

SEA STATEMENT

FOR THE

TRANSPORT STRATEGY

FOR THE

GREATER DUBLIN AREA

2016-2035

STRATEGIC ENVIRONMENTAL ASSESSMENT

for: National Transport Authority

Dún Scéine,
Iveagh Court,
Harcourt Lane,
Dublin 2



by: CAAS Ltd.

2nd Floor, The Courtyard,
25 Great Strand Street,
Dublin 1



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Section 1 Introduction

1.1 Introduction and Legislative Context

This is the Strategic Environmental Assessment (SEA) Statement for the Transport Strategy for the Greater Dublin Region 2016-2035.

SEA is a systematic process of predicting and evaluating the likely environmental effects of implementing a 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 and social considerations.

Directive 2001/42/EC of the European Parliament and of the Council of Ministers, of 27th 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 tourism. The SEA Directive was transposed into Irish Law through the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 and the Planning and Development (Strategic Environmental Assessment) Regulations 2004. The Regulations have been amended by the European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 and the Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011.

1.2 Content of the SEA Statement

Where SEA is undertaken, the Regulations require that a Statement available to the public and the competent environmental authorities after the finalisation of the Strategy. This Statement is referred to as an SEA Statement.

The SEA Statement is required to include information summarising:

- a) how environmental considerations have been integrated into the Strategy;
- b) how the following have been taken into account during the preparation of the Strategy:
 - the environmental report,
 - submissions and observations made to the planning authority on the Draft Strategy and Environmental Report, and
 - any transboundary consultations.
- c) the reasons for choosing the Strategy in the light of the other reasonable alternatives dealt with; and
- d) the measures decided upon to monitor the significant environmental effects of implementation of the Strategy.

1.3 Implications of SEA for the Strategy

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 National Transport Authority (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.

SEA has been undertaken and the findings of the SEA are expressed in an Environmental Report, the first published version of which accompanied the Draft Strategy on public display. The Environmental Report was updated in order to take account of:

- Recommendations contained in submissions; and
- Changes to the Draft Strategy that were made on foot of submissions.

The NTA have taken into account the findings of all relevant SEA output during their consideration of the Draft Transport Strategy and before the Strategy was adopted.

Section 2 How Environmental Considerations were integrated into the Strategy

2.1 Introduction

Transport is one of many sectors operating in the Great Dublin Area and the Transport Strategy is expected to facilitate improvements in environmental management and protection within this area. This facilitation has come about as a result of the following:

1. Consultations;
2. Communication of environmental sensitivities throughout the SEA process; and
3. Suggestions of Strategy provisions to mitigate effects.

2.2 Consultations

As environmental authorities identified under the Planning and Development (SEA) Regulations, as amended, the following authorities were sent SEA scoping notices 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 NTA: 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).

Further detail on submissions made on foot of the SEA scoping notice is provided under Section 3.2.

Furthermore, submissions were made on the Draft Strategy and SEA Environmental Report while they were on public display and these resulted in updates being made to the SEA documents (see Section 3.3).

2.3 Communication of environmental sensitivities throughout the SEA process

2.3.1 Individual Environmental Sensitivities

Environmental considerations were integrated into the Draft Strategy before it was placed on public display. Individual sensitivities which were mapped by the SEA and considered by the Team preparing the Transport Strategy included the following:

- Natura 200 Sites (Special Areas of Conservation and Special Protection Areas)
- Natural Heritage Areas and proposed Natural Heritage Areas
- Population densities
- Water sensitivities
- Land cover sensitivities
- Cultural heritage (archaeological and architectural) sensitivities

Some of these are indicated on Figure 2.1.

2.3.2 Overall Environmental Sensitivities and Opportunities/Robustness

Environmental information was weighted and mapped to show overall environmental sensitivity (see Figure 2.2) and overall environmental robustness (see Figure 2.3) 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 Greater Dublin Area (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 2.1 and Table 2.2 below.

Environmental Sensitivities

For the environmental sensitivity mapping shown on Figure 2.2 weightings were applied as per Table 2.1.

On Figure 2.2, 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	10
Any areas covered by NHAs	10
Any areas covered by pNHAs or potential Annex I landcovers	5
Sensitive Landcovers	10
Recorded Monuments and Protected Structures and associated 250m buffers	10
Highest Water Sensitivity (highest scores from 35 to 50 inclusive)	15
Moderate Water Sensitivity (middle scores from 20 to 30 inclusive)	10
Lowest Water Sensitivity (lowest scores from 5 to 15 inclusive)	5

Table 2.1 Environmental Sensitivity Layers and Weighting

Environmental Opportunities/ Robustness

For the environmental robustness mapping shown on Figure 2.3, weightings were applied as per Table 2.2. On Figure 2.3, 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	10
Any areas not covered by NHAs, pNHAs or potential Annex I landcovers	10
Robust Landcovers	10
Normal Landcovers	5
Areas not covered by Recorded Monuments and Protected Structures and associated 250m buffers	10
Water Sensitivity High (lowest scores from 5 to 15 inclusive)	15
Water Sensitivity Moderate (middle scores from 20 to 30 inclusive)	10
Water Sensitivity Low (highest scores from 35 to 50 inclusive)	5
Population Density High (highest 4 intervals)	15
Population Density Moderate (middle 3 intervals)	10
Population Density Low (middle 3 intervals)	5

Table 2.2 Environmental Opportunities/Robustness Layers and Weighting

2.4 Suggestions of Strategy provisions to mitigate effects

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.

Mitigation measures are measures envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the Strategy.

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 2.3 and Table 2.4 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.

2.3.3 Appropriate Assessment

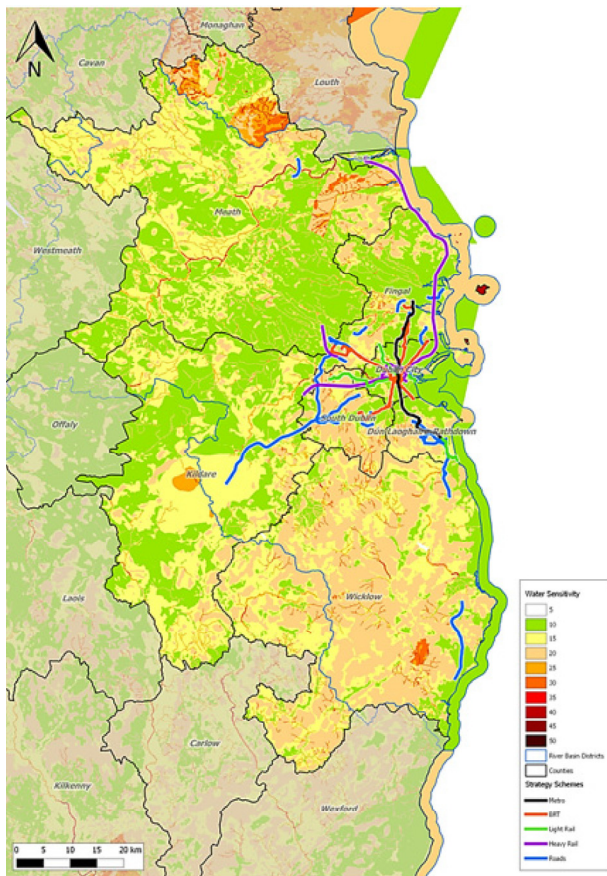
Stage 2 Appropriate Assessment (AA) has been undertaken alongside the Strategy. The requirement for AA is provided under the EU Habitats Directive (Directive 1992/43/EEC).

The AA concluded that the Strategy will not affect the integrity of the Natura 2000 network¹.

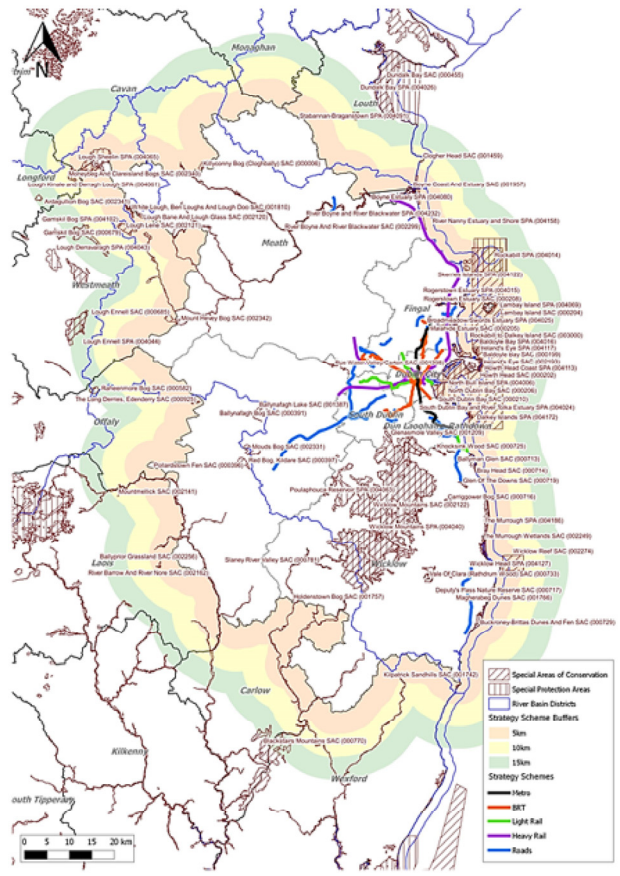
Various content has been integrated into the Strategy through the SEA and AA processes. The preparation of the Strategy, SEA and AA has taken place concurrently and the findings of the AA have informed both the Strategy and the SEA.

¹ Except as provided for in Section 6(4) of the Habitats Directive, viz. There must be:

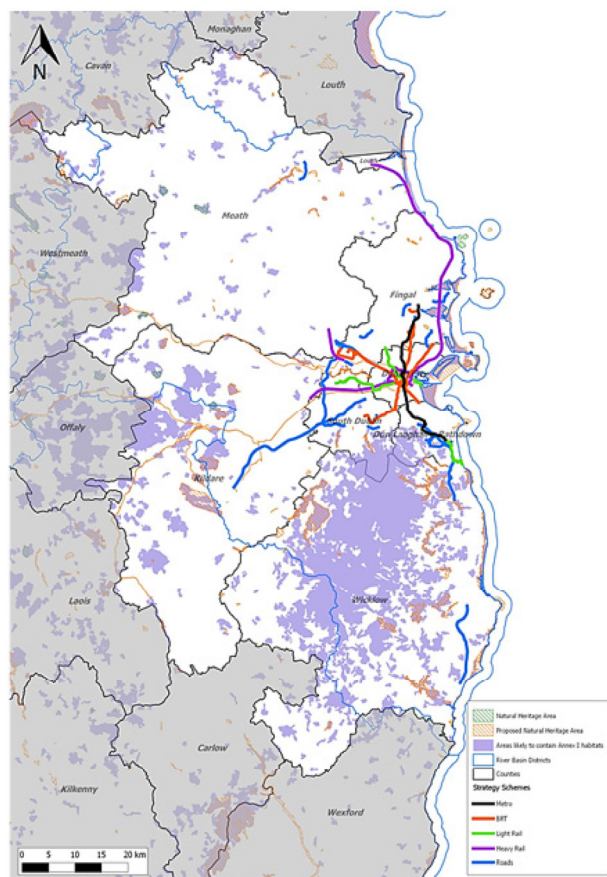
(a) no alternative solution available;
 (b) imperative reasons of overriding public interest for the plan/programme/project to proceed; and
 (c) adequate compensatory measures in place.



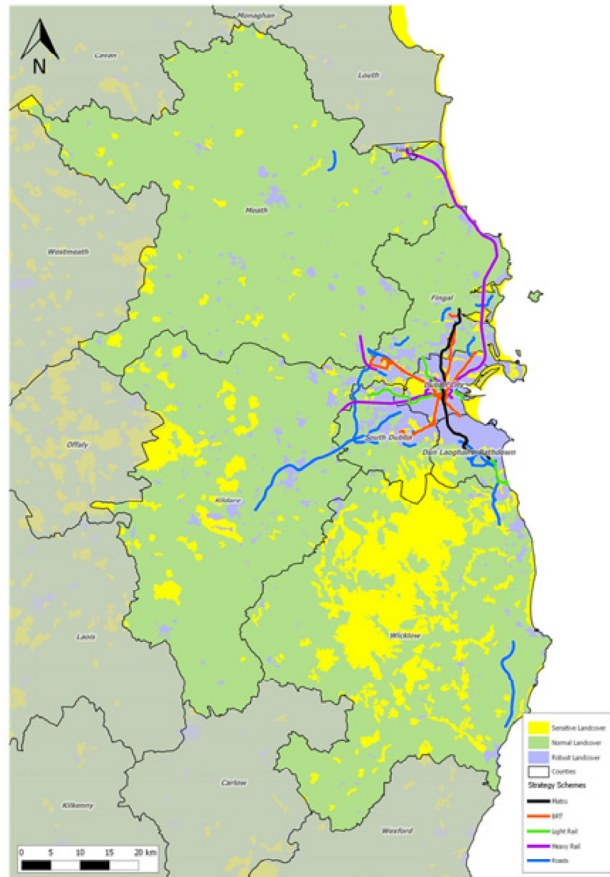
Overlay of Potential Water Sensitivity



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



Natural Heritage Areas (NHAs), proposed NHAs and areas likely to contain Annex I Habitats



Potential Landcover Sensitivity Mapping

Figure 2.1 Selection of Individual Environmental Sensitivities from SEA Environmental Report

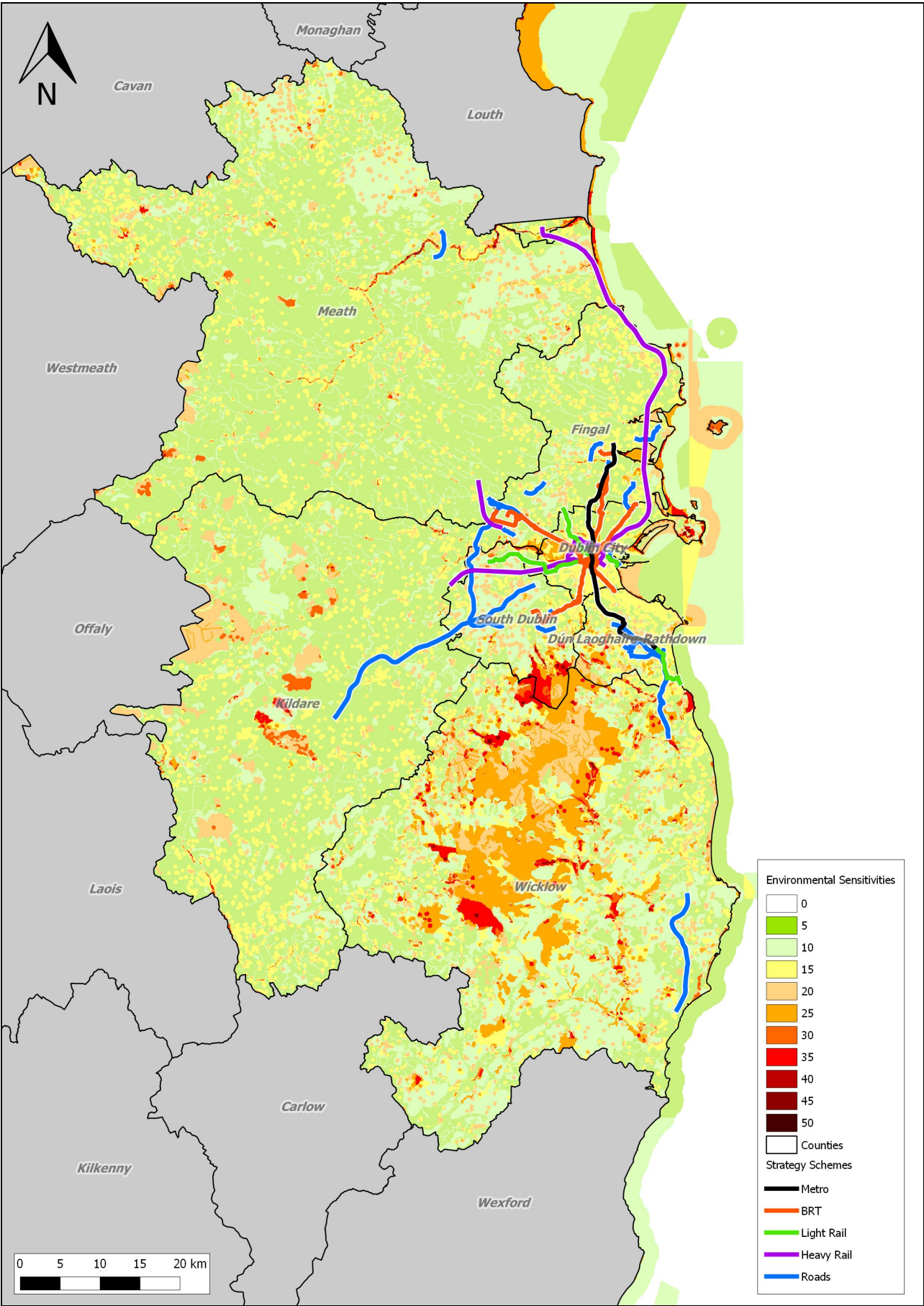


Figure 2.2 Overall Potential Environmental Sensitivity

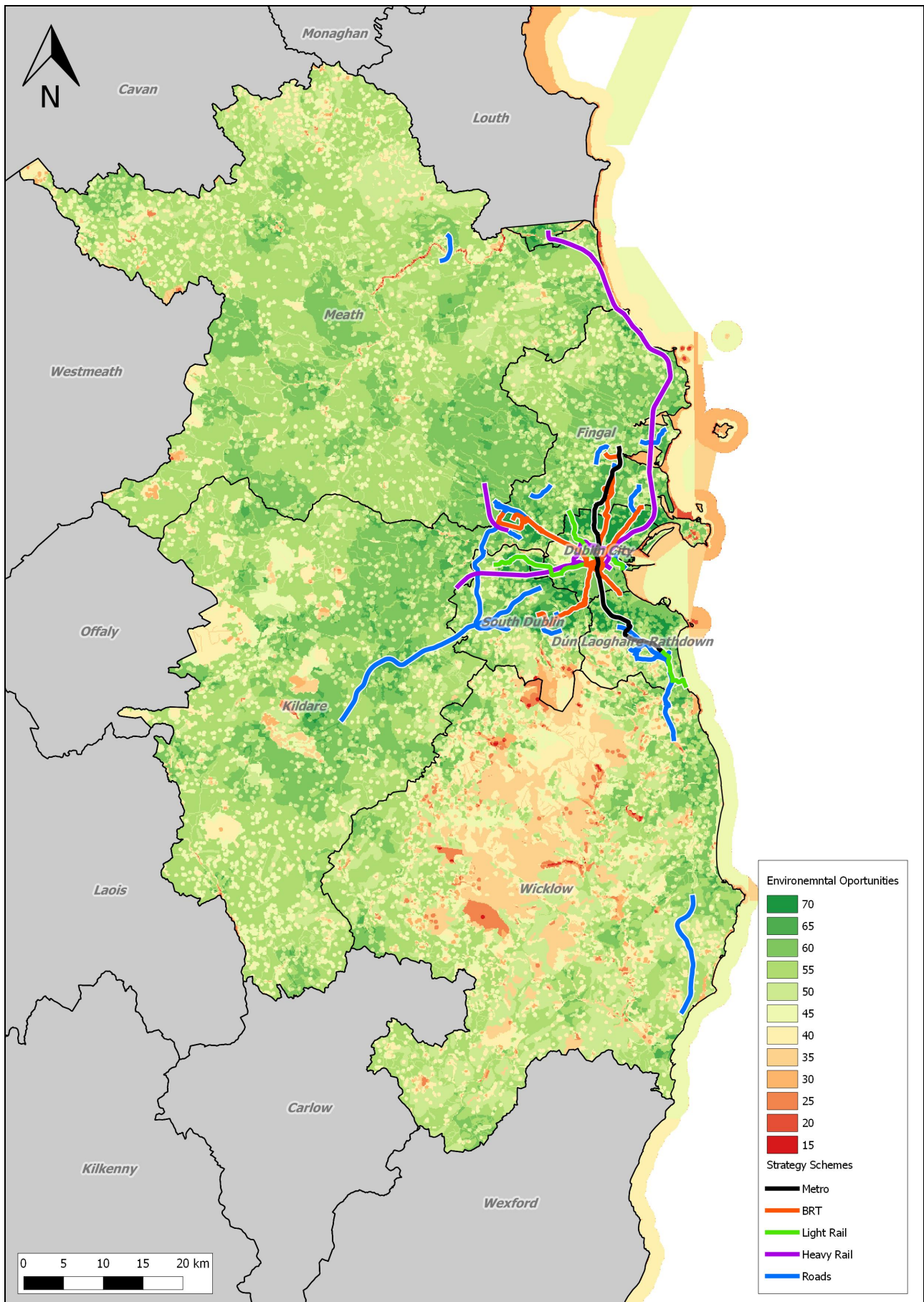


Figure 2.3 Overall Potential Environmental Opportunities/Robustness

Table 2.3 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"> - 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
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"> - 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
6. Transport Services and Integration	None	None	None

Strategy Chapter No.	Change arising from SEA/AA process	Environmental component	Potential adverse effect mitigated
7. Land Use Integration and Behavioural Change	<p>Informing the following paragraph:</p> <p>"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"</p>	None	None
8. Environmental Protection and Management	<p>Insertion of Section 8 entitled "Environmental Protection and Management" which identifies the measures detailed below into the Transportation Strategy.</p>	Various (see Table 2.4)	
	<p>Regulatory framework for environmental protection and management</p> <p>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.</p>	Various (see Table 2.4)	
	<p>Information to be considered at lower levels of decision making and environmental assessment</p> <p>Lower levels of decision making and environmental assessment should consider the sensitivities identified in Section 4 of the SEA Environmental Report, including the following:</p> <ul style="list-style-type: none"> • Candidate Special Areas of Conservation and Special Protection Areas; • Features of the landscape that provide linkages/connectivity to designated sites (e.g. watercourses, areas of semi-natural habitat such as linear woodlands etc); • Salmonid Waters; • Shellfish Waters; • Freshwater Pearl Mussel catchments; • Nature Reserves; • Natural Heritage Areas and proposed Natural Heritage Areas; • Areas likely to contain a habitat listed in annex 1 of the Habitats Directive; • Entries to the Record of Monuments and Places and Zones of Archaeological Potential; • Entries to the Record of Protected Structures; • Un-designated sites of importance to wintering or breeding bird species of conservation concern; • Architectural Conservation Areas; and • Relevant landscape designations. 	Various (see Table 2.4)	

Strategy Chapter No.	Change arising from SEA/AA process	Environmental component	Potential adverse effect mitigated
(8. continued)	<p>Corridor and Route Selection Process for relevant new infrastructure 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"> 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; 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 In addition to the constraints identified above, site specific field data may be required to identify the most appropriate corridors. <p>Stage 2 – Route Identification, Evaluation and Selection</p> <ul style="list-style-type: none"> 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; In addition to the constraints identified above, site specific field data may be required to identify the most appropriate routes; and 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. 	Various (see Table 2.4)	
	<p>Appropriate Assessment 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"> 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 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 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. 	Biodiversity and Flora and Fauna	<ul style="list-style-type: none"> - 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

Strategy Chapter No.	Change arising from SEA/AA process	Environmental component	Potential adverse effect mitigated
(8. continued)	Protection of Natura 2000 Sites 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 ²).	Biodiversity and Flora and Fauna	<ul style="list-style-type: none"> - 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
	Other Plans and Environmental Policies 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.
	Other Measures 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 2.4)	

The SEA and AA recommendations detailed in Table 2.4 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.

² 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 2.4 Provisions referred to in Transport Strategy Section 8.6

Environmental component benefiting	Potential adverse effect mitigated	Requirement
Various	Various – see below	<p>Construction and Environmental Management Plans</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"> a. location of the sites and materials compound(s) including area(s) identified for the storage of construction refuse, b. location of areas for construction site offices and staff facilities, c. details of site security fencing and hoardings, d. details of on-site car parking facilities for site workers during the course of construction, e. details of the timing and routing of construction traffic to and from the construction site and associated directional signage, f. measures to obviate queuing of construction traffic on the adjoining road network, g. measures to prevent the spillage or deposit of clay, rubble or other debris, 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, i. details of appropriate mitigation measures for noise, dust and vibration, and monitoring of such levels, 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, k. disposal of construction/demolition waste and details of how it is proposed to manage excavated soil, 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, m. details of a water quality monitoring and sampling plan. n. if peat is encountered - a peat storage, handling and reinstatement management plan. o. measures adopted during construction to prevent the spread of invasive species (such as Japanese Knotweed). p. appointment of an ecological clerk of works at site investigation, preparation and construction phases.
Various	Various – see below	<p>Maintenance Plan</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>Air and Energy</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>Human Health</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>

Environmental component benefitting	Potential adverse effect mitigated	Requirement
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> <p>- Habitat loss, fragmentation and deterioration, including patch size and edge effects</p> <p>- Disturbance (e.g. due to noise and lighting along transport corridors) and displacement of protected species and coastal squeeze</p> <p>- Effects in riparian zones where new crossings of waters, if any, are progressed</p> <p>- Potential effects from transport emissions</p>	<p>Protection of Biodiversity including Natura 2000 Network</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> <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"> • EU Directives, including the Habitats Directive (92/43/EEC, as amended)³, the Birds Directive (2009/147/EC)⁴, the Environmental Liability Directive (2004/35/EC)⁵, 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). • National legislation, including the Wildlife Acts 1976-2000⁶, 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 2008⁷ and the Flora Protection Order 1999. • 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. • Catchment and water resource management Plans, including River Basin District Management Plans 2009-2015 (including any superseding versions of same). • Biodiversity Plans and guidelines, including Actions for Biodiversity 2011-2016: Ireland's 2nd National Biodiversity Plan (including any superseding version of same), County Biodiversity Action Plans and relevant measures contained in statutory land use plans. • 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. <p>NPWS & Integrated Management Plans</p> <p>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.</p> <p>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.</p> <p>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>

³ 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.

⁴ Including Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur).

⁵ Including protected species and natural habitats.

⁶ Including species of flora and fauna and their key habitats.

⁷ Including protected species and natural habitats.

Environmental component benefitting	Potential adverse effect mitigated	Requirement
		Coastal Zone Management 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 protection of man-made and natural resources of the coastal zone.
		Biodiversity and Ecological Networks 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.
		Protection of Riparian Zone and Waterbodies and Watercourses 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.
		Non-Designated Sites To help to ensure the appropriate protection of non-designated habitats and landscapes and to conserve the biological diversity.
		Non-native invasive species 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.
		National Peatlands Strategy To implement any relevant recommendations contained in the Department of Arts, Heritage and the Gaeltacht's National Peatlands Strategy, when finalised.
Material Assets	<ul style="list-style-type: none"> - Generation of construction waste - Loss or damage to public assets and infrastructure 	Construction Waste 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.
		Waste Creation To support the minimisation of waste creation and promote a practice of reduce, reuse and recycle where possible.
		Waste Disposal To safeguard the environment by seeking to ensure that residual waste is disposed of appropriately.
		Public Assets and Infrastructure 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.).
Water	<ul style="list-style-type: none"> - 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 	Water Framework Directive and associated legislation 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.

Environmental component benefitting	Potential adverse effect mitigated	Requirement
		<p>River Basin Management Plan 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>Bathing Water 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>Flood Risk Management Guidelines 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 Management Studies (CFRAMS).</p> <p>Surface Water Drainage and Sustainable Drainage Systems (SuDs) To ensure that new development is adequately serviced with surface water drainage infrastructure and promote the use of Sustainable Drainage Systems as appropriate.</p>
Landscape	Occurrence of adverse visual impacts and conflicts with the appropriate protection of statutory designations relating to the landscape	<p>Landscape Designations 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.</p> <p>Coastal Areas and Seascapes To protect the character and visual potential of the coast and conserve the character and quality of seascapes.</p> <p>National Landscape Strategy Support, as appropriate, any relevant recommendations contained in the Department of Arts, Heritage and the Gaeltacht's National Landscape Strategy for Ireland, when finalised.</p>
Cultural Heritage	Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities	<p>Archaeological Heritage 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).</p> <p>Protection of Archaeological Sites 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.</p> <p>Consultation To consult with the National Monuments Service of the Department of Arts Heritage and the Gaeltacht in relation to proposed developments adjoining archaeological sites.</p> <p>Underwater Archaeological Sites To contribute, as appropriate, towards the protection and preservation of underwater archaeological sites in riverine, intertidal and sub-tidal locations.</p>

Environmental component benefitting	Potential adverse effect mitigated	Requirement
		Architectural Heritage 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).
Soil	Adverse impacts on the hydrogeological and ecological function of the soil resource as a result of construction of associated facilities/ infrastructure	Soil Protection and Contamination 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.
		Areas of geological interest Contribute towards the appropriate protection and maintenance of the character, integrity and conservation value of features or areas of geological interest.

Section 3 Environmental Report and Submissions/Observations

3.1 Introduction

This section details how both the Environmental Report and submissions and observations made to the NTA on the Environmental Report and SEA process have been taken into account during the preparation of the Strategy.

3.2 SEA Scoping Submissions

3.2.1 Introduction

As part of the scoping process, environmental authorities⁸ were notified that a submission or observation in relation to the scope and level of detail of the information to be included in the environmental report could be made to the NTA.

Submissions were made by the following environmental authorities:

1. Environmental Protection Agency (EPA)
2. Department of Arts, Heritage and the Gaeltacht (DAHG)
3. Department of Agriculture, Food and Marine (DAFF)
4. Department of Communications, Energy and Natural Resources (DCENR)

The 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

⁸ The following authorities were notified: 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).

- Monitoring scoping process guidance / available resources / data sets

The 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
- 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

The submission from the Department of Agriculture, Food 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

The 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

3.3 Submissions on the Environmental Report

Furthermore, submissions were made on the Draft Strategy, SEA Environmental Report and AA Natura Impact Statement while these documents were on public display and these resulted in updates being made to the documents.

Submissions included those made by the Environmental Protection Agency, the Department of Arts, Heritage and the Gaeltacht, and others. Updates made to the SEA Environmental Report on foot of these submissions include those detailed at Table 3.1 below.

Table 3.1 Updates to Strategy/SEA/AA from Submissions

Updates New text in green
<p>To add a new section to the Strategy as follows:</p> <p><i>8.5 Other Plans and Environmental Policies</i> <i>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.</i></p> <p>To reference the following in Appendix I Relationship with Legislation and Other Plans and Programmes: Climate Action and Low Carbon Development Bill 2015; national mitigation plan; national adaptation framework; and Climate Action and Low Carbon Development Bill.</p> <p>To expand the measure 'Air and Energy' detailed in Table 9.2 of the SEA Environmental Report, which the Strategy commits to implement, as follows:</p> <p><i>Air and Energy</i> <i>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.</i></p> <p>To include reference to the following in Appendix I of the SEA Environmental Report: Climate Action and Low Carbon Development Bill 2015, which, when enacted, will include provision for the preparation of a national mitigation plan and a national adaptation framework; and National Policy Framework for Alternative Fuel Infrastructure.</p> <p>To include a new Section in the SEA Environmental Report <i>Section 7.5 Alternatives by Corridor</i>.</p> <p>To add a new section 8.6 to the Strategy as follows:</p> <p><i>8.6 Other SEA Recommendations</i> <i>In implementing the Strategy, the Authority will ensure that the measures included in Table 9.2 of the SEA Environmental Report are complied with.</i></p> <p>Baseline information from the EPA's publication Air Quality in Ireland 2013 (2014) provided in Section 4.3 of the SEA Environmental Report will be updated to take account of the EPA's more recent 2015 publication Air Quality in Ireland 2014.</p> <p>Section 4.2 will also be updated to reference the ongoing ambient air quality monitoring carried out by the EPA.</p> <p>To add the following text to the Strategy at Section 5 'The 2035 Transport Network', subsection 5.1 'Introduction':</p> <p><i>"The alignments and details of proposed public transport projects set out in this Chapter 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. In relation to heavy rail and light rail infrastructure projects, the design of these projects will future-proof their ability to serve the needs of the region for the long term....."</i></p>

<p>Updates</p> <p>New text in green</p>
<p>To expand the measure 'Protection of Biodiversity including Natura 2000 Network' detailed in Table 9.2 of the SEA Environmental Report, which the Strategy commits to implement, as follows:</p> <p>...</p> <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> <p>....</p> <ul style="list-style-type: none"> • Biodiversity Plans and guidelines, including Actions for Biodiversity 2011-2016: Ireland's 2nd National Biodiversity Plan (including any superseding version of same), County Biodiversity Action Plans and relevant measures contained in statutory land use plans. <p>....</p>
<p>To update Section 8.2 of the Strategy as follows:</p> <p>8.2 Lower-level Decision Making</p> <p>Lower levels of decision making and environmental assessment should consider the sensitivities identified in Section 4 Chapter 7 and Appendix B of the SEA Environmental Report, including the following</p>
<p>Reword text in Section 2.3.2 of Natura Impact Statement referring to the GDA Cycle Network Plan as follows:</p> <p>Although the The plan has already been subject to Appropriate Assessment⁹, the provisions of the plan are further considered in this report to ensure that the potential cumulative effects of the Strategy are addressed.</p> <p>Table 2.6 of the Natura Impact Statement has been updated to highlight the risk of cumulative impacts at both Malahide and Rogerstown Estuaries due to DART Expansion and GDA Cycle Network Plan.</p> <p>Parts of Section 3.2 of the Natura Impact Statement have been updated (see point no. 6 below) to highlight the potential for cumulative effects.</p>
<p>To provide more information on this issue by adding new text to the Natura Impact Statement at:</p> <ul style="list-style-type: none"> • Section 3.2.1.2 "Loss / Reduction of Habitat Area" • Section 3.2.1.3 "Disturbance to Key Species" • Section 3.2.1.4 "Reduction in Species Density"
<p>Section 3.2 will be updated to relate the identified impacts to attributes and targets of various QIs / SCIs.</p>
<p>To expand the measure 'NPWS & Integrated Management Plans' detailed in Table 9.2 of the SEA Environmental Report and Table 4.1 of the AA Natura Impact Statement, which the Strategy commits to implement, as follows:</p> <p>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.</p> <p>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.</p> <p>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>

⁹ National Transport Authority (2013). Greater Dublin Area Cycle Network. Appropriate Assessment Screening Report Natura Impact Statement.

Updates

New text in green

To update Section 8.3 of the Strategy as follows (also update where repeated in SEA and AA documents):

Section 8.3 Corridor and Route Selection Process

The following Corridor and Route Selection Process will be undertaken for relevant new infrastructure:

Stage 1 – Route Corridor Identification, Evaluation and Selection

- 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;
- 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 determined by the relevant specialists; and
- In addition to the constraints identified above, site specific field data may be required to identify the most appropriate corridors.

Stage 2 – Route Identification, Evaluation and Selection

- 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 determined by the relevant specialists, taking into account project level information and potential mitigation measures **that are reliably achievable**;
- In addition to the constraints identified above, site specific field data may be required to identify the most appropriate routes; and

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.

To update the measure 'Construction and Environmental Management Plans' detailed in Table 9.2 of the SEA Environmental Report and Table 4.1 of the AA Natura Impact Statement, which the Strategy commits to implement, as follows:

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:

- a. location of the sites and materials compound(s) including area(s) identified for the storage of construction refuse,
- b. location of areas for construction site offices and staff facilities,
- c. details of site security fencing and hoardings,
- d. details of on-site car parking facilities for site workers during the course of construction,
- e. details of the timing and routing of construction traffic to and from the construction site and associated directional signage,
- f. measures to obviate queuing of construction traffic on the adjoining road network,
- g. measures to prevent the spillage or deposit of clay, rubble or other debris,
- 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,
- i. details of appropriate mitigation measures for noise, dust and vibration, and monitoring of such levels,
- 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,
- k. disposal of construction/demolition waste and details of how it is proposed to manage excavated soil,
- 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,
- m. details of a water quality monitoring and sampling plan.
- n. if peat is encountered - a peat storage, handling and reinstatement management plan.
- o. measures adopted during construction to prevent the spread of invasive species (such as Japanese Knotweed).
- p. appointment of an ecological clerk of works at site investigation, preparation and construction phases.

To update the measure 'Maintenance' detailed in Table 9.2 of the SEA Environmental Report and Table 4.1 of the AA Natura Impact Statement, which the Strategy commits to implement, as follows:

Relevant ~~Lower tier assessments should examine the need for~~ **shall put in place** Maintenance Plans informed by environmental considerations **where relevant and appropriate.** ~~to be prepared and implemented.~~

To update references to relevant legislation in the AA Natura Impact Statement.

To update the following indicators/targets wherever they appear in the SEA Environmental Report and AA Natura Impact Statement:

~~B1: Maintenance of favourable conservation status for all habitats and species protected under National and International legislation to be unaffected by implementation of the Strategy~~ **Implementation of the Strategy should not prevent the maintenance or restoration of favourable conservation status of listed habitat and species¹⁰**

~~B3: To avoid significant impacts on relevant habitats¹¹, 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 species¹²~~

¹⁰ 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.

Updates New text in green
To update the following indicators/targets wherever they appear in the SEA Environmental Report and AA Natura Impact Statement: B1: Maintenance of favourable conservation status for all habitats and species protected under National and International legislation to be unaffected by implementation of the Strategy Implementation of the Strategy should not prevent the maintenance or restoration of favourable conservation status of listed habitat and species¹³ B3: To avoid significant impacts on relevant habitats ¹⁴ , 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 ¹⁵
To update Table 2-7 of the AA Natura Impact Statement to include interactions with County Heritage Plans, County Biodiversity Action Plans and the Waterways Ireland draft Heritage Plan.
To update the following indicators/targets wherever they appear in the SEA Environmental Report and AA Natura Impact Statement: B1: Maintenance of favourable conservation status for all habitats and species protected under National and International legislation to be unaffected by implementation of the Strategy Implementation of the Strategy should not prevent the maintenance or restoration of favourable conservation status of listed habitat and species¹⁶ B3: To avoid significant impacts on relevant habitats ¹⁷ , 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 ¹⁸
To add the following text to Section 8.6 of the SEA Environmental Report: 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 regard to biodiversity and flora and fauna (SEO's B1 B2 B3), the Strategy: <ul style="list-style-type: none"> • 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 • Facilitates potential ecological enhancement interventions along transport corridors However, the Strategy also presents the following potentially significant adverse effects: <ul style="list-style-type: none"> • 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 from transport emissions
Section 8.6.1 of the SEA Environmental will be updated to address impacts on ecological corridors and on species listed on annex IV of the Habitats Directive.
To update the text on Table 9.1 as follows: Environmental constraints (including those identified in identified in Section 4 Chapter 7 and Appendix B of the SEA Environmental Report) and opportunities (such as existing linear infrastructure) will assist in the identification of possible route corridor options.

¹¹ Relevant habitats are those for which ecological sites are designated for

¹² List species are those which are specifically listed in legislation for protection

¹³ 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.

¹⁴ Relevant habitats are those for which ecological sites are designated for

¹⁵ List species are those which are specifically listed in legislation for protection

¹⁶ 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.

¹⁷ Relevant habitats are those for which ecological sites are designated for

¹⁸ List species are those which are specifically listed in legislation for protection

<p>Updates New text in green</p>
<p>The replace references to the European Communities (Natural Habitats) Regulations, 2011 (SI No 477 of 2011) with references to the European Communities (Natural Habitats) Regulations, 2011 (SI No 477 of 2011) as amended.</p> <p>To quote the Wildlife Acts collectively as the Wildlife Acts 1976-2010.</p> <p>To merge the two references to the National Biodiversity Plan in Appendix I into one reference.</p> <p>To replace reference to "Heritage Plans" in Appendix I with reference to "County Heritage Plans and Waterways Ireland Draft Heritage Plan"</p> <p>To update Indicator C1i as follows: Compliance with legislation including the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive and the 4th Daughter Directive and adherence to the principles of the Convention on Long Range Transport of Air Pollution associated legislation</p> <p>To update Target C1i as follows: C1i: To contribute towards compliance with legislative air quality limits and target values¹⁹</p> <p>To add a new section to the Strategy as follows:</p> <p>8.5 Other Plans and Environmental Policies <i>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.</i></p> <p>To expand the measure 'Air and Energy' detailed in Table 9.2 of the SEA Environmental Report, which the Strategy commits to implement, as follows:</p> <p>Air and Energy <i>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.</i></p> <p>To update, as follows, text from Section 8.1 (and wherever similar wording occurs) of the SEA Environmental Report:</p> <p>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.</p> <p>To update, as follows, text from Section 8.1 of the SEA Environmental Report:</p> <p>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.</p> <p>To add a new section to the Strategy as follows:</p> <p>8.5 Other Plans and Environmental Policies <i>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.</i></p>

¹⁹ 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>.

3.4 Environmental Report

The Draft Strategy and accompanying documents (including SEA Environmental Report and AA Natura Impact Statement) were placed on public display, having integrated all recommendations arising from the SEA and AA processes.

Responses to submissions made on the Environmental Report during the period of public display were integrated into a Report on Submissions and considered by the National Transport Authority.

The SEA Environmental Report was updated in order to take account of recommendations included in the submissions as well as changes which were made to the original Draft Strategy that was placed on public display.

Changes to the original Draft Strategy that was placed on public display were examined for the need to undertake SEA and AA. It was determined, taking into account the provisions which were already integrated into the Draft Strategy, that the changes would not be likely to result in significant environmental effects nor would they impact upon the Natura 2000 network of sites.

The National Transport Authority have taken into account the findings of all relevant SEA output during their consideration of the Draft Transport Strategy and before the Strategy was adopted.

On adoption of the Strategy, the original Environmental Report which had been placed on public display alongside the Draft Transport Strategy was updated to become a final Environmental Report which is consistent with the adopted Strategy.

Section 4 Reasons for choosing the selected alternative in light of other alternatives considered

4.1 Introduction

As per the requirements of the SEA Directive, the SEA considered reasonable alternatives, which are capable of being implemented for the Transport Strategy for the Greater Dublin Area, taking into account the objectives and the geographical scope of the Strategy.

4.2 Summary Description 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

4.3 Summary 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.

4.4 Reasons for choosing the selected alternative in light of other alternatives considered

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 below. 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 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 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
Air and climatic factors	<ul style="list-style-type: none"> Facilitates contribution towards a shift from car to more sustainable and non-motorised transport modes Facilitates contribution towards managing traffic flows and associated adverse effects on air quality Facilitates contribution towards reductions in travel related greenhouse gas and other emissions to air 	<ul style="list-style-type: none"> Emissions to air 	<ul style="list-style-type: none"> 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.
Population and human health	<ul style="list-style-type: none"> Facilitates contribution towards the protection of human health as a result of contributing towards the protection of environmental vectors, especially air Provides for the development of transport infrastructure and services in locations which will facilitate use by those living and working in urban/suburban areas 	<ul style="list-style-type: none"> Potential interactions if effects upon environmental vectors such as air are not mitigated 	<ul style="list-style-type: none"> 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.

Environmental Component	Significant Positive Effect, likely to occur	Potentially Significant Adverse Effect, if unmitigated	Residual Adverse Effect
Biodiversity and flora and fauna	<ul style="list-style-type: none"> 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 Potential ecological enhancement interventions along transport corridors 	<ul style="list-style-type: none"> 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 from transport emissions 	<ul style="list-style-type: none"> 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)
Material Assets	<ul style="list-style-type: none"> 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.) 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. Facilitates appropriate waste management 	<ul style="list-style-type: none"> Generation of construction waste Loss or damage to public assets and infrastructure 	<ul style="list-style-type: none"> Residual wastes (these would be disposed of in line with higher level waste management policies) Potential residual losses to public assets
Water	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Flood related risks remain due to uncertainty with regard to extreme weather events

Environmental Component	Significant Positive Effect, likely to occur	Potentially Significant Adverse Effect, if unmitigated	Residual Adverse Effect
Landscape	<ul style="list-style-type: none"> Contribution towards the protection of landscape designations by facilitating compliance with relevant plans 	<ul style="list-style-type: none"> Occurrence of adverse visual impacts and conflicts with the appropriate protection of statutory designations relating to the landscape 	<ul style="list-style-type: none"> Residual visual effects (these would be in compliance with landscape designation provisions)
Cultural Heritage	<ul style="list-style-type: none"> Contribution towards the protection of cultural heritage by facilitating compliance with relevant legislation 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. 	<ul style="list-style-type: none"> Potential effects on protected and unknown archaeology and protected architecture arising from construction and operation activities 	<ul style="list-style-type: none"> 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
Soil	<ul style="list-style-type: none"> Facilitates contribution towards the protection of environment from contamination arising from brownfield development Facilitates contribution towards the protection of features or areas of geological / geomorphological interest 	<ul style="list-style-type: none"> Adverse impacts on the hydrogeological and ecological function of the soil resource as a result of construction of associated facilities/ infrastructure 	<ul style="list-style-type: none"> Loss of an extent of soil function arising from the replacement of semi-natural land covers with artificial surfaces

4.5 Alternatives by Corridor

Further to the strategic consideration of alternatives detailed above, a tiered approach was taken in relation to the consideration of alternatives within corridors within the Greater Dublin Area.

The following table details the examination of 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.

Table 4.2 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">Robust in many areasCoastal (designations) and lower river reaches (e.g. Boyne, Nanny) sensitivities Water <ul style="list-style-type: none">Coastal and river sensitivitiesGroundwater vulnerability in the northern areas of this corridor and at area surrounding Duleek Landcover <ul style="list-style-type: none">Robust in general, apart from coastal/estuarine landcovers Cultural Heritage <ul style="list-style-type: none">Various designations, clusters along coast and 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.
	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.		The tracks and route are present here already – this would reduce need for new development and associated impacts.
	Luas – new Luas extension from Cabra to Swords via Airport	Will not sufficiently meet radial demand from the Corridor.		Electrification and expansion of capacity could potentially present effects on ecological connectivity, habitats and species e.g. a collision risk to bird species.
	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		Electrification could displace or remove air emissions, water pollution and noise from existing diesel trains along corridors.
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		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.
				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.
				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.
				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 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.		
Corridor A Preferred Alternative: 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.				
Corridor B – Navan – Dunboyne – Blanchardstown – to Dublin City Centre				
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"> Robust in many areas River sensitivities (e.g. the designated River Boyne in particular) <p>Water</p> <ul style="list-style-type: none"> River sensitivities Groundwater vulnerability in the 	<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. 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. 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.		
Corridor B Preferred Alternative: 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.				
Corridor C – Maynooth, Leixlip, Lucan				
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">• Robust in many areas• River sensitivities (e.g. the designated River Boyne and Rye Water Valley in particular)• Peatland sensitivities in west central and Kildare Water <ul style="list-style-type: none">• River sensitivities• Groundwater vulnerability in much of this corridor Landcover <ul style="list-style-type: none">• Robust in general,	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"> • Various designations, clusters in urban 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 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
Corridor C Preferred Alternative: 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.				
Corridor D – Newbridge, Naas, Clondalkin, North Tallaght				
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">Robust in many areasRiver sensitivities (e.g. the designated River Barrow and River Nore in particular)Peatland sensitivities in west central and Kildare, some off which are designated Water <ul style="list-style-type: none">River sensitivitiesGroundwater vulnerability in much of this corridor including at Pollardstown Fen/Curragh gravels area Landcover <ul style="list-style-type: none">Robust in general, apart from peatlands, Curragh area Cultural Heritage <ul style="list-style-type: none">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. 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.		permanent habitat loss to accommodate above ground structures such as air vents and emergency accesses. 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 - 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.		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 – 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.		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 - 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.		
Corridor D Preferred Alternative: 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.				
Corridor E – N81 Settlements-South Tallaght-Rathfarnham				
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.	Ecological <ul style="list-style-type: none">Sensitive and designated Wicklow Mountains, Poulaphuca	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.

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
				<p>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 in particular.</p>
Corridor E Preferred Alternative: 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.				
Corridor F – Arklow – Wicklow – Greystones – Bray – Cherrywood – Dundrum – Dun Laoghaire				
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.	<p>Ecological</p> <ul style="list-style-type: none"> Sensitive and designated Wicklow Mountains Sensitive and designated coastal areas River sensitivities <p>Water</p> <ul style="list-style-type: none"> Coastal and river sensitivities Extremely and highly vulnerable groundwater in the uplands <p>Landcover</p> <ul style="list-style-type: none"> Sensitive uplands and foothills Sensitive coastal areas <p>Cultural Heritage</p> <ul style="list-style-type: none"> Various designations, clusters along coast and in urban areas, significantly less in upland areas 	<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>Enhancement of the existing line and capacity improvements could potentially present effects on coastal ecological sensitivities and views.</p> <p>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.</p>
	New Heavy Rail	Demand will not be sufficient to justify the significant level of investment required for a new rail line in this corridor.		<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> <p>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.</p>
	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.		<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>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.</p>
	Metro – Upgrade Luas Green Line to Metro	Will adequately meet demand from this corridor. Efficient use of existing infrastructure and connectivity with the PT		<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</p>

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.		
Corridor F Preferred Alternative: 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.				
Corridor G – Dublin City Centre 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"> Robust in most areas Modified River Liffey with associated ecological value Water <ul style="list-style-type: none"> Modified River Liffey with associated ecological value Landcover <ul style="list-style-type: none"> Robust in general, apart from Phoenix Park Cultural Heritage <ul style="list-style-type: none"> High concentrations of designations 	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.		
Corridor G Preferred Alternative: 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.				
Corridor H – Dublin Docklands				
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"> Sensitive locations at interface 	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"> between City and Dublin Bay Terrestrial areas generally robust Tidal reaches of modified River Liffey with associated ecological value 	<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.	Water <ul style="list-style-type: none"> Modified River Liffey with associated ecological value Coastal sensitivities 	
	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.	Landcover <ul style="list-style-type: none"> Sensitive areas at interface between City and Dublin Bay Cultural Heritage <ul style="list-style-type: none"> High concentrations of designations 	<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.		
Corridor H Preferred Alternative: 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 5 Monitoring Measures

5.1 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.

5.2 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 5.1 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.

5.3 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.

5.4 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.

5.5 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 5.1 Selected Indicators, Targets and Monitoring Sources

Environmental Component	Indicators	Targets	Source and Frequency
Air and Climatic Factors	C1i: Compliance with legislation including the Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive and the 4 th 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 ²⁰ C1ii: To facilitate a reduction in greenhouse gas emissions from transport	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Sustainable Energy Ireland <i>Energy in Ireland</i> reports Modelled output
Population and Human Health	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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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)
Biodiversity, Flora and Fauna	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 ²¹	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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)

²⁰ 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>.

²¹ 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:

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

Environmental Component	Indicators	Targets	Source and Frequency
Biodiversity, Flora and Fauna	B3i: Number of significant impacts on relevant habitats ²² , species ²³ , 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"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents • Consultations with the NPWS (at monitoring review)
Material Assets	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"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents
	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"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents
	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"> • Internal examination of compliance with SEA and lower tier assessment mitigation measures
Water	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' ²⁴ 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"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents • Data issued under the Water Framework Directive Monitoring Programme for Ireland (multi-annual) • EPA <i>The Quality of Bathing Water in Ireland</i> reports
	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"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents • Data issued under the Water Framework Directive Monitoring Programme for Ireland (multi-annual)
	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"> • Lower tier environmental assessment and decision making – including review of project approvals granted

²² Relevant habitats are those for which ecological sites are designated for

²³ Listed species are those which are specifically listed in legislation for protection

²⁴ 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
Landscape	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"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents
Cultural Heritage	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"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents • Consultation with Department of Arts, Heritage and the Gaeltacht (at monitoring review)
	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"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents • Consultation with Department of Arts, Heritage and the Gaeltacht (at monitoring review)
Soil	S1: Soil extent and hydraulic connectivity	S1: To minimise reductions in soil extent and hydraulic connectivity	<ul style="list-style-type: none"> • Lower tier environmental assessment and decision making – including review of project approvals granted and associated documents