, Flora and Fauna</b>	B1: To contribute towards compliance with the Habitats and Birds Directives with regard to the protection of Natura 2000 Sites and Annexed habitats and species <sup>29</sup>	B1: Conservation status of habitats and species as assessed under Article 17 of the Habitats Directive	B1: Implementation of the Strategy should not prevent the maintenance or restoration of favourable conservation status of listed habitat and species <sup>30</sup>
	B2: To contribute towards compliance with Article 10 of the Habitats Directive with regard to the management of features of the landscape which - by virtue of their linear and continuous structure or their function as stepping stones (designated or not) - are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species	B2: Percentage loss of functional connectivity without remediation resulting from development provided for by the Strategy	B2: No significant ecological networks or parts thereof which provide functional connectivity to be lost without remediation resulting from development provided for by the Strategy
	B3: To avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in designated sites including Wildlife Sites and to contribute towards compliance with the Wildlife Acts 1976-2010 with regard to the protection of listed species	B3i: Number of significant impacts on relevant habitats <sup>31</sup> , species <sup>32</sup> , environmental features or other sustaining resources in designated sites including Wildlife Sites resulting from development provided for by the Strategy  B3ii: Number of significant impacts on the protection of listed species	B3i: Avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in designated sites including Wildlife Sites resulting from development provided for by the Strategy  B3ii: No significant impacts on the protection of listed species
<b>Material Assets</b>	M1: To contribute towards the protection of public assets and infrastructure	M1: Protection of public assets and infrastructure such as: public open spaces, parks and recreational areas; public buildings and services; utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.)	M1: Minimisation of impacts upon public assets and infrastructure.
	M2: To assist with the reuse and regeneration of brownfield sites	M2: Extent of brownfield land reused and regenerated which has been facilitated by the Strategy	M2: To maximise the sustainable reuse and regeneration of brownfield sites
	M3: To reduce waste volumes, minimise waste to landfill and increase recycling and reuse	M3: Preparation and implementation of construction and environmental management plans	M3: For construction and environmental management plans to be prepared and implemented for relevant projects

<sup>29</sup> 'Annexed habitats and species' refer to those listed under Annex I, II & IV of the EU Habitats Directive and Annex I of the EU Birds Directive.

<sup>30</sup> With regard to Natura 2000 sites there should be no significant adverse effects except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:

- (a) No alternative solution available;
- (b) Imperative reasons of overriding public interest for the plan/programme/project to proceed; and
- (c) Adequate compensatory measures in place.

<sup>31</sup> Relevant habitats are those for which ecological sites are designated for

<sup>32</sup> Listed species are those which are specifically listed in legislation for protection

<b>Water</b>	W1: To contribute towards the maintenance and improvement, where possible, of the quality and status of surface waters	W1i: Classification of Overall Status (comprised of ecological and chemical status) under the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI No. 272 of 2009)  W1ii: Mandatory and Guide values as set by the EU Bathing Water Directive and transposing Bathing Water Quality Regulations (SI No. 79 of 2008)	W1i: Not to cause deterioration in the status of any surface water or affect the ability of any surface water to achieve 'good status' <sup>33</sup> by 2015  W1ii: To contribute towards the achievement of - as a minimum - Mandatory values and, where possible, to achieve Guide values as set by the EU Bathing Water Directive and transposing Bathing Water Quality Regulations (SI No. 79 of 2008)
	W2: To contribute towards the protection of groundwater against pollution and contamination	W2: Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC	W2: Not to affect the ability of groundwaters to comply with Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC
	W3: To comply as appropriate with the provisions of the Planning System and Flood Risk Management: Guidelines for Planning Authorities	W3: Compliance relevant lower tier assessments and decision making with the Flood Risk Management Guidelines	W3: For lower tier assessments and decision making to comply with the Flood Risk Management Guidelines
<b>Landscape</b>	L1: To avoid or, where infeasible, minimise conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities	L1: Number of unmitigated conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities	L1: No unmitigated conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities
<b>Cultural Heritage</b>	CH1: To contribute towards the protection of archaeological heritage including entries to the Record of Monuments and Places and/or their context	CH1: Percentage of entries to the Record of Monuments and Places - including Zones of Archaeological Potential (and the context of the above within the surrounding landscape where relevant) - protected from significant adverse effects arising from development under the Strategy	CH1: Protect entries to the Record of Monuments and Places - including Zones of Archaeological Potential (and their context of the above within the surrounding landscape where relevant) from significant adverse effects arising from development under the Strategy
	CH2: To contribute towards the protection of architectural heritage including entries to the Records of Protected Structures and Architectural Conservation Areas and their context	CH2: Percentage of entries to the Records of Protected Structures and Architectural Conservation Areas and their context protected from significant adverse effects arising from development under the Strategy	CH2: Protect entries to the Records of Protected Structures and Architectural Conservation Areas and their context from significant adverse effects arising from development under the Strategy
<b>Soil</b>	S1: To minimise damage to the hydrogeological and ecological function of the soil resource	S1: Soil extent and hydraulic connectivity	S1: To minimise reductions in soil extent and hydraulic connectivity

<sup>33</sup> Good status as defined by the WFD equates to approximately the following in the current national schemes of classification as set out by the EPA: *Q4* in the biological classification of  *rivers*; *Mesotrophic* in the trophic classification of lakes, as set out by the EPA; or *Unpolluted status* in the Assessment of Trophic Status of Estuaries and Bays in Ireland (ATSEBI).

## Section 6 Description of Alternatives

### 6.1 Introduction

The Strategy comprises a large array of elements – mostly projects. These have different status – some are fully permitted – following Environmental Impact Assessment (EIA) and Consent, some are currently within the consent process and others have not yet sought consent.

Furthermore, some elements constitute parts of adopted County Development Plans and Regional Strategies. For these reasons the alternatives are expressed as alternatives scenarios about the degree of implementation of all or some of the elements that make up the Strategy.

The scenarios examine how changing external circumstances – both economic and policy – alter the location and extent of the implementation of elements of the Strategy.

In Scenarios 2 and 3 the alternatives envisage that greater reliance will be required on other instruments. In these scenarios attempts to meet and manage demand would be contributed towards by: different mode share; or land-use planning and/or demand management.

Transportation is highly integrated with both land-use planning and the provision of public infrastructure – such as water services in particular. Any consideration of the environmental effects of alternatives needs to consider how changes in the transportation strategy will give rise to different land-use patterns – resulting in different environmental effects.

These alternatives may, therefore, be regarded as different evolutions of the priorities, sequence or composition of the elements making up the Strategy in response to changing policy contexts.

Three Main Alternatives are examined:

1. Alternative 1 Orderly Provision of Transport;
2. Alternative 2 Uneven Provision of Transport; and

3. Alternative 3 Under Provision of Transport

### 6.2 Alternative 1: Orderly Provision of Transport

All elements of the Transport Strategy for the Greater Dublin Area will be implemented in an orderly fashion according to priorities based on transport demand within a larger regional context of patterns of demography and economic activity occurring broadly in line with forecast trends and current plans.

The timely availability of transportation infrastructure will significantly increase the likelihood of co-location of other services – especially water services – in areas that are consistent with the principles of proper planning and sustainable development. The greater levels of certainty are likely to increase spatial concentrations of market-led development – residential, commercial and industrial – in areas that are consistent with regional and local land-use planning objectives.

This alternative scenario, as a result, envisages all major land-use and infrastructure plans being developed in time and all policies to be largely driven by the principles of sustainable development. The result will be a balanced distribution of demographic and economic growth throughout the functional urban region – which will itself reduce journey demand and accelerate the realisation of the targets and indicators of sustainable mobility in the region.

This scenario significantly increases the potential for plan-led, integrated development with associated higher efficiency of land and energy resource utilisation.

### **6.3 Alternative 2: Uneven Provision of Transport**

Most major elements and targets of the Transport Strategy are implemented – in broad outline – with some significant delays or omissions that tend to discourage growth in central areas and inner suburbs, and attract development into peripheral suburban areas close to the M50 and into the coastal strip.

This Scenario envisages significantly increasing congestion and delay issues at critical points within the M50 in the near-term. Critical locations will include major junctions [especially along the M50] as well as overcrowding on key public transport routes – especially within the M50 [LUAS, DART and Commuter rail].

This may require alternative or additional interim means of managing demand to enable the deferral, combination, or alternative implementation of elements of the Strategy. This alternative scenario may change the priorities, sequence or composition of Strategy.

The result will be less balanced distribution of demographic and economic growth throughout the functional urban region which will reduce certainty of locations for market-led development – resulting in continued lack of co-ordination of growth.

This scenario significantly reduces the potential for plan-led, integrated development. There will be associated reduced efficiency of land and energy resource utilisation.

### **6.4 Alternative 3: Under Provision of Transport**

A rapid, overheating Dublin-centred economic recovery producing high levels of economic and demographic development concentrated into East Leinster. The effects of such development is worsened because this occurs in circumstances, similar to Scenario 2, where development of critical elements of transportation infrastructure has been delayed or disrupted.

This scenario envisages a 'low tax/low spend' economy – characterised by significant under-investment and/or delayed/deferred capital expenditure on critical infrastructure – including transport.

In parallel, strongly 'low-regulatory' policies lead to high levels of conflict between land-use planning and a resurgent property development sector. The resultant conflicts will lead to delays – and occasional abandonment – of critical projects in an increasingly polarised policy environment.

The lower levels of certainty and consistency will lead to increased spatial dispersal of market-led development – residential, commercial and industrial – causing them to concentrate in 'low-resistance' areas and patterns – with little regard for rational use of resources or environmental sustainability. This dispersed pattern will make it increasingly difficult to find concentrations of use that will justify the cost-benefit assessments of public capital projects, particularly those serving the city centre – and a spiral of dysfunctional land-use patterns that are highly car-dependent will persist.

As a result of this combination of circumstances and drivers this alternative scenario will exhibit 'asymmetries' involving the 'clumping' of projects in some developer-led areas and the delay/ absence of projects in other areas of equal need – but less influence.

## Section 7 Evaluation of Alternatives

### 7.1 Introduction

This section provides a comparative evaluation of the environmental effects of implementing the three main alternatives. This determination sought to understand whether each alternative was likely to improve, conflict with or have a neutral interaction with environmental components.

### 7.2 Methodology

The relevant aspects of the current state of the environment (see Section 4) and the Strategic Environmental Objectives (see Section 5 and Table 7.1) are used in the evaluation of alternatives.

The alternatives are evaluated using compatibility criteria (see Table 7.2 below) in order to determine how they would be likely to affect the status of the SEOs. The SEOs and the alternatives are arrayed against each other to identify which interactions - if any - would cause effects on specific components of the environment. Where the appraisal identifies a likely conflict with the status of an SEO the relevant SEO code is entered into the conflict column - e.g. B1 which stands for the SEO likely to be affected - in this instance 'to contribute towards compliance with the Habitats and Birds Directives with regard to the protection of Natura 2000 Sites and Annexed habitats and species'<sup>34</sup>.

The interactions identified are reflective of likely significant environmental effects<sup>35</sup>:

1. Interactions that would be likely to improve the status of a particular SEO would be likely to result in a significant positive effect on the environmental component to which the SEO relates. The extent of positive effects which would be likely to occur

varies and there are two 'likely to improve columns' (see Table 7.2).

2. Interactions that would potentially conflict with the status of an SEO and would be likely to be mitigated would be likely to result in potential significant negative effects however these effects could be mitigated. The extent to which effects could be mitigated varies and there are three 'likely to be mitigated columns' (see Table 7.2).
3. Interactions that would probably conflict with the status of an SEO and would be unlikely to be mitigated would be likely to result in a significant negative effect on the environmental component to which the SEO relates.

The degree to which effects can be determined is limited as the Strategy will be implemented through the lower tier environmental assessments and decision making of planning authorities and An Bord Pleanála. Nonetheless a comparative evaluation of the various alternatives can be provided.

<sup>34</sup> 'Annexed habitats and species' refer to those listed under Annex I, II & IV of the EU Habitats Directive and Annex I of the EU Birds Directive.

<sup>35</sup> These effects include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects.



**Table 7.1 Strategic Environmental Objectives**

Environmental Component	SEO Code	SEO
<b>Air and Climatic Factors</b>	<b>SEO C1</b>	To facilitate a reduction in travel related emissions (including pollutants, noise and greenhouse gas emissions) to air
	<b>SEO C2</b>	To encourage modal change from car to more sustainable forms of transport
	<b>SEO C3</b>	To facilitate a reduction in energy use by the transport sector
<b>Population and Human Health</b>	<b>SEO P1</b>	To develop transport infrastructure and services closer to urban/suburban areas
	<b>SEO HH1</b>	To protect populations and human health from exposure to incompatible landuses
<b>Biodiversity, Flora and Fauna</b>	<b>SEO B1</b>	To contribute towards compliance with the Habitats and Birds Directives with regard to the protection of Natura 2000 Sites and Annexed habitats and species <sup>36</sup>
	<b>SEO B2</b>	To contribute towards compliance with Article 10 of the Habitats Directive with regard to the management of features of the landscape which - by virtue of their linear and continuous structure or their function as stepping stones (designated or not) - are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species
	<b>SEO B3</b>	To avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in designated sites including Wildlife Sites and to contribute towards compliance with the Wildlife Acts 1976-2010 with regard to the protection of listed species
<b>Material Assets</b>	<b>SEO M1</b>	To contribute towards the protection of public assets and infrastructure
	<b>SEO M2</b>	To assist with the reuse and regeneration of brownfield sites
	<b>SEO M3</b>	To reduce waste volumes, minimise waste to landfill and increase recycling and reuse
<b>Water</b>	<b>SEO W1</b>	To contribute towards the maintenance and improvement, where possible, of the quality and status of surface waters
	<b>SEO W2</b>	To contribute towards the protection of groundwater against pollution and contamination
	<b>SEO W3</b>	To comply as appropriate with the provisions of the Planning System and Flood Risk Management: Guidelines for Planning Authorities
<b>Landscape</b>	<b>SEO L1</b>	To avoid or, where infeasible, minimise conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities
<b>Cultural Heritage</b>	<b>SEO CH1</b>	To contribute towards the protection of archaeological heritage including entries to the Record of Monuments and Places and/or their context
	<b>SEO CH2</b>	To contribute towards the protection of architectural heritage including entries to the Records of Protected Structures and Architectural Conservation Areas and their context
<b>Soil</b>	<b>SEO S1</b>	To minimise damage to the hydrogeological and ecological function of the soil resource

**Table 7.2 Criteria for appraising the effect of Alternatives on SEOs**

Likely to <b>Improve</b> status of SEOs to a <b>greater</b> degree	Likely to <b>Improve</b> status of SEOs to a <b>lesser</b> degree	<b>Least Potential Conflict</b> with status of SEOs- likely to be mitigated	<b>Potential Conflict</b> with status of SEOs- likely to be mitigated	<b>Most Potential Conflict</b> with status of SEOs- likely to be mitigated	Probable <b>Conflict</b> with status of SEOs- unlikely to be mitigated
--	---	---	---	--	--

<sup>36</sup> 'Annexed habitats and species' refer to those listed under Annex I, II & IV of the EU Habitats Directive and Annex I of the EU Birds Directive.

### 7.3 Cumulative Effects

Cumulative effects are one of the types of effects which have been considered by the assessment of the alternatives. Cumulative effects can be described as the addition of many small impacts to create one larger, more significant, impact.

There are 2 types of potential cumulative effects that have been considered, namely:

- Potential *intra-Plan* cumulative effects - these arise from the interactions between different types of potential environmental effects resulting from a plan, programme, etc. The interrelationships between environmental components that help determine these potential effects are identified on Table 8.3 e.g. interrelationships between: human health and air quality; human health and water quality; air quality and vegetation; human health and flood risk; and ecology and water quality.
- Potential *inter-Plan* cumulative effects - these arise when the effects of the implementation of one plan occur in combination with those of other plans, programmes, projects, etc.

Effects that may arise as a result of implementing the Strategy have been mitigated to the extent that the only residual adverse effects likely to occur are those which are identified under Section 8.4.

With regard to potential *inter-Plan* cumulative environmental effects, these occur as a result of the combination of: potential environmental effects which are identified by the assessment; and the effects arising from other legislation, plans, programmes or developments arising. Other legislation, plans, programmes or developments arising which have been considered by the assessment of environmental effects include those which are detailed under Sections 2.4, 3.3, 4 and 5. The types of Plans and Programmes which are most likely to interact with the Transport Strategy include those relating to transport and land use planning. Figure 3.2 details the Hierarchy of Planning and Environmental Assessment and the levels at which environmental assessment is undertaken. This assessment of the Strategy recognises the existence of other environmental assessments with a view to avoid duplication of assessment, in compliance with the SEA Directive.

The SEA undertaken for the Strategy has taken account of the need for the implementation of the Strategy to comply with all environmental legislation and align with and cumulatively contribute towards – in combination with other users and bodies and their plans etc. – the achievement of the objectives of the regulatory framework for environmental protection and management.

In considering the relationship with legislation and other plans and programmes it is important to note that the Strategy will be implemented within areas that have existing plans and programmes for a range of sectors [e.g. water management, land use, energy] at a range of levels [e.g. National, River Basin District, Regional, County and local] that are already subject to more specific higher and lower tier SEA and AA.

The assessment of the likely *inter-Plan* cumulative environmental effects requires knowledge of the likely effects of all plans/developments under consideration. The assessment is limited in this instance as there has been limited assessment of the likely types of developments provided for by other policies, plans and programmes that could occur in combination with the implementation of the Strategy. Potential cumulative/in-combination effects include:

- Contributions towards management of traffic and a shift from motorised transport modes to more sustainable and non-motorised transport modes, in combination with plans and programmes from various sectors, including transport and land use planning.
- Contributions towards reductions in travel related greenhouse gas and other emissions to air (in combination with plans and programmes from all sectors, including transport and land use planning) as a result of facilitating sustainable mobility.
- Contributions towards travel related greenhouse gas and other emissions to air (in combination with plans and programmes from all sectors, including transport and land use

planning) as a result of facilitating the development of roads. This has been mitigated by provisions which have been integrated into the Strategy, including those relating to sustainable mobility.

- In combination with the provisions of land use plans which have undergone SEA and which contribute towards the protection of heritage, facilitating an enhancement of cultural (archaeological and architectural) heritage and its context in urban areas and their surrounds as a result of replacing motorised transport modes with more sustainable and non-motorised modes such as walking, cycling and light rail.
- Potential effects on all environmental components arising from the construction of new transport related development (in combination with plans and programmes from the transport and land use planning sectors). The type of these effects are consistent with those described on Table 7.3. Such development is planned and permitted through the Strategy and lower tier transport and land use plans which undergo SEA and comply with environmental legislation while projects are subject to EIA, as relevant.
- In combination with plans and programmes from all other sectors, including land use planning, potential effects on all environmental components arising from land use development in greenfield and brownfield areas (e.g. infrastructural, residential, employment, retail, etc.). The type of these effects are consistent with those described on Table 7.3. This development is planned and permitted through land use plans which undergo SEA and associated assessments at Regional, County, City and local scale. These plans undergo SEA and comply with environmental legislation while projects are subject to EIA, as relevant.

As with the other interactions detailed above, the mitigation measures which have been integrated into the Strategy (see Section 9) will ensure that no significant adverse residual impacts occur.

## 7.4 Detailed Evaluation of Alternatives<sup>37</sup>

### 7.4.1 Effects common to all alternatives

A number of potentially significant adverse effects are common to all alternatives. These effects would be present to varying degrees as is detailed in Table 7.4.

**Table 7.3 Potentially Significant Adverse Effects common to all Alternatives**

Environmental Component	Effects
<b>Air and Climatic Factors</b>	<ul style="list-style-type: none"> <li>• Emissions to air<sup>38</sup></li> </ul>
<b>Population and human health</b>	<ul style="list-style-type: none"> <li>• Potential interactions if effects upon environmental vectors such as air are not mitigated<sup>39</sup></li> </ul>
<b>Biodiversity and flora and fauna</b>	<ul style="list-style-type: none"> <li>• Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna</li> <li>• Habitat loss, fragmentation and deterioration, including patch size and edge effects</li> <li>• Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species and coastal squeeze</li> <li>• Effects in riparian zones where new crossings of waters, if any, are progressed</li> <li>• Potential effects from transport emissions<sup>40</sup></li> </ul>
<b>Material Assets</b>	<ul style="list-style-type: none"> <li>• Generation of construction waste</li> <li>• Loss or damage to public assets and infrastructure<sup>41</sup></li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>• Adverse impacts upon the status of water bodies and entries to the WFD Register of Protected Areas, arising from changes in quality, flow and/or morphology</li> <li>• Increase in the risk of flooding<sup>42</sup></li> </ul>
<b>Landscape</b>	<ul style="list-style-type: none"> <li>• Occurrence of adverse visual impacts and conflicts with the appropriate protection of statutory designations relating to the landscape<sup>43</sup></li> </ul>
<b>Cultural Heritage</b>	<ul style="list-style-type: none"> <li>• Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities<sup>44</sup></li> </ul>
<b>Soil</b>	<ul style="list-style-type: none"> <li>• Adverse impacts on the hydrogeological and ecological function of the soil resource as a result of construction of associated facilities/ infrastructure<sup>45</sup></li> </ul>

<sup>37</sup> Footnotes like this are used in this section in order to identify instances where interactions between the relevant alternative and the relevant SEOs occur. The nature of these interactions is identified on Table 7.4.

<sup>38</sup> SEO C1

<sup>39</sup> SEO HH1

<sup>40</sup> SEOs B1 B2 B3

<sup>41</sup> SEOs M1 M3

<sup>42</sup> SEOs W1 W2 W3

<sup>43</sup> SEO L1

<sup>44</sup> SEOs CH1 CH2

<sup>45</sup> SEO S1

## 7.4.2 Alternative 1: Orderly Provision of Transport

Alternative 1, orderly provision of transport and associated sustainable patterns of land-use and mobility, would:

- Facilitate the greatest improvement in sustainable mobility of all alternatives (reducing and limiting increases in the number of journeys by car taken as a percentage of all journeys taken), thereby facilitating the greatest reduction and limit of increases in greenhouse gas emissions, noise emissions and other emissions to air (with associated effects on human health). Such emissions would occur otherwise with higher levels of motorised transport and associated traffic. By significantly increasing the potential for plan-led, integrated development, greater usage of public transportation and less movement within denser settlements, this alternative would also be likely to result in a higher efficiency of energy resource utilisation.<sup>46</sup>
- Provides for the development of transport infrastructure and services in locations which will facilitate use by those living and working in urban/suburban areas.<sup>47</sup>
- Facilitate lower overall effects on ecology (including designated sites, ecological connectivity, habitats) – due to increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites.<sup>48</sup>
- Facilitate the reuse and regeneration of brownfield lands thereby contributing towards a higher efficiency of land utilisation, sustainable mobility and a reduction in the need to develop greenfield lands. By facilitating increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites there will be lower adverse effects upon ecology, landscape designations, architectural and archaeological heritage and soil.<sup>49</sup>
- Facilitate lower effects on ground and surface waters due to higher levels of development within established and serviced settlement centres that have installed/upgraded water services capable of delivering Water Framework Directive targets (and associated effects on the protection of ecology and human health).<sup>50</sup>
- Facilitate the enhancement of cultural heritage and its context in urban areas and their surrounds as a result of replacing motorised transport modes with more sustainable and non-motorised modes such as walking, cycling and light rail/metro.<sup>51</sup>
- The higher levels of certainty under this alternative is likely to increase spatial concentrations of market-led development – residential, commercial and industrial – in areas that are consistent with regional and local land-use planning objectives. These planning objectives have been the subject of SEA and AA which have facilitated the integration of environmental considerations. Also, the timely availability of transportation infrastructure will significantly increase the likelihood of co-location of other services – especially water services – in areas that are consistent with the principles of proper planning and sustainable development.<sup>52</sup>

<sup>46</sup> SEOs C1 C2 C3 HH1

<sup>47</sup> SEO P1

<sup>48</sup> SEOs B1 B2 B3 M1

<sup>49</sup> SEOs M2 C1 C2 C3 P1 B1 B2 B3 W1 W2 W3 HH1 CH1 CH2 L1 S1

<sup>50</sup> SEOs W1 W2 W3 B1 B2 B3 HH1

<sup>51</sup> SEOs CH1 CH2

<sup>52</sup> SEOs C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1

### 7.4.3 Alternative 2: Uneven Provision of Transport

Alternative 2, uneven provision of transport and associated uneven patterns of land-use and mobility, would:

- Result in both: congestion and delay issues at critical locations including major junctions, especially along the M50 in the near term; and over-crowding on key public transport routes, especially within the M50 [LUAS, DART and Commuter rail]. Congestion will mean that there will be significant delays in reaching targets for lower emissions to air – including noise and pollutants – and this will be compounded by lower utilisation of public transportation. There would be a failure to maximise contributions towards improving sustainable mobility (there would be increases in the number of journeys by car taken as a percentage of all journeys taken) and a failure to contribute towards managing traffic flows. By reducing the potential for plan-led, integrated development, this alternative would also be likely to result in a reduced efficiency of energy resource utilisation.<sup>53</sup>
- In some locations, not providing enough transport infrastructure and services to maximise use by those living and working in urban/suburban areas.<sup>54</sup>
- Result in mixed effects on ecology (including designated sites, ecological connectivity, habitats), as significant delays or omissions in the implementation of elements of the Strategy would tend to concentrate development into the immediate hinterland of the M50 – both inside and outside – and into the coastal strip. Urbanised areas would continue to benefit, to a lesser extent, from increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites; however, vulnerable coastal fringe areas and certain terrestrial areas with heightened sensitivity e.g. north Wicklow would be subject to occasional pressures and conflicts.<sup>55</sup>
- Result in mixed effects on landscape, architectural and archaeological heritage and ecology – with occasional pressures and conflicts – due to lower utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites combined with sporadic green-field developments outside of planned cores. Both beneficial<sup>56</sup> and adverse<sup>57</sup> effects would be present.
- Result in mixed effects on waters – urbanised areas will continue to benefit from lower effects on ground and surface waters due to higher levels of development within established and serviced settlement centres that have installed/upgraded water services capable of delivering Water Framework Directive targets – however vulnerable coastal fringe areas and sensitive terrestrial areas (especially in North Kildare and South Meath) will be subject to higher pressures and more conflicts than under Alternative 1.<sup>58</sup>

<sup>53</sup> SEOs C1 C2 C3 HH1

<sup>54</sup> SEO P1

<sup>55</sup> SEOs B1 B2 B3 M1

<sup>56</sup> SEOs M2 C1 C2 C3 P1 B1 B2 B3 W1 W2 W3 HH1 CH1 CH2 L1 S1

<sup>57</sup> SEOs M2 C1 C2 C3 P1 B1 B2 B3 W1 W2 W3 HH1 CH1 CH2 L1 S1

<sup>58</sup> SEOs W1 W2 W3 B1 B2 B3 HH1

## 7.4.4 Alternative 3: Under Provision of Transport

Alternative 3, under provision of transport and resultant un-coordinated and unsustainable patterns of land-use and mobility, would:

- Result in a delay/deferral of critical transport infrastructure and ensuing dispersed pattern of development which would make it increasingly difficult to find concentrations of development that would justify the cost-benefit assessments of public capital projects; a spiral of dysfunctional land-use patterns that are highly car-dependent will persist with lower utilisation of public transportation. There would be a failure to maximise contributions towards improving sustainable mobility (there would be increases in the number of journeys by car taken as a percentage of all journeys taken) and a failure to contribute towards managing traffic flows, with resultant adverse effects on greenhouse gas emissions, noise emissions and other emissions to air (with associated effects on human health <sup>59</sup>) as well as energy usage. <sup>60</sup>
- Fail to locate enough transport infrastructure and services in locations which will maximise use by those living and working in urban/suburban areas. <sup>61</sup>
- Result in mixed effects on ecology, as significant delays or omissions in the implementation of elements of the Strategy would tend to concentrate development into the immediate hinterland of the M50 – both inside and outside – and into the coastal strip. Urbanised areas would not benefit to the same extent from increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites as under Alternatives 1 and 2. Additionally vulnerable coastal fringe areas and sensitive terrestrial areas – especially in north Wicklow would be subject to occasional pressures and conflicts. <sup>62</sup>
- Result in sustained ecological pressure on the terrestrial and marine environment of the region (including designated sites, ecological connectivity, habitats) as weakly co-ordinated, market-led development puts pressure on vulnerable coastal fringe areas and sensitive terrestrial areas (especially in north Wicklow) giving rise to continuous and significant pressures and conflicts on the Region's biodiversity and flora and fauna, including designated sites. <sup>63</sup>
- Result in significant adverse effects on the region's ground and surface waters due to higher levels of weakly co-ordinated development outside established and serviced settlement centres – indeed significant developments in areas without installed/upgraded water services will lead to conflicts in delivering Water Framework Directive targets that will eventually impede further growth. Vulnerable coastal fringe areas and sensitive terrestrial areas (especially in North Kildare and South Meath) will be significantly subjected to pressures and conflicts in relationship to the availability of water services. <sup>64</sup>
- Result in mixed effects on landscape, architectural and archaeological heritage and ecology – with occasional pressures and conflicts – due to far lower utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites combined with sporadic green-field developments outside of planned cores. Both beneficial<sup>65</sup> and adverse<sup>66</sup> effects would be present.

---

<sup>59</sup> SEO HH1

<sup>60</sup> SEOs C1 C2 C3

<sup>61</sup> SEO P1

<sup>62</sup> SEOs B1 B2 B3 M1

<sup>63</sup> SEOs M2 C1 C2 C3 P1 B1 B2 B3 W1 W2 W3 HH1 CH1 CH2 L1 S1

<sup>64</sup> SEOs W1 W2 W3 B1 B2 B3 HH1

<sup>65</sup> SEOs M2 C1 C2 C3 P1 B1 B2 B3 W1 W2 W3 HH1 CH1 CH2 L1 S1

<sup>66</sup> SEOs M2 C1 C2 C3 P1 B1 B2 B3 W1 W2 W3 HH1 CH1 CH2 L1 S1

**Table 7.4 Evaluation of Alternatives against SEOs**

Alternative	Likely to <u>Improve</u> status of SEOs to a <u>greater</u> degree	Likely to <u>Improve</u> status of SEOs to a <u>lesser</u> degree	<u>Least Potential Conflict</u> with status of SEOs- likely to be mitigated	<u>Potential Conflict</u> with status of SEOs- likely to be mitigated	<u>Most Potential Conflict</u> with status of SEOs- likely to be mitigated	Probable <u>Conflict</u> with status of SEOs- unlikely to be mitigated
Alternative 1: Orderly Provision of Transport	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1		C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1			
Alternative 2: Uneven Provision of Transport		C1 C2 C3 P1 HH1 B1 B2 B3 M2 W1 W2 W3 L1 CH1 CH2 S1		HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 C2 C3 P1	
Alternative 3: Under Provision of Transport		C1 C2 C3 P1 HH1 B1 B2 B3 M2 W1 W2 W3 L1 CH1 CH2 S1			HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 C2 C3 P1



### 7.4.5 Outcome of Alternatives Assessment

The most preferable outcome from the Alternatives Assessment is Alternative 1 and the full and orderly build-out of the strategy, with a high degree of integration between transport planning and land-use development.

This alternative facilitates the greatest improvements in sustainable mobility (reducing and limiting increases in the number of journeys by car taken as a percentage of all journeys taken), thereby facilitating the greatest reduction and limit of increases in greenhouse gas emissions, noise emissions and other emissions to air. Such emissions would occur otherwise with higher levels of motorised transport and associated traffic.

Among other positive environmental effects, this alternative facilitates the enhancement of cultural heritage and its context in urban areas and their surrounds as a result of replacing motorised transport modes with more sustainable and non-motorised modes such as light rail/metro, cycling and walking.

There are potentially significant adverse effects arising from the alternative and these have been detailed and are tabulated overleaf. These effects will be mitigated by the various provisions which have been integrated into the Strategy. These mitigating provisions together with the contribution that the Strategy will make to sustainable mobility will mean that the selected alternative which has been developed for the Strategy facilitates various significant positive effects upon environmental components.

Table 7.4 overleaf details the following with respect to *Alternative 1: Orderly Provision of Transport* which was developed as the Draft Strategy, placed on public display, updated to take account of submissions and finalised:

- Significant positive effect likely to occur;
- Potentially significant adverse effect, if unmitigated; and
- Residual adverse effects.

By complying with appropriate mitigation measures - including those which have been integrated into the Strategy (see Section 9 of this report) – potentially significant adverse

environmental effects which could arise as a result of implementing the Strategy would be likely to be avoided, reduced or offset. Residual adverse environmental effects would be generally non-significant. Significant residual adverse effects would be in compliance with the relevant environmental protection legislation.

**Table 7.5 Effects Arising from Alternative developed as the Strategy**

<b>Environmental Component</b>	<b>Significant Positive Effect, likely to occur</b>	<b>Potentially Significant Adverse Effect, if unmitigated</b>	<b>Residual Adverse Effect</b>
<b>Air and climatic factors</b>	<ul style="list-style-type: none"> <li>• Facilitates contribution towards a shift from car to more sustainable and non-motorised transport modes</li> <li>• Facilitates contribution towards managing traffic flows and associated adverse effects on air quality</li> <li>• Facilitates contribution towards reductions in travel related greenhouse gas and other emissions to air</li> </ul>	<ul style="list-style-type: none"> <li>• Emissions to air</li> </ul>	<ul style="list-style-type: none"> <li>• An extent of travel related greenhouse gas and other emissions to air. This has been mitigated by provisions which have been integrated into the Strategy, including those relating to sustainable mobility.</li> </ul>
<b>Population and human health</b>	<ul style="list-style-type: none"> <li>• Facilitates contribution towards the protection of human health as a result of contributing towards the protection of environmental vectors, especially air</li> <li>• Provides for the development of transport infrastructure and services in locations which will facilitate use by those living and working in urban/suburban areas</li> </ul>	<ul style="list-style-type: none"> <li>• Potential interactions if effects upon environmental vectors such as air are not mitigated</li> </ul>	<ul style="list-style-type: none"> <li>• An extent of travel related greenhouse gas and other emissions to air. This has been mitigated by provisions which have been integrated into the Strategy, including those relating to sustainable mobility.</li> </ul>
<b>Biodiversity and flora and fauna</b>	<ul style="list-style-type: none"> <li>• Facilitates lower overall effects on ecology (including designated sites, ecological connectivity, habitats) – due to increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites.</li> <li>• Facilitates contribution towards the protection of vegetation as a result of contributing towards the protection of environmental vectors, especially air</li> <li>• Potential ecological enhancement interventions along transport corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna</li> <li>• Habitat loss, fragmentation and deterioration, including patch size and edge effects</li> <li>• Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species and coastal squeeze</li> <li>• Effects in riparian zones where new crossings of waters, if any, are progressed</li> <li>• Potential effects from transport emissions</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of an extent of non-protected habitats arising from the replacement of semi-natural land covers with artificial surfaces</li> <li>• Losses or damage to ecology (these would be in compliance with relevant legislation)</li> </ul>

Environmental Component	Significant Positive Effect, likely to occur	Potentially Adverse Effect, if unmitigated	Significant Adverse Effect, if Residual
<b>Material Assets</b>	<ul style="list-style-type: none"> <li>Facilitates contribution towards the protection of public assets and infrastructure such as: public open spaces, parks and recreational areas; public buildings and services; utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.)</li> <li>Facilitates the reuse and regeneration of brownfield lands thereby contributing towards a higher efficiency of land utilisation, sustainable mobility and a reduction in the need to develop greenfield lands. By facilitating increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites there will be lower adverse effects upon ecology, landscape designations, architectural and archaeological heritage and soil.</li> <li>Facilitates appropriate waste management</li> </ul>	<ul style="list-style-type: none"> <li>Generation of construction waste</li> <li>Loss or damage to public assets and infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Residual wastes (these would be disposed of in line with higher level waste management policies)</li> <li>Potential residual losses to public assets</li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>Facilitates lower effects on ground and surface waters due to higher levels of development within established and serviced settlement centres that have installed/upgraded water services capable of delivering Water Framework Directive targets.</li> </ul>	<ul style="list-style-type: none"> <li>Adverse impacts upon the status of water bodies and entries to the WFD Register of Protected Areas, arising from changes in quality, flow and/or morphology</li> <li>Increase in the risk of flooding</li> </ul>	<ul style="list-style-type: none"> <li>Flood related risks remain due to uncertainty with regard to extreme weather events</li> </ul>
<b>Landscape</b>	<ul style="list-style-type: none"> <li>Contribution towards the protection of landscape designations by facilitating compliance with relevant plans</li> </ul>	<ul style="list-style-type: none"> <li>Occurrence of adverse visual impacts and conflicts with the appropriate protection of statutory designations relating to the landscape</li> </ul>	<ul style="list-style-type: none"> <li>Residual visual effects (these would be in compliance with landscape designation provisions)</li> </ul>

Environmental Component	Significant Positive Effect, likely to occur	Potentially Adverse Effect, if unmitigated	Significant Effect, if	Residual Adverse Effect
<b>Cultural Heritage</b>	<ul style="list-style-type: none"> <li>• Contribution towards the protection of cultural heritage by facilitating compliance with relevant legislation</li> <li>• Facilitates the enhancement of cultural (archaeological and architectural) heritage and its context in urban areas and their surrounds as a result of replacing motorised modes with more sustainable and non-motorised modes of transport such as walking, cycling and light rail/metro.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities</li> </ul>		<ul style="list-style-type: none"> <li>• Potential alteration to the context and setting of designated cultural heritage however these will occur in compliance with legislation. Potential loss of unknown archaeology however this loss will be mitigated by measures integrated into the Strategy</li> </ul>
<b>Soil</b>	<ul style="list-style-type: none"> <li>• Facilitates contribution towards the protection of environment from contamination arising from brownfield development</li> <li>• Facilitates contribution towards the protection of features or areas of geological / geomorphological interest</li> </ul>	<ul style="list-style-type: none"> <li>• Adverse impacts on the hydrogeological and ecological function of the soil resource as a result of construction of associated facilities/ infrastructure</li> </ul>		<ul style="list-style-type: none"> <li>• Loss of an extent of soil function arising from the replacement of semi-natural land covers with artificial surfaces</li> </ul>

## 7.5 Alternatives by Corridor<sup>67</sup>

A tiered approach was taken in relation to the consideration of alternatives within corridors.

The following tables examine a number of alternative schemes on a corridor basis with potential measures considered, an assessment of each measure, and a description of the preferred alternative included. In some cases, the alternatives below relate to those examined in the technical reports which accompany the strategy. Certain schemes and policy proposals apply to all corridors, as set out in Section 4.1 of the Strategy. In the case of BRT and the Core Bus Network, while the strategy incorporated the findings of studies related to those elements, the potential for them to cater for all demand in a corridor, or for the proposed networks to expand into other corridors, still required some examination on a corridor basis. As such, the assessment below examines potential BRT schemes beyond those set out in the Bus Rapid Transit report of 2012, as referenced in Section 4.1 of the Strategy.

In the case of the cycle network, this is proposed to cater for short trips across the GDA, and for some longer trips, particularly for commuters in the Metropolitan Area and is clearly an important element of the overall Strategy. It is not however intended that the cycling schemes within the network would generally compete with the major infrastructural schemes which are intended to serve all demand from each part of the region, including long-distance commuting. As such, the primary cycle routes are not assessed below as alternatives to rail, bus or road schemes but are seen as complementary. Similarly, the policies related to improvements to the pedestrian network are also universal and complementary and are thus not assessed as alternatives to rail, bus and road.

In terms of behavioural change and fiscal measures, these types of measures are similarly universal in application. It is not the intention to implement such measures in one corridor and not another. As such, while these measures do represent alternatives on a global basis, an assessment on a corridor basis would not be appropriate.

The approach is therefore to assess the large-scale big-ticket infrastructural to serve each corridor.

As identified in the Strategy and unless finalised as part of other statutory processes, the alignments and details of projects set out in the Strategy are indicative only and are subject to further development as the design and planning processes for individual projects progress. Accordingly, some of the details of the individual proposals will be subject to amendment as this design development work is undertaken. The design and planning of individual projects will be carried out in accordance with prevailing legislation relating to environmental assessment and public consultation.

---

<sup>67</sup> Footnotes like this are used in this section in order to identify instances where interactions between the relevant alternative and the relevant SEOs occur. The nature of these interactions is identified on Table 7.4.

Table 7.6 Evaluation by Corridor

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
Corridor A – Drogheda – Balbriggan – Swords – Airport – North Inner City – to Dublin City Centre				
Rail based	DART – Electrification of the Northern Rail Line from Malahide to Drogheda and capacity improvements	Will serve significant future demand along part of the Corridor. Maximises use of existing infrastructure and integrates with other parts of the network.	Ecological <ul style="list-style-type: none"><li>Robust in many areas</li><li>Coastal (designations) and lower river reaches (e.g. Boyne, Nanny) sensitivities</li></ul> Water <ul style="list-style-type: none"><li>Coastal and river sensitivities</li><li>Groundwater vulnerability in the northern areas of this corridor and at area surrounding Duleek</li></ul> Landcover <ul style="list-style-type: none"><li>Robust in general, apart from coastal/estuarine landcovers</li></ul> Cultural Heritage <ul style="list-style-type: none"><li>Various designations, clusters along coast and in urban areas</li></ul>	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  The tracks and route are present here already – this would reduce need for new development and associated impacts.  Electrification and expansion of capacity could potentially present effects on ecological connectivity, habitats and species e.g. a collision risk to bird species.  Electrification could displace or remove air emissions, water pollution and noise from existing diesel trains along corridors.  Achievable mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.
	Heavy Rail – new rail spur from Clongriffin on Northern line to Airport and Swords; new rail link from Maynooth Line to Swords via Airport	The demand will not justify the significant level of investment. New heavy rail spurs will be constrained by the need to share existing rail corridors with existing services which will need to be significantly improved.		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  The development of such a spur would have the potential to affect a range of environmental sensitivities, including ecological sensitivities such as connectivity, habitats and species.  Mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.
	Luas – new Luas extension from Cabra to Swords via Airport	Will not sufficiently meet radial demand from the Corridor.		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.
	Metro – new Metro North	Will serve future demand. Integrates well with the proposed upgrade of the Luas Green Line to Metro and the DART Expansion Programme		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets.  The effects of constructing and operating Metro North (Metro Swords is a modified version of this) have been subject to EIA. The development of Metro Swords would potentially conflict with various environmental components. Residual adverse effects identified by the EIS for Metro North include land take/impacts upon certain open spaces, temporary loss of habitat during construction, temporary disturbance to a range of common fauna species during construction and small areas of permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses.
	Bus Based	BRT - along the corridor linking Swords and the Airport to the	Will not sufficiently serve future radial demand from the corridor to the City Centre but could be justified as an interim	Bus based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
	City Centre; along the Malahide Road to Clongriffin	measure in advance of the delivery of new Metro North. Integrates well with the existing and proposed core bus network.		
	Core Bus Network – Infrastructure and operational improvements	Enhanced bus will not provide sufficient capacity to serve all demand from the Corridor into the City Centre, but could be justified as a complementary measure. An effective and feasible proposal to meet demand for orbital movement.		<p>Bus based projects could contribute towards facilitate the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>Infrastructural and operational improvements for the Core Bus Network would be unlikely to produce potential effects other than those foreseen by the evaluation of the strategic alternatives for the Strategy.</p>
	Road Based	Strategic Road – improvements in west Swords; and Donabate; Malahide Road junction with the R139 at Clare Hall		<p>Road based projects facilitate journeys by motorised transport which contribute towards Ireland's greenhouse gas emission levels – particularly if there a low or slow progress towards uptake of electric vehicles.</p> <p>If an integrated approach for the Strategy was not followed and the Strategy only provided for Road based projects it is unlikely that the Strategy would help to facilitate the achievement of Ireland's greenhouse gas emission targets.</p> <p>Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, road projects would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy. Road projects could also facilitate public transport, improving sustainable mobility and associated interactions, and facilitate the reuse and regeneration of brownfield sites.</p> <p>There would be a need to implement mitigation measures for developments along the Donabate coastline in particular.</p>
	Road Expansion	Limited scope for increases in radial road capacity along this corridor. Will not meet the radial demand from the Corridor into the City Centre. Road development will be required for safety reasons and as a means of facilitating land use development.		
<b>Corridor A Preferred Alternative:</b> Given the assessments above it is recommended that the majority of the growth in radial trips will be provided for by the extension of the DART to Drogheda, new Metro North and two BRT corridors from Malahide to Clongriffin and Swords/Airport to the City Centre. These services will be complemented by radial and orbital enhancements to the core bus network through the provision of a core radial bus route between Ballymun and the City Centre and core orbital bus routes between Clongriffin, DCU and Blanchardstown. Strategic road requirements will be provided for through road infrastructure improvements in Swords and Donabate and capacity enhancements at the Malahide Road junction with the R139 at Clare Hall.				
<b>Corridor B – Navan – Dunboyne – Blanchardstown – to Dublin City Centre</b>				
Rail Based	DART – Electrification of the Maynooth Rail Line, and capacity improvements.	Will serve future demand along part of the Corridor. Maximises the use of existing infrastructure and integrates with other parts of the network	<p>Ecological</p> <ul style="list-style-type: none"> <li>Robust in many areas</li> <li>River sensitivities (e.g. the designated River Boyne in particular)</li> </ul> <p>Water</p> <ul style="list-style-type: none"> <li>River sensitivities</li> <li>Groundwater vulnerability in the</li> </ul>	<p>Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>The tracks and route are present here already – this would reduce need for new development and associated impacts.</p> <p>Electrification and expansion of capacity could potentially present effects on ecological connectivity, habitats and species e.g. a collision risk to bird species.</p> <p>Electrification could displace or remove air emissions, water pollution and noise from existing diesel trains along corridors.</p> <p>Achievable mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with</p>

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
			northern areas of this corridor and at area surrounding Duleek	appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.
	Heavy Rail – extension of the commuter rail line to Navan	The level of forecast demand is insufficient to justify the development of a new high-capacity rail link	Landcover • Robust in general, apart from Phoenix Park	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  The extension of this line would have the potential to affect a range of environmental sensitivities, including ecological sensitivities such as connectivity, habitats and species.  Mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.
	Luas – new Luas extension from Boombridge to Finglas	Will meet the demand along parts of Corridor B not served by Heavy Rail. Integrates with existing services and Luas Cross City.	Cultural Heritage • Various designations, clusters in urban areas	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.  There would be a need to implement mitigation measures for any crossings of the Royal Canal and River Tolka.
	Metro	The level of demand is insufficient to justify the development of a new high-capacity rail link		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets.  Effects arising from constructing and operating Metro can include land take/impacts upon certain open spaces, loss of habitat during construction, disturbance to a range of common fauna species during construction and areas of permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses.
Bus Based	BRT - N3 corridor linking Blanchardstown, the Navan Road and City Centre; Broombridge to Finglas	BRT on the N3 Will meet the demand along the N3 that is not directly served by the rail network. Potential to integrate well with the existing bus network. BRT from Broombridge to Finglas will not sufficiently meet future demand due to a constrained road network and passengers travelling to the city would require interchange.		Bus based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.
	Core Bus Network – Infrastructure and operational improvements	Will not sufficiently meet radial demand from the corridor into the City Centre. Could be justified as a complementary measure to DART, light rail and BRT, particularly along the N2 corridor where upgrades could benefit regional and intercity bus services as well as city services. An effective and feasible option to meet demand for orbital movement.		Bus based projects could contribute towards facilitate the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  Infrastructural and operational improvements for the Core Bus Network would be unlikely to produce potential effects other than those foreseen by the evaluation of the strategic alternatives for the Strategy.



Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
Road Based	Strategic Road – upgrade of the N3, N2/M2, Slane bypass; Orbital Routes with links to Navan, upgrade connectivity outside the M50 between the N3, the N4 and N7	Improvements will allow for safe, consistent performance and connectivity of the strategic road network. Will also provide journey time reliability on a congested corridor.		Road based projects facilitate journeys by motorised transport which contribute towards Ireland's greenhouse gas emission levels – particularly if there a low or slow progress towards uptake of electric vehicles.
	Road Expansion	Limited scope for increases in radial road capacity along this corridor. Will not meet the radial demand from the corridor into the City Centre. Road development will be required for orbital movement, safety reasons and as a means of facilitating land use development.		If an integrated approach for the Strategy was not followed and the Strategy only provided for Road based projects it is unlikely that the Strategy would help to facilitate the achievement of Ireland's greenhouse gas emission targets.  Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, road projects would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy. Road projects could also facilitate public transport, improving sustainable mobility and associated interactions, and facilitate the reuse and regeneration of brownfield sites.
<b>Corridor B Preferred Alternative:</b> Given the assessments above it is recommended that the majority of the growth in radial trips will be provided for two rail lines through the extension of the DART to Maynooth and the extension of Luas Cross City to Finglas. These services will be complemented by a BRT corridor from Blanchardstown along the N3 corridor to the City Centre. Further transport demand will be supported by radial and orbital enhancements to the core bus network with the development of a core radial bus route along the N2 corridor and core orbital bus routes between Tallaght and Blanchardstown. Strategic road traffic will be provided for through some road infrastructure improvements along the N2 and N3 and enhanced orbital links outside the M50 between the N3, N4 and N7 to improve safety, connectivity and consistency of the strategic road network performance, and to enable development to occur on strategically important sites.				
<b>Corridor C – Maynooth, Leixlip, Lucan</b>				
Rail based	DART – Maynooth and Kildare Line electrification and capacity improvements.	Will serve future demand along part of the Corridor Maximises use of existing infrastructure and integrates with other parts of the network	Ecological <ul style="list-style-type: none"><li>• Robust in many areas</li><li>• River sensitivities (e.g. the designated River Boyne and Rye Water Valley in particular)</li><li>• Peatland sensitivities in west central and Kildare</li></ul> Water <ul style="list-style-type: none"><li>• River sensitivities</li><li>• Groundwater vulnerability in much of this corridor</li></ul> Landcover <ul style="list-style-type: none"><li>• Robust in general,</li></ul>	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  The tracks and route are present here already – this would reduce need for new development and associated impacts.  Electrification and expansion of capacity could potentially present effects on ecological connectivity, habitats and species e.g. a collision risk to bird species.  Electrification could displace or remove air emissions, water pollution and noise from existing diesel trains along corridors.  Achievable mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.
	Luas – New Luas Line between Lucan and City Centre.	Will meet the demand along those parts of Corridor C not served by Heavy Rail Integrates with existing services on the red line.		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.  There would be a need to implement mitigation measures for any crossings of the River Liffey.

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
	Metro	Will meet demand along parts of corridor C not served by heavy rail. Demand will not be sufficient to justify the level of investment	apart from peatlands  Cultural Heritage <ul style="list-style-type: none"> <li>• Various designations, clusters in urban areas</li> </ul>	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets.  Effects arising from constructing and operating Metro can include land take/impacts upon certain open spaces, loss of habitat during construction, disturbance to a range of common fauna species during construction and areas of permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses.
Bus Based	BRT on the N4 to Lucan between Newcastle and the City Centre	Will not be sufficient to meet radial demand from the corridor, in the areas not served by the rail due to constraints in the road network.		Bus based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.
	Core Bus Network – Core Bus Network – Infrastructure and operational improvements Route along the N4/R148. Orbital corridors from Tallaght to Blanchardstown	Will not be sufficient to meet radial demand from the corridor into the city centre, but improvements can be justified as a complementary measure to rail and light rail proposals particularly along the R148. Effectively uses existing infrastructure and integrate with the road network.  An effective and feasible proposal to meet demand for orbital movement.		Bus based projects could contribute towards facilitate the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  Infrastructural and operational improvements for the Core Bus Network would be unlikely to produce potential effects other than those foreseen by the evaluation of the strategic alternatives for the Strategy.
Road Based	Strategic Road-orbital trips provide enhanced links between corridors outside of the M50, linking the N7, N4 and N3. Improvements on N4	Improvements will allow for safe, consistent performance and connectivity of the strategic road network. Will also provide journey time reliability on a congested corridor		Road based projects facilitate journeys by motorised transport which contribute towards Ireland's greenhouse gas emission levels – particularly if there a low or slow progress towards uptake of electric vehicles.  If an integrated approach for the Strategy was not followed and the Strategy only provided for Road based projects it is unlikely that the Strategy would help to facilitate the achievement of Ireland's greenhouse gas emission targets.  Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, road projects would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy. Road projects could also facilitate public transport, improving sustainable mobility and associated interactions, and facilitate the reuse and regeneration of brownfield sites.
	Road Expansion	Limited scope for increases in radial road capacity along this corridor. Road expansion could not sufficiently meet radial demand from the corridor into the City Centre. Road development will be required for orbital movement, safety reasons and as a means of facilitating land use development.		

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
<b>Corridor C Preferred Alternative:</b> Given the assessments above it is recommended that the majority of the growth in radial trips be provided for by a new Luas line to the City Centre serving north and central Lucan and Ballyfermot. This will be complemented by the electrification of the Maynooth and Kildare Lines, core bus route improvements on the N4/R148 and within Ballyfermot, orbital bus routes, orbital road improvements, and a number of strategic road improvements.				
<b>Corridor D – Newbridge, Naas, Clondalkin, North Tallaght</b>				
Rail based	DART –Kildare Line Electrification and capacity improvements.	Will serve some future demand and can be justified as a complementary measure. This maximises use of existing infrastructure and integrates with other parts of the network.	Ecological <ul style="list-style-type: none"><li>Robust in many areas</li><li>River sensitivities (e.g. the designated River Barrow and River Nore in particular)</li><li>Peatland sensitivities in west central and Kildare, some off which are designated</li></ul> Water <ul style="list-style-type: none"><li>River sensitivities</li><li>Groundwater vulnerability in much of this corridor including at Pollardstown Fen/Curragh gravels area</li></ul> Landcover <ul style="list-style-type: none"><li>Robust in general, apart from peatlands, Curragh area</li></ul> Cultural Heritage <ul style="list-style-type: none"><li>Various designations, clusters in urban areas</li></ul>	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  The tracks and route are present here already – this would reduce need for new development and associated impacts.  Electrification and expansion of capacity could potentially present effects on ecological connectivity, habitats and species e.g. a collision risk to bird species.  Electrification could displace or remove air emissions, water pollution and noise from existing diesel trains along corridors.  Achievable mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.
	New Heavy Rail	There is no clear existing geographical alignment for a new line to serve this Corridor. Demand served would not be sufficient to justify the significant level of investment required.		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  A new heavy rail line would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy.
	Luas – increase frequency of Red Line, and/or extension of Red Line to Clondalkin	Demand will not be sufficient to justify the level of investment required for an LRT extension to Clondalkin and is not seen as feasible. Service improvements on the existing Luas Red Line will serve some future demand and can be justified as a complementary measure. Will be an efficient use of existing infrastructure.		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.
	Metro –Upgrade Luas Red Line to Metro	Demand will not be sufficient to justify the level of investment and providing a fully segregated service along this route would be technically difficult.		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  The tracks and route are present here already – this would reduce need for new development and associated impacts.  This area is generally robust in environmental terms.  Effects arising from constructing and operating Metro can include land take/impacts upon certain open spaces, loss of habitat during construction, disturbance to a range of common fauna species during construction and areas of

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
Bus Based	BRT - N/M7 corridor, Greenhills Road Corridor, connection with Tallaght Luas Redline, and Orbital Corridors	Demand will not be sufficient to justify the level of investment for BRT on the N/M7 and Greenhills Rd Corridors or Orbital corridors.		<p>permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses.</p> <p>Bus based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>This area is generally robust in environmental terms.</p>
	Core Bus Network – Infrastructure and operational improvements - M/N7 Corridor, Greenhills Road/Crumlin Road corridor, Orbital Corridors	Capacity and infrastructure improvements to the core radial bus network on the M/N7 and Greenhills Rd/Crumlin Rd corridors and orbital bus routes will efficiently meet the demand growth, and integrate with the existing road and PT networks.		<p>Bus based projects could contribute towards facilitate the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>Infrastructural and operational improvements for the Core Bus Network would be unlikely to produce potential effects other than those foreseen by the evaluation of the strategic alternatives for the Strategy.</p>
Road Based	Strategic Road – M/ N7 strategic improvements, orbital improvements outside of the M50, linking the N7, N4 and N3	Improvements will allow for safe, consistent performance and connectivity of the strategic road network. Will also provide journey time reliability on a congested corridor.		<p>Road based projects facilitate journeys by motorised transport which contribute towards Ireland's greenhouse gas emission levels – particularly if there a low or slow progress towards uptake of electric vehicles.</p> <p>If an integrated approach for the Strategy was not followed and the Strategy only provided for Road based projects it is unlikely that the Strategy would help to facilitate the achievement of Ireland's greenhouse gas emission targets.</p> <p>Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, road projects would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy. Road projects could also facilitate public transport, improving sustainable mobility and associated interactions, and facilitate the reuse and regeneration of brownfield sites.</p>
	Road Expansion - increasing capacity of the Radial Road network	Limited scope for increases in radial road capacity along this corridor. Road expansion could not sufficiently meet radial demand from the corridor into the City Centre. Road development will be required for orbital movement, safety reasons and as a means of facilitating land use development.		
<b>Corridor D Preferred Alternative:</b> Given the assessments above it is recommended that the majority of the growth in radial trips be provided for by improvements to two radial bus corridors on the M/N7 and Greenhills Road/Crumlin Road. These services will be complemented by strategic road improvement to the M/N 7, electrification of the Kildare Line and extension of DART services; increased frequency of Luas Red Line service, orbital bus routes, and orbital road improvements.				
<b>Corridor E – N81 Settlements-South Tallaght-Rathfarnham</b>				
Rail based	Heavy Rail – New heavy rail line	Demand will not be sufficient to justify the level of investment required for a new rail line in this corridor.	<p>Ecological</p> <ul style="list-style-type: none"> <li>Sensitive and designated Wicklow Mountains, Poulaphuca</li> </ul>	<p>Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>A new heavy rail line in this corridor would have the potential to affect a range of environmental sensitivities depending on location, including ecological sensitivities including connectivity, habitats and species.</p>

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
			Reservoir and Slaney River Valley • River sensitivities in general also	Mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.
	Luas – new Luas from Old Bawn to City Centre via Rathfarnham and Terenure; or City Centre via Rathfarnham, Terenure and Rathmines	Demand will not be sufficient to justify the significant level of investment required for a LRT in this Corridor.	Water • River sensitivities • Extremely and highly vulnerable groundwater in the uplands	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.  There would be a need to implement mitigation measures for any crossing of the River Dodder.
	Metro- New metro to City Centre via Rathfarnham, Terenure and Rathmines	Demand will not be sufficient to justify the significant level of investment required for a Metro in this Corridor, particularly as it would likely require significant tunnelling.	Landcover • Sensitive uplands and foothills  Cultural Heritage • Various designations, clusters in urban areas, significantly less in upland areas	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets.  Effects arising from constructing and operating Metro can include land take/impacts upon certain open spaces, loss of habitat during construction, disturbance to a range of common fauna species during construction and areas of permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses.
Bus Based	BRT –Tallaght to City Centre via Rathfarnham; N81 corridor; and orbital corridors	BRT from Tallaght or Rathfarnham to the City Centre will serve future demand from this corridor, and provide good integration with the existing PT network. It will also integrate well with the existing road network.		Bus based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  This area is generally robust in environmental terms.
	Core Bus Network – Infrastructure and operational improvements - N81; and Rathfarnham QBC improvements,	Will not be sufficient to meet radial demand from the corridor into the city centre, but could be justified as a complementary measure to BRT proposals, particularly along the N81 and Rathfarnham QBC. An effective and feasible proposal to meet demand for orbital movement		Bus based projects could contribute towards facilitate the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  Infrastructural and operational improvements for the Core Bus Network would be unlikely to produce potential effects other than those foreseen by the evaluation of the strategic alternatives for the Strategy.
Road Based	Road Expansion - increasing capacity of the Radial Road network	Limited scope for increases in radial road capacity along this corridor. Road expansion could not sufficiently meet radial demand from the corridor into the City Centre. Road development will be required for orbital movement, safety reasons and as a means of facilitating land use development.		Road based projects facilitate journeys by motorised transport which contribute towards Ireland's greenhouse gas emission levels – particularly if there a low or slow progress towards uptake of electric vehicles.  If an integrated approach for the Strategy was not followed and the Strategy only provided for Road based projects it is unlikely that the Strategy would help to facilitate the achievement of Ireland's greenhouse gas emission targets.  Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, road projects would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy. Road projects could also facilitate public transport, improving sustainable mobility and associated

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
				interactions, and facilitate the reuse and regeneration of brownfield sites.  There would be a need to implement mitigation measures for developments in the Wicklow Mountains and foothills in particular.
<b>Corridor E Preferred Alternative:</b> Given the assessments above it is recommended that the majority of the growth in radial trips be provided for by BRT connection to City Centre and Luas Red Line from Tallaght. These services will be complemented by improvements to the core bus corridors on the N81 and in Rathfarnham/Rathmines, orbital bus routes, orbital road improvements in South Tallaght.				
<b>Corridor F – Arklow – Wicklow – Greystones – Bray – Cherrywood – Dundrum – Dun Laoghaire</b>				
Rail Based	DART – Enhancements to existing South Eastern Rail Line and capacity improvements	DART improvements will serve future demand in parts of the corridor and can be justified as a complementary measure. Maximises use of existing infrastructure and integrates with other parts of the network.	Ecological <ul style="list-style-type: none"> <li>• Sensitive and designated Wicklow Mountains</li> <li>• Sensitive and designated coastal areas</li> <li>• River sensitivities</li> </ul> Water <ul style="list-style-type: none"> <li>• Coastal and river sensitivities</li> <li>• Extremely and highly vulnerable groundwater in the uplands</li> </ul> Landcover <ul style="list-style-type: none"> <li>• Sensitive uplands and foothills</li> <li>• Sensitive coastal areas</li> </ul> Cultural Heritage <ul style="list-style-type: none"> <li>• Various designations, clusters along coast and in urban areas, significantly less in upland areas</li> </ul>	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  The tracks and route are present here already – this would reduce need for new development and associated impacts.  Enhancement of the existing line and capacity improvements could potentially present effects on coastal ecological sensitivities and views.  Achievable mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.
	New Heavy Rail	Demand will not be sufficient to justify the significant level of investment required for a new rail line in this corridor.		Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  A new heavy rail line in this corridor would have the potential to affect a range of environmental sensitivities depending on location, including ecological sensitivities including connectivity, habitats and species.
	Luas – new Luas line; extension of existing line from Bride's Glen to Bray or west of the N11.	The cost of an extension of the Luas west of the N11 would not be justified by the level of demand served. Extension of the existing Luas Green line to Bray could be justified as a complementary measure to DART and could serve future demand from Bray to those parts of the Corridor along the Green Line. This extension would require the upgrading of the existing Green Line to Metro standard to provide the necessary capacity.		Mitigation measures have been integrated into the Strategy would facilitate this risk to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.  Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.
	Metro – Upgrade Luas Green Line to Metro	Will adequately meet demand from this corridor. Efficient use of existing infrastructure and connectivity with the PT		There are a number of ecological and visual sensitivities in this area which would have the potential to be impacted upon by a new line and ancillary development.  Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  The tracks and route are present here already – this would reduce need for new development and associated

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
		network including new Metro North. It will provide additional capacity and journey time improvements as far as Bride's Glen to justify an extension of the Luas to Bray.		<p>impacts.</p> <p>Effects arising from constructing and operating Metro can include land take/impacts upon certain open spaces, loss of habitat during construction, disturbance to a range of common fauna species during construction and areas of permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses.</p>
Bus Based	BRT - N11 from UCD to Blanchardstown, City Centre to Greystones or Fassaroe Via the N11/M11, BRT from Bray to Bride's Glen or Sandyford	Demand is sufficient for such an investment as far south as UCD, but not any further south. Shorter BRT schemes within the Bray environs or to Sandyford are not feasible due to low levels of demand and road network constraints.		<p>Bus based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p>
	Core Bus Network – Increase bus infrastructure and capacity on the N11, N31/R118, and R119/R761 to Bray, and provide orbital bus corridors to link Dun Laoghaire to Sandyford/Dundrum	Will not be sufficient to meet radial demand from the corridor due to limitation of the capacity of the roadway network. Justified as a complimentary measure along the N11, N31/R118, and R119/R761 to Bray. An effective and feasible complimentary measure to meet demand south of Bray that cannot access rail. An effective and feasible proposal to meet demand for orbital movement between Dun Laoghaire to Sandyford/Dundrum.		<p>Bus based projects could contribute towards facilitate the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>Infrastructural and operational improvements for the Core Bus Network would be unlikely to produce potential effects other than those foreseen by the evaluation of the strategic alternatives for the Strategy.</p>
Road Based	Strategic Road – Upgrades to the N11 and M50 between Newtownmountkennedy and Sandyford, Loughlinstown roundabout improvements, road network connections to serve new development south west of the	Improvements will allow for safe, consistent performance and connectivity of the strategic road network. Will also provide journey time reliability on a congested corridor.		<p>Road based projects facilitate journeys by motorised transport which contribute towards Ireland's greenhouse gas emission levels – particularly if there a low or slow progress towards uptake of electric vehicles.</p> <p>If an integrated approach for the Strategy was not followed and the Strategy only provided for Road based projects it is unlikely that the Strategy would help to facilitate the achievement of Ireland's greenhouse gas emission targets.</p> <p>Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, road projects would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy. Road projects could also facilitate public transport, improving sustainable mobility and associated interactions, and facilitate the reuse and regeneration of brownfield sites.</p> <p>There would be a need to implement mitigation measures for developments in the Wicklow Mountains and foothills and in coastal areas in particular.</p>

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
	M50 Road Expansion	Limited scope for increases in radial road capacity along this corridor. Road expansion could not sufficiently meet radial demand from the corridor into the City Centre.		
<b>Corridor F Preferred Alternative:</b> Given the assessments above it is recommended that the majority of the growth in radial trips be provided for by the upgrade of the Luas Green Line from a light rail to a metro with and Luas extension to Bray. This service will be complemented by strategic road improvements to the M50 and N11, Enhancements to DART that will increase capacity and frequency, BRT from UCD to Blanchardstown on the N11, improvements to the core bus network on the N11 south of UCD and along the coast on the N31/R118 from Dun Laoghaire to the City Centre.				
<b>Corridor G – Dublin City Centre</b>  The need to cater for demand to the City Centre was considered within Corridors A-H, potential measures examined and options identified. This section considers the remaining demand within the City Centre Corridor, specifically internal demand and demand to other Corridors. Potential measures for this corridor are significantly constrained by the need to provide for integration with the existing and proposed network. When considering the public transport enhancements, the public transport network proposed from the assessment of Corridors A-H will provide sufficient capacity to meet the demand within Corridor G and no further public transport measures are necessary.  The City Centre Transport Plan, published in June 2015, sought a rebalancing of the available road space to facilitate the introduction of additional capacity for public transport, cycling and walking. Significant changes to the traffic network in the City Centre are included with the objective of guaranteeing that the overall transport system is capable of operating efficiently and reliably. An alternative to the City Centre Transport Plan would be to provide for road expansion. Both potential measures are assessed below.				
Road Based	City Centre Transport Plan	Will provide for the delivery of public transport, walking and cycling measures required to meet demand within this Corridor. Will allow for the more appropriate allocation of road space.	Ecological <ul style="list-style-type: none"> <li>Robust in most areas</li> <li>Modified River Liffey with associated ecological value</li> </ul> Water <ul style="list-style-type: none"> <li>Modified River Liffey with associated ecological value</li> </ul> Landcover <ul style="list-style-type: none"> <li>Robust in general, apart from Phoenix Park</li> </ul> Cultural Heritage <ul style="list-style-type: none"> <li>High concentrations of designations</li> </ul>	Road based projects facilitate journeys by motorised transport which contribute towards Ireland's greenhouse gas emission levels – particularly if there a low or slow progress towards uptake of electric vehicles.  If an integrated approach for the Strategy was not followed and the Strategy only provided for Road based projects it is unlikely that the Strategy would help to facilitate the achievement of Ireland's greenhouse gas emission targets.  Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, road projects would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy. Road projects could also facilitate public transport, improving sustainable mobility and associated interactions, and facilitate the reuse and regeneration of brownfield sites.
	Road Expansion	Limited scope for increases in road capacity along this Corridor. Will not meet the demand within the Corridor.		
<b>Corridor G Preferred Alternative:</b> Given the assessments above it is recommended that the growth in demand from this Corridor will be provided for by the existing and proposed network extending from Corridors A-H. The City Centre Transport Plan will support the delivery of additional capacity for public transport, cycling and walking and ensure the overall transport system is capable of operating efficiently and reliably.				
<b>Corridor H – Dublin Docklands</b>				
Rail Based	DART - DART Expansion Programme	Will serve future demand into parts of the Corridor. Maximises the use of existing infrastructure and integrates	Ecological <ul style="list-style-type: none"> <li>Sensitive locations at interface</li> </ul>	Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.  Some infrastructure is present here already – this would reduce need for new development and associated impacts.



Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
		with other parts of the network.	<ul style="list-style-type: none"> <li>between City and Dublin Bay</li> <li>Terrestrial areas generally robust</li> <li>Tidal reaches of modified River Liffey with associated ecological value</li> </ul>	<p>Achievable mitigation measures have been integrated into the Strategy would facilitate any risks to be dealt with appropriately. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to lower tier assessments as relevant.</p> <p>Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>This area is generally robust in environmental terms.</p> <p>There would be a need to implement mitigation measures for any crossings of the River Liffey.</p>
	Luas – Extension of the Red Line to Poolbeg; new Luas extension from the City Centre through the south Docklands area	Will meet the demand along those parts of Corridor H not served by Heavy Rail. Luas extension from the Point integrates with existing services. Potential difficulties in identifying a suitable corridor for Luas through the south Docklands area.	<p>Water</p> <ul style="list-style-type: none"> <li>Modified River Liffey with associated ecological value</li> <li>Coastal sensitivities</li> </ul>	
	Metro	A Metro from the City Centre to Docklands would most likely be required to be constructed underground and would therefore not be feasible given the level of demand it would serve and the availability of other options such as Luas.	<p>Landcover</p> <ul style="list-style-type: none"> <li>Sensitive areas at interface between City and Dublin Bay</li> </ul> <p>Cultural Heritage</p> <ul style="list-style-type: none"> <li>High concentrations of designations</li> </ul>	<p>Rail based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets.</p> <p>Effects arising from constructing and operating Metro can include land take/impacts upon certain open spaces, loss of habitat during construction, disturbance to a range of common fauna species during construction and areas of permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses.</p>
Bus Based	BRT - from the City Centre to Poolbeg	Could not serve future demand due to road capacity constraints on the approaches to the City Centre.		<p>Bus based projects could contribute towards the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>This area is generally robust in environmental terms.</p>
	Core Bus Network – Infrastructure and operational improvements	Could be justified as a complementary measure to rail, particularly between Ringsend and the City Centre and along the North Wall to the Port Tunnel where upgrades could benefit regional and intercity bus services as well as city services.		<p>Bus based projects could contribute towards facilitate the achievement of Ireland's greenhouse gas emission targets in terms of emissions per passenger per kilometre.</p> <p>Infrastructural and operational improvements for the Core Bus Network would be unlikely to produce potential effects other than those foreseen by the evaluation of the strategic alternatives for the Strategy.</p>
Road Based	Strategic Road – South Port Link Road	Improvements will allow for safe, consistent performance and connectivity of the strategic road network. Will also provide journey time reliability on a congested corridor.		<p>Road based projects facilitate journeys by motorised transport which contribute towards Ireland's greenhouse gas emission levels – particularly if there a low or slow progress towards uptake of electric vehicles.</p> <p>If an integrated approach for the Strategy was not followed and the Strategy only provided for Road based projects it is unlikely that the Strategy would help to facilitate the achievement of Ireland's greenhouse gas emission targets.</p>
	Road Expansion	Limited scope for increases in radial road capacity along this corridor. Will not meet the radial demand from the Corridor into the City Centre.		<p>Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, road projects would have the potential to give rise to a range of adverse impacts upon environmental components such as energy usage, ecology, archaeological and architectural heritage and the status of water bodies. Potential conflicts would be mitigated by the achievable measures which have been integrated into the Draft Strategy. Road projects could also facilitate public transport, improving sustainable mobility and associated interactions, and facilitate the reuse and regeneration of brownfield sites.</p>

Mode	Potential Measures	Transport Assessment	Environmental Assessment Comments	
			Key sensitivities (may be impacted upon)	Specific Comments
		Road development will be required for orbital movement, traffic management, safety reasons and as a means of facilitating land use development.		
<b>Corridor H Preferred Alternative:</b> Given the assessments above it is recommended that the majority of the growth in radial trips be provided for by the extension of Luas from the eastern end of the Red Line to Poolbeg and the DART expansion programme. These services will be complemented by radial enhancements to the core bus network between Ringsend and the City Centre and along Clontarf, East Wall and North Wall, linking to the Port Tunnel. Strategic road traffic will be provided for with the development of the South Port Link Road to improve safety, connectivity and consistency of the strategic road network performance.				

## Section 8 Evaluation of Strategy Provisions

### 8.1 Overall Findings

The overall findings of the SEA are that:

- **Compliance with Legislation and Guidelines – Environmental Protection and Sustainable Development**

The National Transport Authority have integrated all recommendations arising from the SEA and Appropriate Assessment processes into the Transport Strategy, facilitating compliance of the Strategy with various European and National legislation and Guidelines relating to the protection of the environment and the achievement of sustainable development.

- **Improvements in Sustainable Mobility and Associated Effects (emissions, noise and energy usage)**

The Strategy facilitates contributions towards improvements in sustainable mobility (reducing and limiting increases in the number of journeys by car taken as a percentage of all journeys taken), thereby facilitating contributions towards a reduction/limit of increases in greenhouse gas emissions, noise emissions, other emissions to air and energy usage. Such emissions would occur otherwise with higher levels of motorised transport and associated traffic.

- **Positive Effects in Urban Areas (including cultural heritage)**

Among other positive environmental effects, the Strategy facilitates the enhancement of cultural heritage and its context in urban areas and their surrounds as a result of replacing motorised transport modes with more sustainable and non-motorised modes such as light rail/metro, cycling and walking.

- **Potentially Significant Adverse Effects to be mitigated**

There are potentially significant adverse effects arising from the alternative and these have been detailed and these effects will be mitigated by the various provisions which have been integrated into the Strategy including those which have arisen through the SEA and AA processes (see Section 9). These mitigating provisions together with the contribution that the Strategy will make to sustainable mobility means that the Strategy facilitates various significant positive effects upon environmental components.

Chapter 9 of the Transport Strategy provides a summary – based on detailed analysis and modelling – of how the strategy will meet the demand for travel in 2035 how the revised networks are expected to perform; and the benefits which will accrue from the implementation of the Strategy. Key issues identified include:

- **Performance of the Transport Network**

To meet the forecast growth in travel demand, a number of network improvements are proposed, particularly in relation to public transport, but also in order to facilitate an increase in the level of walking, cycling and car use. While the emphasis is on public transport for trips over 3km, additional road capacity is essential to support the investment in strategic National Roads and to facilitate increased speed and convenience for public transport, walking and cycling. As such, a number of road schemes form part of the Strategy, however, the bulk of the increase in travel demand will be catered for by non-car modes.

- **Performance of the Road Network**

The Strategy aims to facilitate the forecast growth in travel demand without significantly impacting on the road network. In general, the performance of road network in the GDA will improve.

- **Performance of the Public Transport Network**

The Strategy proposes a considerable expansion of the GDA's public transport network.

- **Mode Share**

The implementation of the Strategy will have a significant positive impact on the objective of reducing the proportion of all trips undertaken by private car from 59.9%, in 2011, to 52.2% in 2035<sup>68</sup>, with a corresponding positive impact on the proportions using public transport, walking and cycling.

- **Journey Time**

The area within 1 hour's travel time to the city centre is far more extensive in the future and accordingly, the areas within shorter journey times are correspondingly greater. Of particular note, is the impact of Metro Swords on the northern corridor, including Dublin Airport, which facilitates significantly shorter journey times within this area.

- **Land Use Benefits**

The implementation of the Strategy will facilitate a more efficient use of land within the GDA and will improve the accessibility of central areas, which will potentially lead to the greater consolidation of trip intensive developments such as employment and retail into locations served by public transport.

The NTA also undertook environmental assessment as part of the modelling which was undertaken in conjunction with the preparation of the Strategy. Detailed consideration was given to emissions, noise and severance as follows:

- **Modelled Emissions**

All types of vehicle emissions (Carbon Monoxide, Carbon Dioxide, Nitrous Oxides and Hydrocarbons) reduce under the Transport Strategy in comparison with a do minimum scenario. This highlights the air quality improvements for the GDA associated with the introduction of the GDA Transport Strategy provisions.

- **Modelled Noise**

There is significant improvements to noise levels within the Core City Centre network, where the Dublin City Centre Transport Plan measures are implemented.

- **Modelled Severance**

There is significant improvements to severance within the Core City Centre Network, where the Dublin City Centre Transport Plan measures are implemented. Substantial improvements to severance are noted on the quays, and at the Westmoreland Street / D'Olier Street public transport interchange area.

---

<sup>68</sup> Transport model output for all trip purposes, AM peak (2011 & 2035)

## 8.2 Methodology

The relevant aspects of the current state of the environment (see Section 4) and the Strategic Environmental Objectives (see Section 5 and Table 8.1) are used in the evaluation of alternatives.

The provisions are evaluated using compatibility criteria (see Table 8.2 overleaf) in order to determine how they would be likely to affect the status of the SEOs. The SEOs and the Strategy provisions are arrayed against each other to identify which interactions - if any - would cause effects on specific components of the environment. Where the appraisal identifies a likely conflict with the status of an SEO the relevant SEO code is entered into the conflict column - e.g. B1 which stands for the SEO likely to be affected - in this instance 'to contribute towards compliance with the Habitats and Birds Directives with regard to the protection of Natura 2000 Sites and Annexed habitats and species<sup>69</sup>'.

The interactions identified are reflective of likely significant environmental effects<sup>70</sup>:

1. Interactions that would be likely to improve the status of a particular SEO would be likely to result in a significant positive effect on the environmental component to which the SEO relates.
2. Interactions that would potentially conflict with the status of an SEO and would be likely to be mitigated would be likely to result in potential significant negative effects however these effects will be mitigated by measures which have been integrated into the Strategy (see Section 9).
3. Interactions that would probably conflict with the status of an SEO and would be unlikely to be mitigated would be likely to result in a significant negative effect on the environmental component to which the SEO relates.

It should be noted that, although localised impacts are highlighted where relevant, the main thrust of the assessment relates to impacts on SEOs at the regional scale. The degree to which effects can be determined is limited as the Strategy will be implemented through the lower tier environmental assessments and decision making of planning authorities.

---

<sup>69</sup> 'Annexed habitats and species' refer to those listed under Annex I, II & IV of the EU Habitats Directive and Annex I of the EU Birds Directive.

<sup>70</sup> These effects include secondary, cumulative (see Section 7.3), synergistic, short, medium and long-term permanent and temporary, positive and negative effects.

**Table 8.1 Strategic Environmental Objectives**

Environmental Component	SEO Code	SEO
<b>Air and Climatic Factors</b>	<b>SEO C1</b>	To facilitate a reduction in travel related emissions (including pollutants, noise and greenhouse gas emissions) to air
	<b>SEO C2</b>	To encourage modal change from car to more sustainable forms of transport
	<b>SEO C3</b>	To facilitate a reduction in energy use by the transport sector
<b>Population and Human Health</b>	<b>SEO P1</b>	To develop transport infrastructure and services closer to urban/suburban areas
	<b>SEO HH1</b>	To protect populations and human health from exposure to incompatible landuses
<b>Biodiversity, Flora and Fauna</b>	<b>SEO B1</b>	To contribute towards compliance with the Habitats and Birds Directives with regard to the protection of Natura 2000 Sites and Annexed habitats and species <sup>71</sup>
	<b>SEO B2</b>	To contribute towards compliance with Article 10 of the Habitats Directive with regard to the management of features of the landscape which - by virtue of their linear and continuous structure or their function as stepping stones (designated or not) - are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species
	<b>SEO B3</b>	To avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in designated sites including Wildlife Sites and to contribute towards compliance with the Wildlife Acts 1976-2010 with regard to the protection of listed species
<b>Material Assets</b>	<b>SEO M1</b>	To contribute towards the protection of public assets and infrastructure
	<b>SEO M2</b>	To assist with the reuse and regeneration of brownfield sites
	<b>SEO M3</b>	To reduce waste volumes, minimise waste to landfill and increase recycling and reuse
<b>Water</b>	<b>SEO W1</b>	To contribute towards the maintenance and improvement, where possible, of the quality and status of surface waters
	<b>SEO W2</b>	To contribute towards the protection of groundwater against pollution and contamination
	<b>SEO W3</b>	To comply as appropriate with the provisions of the Planning System and Flood Risk Management: Guidelines for Planning Authorities
<b>Landscape</b>	<b>SEO L1</b>	To avoid or, where infeasible, minimise conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities
<b>Cultural Heritage</b>	<b>SEO CH1</b>	To contribute towards the protection of archaeological heritage including entries to the Record of Monuments and Places and/or their context
	<b>SEO CH2</b>	To contribute towards the protection of architectural heritage including entries to the Records of Protected Structures and Architectural Conservation Areas and their context
<b>Soil</b>	<b>SEO S1</b>	To minimise damage to the hydrogeological and ecological function of the soil resource

**Table 8.2 Criteria for appraising the effect of Strategy provisions on SEOs**

Likely to <b>Improve</b> status of SEOs	Potential <b>Conflict</b> with status of SEOs- likely to be mitigated	Probable <b>Conflict</b> with status of SEOs- unlikely to be mitigated	<b>No Likely</b> interaction with status of SEOs
---	---	--	--

<sup>71</sup> 'Annexed habitats and species' refer to those listed under Annex I, II & IV of the EU Habitats Directive and Annex I of the EU Birds Directive.

### **8.3 Appropriate Assessment**

Stage 2 Appropriate Assessment (AA) has been undertaken alongside the Strategy. The requirement for AA is provided under the EU Habitats Directive (Directive 1992/43/EEC).

The AA concluded that the Strategy will not affect the integrity of the Natura 2000 network<sup>72</sup>.

Various content has been integrated into the Strategy through the SEA and AA processes (see Section 9). The preparation of the Strategy, SEA and AA has taken place concurrently and the findings of the AA have informed both the Strategy and the SEA.

### **8.4 Potential and Residual Adverse Effects**

Environmental impacts which occur, if any, will be determined by the nature and extent of multiple or individual projects and site specific environmental factors.

The potentially significant adverse environmental effects arising from implementation of the chosen alternative which has been developed and finalised as the Strategy are detailed in Table 7.5.

### **8.5 Interrelationship between Environmental Components**

The SEA Directive requires the Environmental Report to include information on the likely significant effects on the environment, on issues such as biodiversity, fauna, flora, population, human health, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.

Likely significant effects on environmental components which are identified include those which are interrelated; implementation of the Plan will not affect the interrelationships between these components. The presence of significant interrelationships between environmental components is identified on Table 8.3.

---

<sup>72</sup> Except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:

(a) no alternative solution available;  
(b) imperative reasons of overriding public interest for the plan/programme/project to proceed; and  
(c) adequate compensatory measures in place.

**Table 8.3 Presence of Interrelationships between Environmental Components**

<b>Component</b>	<b>Biodiversity, flora and fauna</b>	<b>Population and human health</b>	<b>Soil</b>	<b>Water</b>	<b>Air and Climatic factors</b>	<b>Material assets</b>	<b>Cultural heritage</b>	<b>Landscape</b>
<b>Biodiversity, flora and fauna</b>		No	Yes	Yes	Yes	Yes	No	Yes
<b>Population and human health</b>			Yes	Yes	Yes	Yes	No	No
<b>Soil</b>				Yes	No	Yes	No	No
<b>Water</b>					No	Yes	No	No
<b>Air and Climatic factors</b>						Yes	No	No
<b>Material assets</b>							Yes	Yes
<b>Cultural heritage</b>								Yes
<b>Landscape</b>								



## 8.6 Detailed Evaluation of Plan Provisions

As detailed in the Strategy and unless finalised as part of other statutory processes, the alignments and details of projects set out in the Strategy are indicative only and are subject to further development as the design and planning processes for individual projects progress. Accordingly, some of the details of the individual proposals will be subject to amendment as this design development work is undertaken. The design and planning of individual projects will be carried out in accordance with prevailing legislation relating to environmental assessment and public consultation.

Some SEOs occur in both the “Likely to Improve status of SEOs” and “Potential Conflict with status of SEOs- likely to be mitigated” columns as the provisions have the potential to both contribute towards the protection of the environment and potentially conflict with it.

For example, with respect to biodiversity and flora and fauna (SEOs B1 B2 B3), the Strategy:

- Facilitates lower overall effects on ecology (including designated sites, ecological connectivity, habitats) – due to increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites.
- Facilitates contribution towards the protection of vegetation as a result of contributing towards the protection of environmental vectors, especially air; and
- Facilitates potential ecological enhancement interventions along transport corridors.

However, the Strategy also presents the following potentially significant adverse effects, also with respect to biodiversity and flora and fauna (SEOs B1 B2 B3):

- Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna;
- Habitat loss, fragmentation and deterioration, including patch size and edge effects;
- Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species and coastal squeeze;
- Effects in riparian zones where new crossings of waters, if any, are progressed; and
- Potential effects from transport emissions.

### 8.6.1 Heavy Rail Infrastructure

	Likely to <b>Improve</b> status of SEOs	Potential <b>Conflict</b> with status of SEOs- likely to be mitigated	Probable <b>Conflict</b> with status of SEOs- unlikely to be mitigated	<b>No Likely</b> interaction with status of SEOs
As part of this Strategy it is intended to: Reopen the Phoenix Park Tunnel Link for passenger services, which will link the Kildare/Cork line to the city centre	<b>C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1</b>	<b>C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</b>		
<b>Commentary on certain interactions:</b>  <i>This tunnel is built and its reuse would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Although this measure would facilitate net reductions in emissions to air (noise), intensifying the use of existing infrastructure would be likely to result in increases at local level (SEOs C1 HH1).</i>  <i>The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i>				
Complete the City Centre Resignalling programme, which will provide additional train paths through the city centre section of the rail network	<b>C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1</b>	<b>C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</b>		
<b>Commentary on certain interactions:</b>  <i>Completion of the City Centre Resignalling Programme would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Although this measure would facilitate net reductions in emissions to air (noise), intensifying the use of existing infrastructure would be likely to result in increases at local level (SEOs C1 HH1).</i>  <i>The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i>				
Implement the DART Expansion Programme, which will provide DART services as far north as Drogheda; to Hazelhatch on the Kildare Line (including a tunnel connection from the Kildare Line to link with the Northern / South-Eastern Line); to Maynooth in the west and to the M3 Parkway.	<b>C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1</b>	<b>C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</b>		
<b>Commentary on certain interactions:</b>  <i>Implementation of the DART Expansion Programme would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Although this measure would facilitate net reductions in emissions to air (noise), intensifying the use of existing infrastructure would be likely to result in increases at local level (SEOs C1 HH1).</i>  <i>Development arising from this provision – including the electrification of heavy rail lines – would be required to comply with, as relevant, the mitigation measures which have been integrated into the</i>				

<p><i>Strategy, including those measures concerning compliance with legislation such as the Habitats and Water Framework Directives (see Section 9).</i></p> <p><i>The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i></p> <p><i>It is noted that the DART Underground is already permitted and has been subject to EIA.</i></p> <p><i>Ecological corridors (as envisaged under Article 10 of the Habitats Directive) and species that live within these corridors (including those listed on annex IV of the Habitats Directive for strict protection such as otters and bats), have the potential to be impacted upon by the DART expansion, both directly and in-combination with similar potential impacts arising from the GDA Cycle Network Plan – such impacts would be mitigated by measures, including those which have been integrated into the Strategy.</i></p> <p><i>The development of overhead power lines associated with the electrification of rail infrastructure could present a collision hazard to vulnerable bird species. In particular, the electrification of lines at Rogerstown and Malahide Estuary could potentially present a collision risk to bird species for which these sites are designated. Achievable mitigation measures – including those which have been integrated into the Strategy - will ensure that this type of development will not impact on the Natura 2000 network of sites<sup>73</sup>. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to AA. Detailed information such as how birds use the estuary, particularly in relation to flight paths, feeding and foraging areas will inform lower tier decision making and AA. Potential effects have been examined in the AA of the lower tier GDA Implementation Strategy where mitigation has been considered, including:</i></p> <ul style="list-style-type: none"> <li><i>Looking at alternative methods of electrification that would remove the requirement for overhead lines; or</i></li> <li><i>Improving the visibility of the overhead lines by their arrangement or by incorporating line markers.</i></li> </ul>				
Develop a new train control centre to manage the operation of the rail network	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
<p><b>Commentary on certain interactions:</b></p> <p><i>A new train control centre would facilitate intensification of use of heavy rail infrastructure thereby improving the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Development of a new train control centre would also be likely to potentially conflict with various environmental components such as ecology (B1 B2 B3), human health (HH1), soil (S1), water (W1 W2 W3), material assets (M1 M3), cultural heritage (CH1 CH2) and landscape (L1). Potentially adverse impacts would be dependent on the location and the nature of the development however mitigation would be achieved by compliance with the measures which have been integrated into the Strategy (see Section 9).</i></p> <p><i>The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i></p>				
Construct additional train stations in developing areas with sufficient demand	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		

<sup>73</sup> Except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:

- no alternative solution available,
- imperative reasons of overriding public interest for the plan to proceed; and
- Adequate compensatory measures in place.

<b>Commentary on certain interactions:</b>  <i>The construction of additional train stations in developing areas with sufficient demand would facilitate intensification of use of public transport thereby improving the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). This provision is consistent with SEO P1 (To develop transport infrastructure and services closer to urban/suburban areas). Development of new train stations would be likely to potentially conflict with various environmental components including ecology (B1 B2 B3), human health (HH1), soil (S1), water (W1 W2 W3), material assets (M1 M3), cultural heritage (CH1 CH2) and landscape (L1). Potentially adverse impacts would be dependent on the locations and the nature of the developments however mitigation would be achieved by compliance with the measures which have been integrated into the Strategy (see Section 9).</i>  <i>The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i>				
Implement a programme of station upgrades and enhancement;	C1 C2 C3 P1 HH1	CH2 HH1 B1 B2 B3 M3 W1 W2 L1 CH1		M1 M2 W3 S1
<b>Commentary on certain interactions:</b>  <i>Upgrading and enhancing train stations would contribute towards the attractiveness of public transport thereby improving the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Upgrading and enhancing certain structures could potentially conflict with the protection of environmental components including architectural heritage (CH2) and relevant mitigation measures would have to be complied with (see Section 9).</i>				
Ensure an appropriate level of train fleet, of an appropriate standard, to operate on the rail network	C1 C2 C3 P1 HH1			B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1
<b>Commentary on certain interactions:</b>  <i>Replacement/refurbishment of the fleet would facilitate intensification of use of public transport thereby improving the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1).</i>				
Other Rail Investments - While the above projects set out the main activities in relation to the rail network, other smaller interventions will be undertaken during the period of the Strategy. These include: Renewal, replacement, upgrading of ticketing systems; Platform changes / additions at stations; Additional works to maintain the operational efficiency of the train network and additional works to enhance service provision; Rail safety systems; and Passenger information systems.	C1 C2 C3 P1 HH1	HH1 B1 B2 B3 M3 W1 W2 L1 CH1 CH2 S1		M1 M2 W3
<b>Commentary on certain interactions:</b>  <i>The development of tracks and platforms would be required to comply with relevant mitigation measures.</i>				

## 8.6.2 Light Rail Infrastructure

	Likely to <b>Improve</b> status of SEOs	Potential <b>Conflict</b> with status of SEOs- likely to be mitigated	Probable <b>Conflict</b> with status of SEOs- unlikely to be mitigated	<b>No Likely</b> interaction with status of SEOs
It is intended to further develop the light rail network in the GDA through the implementation of the following projects:				
Metro Swords - Metro link from St. Stephen's Green to Swords and serving Dublin Airport, operating in tunnel under Dublin City Centre, and providing a high frequency, high capacity service	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
<p><b>Commentary on certain interactions:</b></p> <p><i>The development and use of light rail would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1) as well as contributing towards the enhancement of cultural heritage and its context in urban areas and their surrounds (SEO CH2). The effects of constructing and operating Metro North (Metro Swords is a modified version of this) have been subject to EIA. The development of Metro Swords would potentially conflict with various environmental components. Residual adverse effects identified by the EIS for Metro North include land take/impacts upon certain open spaces, temporary loss of habitat during construction, temporary disturbance to a range of common fauna species during construction and small areas of permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses.</i></p> <p><i>The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i></p>				
Green Line Capacity Enhancement - capacity enhancements to the Luas Green Line between St. Stephen's Green and Bride's Glen (in advance of Metro South) allowing longer and higher capacity trams to be brought into service on this line	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
<p><b>Commentary on certain interactions:</b></p> <p><i>Lengthening of platforms and new trams would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). The development of platforms would be required to comply with relevant mitigation measures. The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i></p>				
Metro South - Luas Green Line Capacity Upgrade from St. Stephen's Green to Bride's Glen, completing a full north-south high-capacity high-frequency cross-city rail corridor through the central spine of the Metropolitan Area	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		

<b>Commentary on certain interactions:</b>  <i>This provision would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). The replacement of tracks would be required to comply relevant mitigation measures. The undergrounding associated with the extension of Metro Swords southwards would potentially conflict with a variety of environmental components including ecology (B1 B2 B3), human health – including noise and vibration - (HH1), soil (S1), water (W1 W2 W3), material assets (M1 M3) and cultural heritage (CH1 CH2). Potentially adverse impacts would be dependent on the locations and the nature of the developments however mitigation would be achieved by compliance with the measures which have been integrated into the Strategy. The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i>				
Luas Cross City connecting St. Stephen's Green to Broombridge and intersecting with the Red Line at Abbey Street	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
Extension of Luas Green Line to Bray, providing a second rail alternative to this large town, connecting to the city centre and major destinations along the corridor at Cherrywood, Sandyford and Dundrum;	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
Extension of Luas Cross City to Finglas, utilising the new Luas Cross City line to provide a light rail link to the Finglas area;	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
Luas to Lucan, providing a high capacity link into the centre of Lucan's large residential areas to the south of the N4 national road, and connecting to the city centre;	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
Luas Red Line extension to Poolbeg, linking the north Docklands to this new development area south of the Liffey.	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
<b>Commentary on certain interactions:</b>  <i>The development/extension of the Luas lines will improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1) as well as contributing towards the enhancement of cultural heritage and its context in urban areas and their surrounds (SEO CH2). The development of this infrastructure would be likely to potentially conflict with various environmental components (including ecology B1 B2 B3, human health HH1, soil S1, water W1 W2 W3, material assets M1 M3, cultural heritage CH1 CH2 and landscape L1). Potentially adverse impacts would be dependent on the locations and the nature of the developments however mitigation would be achieved by compliance with the measures which have been integrated into the Strategy.</i>				

*The evaluation against SEOs provided for these provisions reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.*

*Lower tiers of decision making would have to consider impacts on, inter alia, ecology and water arising from the crossing of any waters;*

- *The extension of the Luas Green Line to Bray would need to cross the Bride's Glen Stream and the Dargle River (and possibly a number of its tributaries) via new or existing crossings.*
- *The extension of the Luas Cross City to Finglas would need to cross the Royal Canal and the Tolka via new or existing crossings.*
- *Luas to Lucan may cross the Tobermaclugg Stream, Liffey or Grand Canal via new or existing crossings*
- *The extension of the Luas Red Line extension to Poolbeg would have to cross the Liffey*

*Luas Cross City is permitted.*

### 8.6.3 Bus Infrastructure

	Likely to <b>Improve</b> status of SEOs	Potential <b>Conflict</b> with status of SEOs- likely to be mitigated	Probable <b>Conflict</b> with status of SEOs- unlikely to be mitigated	<b>No Likely</b> interaction with status of SEOs
<b>Core Bus Network</b> A "Core Bus Network" was identified for the overall region. The identified core network comprises sixteen radial bus corridors, three orbital bus corridors and six regional bus corridors. In order to ensure an efficient, reliable and effective bus system, it is intended, as part of the Strategy, to develop the Core Bus network to achieve, as far as practicable, continuous priority for bus movement on the portions of the Core Bus Network within the Metropolitan Area. This will mean enhanced bus lane provision on these corridors.	<b>C1 C2 C3 P1</b> <b>HH1 B1 B2 B3</b> <b>M1 M2 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>	<b>C1 HH1 B1 B2</b> <b>B3 M1 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>		
<b>Bus Rapid Transit</b> A number of the Core Radial Bus Corridors are proposed to be developed as Bus Rapid Transit routes, where the passenger numbers forecast on the routes are approaching the limits of conventional bus route capacity. Bus Rapid Transit (BRT) is a high-quality bus based transit system that delivers a service with higher speeds and quality of service than traditional bus services. This is achieved by improved road infrastructure, the provision of appropriate vehicles, rapid and frequent operations, fast boarding/alighting and a strong focus on marketing plus customer service. As part of the Strategy it is intended to develop three BRT schemes along routes forming part of the Core Bus Network. These are: <ul style="list-style-type: none"> <li>• Swords/Airport to City Centre;</li> <li>• Blanchardstown to UCD; and</li> <li>• Clongriffin to Tallaght.</li> </ul>	<b>C1 C2 C3 P1</b> <b>HH1 B1 B2 B3</b> <b>M1 M2 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>	<b>C1 HH1 B1 B2</b> <b>B3 M1 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>		
<b>Other Bus Related Measures</b> Outside of the Core Bus Network, it is intended to seek the provision of necessary bus priority measures at locations where a large number of buses are likely to be delayed or where substantial delays are likely to occur to a smaller number of buses. In addition, a programme of improvements to bus facilities and stopping areas will be undertaken, comprising: <ul style="list-style-type: none"> <li>• The development of a coach parking facility in Dublin City Centre, to facilitate the removal of on-street coach layover;</li> </ul>	<b>C1 C2 C3 P1</b> <b>HH1 B1 B2 B3</b> <b>M1 M2 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>	<b>C1 HH1 B1 B2</b> <b>B3 M1 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>		

<ul style="list-style-type: none"> <li>• New bus station facilities to provide for intercity and regional buses which serve Dublin City Centre;</li> <li>• Continual replacement and upgrading of the bus fleet with vehicles that meet or exceed EURO emissions standards;</li> <li>• Rationalisation of stop poles and sharing of nearby bus stops between operators;</li> <li>• Installation of enhanced standardised bus stops, with a single, uniform style of bus stop pole, flag (the plate on top of the bus pole) and information carousel;</li> <li>• Provision of enhanced travel information including stop specific timetables, route maps and real time bus arrival information;</li> <li>• Installation of bus shelters, incorporating seating, in high usage locations, where space permits; and</li> <li>• Implementation of cycle parking facilities where appropriate.</li> </ul>				
<p><b>Commentary on certain interactions:</b></p> <p><i>Enhanced bus lane provision, the introduction of Bus Rapid Transit and the other measures specified will improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Potential conflicts could arise where road widening/improved road infrastructure/other works are required. Potentially adverse impacts would be dependent on the locations and the nature of the developments however mitigation would be achieved by compliance with the measures which have been integrated into the Strategy (see Section 9). The evaluation against SEOs provided for these provisions reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i></p>				

## 8.6.4 Cycling Infrastructure

	Likely to <b>Improve</b> status of SEOs	Potential <b>Conflict</b> with status of SEOs- likely to be mitigated	Probable <b>Conflict</b> with status of SEOs- unlikely to be mitigated	<b>No Likely</b> interaction with status of SEOs
<p>As part of the Strategy it is intended to implement this Greater Dublin Area Cycle Network <sup>74</sup> in full, delivering safe, high quality cycle facilities, which will be designed and constructed in accordance with the principles set out in the National Cycle Manual. To complement the investment in the cycle network, it is intended to:</p> <ul style="list-style-type: none"> <li>• Provide for sufficient on-street public cycle parking at key destinations such as bus and rail stations, schools, colleges, hospitals and large workplaces, particularly in urban areas;</li> <li>• Provide for off-street public cycle parking, including secure lockers, in a number of car parks in Dublin City Centre, and investigate the feasibility of such facilities in other urban areas;</li> <li>• Seek the expansion of the bike share scheme in Dublin City (<i>dublinbikes</i>) and the introduction of similar schemes in other appropriate centres and areas across the GDA;</li> <li>• Implement a comprehensive cycle route signage programme in conjunction with the development of the cycle network;</li> <li>• Continue, and expand, cycle training as part of the <i>Smarter Travel Workplaces, Campuses and Green Schools</i> programmes;</li> <li>• Develop an education/information programme in conjunction with other agencies, to promote safe cycling behaviour and compliance with road traffic regulations; and</li> <li>• Cooperate with other agencies in the enforcement of laws in relation to parking on cycle lanes and cycle tracks.</li> </ul>	<b>C1 C2 C3 P1</b> <b>HH1 B1 B2 B3</b> <b>M1 M2 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>	<b>HH1 B1 B2 B3</b> <b>M1 M3 W1 W2</b> <b>W3 L1 CH1 CH2</b> <b>S1</b>		

<sup>74</sup> Subject to compliance with the EU Habitats and Birds Directives.



**Commentary on certain interactions:**

Implementation of the Greater Dublin Area Cycle Network and associated complementary measures specified will improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). The Greater Dublin Area Cycle Network Plan has been subjected to SEA and AA. The SEA Environmental Report for the Plan identifies significant positive effects on environmental topics including sustainable mobility, accessibility to public assets and infrastructure, air and climatic factors, landscape and cultural heritage. Potential disturbance of archaeological resources during scheme development will generally be mitigated by preservation in-situ where possible and preservation by recording. The SEA identifies that In conclusion, the Authority, in conjunction with other agencies and the local authorities will not pursue any schemes arising out of this plan, or in-combination with other plans or projects, which will adversely affect the integrity of a Natura 2000 site, unless there are no alternative solutions and that it has been demonstrated that the project is of overriding public interest. The evaluation against SEOs provided for these provisions reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4 (although there is no conflicting interaction with emissions to air SEO C1).

Ecological corridors (as envisaged under Article 10 of the Habitats Directive) and species that live within these corridors (including those listed on annex IV of the Habitats Directive for strict protection such as otters and bats), have the potential to be impacted upon by the DART expansion, both directly and in-combination with similar potential impacts arising from the GDA Cycle Network Plan – such impacts would be mitigated by measures, including those which have been integrated into the Strategy.

The development of cycle networks in combination with the electrification of lines at Rogerstown and Malahide Estuary could potentially present a collision risk to bird species for which these sites are designated. Achievable mitigation measures – including those which have been integrated into the Strategy - will ensure that this type of development will not impact on the Natura 2000 network of sites<sup>75</sup>. Lower level plans and projects arising through the implementation of the Strategy will themselves be subject to AA. Detailed information such as how birds use the estuary, particularly in relation to flight paths, feeding and foraging areas will inform lower tier decision making and AA. Potential effects have been examined in the AA of the lower tier GDA Implementation Strategy where mitigation has been considered, including:

- Looking at alternative methods of electrification that would remove the requirement for overhead lines; or
- Improving the visibility of the overhead lines by their arrangement or by incorporating line markers.

## 8.6.5 Walking

	Likely to <b>Improve</b> status of SEOs	Potential <b>Conflict</b> with status of SEOs- likely to be mitigated	Probable <b>Conflict</b> with status of SEOs- unlikely to be mitigated	<b>No Likely</b> interaction with status of SEOs
<p>To address walking issues, it is intended to:</p> <ul style="list-style-type: none"> <li>• Provide a safer, more comfortable and more convenient walking environment for those with mobility, visual and hearing impairments, and for those using buggies and prams;</li> <li>• Develop, in collaboration with the local authorities, a strategic pedestrian network plan, encompassing the main urban centres of the region, which will identify the key pedestrian linkages in those areas;</li> <li>• Enhance pedestrian movement along the strategic pedestrian routes by widening footpaths where appropriate, providing better surfacing and by removing unnecessary poles, signs, street cabinets, advertising and other street clutter;</li> <li>• Support local authorities in the implementation of pedestrianisation schemes, particularly in central areas of high pedestrian footfall, such as shopping streets;</li> <li>• Revise road junction layouts, where appropriate, to provide dedicated pedestrian crossings, reduce</li> </ul>	<b>C1 C2 C3 P1</b> <b>HH1 B1 B2 B3</b> <b>M1 M2 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>	<b>HH1 B1 B2 B3</b> <b>M1 M3 W1 W2</b> <b>W3 L1 CH1 CH2</b> <b>S1</b>		

<sup>75</sup> Except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:

- a) no alternative solution available,
- b) imperative reasons of overriding public interest for the plan to proceed; and
- c) Adequate compensatory measures in place.

<p>pedestrian crossing distances, provide more direct pedestrian routes, and reduce the speed of turning traffic;</p> <ul style="list-style-type: none"> <li>• Reduce waiting time for pedestrians at crossings in Dublin City Centre and other urban centres;</li> <li>• Liaise with local authorities to deliver pedestrian information and wayfinding signage in urban centres across the GDA;</li> <li>• In conjunction with local authorities and An Garda Síochána, evaluate, and where appropriate seek the introduction of, lower speed limits on residential streets and in urban centres;</li> <li>• Cooperate with other agencies in the enforcement of laws in relation to parking on footpaths; and</li> <li>• Support pedestrian permeability provision in new developments, and the maintenance, plus enhancement, where appropriate, of such arrangements in existing developments.</li> </ul>				
<p><b>Commentary on certain interactions:</b></p> <p><i>Implementation of these measures to address walking related issues will improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). The Greater Dublin Area Cycle Network Plan has been subjected to SEA and AA. Potentially adverse impacts arising from certain measures such as the widening of footpaths would be dependent on the locations and the nature of the developments however mitigation would be achieved by compliance with the measures which have been integrated into the Strategy (see Section 9). The evaluation against SEOs provided for these provisions reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4 (although there is no conflicting interaction with emissions to air SEO C1).</i></p>				

### 8.6.6 Roads

	Likely to <b>Improve</b> status of SEOs	Potential <b>Conflict</b> with status of SEOs- likely to be mitigated	Probable <b>Conflict</b> with status of SEOs- unlikely to be mitigated	<b>No Likely</b> interaction with status of SEOs
<p>National Roads</p> <p>During the period of the Strategy it is intended to further develop and enhance the national road network including the delivery of the following projects:</p> <ul style="list-style-type: none"> <li>• Reconfiguration of the N7 from its junction with the M50 to Naas, to rationalise junctions and accesses in order to provide a higher level of service for strategic traffic travelling on the mainline;</li> <li>• Junction upgrades and other capacity improvements on the M1 motorway, including additional lanes south of Drogheda, where required;</li> <li>• Widening of the M7 between Junction 9 (Naas North) and Junction 11 (M7/M9) to provide an additional lane in each direction;</li> <li>• Widening of the M50 to three lanes in each direction between Junction 14 (Sandyford) and Junction 17 (M11) plus related junction and other changes;</li> <li>• Reconfiguration of the N4 from its junction with the M50 to Leixlip to rationalise accesses and to provide additional capacity at the Quarryvale junction;</li> <li>• Capacity enhancement and reconfiguration of the M11/N11 from Junction 4 (M50) to Junction 14 (Ashford) inclusive of ancillary and associated road schemes, to provide additional lanes and upgraded junctions, plus service roads and linkages to cater for local traffic movements;</li> </ul>	<p><b>C1 C2 C3 P1 HH1 M2</b></p>	<p><b>C1 C2 C3 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</b></p>		

<ul style="list-style-type: none"> <li>Enhancements of the N2/M2 national route inclusive of a bypass of Slane, to provide for additional capacity on the non-motorway sections of this route, and to address safety issues in Slane village associated with, in particular, heavy goods vehicles;</li> <li>Widening of the N3 between Junction 1 (M50) and Junction 4 (Clonee), plus related junction and necessary changes to the existing national road network;</li> <li>Development of a road link connecting from the southern end of the Dublin Port Tunnel to the South Port area, which will serve the South Port and adjoining development areas;</li> <li>Provision of additional service areas on the national road network in line with national policy;</li> <li>Provision of necessary upgrades to the national secondary road network, including bypasses, in line with the "Principles of Road Development" set out in Section 5.8.3; and</li> <li>Various signage, safety interventions, junction improvements and local reconfigurations on the national road network.</li> </ul>				
<p><b>Commentary on certain interactions:</b></p> <p><i>The Strategy aims to facilitate the forecast growth in travel demand without significantly impacting on the road network. In general, the performance of road network in the GDA will improve.</i></p> <p><i>Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, these projects would have the potential to give rise to a range of adverse impacts including contributing towards the motorised transport and associated emissions and energy usage (SEOs C1 C2 C3), ecology (SEOs B1 B2 B3), archaeological and architectural heritage, including context (SEOs CH1 CH2), visual impacts (SEO L1), public amenities and waste levels (SEOs M1 M3), human health (SEO HH1), soil and the status of water bodies (SEOs S1 W1 W2), flood risk (SEO W3). Potential conflicts would be mitigated by the measures which have been integrated into the Strategy and are identified in Section 9 of this report. These projects could also facilitate public transport, improving sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1), and facilitate the reuse and regeneration of brownfield sites (SEO M2).</i></p>				
<p>Leinster Orbital Route and Eastern Bypass</p> <p>The Leinster Orbital Route is an orbital road proposal extending from Drogheda to the Naas/Newbridge area with intermediate links to Navan and other towns. It would provide connections between these towns, currently poorly served by direct linkages, supporting their economic development and improvements in orbital public transport connectivity. While this project is not planned for implementation during the period of the Strategy, the finalisation of the route corridor and its protection from development intrusion is recommended.</p> <p>Similarly, in the case of the Eastern Bypass, while the section of the route from the Dublin Port Tunnel to the South Port area is included for delivery in this Strategy, the remainder of the route is not proposed for development during the Strategy period. However, the retention of a route corridor for this scheme is recommended, to facilitate the possible future use of the corridor for transport provision.</p>	<p>P1 HH1 B1 B2 B3 M1 M3 W1 W2 S1</p>			<p>C1 C2 C3 M2 W3 L1 CH1 CH2</p>
<p><b>Commentary on certain interactions:</b></p> <p><i>The Strategy does not provide for the development of these routes and any future amendment of the Strategy to accommodate these would have to be subject to SEA and AA – were this to occur, reservation of the route corridors now would facilitate the avoidance of future disturbance of development areas and associated potential effects upon various environmental components.</i></p>				
<p>Regional Roads</p> <p>Regional and local roads make up the vast majority of the road network in the Greater Dublin Area. In relation to this network it is intended to:</p> <ul style="list-style-type: none"> <li>Enhance orbital movement, outside of the M50 C-Ring, between the N3, the N4 and N7 national</li> </ul>	<p>C1 C2 C3 P1 HH1 M2</p>	<p>C1 C2 C3 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</p>		

<p>roads, by the widening of existing roads and the development of new road links;</p> <ul style="list-style-type: none"> <li>• Develop orbital roads around town centres accompanied by enhanced public transport, cycling and pedestrian facilities in the relevant centre;</li> <li>• Develop appropriate road links to service development areas;</li> <li>• Implement necessary upgrades to the regional and local road network in line with the "Principles of Road Development" set out in Section 5.8.3;</li> <li>• Enhance pedestrian and cycle safety through the provision of safer road junctions, improved pedestrian crossing facilities and the incorporation of appropriate cycle measures including signalised crossings where necessary;</li> <li>• Address localised traffic delay locations, including on radial routes inside the M50 C-Ring, in cases where the primary reason for intervention is to address safety or public transport issues at such locations; and</li> <li>• Implement various junction improvements and local reconfigurations on the regional and local road network.</li> </ul> <p>Given that many of the proposed road schemes are relatively small and localised it is not intended to establish an exhaustive list of such schemes for development over the period of the Strategy. Instead, it is intended that each road scheme is developed in accordance with the principles set out in this Strategy and that confirmation of consistency with the Strategy is obtained from the Authority in advance of a road authority seeking development consent for a particular road scheme.</p>				
<p><b>Commentary on certain interactions:</b></p> <p><i>Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, these projects would have the potential to give rise to a range of adverse impacts including contributing towards motorised transport and associated emissions and energy usage (SEOs C1 C2 C3), ecology (SEOs B1 B2 B3), archaeological and architectural heritage, including context (SEOs CH1 CH2), visual impacts (SEO L1), public amenities and waste levels (SEOs M1 M3), human health (SEO HH1), soil and the status of water bodies (SEOs S1 W1 W2), flood risk (SEO W3). Potential conflicts would be mitigated by the measures which have been integrated into the Strategy and are identified in Section 9 of this report. These projects could also facilitate public transport, improving sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1), and facilitate the reuse and regeneration of brownfield sites (SEO M2).</i></p>				
<p>Principles of Road Development</p> <p>Given that national transport policy seeks a reduction in the growth in car travel and an increase in the use of public transport, cycling and walking, it is important that certain principles are reflected in the development of individual road projects within the Greater Dublin Area. Accordingly, it is intended that road development in the Greater Dublin Area will be undertaken in accordance with the following principles:</p> <p>a) That there will be no significant increase in road capacity for private vehicles on radial roads inside the M50 motorway;</p> <p>b) That each proposed road scheme is consistent with this Strategy and with Government policies related to transport;</p> <p>c) That the demand needs 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;</p> <p>d) That the development of the road scheme does not diminish in any significant way the expected beneficial outcomes of the Strategy;</p> <p>e) 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</p>	<p>C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1</p>	<p>C1 C2 C3 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</p>		

f) 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.				
<b>Commentary on certain interactions:</b>  <i>These principles would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1) and by requiring compliance with Government Policies relating to transport would facilitate environmental protection and sustainable development. Nonetheless the development of roads would result in various potential environmental conflicts which are detailed above in this table and which would be mitigated by the measures which have been integrated into the Strategy and are identified in Section 9 of this report.</i>				
<b>Freight Movement</b>  In the area of freight it is intended to: <ul style="list-style-type: none"> <li>Implement demand management measures on the M50 motorway to ensure that it retains sufficient capacity to fulfil its strategic functions, including freight movement;</li> <li>Implement, when appropriate, demand management measures on the radial national routes approaching the M50 motorway (M1, M2/N2, N3/M3, N/M4, N/M7, M11) to ensure that these routes retain sufficient capacity to fulfil their strategic functions, including freight movement;</li> <li>Ensure that the Dublin Tunnel continues to perform its primary function of providing access to Dublin Port for freight traffic;</li> <li>Provide for the continuation of the current Dublin City HGV Management Strategy and for its further expansion to other vehicle types, potentially with an expanded exclusion area;</li> <li>Assess the potential for, and, if appropriate, introduce, similar HGV management measures in other town centres in the GDA;</li> <li>Provide goods vehicle parking facilities at on-line motorway service areas and other appropriate locations within the GDA;</li> <li>Require the clear identification in development plans of appropriate locations for freight intensive developments, and the implementation of Distribution and Servicing Plans for such developments as part of the planning process;</li> <li>Introduce specific delivery arrangements in large urban centres, including Dublin City Centre, which targets deliveries outside of peak commuting hours and, preferably, outside of daytime business hours; and</li> <li>Introduce low impact delivery schemes in Dublin City Centre and other town centres by using smaller, quieter and/or lower emissions vehicles.</li> </ul>	<b>C1 C2 C3 P1 HH1</b>	<b>C1 C2 C3 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</b>		
<b>Commentary on certain interactions:</b>  <i>The movement of freight contributes towards motorised transport and associated emissions and energy usage and interactions (SEOs C1 C2 C3 HH1). The appropriate management of freight movement as provided for by these measures would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Development such as goods vehicle parking facilities and freight intensive developments would potentially conflict with various environmental components - these would be mitigated by the measures which have been integrated into the Strategy and are identified in Section 9 of this report.</i>				

<p><b>Parking Provision Parking Supply</b></p> <p>It is recognised that private car transport will continue to act as an important element of the GDA transport network. As such, it is critical that the location, quantum and access to parking for private vehicles are considered.</p> <p>As far as possible, information on car-parking availability at centres of activity will be communicated to motorists in advance of reaching their destination. Decisions on parking can then be made in a predetermined manner, thus minimising the number of entry routings necessary for vehicular access through congested parts of the road network. This use of electronic signage to channel traffic to parking facilities will be important in this regard.</p> <p>The design of new parking and the reconfiguration of existing parking should be cognisant of the public transport, cycle and pedestrian networks in the locality, to ensure conflict between the modes is minimised, and that potential for delays is reduced. New parking arrangements should consider the requirements of disabled drivers, and ensure that appropriately designed spaces are provided as close to the destination as possible.</p> <p>It is also intended to provide both on-street and off-street secure parking for motorcycles and scooters in Dublin City Centre and other centres of activity, as well as at public transport facilities, in line with demand and having regard to the needs of other modes.</p> <p>The supply and management of parking at destinations is central to the management of travel demand. It has a critical influence on mode choice for all journey purposes. It also has a critical influence on congestion, the design of new development, operation of all transport modes, and the allocation and design of space in urban areas. Accordingly, it is intended to:</p> <ul style="list-style-type: none"> <li>• Seek the implementation of Implement common maximum standards for a range of consistently-defined land use types within the GDA regional land use hierarchy;</li> <li>• Seek reductions inLimit the availability of workplace parking in urban centres to discourage car commuting, where alternative transport options are available;</li> <li>• Promote Implement area-based parking cap in locations where the highest intensity of development occurs and is promoted, such as Dublin City Centre, town / district centres and higher-order public transport nodes;</li> <li>• Promote the provision and management of destination parking in areas of high trip demand, subject to appropriate pricing and locational criteria; and</li> <li>• Provide appropriate parking arrangements for specific user requirements including disabled drivers, motorcycles and scooters in Dublin City Centre and other centres of activity, as well as at public transport nodes, in line with demand, and having regard to the needs of other modes.</li> </ul>	<p>C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1</p>	<p>C1 C2 C3 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</p>		
<p><b>Park and Ride</b> it is intended to:</p> <ul style="list-style-type: none"> <li>• Develop a network of strategic rail-based park and ride facilities at appropriate points where rail services intersect with the national road network, adjacent to, or outside of, the M50. These facilities are, or would be, located at Swords, Finglas, Dunboyne, Liffey Valley, Carrickmines, Woodbrook, Naas Road, and Greystones;</li> </ul>	<p>C1 C2 C3 P1 HH1</p>	<p>C1 C2 C3 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</p>		

<ul style="list-style-type: none"> <li>• Further develop the provision of local park and ride facilities at appropriate locations on the rail network in the outer parts of the Metropolitan Area and in the Hinterland area, where they improve public transport accessibility without worsening road congestion, or increasing car travel distance;</li> <li>• Consider the potential for bus-based park and ride, in particular, close to high quality road corridors leading from Hinterland towns, with good bus priority to commuter destinations in the Metropolitan area; and</li> <li>• Implement suitable charging structures for park and ride facilities to make it more likely that those who most need the service (i.e. those outside walking distance and where alternative public transport options are not available), will obtain parking</li> </ul>				
<p><b>Commentary on certain interactions:</b></p> <p><i>Park and ride would facilitate increased use of public transport and achievement of objectives relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Arising both directly from the construction and operation and indirectly from facilitating non-transport related development, parking/park and ride would have the potential to give rise to a range of adverse impacts including contributing towards motorised transport and associated emissions and energy usage and interactions with human health (SEOs C1 C2 C3 HH1). Potential conflicts would be mitigated by the measures which have been integrated into the Strategy and are identified in Section 9 of this report. Also, by being “cognisant of the public transport, cycle and pedestrian networks in the locality, to ensure conflict between the modes is minimised, and that potential for delays is reduced”, projects could facilitate improvements in sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1).</i></p>				
<p>Demand Management</p> <p>It is intended to:</p> <ul style="list-style-type: none"> <li>• Encourage land use policies which support the provision of development in locations and at densities which enable the efficient provision of public transport services;</li> <li>• Set maximum parking standards for all new developments, with the level of parking provision applied being based on the level of public transport accessibility;</li> <li>• Reduce the availability of workplace parking in urban centres to discourage car commuting, where alternative transport options are available;</li> <li>• Implement demand management measures on the M50 motorway to ensure that it retains sufficient capacity to fulfill its strategic functions;</li> <li>• Implement, at the appropriate time, demand management measures to address congestion issues on the radial national routes approaching the M50 motorway, to ensure that these routes retain sufficient capacity to fulfill their strategic functions;</li> <li>• Secure the introduction or expansion of on-street parking controls, and charging structures, that seek to reduce commuter parking and which contribute to greater parking turnover for non-commuting purposes;</li> <li>• Introduce parking charges at out-of-town retail centres, to reduce the congestion potential at these locations; and</li> <li>• Support and facilitate the implementation and expansion of: <ul style="list-style-type: none"> <li>◦ Workplace Travel Plans for all large employers;</li> <li>◦ Tailored travel planning information provision for residential and commercial/retail areas;</li> <li>◦ Travel Plans for schools, colleges and all education campuses; and</li> <li>◦ Car club schemes, car-pooling and car sharing.</li> </ul> </li> </ul>	<p>C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1</p>	<p>C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1</p>		

<b>Commentary on certain interactions:</b>  <i>Demand management would improve the status of SEOs relating to sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). The evaluation against SEOs provided for this provision reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4. Potentially adverse impacts would be dependent on the location and the nature of the development however mitigation would be achieved by compliance with the measures which have been integrated into the Strategy (see Section 9).</i>				
<b>Delivery and Phasing</b>  <p>Section 13 of the Dublin Transport Authority Act 2008 requires the preparation of an Integrated Implementation Plan within nine months of the adoption of a transport strategy. That Integrated Implementation Plan is required to set out the investment priorities and proposals for the subsequent six years. Successive Integrated Implementation Plans will deal with the remaining years of the Strategy.</p> <p>While it is within the context of the Integrated Implementation Plan that specific six year priorities will be established, aligned with available funding, it is appropriate to set out a sequencing of the major elements of the Strategy to guide the development of those Integrated Implementation Plans.</p> <p>The delivery of the proposals contained in this Strategy will be subject to a number of influencing factors. The primary factor will be the availability of funding to construct the various infrastructural elements of the Strategy and the necessary financial supports to provide additional transport services. Such funding will primarily be Exchequer funding but may include private sector funding for the delivery of certain elements. Other factors include the need to align provision of new infrastructure and services with the emergence of the transport need for such provision. In addition, the process of planning consent, and the risk of legal challenges to such consents, is also a factor which is relevant to the delivery of infrastructure in particular.</p> <p>While the Integrated Implementation Plans will establish the full detail of delivery of the proposals set out in the Strategy, Figure 5.12 sets out the proposed sequencing of the delivery of the infrastructure elements of the Strategy. This sequencing has considered:</p> <ul style="list-style-type: none"> <li>the importance of each element of the Strategy in meeting the requirements for travel in the Greater Dublin Area over the 20-year period of the Strategy;</li> <li>the Government's Capital Investment Plan "Building on Recovery: Infrastructure and Capital Investment 2016-2021",</li> <li>the likely sequencing pattern of land use development over the period of the Strategy;</li> <li>the issue of traffic congestion on key strategic routes; and</li> <li>the required planning, design and procurement times for major infrastructural schemes.</li> </ul>	<b>C1 C2 C3 P1</b> <b>HH1 B1 B2 B3</b> <b>M1 M2 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>	<b>C1 HH1 B1 B2</b> <b>B3 M1 M3 W1</b> <b>W2 W3 L1 CH1</b> <b>CH2 S1</b>		
<b>Commentary on certain interactions:</b>  <i>The evaluation against SEOs provided for this delivery and phasing reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4. Lower tiers of plan-making and project preparation – including the Implementation Plans – are required to be subject to environmental assessment (SEA/EIA) and Appropriate Assessment requirements as relevant.</i>				



### 8.6.7 Transport Services and Integration

	Likely to <u>Improve</u> status of SEOs	Potential <u>Conflict</u> with status of SEOs- likely to be mitigated	Probable <u>Conflict</u> with status of SEOs- unlikely to be mitigated	<u>No Likely</u> interaction with status of SEOs
The Strategy provides for Transport Services and Integration covering topics including Bus Services, Bus stops and Bus Shelters, Rail Services, Fares, Passenger Information Systems, Optimising Interchange and transport facilities, Accessibility, Small Public Service Vehicles (Taxis, Hackneys and Limousines), Local Transport Services, Enforcement and Security, Information and Security and Environmental.	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
<b>Commentary on certain interactions:</b>  <i>Improving Transport Services and Integration would primarily improve sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). Arising both directly from the localised construction and operation and indirectly from facilitating non-transport related development, these projects would have the potential to give rise to a range of adverse impacts including contributing towards the motorised transport and associated emissions and energy usage (SEOs C1 C2 C3), ecology (SEOs B1 B2 B3), archaeological and architectural heritage, including context (SEOs CH1 CH2), visual impacts (SEO L1), public amenities and waste levels (SEOs M1 M3), human health (SEO HH1), soil and the status of water bodies (SEOs S1 W1 W2), flood risk (SEO W3). Potentially adverse impacts would be dependent on the location and the nature of the development however mitigation, where necessary, would be achieved by compliance with the measures which have been integrated into the Strategy (see Section 9). The evaluation against SEOs provided for these provisions reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i>				

### 8.6.8 Land Use Integration and Behavioural Change

	Likely to <u>Improve</u> status of SEOs	Potential <u>Conflict</u> with status of SEOs- likely to be mitigated	Probable <u>Conflict</u> with status of SEOs- unlikely to be mitigated	<u>No Likely</u> interaction with status of SEOs
The Strategy provides for Land Use Integration and Behavioural Change covering topics including Land Use Integration, Process of Integrating the Strategy with Land Use Policy, Principles of Land Use and Transport Integration and Behavioural Change Programmes	C1 C2 C3 P1 HH1 B1 B2 B3 M1 M2 M3 W1 W2 W3 L1 CH1 CH2 S1	C1 HH1 B1 B2 B3 M1 M3 W1 W2 W3 L1 CH1 CH2 S1		
<b>Commentary on certain interactions:</b>  <i>The implementation of the Strategy will facilitate a more efficient use of land within the GDA and will improve the accessibility of central areas, which will potentially lead to the greater consolidation of trip intensive developments such as employment and retail into locations served by public transport.</i>  <i>Improving Land Use Integration and Behavioural Change would primarily improve sustainable mobility and associated interactions (SEOs C1 C2 C3 P1 HH1). The evaluation against SEOs provided for these provisions reflects the evaluation for the selected alternative for the Strategy which is provided under Section 7.4.</i>				

## Section 9 Mitigation Measures

Transport is one of many sectors operating in the Greater Dublin Area and the Transport Strategy is expected to facilitate improvements in environmental management and protection within this area. There are various positive environmental effects likely to be facilitated by the implementation of the Strategy and these have been detailed under the preceding sections.

The SEA and AA processes which have been undertaken alongside the preparation of the Strategy have brought about changes to the emerging Strategy thereby enabling the mitigation of any potentially adverse environmental effects. All recommendations made by the SEA and AA processes were integrated into the Strategy. The changes which have been brought about by the SEA and AA processes are detailed in Table 9.1 and Table 9.2 below which also link the changes to specific environmental components and the potential adverse effects which would be present if the changes were not made.

**Table 9.1 Provisions contained in the Strategy main body**

Strategy Chapter No.	Change arising from SEA/AA process	Environmental component	Potential adverse effect mitigated
1. Introduction and Context	Insertion of text providing an introduction and context to SEA and AA	None	None
2. Policy Review	Inclusion of hierarchy diagram that shows where the Strategy is situated in the planning and environmental assessment hierarchy of transport policy, plans, programmes and projects	None	None
3. Transport in the Greater Dublin Area	None	None	None
4. Development of the Strategy	The insertion of two footnotes: "Subject to compliance with the EU Habitats and Birds Directives."	Biodiversity and Flora and Fauna	<ul style="list-style-type: none"> <li>- Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna</li> <li>- Habitat loss, fragmentation and deterioration, including patch size and edge effects</li> <li>- Disturbance and displacement of protected species and coastal squeeze</li> <li>- Effects in riparian zones where new crossings of waters, if any, are progressed</li> </ul>
5. The 2035 Transport Network	The insertion of one footnote: "Subject to compliance with the EU Habitats and Birds Directives."	Biodiversity and Flora and Fauna	<ul style="list-style-type: none"> <li>- Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna</li> <li>- Habitat loss, fragmentation and</li> </ul>

Strategy Chapter No.	Change arising from SEA/AA process	Environmental component	Potential adverse effect mitigated
			deterioration, including patch size and edge effects - Disturbance and displacement of protected species and coastal squeeze - Effects in riparian zones where new crossings of waters, if any, are progressed
6. Transport Services and Integration	None	None	None
7. Land Use Integration and Behavioural Change	Informing the following paragraph:  “Land use and the manner in which it is developed is the primary influencing factor for travel demand. A closer relationship between how transport demand is created and how it can be catered for is provided for in the Dublin Transport Authority Act 2008 and the Planning and Development Act 2000, which state that the Regional Spatial and Economic Strategies (formerly Regional Planning Guidelines), Development Plans and Local Area Plans in the GDA must be consistent with the Authority's Transport Strategy. All of these plans are also subject to Strategic Environmental Assessment and Appropriate Assessment. This section sets out both the process by which this closer integration will occur, and the principles which will guide this interaction”	None	None
8. Environmental Protection and Management	Insertion of Section 8 entitled “Environmental Protection and Management” which identifies the measures detailed below into the Transportation Strategy.	Various (see Table 9.2)	
	<b>Regulatory framework for environmental protection and management</b> In implementing this strategy, the Authority will cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management and will ensure that plans, programmes and projects comply with EU Directives - including the Habitats Directive (92/43/EEC, as amended), the Birds Directive (2009/147/EC), the Environmental Impact Assessment Directive (85/337/EEC, as amended) and the Strategic Environmental Assessment Directive (2001/42/EC) – and relevant transposing Regulations.	Various (see Table 9.2)	
(8. continued)	<b>Information to be considered at lower levels of decision making and environmental assessment</b> Lower levels of decision making and environmental assessment should consider the sensitivities identified in Section 4 of the SEA Environmental Report, including the following: <ul style="list-style-type: none"> <li>• Candidate Special Areas of Conservation and Special Protection Areas;</li> <li>• Features of the landscape that provide linkages/connectivity to designated sites (e.g. watercourses, areas of semi-natural habitat such as linear woodlands etc);</li> <li>• Salmonid Waters;</li> <li>• Shellfish Waters;</li> <li>• Freshwater Pearl Mussel catchments;</li> <li>• Nature Reserves;</li> <li>• Natural Heritage Areas and proposed Natural Heritage Areas;</li> <li>• Areas likely to contain a habitat listed in annex 1 of the Habitats Directive;</li> <li>• Entries to the Record of Monuments and Places and Zones of Archaeological Potential;</li> <li>• Entries to the Record of Protected Structures;</li> <li>• Un-designated sites of importance to wintering or breeding bird species of conservation concern;</li> <li>• Architectural Conservation Areas; and</li> <li>• Relevant landscape designations.</li> </ul>	Various (see Table 9.2)	

Strategy Chapter No.	Change arising from SEA/AA process	Environmental component	Potential adverse effect mitigated
(8. continued)	<p><b>Corridor and Route Selection Process for relevant new infrastructure</b></p> <p>The following Corridor and Route Selection Process will be undertaken for relevant new infrastructure:</p> <p>Stage 1 – Route Corridor Identification, Evaluation and Selection</p> <ul style="list-style-type: none"> <li>Environmental constraints (including those identified in identified in Section 4 of the SEA Environmental Report) and opportunities (such as existing linear infrastructure) will assist in the identification of possible route corridor options;</li> <li>Potentially feasible corridors within which infrastructure could be accommodated will be identified and these corridors assessed. The selection of the preferred route corridor will avoid constraints and meet opportunities to the optimum extent, as advised by the relevant specialists; and</li> <li>In addition to the constraints identified above, site specific field data may be required to identify the most appropriate corridors.</li> </ul> <p>Stage 2 – Route Identification, Evaluation and Selection</p> <ul style="list-style-type: none"> <li>Potentially feasible routes within the preferred corridor will be identified and assessed. The selection of preferred routes will avoid constraints and meet opportunities to the optimum extent, as advised by the relevant specialists, taking into account project level information and potential mitigation measures that are readily achievable;</li> <li>In addition to the constraints identified above, site specific field data may be required to identify the most appropriate routes; and</li> <li>In addition to environmental considerations, the identification of route corridors and the refinement of the route lines is likely to be informed by other considerations.</li> </ul>	Various (see Table 9.2)	
(8. continued)	<p><b>Appropriate Assessment</b></p> <p>All projects and plans arising from this Strategy will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive. A plan or project will only be authorised after the competent authority has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and a Stage 2 Appropriate Assessment where necessary, that:</p> <ol style="list-style-type: none"> <li>The Plan or project will not give rise to significant adverse direct, indirect or secondary effects on the integrity of any European site (either individually or in combination with other plans or projects); or</li> <li>The Plan or project will have significant adverse effects on the integrity of any European site (that does not host a priority natural habitat type/and or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000; or</li> <li>The Plan or project will have a significant adverse effect on the integrity of any European site (that hosts a natural habitat type and/or a priority species) but there are no alternative solutions and the plan or project must nevertheless be carried out for imperative reasons for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000.</li> </ol>	Biodiversity and Flora and Fauna	<p>- Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna</p> <ul style="list-style-type: none"> <li>- Habitat loss, fragmentation and deterioration, including patch size and edge effects</li> <li>- Disturbance and displacement of protected species and coastal squeeze</li> <li>- Effects in riparian zones where new crossings of waters, if any, are progressed</li> </ul>

Strategy Chapter No.	Change arising from SEA/AA process	Environmental component	Potential adverse effect mitigated
(8. continued)	<b>Protection of Natura 2000 Sites</b> No projects giving rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall be permitted on the basis of this Strategy (either individually or in combination with other plans or projects <sup>76</sup> ).	Biodiversity and Flora and Fauna	- Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna - Habitat loss, fragmentation and deterioration, including patch size and edge effects - Disturbance and displacement of protected species and coastal squeeze - Effects in riparian zones where new crossings of waters, if any, are progressed
(8. continued)	<b>Other Plans and Environmental Policies</b> Various policies related to climate change, carbon emissions and associated action plans are under development at the time of preparation of this Strategy. This includes new legislation in the form of the "Climate Action and Low Carbon Development Bill 2015". That Bill, when enacted, will include provision for the preparation of a "national mitigation plan" and a "national adaptation framework", which will establish energy related targets and actions to be adopted across the transport sector. The implementation of the Strategy will incorporate the relevant targets and actions arising from these and related policies in the area of transport energy. The relevant Integrated Implementation Plans to be developed, pursuant to Section 13 of the Dublin Transport Authority Act 2008, will also incorporate the necessary provisions arising from these developing policies.	Air and Climatic Factors	An extent of travel related greenhouse gas and other emissions to air. This has been mitigated by provisions which have been integrated into the Strategy, including those relating to sustainable mobility.
(8. continued)	<b>Other Measures</b> In implementing the Strategy, the Authority will ensure that the measures included in Table 9.2 of the SEA Environmental Report are complied with.	Various (see Table 9.2)	

The SEA and AA recommendations detailed in Table 9.2 below have been integrated into the Strategy through the commitment provided at Section 8.6 of the Strategy. These measures are linked to specific environmental components and the potential adverse effects which would be present if the measures were not integrated into the Strategy.

<sup>76</sup> Except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:

- no alternative solution available,
- imperative reasons of overriding public interest for the plan/programme/project to proceed; and
- Adequate compensatory measures in place.

**Table 9.2 Provisions referred to in Transport Strategy Section 8.6**

Environmental component benefitting	Potential adverse effect mitigated	Requirement
Various	Various – see below	<p><b>Construction and Environmental Management Plans</b></p> <p>Construction Environment Management Plans (CEMPs) shall be prepared in advance of the construction of larger projects and implemented throughout. Such plans shall incorporate relevant and reliable mitigation measures which have been integrated into the Strategy and any lower tier Environmental Impact Statement or Appropriate Assessment. CEMPs typically provide details of intended construction practice for the proposed development, including:</p> <ul style="list-style-type: none"> <li>a. location of the sites and materials compound(s) including area(s) identified for the storage of construction refuse,</li> <li>b. location of areas for construction site offices and staff facilities,</li> <li>c. details of site security fencing and hoardings,</li> <li>d. details of on-site car parking facilities for site workers during the course of construction,</li> <li>e. details of the timing and routing of construction traffic to and from the construction site and associated directional signage,</li> <li>f. measures to obviate queuing of construction traffic on the adjoining road network,</li> <li>g. measures to prevent the spillage or deposit of clay, rubble or other debris,</li> <li>h. alternative arrangements to be put in place for pedestrians and vehicles in the case of the closure of any public right of way during the course of site development works,</li> <li>i. details of appropriate mitigation measures for noise, dust and vibration, and monitoring of such levels,</li> <li>j. containment of all construction-related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained; such bunds shall be roofed to exclude rainwater,</li> <li>k. disposal of construction/demolition waste and details of how it is proposed to manage excavated soil,</li> <li>l. a water and sediment management plan, providing for means to ensure that surface water runoff is controlled such that no silt or other pollutants enter local water courses or drains,</li> <li>m. details of a water quality monitoring and sampling plan.</li> <li>n. if peat is encountered - a peat storage, handling and reinstatement management plan.</li> <li>o. measures adopted during construction to prevent the spread of invasive species (such as Japanese Knotweed).</li> <li>p. appointment of an ecological clerk of works at site investigation, preparation and construction phases.</li> </ul>
Various	Various – see below	<p><b>Maintenance Plan</b></p> <p>Relevant lower tier assessments shall put in place Maintenance Plans informed by environmental considerations where relevant and appropriate.</p>
Air and Climatic Factors	Emissions to air	<p><b>Air and Energy</b></p> <p>To contribute towards: compliance with air quality legislation; greenhouse gas emission targets; management of noise levels; and reductions in energy usage. This includes: contributions towards meeting legislative targets contained in the CAFE Directive as transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011); principles of the Convention on Long Range Transport of Air Pollution; and incorporation of the relevant targets and actions arising from the Climate Action and Low Carbon Development Bill 2015 and the national mitigation and adaptation plans and related policies in the area of transport energy.</p>
Population and human health	Potential interactions if effects upon environmental vectors such as air are not mitigated	<p><b>Human Health</b></p> <p>To assess proposals for development in terms of, inter alia, potential impact on existing adjacent developments, existing land uses and/or the surrounding landscape. Where proposed developments would be likely to have a significant adverse effect on the amenities of the area through pollution by noise, fumes, odours, dust, grit or vibration, or cause pollution of air, water and/or soil, mitigation measures shall be introduced in order to eliminate adverse environmental impacts or reduce them to an acceptable operating level.</p>
Biodiversity and flora and fauna	- Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to	<p><b>Protection of Biodiversity including Natura 2000 Network</b></p> <p>To contribute, as appropriate, towards the protection of designated ecological sites including candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs); UNESCO World Heritage and UNESCO Biosphere sites; Ramsar Sites; Salmonid Waters; Shellfish Waters; Freshwater Pearl Mussel catchments; Flora Protection Order sites; Wildlife Sites (including Nature Reserves); Certain entries to the Water Framework Directive Register of Protected Areas; Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs); Wildfowl Sanctuaries (see S.I. 192 of 1979) ; and Tree Preservation Orders (TPOs).</p>

Environmental component benefitting	Potential adverse effect mitigated	Requirement
	biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna - Habitat loss, fragmentation and deterioration, including patch size and edge effects - Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species and coastal squeeze - Effects in riparian zones where new crossings of waters, if any, are progressed - Potential effects from transport emissions	<p>To comply with relevant EU Environmental Directives and applicable National Legislation, Policies, Plans and Guidelines, including the following and any updated/superseding documents):</p> <ul style="list-style-type: none"> <li>• EU Directives, including the Habitats Directive (92/43/EEC, as amended)<sup>77</sup>, the Birds Directive (2009/147/EC)<sup>78</sup>, the Environmental Liability Directive (2004/35/EC)<sup>79</sup>, the Environmental Impact Assessment Directive (85/337/EEC, as amended), the Water Framework Directive (2000/60/EC) and the Strategic Environmental Assessment Directive (2001/42/EC).</li> <li>• National legislation, including the Wildlife Acts 1976-2000<sup>80</sup>, the European Communities (Environmental Impact Assessment) Regulations 1989 (SI No. 349 of 1989) (as amended), the Wildlife (Amendment) Act 2000, the European Union (Water Policy) Regulations 2003 (as amended), the Planning and Development Act 2000 (as amended), the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477 of 2011) as amended, the European Communities (Environmental Liability) Regulations 2008<sup>81</sup> and the Flora Protection Order 1999.</li> <li>• National policy guidelines (including any clarifying Circulars or superseding versions of same), including the Landscape and Landscape Assessment Draft Guidelines 2000, the Environmental Impact Assessment Sub-Threshold Development Guidelines 2003, Strategic Environmental Assessment Guidelines 2004 and the Appropriate Assessment Guidance 2010.</li> <li>• Catchment and water resource management Plans, including River Basin District Management Plans 2009-2015 (including any superseding versions of same).</li> <li>• Biodiversity Plans and guidelines, including Actions for Biodiversity 2011-2016: Ireland's 2<sup>nd</sup> National Biodiversity Plan (including any superseding version of same), County Biodiversity Action Plans and relevant measures contained in statutory land use plans.</li> <li>• Ireland's Environment 2014 (EPA, 2014, including any superseding versions of same), and to make provision where appropriate to address the report's goals and challenges.</li> </ul> <p><b>NPWS &amp; Integrated Management Plans</b>            Regarding, integrated management plans, Article 6(1) of the Habitats Directive requires that Member States establish the necessary conservation measures for European sites involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans. The NPWS's current priority is to identify site specific conservation objectives; management plans may be considered after this is done.            Where Integrated Management Plans are being prepared for European sites (or parts thereof), the NTA shall engage with the National Parks and Wildlife Service in order to ensure that plans are fully integrated with the Strategy and other plans and programmes, with the intention that such plans are practical, achievable and sustainable and have regard to all relevant ecological, cultural, social and economic considerations.            In the absence of management plans, the NTA will have due regard to the management requirements of European sites as implied by published Site Specific Conservation Objectives (SSOCs).</p> <p><b>Coastal Zone Management</b>            To support measures to protect the coast, the coastal edge and coastal habitats; and facilitate an Integrated Coastal Zone Management approach to ensure the conservation, management and projection of man-made and natural resources of the coastal zone.</p>
		<p><b>Biodiversity and Ecological Networks</b>            To contribute towards the protection and enhancement of biodiversity and ecological connectivity, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands, geological and geo-morphological systems, other landscape features and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones in the context of Article 10 of the Habitats Directive.</p>

<sup>77</sup> Including Annex I habitats, Annex II species and their habitats and Annex IV species and their breeding sites and resting places (wherever they occur). Note that the NPWS provide sensitive areas mapping for Freshwater Pearl Mussels which are listed under Annex II of the Directive.

<sup>78</sup> Including Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur).

<sup>79</sup> Including protected species and natural habitats.

<sup>80</sup> Including species of flora and fauna and their key habitats.

<sup>81</sup> Including protected species and natural habitats.

Environmental component benefitting	Potential adverse effect mitigated	Requirement
		<p><b>Protection of Riparian Zone and Waterbodies and Watercourses</b> To help to ensure that waterbodies and watercourses are protected from inappropriate development, including rivers, streams, associated undeveloped riparian strips, wetlands and natural floodplains. This will include protection buffers in riverine, wetland and coastal areas, as appropriate.</p> <p><b>Non-Designated Sites</b> To help to ensure the appropriate protection of non-designated habitats and landscapes and to conserve the biological diversity.</p> <p><b>Non-native invasive species</b> To support, as appropriate, the National Parks and Wildlife Service's efforts to seek to control the spread of non-native invasive species on land and water.</p> <p><b>National Peatlands Strategy</b> To implement any relevant recommendations contained in the Department of Arts, Heritage and the Gaeltacht's National Peatlands Strategy, when finalised.</p>
<b>Material Assets</b>	<ul style="list-style-type: none"> <li>- Generation of construction waste</li> <li>- Loss or damage to public assets and infrastructure</li> </ul>	<p><b>Construction Waste</b> To demonstrate that all waste arising during construction phase will be managed and disposed of in a way that ensures the provisions of the Waste Management Acts and regulations and any of the relevant Local Authorities Waste Management Plans. Construction Waste Management Plans will be implemented to minimise waste and ensure correct handling and disposal of construction waste streams in accordance with the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects, Department of the Environment, July 2006.</p> <p><b>Waste Creation</b> To support the minimisation of waste creation and promote a practice of reduce, reuse and recycle where possible.</p> <p><b>Waste Disposal</b> To safeguard the environment by seeking to ensure that residual waste is disposed of appropriately.</p> <p><b>Public Assets and Infrastructure</b> To contribute towards the protection of public assets and infrastructure including resources such as: public open spaces, parks and recreational areas; public buildings and services; and utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.).</p>
<b>Water</b>	<ul style="list-style-type: none"> <li>- Adverse impacts upon the status of water bodies and entries to the WFD Register of Protected Areas, arising from changes in quality, flow and/or morphology</li> <li>- Increase in the risk of flooding</li> </ul>	<p><b>Water Framework Directive and associated legislation</b> To contribute towards, as appropriate, the protection of existing and potential water resources, and their use by humans and wildlife, including rivers, streams, wetlands, groundwater, coastal waters and associated habitats and species in accordance with the requirements and guidance in the EU Water Framework Directive 2000 (2000/60/EC), the European Union (Water Policy) Regulations 2003 (as amended), the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI No. 272 of 2009), the Groundwater Directive 2006/118/EC and the European Communities Environmental Objectives (groundwater) Regulations, 2010 (S.I. No. 9 of 2010) and other relevant EU Directives, including associated national legislation and policy guidance (including any superseding versions of same). To support the application and implementation of a catchment planning and management approach to development and conservation, including the implementation of Sustainable Drainage System techniques for new development.</p> <p><b>River Basin Management Plan</b> To support the implementation of the relevant recommendations and measures as outlined in the various River Basin Management Plans 2009 – 2015, and associated Programmes of Measures, or any such plans that may supersede same during the lifetime of the Strategy, as well as relevant recommendations contained in the Water Quality in Ireland 2007 – 2009 (EPA, 2011, and any updated/superseding document). Proposals for development shall not have an unacceptable impact on the water environment, including surface waters, groundwater quality and quantity, river corridors and associated woodlands and coastal waters. Cognisance shall be given to the EU's Common Implementation Strategy Guidance Document No. 20 (which provides guidance on exemptions to the environmental objectives of the Water Framework Directive) where relevant.</p> <p><b>Bathing Water</b> To contribute towards the achievement of the requirements of the EU Bathing Water Directive and transposing Bathing Water Quality Regulations (SI No. 79 of 2008) and EU Mandatory Values, as a minimum, and EU Guide Values, where possible.</p> <p><b>Flood Risk Management Guidelines</b> To support, as appropriate, in co-operation with the OPW and planning authorities, the implementation of the EU Flood Risk Directive (2007/60/EC), the Flood Risk Regulations (SI No. 122 of 2010), the DEHLG/OPW publication <i>The Planning System and Flood Risk Management Guidelines</i> (2009) (including any clarifying Circulars or superseding versions of same) and relevant outputs of the Catchment and Flood Risk Assessment and</p>



Environmental component benefitting	Potential adverse effect mitigated	Requirement
		Management Studies (CFRAMS).
		<b>Surface Water Drainage and Sustainable Drainage Systems (SuDs)</b> To ensure that new development is adequately serviced with surface water drainage infrastructure and promote the use of Sustainable Drainage Systems as appropriate.
<b>Landscape</b>	Occurrence of adverse visual impacts and conflicts with the appropriate protection of statutory designations relating to the landscape	<b>Landscape Designations</b> To contribute, as appropriate, towards the protection of county and local level landscape designations from incompatible developments. Proposals for development that have the potential to significantly adversely impact upon these designations shall be accompanied by an assessment of the potential landscape and visual impacts of the proposed development - demonstrating that landscape impacts have been anticipated and avoided to a level consistent with the sensitivity of the landscape and the nature of the designation.
		<b>Coastal Areas and Seascapes</b> To protect the character and visual potential of the coast and conserve the character and quality of seascapes.
		<b>National Landscape Strategy</b> Support, as appropriate, any relevant recommendations contained in the Department of Arts, Heritage and the Gaeltacht's National Landscape Strategy for Ireland, when finalised.
<b>Cultural Heritage</b>	Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities	<b>Archaeological Heritage</b> To contribute, as appropriate, towards the protection and sympathetic enhancement of archaeological heritage, in particular by implementing the relevant provisions of the Planning and Development Act 2000 (as amended) and the National Monuments Act, 1930 (as amended).
		<b>Protection of Archaeological Sites</b> To contribute, as appropriate, towards the protection of archaeological sites and monuments and their settings, archaeological objects and underwater archaeological sites that are listed in the Record of Monuments and Places, in the ownership/guardianship of the State, or that are subject of Preservation Orders or have been registered in the Register of Historic Monuments. Contribute, as appropriate, towards the protection and preservation of archaeological sites, which have been identified subsequent to the publication of the Record of Monuments and Places.
		<b>Consultation</b> To consult with the National Monuments Service of the Department of Arts Heritage and the Gaeltacht in relation to proposed developments adjoining archaeological sites.
		<b>Underwater Archaeological Sites</b> To contribute, as appropriate, towards the protection and preservation of underwater archaeological sites in riverine, intertidal and sub-tidal locations.
		<b>Architectural Heritage</b> Help to ensure the appropriate protection of architectural heritage by complying, as appropriate, with the legislative provisions of the Planning and Development Act 2000 (as amended) in relation to architectural heritage and the policy guidance contained in the Architectural Heritage Protection Guidelines 2011 (and any updated/superseding document).
<b>Soil</b>	Adverse impacts on the hydrogeological and ecological function of the soil resource as a result of construction of associated facilities/ infrastructure	<b>Soil Protection and Contamination</b> To ensure that adequate soil protection measures are undertaken where appropriate. Adequate and appropriate investigations shall be carried out into the nature and extent of any soil and groundwater contamination and the risks associated with site development work, where brownfield development is proposed.
		<b>Areas of geological interest</b> Contribute towards the appropriate protection and maintenance of the character, integrity and conservation value of features or areas of geological interest.

## Section 10 Monitoring Programme

### 10.1 Introduction

The SEA Directive requires that the significant environmental effects of the implementation of plans and programmes are monitored. This section details the measures which will be used in order to monitor the likely and potential significant effects of implementing the Transport Strategy.

Monitoring can both demonstrate the positive effects facilitated by the Strategy including those relating to sustainable mobility and can enable, at an early stage, the identification of unforeseen adverse effects and the undertaking of appropriate remedial action.

### 10.2 Indicators and Targets

Monitoring is based around indicators which allow quantitative measures of trends and progress over time relating to the Strategic Environmental Objectives identified in Section 5 and used in the evaluation. Each indicator to be monitored is accompanied by the target(s) which were identified with regard to the relevant strategic actions.

Table 10.1 overleaf shows the indicators and targets which have been selected for monitoring the likely significant environmental effects of implementing the Strategy, if unmitigated.

Monitoring is an ongoing process and the programme allows for flexibility and the further refinement of indicators and targets. The Monitoring Programme may also be updated to deal with specific environmental issues - including unforeseen effects - as they arise.

### 10.3 Sources

Measurements for indicators generally come from existing monitoring sources. Existing monitoring sources include those maintained by the relevant authorities including the National Transport Authority, the Environmental Protection Agency, the National

Parks and Wildlife Service and the Central Statistics Office.

The output of lower-tier environmental assessment and decision making – including a review of project approvals granted and associated documents – will also be utilised as part of the Monitoring Programme.

Where significant effects - including positive, negative, cumulative and indirect - have the potential to occur as a result of the undertaking of individual projects or multiple individual projects such instances should be identified and recorded and should feed into the monitoring evaluation.

### 10.4 Reporting

A stand-alone Monitoring Report on the significant environmental effects of implementing the Strategy will be prepared on in advance of the review of the Strategy. This report will address the indicators set out below. The National Transport Authority is responsible for the ongoing review of indicators and targets, collating existing relevant monitored data, the preparation of monitoring evaluation report(s), the publication of these reports and, if necessary, the carrying out of corrective action, in combination with the relevant authorities.

The hierarchy of planning and environmental assessment – including associated environmental monitoring requirements - in which the Transport Strategy is situated is noted. This hierarchy is detailed on Figure 3.2.

### 10.5 Thresholds

Thresholds at which corrective action will be considered include:

- Complaints received from statutory consultees regarding avoidable impacts on any environmental components resulting from development which is granted permission under the Strategy;
- Court cases taken by the Department of Arts, Heritage and the Gaeltacht regarding impacts upon archaeological

heritage from development which is provided for by the Strategy;

- Fish kills directly attributable to development which is provided for by the Strategy; and
- The occurrence of flood events which are directly attributable to development which is provided for by the Strategy.

**Table 10.1 Selected Indicators, Targets and Monitoring Sources**

Environmental Component	Indicators	Targets	Source and Frequency
<b>Air and Climatic Factors</b>	C1i: Compliance with legislation including the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive and the 4 <sup>th</sup> Daughter Directive and adherence to the principles of the Convention on Long Range Transport of Air Pollution C1ii: Greenhouse gas emissions from transport	C1i: To contribute towards compliance with legislative air quality limits and target values <sup>82</sup> C1ii: To facilitate a reduction in greenhouse gas emissions from transport	• EPA Monitoring and publications on Air Quality and Greenhouse gas emissions
	C2: Percentage of population travelling to work, school or college by public transport or non-mechanical means	C2: An increase in the percentage of the population travelling to work, school or college by public transport or non-mechanical means	• Central Statistics Office data • Modelled output
	C3: Energy use by the transport sector as a percentage of Total Final Energy Consumption	C3: To facilitate a reduction in the percentage of energy use by the transport sector as a percentage of Total Final Energy Consumption	• Sustainable Energy Ireland <i>Energy in Ireland</i> reports • Modelled output
<b>Population and Human Health</b>	P1: Extent of urban/suburban areas within the catchment of transport infrastructure and services	P1: To maximise the extent of urban/suburban areas within the catchment of transport infrastructure and services	• Modelled output • Central Statistics Office data
	HH1: Occurrence (any) of a spatially concentrated deterioration in human health arising from environmental factors resulting from development provided for by the Strategy, as identified by the Health Service Executive and Environmental Protection Agency	HH1: No spatial concentrations of health problems arising from environmental factors as a result of implementing the Strategy	• Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents • Consultations with EPA and Health Service Executive (at monitoring review)
<b>Biodiversity, Flora and Fauna</b>	B1: Conservation status of habitats and species as assessed under Article 17 of the Habitats Directive	B1: Implementation of the Strategy should not prevent the maintenance or restoration of favourable conservation status of listed habitat and species <sup>83</sup>	• Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents • Department of Arts, Heritage and the Gaeltacht report of the implementation of the measures contained in the Habitats Directive - as required by Article 17 of the Directive (every 6 years) • Department of Arts, Heritage and the Gaeltacht's National Monitoring Report for the Birds Directive under Article 12 (every 3 years) • Consultations with the NPWS (at monitoring review)
	B2: Percentage loss of functional connectivity without remediation resulting from development provided for by the Strategy	B2: No significant ecological networks or parts thereof which provide functional connectivity to be lost without remediation resulting from development provided for by the Strategy	• Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents • CORINE mapping resurvey (every c. 5 years) • Review of EPA Ecological Network Mapping (if available)

<sup>82</sup> Information on air quality including standards is made available and kept up to date by the EPA at <http://www.epa.ie/air/quality/standards>.

<sup>83</sup> With regard to Natura 2000 sites there should be no significant adverse effects except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:

- (a) No alternative solution available;
- (b) Imperative reasons of overriding public interest for the plan/programme/project to proceed; and
- (c) Adequate compensatory measures in place.

Environmental Component	Indicators	Targets	Source and Frequency
<b>Biodiversity, Flora and Fauna</b>	B3i: Number of significant impacts on relevant habitats <sup>84</sup> , species <sup>85</sup> , environmental features or other sustaining resources in designated sites including Wildlife Sites resulting from development provided for by the Strategy  B3ii: Number of significant impacts on the protection of listed species	B3i: Avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in designated sites including Wildlife Sites resulting from development provided for by the Strategy  B3ii: No significant impacts on the protection of listed species	<ul style="list-style-type: none"> <li>Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> <li>Consultations with the NPWS (at monitoring review)</li> </ul>
<b>Material Assets</b>	M1: Protection of public assets and infrastructure such as: public open spaces, parks and recreational areas; public buildings and services; utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.)	M1: Minimisation of impacts upon public assets and infrastructure.	<ul style="list-style-type: none"> <li>Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> </ul>
	M2: Extent of brownfield land reused and regenerated which has been facilitated by the Strategy	M2: To maximise the sustainable reuse and regeneration of brownfield sites	<ul style="list-style-type: none"> <li>Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> </ul>
	M3: Preparation and implementation of construction and environmental management plans	M3: For construction and environmental management plans to be prepared and implemented for relevant projects	<ul style="list-style-type: none"> <li>Internal examination of compliance with SEA and lower tier assessment mitigation measures</li> </ul>
<b>Water</b>	W1i: Classification of Overall Status (comprised of ecological and chemical status) under the European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI No. 272 of 2009)  W1ii: Mandatory and Guide values as set by the EU Bathing Water Directive and transposing Bathing Water Quality Regulations (SI No. 79 of 2008)	W1i: Not to cause deterioration in the status of any surface water or affect the ability of any surface water to achieve 'good status' <sup>86</sup> by 2015  W1ii: To contribute towards the achievement of - as a minimum - Mandatory values and, where possible, to achieve Guide values as set by the EU Bathing Water Directive and transposing Bathing Water Quality Regulations (SI No. 79 of 2008)	<ul style="list-style-type: none"> <li>Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> <li>Data issued under the Water Framework Directive Monitoring Programme for Ireland (multi-annual)</li> <li>EPA <i>The Quality of Bathing Water in Ireland</i> reports</li> </ul>
	W2: Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC	W2: Not to affect the ability of groundwaters to comply with Groundwater Quality Standards and Threshold Values under Directive 2006/118/EC	<ul style="list-style-type: none"> <li>Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> <li>Data issued under the Water Framework Directive Monitoring Programme for Ireland (multi-annual)</li> </ul>
	W3: Compliance relevant lower tier assessments and decision making with the Flood Risk Management Guidelines	W3: For lower tier assessments and decision making to comply with the Flood Risk Management Guidelines	<ul style="list-style-type: none"> <li>Lower tier environmental assessment and decision making – including review of project approvals granted</li> </ul>

<sup>84</sup> Relevant habitats are those for which ecological sites are designated for

<sup>85</sup> Listed species are those which are specifically listed in legislation for protection

<sup>86</sup> Good status as defined by the WFD equates to approximately the following in the current national schemes of classification as set out by the EPA:

- *Q4* in the biological classification of rivers;
- *Mesotrophic* in the trophic classification of lakes, as set out by the EPA;
- *Unpolluted status* in the Assessment of Trophic Status of Estuaries and Bays in Ireland (ATSEBI).

Environmental Component	Indicators	Targets	Source and Frequency
<b>Landscape</b>	L1: Number of unmitigated conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities	L1: No unmitigated conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities	<ul style="list-style-type: none"> <li>• Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> </ul>
<b>Cultural Heritage</b>	CH1: Percentage of entries to the Record of Monuments and Places - including Zones of Archaeological Potential (and the context of the above within the surrounding landscape where relevant) - protected from significant adverse effects arising from development under the Strategy	CH1: Protect entries to the Record of Monuments and Places - including Zones of Archaeological Potential (and their context of the above within the surrounding landscape where relevant) from significant adverse effects arising from development under the Strategy	<ul style="list-style-type: none"> <li>• Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> <li>• Consultation with Department of Arts, Heritage and the Gaeltacht (at monitoring review)</li> </ul>
	CH2: Percentage of entries to the Records of Protected Structures and Architectural Conservation Areas and their context protected from significant adverse effects arising from development under the Strategy	CH2: Protect entries to the Records of Protected Structures and Architectural Conservation Areas and their context from significant adverse effects arising from development under the Strategy	<ul style="list-style-type: none"> <li>• Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> <li>• Consultation with Department of Arts, Heritage and the Gaeltacht (at monitoring review)</li> </ul>
<b>Soil</b>	S1: Soil extent and hydraulic connectivity	S1: To minimise reductions in soil extent and hydraulic connectivity	<ul style="list-style-type: none"> <li>• Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents</li> </ul>

## Appendix I Relationship with Legislation and Other Plans and Programmes

This appendix is not intended to be a full and comprehensive review of EU Directives, the transposing regulations or the regulatory framework for environmental protection and management. The information is not exhaustive and it is recommended to consult the Directive, Regulation, Plan or Programme to become familiar with the full details of each.

<b>European</b>				
<b>Directive/ Plan/ Programme</b>	<b>Highest Level Aim/ Purpose/ Objective</b>	<b>Lower level objectives, actions etc.</b>	<b>Relevant legislation in Ireland</b>	<b>Relevance to the Transport Strategy</b>
UN Kyoto Protocol and the Second European Climate Change Programme (ECCP II)	The UN Kyoto Protocol set of policy measures to reduce greenhouse gas emissions The Second European Climate Change Programme (ECCP II) aims to identify and develop all the necessary elements of an EU strategy to implement the Kyoto Protocol	<ul style="list-style-type: none"> <li>The Kyoto Protocol is implemented through the European Climate Change Programme (ECCP II)</li> <li>EU member states implement measures to improve on or complement the specified measures and policies arising from the ECCP</li> </ul>	National Policy Position and final Heads of the Climate Action and Low-Carbon Development Bill	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
EU 2020 climate and energy package	<ul style="list-style-type: none"> <li>Binding legislation which aims to ensure the European Union meets its climate and energy targets for 2020</li> <li>Aims to achieve a 20% reduction in EU greenhouse gas emissions from 1990 levels</li> <li>Aims to raise the share of EU energy consumption produced from renewable resources to 20%</li> <li>Achieve a 20% improvement in the EU's energy efficiency</li> </ul>	Four pieces of complimentary legislation: <ul style="list-style-type: none"> <li>Reform of the EU Emissions Trading System (EU ETS) to include a cap on emission allowances in addition to existing system of national caps</li> <li>Member States have agreed national targets for non-EU ETS emissions from countries outside the EU</li> <li>Meet the national renewable energy targets of 16% for Ireland by 2020</li> <li>Preparing a legal framework for technologies in carbon capture and storage</li> </ul>	The Framework for Climate Change Bill  European Communities (Renewable Energy) Regulations 2011 (S.I. No. 147/2011)	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Habitats Directive (92/43/EEC)	<ul style="list-style-type: none"> <li>Promote the preservation, protection and improvement of the quality of the environment, including the conservation of natural habitats and of wild fauna and flora</li> <li>Contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora</li> <li>Maintain or restore to favourable conservation status, natural habitats and species of wild fauna and flora of Community interest</li> <li>Promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Propose and protect sites of importance to habitats, plant and animal species</li> <li>Establish a network of Natura 2000 sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, to enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range</li> <li>Carry out comprehensive assessment of habitat types and species present</li> <li>Establish a system of strict protection for the animal species and plant species listed in Annex IV</li> </ul>	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)  The Wildlife Act 1976 and the Wildlife (Amendment) Act 2000	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations
Birds Directive (2009/147/EC)	<ul style="list-style-type: none"> <li>Conserve all species of naturally occurring birds in the wild state including their eggs, nests and habitats</li> <li>Protect, manage and control these species and comply with regulations relating to their exploitation</li> <li>The species included in Annex I shall be the subject</li> </ul>	<ul style="list-style-type: none"> <li>Preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Annex 1.</li> <li>Preserve, maintain and establish biotopes and habitats to include the creation of protected areas (Special Protection Areas); ensure the upkeep and management in accordance with the ecological needs of habitats inside</li> </ul>	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations

	of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution	and outside the protected zones, re-establish destroyed biotopes and creation of biotopes <ul style="list-style-type: none"> <li>Measures for regularly occurring migratory species not listed in Annex I is required as regards their breeding, moulting and wintering areas and staging posts along their migration routes. The protection of wetlands and particularly wetlands of international importance.</li> </ul>		
European Union Biodiversity Strategy to 2020	<ul style="list-style-type: none"> <li>Aims to halt or reverse biodiversity loss and speed up the EU's transition towards a resource efficient and green economy</li> <li>Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible</li> </ul>	<ul style="list-style-type: none"> <li>Outlines six targets and twenty actions to aid European in halting the loss to biodiversity and ecosystem services</li> <li>The six targets cover: <ul style="list-style-type: none"> <li>Full implementation of EU nature legislation to protect biodiversity</li> <li>Maintaining, enhancing and protecting for ecosystems, and green infrastructure</li> <li>Ensuring sustainable agriculture, and forestry</li> <li>Sustainable management of fish stocks</li> <li>Reducing invasive alien species</li> <li>Addressing the global need to contribute towards averting global biodiversity loss</li> </ul> </li> </ul>	Actions for Biodiversity 2011-2016 Ireland's National Biodiversity Plan, 2011	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
The Clean Air for Europe Directive (2008/50/EC)	<ul style="list-style-type: none"> <li>The CAFE Directive merges existing legislation into a single directive (except for the fourth daughter directive)</li> <li>Sets new air quality objectives for PM2.5 (fine particles) including the limit value and exposure related objectives</li> <li>Accounts for the possibility to discount natural sources of pollution when assessing compliance against limit values</li> <li>Allows the possibility for time extensions of three years (PM10) or up to five years (NO2, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.</li> </ul>	<ul style="list-style-type: none"> <li>Sets objectives for ambient air quality</li> <li>designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole</li> <li>Aims to assess the ambient air quality in Member States on the basis of common methods and criteria;</li> <li>Obtains information on ambient air quality in order to help combat air pollution and nuisance and to monitor long-term</li> <li>trends and improvements resulting from national and Community</li> <li>measures;</li> <li>Ensures that such information on ambient air quality is made available to the public;</li> <li>Aims to maintain air quality where it is good and improving it in other cases;</li> <li>Aims to promote increased cooperation between the Member States in reducing air pollution.</li> </ul>	<p>Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011)</p> <p>Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58 of 2009)</p>	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations
Fourth Daughter Directive (2004/107/EC)	<ul style="list-style-type: none"> <li>The Fourth Daughter Directive lists pollutants, target values and monitoring requirements for the following: arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air</li> </ul>			
Noise Directive 2002/49/EC	The Noise Directive - Directive 2002/49/EC relating to the assessment and management of environmental noise - is part of an EU strategy setting out to reduce the number of people affected by noise in the longer term and to provide a framework for developing existing Community policy on noise reduction from source.	<p>The Directive requires competent authorities in Member States to:</p> <ul style="list-style-type: none"> <li>Draw up strategic noise maps for major roads, railways, airports and agglomerations, using harmonised noise indicators and use these maps to assess the number of people which may be impacted upon as a result of excessive noise levels;</li> <li>Draw up action plans to reduce noise where necessary and maintain environmental noise quality where it is good; and</li> <li>Inform and consult the public about noise exposure, its</li> </ul>	Environmental Noise Regulations 2006 (S.I. No. 140 of 2006)	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations



		effects, and the measures considered to address noise. The Directive does not set any limit value, nor does it prescribe the measures to be used in the action plans, which remain at the discretion of the competent authorities.		
Floods Directive (2007/60/EC)	<ul style="list-style-type: none"> <li>Establishes a framework for the assessment and management of flood risks</li> <li>Reduce adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods in the Community</li> </ul>	<ul style="list-style-type: none"> <li>Assess all water courses and coast lines at risk from flooding through Flood Risk Assessment</li> <li>Prepare flood hazard maps and flood risk maps outlining the extent or potential of flooding and assets and humans at risk in these areas at River Basin District level (Article 3(2) (b)) and areas covered by Article 5(1) and Article 13(1) (b) in accordance with paragraphs 2 and 3</li> <li>Implement flood risk management plans and take adequate and coordinated measures to reduce flood risk for the areas covered by the Articles listed above</li> <li>Inform the public and allow the public to participate in planning process</li> </ul>	<p>European Communities (Assessment and Management of Flood Risks) Regulations (S.I. 122/2010)</p> <p>European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470/2012)</p>	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations
Water Framework Directive (2000/60/EC)	<ul style="list-style-type: none"> <li>Establish a framework for the protection of water bodies to include inland surface waters, transitional waters, coastal waters and groundwater and their dependent wildlife and habitats</li> <li>Preserve and prevent the deterioration of water status and where necessary improve and maintain "good status" of water bodies</li> <li>Promote sustainable water usage</li> <li>The Water Framework Directive repealed the following Directives: <ul style="list-style-type: none"> <li>The Drinking Water Abstraction Directive</li> <li>Sampling Drinking Water Directive</li> <li>Exchange of Information on Quality of Surface Freshwater Directive</li> <li>Shellfish Directive</li> <li>Freshwater Fish Directive</li> <li>Groundwater (Dangerous Substances) Directive</li> <li>Dangerous Substances Directive</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Protect, enhance and restore all water bodies and meet the environmental objectives outlined in Article 4 of the Directive</li> <li>Achieve "good status" for all waters by December 2015</li> <li>Manage water bodies based on identifying and establishing river basins districts</li> <li>Involve the public and streamline legislation</li> <li>Prepare and implement a River Basin Management Plan for each river basin districts identified and a Register of Protected Areas</li> <li>Establish a programme of monitoring for surface water status, ground water status and protected areas</li> <li>Recover costs for water services</li> </ul>	European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) (as amended)	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations
Groundwater Directive (2006/118/EC)	<ul style="list-style-type: none"> <li>Protect, control and conserve groundwater</li> <li>Prevent the deterioration of the status of all bodies of groundwater</li> <li>Implements measures to prevent and control groundwater pollution, including criteria for assessing good groundwater chemical status and criteria for the identification of significant and sustained upward trends and for the definition of starting points for trend reversals.</li> </ul>	<ul style="list-style-type: none"> <li>Meet minimum groundwater standards listed in Annex 1 of Directive</li> <li>Meet threshold values adopted by national legislation for the pollutants, groups of pollutants and indicators of pollution which have been identified as contributing to the characterisation of bodies or groups of bodies of groundwater as being at risk, also taking into account Part B of Annex II</li> </ul>	European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9/2010) (as amended)	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations
Bathing Water Directive (2006/7/EC)	<ul style="list-style-type: none"> <li>Preserve, protect and improve the quality of the environment and to protect human health by complementing the Water Framework Directive 2000/60/EC</li> </ul>	<ul style="list-style-type: none"> <li>Identify all bathing waters and define the length of the bathing season</li> <li>Monitor bathing water quality as per Annex 1, Column A at the frequency outlined in Annex IV of the Directive</li> <li>Determine the quality status of the bathing water</li> <li>Achieve at least 'sufficient' standard by 2015 with the aim</li> </ul>	Bathing Water Quality (Amendment) Regulations 2008 (S.I. No. 79 of 2008) (as amended)	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations

		<ul style="list-style-type: none"> <li>increase the standard to 'excellent' or 'good'</li> <li>Prepare, review and update a bathing water profile of each in accordance with Annex III</li> <li>Manage bathing water areas in exceptional circumstances to prevent an adverse impact on bathing water quality and on bathers' health</li> <li>Provide public information on bathing water quality</li> </ul>		
Drinking Water Directive (98/83/EC)	<ul style="list-style-type: none"> <li>Improve and maintain the quality of water intended for human consumption</li> <li>Protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean</li> </ul>	<ul style="list-style-type: none"> <li>Set values applicable to water intended for human consumption for the parameters set out in Annex I</li> <li>Set values for additional parameters not included in Annex I, where the protection of human health within national territory or part of it so requires. The values set should, as a minimum, satisfy the requirements of Article 4(1) (a)</li> <li>Implement all measures necessary to ensure that regular monitoring of the quality of water intended for human consumption is carried out, in order to check that the water available to consumers meets the requirements of this Directive and in particular the parametric values set in accordance with Article 5</li> <li>Ensure that any failure to meet the parametric values set in accordance with Article 5 is immediately investigated in order to identify the cause</li> <li>Ensure that the necessary remedial action is taken as soon as possible to restore its quality and shall give priority to their enforcement action</li> <li>Undertake remedial action to restore the quality of the water where necessary to protect human health</li> <li>Notify consumers when remedial action is being undertaken except where the competent authorities consider the non-compliance with the parametric value to be trivial</li> </ul>	<p>European Union (Drinking Water) Regulations 2014 (S.I. No. 106 of 2007) (as amended)</p> <p>European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)</p>	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations
Urban Waste Water Treatment Directive (91/271/EEC)	<ul style="list-style-type: none"> <li>This Directive concerns the collection, treatment and discharge of urban waste water and the treatment and discharge of waste water from certain industrial sectors</li> <li>The objective of the Directive is to protect the environment from the adverse effects of waste water discharges</li> </ul>	<ul style="list-style-type: none"> <li>Urban waste water entering collecting systems shall before discharge, be subject to secondary treatment</li> <li>Annex II requires the designation of areas sensitive to eutrophication which receive water discharges</li> <li>Establishes minimum requirements for urban waste water collection and treatment systems in specified agglomerations to include special requirements for sensitive areas and certain industrial sectors</li> </ul>	European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001)	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations
Environmental Liability Directive (2004/35/EC)	<ul style="list-style-type: none"> <li>Establish a framework of environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage</li> </ul>	<ul style="list-style-type: none"> <li>Relates to environmental damage caused by any of the occupational activities listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities; damage to protected species and natural habitats caused by any occupational activities other than those listed in Annex III, and to any imminent threat of such damage occurring by reason of any of those activities, whenever the operator has been at fault or negligent</li> <li>Where environmental damage has not yet occurred but</li> </ul>	European Communities (Environmental Liability) Regulations, 2008	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations

		<p>there is an imminent threat of such damage occurring, the operator shall, without delay, take the necessary preventive measures</p> <ul style="list-style-type: none"> <li>Where environmental damage has occurred the operator shall, without delay, inform the competent authority of all relevant aspects of the situation and take all practicable steps to immediately control, contain, remove or otherwise manage the relevant contaminants and/or any other damage factors in order to limit or to prevent further environmental damage and adverse effects on human health or further impairment of services and the necessary remedial measures, in accordance with Article 7.</li> <li>The operator shall bear the costs for the preventive and remedial actions taken pursuant to this Directive</li> <li>The competent authority shall be entitled to initiate cost recovery proceedings against the operator</li> <li>The operator may be required to provide financial security guarantees to ensure their responsibilities under the directive are met</li> </ul>		
SEA Directive (2001/42/EC)	<ul style="list-style-type: none"> <li>Contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development</li> <li>Provide for a high level of protection of the environment by carrying out an environmental assessment of plans and programmes which are likely to have significant effects on the environment</li> </ul>	<ul style="list-style-type: none"> <li>Carry out an environmental assessment for plans or programmes referred to in Articles 2 to 4 of the Directive</li> <li>Prepare an environmental report which identifies, describes and evaluates the likely significant effects on the environment of implementing the plan or programme and reasonable alternatives that consider the objectives and the geographical scope of the plan or programme</li> <li>Consult with relevant authorities, stakeholders and public allowing sufficient time to make a submission</li> <li>Consult other Member States where the implementation of a plan or programme is likely to have transboundary environmental effects</li> <li>Inform relevant authorities and stakeholders on the decision to implement the plan or programme</li> <li>Issue a statement to include requirements detailed in Article 9 of the Directive</li> <li>Monitor and mitigate significant environmental effects identified by the assessment</li> </ul>	<p>European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435/ 2004) (as amended)</p> <p>Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436/2004) (as amended)</p>	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations

EIA Directive (2011/92/EU as amended by 2014/52/EU)	<ul style="list-style-type: none"> <li>Requires the assessment of the environmental effects of public and private projects which are likely to have significant effects on the environment</li> <li>Aims to assess and implement avoidance or mitigation measures to eliminate environmental effects, before consent is given of projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects. Those projects are defined in Article 4</li> </ul>	<ul style="list-style-type: none"> <li>All projects listed in Annex I are considered as having significant effects on the environment and require an EIA</li> <li>For projects listed in Annex II, a "screening procedure" is required to determine the effects of projects on the basis of thresholds/criteria or a case by case examination. This should take into account Annex III.</li> <li>The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 12, the direct and indirect effects of a project on the following factors: human beings, fauna and flora, soil, water, air, climate and the landscape, material assets and the cultural heritage, the interaction between each factor</li> <li>Consult with relevant authorities, stakeholders and public allowing sufficient time to make a submission before a decision is made</li> <li>The information to be provided by the developer in accordance with paragraph 1 shall include at least: <ul style="list-style-type: none"> <li>a description of the project comprising information on the site, design and size of the project;</li> <li>a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects;</li> <li>the data required to identify and assess the main effects which the project is likely to have on the environment;</li> <li>an outline of the main alternatives studied by the developer and an indication of the main reasons for his choice, taking into account the environmental effects;</li> <li>a non-technical summary of the information referred to each of the above.</li> </ul> </li> </ul>	<p>European Communities (Environmental Impact Assessment) Regulations 1989 (S.I. No. 349/1989) (as amended)</p> <p>European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470/2012)</p>	The NTA is obliged to comply with, as relevant and appropriate, the requirements of the Directive and transposing regulations
<b>National/Regional</b>				
<b>Plan/Programme</b>	<b>Highest Level Aim/ Purpose/ Objective</b>	<b>Lower level relevant objectives , actions etc.</b>	<b>Relevant legislation</b>	<b>Relevance to the Transport Strategy</b>
National Recovery Plan 2011-2014	<ul style="list-style-type: none"> <li>The Plan aims to restore public finances for a return to sustainable growth in the Irish economy</li> <li>Aims to restore confidence in economy, restore jobs and drive recovery</li> </ul>	<ul style="list-style-type: none"> <li>Sets out the measures that will be taken to restore order to our public finances</li> <li>Identifies the areas of economic activity which will provide growth and employment in the recovery</li> <li>Specifies the reforms the Government will implement to accelerate growth in those key sectors</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Infrastructure and Capital Investment 2012-16: Medium Term Exchequer Framework	<ul style="list-style-type: none"> <li>Reviews infrastructure and capital spending over a medium timeframe to ensure investment is made in the best areas</li> <li>Identifies gaps in existing infrastructure that require addressing to aid economic recovery, social cohesion and environmental sustainability</li> </ul>	<p>The approach identifies four main components of the investment strategy as follows:</p> <ul style="list-style-type: none"> <li>Economic infrastructure – encompassing transport networks, energy provision and telecommunications capacity</li> <li>Investment in the productive sector and human capital –</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and

		<p>such as direct supports for enterprise development; science, technology and innovation advancement; supports for tourism, agriculture, fisheries and forestry; and capital investment in education infrastructure</p> <ul style="list-style-type: none"> <li>• Environmental infrastructure – including our waste and water systems and investment for environmental sustainability</li> <li>• Critical social investment – such as the health service and social housing programmes</li> </ul>		management
Investing in our Transport Future – A Strategic Investment Framework for Land Transport	<p>The Framework establishes:</p> <ul style="list-style-type: none"> <li>• High level priorities for future investment in land transport; and</li> <li>• Key principles, reflective of those priorities, to which transport investment proposals will be required to adhere.</li> </ul>	<p>The Overarching Priority for future transport infrastructure investment is to attain funding levels consistent with maintaining, renewing and improving an appropriate transport network that can efficiently support the economic and social needs of the country. In order to maintain the transport network and provide for some limited investment to address additional demand, capital investment in land transport should, at a minimum, be restored to, and maintained at, its long run average level of 1.1% to 1.15% of GDP per annum. This represents an average target to be achieved over an economic cycle. Therefore, to redress the period of underfunding experienced, funding in excess of the average will be required to begin with, followed by a convergence towards the recommended average long run investment level.</p> <ul style="list-style-type: none"> <li>• Other key priorities are to: achieve steady state maintenance; address urban congestion; and maximise the contribution of land transport networks to our national development.</li> </ul>	not applicable	In combination with this Framework the Transport Strategy will contribute towards smarter travel and associated positive environmental effects.
Smarter Travel – A Sustainable Transport Future – A New Transport Policy for Ireland 2009 – 2020 (2009)	<ul style="list-style-type: none"> <li>• Outlines a policy for how a sustainable travel and transport system can be achieved</li> <li>• Sets out five key goals: <ul style="list-style-type: none"> <li>○ To reduce overall travel demand.</li> <li>○ To maximise the efficiency of the transport network.</li> <li>○ To reduce reliance on fossil fuels.</li> <li>○ To reduce transport emissions.</li> <li>○ To improve accessibility to transport.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Others lower level aims include: <ul style="list-style-type: none"> <li>○ reduce distance travelled by private car and encourage smarter travel, including focusing population growth in areas of employment and to encourage people to live in close proximity to places of employment</li> <li>○ ensuring that alternatives to the car are more widely available, mainly through a radically improved public transport service and through investment in cycling and walking</li> <li>○ improving the fuel efficiency of motorised transport through improved fleet structure, energy efficient driving and alternative technologies</li> <li>○ strengthening institutional arrangements to deliver the targets</li> </ul> </li> </ul>	not applicable	In combination with this Policy the Transport Strategy will contribute towards smarter travel and associated positive environmental effects.
Ireland's First National Cycle Policy Framework (2009)	<ul style="list-style-type: none"> <li>• Outlines objectives and actions aimed at developing a strong cycle network in Ireland</li> <li>• Sets out 19 specific objectives, and details the 109 actions, aimed at ensuring that a cycling culture is developed</li> </ul>	<ul style="list-style-type: none"> <li>• Sets a target where 10% of all journeys will be made by bike by 2020</li> <li>• Proposes the planning, infrastructure, communication, education and stakeholder participations measures required to implement the initiative</li> </ul>	not applicable	In combination with this Framework the Transport Strategy will contribute towards the five key goals of Smarter Travel and associated positive environmental effects.

Climate Action and Low Carbon Development Bill 2015	<ul style="list-style-type: none"> <li>Provides for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy; to establish a body to be known in the Irish language as the National Expert Advisory Council on Climate Change</li> </ul>	Plans provided for include: <ul style="list-style-type: none"> <li>National low carbon transition and mitigation plan</li> <li>National climate change adaptation framework</li> <li>Sectoral adaptation plan</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
National Climate Change Strategy 2007 – 2012 (2007)	<ul style="list-style-type: none"> <li>Outlines measures to be undertaken to meet the commitments under the Kyoto Protocol</li> <li>Identifies specific measures to meet the commitment up to 2012 and further measures to meet the 2020 target</li> </ul>	not applicable	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Delivering a Sustainable Energy Future for Ireland – The Energy Policy Framework 2007 – 2020 (2007)	<ul style="list-style-type: none"> <li>White paper setting out a framework for delivering a sustainable energy future in Ireland</li> <li>Outlines strategic Goals for: <ul style="list-style-type: none"> <li>Security of Supply</li> <li>Sustainability of Energy</li> <li>Competitiveness of Energy Supply</li> </ul> </li> </ul>	The underpinning Strategic Goals are: <ul style="list-style-type: none"> <li>Ensuring that electricity supply consistently meets demand</li> <li>Ensuring the physical security and reliability of gas supplies to Ireland</li> <li>Enhancing the diversity of fuels used for power generation</li> <li>Delivering electricity and gas to homes and businesses over efficient, reliable and secure networks</li> <li>Creating a stable attractive environment for hydrocarbon exploration and production</li> <li>Being prepared for energy supply disruptions</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
National Renewable Energy Action Plan	<ul style="list-style-type: none"> <li>A strategic approach for Ireland including measures to meet European targets for 2020 including Ireland's 16% target of gross final consumption to come from renewables by 2020</li> </ul>	not applicable	Renewable Energy Directive 2009/28/EC	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
National Energy Efficiency Action Plan for Ireland 2007 – 2020 (2007)	<ul style="list-style-type: none"> <li>This is the second National Energy Efficiency Action Plan for Ireland</li> </ul>	<ul style="list-style-type: none"> <li>The Plan reviews the original 90 actions outlined in the first Plan and updates/renews/removes them as appropriate</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
National Policy Framework for Alternative Fuel Infrastructure	<ul style="list-style-type: none"> <li>National Policy Framework to support the deployment of alternative fuels in Ireland arising from obligations associated with EU Alternative Fuels Infrastructure Directive (2014/94/EU)</li> </ul>	Contains provisions relating to coverage and timings for alternative fuels including electricity, Liquefied Natural Gas (LNG), Compressed Natural Gas (CNG) and Hydrogen.	EU Alternative Fuels Infrastructure Directive (2014/94/EU)	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Sustainable Development – A Strategy for Ireland	<ul style="list-style-type: none"> <li>Provides an analysis and a strategic framework for sustainable development in Ireland</li> <li>Identifies the approaches required to support</li> </ul>	not applicable	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the

(1997)	sustainable development			achievement of the objectives of the regulatory framework for environmental protection and management
Wildlife Act of 1976  Wildlife (Amendment) Act, 2000	<ul style="list-style-type: none"> <li>The act provides protection and conservation of wild flora and fauna</li> </ul>	<ul style="list-style-type: none"> <li>Provides protection for certain species, their habitats and important ecosystems</li> <li>Give statutory protection to NHAs</li> <li>Enhances wildlife species and their habitats</li> <li>Includes more species for protection</li> </ul>	not applicable	The NTA is obliged to comply with, as relevant and appropriate, the requirements of this legislation
Actions for Biodiversity 2011-2016 Ireland's National Biodiversity Plan, 2011	<ul style="list-style-type: none"> <li>Sets out strategic objectives, targets and actions to conserve and restore Ireland's biodiversity and to prevent and reduce the loss of biodiversity in Ireland and globally</li> </ul>	<ul style="list-style-type: none"> <li>To mainstream biodiversity in the decision making process across all sectors</li> <li>To substantially strengthen the knowledge base for conservation, management and sustainable use of biodiversity</li> <li>To increase awareness and appreciation of biodiversity and ecosystem services</li> <li>To conserve and restore biodiversity and ecosystem services in the wider countryside</li> <li>To conserve and restore biodiversity and ecosystem services in the marine environment</li> <li>To expand and improve on the management of protected areas and legally protected species</li> <li>To substantially strengthen the effectiveness of international governance for biodiversity and ecosystem services</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009)	<ul style="list-style-type: none"> <li>Sets out comprehensive mechanisms for the incorporation of flood risk identification, assessment and management into the planning process</li> <li>Ensures flood risk is a key consideration</li> <li>in preparing development plans and local area plans and in the assessment</li> <li>of planning applications</li> <li>Implementation of the Guidelines is through actions at national, regional, local authority and site-specific levels</li> </ul>	<ul style="list-style-type: none"> <li>Avoid inappropriate development in areas at risk of flooding</li> <li>Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off</li> <li>Ensure effective management of residual risks for development permitted in floodplains</li> <li>Avoid unnecessary restriction of national, regional or local economic and social growth</li> <li>Improve the understanding of flood risk among relevant stakeholders</li> <li>Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.</li> </ul>	<p>Planning and Development Act 2000 (as amended)</p> <p>S.I. No. 122/2010 EC (Assessment and Management of Flood Risks) Regulations 2010</p> <p>S.I. No. 470/2012 European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012.</p>	The NTA is obliged to comply with, as relevant and appropriate, the requirements of these Guidelines
European Communities (Water Policy) Regulations of 2003 (SI 722 of 2003)  European Communities (Water Policy) Regulations of 2003 (SI 350 of 2014)	<ul style="list-style-type: none"> <li>Transposes the Water Framework Directive into legislation</li> <li>Outlines the general duty of public authorities in relation to water</li> <li>Identifies the competent authorities in charge of water policy (amended to Irish Water in 2013) and gives EPA and the CER the authority to regulate and supervise their actions</li> </ul>	<ul style="list-style-type: none"> <li>Implements River basin districts and characterisation of RBDs and River Basin Management Plans</li> <li>Requires the public to be informed and consulted on the Plan and for progress reports to be published on RBDs</li> <li>Implements a Register of protected areas, Classification systems and Monitoring programmes for water bodies</li> <li>Allows the competent authority to recover the cost of damage/destruction of status of water body</li> <li>Outlines environmental objectives and programme of</li> </ul>	Water Framework Directive 2000/60/EC	The NTA is obliged to comply with, as relevant and appropriate, the requirements of this legislation

		<p>measures and environmental quality standards for priority substances</p> <ul style="list-style-type: none"> <li>• Outlines criteria for assessment of groundwater</li> </ul>		
European Communities Environmental Objectives (Surface waters) Regulations of 2009 (SI 272 of 2009)	<ul style="list-style-type: none"> <li>• Transposes the requirements of the Water Framework Directive into Irish Legislation</li> <li>• The Surface Waters Regulations also give further effect to the WFD, establishing a framework for Community action in the field of water policy and Directive 2006/11/EC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community.</li> </ul>	<p>These Regulations provide, inter alia, for:</p> <ul style="list-style-type: none"> <li>• The establishment of legally binding quality objectives for all surface waters and environmental quality standards for pollutants;</li> <li>• The examination and where appropriate, review of existing discharge authorisations by Public Authorities to ensure that the emission limits laid down in authorisations support compliance with the new water quality objectives/standards;</li> <li>• The classification of surface water bodies by the EPA for the purposes of the Water Framework Directive;</li> <li>• The establishment of inventories of priority substances by the EPA; and</li> <li>• The drawing up of pollution reduction plans by coordinating local authorities (in consultation with the EPA) to reduce pollution by priority substances and to cease and/or phase out discharges, emissions or losses of priority hazardous substances.</li> </ul>	Water Framework Directive 2000/60/EC	The NTA is obliged to comply with, as relevant and appropriate, the requirements of this legislation
European Communities Environmental Objectives (Groundwater) Regulations of 2010 (SI 9 of 2010)	<ul style="list-style-type: none"> <li>• Transposes the requirements of the Groundwater Directive 2006/118/EC into Irish Legislation</li> </ul>	<ul style="list-style-type: none"> <li>• Outlines environmental objectives to be achieved for groundwater bodies of groundwater against pollution and deterioration in quality</li> <li>• Sets groundwater quality standards</li> <li>• Outlines threshold values for the classification and protection of groundwater</li> </ul>	<p>Water Framework Directive 2000/60/EC Groundwater Directive (2006/118/EC)</p> <p>European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9/2010) (as amended)</p>	The NTA is obliged to comply with, as relevant and appropriate, the requirements of this legislation
Water Pollution Acts 1977 to 1990	<ul style="list-style-type: none"> <li>• The Water Pollution Acts allow Local Authorities the authority regulate and supervise actions relating to water in their division</li> </ul>	<p>The Water Pollution Acts enable local authorities to:</p> <ul style="list-style-type: none"> <li>• prosecute for water pollution offences;</li> <li>• attach appropriate pollution control conditions in the licensing of effluent discharges from industry, etc., made to waters;</li> <li>• issue notices ("section 12 notices") to farmers, etc., specifying measures to be taken within a prescribed period to prevent water pollution;</li> <li>• issue notices requiring a person to cease the pollution of waters and requiring the mitigation or remedying of any effects of the pollution in the manner and within the period specified in such notices;</li> <li>• seek court orders, including High Court injunctions, to prevent, terminate, mitigate or remedy pollution/its effects;</li> <li>• prepare water quality management plans for any waters</li> </ul>	Water Services Act 2013	The NTA is obliged to comply with, as relevant and appropriate, the requirements of this legislation



		in or adjoining their functional areas		
Groundwater Protection Schemes	<ul style="list-style-type: none"> <li>Aims to maintain and improve the quantity and quality of groundwater, by using a risk assessment-based approach to groundwater protection and sustainable development.</li> </ul>	<ul style="list-style-type: none"> <li>Provides a system that brings together land surface zoning and groundwater protection responses</li> <li>Provides a framework to guide relevant Authorities in undertaking functions, decision making</li> </ul>	<p>Groundwater Directive (2006/118/EC)</p> <p>European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9/2010) (as amended)</p>	The NTA is obliged to comply with, as relevant and appropriate, the requirements of this legislation
Water Quality Management Plans	<ul style="list-style-type: none"> <li>Ensure that the quality of waters covered by the plan is maintained</li> <li>Maintain and improve the quantity and quality of water included in the Plan scope</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of water bodies against quality standards</li> <li>Outlines management programmes for water catchments</li> <li>Purpose is to maintain and improve the quantity and quality of groundwater</li> </ul>	Water Pollution Acts 1977 to 1990	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001)	<ul style="list-style-type: none"> <li>Transposes the Urban Waste Water Treatment Directive into Irish Legislation</li> <li>Aims to protect receiving waters from environmental damage arising from Urban Wastewater</li> </ul>	<ul style="list-style-type: none"> <li>Sets out the legislative requirements for urban waste water collection and treatment systems</li> <li>Provides for monitoring programmes of discharges</li> <li>Specifies threshold values and minimum standards for water quality</li> </ul>	Urban Waste Water Treatment Directive (91/271/EEC)	The NTA is obliged to comply with, as relevant and appropriate, the requirements of this legislation
<p>Water Services Act 2007</p> <p>Water Services (Amendment) Act 2012</p> <p>Water Services Act 2013</p>	<ul style="list-style-type: none"> <li>Provides the water services infrastructure</li> <li>Outlines the responsibilities involved in delivering and managing water services</li> <li>Identifies the authority in charge of provision of water and waste water supply</li> <li>Irish Water was given the responsibility of the provision of water and wastewater services in the amendment act during 2013, therefore these services are no longer the responsibility of the 34 Local Authorities in Ireland</li> </ul>	<p>Key strategic objectives include:</p> <ul style="list-style-type: none"> <li>Ensuring Irish Water delivers infrastructural projects that meet key public health, environmental and economic objectives in the water services sector.</li> <li>Ensuring the provision of adequate water and sewerage services in the gateways and hubs listed in the National Spatial Strategy, and in other locations where services need to be enhanced.</li> <li>Ensuring good quality drinking water is available to all consumers of public and group water supplies, in compliance with national and EU drinking water standards</li> <li>Ensuring the provision of the remaining infrastructure needed to provide secondary wastewater treatment, for compliance with the requirements of the EU Urban Wastewater Treatment Directive.</li> <li>Promoting water conservation through Irish Water's Capital Investment Plan, the Rural Water Programme and other measures.</li> <li>Monitoring the on-going implementation of septic tanks inspection regime and the National Inspection Plan for Domestic Waste Water Treatment Systems.</li> <li>Ensuring a fair funding model to deliver water services.</li> <li>Overseeing the establishment of an economic regulation function under the CER.</li> </ul>	not applicable	The NTA is obliged to comply with, as relevant and appropriate, the requirements of this legislation

National Spatial Strategy 2002-2020 (2002)	<ul style="list-style-type: none"> <li>Planning framework for Ireland</li> <li>Aims to achieve a better balance of social, economic and physical development across Ireland, supported by effective planning</li> </ul>	<ul style="list-style-type: none"> <li>Proposes that areas of sufficient scale and critical mass will be built up through a network of gateways, hubs and key town</li> </ul>	<p>Local Government (Planning and Development) Act, 1963 (as amended)</p> <p>Requirement of the Planning and Development (Amendment) Act (2010)</p>	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Grid25 Implementation Programme	<ul style="list-style-type: none"> <li>Framework for the development of the electricity transmission grid in the short, medium and long terms, to support a long-term sustainable and reliable electricity supply</li> </ul>	<ul style="list-style-type: none"> <li>Seeks to implement the provisions of the 2007 Government White Paper on Energy - "Delivering a Sustainable Energy Future for Ireland" in terms of development of electricity transmission infrastructure</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
National Landscape Strategy 2015	<ul style="list-style-type: none"> <li>Aims to implement the European Landscape Convention in Ireland by providing for specific measures to promote the protection, management and planning of the landscape.</li> </ul>	<p>The objectives of the National Landscape Strategy are to:</p> <ul style="list-style-type: none"> <li>Recognise landscapes in law</li> <li>Develop a National Landscape Character Assessment;</li> <li>Develop Landscape Policies;</li> <li>Increase Landscape Awareness;</li> <li>Identity Education, Research and Training Needs; and</li> <li>Strengthen Public Participation.</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
National Rural Development Programme (draft/in preparation)	<ul style="list-style-type: none"> <li>The National Rural Development Programme, prepared by the Department of Agriculture, Fisheries and Food, sets out a national programme based on the EU framework for rural development and prioritises improving the competitiveness of agriculture, improving the environment and improving the quality of life in rural areas</li> </ul>	<p>At a more detailed level, the programme also:</p> <ul style="list-style-type: none"> <li>Supports structural change at farm level including training young farmers and encouraging early retirement, support for restructuring, development and innovation;</li> <li>Aims to improve the environment, biodiversity and the amenity value of the countryside by support for land management through funds such as Natura 2000 payments etc.; and</li> <li>Aims to improve quality of life in rural areas and encouraging diversification of economic activity through the implementation of local development strategies such as non-agricultural activities</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
National Forestry Programme 2014-2020 (draft/in preparation)	<ul style="list-style-type: none"> <li>The Draft National Forestry Programme 2014-2020, <i>Forests, Products and People. Ireland's Forest Policy - A Renewed Vision</i>, is currently being prepared by the Department of Agriculture, Food and the Marine and views of stakeholders are now being sought on the composition of the new proposed forestry measures. These proposed measures represent a continuation of the previous Forestry Programme 2007-2013 which has been effective in supporting the growth and development of the forestry sector and rural economies.</li> </ul>	not applicable	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management

SEA Environmental Report for the Transport Strategy for the Greater Dublin Area 2016-2035

National Peatlands Strategy (draft/in preparation)	<ul style="list-style-type: none"> <li>This Draft Strategy, prepared by the National Parks and Wildlife Service, will, when finalised, establish principles in relation to Irish peatlands in order to guide Government policy. The Draft Strategy aims to provide a framework for which all of the peatlands within the State can be managed responsibly in order to optimise their social, environmental and economic contribution.</li> </ul>	not applicable	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
National Biodiversity Action Plan	<ul style="list-style-type: none"> <li>This Action Plan sets out an integrated strategy for collective delivery of the potential benefits of bioenergy resources across the agriculture, enterprise, transport, environment and energy sectors.</li> </ul>	Includes detailed actions for the electricity sector, transport fuel sector, heat sector, research and development sector.	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Flood Risk Management Plans arising from National Catchment Flood Risk Assessment and Management Programme (draft/in preparation)	<ul style="list-style-type: none"> <li>The national Catchment Flood Risk Assessment and Management (CFRAM) programme commenced in Ireland in 2011 and is being overseen by the Office of Public Works. The CFRAM Programme is intended to deliver on core components of the National Flood Policy, adopted in 2004, and on the requirements of the EU Floods Directive. The Programme is being implemented through CFRAM Studies which are being undertaken for each of the six river basin districts in Ireland.</li> </ul>	<p>CFRAM Studies are being undertaken for all River Basin Districts.</p> <p>The studies are focusing on areas known to have experienced flooding in the past and areas that may be subject to flooding in the future either due to development pressures or climate change. In 2014, draft Flood Maps will be published. The final output from the studies will be CFRAM Plans, to be published in December 2016. The Plans will define the current and future flood risk in the River Basin Districts and set out how this risk can be managed.</p>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
<b>Regional, County and Local</b>				
<b>Plan/Programme</b>	<b>Highest Level Aim/ Purpose/ Objective</b>	<b>Lower level relevant objectives , actions etc.</b>	<b>Relevant legislation in Ireland</b>	<b>Relevance to the Transport Strategy</b>
<p>Greater Dublin Area Cycle Network Plan</p> <p>Note that this Plan incorporates the Sutton to Sandycove cycleway and the parts of the National Cycle Route Network, including parts of the Dublin to Galway Greenway Plan</p>	<ul style="list-style-type: none"> <li>Sets out a ten year cycling strategy for Counties Dublin, Kildare, Meath and Wicklow</li> <li>Plan to increase regions cycle network dramatically</li> </ul>	<p>Aims to identify and determine:</p> <ul style="list-style-type: none"> <li>The Urban Cycle Network at the Primary, Secondary and Feeder level</li> <li>The Inter-Urban Cycle Network linking the relevant sections of the Urban Network including the elements of the National Cycle Network within the GDA including linkages to key transport locations outside of urban areas such as airports and ports</li> <li>The Green Route Network being cycle routes for development of tourist, recreational and leisure purposes.</li> </ul>	not applicable	The GDA Cycle Network Plan has been incorporated into the Transport Strategy
Regional & County Green Infrastructure Plans/Strategies – including any relevant Waterways Ireland plans/programmes	<ul style="list-style-type: none"> <li>Promotes the maintenance and improvement of green infrastructure in an area</li> <li>Aims to protect and enhance biodiversity and habitats</li> </ul>	not applicable	not applicable	In combination with these plans/strategies / programmes the Transport Strategy will contribute towards smarter travel and associated positive environmental effects.
River Basin Management Plans and associated	<ul style="list-style-type: none"> <li>Establish a framework for the protection of water bodies at River Basin District (RBD) level</li> <li>Preserve, prevent the deterioration of water status</li> </ul>	<ul style="list-style-type: none"> <li>Aims to protect and enhance all water bodies in the RBD and meet the environmental objectives outlined in Article 4 of the Water Framework Directive</li> </ul>	Requirement of the Water Framework Directive (2000/60/EC)	To cumulatively contribute towards – in combination with other users and bodies – the

Programmes of Measures	<p>and where necessary improve and maintain “good status” of water bodies in that RBD before 2015</p> <ul style="list-style-type: none"> <li>Promote sustainable water usage</li> </ul>	<ul style="list-style-type: none"> <li>Identifies and manages water bodies in the RBD</li> <li>Establishes a programme of measures for monitoring and improving water quality in the RBD</li> <li>Involves the public through consultations</li> </ul>	<p>European Communities (Water Policy) Regulations, 2003 (SI No. 722) (as amended)</p> <p>Guidelines for the Establishment of River Basin District Advisory Councils (RBDAC)</p>	achievement of the objectives of the regulatory framework for environmental protection and management
Regional Planning Guidelines	<ul style="list-style-type: none"> <li>Provides a long-term strategic planning framework for the development of regions</li> </ul>	<ul style="list-style-type: none"> <li>Aim to give regional effect to the National Spatial Strategy</li> <li>Guide the Development Plans and lower tier plans of planning authorities</li> </ul>	Requirement of the Planning and Sustainable Development Act (2000), as amended	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Development Plans including those for Dublin City, Fingal, Dún Laoghaire-Rathdown, South Dublin and Counties Meath, Kildare and Wicklow	<ul style="list-style-type: none"> <li>Outlines planning objectives for County/Town development over six year lifespan (including greenway and other transport objectives)</li> <li>Strategic framework for planning and sustainable development including those set out in National Spatial Strategy and Regional Planning Guidelines</li> </ul>	<ul style="list-style-type: none"> <li>Identifies future infrastructure, development and zoning required</li> <li>Protects and enhances amenities and environment</li> <li>Guides planning authority in assessing proposals</li> </ul>	Requirement of the Planning and Development Act (2000), as amended	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Local Plans	<ul style="list-style-type: none"> <li>Statutory documents which provide detailed planning policies to ensure proper planning and sustainable development of area</li> <li>Set out objectives for future planning and development</li> </ul>	<ul style="list-style-type: none"> <li>Identifies issues of relevance to the area and outlines principles for future development of area</li> <li>Is consistent with relevant County/Town Development Plans, National Spatial Strategy and Regional Planning Guidelines</li> </ul>	<p>Local Government (Planning and Development) Act, 1963 (as amended)</p> <p>Requirement of the Planning and Development (Amendment) Act (2010)</p>	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Planning Schemes for Strategic Development Zones e.g. Docklands, Grangegorman and Cherrywood	<ul style="list-style-type: none"> <li>An area of land designated by the Government to contain specified developments of economic or social importance to the State</li> <li>Aims to create sustainable communities under a master plan to facilitate the requirements by which it was acquired by the State</li> </ul>	<ul style="list-style-type: none"> <li>Development includes necessary infrastructural and community facilities and services</li> </ul>	Local Government (Planning and Development) Act, 1963 (as amended)	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Biodiversity Action Plans	<ul style="list-style-type: none"> <li>Aims to protect, conserve, enhance and restore biodiversity and ecosystem services across all spectrums</li> </ul>	<ul style="list-style-type: none"> <li>Outlines the status of biodiversity and identifies species of importance</li> <li>Outlines objectives and targets to be met to maintain and improve biodiversity</li> <li>Aims increase awareness</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management

SEA Environmental Report for the Transport Strategy for the Greater Dublin Area 2016-2035

County Heritage Plans and Waterways Ireland Draft Heritage Plan	<ul style="list-style-type: none"> <li>Aims to highlight the importance of heritage at a strategic level</li> </ul>	<ul style="list-style-type: none"> <li>Manage and promote heritage as well as increase awareness</li> <li>Aim to conserve and protect heritage</li> </ul>	not applicable	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
County Landscape Character Assessments	<ul style="list-style-type: none"> <li>Characterises the geographical dimension of the landscape</li> </ul>	<ul style="list-style-type: none"> <li>Identifies the quality, value, sensitivity and capacity of the landscape area</li> <li>Guides strategies and guidelines for the future development of the landscape</li> </ul>	<p>Requirement of the Planning and Development) Act, 2000 (as amended)</p> <p>Landscape and Landscape Assessment Guidelines</p>	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Special Amenity Area Orders	<ul style="list-style-type: none"> <li>Aims to protect special areas of landscape, environmental or amenity value</li> </ul>	not applicable	<p>Local Government (Planning and Development) Act, 1963 (as amended)</p> <p>Requirement of the Planning and Development Act 1963 (as amended)</p>	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
Freshwater Pearl Mussel Sub-Basin Management Plans	<ul style="list-style-type: none"> <li>Identifies the current status of the species and the reason for loss or decline</li> <li>Identifies measure required to improve or restore current status</li> </ul>	<ul style="list-style-type: none"> <li>Identifies pressures on Freshwater Pearl Mussels for each of the designated populations in Ireland</li> <li>Outlines restoration measures required to ensure favourable conservation status</li> </ul>	<p>Requirement of Water Framework Directive (2000/60/EC) and Habitats Directive (92/43/EEC)</p> <p>European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003)</p> <p>European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011)</p> <p>The Wildlife Act 1976 and the Wildlife (Amendment) Act 2000</p>	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management

Local Catchment Flood Risk Management Plans	<ul style="list-style-type: none"> <li>Produced by Local Authorities</li> <li>Outlines areas local flood risk</li> <li>Sets out measures to manage and prevent flood risk at a local level</li> </ul>	not applicable	Floods Directive 2007/60/EC Planning and Development Act 2000 (as amended) S.I. No. 122/2010 EC (Assessment and Management of Flood Risks) Regulations 2010 S.I. No. 470/2012 European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012	To cumulatively contribute towards – in combination with other users and bodies – the achievement of the objectives of the regulatory framework for environmental protection and management
---	---	----------------	---	---

# SEA ENVIRONMENTAL REPORT APPENDIX II

## NON-TECHNICAL SUMMARY

---

FOR THE

### TRANSPORT STRATEGY

FOR THE

### GREATER DUBLIN AREA

### 2016-2035

**for: National Transport Authority**

Dún Scéine,  
Iveagh Court,  
Harcourt Lane,  
Dublin 2



**by: CAAS Ltd.**

2<sup>nd</sup> Floor, The Courtyard,  
25 Great Strand Street,  
Dublin 1



**DECEMBER 2015**

## Table of Contents

<b>Section 1</b>	<b>Introduction and Terms of Reference.....</b>	<b>1</b>
<b>Section 2</b>	<b>The Strategy.....</b>	<b>2</b>
2.1	Introduction.....	2
2.2	Dublin Transport Authority Act .....	2
2.3	Layout.....	3
2.4	Relationship with other relevant Plans and Programmes .....	3
<b>Section 3</b>	<b>Relevant aspects of the current state of the environment.....</b>	<b>5</b>
3.1	Introduction.....	5
3.2	Likely Evolution of the Environment in the Absence of the Plan .....	5
3.3	Air and Climatic Factors .....	6
3.4	Population and Human Health .....	7
3.5	Biodiversity and Flora and Fauna .....	7
3.6	Material Assets.....	10
3.7	Water.....	10
3.8	Landscape .....	11
3.9	Cultural Heritage .....	12
3.10	Soil .....	12
3.11	Overall Environmental Sensitivities and Opportunities/ Robustness .....	13
3.12	Appropriate Assessment.....	13
3.13	Strategic Environmental Objectives .....	14
<b>Section 4</b>	<b>Effects of Alternatives and the Plan.....</b>	<b>23</b>
4.1	Summary of Alternatives .....	23
4.2	Summary of Evaluation of Alternatives .....	23
4.3	Overall Findings .....	28
<b>Section 5</b>	<b>Mitigation and Monitoring Measures .....</b>	<b>30</b>
5.1	Mitigation .....	30
5.2	Monitoring .....	30



## **Section 1 Introduction and Terms of Reference**

This is the Non-Technical Summary of the Strategic Environmental Assessment (SEA) Environmental Report for the Transport Strategy for the Greater Dublin Area 2016-2035. The purpose of the Environmental Report is to comply with SEA legislation and provide a clear understanding of the likely environmental consequences of decisions regarding the adoption and implementation of the Strategy.

### **What is an SEA?**

SEA is a systematic process of predicting and evaluating the likely environmental effects of implementing a proposed plan, or other strategic action, in order to ensure that these effects are appropriately addressed at the earliest appropriate stage of decision-making on a par with economic, social and other considerations.

### **Why is it needed?**

The SEA has been carried out in order to comply with the provisions of the SEA Regulations as amended and in order to contribute towards environmental management and sustainable development. The output of the process is an Environmental Report which should be read in conjunction with the Strategy.

### **How does it work?**

Relevant aspects of the current state of the environment are assembled and presented to the team who prepared the Strategy. This helped them to devise a Strategy that protects whatever is sensitive in the environment. To decide how best to make a Strategy that helps to protect the environment as much as possible, the Authority examined different alternatives for the Strategy. This helped to highlight where conflicts could occur and facilitated the development of mitigation measures which will help to avoid/reduce adverse environmental effects.

### **What is included in the Environmental Report which accompanies the Strategy?**

The Environmental Report contains the following information:

- A description of the relevant aspects of the current state of the environment;
- A description and assessment of alternatives;
- An assessment of Strategy provisions; and,
- Mitigation measures which set out to aid compliance with important environmental protection legislation - e.g. the Water Framework Directive, the Habitats Directive - and which will help to avoid/reduce the adverse environmental effects of implementing the Strategy.

### **What happens at the end of the process?**

On finalisation of the Strategy, an SEA Statement is prepared and made available. The SEA Statement includes information on how environmental considerations were integrated into the Strategy and why the preferred alternative was chosen for the Strategy.

## Section 2 The Strategy

### 2.1 Introduction

The transport strategy (Strategy) provides a framework for the planning and delivery of transport infrastructure and services in the Greater Dublin Area (GDA) over the next two decades. It also provides a transport planning policy around which other agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, can align their investment priorities. It is, therefore, an essential component, along with investment programmes in other sectors, for the orderly development of the Greater Dublin Area over the next 20 years.

Land use planning in the Greater Dublin Area, which covers the counties of Dublin, Meath, Kildare and Wicklow, is guided by the Regional Planning Guidelines for the Greater Dublin Area 2010-2022 (Regional Planning Guidelines), which were adopted by the Dublin and Mid-East Regional Authorities in 2010. Recent legislation has replaced those authorities with the Eastern and Midland Regional Assembly (Assembly), who are tasked with preparing a Regional Spatial and Economic Strategy for the overall Assembly area. Pending the adoption of such a Regional Spatial and Economic Strategy by the Assembly, the above Regional Planning Guidelines continue to guide overall planning and development across the region.

### 2.2 Dublin Transport Authority Act

Under section 12 of the 2008 Dublin Transport Authority Act, the Authority is required to prepare a Transport Strategy for the Greater Dublin Area. Section 12 (3) states that the objective of the strategy shall be to provide a long-term strategic planning framework for the integrated development of transport infrastructure and services in the GDA and, in accordance with section 12 (4), shall consider the future development of the transport system in the GDA for a period of not less than 12 years and not more than 20 years.

Section 12 (5) states that when preparing a transport strategy the Authority shall have regard to:

1. the National Spatial Strategy;
2. the regional planning guidelines in force for the GDA;
3. the development plans in force in the GDA, the Dublin Docklands Development Authority's master plan and the Grangegorman Development Agency's strategic plan;
4. Transport 21 or any subsequent capital investment framework for transport published by the Minister or Government;
5. the Department of Transport's sectoral plan under the Disability Act 2005 or any subsequent sectoral plan under that Act;
6. demographic, economic, social, travel and transport trends in the GDA;
7. existing, planned and projected land use developments;
8. trends and requirements of persons travelling from outside the GDA into the GDA, and vice versa, and the demand for such travel;
9. any proposals received from public transport authorities and operators, and
10. such other matters as may be prescribed by the Minister or as the Authority considers appropriate.

The Transport Strategy must also be reviewed every 6 years.

## 2.3 Layout

The Strategy is set out over 9 chapters as detailed below:

- Chapter 1 - Introduction and Context
- Chapter 2 - Policy Review
- Chapter 3 - Transport in the Greater Dublin Area
- Chapter 4 - Development of the Strategy
- Chapter 5 - The 2035 Transport Network
- Chapter 6 - Transport Services and Integration
- Chapter 7 - Land Use Integration and Behavioural Change
- Chapter 8 - Environmental Protection and Management
- Chapter 9 – Summary of Outcomes

Various appendices including this SEA Environmental Report and an AA Natura Impact Statement accompany the Strategy.

The Transport Strategy includes, inter alia, a number of different schemes grouped under four main modes; rail, bus, cycle and road.

## 2.4 Relationship with other relevant Plans and Programmes

The Strategy sits within a hierarchy of strategic actions such as plans and programmes, including the following:

- UN Kyoto Protocol and the Second European Climate Change Programme (ECCP II)
- EU 2020 climate and energy package
- Habitats Directive (92/43/EEC)
- Birds Directive (2009/147/EC)
- European Union Biodiversity Strategy to 2020
- The Clean Air for Europe Directive (2008/50/EC)
- Fourth Daughter Directive (2004/107/EC)
- Noise Directive 2002/49/EC
- Floods Directive (2007/60/EC)
- Water Framework Directive (2000/60/EC)
- Groundwater Directive (2006/118/EC)
- Bathing Water Directive (2006/7/EC)
- Drinking Water Directive (98/83/EC)
- Urban Waste Water Treatment Directive (91/271/EEC)
- Environmental Liability Directive (2004/35/EC)
- SEA Directive (2001/42/EC)
- EIA Directive (2011/92/EU as amended by 2014/52/EU)
- National Recovery Plan 2011-2014
- Infrastructure and Capital Investment 2012-16: Medium Term Exchequer Framework
- Smarter Travel – A Sustainable Transport Future – A New Transport Policy for Ireland 2009 – 2020 (2009)
- Ireland's First National Cycle Policy Framework (2009)
- National Climate Change Strategy 2007 – 2012 (2007)
- Delivering a Sustainable Energy Future for Ireland – The Energy Policy Framework 2007 – 2020 (2007)
- National Renewable Energy Action Plan
- National Energy Efficiency Action Plan for Ireland 2007 – 2020 (2007)
- Sustainable Development – A Strategy for Ireland (1997)
- Wildlife Act of 1976
- Wildlife (Amendment) Act, 2000
- Actions for Biodiversity 2011-2016 Ireland's National Biodiversity Plan, 2011

- The Planning System and Flood Risk Management – Guidelines for Planning Authorities (2009)
- European Communities (Water Policy) Regulations of 2003 (SI 722 of 2003)
- European Communities (Water Policy) Regulations of 2003 (SI 350 of 2014)
- European Communities Environmental Objectives (Surface waters) Regulations of 2009 (SI 272 of 2009)
- European Communities Environmental Objectives (Groundwater) Regulations of 2010 (SI 9 of 2010)
- Water Pollution Acts 1977 to 1990
- Groundwater Protection Schemes
- Water Quality Management Plans
- European Communities (Urban Waste Water Treatment) Regulations 2001 (S.I. No. 254/2001)
- Water Services Act 2007
- Water Services (Amendment) Act 2012
- Water Services Act 2013
- National Spatial Strategy 2002-2020 (2002)
- Grid25 Implementation Programme
- National Landscape Strategy 2015
- National Rural Development Programme (draft/in preparation)
- National Forestry Programme 2014-2020 (draft/in preparation)
- National Peatlands Strategy (draft/in preparation)
- National Biodiversity Action Plan
- Flood Risk Management Plans arising from National Catchment Flood Risk Assessment and Management Programme (draft/in preparation)
- Greater Dublin Area Cycle Network Plan
- Note that this Plan incorporates the Sutton to Sandycove cycleway and the parts of the National Cycle Route Network, including parts of the Dublin to Galway Greenway Plan
- Regional & County Green Infrastructure Plans/Strategies – including any relevant Waterways Ireland plans/programmes
- River Basin Management Plans and associated Programmes of Measures
- Regional Planning Guidelines
- Development Plans including those for Dublin City, Fingal, Dún Laoghaire-Rathdown, South Dublin and Counties Meath, Kildare and Wicklow
- Planning Schemes for Strategic Development Zones e.g. Docklands, Grangegorman and Cherrywood
- Biodiversity Action Plans
- Heritage Plans
- County Landscape Character Assessments
- Special Amenity Area Orders
- Freshwater Pearl Mussel Sub-Basin Management Plans
- Local Catchment Flood Risk Management Plans

The Strategy must comply with relevant higher level strategic actions and may, in turn, guide lower level strategic actions.

The Strategy is subject to a number of high level environmental protection policies and objectives with which it must comply, including those which have been identified as Strategic Environmental Objectives in Section 3.13. Examples of Environmental Protection Objectives include the aim of the EU Habitats Directive - which is to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of Member States - and the purpose of the Water Framework Directive - which is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which, among other things, prevents deterioration in the status of all water bodies and protects, enhances and restores all waters with the aim of achieving good status by 2015.

## Section 3 Relevant aspects of the current state of the environment

### 3.1 Introduction

Reflecting the specifications in the SEA Directive, the relevant aspects of the current state of the environment for the following environmental components are summarised in this section: biodiversity and flora and fauna, population and human health, soil, water, air and climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors. The spatial scope of the Strategy generally corresponds to the jurisdictions of the seven local authorities of the Greater Dublin Area<sup>1</sup>.

### 3.2 Likely Evolution of the Environment in the Absence of the Plan

The implementation of the Strategy is likely to give rise to the following residual adverse environmental effects:

- An extent of travel related greenhouse gas and other emissions to air. This has been mitigated by provisions which have been integrated into the Strategy, including those relating to sustainable mobility;
- Loss of an extent of non-protected habitats arising from the replacement of semi-natural land covers with artificial surfaces;
- Losses or damage to ecology (these would be in compliance with relevant legislation);
- Residual wastes (these would be disposed of in line with higher level waste management policies);
- Potential residual losses to public assets;
- Flood related risks remain due to uncertainty with regard to extreme weather events;
- Residual visual effects (these would be in compliance with landscape designation provisions);
- Potential alteration to the context and setting of designated cultural heritage however these will occur in compliance with legislation. Potential loss of unknown archaeology however this loss will be mitigated by measures integrated into the Strategy; and
- Loss of an extent of soil function arising from the replacement of semi-natural land covers with artificial surfaces.

In the absence of a new Strategy, none of the adverse effects detailed above would result due to the implementation of the Strategy. However lower-tier Plans would continue to be reviewed and implemented and applications for permission for new projects would continue to be made. Compliance with the mitigation measures outlined under Section 9 of this report would be necessary in order to help ensure that the following significant adverse environmental effects do not occur:

- Potential interactions with human health if effects upon environmental vectors such as air are not mitigated;
- Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna;
- Habitat loss, fragmentation and deterioration, including patch size and edge effects;
- Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species and coastal squeeze;
- Effects in riparian zones where new crossings of waters, if any, are progressed;
- Potential effects upon ecology from transport emissions;
- Generation of construction waste;
- Loss or damage to public assets and infrastructure;
- Adverse impacts upon the status of water bodies and entries to the WFD Register of Protected Areas, arising from changes in quality, flow and/or morphology;
- Increase in the risk of flooding;
- Occurrence of adverse visual impacts and conflicts with the appropriate protection of statutory designations relating to the landscape;

<sup>1</sup> Dublin City Council, Dún Laoghaire Rathdown County Council, Fingal County Council, South Dublin County Council, Kildare County Council, Meath County Council and Wicklow County Council in addition to an area of County Louth to take account of the Dublin to Drogheda rail line.

- Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities; and
- Adverse impacts on the hydrogeological and ecological function of the soil resource as a result of construction of associated facilities/ infrastructure

In the absence of the Strategy, it is uncertain as to which projects would be progressed or prioritised. Lower-tier plans and projects would be less coordinated. It is uncertain as to whether the following positive effects (that would be facilitated by implementation of the Strategy) would be achieved:

In the absence of the Strategy and the investment in public transport, walking and cycling proposed, lower-tier plans and projects would be less coordinated and it is uncertain as to whether the following positive effects would be achieved:

- A shift from car to more sustainable and non-motorised transport modes;
- Management of traffic flows and associated effects on air quality;
- Reductions in travel related greenhouse gas and other emissions to air and energy usage;
- The development of transport infrastructure and services in locations which will facilitate use by those living and working in urban/suburban areas;
- Reuse and regeneration of brownfield lands thereby contributing towards a higher efficiency of land utilisation, sustainable mobility and a reduction in the need to develop greenfield lands; and
- Enhancement of cultural (archaeological and architectural) heritage and its context in urban areas and their surrounds as a result of replacing motorised modes with more sustainable and non-motorised modes of transport such as walking, cycling and light rail/metro.

### 3.3 Air and Climatic Factors

#### Climatic Factors

The key issue involving the assessment of the effects of implementing the Strategy on climatic factors relates to greenhouse gas emissions arising from transport.

The Strategy facilitates contributions towards improvements in sustainable mobility, thereby facilitating contributions towards reductions in and limiting increases of greenhouse gas emissions. Such emissions would occur otherwise with higher levels of motorised transport and associated traffic.

Ireland's emissions profile has changed considerably since 1990, with the contribution from transport more than doubling and the share from agriculture reducing since 1998.

Maximising sustainable mobility will help Ireland meet its emission target for greenhouse gases under the 2020 EU Effort Sharing target which commits Ireland to reducing emissions from those sectors that are not covered by the Emissions Trading Scheme (e.g. transport, agriculture, residential) to 20% below 2005 levels.

Figure 3.1 maps journeys by car taken as a percentage of all journeys taken (2011 base year) across the GDA. The lowest amount of journeys by car taken as a percentage of all journeys taken occur in areas in Dublin within the M50, in areas surrounding the M50 along the M4, M7, N81 and R156. The highest amount of journeys by car taken as a percentage of all journeys taken occur in more rural areas, away from settlements.

#### Ambient Air Quality

The EPA's (2015) *Air Quality in Ireland 2014* identifies that, overall, air quality in Ireland compares favourably with other EU Member States and continues to be of good quality relative to other EU countries.

The Strategy facilitates contributions towards improvements in sustainable mobility, thereby facilitating contributions towards reductions in and limiting increases of emissions to air (including noise). Such emissions would occur otherwise with higher levels of motorised transport and associated traffic.

### 3.4 Population and Human Health

Most users of transport within the Greater Dublin Area will reside in and commute to and from urban/suburban areas. Figure 3.2 shows population density across the Greater Dublin Area per Electoral Division. Population for each division has been classified into ten categories with an equal number of units in each category. The most populous divisions are generally concentrated within and surrounding the M50 motorway, along the coast of the GDA (as far south as Wicklow), in areas of Meath closest to Dublin and within North-East Kildare and along the M7 corridor. The uplands in County Wicklow, North-West and South Kildare and North County Meath are among the least populous divisions. Locating transport infrastructure and services closer to urban/suburban areas (which have higher populations and densities) will allow for a greater number journeys via sustainable transport modes and associated positive environmental effects on energy usage, air and noise emissions.

With regard to human health, impacts relevant to the SEA are those which arise as a result of interactions with environmental vectors (i.e. environmental components such as air, water or soil through which contaminants or pollutants, which have the potential to cause harm, can be transported so that they come into contact with human beings). Hazards or nuisances to human health can arise as a result of exposure to these vectors e.g. interactions with human health that could occur in urban locations that experience high levels of traffic congestion and associated particulate matter and noise emissions to air.

### 3.5 Biodiversity and Flora and Fauna

Information on biodiversity and flora and fauna which is relevant to lower tier project planning and development and associated environmental assessment includes available information on designated ecological sites and protected species, ecological connectivity (including stepping stones and corridors) and non-designated habitats.

Ecological designations include:

- Candidate Special Areas of Conservation<sup>2</sup> (cSACs) and Special Protection Areas<sup>3</sup> (SPAs);
- UNESCO World Heritage and UNESCO Biosphere sites<sup>4</sup>;
- Ramsar Sites<sup>5</sup>;
- Salmonid Waters<sup>6</sup>;

---

<sup>2</sup> cSACs have been selected for protection under the European Council Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) by the DECLG due to their conservation value for habitats and species of importance in the European Union. The sites are *candidate* sites because they are currently under consideration by the Commission of the European Union. The Habitats Directive seeks to establish Natura 2000, a network of protected areas throughout the EU. It is the responsibility of each member state to designate SACs to protect habitats and species, which, together with the SPAs designated under the 1979 Birds Directive, form Natura 2000.

The European Communities (Birds and Natural Habitats) Regulations 2011 consolidate the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats)(Control of Recreational Activities) Regulations 2010. The Regulations have been prepared to address several judgments of the Court of Justice of the European Union (CJEU) against Ireland, notably cases C-418/04 and C-183/05, in respect of failure to transpose elements of the Birds Directive and the Habitats Directive into Irish law.

<sup>3</sup> SPAs have been selected for protection under the 1979 European Council Directive on the Conservation of Wild Birds (79/409/EEC) - referred to as the Birds Directive - by the DECLG due to their conservation value for birds of importance in the European Union.

<sup>4</sup> United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List comprises sites of outstanding universal value: cultural, natural or mixed. The UNESCO Biosphere Reserves List comprises areas of terrestrial and coastal ecosystems promoting solutions to reconcile the conservation of biodiversity with its sustainable use.

<sup>5</sup> Ramsar sites are designated and protected under the Convention of Wetlands of International Importance, especially as Water Fowl Habitat, which was established at Ramsar in 1971 and ratified by Ireland in 1984. Ireland presently has 45 sites designated as Wetlands of International Importance, with surface areas of 66,994 hectares. The objective of a Ramsar site is the conservation of wetlands for wildfowl. While Ireland ratified the Ramsar Convention in 1984 there is no legal backing for Ramsar sites unless they are also Nature Reserves or SPAs and as such are protected by the Wildlife Acts 1976 and 2000 or the Birds or Habitats Directives.

- Shellfish Waters<sup>7</sup>;
- Freshwater Pearl Mussel catchments<sup>8</sup>;
- Flora Protection Order<sup>9</sup> sites;
- Wildlife Sites (including Nature Reserves<sup>10</sup>);
- Certain entries to the Water Framework Directive Register of Protected Areas<sup>11</sup>;
- Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs)<sup>12</sup>;
- Wildfowl Sanctuaries (see S.I. 192 of 1979)<sup>13</sup>; and
- Tree Preservation Orders (TPOs)<sup>14</sup>.

Protected Species include:

- Annex IV (Habitats Directive) species of flora and fauna, and their key habitats (i.e. breeding sites and resting places), which are strictly protected wherever they occur, whether inside or outside the above sites, e.g. Otter and bats;
- Other species of flora and fauna and their key habitats which are protected under the Wildlife Acts, 1976-2000, wherever they occur; and
- 'Protected species and natural habitats' as defined in the European Liability Directive (2004/35/EC) and European Communities (Environmental Liability) Regulations, 2008, including: Birds Directive – Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur) and Habitats Directive – Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places (wherever they occur).

The following information is relevant to ecological networks and connectivity and non-designated habitats:

- CORINE land cover mapping (including areas likely to contain a habitat listed in annex 1 of the Habitats Directive)<sup>15</sup>;

---

<sup>6</sup> Salmonid waters are designated and protected as under the European Communities (Quality of Salmonid Waters) Regulations 1988 (SI No. 293 of 1988). Designated Salmonid Waters are capable of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*).

<sup>7</sup> In order to protect existing shellfish waters and to ensure the future protection of these areas, the European Union introduced the Shellfish Waters Directive (2006/113/EC). The purpose of this Directive is to put in place concrete measures to protect waters, including shellfish waters, against pollution and to safeguard certain shellfish populations from various harmful consequences, resulting from the discharge of pollutant substances into the sea. The Directive applies to the aquatic habitat of bivalve and gastropod molluscs only (includes oysters, mussels, cockles, scallops and clams). It does not include crustaceans such as lobsters, crabs and crayfish.

<sup>8</sup> Freshwater pearl mussel is a globally threatened, long-lived and extremely sensitive species that can be impacted by many forms of pollution, particularly sediment and nutrient pollution and by hydrological and morphological changes, which may arise from developments, activities or changes in any part of the catchment.

<sup>9</sup> The current list of plant species protected by Section 21 of the Wildlife Act, 1976 is set out in the Flora (Protection) Order, 1999.

<sup>10</sup> A Nature Reserve is an area of importance to wildlife, which is protected under Ministerial order. There are currently 78 Statutory Nature Reserves. Most are owned by the State but some are owned by organisations or private landowners.

<sup>11</sup> In response to the requirements of the Water Framework Directive a number of water bodies or parts of water bodies which must have extra controls on their quality by virtue of how their waters are used by wildlife have been listed on Registers of Protected Areas (RPAs). RPAs include those for Protected Habitats or Species, Shellfish, Salmonid, Nutrient Sensitive Areas, Recreational Waters and Drinking Water.

<sup>12</sup> NHAs are designated due to their national conservation value for ecological and/or geological/geomorphological heritage. They cover nationally important semi-natural and natural habitats, landforms or geomorphological features, wildlife plant and animal species or a diversity of these natural attributes. NHAs are designated under the Wildlife (Amendment) Act 2000. pNHAs were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats.

<sup>13</sup> Wildfowl Sanctuaries are areas that have been excluded from the 'Open Season Order' so that game birds can rest and feed undisturbed. There are 68 sanctuaries in the State. Shooting of game birds is not allowed in these sanctuaries.

<sup>14</sup> TPOs are a planning mechanism whereby individual trees or groups of trees can be identified as important and protected by a TPO.

<sup>15</sup> The CORINE land cover mapping classifies land cover under various headings. This dataset allows for the identification of lands that are likely to be most valuable to biodiversity including those which are likely to contain a habitat listed in Annex 1 of the Habitats Directive e.g. natural grasslands, peat bogs, salt marshes. CORINE Land Cover (CLC) is a map of the European environmental landscape based on interpretation of satellite images. Land cover is the observed physical cover, as seen from the ground or through remote sensing, including for example natural or planted vegetation, water and human constructions which cover the earth's surface.



- Watercourses, wetlands and peatlands;
- Other relevant County Development Plan designations;
- The EPA's Framework National Ecological Network for Ireland<sup>16</sup>; and
- Other sites of high biodiversity value or ecological importance, e.g. BirdWatch Ireland's 'Important Bird Areas' (Crowe et al., 2009).

Ecological networks are important in connecting areas of local biodiversity with each other and with nearby designated sites so as to prevent islands of habitat from being isolated entities. They are composed of linear features, such as treelines, hedgerows and rivers/streams, which provide corridors or stepping stones for wildlife species moving within their normal range. They are important for the migration, dispersal and genetic exchange of species of flora and fauna particularly for mammals, especially for bats and small birds and facilitate linkages both between and within designated ecological sites, the non-designated surrounding countryside and urban areas.

Article 10 of the Habitats Directive recognises the importance of ecological networks as corridors and stepping stones for wildlife, including for migration, dispersal and genetic exchange of species of flora and fauna. The Directive requires that ecological connectivity and areas of ecological value outside the Natura 2000 network of designated ecological sites are maintained.

Ecological islands or areas of habitat that are not connected to surrounding ecologically valuable habitats can also be important.

Figure 3.3 maps Natura 2000 sites within 15km of the Strategy Area. The greatest extent of area designated within the GDA comprises the Wicklow Mountains. Lands at the coastal margins and coastal waters adjacent to the GDA are also designated. Other Natura 2000 designations within the GDA include river systems (e.g. River Boyne and Blackwater in West and North Meath, River Barrow and Nore in West and South Kildare and River Slaney in South Kildare) and patches of bog designations (primarily in West Kildare).

Natural Heritage Areas (NHAs), proposed NHAs and areas likely to contain habitats listed on Annex I of the Habitats Directive are illustrated on Figure 3.4. Where they occur, pNHA and NHA designations often overlap with Natura 2000 site boundaries and they include lakes, bog areas, the Grand and Royal Canals and coastal areas including islands and waters. Areas likely to contain Annex I Habitats comprise selected 2012 CORINE landcover mapping entries which are indicative of these areas: broad-leaved forest, peat bog, natural grassland, water bodies, coastal lagoons, mixed forests, moors and heaths, intertidal flats, beaches dunes sand, inland marshes, stream courses, estuaries, sparsely vegetated areas, burnt areas, salt marshes, bare rocks, transitional woodland scrub and land principally occupied by agriculture with areas of natural vegetation. These areas cover much of the uplands and foothills of County Wicklow, the bogs in Kildare and smaller pockets elsewhere.

Previous changes in land uses arising from human development have resulted in a loss of biodiversity and flora and fauna however legislative objectives governing biodiversity and fauna were not identified as being conflicted with by the assessment.

The Department of Arts, Heritage and the Gaeltacht's Article 17 report on the Status of EU Protected Habitats and Species in Ireland (2013) identifies many Irish habitats to be of unfavourable status and many to be still declining, although it also identifies that a range of positive actions are underway. The report identifies that the majority of EU-protected species are, however, in "Favourable" status in Ireland, and stable, although a small number are considered to be in "Bad" status and continue to require concerted efforts to protect them.

The Transport Strategy includes robust measures to contribute towards the protection of biodiversity and flora and fauna.

---

<sup>16</sup> The EPA's Framework National Ecological Network provides a classification of the relative importance of areas by virtue of the biodiversity and flora that they contain and the connectivity they provide. Many of the areas identified are corridors.

### 3.6 Material Assets

Resources that are valued and that are intrinsic to specific places are called 'material assets'.

#### Public Assets and Infrastructure

Public assets and infrastructure which have the potential to be impacted upon by the development of transport infrastructure, if unmitigated, include 'on the ground' resources such as public open spaces, parks and recreational areas; public buildings and services; utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.). Within the Strategy area, these resources are generally located within the immediate outskirts of urban/suburban areas.

#### Land

The development of transport infrastructure and services has the potential to assist with the reuse and regeneration of brownfield sites thereby contributing towards sustainable mobility and reducing the need to develop greenfield lands and associated adverse environmental effects. Within the Strategy area, brownfield lands are generally located within urban/suburban areas.

#### Waste Management

Any construction waste arising from the development of infrastructure is required to be dealt with in compliance with relevant EU and National waste management policy, including that relating to the waste hierarchy of prevention, recycling, energy recovery and disposal.

For the purposes of waste management planning, Ireland is now divided into three regions: Southern, Eastern-Midlands and Connacht-Ulster. The Strategy area is located within the Eastern-Midlands Region for which a new waste management plan has been adopted in 2015.

### 3.7 Water

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD requires that all Member States implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving "good status" by 2015. All public bodies are required to coordinate their policies and operations so as to maintain the good status of water bodies which are currently unpolluted and improve polluted water bodies to good status by 2015.

A potential water sensitivity map (see Figure 3.5) has been prepared as part of the SEA process. The purpose of the map is to indicate at a regional level where the main concentrations of water sensitivities might occur within and surrounding the GDA. Layers relating to water sensitivity taken into account by the mapping include the following:

- WFD River, Coastal, Transitional Waters of Moderate / Poor / Bad Status
- WFD Groundwater of Poor Status
- Geological Survey of Ireland (GSI) Groundwater Vulnerability Extreme or Karst
- GSI Groundwater Vulnerability High
- WFD Register of Protected Area (RPA) Entries for Drinking Water (surface and ground), Bathing Waters, Shellfish Waters, Salmonid Rivers and Nutrient Sensitive Areas

Areas with higher water sensitivities are indicated by darker orange colours, areas with moderate water sensitivities are indicated by yellow colours and areas with lower water sensitivities are indicated with green colours.

Where the sensitivity mapping shows a concentration of water sensitivities there is an increased likelihood that development will conflict with this sensitivities and cause environmental deterioration, if mitigation is not applied. It is emphasised that the occurrence of water sensitivities does not preclude development; rather it flags at a strategic level that the mitigation measures - which have

already been integrated into the Strategy - will need to be adhered to at lower tiers of decision making in order to ensure that the implementation of the Strategy contributes towards the objectives of the Water Framework Directive. It is emphasised that the map is a high scale, regional map and additional, local water sensitivities may become apparent during the consideration of projects at local level.

Rivers throughout the region show up as being sensitive. Heightened sensitivities arising from groundwater data are found in much of County Wicklow, North-West and East Meath, Dublin County and central Kildare. Sensitivity is also attached to coastal areas. Figure 3.5 should be viewed alongside Figure 3.3 and Figure 3.4 which provide information including ecological designations.

## 3.8 Landscape

Landscapes are areas which are perceived by people and are made up of a number of layers: landform, which results from geological and geomorphological history; landcover, which includes vegetation, water, human settlements, and; human values which are a result of historical, cultural, religious and other understandings and interactions with landform and landcover.

The importance of landscape and visual amenity and the role of its protection are recognised in the Planning and Development Act 2000 as amended, which requires that Development Plans include objectives for the preservation of the landscape, views and the amenities of places and features of natural beauty. These objectives and associated plan content often designate different aspects of the landscape such as the following:

- Landscape character areas;
- Landscape sensitivity and value areas;
- High amenity zones;
- Scenic views and prospects; and
- Land use objectives relating to landscape protection.

Landcover (see below) is one factor which is taken into account in the designation of these aspects.

CORINE land cover mapping classifies land cover under various headings. This dataset allows for the identification of areas that are likely to be most visually sensitive and robust. Land cover is the observed physical cover, as seen from the ground or through remote sensing, including for example natural or planted vegetation, water and human constructions which cover the earth's surface. The CORINE Land Cover map is based on interpretation of satellite images.

Three categories of potential landcover sensitivity have been identified within the GDA on Figure 3.6 by combining the following landcover layers:

### Category 1 Robust Landcover

Sport and leisure facilities; Continuous urban fabric; Discontinuous urban fabric; Industrial or commercial units; Road and rail networks; Sea ports; Airports; Mineral extraction sites; Dump; Construction sites.

### Category 2 Normal Landcover

Non-irrigated land; Coniferous forest; Complex cultivation patterns; Pasture; Transitional woodland scrub; Land principally occupied by agriculture with areas of natural vegetation

### Category 3 Sensitive Landcover

Fruit trees and berry; Green urban sites; Broad-leaved forest; Peat bog; Natural grassland; Water bodies; Coastal lagoons; Mixed Forests; Moors and Heaths; Intertidal Flats; Beaches Dunes Sand; Inland marshes; Stream Courses; Estuaries; Sparsely Vegetated Areas; Burnt Areas; Salt Marshes; Bare Rocks

Normal landcover is the predominant landcover type and is generally found throughout much of County Meath, County Kildare, County Wicklow and Dublin County. Robust landcover is found within and surrounding the M50 motorway and in pockets throughout the GDA. Sensitive landcover are most common in the Wicklow Mountain uplands/foothills, in bog areas in North-West Kildare and in coastal areas and parklands.

### 3.9 Cultural Heritage

Archaeology is the study of past societies through the material remains left by those societies and the evidence of their environment. Archaeological sites and monuments vary greatly in form and date; examples include earthworks of different types and periods, (e.g. early historic ringforts and prehistoric burial mounds), megalithic tombs from the Prehistoric period, medieval buildings, urban archaeological deposits and underwater features. Archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997 and the Planning Acts. A recorded monument is a monument included in the list and marked on the map which comprises the RMP set out county by county under Section 12 of the National Monuments (Amendment) Act, 1994 by the Archaeological Survey of Ireland. The definition includes Zones of Archaeological Potential in towns and all other monuments of archaeological interest which have so far been identified by the government. Monuments are concentrated within urban/suburban areas and are less common in areas which are not settled.

The term architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments Act 1999 as meaning all: structures and buildings together with their settings and attendant grounds, fixtures and fittings; groups of structures and buildings; and, sites which are of technical, historical, archaeological, artistic, cultural, scientific, social, or technical interest. Records of Protected Structures are legislated for under Section 12 and Section 51 of the Planning and Development Act 2000 as amended. In addition to Protected Structures, the Planning and Development Act, 2000 provides the legislative basis for the protection of Architectural Conservation Areas (ACAs). An ACA is a place, area or group of structures or townscape which is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or contributes to the appreciation of protected structures, whose character it is an objective to preserve in a development plan. Similar to the general spatial spread of monuments, Protected Structures are concentrated within urban/suburban areas and are less common in areas which are not settled, most noticeably much of the Wicklow Mountains.

### 3.10 Soil

Information sources relevant to the environmental component of soil which may be used in lower tier planning and environmental assessments includes:

- Soil types (2006) published by Teagasc, Geological Survey of Ireland (GSI), Forest Service & EPA;
- Soils and Subsoils Class (2006) published by Teagasc, GSI, Forest Service & EPA (2006);
- Sites of Geological Interest which have been published for some counties and provisional information on same for other counties (both available from GSI);
- Other datasets published by and available from GSI including those relating to Bedrock Geology, Quaternary Geology, Mineral deposits, Groundwater Resources and Landslides; and
- Datasets on contaminated soils which may be kept by planning authorities (these occur most often in urban areas).

### 3.11 Overall Environmental Sensitivities and Opportunities/Robustness

Some of the environmental information summarised under previous subsections has been weighted and mapped to show overall environmental sensitivity (see Figure 3.7) and overall environmental robustness (see Figure 3.8) with regard to the development of transport projects. The purpose of the map is to indicate at a regional level where the main concentrations of sensitivities might occur within and surrounding the GDA.

The maps are prepared at the regional scale and different layers or weightings would produce different map outputs. It is emphasised that the maps are high scale, regional maps and additional, local sensitivities and opportunities may become apparent during the consideration of projects at local level.

#### Environmental Sensitivities

For the environmental sensitivity mapping, areas with higher environmental sensitivities are indicated by darker orange/red colours, areas with moderate environmental sensitivities are indicated by yellow colours and areas with lower environmental sensitivities are indicated with green colours.

Heightened areas of sensitivity within the GDA include those in the uplands and foothills of the Wicklow Mountains, in the bog areas of west Kildare, in river valleys (e.g. the River Boyne in central and North Meath, the River Barrow in West and South Kildare and Slaney in South Wicklow) and at lakes. Lands at the coastal margins and coastal waters adjacent to the GDA are also sensitive, especially within and to the north of Dublin Bay. Lower levels of sensitivity occur elsewhere.

Where the sensitivity mapping shows a concentration of environmental sensitivities there is an increased likelihood that development will conflict with these sensitivities and cause environmental deterioration, if mitigation is not applied. It is emphasised that the occurrence of environmental sensitivities does not preclude development; rather it flags at a strategic level that the mitigation measures - which have already been integrated into the Strategy - will need to be adhered to at lower tiers of decision making in order to ensure that the implementation of the Strategy contributes towards environmental protection.

#### Environmental Opportunities/Robustness

For the environmental opportunities/robustness mapping, areas with higher environmental robustness are indicated by darker green colours, areas with moderate environmental robustness are indicated by yellow colours and areas with lower environmental robustness are indicated with red/pink colours.

Heightened areas of robustness within the GDA include those within and surrounding the M50 motorway, in much of County Meath, especially South and South-East Meath, in much of County Kildare, especially North-East Kildare, and in County Wicklow, between the Mountains and the coast. Lower levels of robustness occur elsewhere.

Where the robustness mapping shows a concentration of environmental robustness there is a decreased likelihood that development will conflict with the environment.

### 3.12 Appropriate Assessment

A Stage 2 Appropriate Assessment (AA) has been undertaken alongside the Strategy. The requirement for AA is provided under the EU Habitats Directive (Directive 1992/43/EEC). The AA concluded that the Strategy will not affect the integrity of the Natura 2000 network<sup>17</sup>.

<sup>17</sup> Except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:  
(a) no alternative solution available;

The preparation of the Strategy, SEA and AA has taken place concurrently and the findings of the AA have informed both the Strategy and the SEA. All recommendations made by the AA were integrated into the Strategy.

### 3.13 Strategic Environmental Objectives

Strategic Environmental Objectives (SEOs) are methodological measures developed from policies which generally govern environmental protection objectives established at international, Community or Member State level e.g. the environmental protection objectives of various European Directives which have been transposed into Irish law and which are required to be implemented. SEOs used in the assessment (this assessment is detailed in the main SEA Environmental Report) are as follows:

- *To facilitate a reduction in travel related emissions (including pollutants, noise and greenhouse gas emissions) to air*
- *To encourage modal change from car to more sustainable forms of transport*
- *To facilitate a reduction in energy use by the transport sector*
- *To develop transport infrastructure and services closer to urban/suburban areas*
- *To protect populations and human health from exposure to incompatible landuses*
- *To contribute towards compliance with the Habitats and Birds Directives with regard to the protection of Natura 2000 Sites and Annexed habitats and species<sup>18</sup>*
- *To contribute towards compliance with Article 10 of the Habitats Directive with regard to the management of features of the landscape which - by virtue of their linear and continuous structure or their function act as stepping stones (designated or not) - are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species*
- *To avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in designated sites including Wildlife Sites and to contribute towards compliance with the Wildlife Acts 1976-2010 with regard to the protection of listed species*
- *To contribute towards the protection of public assets and infrastructure*
- *To assist with the reuse and regeneration of brownfield sites*
- *To reduce waste volumes, minimise waste to landfill and increase recycling and reuse*
- *To contribute towards the maintenance and improvement, where possible, of the quality and status of surface waters*
- *To contribute towards the protection of groundwater against pollution and contamination*
- *To comply as appropriate with the provisions of the Planning System and Flood Risk Management: Guidelines for Planning Authorities*
- *To avoid or, where infeasible, minimise conflicts with the appropriate protection of statutory designations relating to the landscape, including those included in the land use plans of planning authorities*
- *To contribute towards the protection of archaeological heritage including entries to the Record of Monuments and Places and/or their context*
- *To contribute towards the protection of architectural heritage including entries to the Records of Protected Structures and Architectural Conservation Areas and their context*
- *To minimise damage to the hydrogeological and ecological function of the soil resource*

---

(b) imperative reasons of overriding public interest for the plan/programme/project to proceed; and

(c) adequate compensatory measures in place.

<sup>18</sup> 'Annexed habitats and species' refer to those listed under Annex I, II & IV of the EU Habitats Directive and Annex I of the EU Birds Directive.

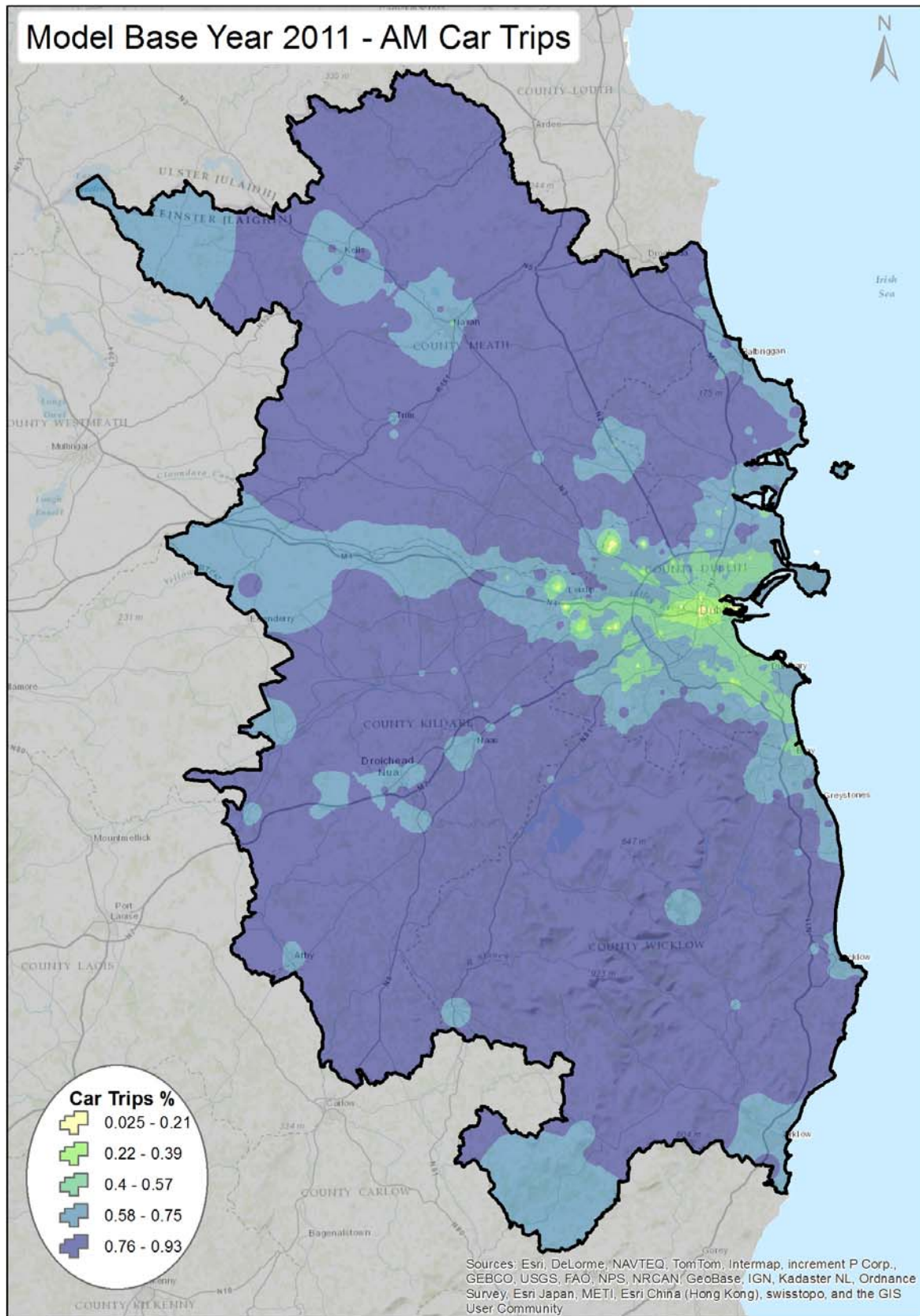


Figure 3.1 Journeys by car taken as a percentage of all journeys taken (2011 base year)



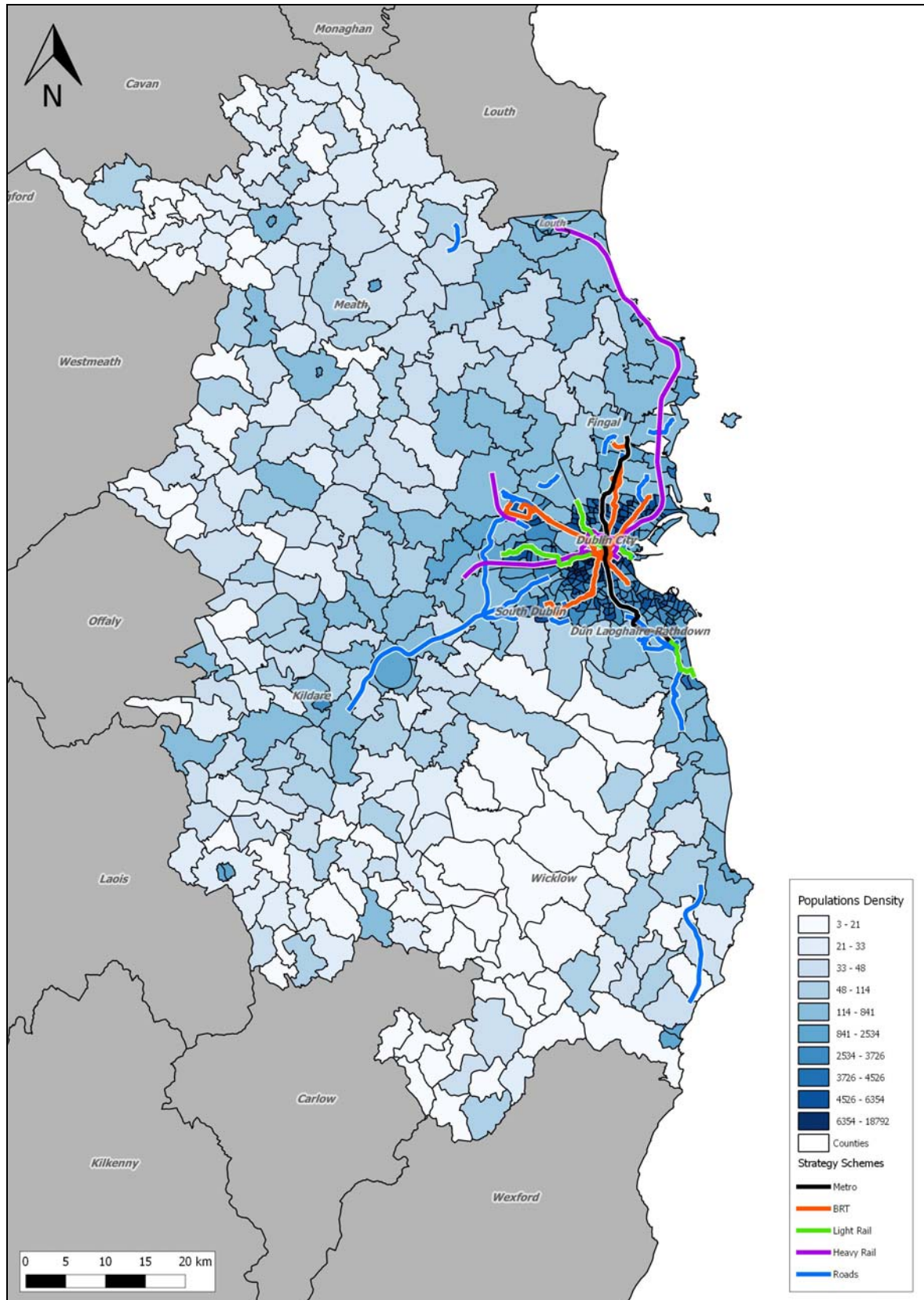
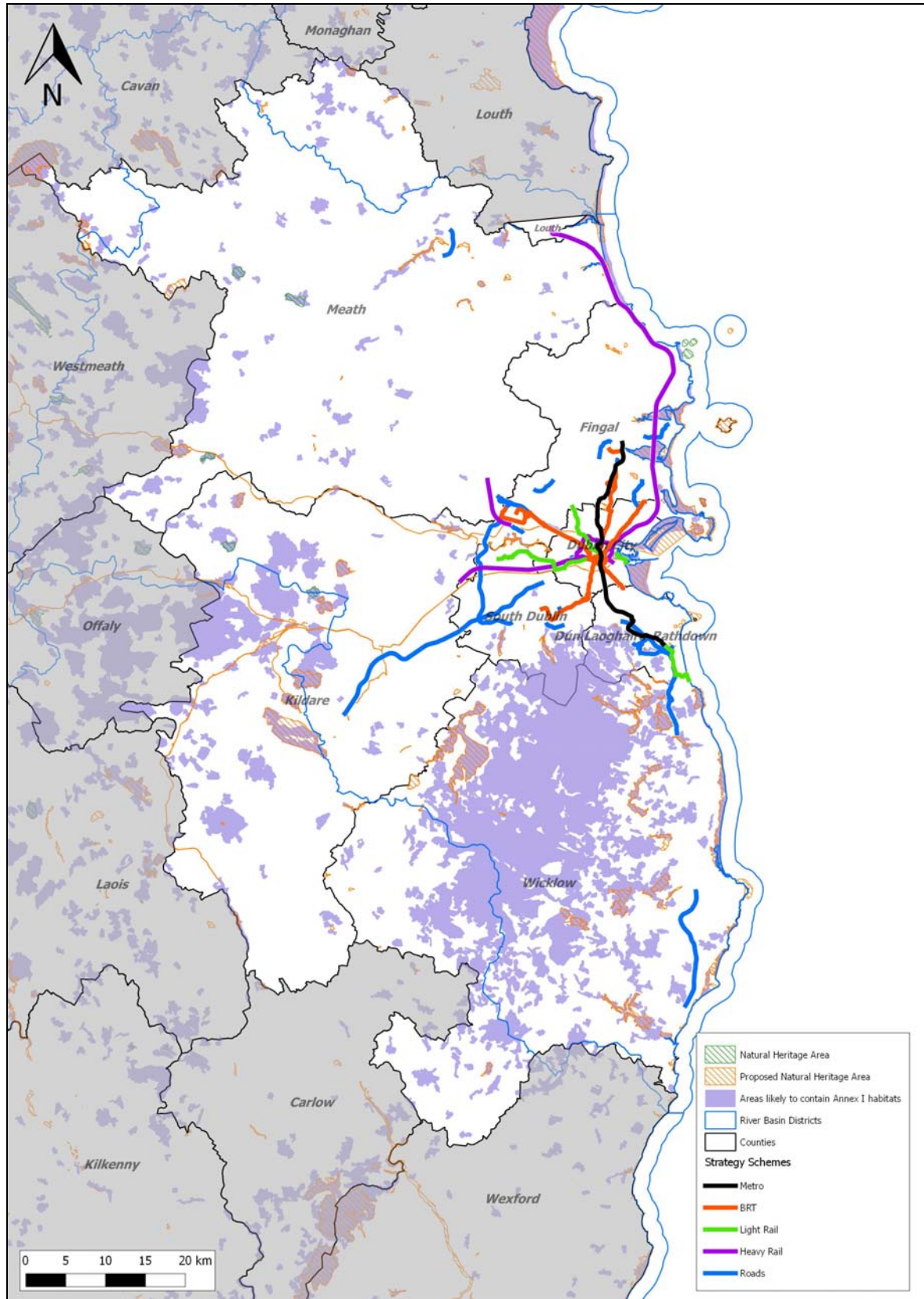


Figure 3.2 Population Density



17



**Figure 3.4 Potential Habitat Sensitivity: Natural Heritage Areas (NHAs), proposed NHAs and areas likely to contain Annex I Habitats**



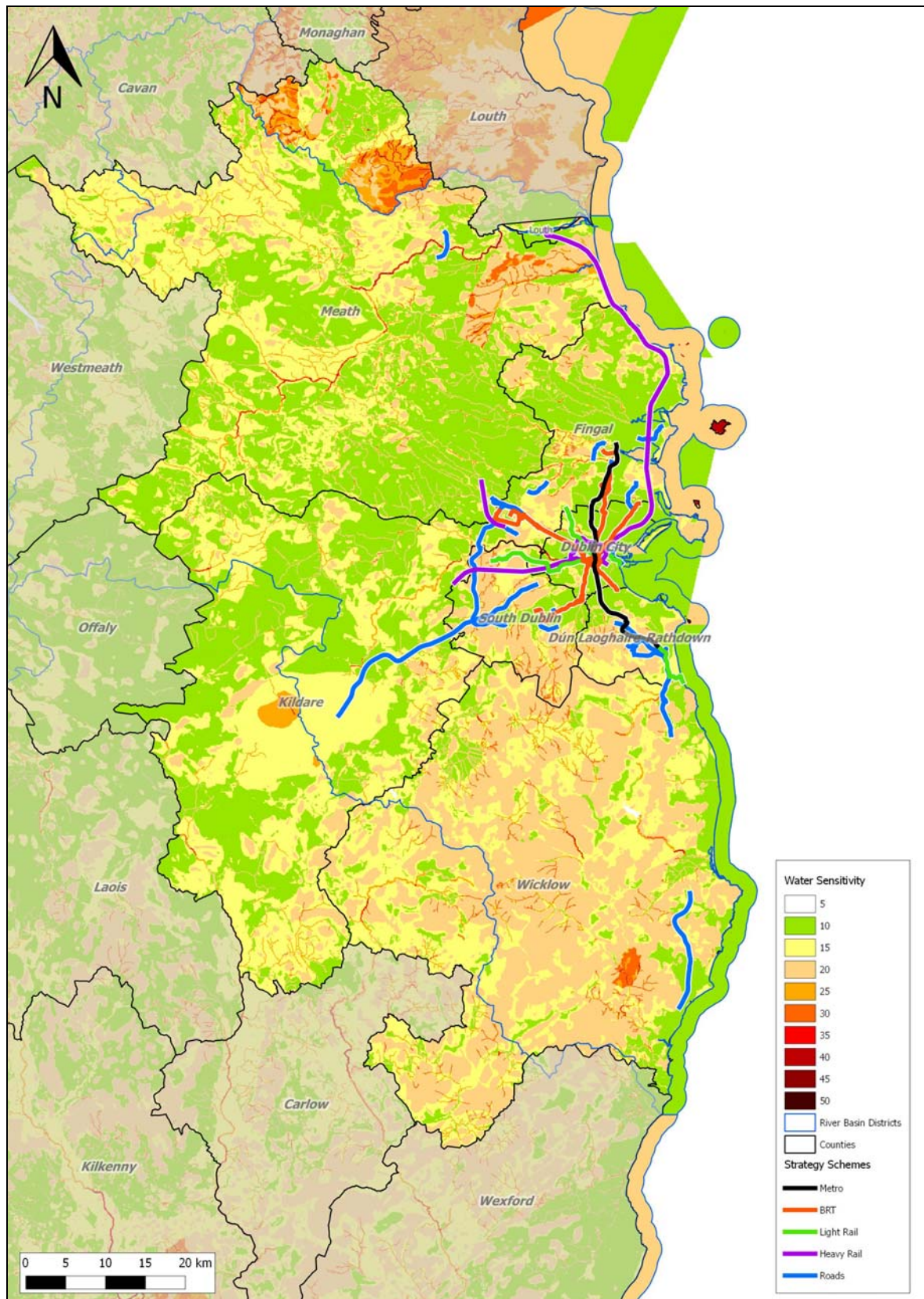


Figure 3.5 Potential Water Sensitivity

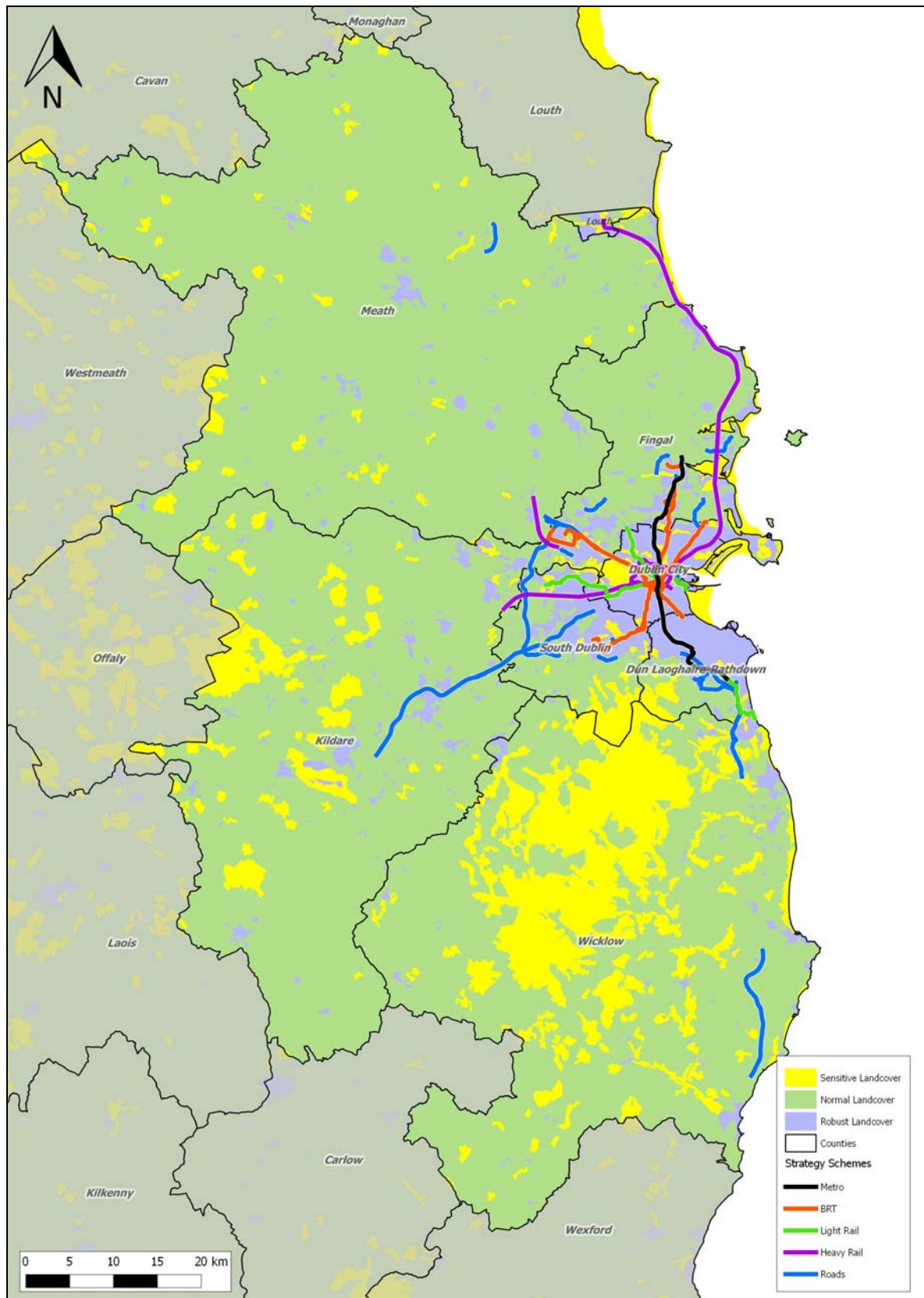
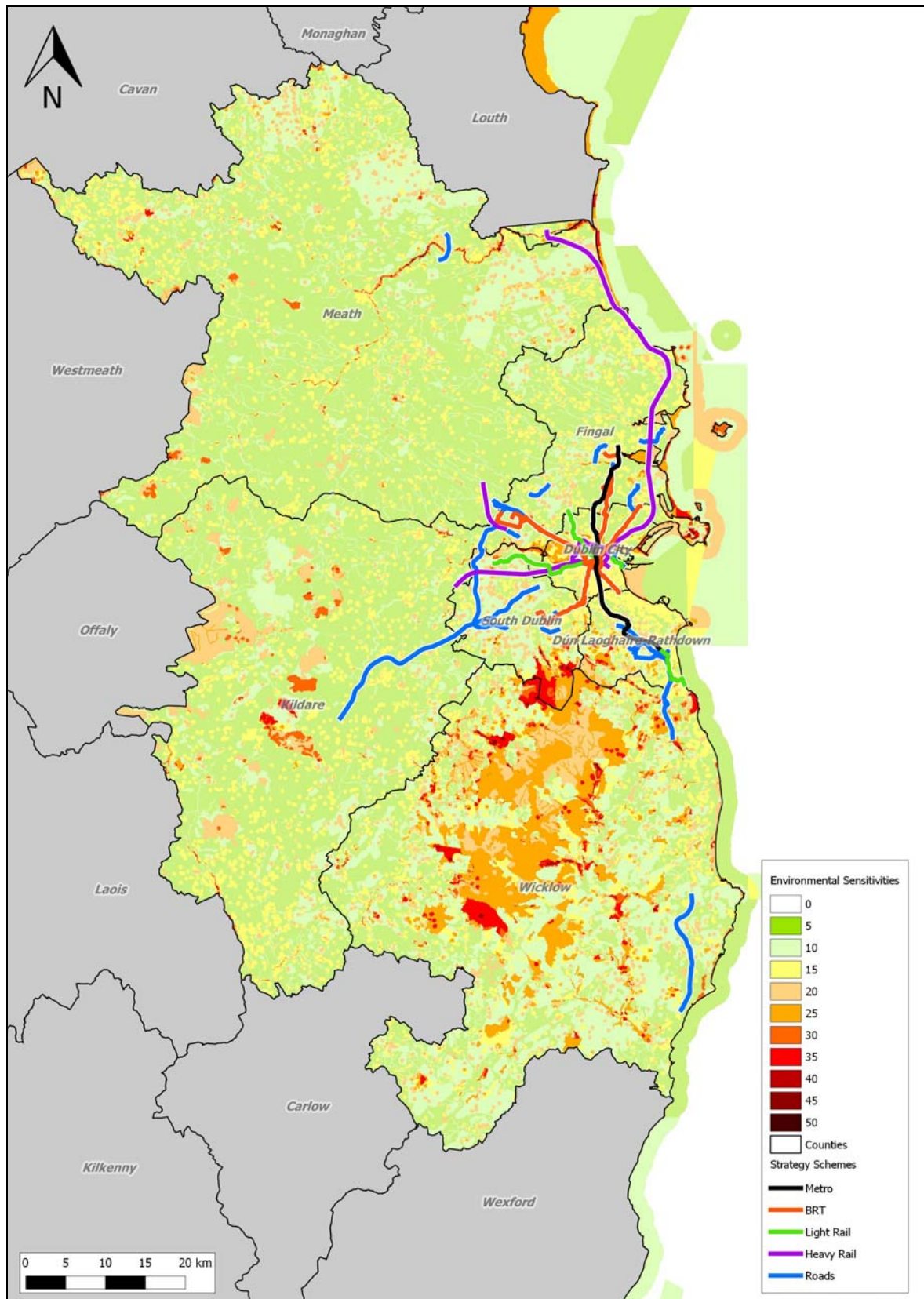
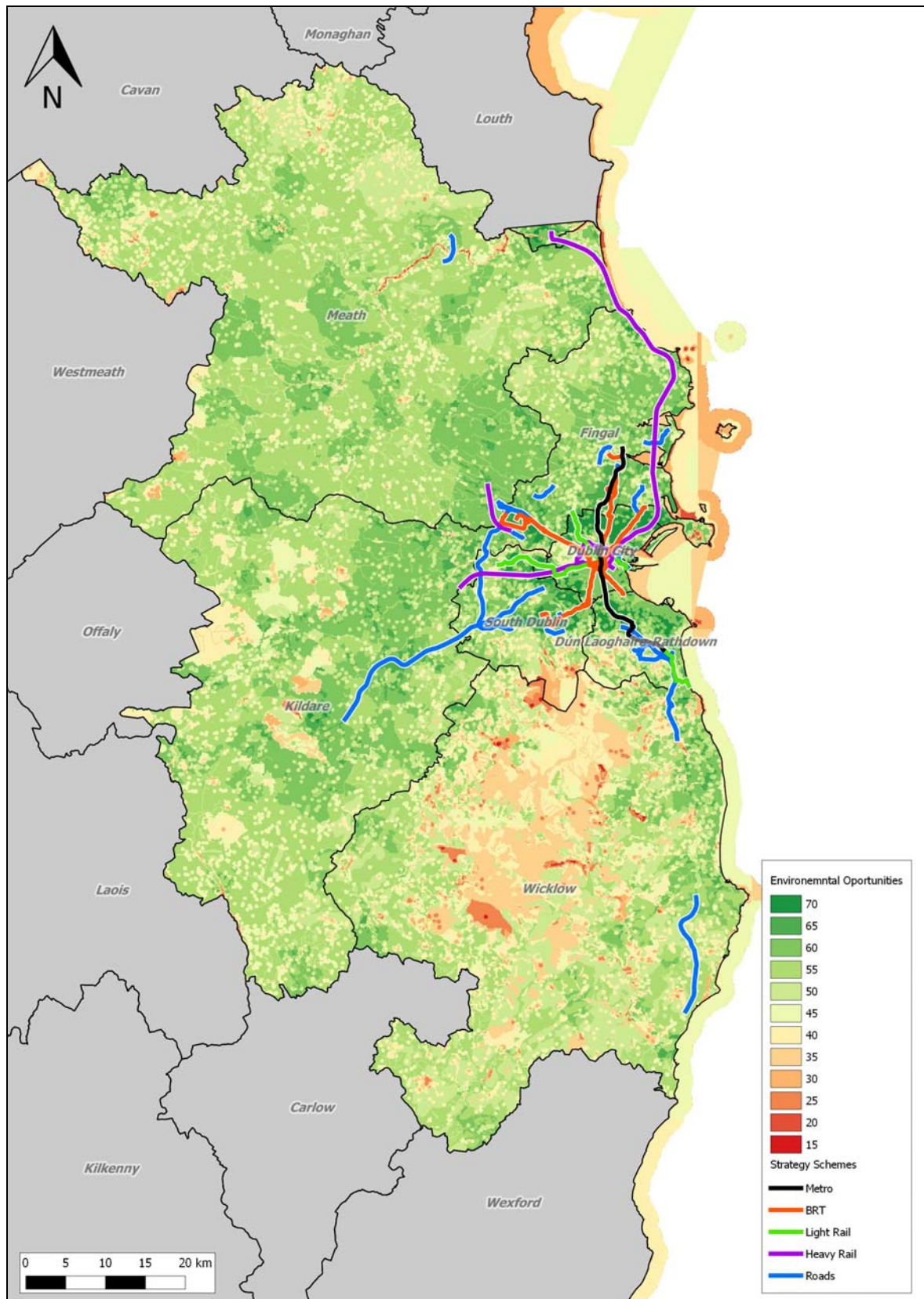


Figure 3.6 Potential Landcover Sensitivity Mapping





**Figure 3.7 Overall Potential Environmental Sensitivity**



**Figure 3.8 Overall Potential Environmental Opportunities/Robustness**

## Section 4 Effects of Alternatives and the Plan

### 4.1 Summary of Alternatives

The following three main alternatives are examined:

#### **Alternative 1: Orderly Provision of Transport**

All elements of the Transport Strategy for the Greater Dublin Area will be implemented in an orderly fashion according to priorities based on transport demand within a larger regional context of patterns of demography and economic activity occurring broadly in line with forecast trends and current plans.

#### **Alternative 2: Uneven Provision of Transport**

Most major elements and targets of the Transport Strategy are implemented – in broad outline – with some significant delays or omissions that tend to discourage growth in central areas and inner suburbs, and attract development into peripheral suburban areas close to the M50 and into the coastal strip.

#### **Alternative 3: Under Provision of Transport**

A rapid, overheating Dublin-centred economic recovery producing high levels of economic and demographic development concentrated into East Leinster. The effects of such development is worsened because this occurs in circumstances, similar to Scenario 2, where development of critical elements of transportation infrastructure has been delayed or disrupted.

### 4.2 Summary of Evaluation of Alternatives

#### **Alternative 1: Orderly Provision of Transport**

Alternative 1, orderly provision of transport and associated sustainable patterns of land-use and mobility, would:

- Facilitate the greatest improvement in sustainable mobility of all alternatives (reducing and limiting increases in the number of journeys by car taken as a percentage of all journeys taken), thereby facilitating the greatest reduction and limit of increases in greenhouse gas emissions, noise emissions and other emissions to air (with associated effects on human health). Such emissions would occur otherwise with higher levels of motorised transport and associated traffic. By significantly increasing the potential for plan-led, integrated development, greater usage of public transportation and less movement within denser settlements, this alternative would also be likely to result in a higher efficiency of energy resource utilisation.
- Provides for the development of transport infrastructure and services in locations which will facilitate use by those living and working in urban/suburban areas.
- Facilitate lower overall effects on ecology (including designated sites, ecological connectivity, habitats) – due to increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites.
- Facilitate the reuse and regeneration of brownfield lands thereby contributing towards a higher efficiency of land utilisation, sustainable mobility and a reduction in the need to develop greenfield lands. By facilitating increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites there will be lower adverse effects upon ecology, landscape designations, architectural and archaeological heritage and soil.
- Facilitate lower effects on ground and surface waters due to higher levels of development within established and serviced settlement centres that have installed/upgraded water

services capable of delivering Water Framework Directive targets (and associated effects on the protection of ecology and human health).

- Facilitate the enhancement of cultural heritage and its context in urban areas and their surrounds as a result of replacing motorised transport modes with more sustainable and non-motorised modes such as walking, cycling and light rail/metro.
- The higher levels of certainty under this alternative is likely to increase spatial concentrations of market-led development – residential, commercial and industrial – in areas that are consistent with regional and local land-use planning objectives. These planning objectives have been the subject of SEA and AA which have facilitated the integration of environmental considerations. Also, the timely availability of transportation infrastructure will significantly increase the likelihood of co-location of other services – especially water services – in areas that are consistent with the principles of proper planning and sustainable development.

### **Alternative 2: Uneven Provision of Transport**

Alternative 2, uneven provision of transport and associated uneven patterns of land-use and mobility, would:

- Result in both: congestion and delay issues at critical locations including major junctions, especially along the M50 in the near term; and over-crowding on key public transport routes, especially within the M50 [LUAS, DART and Commuter rail]. Congestion will mean that there will be significant delays in reaching targets for lower emissions to air – including noise and pollutants – and this will be compounded by lower utilisation of public transportation. There would be a failure to maximise contributions towards improving sustainable mobility (there would be increases in the number of journeys by car taken as a percentage of all journeys taken) and a failure to contribute towards managing traffic flows. By reducing the potential for plan-led, integrated development, this alternative would also be likely to result in a reduced efficiency of energy resource utilisation.
- In some locations, not providing enough transport infrastructure and services to maximise use by those living and working in urban/suburban areas.
- Result in mixed effects on ecology (including designated sites, ecological connectivity, habitats), as significant delays or omissions in the implementation of elements of the Strategy would tend to concentrate development into the immediate hinterland of the M50 – both inside and outside – and into the coastal strip. Urbanised areas would continue to benefit, to a lesser extent, from increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites; however, vulnerable coastal fringe areas and certain terrestrial areas with heightened sensitivity e.g. north Wicklow would be subject to occasional pressures and conflicts.
- Result in mixed effects on landscape, architectural and archaeological heritage and ecology – with occasional pressures and conflicts – due to lower utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites combined with sporadic green-field developments outside of planned cores. Both beneficial and adverse effects would be present.
- Result in mixed effects on waters – urbanised areas will continue to benefit from lower effects on ground and surface waters due to higher levels of development within established and serviced settlement centres that have installed/upgraded water services capable of delivering Water Framework Directive targets – however vulnerable coastal fringe areas and sensitive terrestrial areas (especially in North Kildare and South Meath) will be subject to higher pressures and more conflicts than under Alternative 1.

### **Alternative 3: Under Provision of Transport**

Alternative 3, under provision of transport and resultant un-coordinated and unsustainable patterns of land-use and mobility, would:

- Result in a delay/deferral of critical transport infrastructure and ensuing dispersed pattern of development which would make it increasingly difficult to find concentrations of development



that would justify the cost-benefit assessments of public capital projects; a spiral of dysfunctional land-use patterns that are highly car-dependent will persist with lower utilisation of public transportation. There would be a failure to maximise contributions towards improving sustainable mobility (there would be increases in the number of journeys by car taken as a percentage of all journeys taken) and a failure to contribute towards managing traffic flows, with resultant adverse effects on greenhouse gas emissions, noise emissions and other emissions to air (with associated effects on human health) as well as energy usage.

- Fail to locate enough transport infrastructure and services in locations which will maximise use by those living and working in urban/suburban areas.
- Result in mixed effects on ecology, as significant delays or omissions in the implementation of elements of the Strategy would tend to concentrate development into the immediate hinterland of the M50 – both inside and outside – and into the coastal strip. Urbanised areas would not benefit to the same extent from increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites as under Alternatives 1 and 2. Additionally vulnerable coastal fringe areas and sensitive terrestrial areas – especially in north Wicklow would be subject to occasional pressures and conflicts.
- Result in sustained ecological pressure on the terrestrial and marine environment of the region (including designated sites, ecological connectivity, habitats) as weakly co-ordinated, market-led development puts pressure on vulnerable coastal fringe areas and sensitive terrestrial areas (especially in north Wicklow) giving rise to continuous and significant pressures and conflicts on the Region's biodiversity and flora and fauna, including designated sites.
- Result in significant adverse effects on the region's ground and surface waters due to higher levels of weakly co-ordinated development outside established and serviced settlement centres – indeed significant developments in areas without installed/upgraded water services will lead to conflicts in delivering Water Framework Directive targets that will eventually impede further growth. Vulnerable coastal fringe areas and sensitive terrestrial areas (especially in North Kildare and South Meath) will be significantly subjected to pressures and conflicts in relationship to the availability of water services.
- Result in mixed effects on landscape, architectural and archaeological heritage and ecology – with occasional pressures and conflicts – due to far lower utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites combined with sporadic green-field developments outside of planned cores. Both beneficial and adverse effects would be present.

#### 4.2.1 Outcome of the Assessment

The most preferable outcome from the Alternatives Assessment is Alternative 1 and the full and orderly build-out of the strategy, with a high degree of integration between transport planning and land-use development.

This alternative facilitates the greatest improvements in sustainable mobility (reducing and limiting increases in the number of journeys by car taken as a percentage of all journeys taken), thereby facilitating the greatest reduction and limit of increases in greenhouse gas emissions, noise emissions and other emissions to air. Such emissions would occur otherwise with higher levels of motorised transport and associated traffic. Among other positive environmental effects, this alternative facilitates the enhancement of cultural heritage and its context in urban areas and their surrounds as a result of replacing motorised transport modes with more sustainable and non-motorised modes such as light rail/metro, cycling and walking.

There are potentially significant adverse effects arising from the alternative and these have been detailed and are tabulated overleaf. These effects will be mitigated by the various provisions which have been integrated into the Strategy. These mitigating provisions together with the contribution that the Strategy will make to sustainable mobility will mean that the selected alternative which has been developed for the Strategy facilitates various significant positive effects upon environmental components.

Table 4.1 below details the various effects with respect to *Alternative 1: Orderly Provision of Transport* which has been developed and finalised as the Strategy. By complying with appropriate mitigation measures - including those which have been integrated into the Strategy – potentially significant adverse environmental effects which could arise as a result of implementing the Strategy would be likely to be avoided, reduced or offset. Residual adverse environmental effects would be generally non-significant. Significant residual adverse effects would be in compliance with the relevant environmental protection legislation.

**Table 4.1 Summary of Effects of Implementing the Strategy**

Environmental Component	Significant Positive Effect, likely to occur	Potentially Significant Adverse Effect, if unmitigated	Residual Adverse Effect
<b>Air and climatic factors</b>	<ul style="list-style-type: none"> <li>Facilitates contribution towards a shift from car to more sustainable and non-motorised transport modes</li> <li>Facilitates contribution towards managing traffic flows and associated adverse effects on air quality</li> <li>Facilitates contribution towards reductions in travel related greenhouse gas and other emissions to air</li> </ul>	<ul style="list-style-type: none"> <li>Emissions to air</li> </ul>	<ul style="list-style-type: none"> <li>An extent of travel related greenhouse gas and other emissions to air. This has been mitigated by provisions which have been integrated into the Strategy, including those relating to sustainable mobility.</li> </ul>
<b>Population and human health</b>	<ul style="list-style-type: none"> <li>Facilitates contribution towards the protection of human health as a result of contributing towards the protection of environmental vectors, especially air</li> <li>Provides for the development of transport infrastructure and services in locations which will facilitate use by those living and working in urban/suburban areas</li> </ul>	<ul style="list-style-type: none"> <li>Potential interactions if effects upon environmental vectors such as air are not mitigated</li> </ul>	<ul style="list-style-type: none"> <li>An extent of travel related greenhouse gas and other emissions to air. This has been mitigated by provisions which have been integrated into the Strategy, including those relating to sustainable mobility.</li> </ul>
<b>Biodiversity and flora and fauna</b>	<ul style="list-style-type: none"> <li>Facilitates lower overall effects on ecology (including designated sites, ecological connectivity, habitats) – due to increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites.</li> <li>Facilitates contribution towards the protection of vegetation as a result of contributing towards the protection of environmental vectors, especially air</li> <li>Potential ecological enhancement interventions along transport corridors</li> </ul>	<ul style="list-style-type: none"> <li>Arising from both construction and operation of transport infrastructure and services and associated facilities/ infrastructure: loss of/damage to biodiversity in designated sites, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna</li> <li>Habitat loss, fragmentation and deterioration, including patch size and edge effects</li> <li>Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species and coastal squeeze</li> <li>Effects in riparian zones where new crossings of waters, if any, are progressed</li> <li>Potential effects from transport emissions</li> </ul>	<ul style="list-style-type: none"> <li>Loss of an extent of non-protected habitats arising from the replacement of semi-natural land covers with artificial surfaces</li> <li>Losses or damage to ecology (these would be in compliance with relevant legislation)</li> </ul>

Environmental Component	Significant Positive Effect, likely to occur	Potentially Significant Adverse Effect, if unmitigated	Residual Adverse Effect
<b>Material Assets</b>	<ul style="list-style-type: none"> <li>Facilitates contribution towards the protection of public assets and infrastructure such as: public open spaces, parks and recreational areas; public buildings and services; utility infrastructure (electricity, gas, telecommunications, water supply, wastewater infrastructure etc.)</li> <li>Facilitates the reuse and regeneration of brownfield lands thereby contributing towards a higher efficiency of land utilisation, sustainable mobility and a reduction in the need to develop greenfield lands. By facilitating increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites there will be lower adverse effects upon ecology, landscape designations, architectural and archaeological heritage and soil.</li> <li>Facilitates appropriate waste management</li> </ul>	<ul style="list-style-type: none"> <li>Generation of construction waste</li> <li>Loss or damage to public assets and infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Residual wastes (these would be disposed of in line with higher level waste management policies)</li> <li>Potential residual losses to public assets</li> </ul>
<b>Water</b>	<ul style="list-style-type: none"> <li>Facilitates lower effects on ground and surface waters due to higher levels of development within established and serviced settlement centres that have installed/upgraded water services capable of delivering Water Framework Directive targets.</li> </ul>	<ul style="list-style-type: none"> <li>Adverse impacts upon the status of water bodies and entries to the WFD Register of Protected Areas, arising from changes in quality, flow and/or morphology</li> <li>Increase in the risk of flooding</li> </ul>	<ul style="list-style-type: none"> <li>Flood related risks remain due to uncertainty with regard to extreme weather events</li> </ul>
<b>Landscape</b>	<ul style="list-style-type: none"> <li>Contribution towards the protection of landscape designations by facilitating compliance with relevant plans</li> </ul>	<ul style="list-style-type: none"> <li>Occurrence of adverse visual impacts and conflicts with the appropriate protection of statutory designations relating to the landscape</li> </ul>	<ul style="list-style-type: none"> <li>Residual visual effects (these would be in compliance with landscape designation provisions)</li> </ul>
<b>Cultural Heritage</b>	<ul style="list-style-type: none"> <li>Contribution towards the protection of cultural heritage by facilitating compliance with relevant legislation</li> <li>Facilitates the enhancement of cultural (archaeological and architectural) heritage and its context in urban areas and their surrounds as a result of replacing motorised modes with more sustainable and non-motorised modes of transport such as walking, cycling and light rail/metro.</li> </ul>	<ul style="list-style-type: none"> <li>Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities</li> </ul>	<ul style="list-style-type: none"> <li>Potential alteration to the context and setting of designated cultural heritage however these will occur in compliance with legislation. Potential loss of unknown archaeology however this loss will be mitigated by measures integrated into the Strategy</li> </ul>
<b>Soil</b>	<ul style="list-style-type: none"> <li>Facilitates contribution towards the protection of environment from contamination arising from brownfield development</li> <li>Facilitates contribution towards the protection of features or areas of geological / geomorphological interest</li> </ul>	<ul style="list-style-type: none"> <li>Adverse impacts on the hydrogeological and ecological function of the soil resource as a result of construction of associated facilities/ infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>Loss of an extent of soil function arising from the replacement of semi-natural land covers with artificial surfaces</li> </ul>

## 4.3 Overall Findings

The overall findings of the SEA are that:

- **Compliance with Legislation and Guidelines – Environmental Protection and Sustainable Development**

The National Transport Authority have integrated all recommendations arising from the SEA and Appropriate Assessment processes into the Transport Strategy, facilitating compliance of the Strategy with various European and National legislation and Guidelines relating to the protection of the environment and the achievement of sustainable development.

- **Improvements in Sustainable Mobility and Associated Effects (emissions, noise and energy usage)**

The Strategy facilitates contributions towards improvements in sustainable mobility (reducing and limiting increases in the number of journeys by car taken as a percentage of all journeys taken), thereby facilitating contributions towards a reduction/limit of increases in greenhouse gas emissions, noise emissions, other emissions to air and energy usage. Such emissions would occur otherwise with higher levels of motorised transport and associated traffic.

- **Positive Effects in Urban Areas (including cultural heritage)**

Among other positive environmental effects, the Strategy facilitates the enhancement of cultural heritage and its context in urban areas and their surrounds as a result of replacing motorised transport modes with more sustainable and non-motorised modes such as light rail/metro, cycling and walking.

- **Potentially Significant Adverse Effects to be mitigated**

There are potentially significant adverse effects arising from the alternative and these have been detailed and these effects will be mitigated by the various provisions which have been integrated into the Strategy including those which have arisen through the SEA and AA processes (these are summarised at Section 5.1). These mitigating provisions together with the contribution that the Strategy will make to sustainable mobility means that the Strategy facilitates various significant positive effects upon environmental components.

Chapter 9 of the Transport Strategy provides a summary – based on detailed analysis and modelling – of how the strategy will meet the demand for travel in 2035 how the revised networks are expected to perform; and the benefits which will accrue from the implementation of the Strategy. Key issues identified include:

- **Performance of the Transport Network**

To meet the forecast growth in travel demand, a number of network improvements are proposed, particularly in relation to public transport, but also in order to facilitate an increase in the level of walking, cycling and car use. While the emphasis is on public transport for trips over 3km, additional road capacity is essential to support the investment in strategic National Roads and to facilitate increased speed and convenience for public transport, walking and cycling. As such, a number of road schemes form part of the Strategy, however, the bulk of the increase in travel demand will be catered for by non-car modes.

- **Performance of the Road Network**

The Strategy aims to facilitate the forecast growth in travel demand without significantly impacting on the road network. In general, the performance of road network in the GDA will improve.

- **Performance of the Public Transport Network**

The Strategy proposes a considerable expansion of the GDA's public transport network.

- **Mode Share**

The implementation of the Strategy will have a significant positive impact on the objective of reducing the proportion of all trips undertaken by private car from 59.9%, in 2011, to 52.2% in 2035<sup>19</sup>, with a corresponding positive impact on the proportions using public transport, walking and cycling.

- **Journey Time**

The area within 1 hour's travel time to the city centre is far more extensive in the future and accordingly, the areas within shorter journey times are correspondingly greater. Of particular note, is the impact of Metro Swords on the northern corridor, including Dublin Airport, which facilitates significantly shorter journey times within this area.

- **Land Use Benefits**

The implementation of the Strategy will facilitate a more efficient use of land within the GDA and will improve the accessibility of central areas, which will potentially lead to the greater consolidation of trip intensive developments such as employment and retail into locations served by public transport.

The NTA also undertook environmental assessment as part of the modelling which was undertaken in conjunction with the preparation of the Strategy. Detailed consideration was given to emissions, noise and severance as follows:

- **Modelled Emissions**

All types of vehicle emissions (Carbon Monoxide, Carbon Dioxide, Nitrous Oxides and Hydrocarbons) reduce under the Transport Strategy in comparison with a do minimum scenario. This highlights the air quality improvements for the GDA associated with the introduction of the GDA Transport Strategy provisions.

- **Modelled Noise**

There is significant improvements to noise levels within the Core City Centre network, where the Dublin City Centre Transport Plan measures are implemented.

- **Modelled Severance**

There is significant improvements to severance within the Core City Centre Network, where the Dublin City Centre Transport Plan measures are implemented. Substantial improvements to severance are noted on the quays, and at the Westmoreland Street / D'Olier Street public transport interchange area.

---

<sup>19</sup> Transport model output for all trip purposes, AM peak (2011 & 2035)

## Section 5 Mitigation and Monitoring Measures

### 5.1 Mitigation

Transport is one of many sectors operating in the Greater Dublin Area and the Transport Strategy is expected to facilitate improvements in environmental management and protection within this area. There are various positive environmental effects likely to be facilitated by the implementation of the Strategy and these have been detailed under the preceding sections.

The SEA and AA processes which have been undertaken alongside the preparation of the Strategy have brought about changes to the emerging Strategy thereby enabling the mitigation of any potentially adverse environmental effects. All recommendations made by the SEA and AA processes were integrated into the Strategy. The changes which have been brought about by the SEA and AA processes are summarised as follows:

- Amendments throughout the Strategy text
- Insertion of Section 8 entitled “Environmental Protection and Management” into the Transportation Strategy. This section includes measures covering the following:
  - Regulatory framework for environmental protection and management
  - Information to be considered at lower levels of decision making and environmental assessment
  - Corridor and Route Selection Process for relevant new infrastructure
  - Appropriate Assessment
  - Protection of Natura 2000 Sites
  - Other Plans and Environmental Policies
  - Other Measures<sup>20</sup>

### 5.2 Monitoring

The Environmental Report contains proposals for monitoring the potential significant effects of implementing the Strategy, if unmitigated, which are adopted alongside the Strategy. Monitoring enables, at an early stage, the identification of unforeseen adverse effects and the undertaking of appropriate remedial action.

Monitoring is an ongoing process and the Programme allows for flexibility and the further refinement of indicators and targets. The Monitoring Programme may also be updated to deal with specific environmental issues - including unforeseen effects - as they arise.

A stand-alone Monitoring Report on the significant environmental effects of implementing the Strategy will be prepared in advance of the review of the Strategy. This report will address the indicators set out below. The National Transport Authority is responsible for the ongoing review of indicators and targets, collating existing relevant monitored data, the preparation of monitoring evaluation report(s), the publication of these reports and, if necessary, the carrying out of corrective action, in combination with the relevant authorities.

---

<sup>20</sup> These include measures relating to: Construction and Environmental Management Plans; Maintenance Plan; Air and Energy Human Health; Protection of Biodiversity including Natura 2000 Network; NPWS & Integrated Management Plans; Coastal Zone Management; Biodiversity and Ecological Networks; Protection of Riparian Zone and Waterbodies and Watercourses; Non-Designated Sites; Non-native invasive species; National Peatlands Strategy; Construction Waste; Waste Creation; Waste Disposal; Public Assets and Infrastructure; Water Framework Directive and associated legislation; River Basin Management Plan; Bathing Water; Flood Risk Management Guidelines; Surface Water Drainage and Sustainable Drainage Systems (SuDs); Landscape Designations; Coastal Areas and Seascapes; National Landscape Strategy; Archaeological Heritage; Protection of Archaeological Sites; Consultation; Underwater Archaeological Sites Architectural Heritage; Soil Protection and Contamination; Areas of geological interest.