

SEA ENVIRONMENTAL REPORT

APPENDIX III: NON-TECHNICAL SUMMARY

FOR THE

DRAFT TRANSPORT STRATEGY

FOR THE

GREATER DUBLIN AREA

2022-2042

for: National Transport Authority

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NOVEMBER 2021

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Section 1 Introduction and Terms of Reference

This is the Non-Technical Summary of the Strategic Environmental Assessment (SEA) Environmental Report for the Transport Strategy for the Greater Dublin Area 2022-2042 (referred to hereafter as the Strategy). The purpose of the Environmental Report is to comply with SEA legislation and provide a clear understanding of the likely environmental consequences of decisions regarding the adoption and implementation of the Strategy.

What is an SEA?

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

Why is it needed?

The SEA was carried out in order to comply with the provisions of the SEA Regulations, as amended, and in order to contribute towards environmental management and sustainable development.

How does it work?

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

What is included in the Environmental Report that accompanies the Strategy?

The Environmental Report contains the following information:

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

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

What happens at the end of the process?

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

Section 2 The Draft Strategy

2.1 Introduction

Under the Dublin Transport Authority Act, the National Transport Authority (NTA) must review its transport strategy every 6 years. Arising from the review of the 2016 plan, an updated strategy has been developed which sets out the framework for investment in transport infrastructure and services over the next two decades to 2042.

The Transport Strategy for the Greater Dublin Area 2022-2042 will replace the previous strategy, titled the Transport Strategy for the Greater Dublin Area 2016-2035, which was approved by the then Minister for Transport, Tourism and Sport in 2016.

That 2016-2035 Transport Strategy set out to contribute to the economic, social and cultural progress of the Greater Dublin Area (GDA) by providing for the efficient, effective and sustainable movement of people and goods. In other words, it was about making the Dublin region a better place for people who live and work there, and for those who visit.

It did so by providing a framework for the planning and delivery of transport infrastructure and services in the GDA. It has also provided a transport planning policy around which other agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, could align their own investment priorities.

It has been an essential component, along with investment programmes in other sectors, for the development of the GDA which covers the counties of Dublin, Meath, Kildare and Wicklow. Major projects provided for in that strategy included:

- Luas Cross City;
- The reopening of the Phoenix Park Tunnel Rail Line;
- The on-going roll out of cycle tracks and greenways;
- Metrolink;
- DART+ Programme;
- Investment in bus priority and bus service improvements – BusConnects Dublin; and
- M7 Naas to Newbridge widening, Osberstown Interchange and Sallins Bypass.

2.2 Strategy Aim

To provide a sustainable, accessible and effective transport system for the Greater Dublin Area which meets the region's climate change requirements, serves the needs of urban and rural communities, and supports economic growth.

2.3 Strategy Objectives

An Enhanced Natural and Built Environment

To create a better environment and meet our environmental obligations by transitioning to a clean, low emission transport system, reducing car dependency, and increasing walking, cycling and public transport use.

Connected Communities and Better Quality of Life

To enhance the health and quality of life of our society by improving connectivity between people and places, delivering safe and integrated transport options, and increasing opportunities for walking and cycling.

A Strong Sustainable Economy

To support economic activity and growth by improving the opportunity for people to travel for work or business where and when they need to, and facilitating the efficient movement of goods.

An Inclusive Transport System

To deliver a high quality, equitable and accessible transport system, which caters for the needs of all members of society.

2.4 Relationship with other relevant Plans and Programmes

Of course no transport strategy can ever be a standalone document. A transport strategy will always be part of a larger picture of overall national policies that must work towards a single set of overall objectives. To a large extent, policies and objectives around issues such as land use, development, population distribution, investment, sustainability and climate action, for example, are determined by other state agencies and authorities, but must be fully reflected in any transport strategy.

As such, the Transport Strategy has been developed to be consistent with the spatial planning policies and objectives set out in the Regional Spatial and Economic Strategy (RSES). These objectives in turn are consistent with the National Planning Framework 2018 and the National Development Plan 2021-2030.

The Strategy aligns with legislation and documents setting out public policy for land use, transport and climate action and will be incorporated into the review and preparation of these documents. These include the National Planning Framework (and associated National Development Plan), the Strategic Investment Framework for Land Transport, the National Investment Framework for Transport in Ireland, the Regional Economic and Spatial Strategy for the Eastern and Midland Region (as adopted by the Eastern and Midland Regional Assembly, and finalised in January 2020) and associated Dublin Metropolitan Area Strategic Plan, the City and County Development Plans, Local Area Plans and Planning Schemes. Certain transport related proposals already provided for by these documents (and considered by their environmental assessments) are amongst those included within the Strategy. The Transport Strategy is based on national policies on sustainability as set out in the Climate Action Plan and recent climate action legislation.

The Strategy is subject to a number of high level environmental protection policies and objectives with which they must comply, including those which have been identified as Strategic Environmental Objectives (please refer to Section 3.13 of this Non-Technical Summary).

Examples of Environmental Protection Objectives include the aim of the EU Habitats Directive - which is to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of Member States - and the purpose of the Water Framework Directive - which is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater which, among other things, prevents deterioration in the status of all water bodies and protects, enhances and restores all waters with the aim of achieving *good status*.

Section 3 Relevant aspects of the current state of the environment

3.1 Introduction

Reflecting the specifications in the SEA Directive, the relevant aspects of the current state of the environment for the following environmental components are summarised in this section: biodiversity and flora and fauna, population and human health, soil, water, air and climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.

3.2 Likely Evolution of the Environment in the Absence of the Strategy

The implementation of the Strategy is likely to give rise to the following residual adverse environmental effects identified on Table 5.1. In the absence of the Strategy, none of the adverse effects detailed on Table 5.1 would result as a result of the Strategy; however, lower-tier Plans would continue to be reviewed and implemented and applications for permission for new projects would continue to be made. Compliance with the mitigation measures would be necessary in order to help ensure that the potentially significant adverse environmental effects identified on Table 5.1 do not occur. In the absence of the Strategy, it is uncertain as to whether the investment proposed (including that relating to public transport, walking and cycling developments) would be made and it is uncertain as to which projects would be progressed or prioritised. Lower-tier plans and projects would be less coordinated. It is uncertain as to whether the positive effects identified on Table 5.1 (that would be facilitated by implementation of the Strategy) would be achieved.

3.3 Air and Climatic Factors

Introduction

The key issue involving the assessment of the effects of implementing the Strategy on climatic factors relates to greenhouse gas emissions arising from transport. Interactions are also present with flooding (see Section 3.8).

Greenhouse Gas Emissions

Ireland's Provisional Greenhouse Gas Emissions 1990-2017 (EPA, 2018) report details provisional estimates of greenhouse gas emissions for the period 1990-2017. For 2017, total national greenhouse gas emissions are estimated to be 60.75 million tonnes carbon dioxide equivalent (Mt CO₂ eq). This is 0.9% lower (0.53 Mt CO₂ eq) than emissions in 2016. Greenhouse gas emissions from the Transport sector decreased by 2.4% or 0.29 Mt CO₂eq in 2017. This is the first year of decreased emissions after four successive years of increases in transport emissions.

In 2020, the sectors with the largest contribution of emissions were agriculture (37.4%), transport (18.4%) and energy industries (14.8%). This projection includes the impact of COVID on the 2020 emissions, which due to national lockdowns, saw transport emissions decline, but agriculture emissions largely unaffected. The main source of emissions from the transport sector was road transport, accounting for approximately 95% of transport emissions in 2019. The contribution by the transport sector to Ireland's greenhouse gas emissions highlights the need for a concentrated effort to reduce transport emissions.

Alternative Fuels and Renewable Electricity Generation Targets

The use of alternative fuels, including electricity, forms a significant part of government policy to reduce transport emissions. The Plan facilitates a mode shift away from the private car to public transport, walking and cycling and provisions relating to electric vehicles. This will contribute towards

reductions in the consumption of non-renewable energy sources and achievement of legally binding renewable energy targets. The overall target for Ireland in Directive 2009/28/EC was 16% share of renewable energy in Gross Final Consumption (GFC) by 2020. Under the Directive (2009/28/EC), Ireland was obliged to deliver 10% of transport energy by renewable sources by 2020. SEAI's 2020 publication *Renewable Energy in Ireland Report* includes the most recent assessment of Ireland's progress towards renewable energy targets up to 2018. This Report identifies that 7.2% of energy consumed in road and rail transport in 2018 was from renewable sources.

Ambient Air Quality

In order to protect human health, vegetation and ecosystems, EU Directives set down air quality standards in Ireland and the other Member States for a wide variety of pollutants. These pollutants are generated through fuel combustion, in space heating, traffic, electricity generation and industry and, in sufficient amounts, could affect the well-being of the areas inhabitants. The EU Directives include details regarding how ambient air quality should be monitored, assessed and managed. In order to comply with the directives mentioned above, the EPA measures the levels of a number of atmospheric pollutants. For the purposes of monitoring in Ireland, four zones are defined in the Air Quality Standards Regulations 2002 (SI No. 271 of 2002).

The EPA's (2020) *Air Quality in Ireland 2019* identifies that:

- Air quality in Ireland is generally good however there are localised issues;
- Nitrogen dioxide (NO₂) from transport emissions is polluting urban areas; and
- Ireland was above World Health Organization air quality guideline value levels at 33 monitoring sites – mostly due to the burning of solid fuel within settlements across the country.

Air pollution from transport is dominated by NO_x emissions. Of these, NO₂ is particularly impactful from a health perspective. The report describes that concentrations of NO₂ at urban areas in Ireland are close to the EU annual limit value. The potential implications for air quality with increases in traffic numbers or from certain weather conditions unfavourable to dispersion of pollutants could result in exceedances of the EU limit value. The report states that:

- "Short-term exposure to NO₂ is linked to adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in asthmatics.
- Long-term exposure is associated with increased risk of respiratory infection in children. NO_x is a major precursor in the formation of ground level ozone. It is also a major precursor in the formation of photochemical 'smog'."

Noise

Noise is unwanted sound. The Noise Directive - Directive 2002/49/EC relating to the assessment and management of environmental noise - is part of an EU strategy setting out to reduce the number of people affected by noise in the longer term and to provide a framework for developing existing EU policy on noise reduction from source. In compliance with the Directive and transposing Environmental Noise Regulations (S.I. No. 140 of 2006), Noise Action Plans have been prepared for each local authority area within the country. These action plans address the agglomeration of Dublin and major roads, railways and airports. The Action Plans include noise mapping and are required to include measures to manage noise issues and effects, including noise reduction if necessary. Noise maps identify and prioritise cluster areas which will require further assessment and may require mitigation measures to be put in place. Roads are the dominant noise source within the Greater Dublin Area.

Existing problems

Legislative objectives governing air and climatic factors were not identified as being conflicted with. However, Ireland will miss emissions reduction targets unless urgent action that leads to tangible and substantial reductions in greenhouse gas emissions is taken. The Strategy will, in combination with various plans and programmes from the transport sector and from other sectors, contribute towards reducing greenhouse gas emissions and moving in the direction of these targets.

With regard to air quality, air pollution from transport is dominated by NO_x emissions. Of these, NO₂ is particularly impactful from a health perspective. The Strategy will help to facilitate reductions in emissions and a transition from dependence on fossil fuel combustion powered transport.

3.4 Population and Human Health

Population

The Strategy area covers four counties and was identified as having a total population of over 1.7 million persons (as per Census 2016), including: c. 1,347,400 persons in County Dublin; c. 195,000 persons in County Meath; c. 222,500 persons in County Kildare; and c. 142,400 persons in County Wicklow. The Strategy area contains Dublin - the largest urban centre and only international city of scale in Ireland and accounts for over 40% of the national population. Most users of transport within the Strategy area will reside in and commute to and from urban/suburban areas. The most populous divisions are generally concentrated within and surrounding the M50 motorway, along the coast (as far south as Wicklow), in areas of County Meath closest to Dublin and within north-east of County Kildare and along the M7 corridor. The uplands in County Wicklow, north-west and south of County Kildare and north County Meath are among the least populous divisions. Locating transport infrastructure and services closer to urban/suburban areas (which have higher populations and densities) will allow for a greater number journeys via sustainable transport modes and associated positive environmental effects on energy usage, air and noise emissions.

Human Health

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

Emission limits for discharges to air, soil and water are set with regards to internationally recognised exposure limit values. These are generally set to be many times the safe exposure limit - in order to provide protection. In the event that a plan or programme began to have adverse health effects on surrounding populations it is likely that it would have been identified as being in breach of such emission standards at a very early stage - and long before the manifestation of any adverse health effects in the population.

Existing Problems

Transport issues that present potential interactions with human health include emissions to air including noise and other emissions. These issues are identified under the relevant environmental component and potential interactions have been taken into account by the provisions contained within the Strategy.

There is historic and predictive evidence of flooding within the Greater Dublin Area. Parts of the Strategy area are very vulnerable to adverse effects from small changes in sea level combined with changes in the occurrence of severe rainfall events and associated flooding of rivers and a number of smaller urban streams. Flooding in certain circumstances could pose a risk to human health.

3.5 Biodiversity and Flora and Fauna

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

There are a number of designated sites located within or adjacent to the Greater Dublin Area. The wider Dublin Bay area is among the most highly designated locations in the country for biodiversity. Despite its location surrounded by a city, Dublin Bay is an internationally significant wildlife and biosphere reserve, principally on account of wading birds that over-winter in the area, including internationally important numbers of light bellied brent geese and other species.

County Wicklow's sensitivities include peat bogs and forest areas, such as those found in the uplands and along the coastal, while County Kildare's sensitivities include peat bogs in the north-west parts of the County. Dispersed areas of marginal agricultural lands that may include ecological sensitivities generally occur in Counties Meath, Kildare and Wicklow.

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

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

Man-made habitats within the Greater Dublin Area can also include important biodiversity features. Gardens provide habitats for a range of wildlife including various bird species, invertebrates such as bees and butterflies and mammals such as hedgehogs, mice, rats and foxes. These species move around between gardens using hedgerows and vegetated areas. These urban green spaces are of importance as they form part of a network of green spaces across the Stagey area including gardens, parks, graveyards, amenity walks, old railway lines and patches of woodland and scrub within which animals and plants continue to thrive. Ecological islands or areas of habitat that are not connected to surrounding ecologically valuable habitats can also be important.

Figure 3.1 maps European Sites within 15km of the Greater Dublin Area.

Existing Problems

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

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

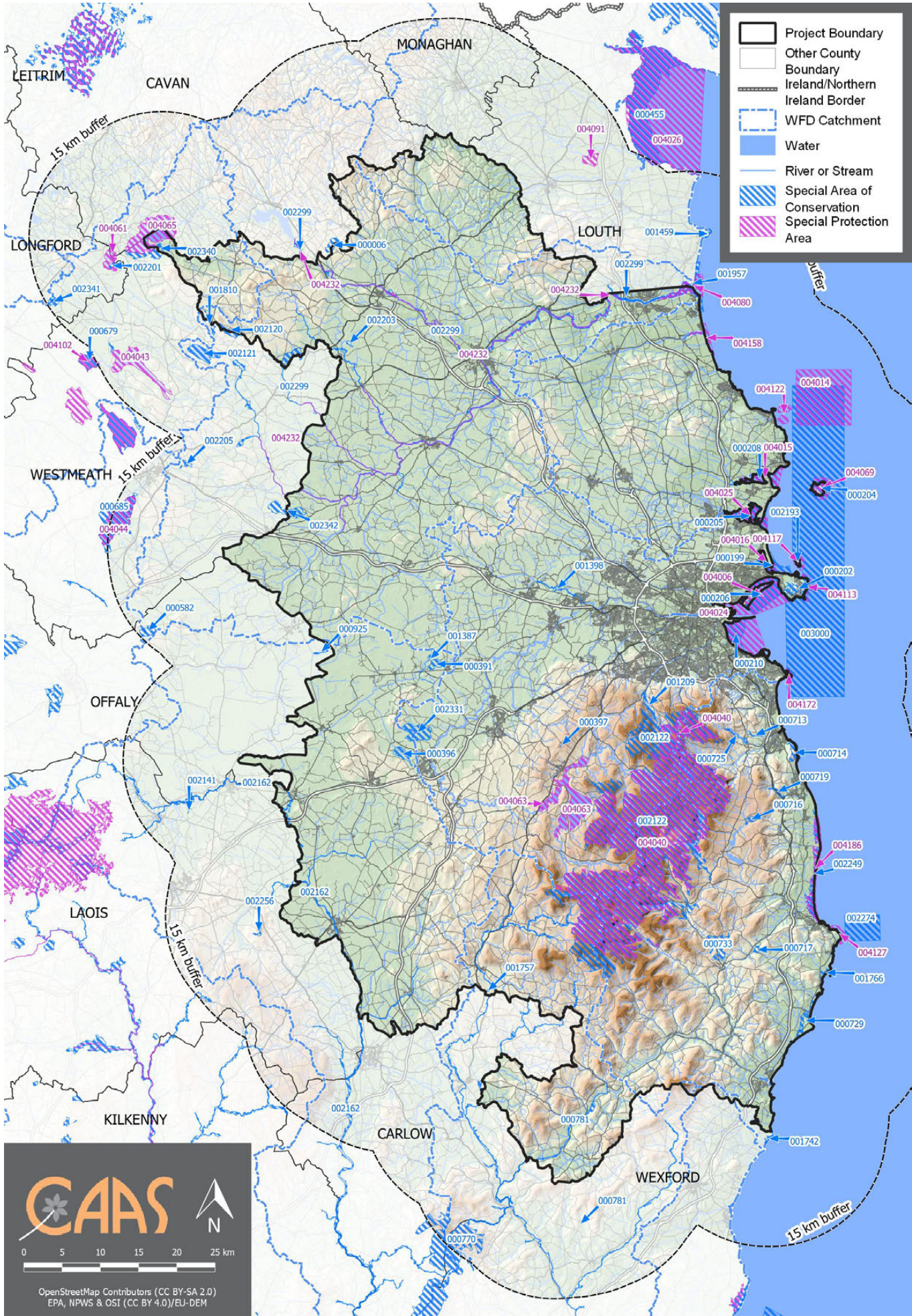


Figure 3.1 Ecologically Designated European Sites

3.6 Material Assets

Introduction

Resources that are valued and that are intrinsic to specific places are called 'material assets'. Material assets other than those detailed below that are covered by this SEA include archaeological and architectural heritage (see Section 3.10) natural resources of economic value, such as water and air (see Sections 3.8 and 3.3)

Transport

The Strategy relates to the development of transport infrastructure, which is a material asset. This infrastructure can support reductions in energy demand from the transport sector, including through electrification of modes. Existing transport infrastructure across the Strategy area includes railways, roads, bus and train stations, cycleways and paths. The following are the outcomes of implementing the current 2016-2035 Strategy to date:

- The share of people travelling in to Dublin City Centre by sustainable modes in the morning peak period has increased from 66% in 2015 to 72% in 2019;
- The number of cars entering the city centre between 7 am and 10 am has fallen from 65,000 in 2015 to 58,000 in 2019, while the total person trips has increased from under 200,000 to 217,000 over the same period.
- The total passengers carried daily by Irish Rail services in the Dublin region rose from 28 million in 2015 to over 35 million in 2019, with its peak hour mode share also growing.
- The total passengers carried by Metropolitan bus services annually in Dublin grew from 120 million in 2015 to 153 million in 2019.
- The total passengers carried by Luas grew from 35 million in 2015 to 48 million in 2019.
- The 2019 Customer Satisfaction Survey carried out on behalf of the NTA showed 87% of public transport users to be satisfied with their public transport services.

Public Assets and Infrastructure

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

Green Infrastructure

Parks and open space promote health and well-being, provide recreational facilities and range of habitats for various species. Green infrastructure is also a crucial component in building resilient communities capable of adapting to the consequences of climate change with trees, woodlands and wetlands providing carbon capture and slowing water flows while improving air quality.

Land

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

Forestry

An extent of the Strategy area is covered by forestry, the highest concentration of which is within County Wicklow. Woodlands provide recreational opportunities in addition to their heritage and economic benefits. They are a valuable resource in terms of biodiversity, recreation and tourism, and also important as links in the county's green infrastructure network.

Peatlands

Peatlands provide a valuable natural and archaeological resource. Peatlands are also important controllers of water levels in river catchments, providing a source of water in dry conditions and soaking up excess water during wetter periods; they actively capture and hold carbon and are an important natural resource in combatting climate change. Cutaway bogs have the potential to facilitate land uses such as employment, renewable energy generation, waste management, industrial, and tourism and recreation. Peat soils, such as those in upland areas and in west Kildare,

are often indicative of areas that are the most sensitive to development due to ecological sensitivities and impeded drainage issues; various peatland areas are subject to ecological designations.

Coastline

Management of the Strategy area's coastline and coastal erosion are topics with relevance to various environmental components. Coastlines can be amongst the most sensitive and valuable resources, in terms of natural and cultural heritage, scenic beauty and recreation. The coast is also an important economic resource - particularly for the fishing, aquaculture, leisure and tourism industries. Many of the Strategy areas settlements have developed along or near the coast.

Renewable Energy Potential

Under EU Directive 2001/77/EC Renewable Energy, renewable energy sources are defined as renewable non-fossil energy sources such as, but not limited to wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas, bio-gases and bio-char (i.e. the thermal treatment of natural organic materials in an oxygen-limited environment). There is potential for renewable energy development across the Strategy area.

Minerals and Aggregates

Minerals such as iron and copper and aggregates such as sand and gravel can occur throughout the country. Minerals and aggregates are essential to manufacturing and construction. The GSI have a suite of data sources available that would be useful in planning and assessing individual projects with regard to the environmental topic(s) of soil and/or material assets.

Waste Management

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

Existing Problems

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

3.7 Soil

Information sources relevant to the environmental component of soil which may be used in lower tier assessments and decision making by local authorities and others includes:

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

County Geological Sites

Sites that are appraised, but which are not selected for NHA designation, are classified as 'County Geological Sites' (CGS), as recognised in the National Heritage Plan (2002). This enables their integration into County Development Plans. Nationally, audits of geological sites in 19 counties have been completed to date, including Dublin, Wicklow, Kildare and Meath. Concentrations of these designations within the Strategy area can be found in the upland areas and along the coast.

3.8 Water

Water Framework Directive

Since 2000, Water Management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The WFD requires that all Member States implement the necessary measures to prevent deterioration of the status of all waters - surface, ground, estuarine and coastal - and protect, enhance and restore all waters with the aim of achieving *good status*. For the purpose of assessment, reporting and management, water is divided into groundwater, rivers, lakes, estuarine waters and coastal waters which are in turn divided into specific, clearly defined water bodies.

Status of surface and ground waters

WFD Monitoring Programmes are undertaken in Ireland by the Environmental Protection Agency and in Northern Ireland by the Department of the Environment's Northern Ireland Environmental Agency. Overviews of the status for monitored waterbodies are published and made available online. The WFD defines surface water status as the general expression of the status of a body of surface water, determined by the poorer of its ecological status and its chemical status. WFD Status of Waters and Bathing Water Quality is mapped on Figure 3.2.

The WFD status (2013-2018) of most of the rivers and lakes within the Strategy area is classified as *moderate*, *good* and *high*; however some sections of rivers and lakes are identified as *bad* and *poor* due to unsatisfactory ecological/biological and/or physio-chemical status. The surface water status of coastal and transitional waterbodies within and surrounding the Strategy area is identified as *moderate*, *good* and *high*, however Rogerstown Estuary is identified as *bad* and Broadmeadow Water is identified as *poor* due to unsatisfactory ecological/biological and/or physio-chemical status. The status of groundwater underlying the Strategy area is mostly identified as being of *good* status, with some areas of *poor* status, including areas underlying Avoca Historic Mine, Glendalough Historic Mine, Glenmalur Historic Mine, Waste Facility and a number of Industrial Facilities.

Bathing Waters

Bathing waters are now classified into four quality categories; '*excellent*', '*good*', '*sufficient*', or '*poor*' with a minimum target of '*sufficient*' required to be achieved for all bathing waters. The most recent available data from the EPA for 2020 shows that 24 locations of designated bathing waters along the Greater Dublin Area's coastline are either classified as *excellent* (at: Laytown/Bettystown; Rush South Beach; Donabate/Balcarrick Beach; Portmarnock/Velvet Strand; Sutton/Burrow Beach; Seapoint; Forty Foot Bathing Place; White Rock Beach; Killiney; Bray South Promenade; Greystones South; Brittas Bay North; Brittas Bay South; and Clogga) or *good* (at: Skerries South Beach; Rush North Beach; Dollymount Strand; Sandycove Beach; Portrane/the Brook Beach; and Silver Strand). Bathing waters at Balbriggan/Front Strand Beach are classified as *poor* and bathing waters at Loughshinny Beach, Claremont Beach and Sandymount Strand are classified as *sufficient*.

Flooding

Flooding is an environmental phenomenon which, as well as causing economic and social impacts, could in certain circumstances pose a risk to human health. The existence of flood risk across the country is illustrated by various sources of information on historical flooding events – including those available from the Office of Public Works, the lead Authority on flooding in the country, National Flood Hazard Mapping website. In addition to this historic mapping there is predictive, modelled Preliminary Flood Risk Assessment and Flood Risk and Hazard mapping available from the OPW including through the National Catchment Flood Risk Management Programme. These mapping sources identify flood risk from various sources, including fluvial, pluvial, coastal and groundwater. The Flood Risk and Hazard mapping has informed the preparation of Flood Risk Management Plans.

Existing Problems

Subject to exemptions provided for by Article 4 of the WFD, based on available water data, certain surface and groundwater bodies will need improvement in order to comply with the objectives of the WFD.

There is historic and predictive evidence of flooding at locations across the Greater Dublin Area.

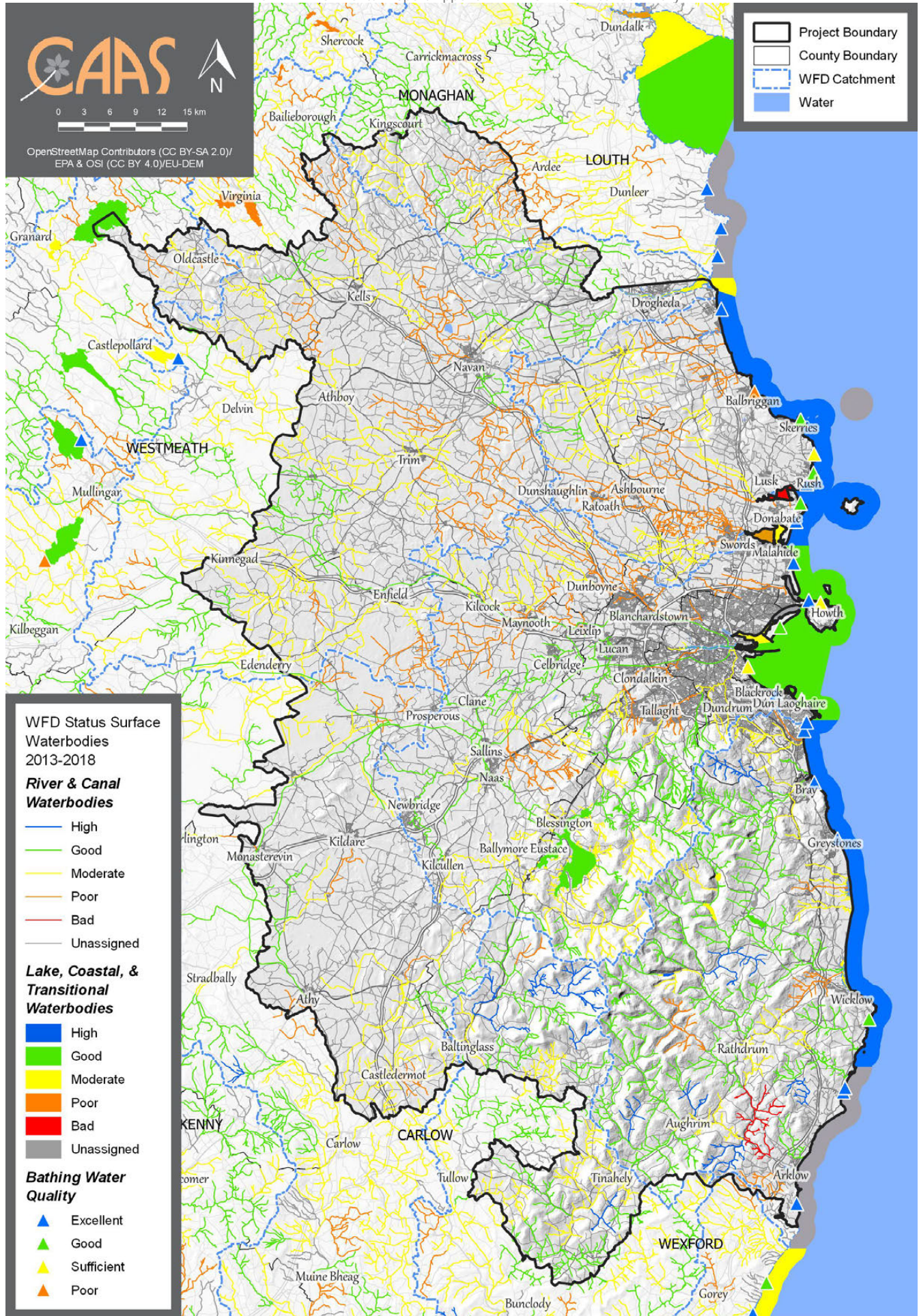


Figure 3.2 WFD Surface Water Status

3.9 Landscape

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

Land cover is the observed physical cover, as seen from the ground or through remote sensing, including for example natural or planted vegetation, water and human constructions which cover the earth's surface. The CORINE Land Cover map is based on interpretation of satellite images. Three categories of potential land cover sensitivity (normal, robust and sensitive) have been identified on Figure 3.3. Normal landcover is the predominant landcover type and is generally found throughout much of County Meath, County Kildare, County Wicklow and Dublin County. Robust landcover is found within and surrounding the M50 motorway and in pockets throughout the Strategy area. Sensitive landcover are most common in the Wicklow Mountain uplands/foothills, in bog areas in north-west Kildare and in coastal areas and parklands.

The unique visual character of the Strategy area is due to its variety of landscapes, seascapes and rich and diverse built, natural and cultural heritage. The Strategy area encompasses landscape designations and sensitivities that have been identified by Development Plans prepared for administrative areas of Counties Dublin, Meath, Kildare and Wicklow and also landscape designations and sensitivities in adjacent counties.

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

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

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

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

Existing Problems

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

CAAS for the National Transport Authority

3.10 Cultural Heritage

Archaeological Heritage

Archaeology is the study of past societies through the material remains left by those societies and the evidence of their environment. Archaeological sites and monuments vary greatly in form and date; examples include earthworks of different types and periods, (e.g. early historic ringforts and prehistoric burial mounds), megalithic tombs from the Prehistoric period, medieval buildings, urban archaeological deposits and underwater features. Archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997 and the Planning Acts.

Archaeological Heritage is mapped on Figure 3.4.

There are many sites of significant archaeological interest within the Strategy area, including the UNESCO World Heritage Site of Brú na Bóinne, which refers to the area within the bend of the river Boyne around Newgrange, Knowth and Dowth, and is one of the world's most important archaeological complexes. It contains many outstanding archaeological features, notably its megalithic art, the large and varied grouping of monuments, and evidence of continuous settlement and activity in the area for some 7,000 years.

There are five sites within the Strategy area included on the Tentative UNESCO World Heritage Sites List: Kells; Hill of Tara; Glendalough; Kilcullen; and the Historic City of Dublin. A Tentative List is an inventory of properties, which a country intends to consider for nomination to the World Heritage List. There are thousands of Recorded Monuments within the Strategy area, concentrated within urban/suburban areas and are less common in areas which are not settled, most noticeably much of the Wicklow Mountains.

Architectural Heritage

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

Similar to the general spatial spread of archaeological heritage, clusters of architectural heritage are indicated within already developed urban and suburban areas.

The National Inventory of Architectural Heritage (NIAH) is a State initiative under the administration of the Department of Arts, Heritage and the Gaeltacht and was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The purpose of the NIAH is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for the Environment, Heritage and Local Government to the local authorities for the inclusion of particular structures in their Record of Protected Structures (RPS). The NIAH encompasses a survey of Historic Gardens and Designed Landscapes.

Figure 3.5 shows entries to the NIAH within the Strategy area.

Records of Protected Structures are legislated for under Section 12 and Section 51 of the Planning and Development Act 2000 as amended. In addition to Protected Structures, the Planning and Development Act, 2000 provides the legislative basis for the protection of Architectural Conservation Areas (ACAs). An ACA is a place, area or group of structures or townscape which is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or contributes to the appreciation of protected structures, whose character it is an objective to preserve in a development plan.

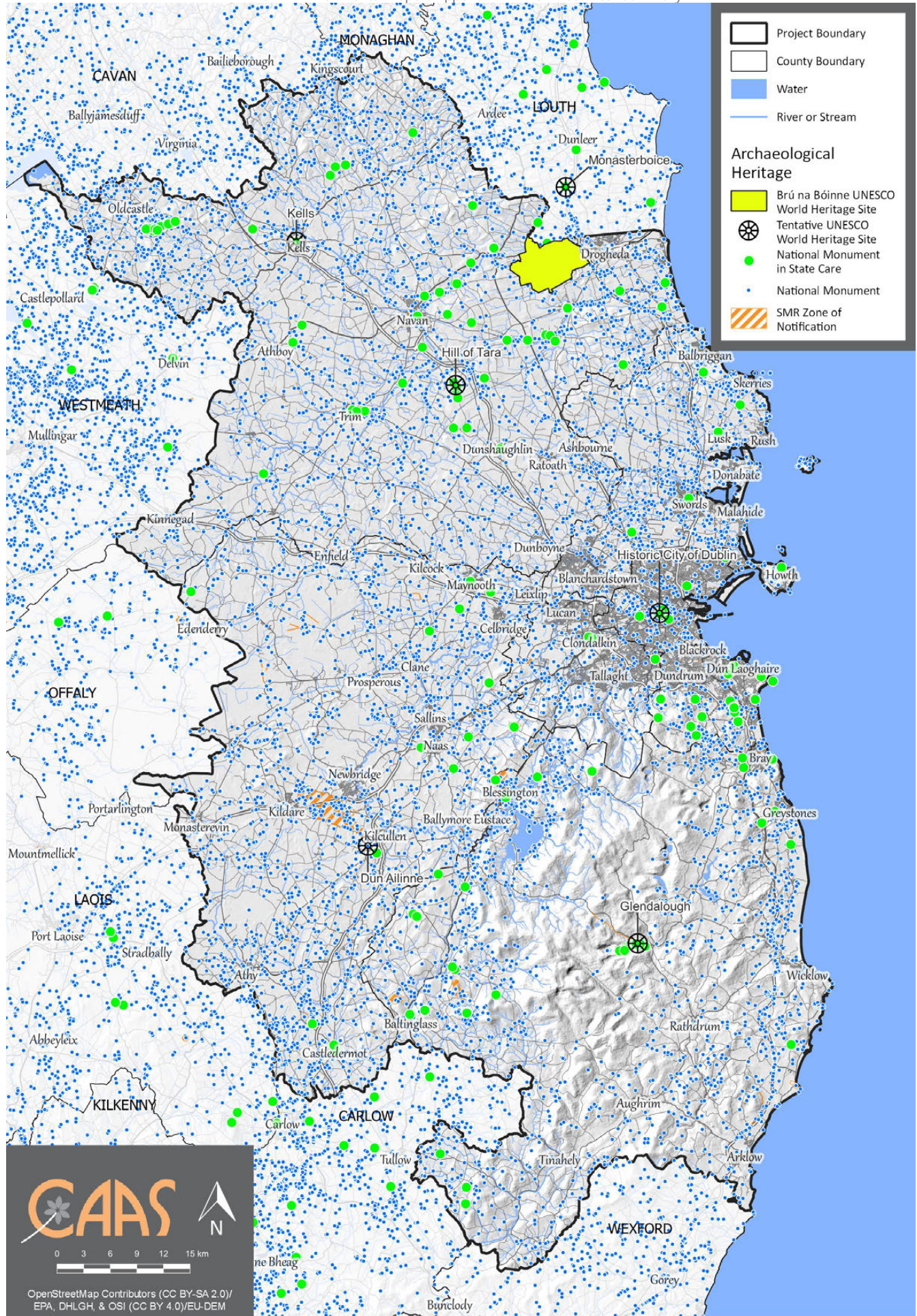


Figure 3.4 Archaeological Heritage

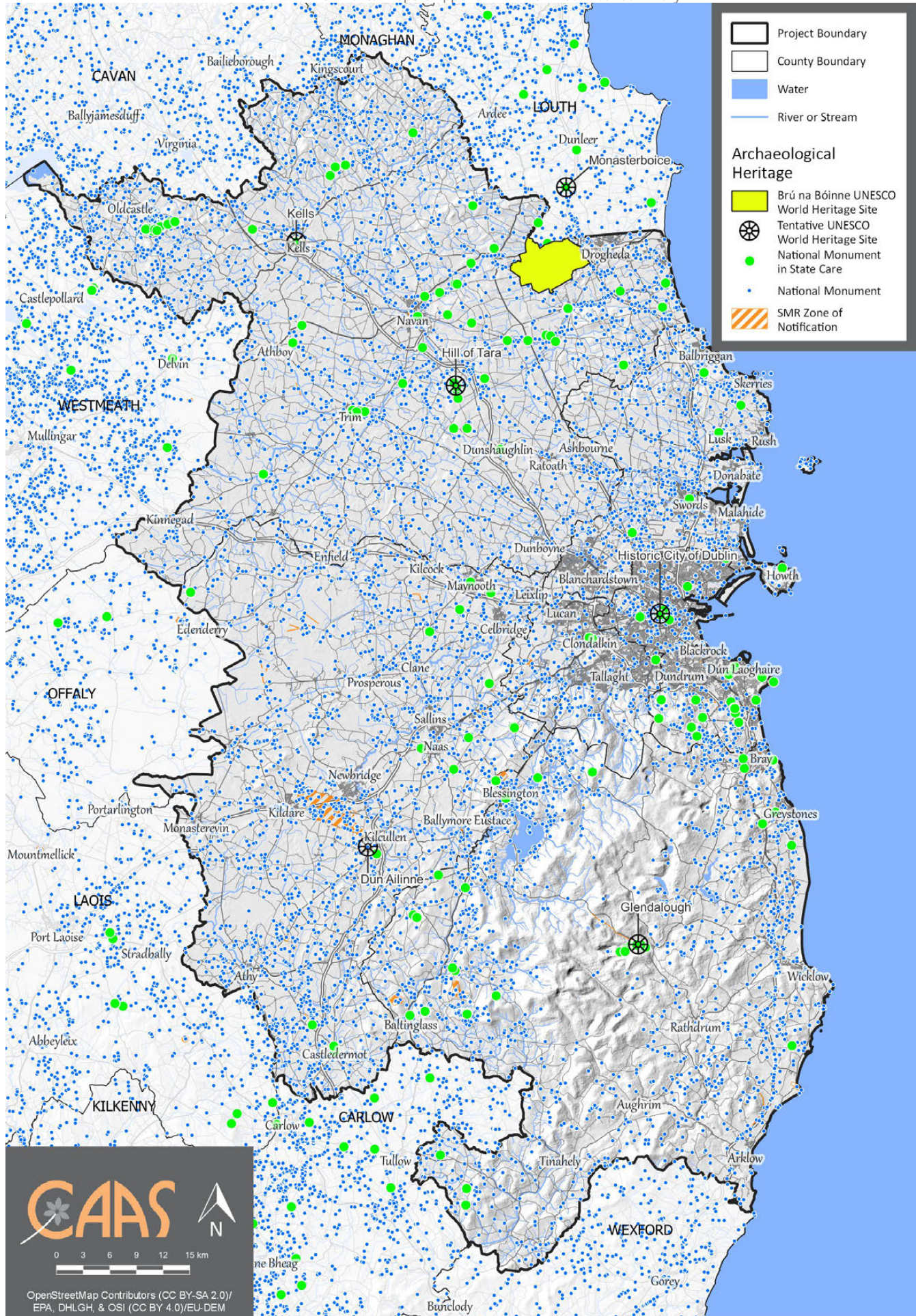


Figure 3.5 Architectural Heritage

3.11 Overall Environmental Sensitivities and Opportunities/Robustness

Some of the environmental information for detailed under previous subsections has been weighted and mapped to show overall environmental sensitivity (see Figure 3.6) and overall environmental opportunities/robustness (see Figure 3.7) with regard to the development of transport projects. The purpose of the mapping is to indicate at a regional level where the main concentrations of sensitivities might occur.

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 Plan contributes towards environmental protection.

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

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.

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.

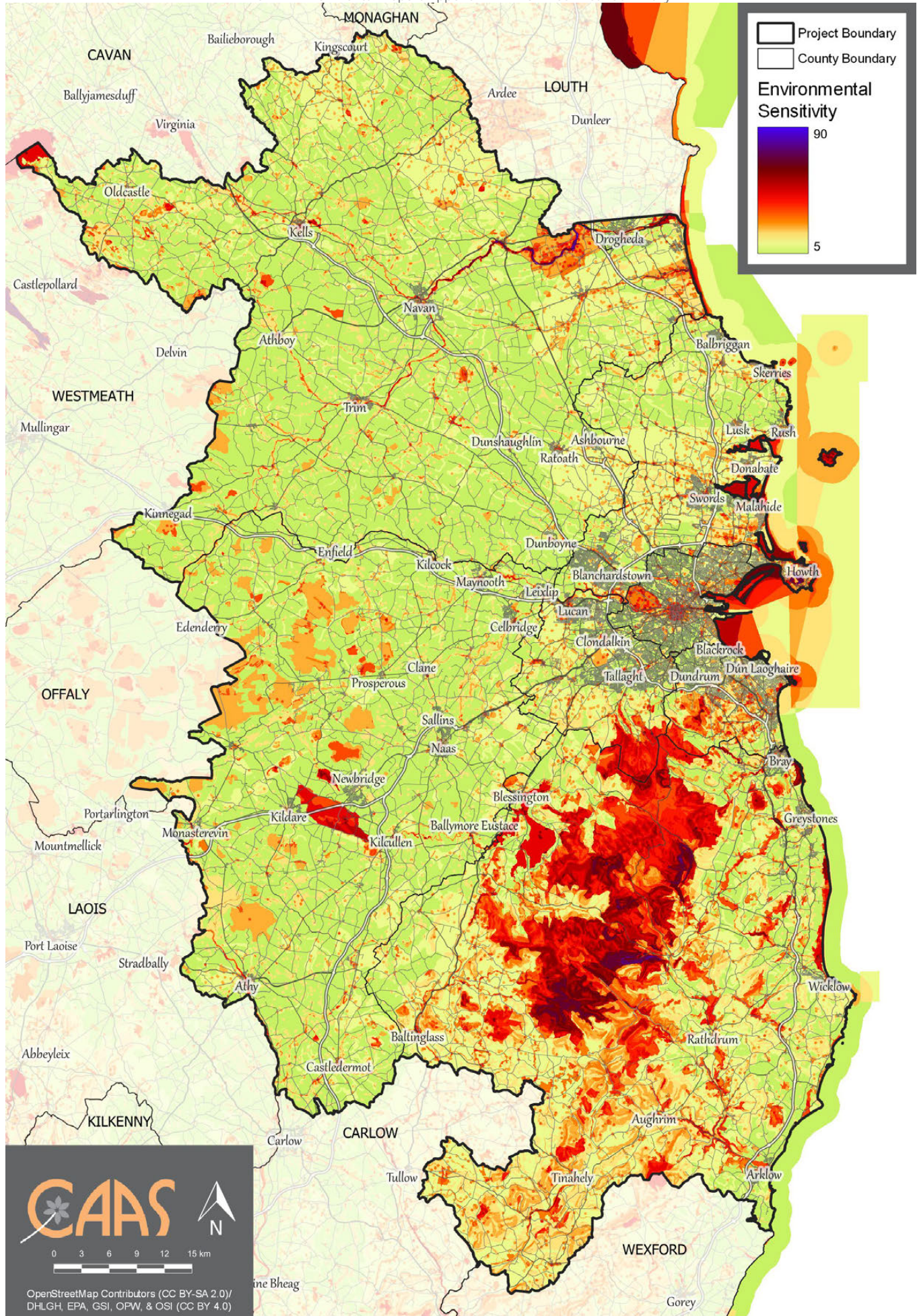


Figure 3.6 Overall Potential Environmental Sensitivity

CAAS for the National Transport Authority

3.12 Appropriate Assessment

Stage 2 Appropriate Assessment (AA) is being undertaken alongside the preparation of the Strategy. The requirement for AA is provided under the EU Habitats Directive (Directive 1992/43/EEC). The emerging conclusion of the AA is 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 (see Section 6). The preparation of the Strategy, SEA and AA is taking place concurrently and the findings of the AA have informed both the Strategy and the SEA..

3.13 Strategic Environmental Objectives

Strategic Environmental Objectives (SEOs) are methodological measures developed from policies which generally govern environmental protection objectives established at international, Community or Member State level and are used as standards against which the provisions of the Strategy and the alternatives can be evaluated in order to help identify significant environmental effects. SEOs are shown on the table below.

Table 3.1 Strategic Environmental Objectives

Environmental Component	Strategic Environmental Objectives
Air	<ul style="list-style-type: none"> To avoid, prevent or reduce harmful effects on human health and the environment as a whole resulting from emissions to air from transport Maintain and promote continuing improvement in air quality through the reduction of emissions and promotion of renewable energy and energy efficiency Promote continuing improvement in air quality Reduction of emissions of sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and fine particulate matter which are responsible for acidification, eutrophication and ground-level ozone pollution Meet Air Quality Directive standards for the protection of human health — Air Quality Directive Significantly decrease noise pollution by 2020 and move closer to WHO recommended levels
Climatic Factors	<ul style="list-style-type: none"> To minimise emissions of greenhouse gasses Integrate sustainable design solutions into infrastructure Contribute towards the reduction of greenhouse gas emissions in line with national targets Promote development resilient to the effects of climate change Promote the use of renewable energy, energy efficient development and increased use of public transport
Population and Human Health	<ul style="list-style-type: none"> Promote economic growth to encourage retention of working age population and funding of sustainable development and environmental protection and management Ensure that existing population and planned growth is matched with the required public infrastructure and the required services Safeguard citizens from environment-related pressures and risks to health and well-being
Biodiversity, Flora and Fauna	<ul style="list-style-type: none"> To preserve, protect, maintain and, where appropriate, enhance the terrestrial, aquatic and soil biodiversity, particularly EU designated sites and protected species Ensure no adverse effects on the integrity of any European site, with regard to its qualifying interests, associated conservation status, structure and function Safeguard national, regional and local designated sites and supporting features which function as stepping stones for migration, dispersal and genetic exchange of wild species Enhance biodiversity in line with the National Biodiversity Strategy and its targets To protect, maintain and conserve natural capital
Material Assets	<ul style="list-style-type: none"> Optimise existing infrastructure and provide new infrastructure to match population distribution proposals Reduce the energy demand from the transport sector and support moves to electrification of road and rail transport modes
Soil (and Land)	<ul style="list-style-type: none"> Protect soils against pollution, and prevent degradation of the soil resource Promote the sustainable use of infill and brownfield sites over the use of greenfield Safeguard areas of prime agricultural land and designated geological sites
Water	<ul style="list-style-type: none"> Ensure that the status of water bodies is protected, maintained and improved in line with the requirements of the Water Framework Directive and Marine Strategy Framework Directive Avoid inappropriate development in areas at risk of flooding and areas that are vulnerable to current and future erosion, particularly coastal areas Integrate sustainable water management solutions (such as SuDS, porous surfacing, etc.) into new projects
Landscape	<ul style="list-style-type: none"> To implement the identification, assessment, protection, management and planning of landscapes having regard to the European Landscape Convention
Cultural Heritage	<ul style="list-style-type: none"> Protect places, features, buildings and landscapes of cultural, archaeological or architectural heritage

¹ Except as provided for in Article 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.

Section 4 Consideration of Alternatives

4.1 Need for the Strategy

Under the Dublin Transport Authority Act, the National Transport Authority (NTA) must review its transport strategy every 6 years. Arising from the review of the 2016 plan, an updated strategy has been developed which sets out the framework for investment in transport infrastructure and services over the next two decades to 2042.

4.2 Existing provisions already in place

The Strategy aligns with legislation and documents setting out public policy for land use, transport and climate action and will be incorporated into the review and preparation of these documents. These include the National Planning Framework (and associated National Development Plan), the Strategic Investment Framework for Land Transport, the National Investment Framework for Transport in Ireland, the Regional Economic and Spatial Strategy for the Eastern and Midland Region (as adopted by the Eastern and Midland Regional Assembly, and finalised in January 2020) and associated Dublin Metropolitan Area Strategic Plan, the City and County Development Plans, Local Area Plans and Planning Schemes. Certain transport related proposals already provided for by these documents (and considered by their environmental assessments) are amongst those included within the Strategy. This Transport Strategy is based on national policies on sustainability as set out in the Climate Action Plan and recent climate action legislation.

4.3 Alternatives Considered

The various elements of the Strategy are at different stages in the planning/environmental process. Furthermore, different elements of the Strategy will be developed by different agencies, at different times, according to different funding allocations.

Transportation is highly integrated with both land-use planning and the provision of other public infrastructure, such as water services. Different alternative scenarios will give rise to different land-use patterns, resulting in different environmental effects.

The Strategy was developed and assessed in the context of three notional **Investment Scenarios** as follows:

1. Business as Usual Scenario that incorporates committed investment in the road network and public transport only.

Choice 1 is the 'Business As Usual' scenario. This scenario is based on the continuation of the trend that investment in transport infrastructure in the GDA would be predominantly focussed on a mix of road capacity improvements and public transport schemes, such as BusConnects Network Redesign to accommodate the growth and changes in travel demand.

Committed improvements would be realised. However, investment in Strategic Public Transport, such as Metrolink would not be included. Investment in walking and cycling networks would remain static.

Land use policy within the GDA would continue in line with the RSES.

2. Improvements to Public Transport and Sustainable Travel - scenario this substantially increases public transport investment

Choice 2 is to prioritise investment in providing a comprehensive public transport network in line with the Strategy proposals.

New heavy rail, metro and luas infrastructure would be built, and frequencies on existing routes would be increased.

Bus services would be significantly improved in line with the BusConnects Project, with the full implementation of the Network Redesign, Ticketing and Core Bus Corridor elements of the Programme.

The GDA Cycle Network would be delivered in full, and walking permeability prioritised.

Land use policy within the GDA would continue in line with the RSES.

3. **Improvements in Public Transport and Sustainable Travel, with complimentary Demand Management Measures** - this scenario has elements of Scenario 2 but with the addition of demand management measures to influence the choice of travel

Choice 3 builds upon Choice 2 and represents the optimal utilisation of the transport network in the GDA.

Measures such as parking restrictions, reduced accessibility and permeability for vehicular traffic, particularly in town centres and other destinations will be included.

In addition a network wide reduction in road speed limits for vehicular traffic, and reconfigured junction signal times in favour of pedestrian / cycle / public transport movement will be implemented.

Land use policy within the GDA would continue in line with the RSES.

4.4 Summary of Evaluation of Alternatives

Each of the Scenarios would help to contribute towards meeting the various Strategy challenges, with varying degrees of success. These challenges are detailed in the Strategy and comprise:

- Climate Change
- Recovery from the Covid-19 Pandemic
- Servicing the Legacy Development Patterns
- Revitalisation of the City Centre and Town Centres
- Transformation of the Urban Environment
- Ensuring Universal Access
- Serving Rural Development
- Improving Health and Equality
- Fostering Economic Development
- Delivering Transport Schemes

As Scenario 1 “Business as Usual” would progress sustainable mobility initiatives to a lesser extent than the other two scenarios, it would contribute towards meeting the various Strategy challenges the least. It would not be as successful as the other scenarios at addressing congestion, contributing towards climate action and revitalising urban areas.

A mix of road capacity improvements and public transport schemes would potentially conflict with the protection of the environment, however, by not progressing certain strategic public transport projects these potential direct conflicts with the environment would be avoided.

Indirectly, however, by not fully addressing the various Strategy challenges, this scenario would see greater demand for development in more dispersed settlements, making compact growth more difficult to achieve and increased levels of sprawl more likely. Such development, which would have higher levels of car dependency and result in more trips by car, would be likely to result in the following adverse environmental effects:

- Significant delays in reaching targets for lower emissions to air – including noise and pollutants – and this would be compounded by lower utilisation of public transportation;
- A failure to maximise contributions towards improving sustainable mobility and managing traffic flows;
- A reduced efficiency of energy resource utilisation;
- Reduction in the economic viability of services, such as water services, and heightened potential for adverse effects on the protection of waters - and associated interactions with ecology and human health;
- More frequent and severe conflicts with environmental components including biodiversity, air and water; and
- Reduction in potential placemaking in urban areas as a result of failing to replace motorised modes of transport with more sustainable and non-motorised modes.

Scenario 2 “Improvements to Public Transport and Sustainable Travel” would prioritise investment in providing a comprehensive public transport network:

- New heavy rail, metro and luas infrastructure would be built, and frequencies on existing routes would be increased.
- Bus services would be significantly improved in line with the BusConnects Project, with the full implementation of the Network Redesign, Ticketing and Core Bus Corridor elements of the Programme.
- The GDA Cycle Network would be delivered in full, and walking permeability prioritised.

In this way, Scenario 2 would significantly progress sustainable mobility initiatives and would make significant contributions towards meeting the various Strategy challenges listed above. It would be significantly more successful than Scenario 1 at addressing congestion, contributing towards climate action and revitalising urban areas, for example.

As Scenario 2 would provide for the construction of many new projects to provide a comprehensive public transport network, it would present potential direct conflicts with the environment, especially during the construction phase and there would be a requirement to mitigate these.

By making significant contributions in addressing the various Strategy challenges, this scenario would help to facilitate compact growth and reduce sprawl. Compact growth accompanied by a comprehensive public transport network would have lower levels of car dependency and result in fewer trips by car and would be likely to make significant contributions towards:

- Reaching targets for lower emissions to air – including noise and pollutants;
- Improving sustainable mobility and managing traffic flows;
- Increasing the efficiency of energy resource utilisation;
- Increasing in the economic viability of services, such as water services, and lowering the potential for adverse effects on the protection of waters - and associated interactions with ecology and human health;
- Reducing the frequency and severity of conflicts with environmental components, including biodiversity, air and water; and
- Increasing the potential of placemaking in urban areas as a result of replacing motorised with more sustainable and non-motorised modes of transport.

Notwithstanding the above, Scenario 2 would not incorporate Demand Management Measures. By incorporating Demand Management Measures, Scenario 3 “Improvements in Public Transport and Sustainable Travel, with complimentary Demand Management Measures” would optimise the utilisation of the transport network in the GDA. Demand Management Measures would encompass:

- Parking restrictions
- Reduced accessibility and permeability for vehicular traffic, particularly in town centres and other destinations
- Network wide reduction in road speed limits for vehicular traffic
- Reconfigured junction signal times in favour of pedestrian / cycle / public transport movement

Scenario 3 would progress sustainable mobility initiatives the most out of each of the three scenarios and would make the greatest contribution towards meeting the various Strategy challenges listed above. It would be more successful than both Scenarios 1 and 2 at addressing congestion, contributing towards climate action and revitalising urban areas, for example. Scenario 3 would build on Scenario 2 and the positive environmental effects of implementing a Transport Strategy under this scenario would be greater than under both Scenarios 1 and 2.

Section 5 Evaluation of Draft Strategy Provisions

The overall findings of the SEA are that:

- **Final 2030 Emissions Assessment**

The implementation of the Strategy elements intended for delivered by 2030, coupled with the planned vehicle electrification and increased use of bio-fuel set out in the Climate Action Plan 2019, will see transport emissions in the GDA decrease from a “business as usual” figure of 3.4 MtCO₂eq in 2030 to 2.0 MtCO₂eq, also in 2030. This represents a reduction of 45% from the 2018 GDA emissions total of 3.2 MtCO₂eq.

Additional measures are required to further reduce emissions to meet the 51% reduction target of 1.6 MtCO₂eq. A number of alternative approaches, as set out above, are available to achieve this supplemental reduction.

It is acknowledged that Approach 1 (increased fuel price) and Approach 2 (additional electrification) are national policy issues rather than regional matters. It is likely that general carbon pricing policy will see increased fuel costs of some level over the coming years to reflect the overall objective of reducing fossil fuel use.

In relation to additional electrification (Approach 2), the already planned level of electrification by 2030 is highly ambitious and the potential to further ramp this up is limited. Accordingly, most of the remaining emissions reduction target will fall to be achieved by the types of demand management measures set out under Approach 3.

However, there are various permutations of such proposals available and further detailed assessment will be required to establish and calibrate the optimal framework. That assessment work to develop the optimal framework will be undertaken at an early point in the lifetime of the Strategy, and will take account of policies set out in updates to the Climate Action Plan 2019 and derived from the carbon budgets to be established under the Climate Action Plan and Low Carbon Development (Amendment) Act 2021.

- **Emissions Levels in 2042**

Emissions targets are clearly established for 2030 under the provisions of the Climate Action Plan and Low Carbon Development (Amendment) Act 2021. That Act also sets out the objective to achieve a “climate neutral economy by no later than the end of the year 2050”. Accordingly, while no specific targets are set for 2042, the final year of this strategy, it is intended that emissions will continue on a downwards trajectory between 2030 to 2050.

The continued electrification of the transport fleet and the implementation of the remaining elements of this strategy will further reduce greenhouse gas emissions within the GDA. Assessment work carried out has indicated that greenhouse gas emissions from transport in the GDA will reduce to below 1 MtCO₂eq by 2042.

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

The National Transport Authority are integrating all recommendations arising from the SEA and AA processes into the Strategy (see Section 9 of this report), facilitating compliance of the Strategy with various European and National legislation and Guidelines relating to the protection of the environment and the achievement of sustainable development.

Implementation of the Strategy will contribute towards efforts to achieve a number of the 17 United Nations Sustainable Development Goals² of the 2030 Agenda for Sustainable Development.

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

The Strategy facilitates improvements in sustainable mobility, including a shift from car to more sustainable and non-motorised transport modes, through the development of transport infrastructure and services and transitioning to lower emission vehicles. Improvements in sustainable mobility will result in the following positive effects:

- Reductions in/limits in increases of greenhouse gas emissions and associated achievement of legally binding greenhouse gas emissions targets;
- Reductions in/limits in increases of all emissions to air and associated achievement of air quality objectives, thereby contributing towards improvement of air quality and protection of human health;
- Reductions in/limits in increases of consumption of non-renewable energy sources and achievement of legally binding renewable energy targets; and
- Energy security.

- **Positive Effects in Urban Areas**

In combination with other plans and programmes, including those from the land use sector, the Strategy facilitates more consolidated urban areas, reuse and regeneration of brownfield lands and reductions in sprawl. In this way the Strategy would facilitate a higher efficiency of land utilisation, increases in sustainable mobility and a reduction in the need to develop greenfield lands. The reduced need to develop greenfield lands further away from existing urban areas would result in lower adverse effects upon ecology, landscape designations, architectural and archaeological heritage and soil.

Among other positive environmental effects, the Strategy facilitates the enhancement of the public realm (including cultural heritage and its context) in urban areas by facilitating the replacement of motorised transport modes with more sustainable and non-motorised modes including light rail/metro, cycling and walking.

The Strategy will contribute to an enhanced natural and built environment by:

- Supporting Consolidated Development
- Improving the Public Realm and Supporting Placemaking
- Reducing the Impacts of Traffic
- Reducing Carbon Emissions
- Improving Air Quality
- Reducing Noise
- Improving Mode Share
- Reducing Vehicle Kilometres

² Including:

- Goal 3. Ensure healthy lives and promote well-being for all at all ages.
- Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.
- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable.
- Goal 12. Ensure sustainable consumption and production patterns.
- Goal 13. Take urgent action to combat climate change and its impacts.
- Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
- Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

The Strategy will lead to a more connected communities and better quality of life by:

- Facilitating Higher Levels of Walking and Cycling
- Extending High Quality Public Transport Coverage
- Reducing Travel Time to Major Destinations
- Improving Road Safety

The Strategy will contribute to a strong and sustainable economy by including measures relating to:

- Fostering Economic Activity
- Facilitating a Greater Level of Business Travel
- Trips to Work
- Goods Vehicles
- Travel to Dublin Port
- Travel to Dublin Airport

The Strategy will foster an inclusive transport system by:

- Continuing to Improve Inclusion and Equality
- Increasing Accessibility to Jobs
- Increasing Accessibility to Jobs for those Living in Disadvantaged Areas
- Increasing Accessibility to High Frequency Public Transport
- Promoting Culture and the Night-Time Economy

Table 5.1 details the various types of environmental effects likely to arise with respect to the Strategy (as developed from the selected alternatives – see Section 4) as a direct result of development and activities under the Strategy and in combination with the wider planning framework. Environmental impacts which occur will be determined by the nature and extent of multiple or individual projects and site specific environmental factors. 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.

Potentially significant adverse environmental effects arising from the Strategy are also detailed on Table 5.1. These effects will be mitigated by the various provisions which have been integrated into the Strategy including those that have arisen through the SEA and AA processes (see Section 6). These mitigating provisions together with the contribution that the Strategy will make to sustainable mobility means that the Strategy facilitates various significant positive effects upon the protection and management of environmental components.

Taking into account the geographical scope of Strategy provisions and the detailed Strategy provisions relating to environmental protection and management, it is determined that significant environmental effects will not occur in Northern Ireland.

Table 5.1 Overall Effects Arising from the Strategy

Environmental Component	Summary of Likely Environmental Effects, as a direct result of development and activities under the Strategy and in combination with the wider planning framework		
	Significant Positive Effect likely to occur	Potentially Significant Adverse Effect, if unmitigated	Residual Adverse Effect ³
Air and climatic factors	<ul style="list-style-type: none"> Contributions towards reductions in greenhouse gas and other emissions to air and associated achievement of legally binding targets (in combination with plans and programmes from all sectors, including energy, transport and land use planning) as a result of: facilitating a shift from car to more sustainable and non-motorised transport modes; and facilitating more consolidated urban areas and reductions in sprawl. Contributions towards reductions in consumption from non-renewables and associated achievement of legally binding renewable energy targets, including sectoral targets for transport (in combination with plans and programmes from all sectors, including energy, transport and land use planning). Contributions towards managing traffic flows (and associated management of adverse effects as a result of traffic on air quality and noise levels). 	<ul style="list-style-type: none"> Emissions to air and associated issues. 	<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"> Provides for the development of transport infrastructure and services in locations which will facilitate use by those living and working in urban/suburban areas. Facilitates contribution towards the protection of human health as a result of contributing towards the protection of environmental vectors, especially air. 	<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.
Biodiversity and flora and fauna	<ul style="list-style-type: none"> Facilitates lower overall effects on ecology (including designated sites, ecological connectivity and habitats) – due to increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites. Contributes 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/or coastal squeeze. Effects in riparian zones where new crossings of waters, if any, are progressed. Potential effects on vegetation from transport emissions. 	<ul style="list-style-type: none"> Loss of an extent of non-protected habitats as a result of new or widened transport infrastructure that involves the replacement of semi-natural land covers with artificial surfaces Losses or damage to ecology (these would be in compliance with relevant legislation)

³ Residual adverse environmental effects would be generally non-significant. Significant residual adverse effects would be in compliance with the relevant environmental protection legislation.

Environmental Component	Summary of Likely Environmental Effects, as a direct result of development and activities under the Strategy and in combination with the wider planning framework		
	Significant Positive Effect likely to occur	Potentially Significant Adverse Effect, if unmitigated	Residual Adverse Effect ³
Material Assets	<ul style="list-style-type: none"> Contributions towards energy security (in combination with plans and programmes from all sectors, including energy, transport and land use planning) as a result of reducing traffic flows and associated energy use. Contributions towards a mode shift away from the private car to public transport, walking and cycling and associated enhancement of the public realm. Contributions towards the protection of built/amenity assets and infrastructure. Contributions towards 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. Contributions towards appropriate waste management. 	<ul style="list-style-type: none"> Generation of construction waste. Loss or damage to built/amenity assets and infrastructure including as a result of new or widened transport 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 built/amenity assets and infrastructure including as a result of new or widened transport infrastructure
Soil	<ul style="list-style-type: none"> Minimises land-take and loss of extent of soil resource – as a result of facilitating increased utilisation of lands within existing development boundaries and use of existing utilities and brownfield sites. Contributions towards the protection of the environment from contamination arising from brownfield development. Contributions 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 transport and associated transport facilities/infrastructure. Adverse impacts on features or areas of geological/geomorphological interest as a result of construction of transport and associated transport facilities/infrastructure. Potential for increase in coastal/river bank erosion. 	<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 and from sea level rise/coastal erosion.
Water	<ul style="list-style-type: none"> Contributions towards 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. Contributions towards compliance with the Flood Risk Management Guidelines. 	<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.
Landscape	<ul style="list-style-type: none"> Contributions towards the protection of landscape designations as a result of 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"> Contributions towards the protection of cultural heritage (archaeological and architectural) as a result of facilitating compliance with relevant legislation. Contributions towards the enhancement of cultural 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, including as a result of increasing traffic flows. 	<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.

Section 6 Mitigation and Monitoring Measures

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. Various environmental sensitivities and issues have been communicated to the Authority through the SEA and Appropriate Assessment (AA) processes.

By integrating all SEA and AA recommendations into the Strategy, the Authority is helping to ensure that: the potential significant adverse effects of implementing the Strategy are avoided, reduced or offset; and the beneficial environmental effects of implementing the Strategy are maximised.

Mitigation was achieved through the following: early work undertaken to ensure contribution towards environmental protection and sustainable development; consideration of alternatives; and integration of individual measures into the Strategy. A selection of the measures that have/are being integrated into the Strategy are shown on Table 6.1.

The Environmental Report contains proposals for **monitoring** the potential significant effects of implementing the Strategy, if unmitigated, which are adopted alongside the preparation of the Strategy. 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.

Monitoring measures chosen for the SEA of the Strategy align with those used in the SEA of the Eastern and Midland RSES and in the SEAs of other land use plans across the Region. This consistency across the hierarchy of land use/transport planning will improve the efficiency and effectiveness of future monitoring.

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. A stand-alone Monitoring Report on the significant environmental effects of implementing the Strategy will be prepared during the implementation of the Strategy, in advance of the review of the Strategy. This report will address the following indicators set out below:

- Proportion of journeys made by private fossil fuel-based car compared to previous National Travel Survey levels
- NOx, SOx, PM10 and PM2.5 as part of Ambient Air Quality Monitoring
- Implementation of the Strategy, which will contribute towards and facilitate climate action
- A competitive, low-carbon, climate-resilient and environmentally sustainable economy
- Share of renewable energy in transport
- Carbon dioxide (CO₂) emissions across the transport sector
- Energy consumption, the uptake of renewable options and solid fuels for residential heating
- Proportion of journeys made by private fossil fuel-based car compared to previous levels
- Proportion of people reporting regular cycling / walking to school and work above previous CSO figures
- Implementation of the Strategy, which will contribute towards and facilitate economic growth
- Number of spatial concentrations of health problems arising from environmental factors resulting from development permitted under the Strategy
- Proportion of people reporting regular cycling / walking to school and work above previous CSO figures
- Access to sustainable modes of transport
- Condition of European sites
- Number of projects that have integrated ecosystem services considerations
- EIAs and AAs as relevant for new projects
- Compliance of planning permissions with Strategy measures providing for the protection of biodiversity and flora and fauna – see Chapter 18 of the Strategy
- Status of water bodies as reported by the EPA Water Monitoring Programme for the WFD
- Number of incompatible developments permitted within flood risk areas
- Integration of sustainable water management solutions (such as SuDS, porous surfacing, etc.) into new projects
- Number of developments permitted that result in avoidable adverse visual impacts on the landscape, especially with regard to landscape and amenity designations included in Land Use Plans, resulting from development which is granted permission under the Strategy
- Percentage of entries to the Record of Monuments and Places, and the context these entries within the surrounding landscape where relevant, protected from adverse effects resulting from development which is granted permission under the Strategy

Table 6.1 Selection of SEA/AA recommendations included within the Strategy

Strategy Section No.	SEA/AA Recommended Text
7.4.1 Environmental Assessment	The alignments and details of proposed transport projects set out in the Transport Strategy, unless already provided for by plans or proposals that have been subject to environmental assessment, are indicative only and are subject to further development as the design and planning processes for individual projects progress. New projects will be required to be subject to lower-tier environmental assessment and detailed corridor and route selection processes as relevant (including those arising from SEA recommendation “Corridor and Route Selection Process” integrated into Chapter 18.
16. Climate Action Management	<p>Climate 1 Additional demand management measures to achieve the GDA transport emissions target for 2030 will be implemented. The NTA will undertake a detailed assessment to establish the optimal framework of demand management measures, which is likely to include parking restraint, zonal charging, additional tolling / road pricing and/or further vehicle electrification.</p> <p>Climate 2 Through the implementation of the full measures set out in this strategy, in combination with the plans and programmes of Government, the NTA will contribute to a reduction in CO2 emissions from transport in the GDA to below 1 MtCO₂eq by 2042.</p>
18. Environmental Protection and Management	<p>Introduction Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) have both been undertaken alongside the preparation of the Strategy. All recommendations arising from the SEA and AA processes have been integrated into the Strategy. Many of these recommendations have been set out in the SEA Environmental Report; however, some of the more strategic recommendations are detailed below. Compliance with these measures will facilitate environmental protection and management.</p>
18. Environmental Protection and Management	<p>Regulatory Framework for Environmental Protection and Management 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), the Birds Directive (2009/147/EC), the Environmental Impact Assessment Directive (2011/92/EU, as amended by 2014/52/EC) and the Strategic Environmental Assessment Directive (2001/42/EC) – and relevant transposing Regulations.</p>
18. Environmental Protection and Management	<p>Lower-level Decision Making Lower levels of decision making and environmental assessment should consider the environmental sensitivities identified in Section 4 of the SEA Environmental Report, including the following:</p> <ul style="list-style-type: none"> • Special Areas of Conservation and Special Protection Areas; • Features of the landscape that provide linkages/connectivity to designated sites (e.g. watercourses and areas of semi-natural habitat, such as linear woodlands); • 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.
18. Environmental Protection and Management	<p>Corridor and Route Selection Process 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 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 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 relevant specialists, taking into account project level information and potential mitigation measures that are readily achievable;

Strategy Section No.	SEA/AA Recommended Text
	<ul style="list-style-type: none"> 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.
18. Environmental Protection and Management	<p>Appropriate Assessment</p> <p>All projects and plans arising from this Strategy will be screened for the need to undertake Appropriate Assessment under Article 6 of the Habitats Directive. A plan or project will only be authorised after the competent authority has ascertained, based on scientific evidence, Screening for Appropriate Assessment, and subsequent Appropriate Assessment where necessary, that:</p> <ul style="list-style-type: none"> The Plan or project will not give rise to 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 of 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.
18. Environmental Protection and Management	<p>Protection of Natura 2000 Sites</p> <p>No plans or projects giving rise to adverse effects on the integrity of European sites (cumulatively, directly or indirectly) 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)⁴.</p>
18. Environmental Protection and Management	<p>Climate Change, Emissions and Energy</p> <p>As identified in the SEA Environmental Report that accompanies this Strategy, the Strategy facilitates sustainable mobility and associated positive effects, including those relating to:</p> <ul style="list-style-type: none"> Reductions in greenhouse gas emissions and associated achievement of legally binding targets; Reductions in emissions to air and associated achievement of air quality objectives, thereby contributing towards improvement or air quality and protection of human health; Reductions in consumption of non-renewable energy sources and achievement of legally binding renewable energy targets; and Energy security. <p>In implementing the Strategy, the Authority will support relevant provisions contained in the National Energy and Climate Plan, the Climate Adaptation Strategies of planning authorities within the Greater Dublin Area, the Climate Action Plan (2019), National Climate Change Adaptation Framework (2018), the National Mitigation Plan (2017) and the Department of Transport's Sectoral Adaptation Plan for Transport Infrastructure, which builds on the 2017 "Adaptation Planning – Developing Resilience to Climate Change in the Irish Transport Sector".</p> <p>Cognisant of the imperative to reduce emissions, the Authority will seek to ensure primacy for transport options that provide for unit reductions in carbon emissions. This can most effectively be done by promoting public transport, walking and cycling, and by actively seeking to reduce car use in circumstances where alternative options are available.</p> <p>During the preparation and/or review of policies and plans relating to climate change, carbon emissions and energy usage, the Authority will seek to integrate Strategy objectives, as appropriate.</p>
18. Environmental Protection and Management	<p>Other SEA/AA Recommendations</p> <p>In implementing the Strategy, the Authority will ensure that the measures included in Table 9.2 of the SEA Environmental Report are complied with.</p>

⁴ Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be: a) no alternative solution available; b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place.