

SEA ENVIRONMENTAL REPORT

APPENDIX II: NON-TECHNICAL SUMMARY

FOR THE

WATERFORD METROPOLITAN AREA TRANSPORT STRATEGY 2040

for: National Transport Authority

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Table of Contents

Section 1	Introduction and Terms of Reference.....	1
Section 2	The Draft Strategy	2
2.1	Introduction.....	2
2.2	Strategy Vision.....	2
2.3	Strategy Objectives	2
2.4	Relationship with other relevant Plans and Programmes	3
Section 3	Relevant aspects of the current state of the environment.....	4
3.1	Introduction.....	4
3.2	Likely Evolution of the Environment in the Absence of the Strategy	4
3.3	Air and Climatic Factors	4
3.4	Population and Human Health	6
3.5	Biodiversity and Flora and Fauna	7
3.6	Material Assets.....	9
3.7	Soil	10
3.8	Water.....	11
3.9	Landscape	13
3.10	Cultural Heritage	15
3.11	Overall Environmental Sensitivities and Opportunities	18
3.12	Appropriate Assessment.....	21
3.13	Strategic Environmental Objectives	21
Section 4	Consideration of Alternatives	22
4.1	Need for the Strategy	22
4.2	Existing provisions already in place	22
4.3	Alternatives Considered	22
4.4	Summary of Evaluation of Alternatives for all Corridors.....	24
Section 5	Evaluation of Draft Strategy Provisions.....	26
Section 6	Mitigation and Monitoring Measures	32

Section 1 Introduction and Terms of Reference

This is the Non-Technical Summary of the Strategic Environmental Assessment (SEA) Environmental Report for the Waterford Metropolitan Area Transport Strategy 2040 (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 to date 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

The National Planning Framework 2040 (NPF) envisages that the Waterford Metropolitan Area (WMA) will become the growth engine of the South-East Region with projected growth of at least 50% during the period up to 2040. This projected population, employment and education growth brings opportunities for the development of the WMA.

This projected population and associated economic growth will result in a significant increase in the demand for travel. This demand needs to be managed and planned for carefully to safeguard and enhance the WMA's attractiveness to live, work, visit and invest in.

Current congestion and poor journey time reliability for users during core times of the day in the WMA already highlights the limited capacity within the existing transport network to cater for additional motor traffic.

In common with the other regional metropolitan areas of Cork, Limerick and Galway, there is a legacy of car dependency in the WMA. This has contributed to a wide range of economic, environmental, and social issues including longer commutes, declining urban centres, poor public health, reduced air quality and noise pollution.

To mitigate this, land use planning and transport planning needs to be far more closely aligned. This will discourage the use of the private car, particularly for short trips, to fundamentally change how people move around the WMA. This requires a more efficient use of valuable street and road space and a prioritisation of walking, cycling and public transport.

The Waterford Metropolitan Area Transport Strategy 2040 (WMATS or the 'Strategy') has been developed by the National Transport Authority in collaboration with Waterford City and County Council, Kilkenny County Council, Southern Regional Assembly (SRA) and Transport Infrastructure Ireland (TII). It has also been informed by pre-consultation submissions from several stakeholders. WMATS is intended to be subject to periodic review at approximately six-year intervals

2.2 Strategy Vision

The proposed Vision for WMATS is aligned with that outlined in the RSES / Metropolitan Area Strategic Plan (MASP): To set the framework for an accessible, high-quality and integrated transport network that enables the sustainable growth of the Waterford Metropolitan Area as a key regional driver of growth in the South-East Region, and an international competitive European city region as envisaged by the National Planning Framework 2040.

2.3 Strategy Objectives

The Strategic Objectives of the Strategy are as follows:

- To meet the demand generated by future growth of the WMA through the provision of an efficient transport network.
- To prioritise sustainable transport and active travel to reduce car dependency.
- The provision of a high level, citywide public transport system connecting to key destinations within high demand corridors.
- To increase transport capacity where needed to achieve the strategy outcomes.
- To deliver a fully accessible and inclusive transport system.
- To enhance the public realm of the WMA through demand management measures and transport interventions.
- To minimise the impact of motorised traffic in urban centres.
- To identify and protect key strategic routes for the movement of freight traffic.

2.4 Relationship with other relevant Plans and Programmes

WMATS is a sub-regional plan and is directly informed by National Level policies. The key national policy documents are the National Planning Framework 2040 (NPF), the National Development Plan 2021-2030 (NDP) and the National Investment Framework for Transport in Ireland (NIFTI) and the recently published National Sustainable Mobility Policy.

The NPF sets out Ireland's planning policy direction up to 2040; the NDP sets out the investment priorities that will underpin the successful implementation of the NPF up to 2030; and NIFTI sets out the strategy for the development and management of Ireland's land transport network (walking, cycling, public transport and roads) over the next two decades.

Policy documents relevant to WMATS include, but are not limited to:

- National Planning Framework 2040;
- National Development Plan 2021-2030;
- National Investment Framework for Transport in Ireland;
- Climate Action Plan 2021;
- National Cycle Policy Framework 2009-2020;
- Smarter Travel - A Sustainable Transport Future;
- Regional Spatial and Economic Strategy for the Southern Region and associated Metropolitan Area Strategic Plan;
- National Sustainable Mobility Policy; and
- The relevant City and County Development Plans and Local Plans.

The National Cycle Policy Framework 2009-2020 and Smarter Travel - A Sustainable Transport Future have been superseded by the National Sustainable Mobility Policy.

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.

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

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

Ireland's Provisional Greenhouse Gas Emissions 1990-2020 (EPA, 2021) report details provisional estimates of greenhouse gas emissions for the period 1990-2020. 2020 total national greenhouse gas emissions are estimated to have declined by 3.6% on 2019 levels to 57.70 million tonnes carbon dioxide equivalent (Mt CO₂eq). This reduction in total emissions was driven by the COVID impact on Transport and less peat used for electricity generation. It highlights that further, transformative measures will be needed to meet National Climate ambitions.

Greenhouse gas emissions from the Transport sector decreased by 15.7% or 1.92 Mt CO₂eq in 2020. This decrease was largely driven by the impact of COVID restrictions on passenger car and public transport usage. International aviation, not included in national total emissions, declined by 65% in 2020 or by 2.17 Mt CO₂ eq.

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 Strategy 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 Renewable Energy Directive (Directive 2009/28/EC) requires each Member State to adopt a national renewable energy action plan (NREAP) to set out Member States' national targets for the share of energy from renewable sources consumed in transport, electricity and heating in 2020 that will ensure delivery of the overall renewable energy target. These sectoral targets are referred to as RES-E (electricity), RES-T (transport) and RES-H (heat).

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 2020¹. SEAI's 2021 publication "*Energy in Ireland 2021*" report includes the most recent assessment of Ireland's progress towards renewable energy targets up to 2020 and identifies that Ireland:

- Did not meet its EU 2020 overall renewable energy target. The overall share of renewable energy was 13.5%, compared to the target of 16%;
- Succeeded against its EU 2020 renewable energy target for transport (10.2% vs. 10%), and just missed its renewable energy target for electricity (39.1% vs. 40%);
- Achieved just half its 2020 renewable energy target for heating and cooling (6.3% vs. 12%); and
- Energy from renewable sources grew by 8.9% in 2020.

Ambient Air Quality

The EPA's (2021) *Air Quality in Ireland 2020* identifies that:

- Air quality in Ireland is generally good however there are localised issues.
- Ireland was above the European Environment Agency reference level for polycyclic aromatic hydrocarbons (PAHs), a toxic chemical, at 4 monitoring sites due to the burning of solid fuel.
- Ireland was above World Health Organization (WHO) air quality guidelines for particulate matter (PM), sulphur dioxide (SO₂) and ozone at 52 monitoring sites across the country.
- The travel restrictions imposed as a result of Covid-19 had a positive impact on air pollution in Ireland's urban areas with up to 50% reductions in traffic pollution.
- Levels of nitrogen dioxide (NO₂) from transport emissions fell in 2020, however, if long-term changes are not made to modes or patterns of transport it will lead to future exceedances in the urban areas.

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. The Waterford city and County Noise Action Plan 2019-2023 is currently in force within the Strategy area. The Action Plan includes noise mapping and measures to manage noise issues and effects.

Existing problems

The Climate Change Advisory Council's *Annual Review 2021* identified that when considering national policy goals to 2050, Ireland is presently significantly off-track from paths that deliver long-term transition towards climate neutrality on that timescale. The Council also noted that:

¹ Department of Communications, Climate Action and Environment (2017) National Renewable Energy Action Plan Fourth Progress Report submitted under Article 22 of Directive 2009/28/EC.

- Transport trends are not consistent with a sustainable low-carbon path, making emissions reductions more difficult, while also driving congestion and a host of sustainability problems and costs; and
- It is necessary to accelerate electrification while putting an urgent priority on long-term integrated spatial and mobility planning in Ireland, if a transformational sustainable path is to be delivered.

Air quality and noise present challenges, especially in urban areas, as detailed under the relevant sub-sections above. 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 Waterford - the largest urban centre in the south-east and the State's fifth largest city. Waterford Metropolitan Area² is identified by Southern Regional Assembly Regional Spatial and Economic Strategy (RSES) as the principal urban centre of the South-East and a Regional City of Scale. In 2016 the total population of Waterford Metropolitan Area (the total area of the Waterford City, including suburbs within Counties Waterford and Kilkenny) was identified as being of 59,854 persons³. Most users of transport within the Strategy area reside in and commute to and from urban/suburban areas.

The most populous divisions are generally concentrated within and surrounding the city centre, while the adjacent hinterland areas are among the least populous divisions.

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 area. Flooding can pose a risk to human health.

² Large urban area accessible with national and international connectivity, strong business core, innovation, education, retail, health and cultural role.

³ Draft Waterford City and County Development Plan 2022-2028

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.

The most ecologically sensitive, designated and protected areas within the Strategy area comprise the Lower River Suir and the River Barrow and their tributaries and estuary. These surface waters provide habitats for sensitive species. Dispersed areas of marginal agricultural lands that may include ecological sensitivities occur throughout the WMA.

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 Strategy 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 Strategy 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 (Special Areas of Conservation, prime wildlife conservation areas in the country, considered to be important on a European as well as Irish level, and Special Protection Areas, areas designated to protect listed rare and vulnerable bird species, regularly occurring migratory bird species and wetlands, especially those of international importance) within 15km of the WMA.

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.

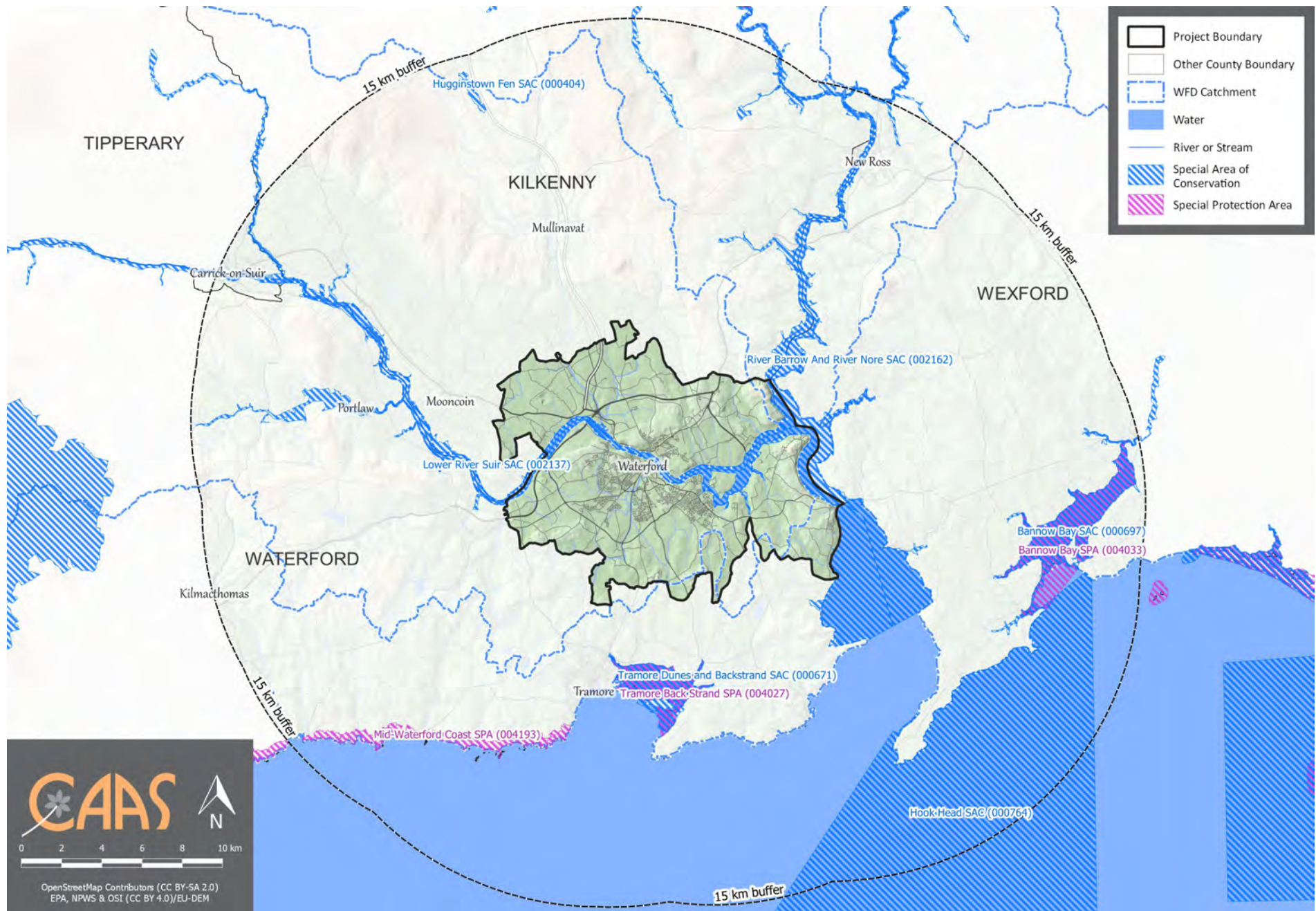


Figure 3.1 Ecologically Designated European Sites within and within 15 km of the Strategy area

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 WMA is served by:

- InterCity rail services;
- City, Regional and Expressway bus/ coach and Local Link services; and
- Waterford Airport (located approximately 10 km to the south-east of the City Centre).

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

Some parts of the Strategy area are covered by woodland and treelines, including certain areas adjacent to the channel of the River Suir and Barrow and their estuary. 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 found south-eastern parts of the Strategy area, are often indicative of areas that are the most sensitive to development due to ecological sensitivities and impeded drainage issues. Some of the peatland areas are subject to ecological designations.

Coastline and Estuarine Areas

Management of the coastline/estuarine areas and coastal/estuarine erosion are topics with relevance to various environmental components. Coastlines and estuarine areas 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.

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 27 counties have been completed to date, including County Waterford, County Kilkenny and County Wexford. There are four CGSs within or partially within the Strategy area:

- Granny Quarry (Site code: KK011);
- N25 Road Cuttings (Site code: WD043);
- Newtown (Site code: WD044); and
- Raheen Shore (site code: WD047).

The Copper Coast United Nations Educational, Scientific and Cultural Organisation (UNESCO) Global Geopark⁴ covers geological and cultural heritage of the historic 19th century metal mines, extending

⁴ UNESCO Global Geoparks are single, unified geographical areas where sites and landscapes of international geological significance, managed with a holistic concept of protection, education and sustainable development. They strive to raise awareness of geodiversity and promote protection, education and tourism best practices. Whilst Global Geopark is not a legislative designation, the key heritage sites within a Geopark must be protected under local, regional and national legislation as appropriate.

approx. 17 km along the coast in County Waterford, and is located approx. 5 km to the south-west of the Strategy area.

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. 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 (2013-2018) is mapped on Figure 3.2.

The WFD status of some sections of the rivers within the Strategy area are classified as *moderate* and *good*, however sections of St. John's River are identified as *poor* due to unsatisfactory ecological/biological and/or physio-chemical status. The WFD surface water status of transitional waterbodies within and surrounding the Strategy area is identified as *moderate* (Barrow Suir Nore Estuary and New Ross Port) and *good* (Lower Suir Estuary/ Little Island-Checkpoint), however Middle Suir Estuary is identified as *poor* due to unsatisfactory ecological/biological and/or physio-chemical status.

The WFD status (2013-2018) of groundwater underlying the Strategy area is mostly identified as being of *good* status, with some areas of *poor* status, including areas underlying Industrial Facility (P0157-02) and Waste Facility (W0018-01), within and adjacent to the southern parts of the Waterford city centre.

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 (including for the Suir, Nore and Colligan-Mahon River Basins) which have been in force since 2018 across different parts of the Strategy area.

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 Strategy Area.

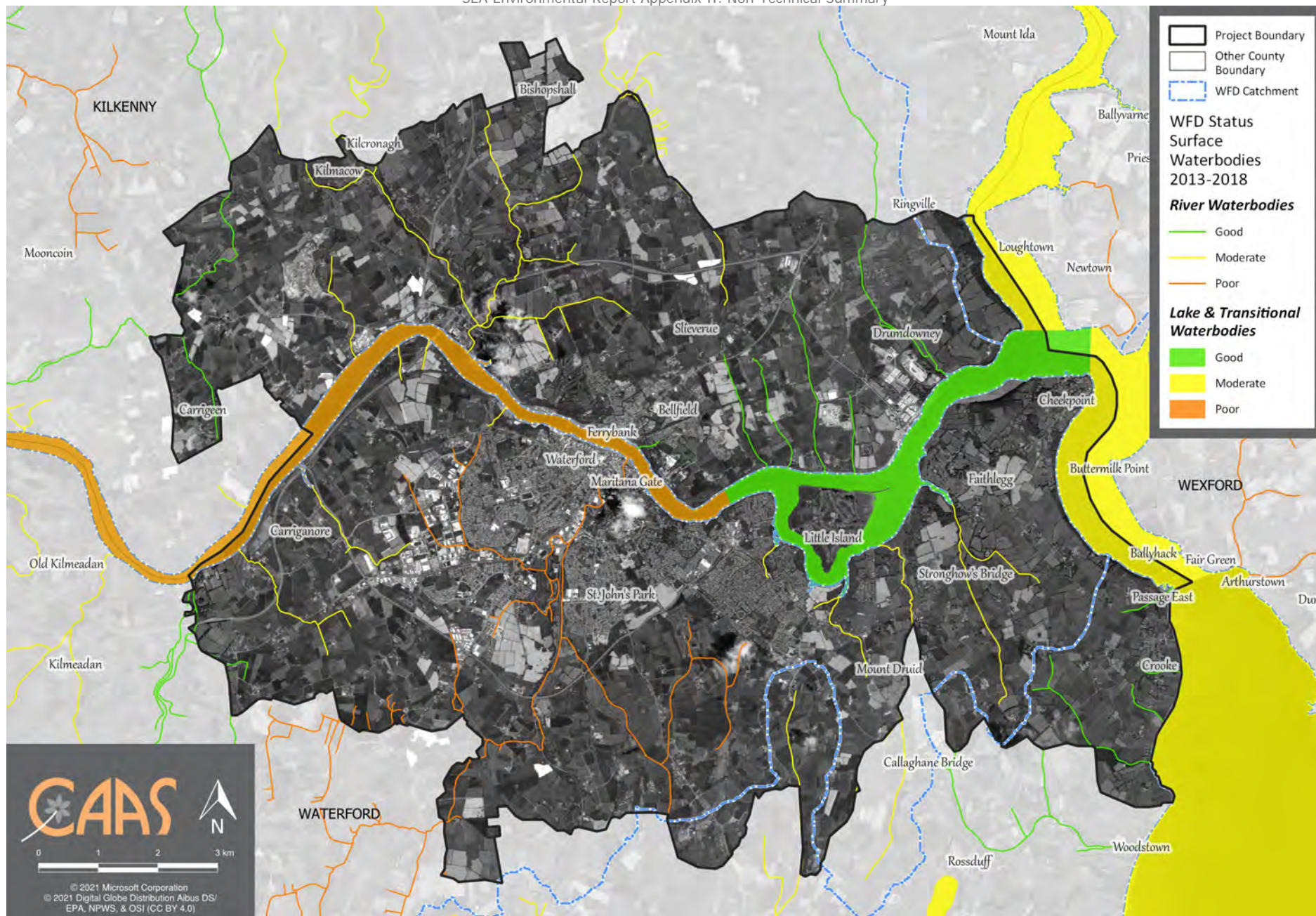


Figure 3.2 WFD Surface Water Status

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; landcover, which includes vegetation, water, human settlements, and; human values which are a result of historical, cultural, religious and other understandings and interactions with landform and landcover.

The 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 Waterford and Kilkenny 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.

transitional waterbodies, especially across the central and eastern parts of the Strategy area.

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 of the Strategy area. Robust landcover is found within and surrounding the Waterford City and in pockets throughout the Strategy area. Sensitive landcover is most common within and surrounding the rivers and transitional waterbodies, especially across the central and eastern parts of the Strategy area.

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.

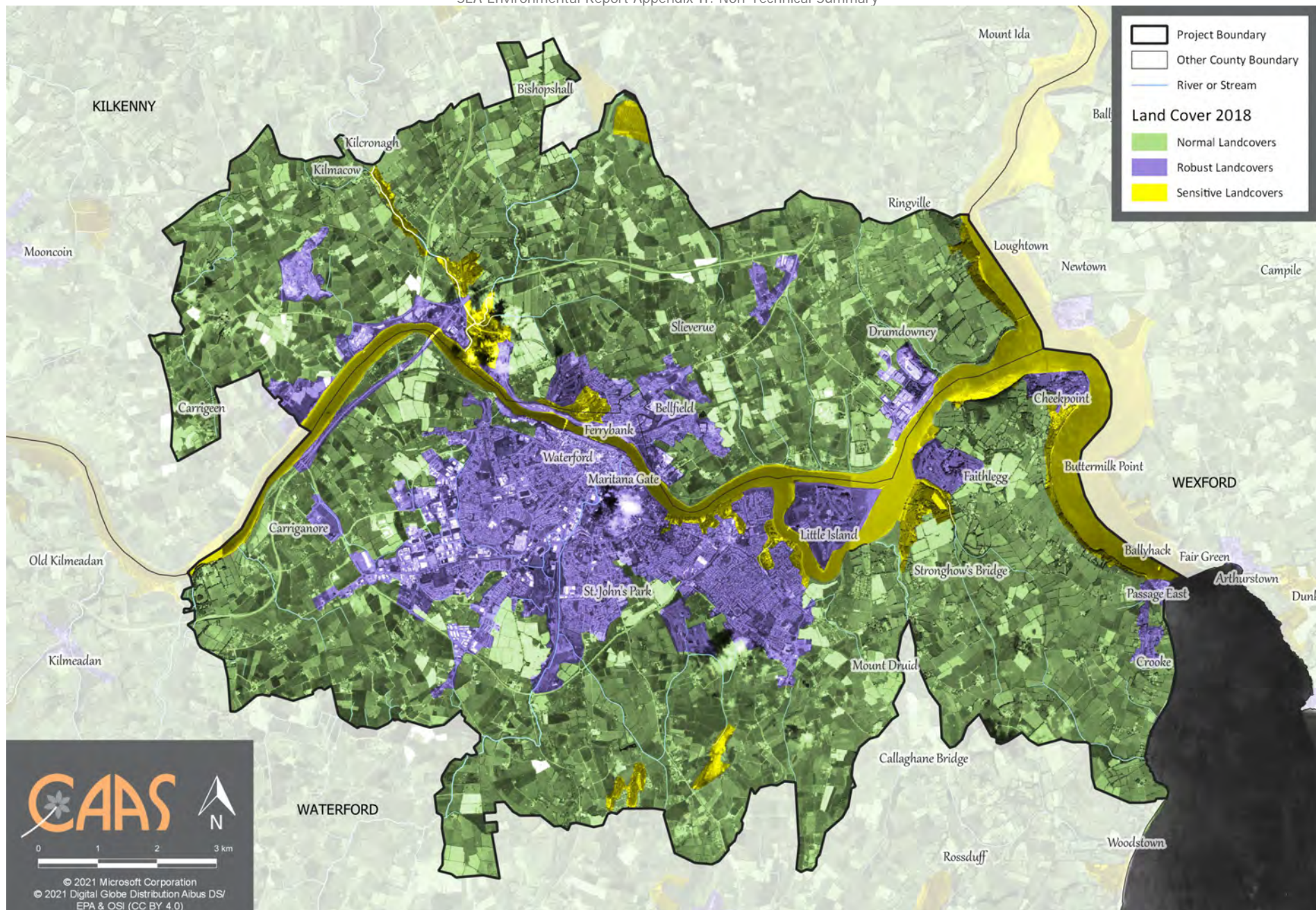


Figure 3.3 Potential Landcover Sensitivity Mapping

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.

Waterford is Ireland's oldest city and has a rich and significant archaeological heritage, with the largest collection of medieval urban defences in Ireland with six intact towers, and over 700m meters of wall. There are many sites of significant archaeological interest within the Strategy area, including the remains of a 9th century settlement in Woodstown along the River Suir - a unique and internationally important Viking site.

There are eight Monuments in State Care (four in State Ownership and four in State Guardianship)⁵ within the Strategy area, mapped on Figure 3.4 and listed below:

- Granny Castle;
- Dunbrody Abbey;
- Gaulstown;
- Knockeen;
- Reginald's Tower;
- Ballyhack Castle;
- The French Church (Waterford); and
- Duncannon.

Archaeological Heritage is mapped on Figure 3.4.

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.

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

⁵ This list of National Monuments in State care includes those which are in the ownership and guardianship of the Minister for the Environment, Heritage and Local Government.

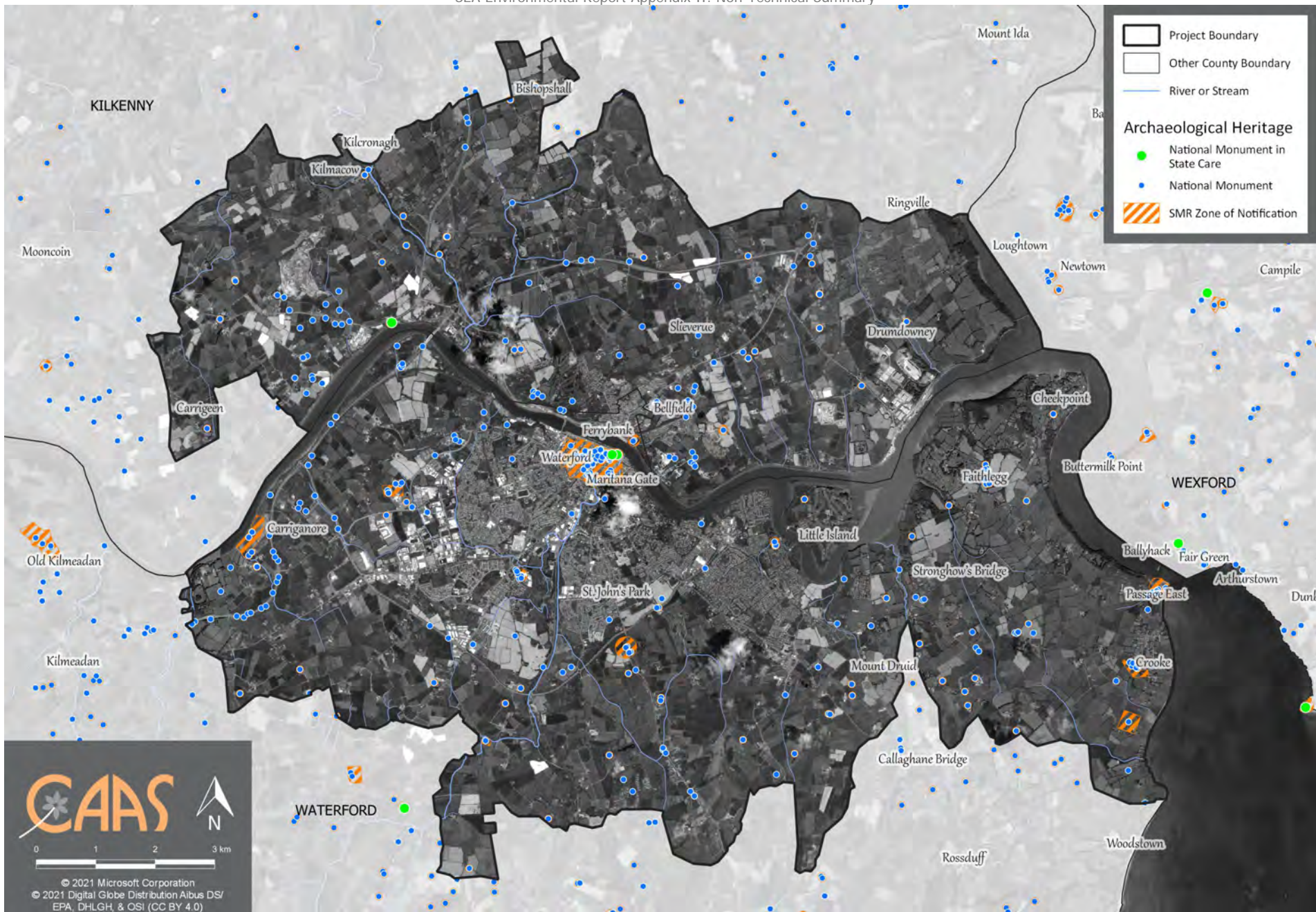


Figure 3.4 Archaeological Heritage
CAAS for the National Transport Authority

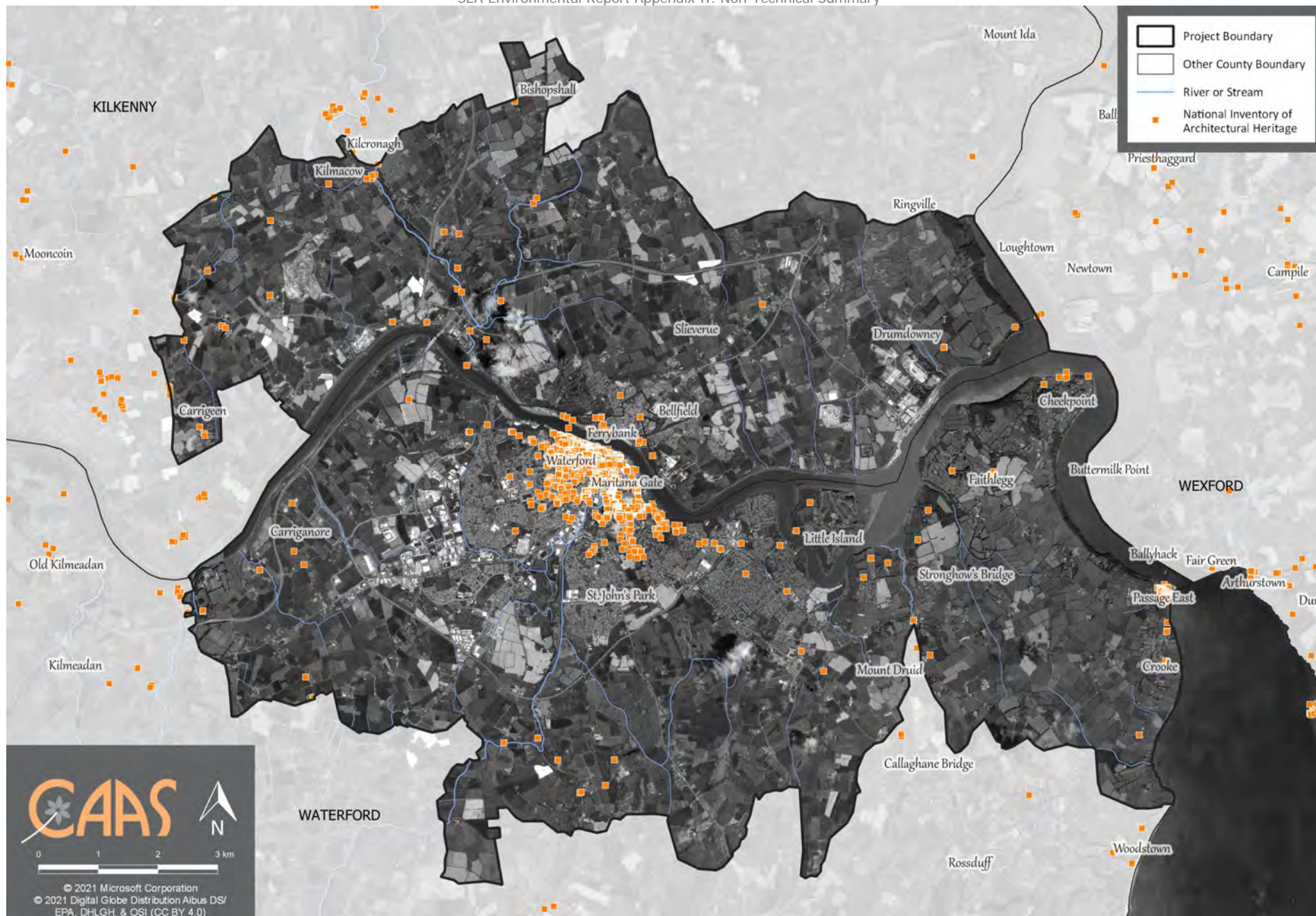


Figure 3.5 Architectural Heritage

CAAS for the National Transport Authority

3.11 Overall Environmental Sensitivities and Opportunities

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 (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.

Lower levels of sensitivity occur across most of the Strategy area. Heightened areas of sensitivity within the Strategy area include rivers, valleys, estuaries and transitional waters, chiefly those of the Rivers Suir and Barrow and their tributaries, on account of ecological designations, landscape sensitivities, areas of extreme groundwater vulnerability and flood risk. Heightened levels of sensitivity are also indicated within the central parts of the Waterford City, Maritanna Gate and Ferrybank on account of cultural heritage designations.

Heightened areas of opportunities within the Strategy area include those associated with the existing built-up footprint of the City and its suburbs. Lower levels of robustness occur elsewhere.

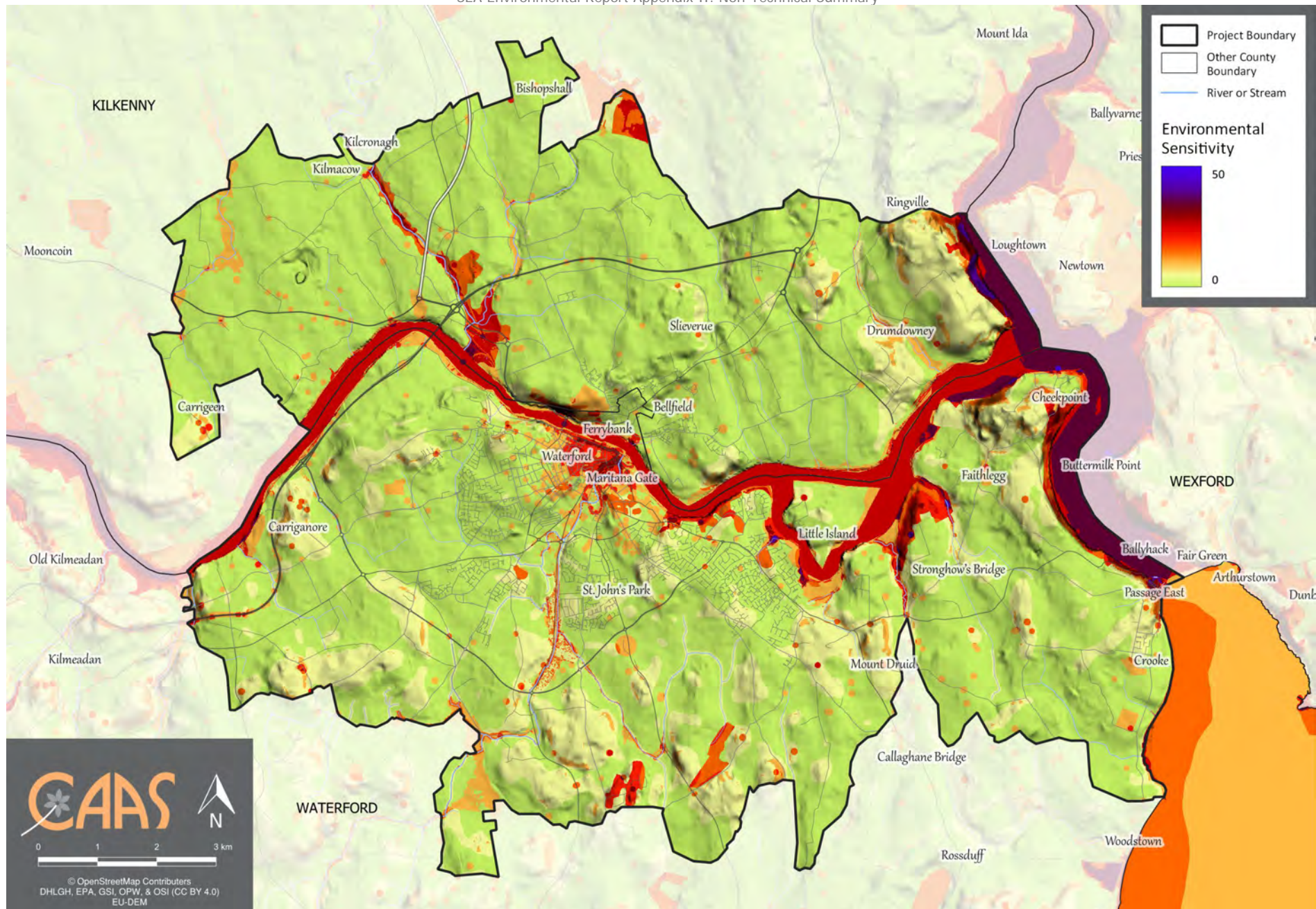


Figure 3.6 Overall Potential Environmental Sensitivity

CAAS for the National Transport Authority

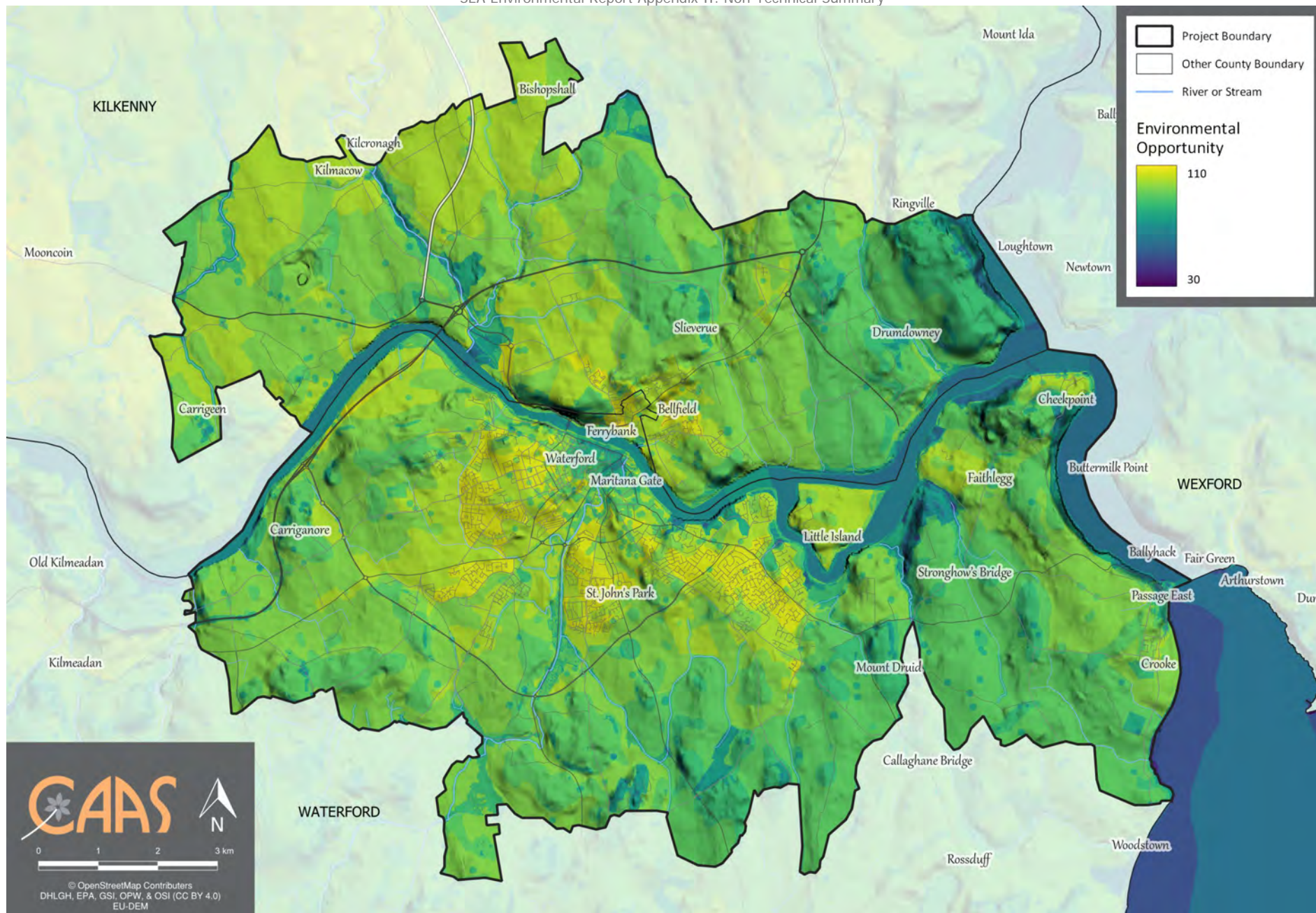


Figure 3.7 Overall Potential Environmental Opportunities

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 network⁶. 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

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 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

⁶ 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

The Metropolitan Area Strategic Plan (MASP) for Waterford provides for the preparation of the preparation of the Waterford Metropolitan Area Transport Strategy 2040 (WMATS) through Policy Objective “Integration of Land Use and Transport” 6 (a):

“Prepare WMATS during the lifetime of this MASP and ensure investment and implementation of WMATS”.

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 Southern Region (as adopted by the Southern Regional Assembly) and associated MASP, 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 provision of an enhanced public transport network within the WMA is a key priority for the Strategy.

Six guiding principles for successful public transport networks were set out to help in the early development and assessment of options. The adoption of these principles will result in an attractive public transport service that provides a realistic alternative to the private car.

Key strategic public transport corridors (A, B, C, D and E&F) and supporting public transport services for the wider WMA were identified, underpinned by these principles. Once a high-level indicative public transport network was identified, more detailed analysis and specific considerations for the public transport network were addressed at a corridor level.

Within each specific corridor of the WMA, the public transport proposals were developed based on the identified public transport demand from the ‘idealised’ network analysis. Further details on the methodology employed can be found in the supporting Demand Analysis Report and Transport Options and Network Development Report.

The identification of the appropriate infrastructure to service the demand levels for each corridor was based on a typical range of public transport capacities that can be achieved by Bus, Bus Rapid Transit (BRT), Light Rail Transit (LRT) and Heavy Rail.

With respect to the walking, cycle and road networks:

- The Walking Network in the Strategy focuses on the existing and proposed Development Plans and Local Area Plans from both Local Authorities. These plans were reviewed to enhance integration and connectivity with the measures for the cycle, public transport and road network.

- The Cycle Network in the Strategy is fundamentally based on the proposals contained within the Draft Cycle Network Plan for Waterford City and Environs 2014. This Cycle Plan was reviewed to ensure integration with the proposals for public transport, walking and roads within the Strategy.
- A review of committed and proposed road schemes was undertaken as part of the Strategy development and aligned to policy within the WMA. The road network was also reviewed with the aim of supporting new public transport, walking and cycling provision.

The following Public Transport Network Options were considered for each of the Public Transport Corridors (A, B, C, D and E&F):

- Option 1: Bus Services;
- Option 2: Bus Rapid Transit;
- Option 3: Light Rail Transit; and
- Option 4: Suburban Rail.

4.4 Summary of Evaluation of Alternatives for all Corridors

A summary of the evaluation of alternatives for all each of the Public Transport Corridors (A, B, C, D and E&F) is provided on Table 4.1.

Table 4.1 Summary of Evaluation of Alternatives for all Corridors

Alternative	Likely to improve status of the environment to a greater degree	Less Potential Conflict with status of the environment - likely to be mitigated	Moderate Potential Conflict with status of the environment - likely to be mitigated	More Potential Conflict with status of the environment - less likely to be fully mitigated	Most Conflict with status of the environment - less likely to be fully mitigated
Option 1: Bus Services	This option would improve the capacity of public transport and help to reduce congestion. Emissions (and associated interactions with human health) would be significantly lower per journey with this mode than would be the case with journeys by car. Energy security would be contributed towards. This option would also help to facilitate integration of land-use development with sustainable transport provision including appropriate levels of consolidated and intensified development around public transport networks. By facilitating consolidated and intensified development, this option would help to indirectly protect environmental components that might otherwise be impacted upon as a result of development that would potentially be spread out over greater areas and at a lower density.	As the bus-based network on this corridor under Option 1 Bus Services would be able to utilise existing road space, potential adverse direct environmental effects would be least under this option.	All options would facilitate new consolidated and intensified development, potentially indirectly affecting all environmental components.		
Option 2: Bus Rapid Transport	This option would improve the capacity of public transport and help to reduce congestion. Emissions (and associated interactions with human health) would be significantly lower per journey with this mode than would be the case with journeys by car. Energy security would be contributed towards. This option would also help to facilitate integration of land-use development with sustainable transport provision including appropriate levels of consolidated and intensified development around public transport networks. By facilitating consolidated and intensified development, this option would help to indirectly protect environmental components that might otherwise be impacted upon as a result of development that would potentially be spread out over greater areas and at a lower density.		All options would facilitate new consolidated and intensified development, potentially indirectly affecting all environmental components. Option 2 BRT would have a present a greater extent of potential adverse direct environmental effects in comparison to the bus services under Option 1, as Option 2 BRT would need more works and land to accommodate bus priority measures, junction widening and improved permeability.		
Option 3: Light Rail Transit	This option would improve the capacity of public transport and help to reduce congestion. Emissions (and associated interactions with human health) would be significantly lower per journey with this mode than would be the case with journeys by car. Energy security would be contributed towards. This option would also help to facilitate integration of land-use development with sustainable transport provision including appropriate levels of consolidated and intensified development around public transport networks. By facilitating consolidated and intensified development, this option would help to indirectly protect environmental components that might otherwise be impacted upon as a result of development that would potentially be spread out over greater areas and at a lower density.		All options would facilitate new consolidated and intensified development, potentially indirectly affecting all environmental components.	Potential adverse direct environmental effects would be elevated under Option 3 Light Rail Transit due to the construction impacts arising, particularly on lands that are already developed and in a context where there is currently an absence of this type of infrastructure.	
Option 4: Suburban Rail	This option would improve the capacity of public transport and help to reduce congestion. Emissions (and associated interactions with human health) would be significantly lower per journey with this mode than would be the case with journeys by car. Energy security would be contributed towards. This option would also help to facilitate integration of land-use development with sustainable transport provision including appropriate levels of consolidated and intensified development around public transport networks. By facilitating consolidated and intensified development, this option would help to indirectly protect environmental components that might otherwise be impacted upon as a result of development that would potentially be spread out over greater areas and at a lower density.		All options would facilitate new consolidated and intensified development, potentially indirectly affecting all environmental components.		Potential adverse direct environmental effects would be most under Option 4 Suburban Rail due to the construction impacts arising, particularly on lands that are already developed and in a context where there is currently an absence of this type of infrastructure.

The options selected for the Strategy and the reasons for their selection are detailed on Table 4.2.

Table 4.2 Selected Options for the Strategy for each Corridor

Corridor	Options Considered (Selected Option(s) for the Strategy in bold)	Reasons for Choosing the Selected Alternatives in light of Other Reasonable Alternatives Considered
A	Option 1: Bus Services Option 2: Bus Rapid Transit Option 3: Light Rail Transit Option 4: Suburban Rail	Alternatives have been selected taking into account the selected criteria (economy, environment, safety, integration and accessibility and social inclusion). "Option 1: Bus Services" is the preferred option for Corridor A based on the multi-criteria assessment, providing the most benefits in terms of Economy (return on investment), Environmental Impact and Integration. Bus Rapid Transit is not preferred given that the capacity of the bus-based option can cater for the travel demand on the corridor and provide more flexibility. However, it is acknowledged the bus network could be upgraded to a BRT type service in the future should demand exceed capacity. Travel demand, population and employment densities are below that required for any other alternative public transport measures along the corridor such as Light Rail and Heavy Rail.
B	Option 1: Bus Services Option 2: Bus Rapid Transit Option 3: Light Rail Transit Option 4: Suburban Rail	Alternatives have been selected taking into account the selected criteria (economy, environment, safety, integration and accessibility and social inclusion). "Option 1: Bus Services" is considered to be the preferred option for Corridor B based on the multi-criteria assessment, providing the most benefits overall while maximising the economic benefits and cost efficiency. Travel demand, population and employment densities are below that required for any other alternative public transport measures along the corridor such as Bus Rapid Transit, Light Rail and Heavy Rail.
C	Option 1: Bus Services Option 2: Bus Rapid Transit Option 3: Light Rail Transit Option 4: Suburban Rail	Alternatives have been selected taking into account the selected criteria (economy, environment, safety, integration and accessibility and social inclusion). "Option 1: Bus Services" is considered to be the preferential option for Corridor C based on the multi-criteria assessment, providing the most benefits overall while maximising value for money. Travel demand, population and employment densities are below that required for any other alternative public transport measures along the corridor such as Bus Rapid Transit, Light Rail and Heavy Rail.
D	Option 1: Bus Services Option 2: Bus Rapid Transit Option 3: Light Rail Transit Option 4: Suburban Rail	Alternatives have been selected taking into account the selected criteria (economy, environment, safety, integration and accessibility and social inclusion). "Option 1: Bus Services" is considered to be the preferred options for Corridor D based on the multi-criteria assessment, providing the most benefits overall while maximising value for money. Bus Rapid Transit is not preferred given the capacity of a bus-based options can cater for the travel demand and provide more flexibility. However, the bus network could be upgraded to a BRT type service in the future should demand exceed capacity. Travel demand, population and employment densities are below that required for any other alternative public transport measures along the corridor such as Light Rail and Heavy Rail.
E&F	Option 1: Bus Services Option 2: Bus Rapid Transit Option 3: Light Rail Transit Option 4: Suburban Rail	Alternatives have been selected taking into account the selected criteria (economy, environment, safety, integration and accessibility and social inclusion). "Option 1: Bus Services" is considered to be the preferred option based on the multi-criteria assessment, providing the most benefits overall while maximising the economic benefits. The corridor does not have the population or employment density to support a BRT or LRT line, while the creation of additional stations along the existing rail corridor would require substantial investment but would still not improve accessibility as the bus services provides greater coverage and flexibility in accessing the predominantly low-density residential areas in the corridor.

Section 5 Evaluation of Draft Strategy Provisions

The overall findings of the SEA are that:

- **Final 2030 Emissions Assessment**

The implementation of the WMATS elements intended for delivered by 2030 – which comprises an ambitious delivery programme for BusConnects Waterford and the WMA Cycle Network, coupled with the planned vehicle electrification and increased use of bio-fuel set out in the Climate Action Plan 2021, (taking account of the growth to 2030), will achieve a 26% reduction compared to the 2018 figure.

Additional measures are required to further reduce emissions to meet the 51% reduction target. A number of alternative approaches, as set out above, are available to achieve this supplemental reduction and it is clear that viable pathways are available to achieve the halving of greenhouse gas emissions from transport across the region by 2030.

Following the adoption of the final WMATS, it is intended that an additional demand management study will be undertaken, in conjunction with a further examination of goods vehicles operation, to develop finalised proposals to achieve the intended level of emissions reductions.

It is acknowledged that there are various permutations available to achieve the required target, 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 2021 and derived from the carbon budgets to be established under the Climate Action Plan and Low Carbon Development (Amendment) Act 2021.

- **Emissions Levels in 2040**

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 2040, the final year of the strategy, it is intended that emissions will continue on a downwards trajectory between 2030 and 2050.

The continued electrification of the transport fleet and the implementation of the remaining elements of the strategy will further reduce greenhouse gas emissions within the WMA.

- **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 Goals⁷ of the 2030 Agenda for Sustainable Development.

⁷ 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.

- **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 or 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 cycling and walking.

- **Strategy Outcomes - Key Indicators - Reduction in CO₂ Emissions from Transport in the WMA**

The WMATS, in combination with a number of Government initiatives, related primarily to the conversion of the national fleet to low and zero- emissions vehicles, is forecast to lead to a reduction in CO₂ Emissions of approximately 56% over the lifetime of the Strategy to 2040.

The rate at which this is achieved will depend on a number of factors, including the following:

1. The speed at which the conversion of the fleet to electric vehicles can be rolled out;
2. The extent to which the local authorities and the NTA deliver alternatives to the private car such as the Cycle Network and Bus Corridors;
3. The extent to which demand management measures are implemented by local and national government to reduce the use of cars; and
4. Technological advances in the area of alternative fuels for goods vehicles.

In phasing the implementation of the WMATS, many of the key Climate Action Management measures, such as BusConnects Waterford, the cycle network, traffic signal prioritisation for sustainable modes, reduced parking and vehicle electrification are front-loaded into the first phase. This enables, in conjunction with the additional steps set out in Chapter 14, transport emissions in the WMA to meet the target level of reduction by 2030.

As set out in that chapter, this will require additional assessment work on the additional emissions reduction approaches to establish and calibrate the optimal permutation, particularly in relation to demand management. The assessment work to develop this optimal

-
- 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.

framework will be undertaken at an early point in the lifetime of the WMATS in cooperation with Government and the local authorities.

- **Strategy Outcomes - Key Indicators - Air Quality**

The Transport Strategy, in combination with other Government policies and programmes, is forecast to lead to a significant reduction in air polluting emissions compared to 2016 as indicated below.

Air-polluting Emissions 2016 and 2040 (Kg)

	NOx	NO2	PM10	PM2.5
2016	232.72	70.38	16.97	11.16
2040 with strategy	41.22	10.13	15.36	8.45
Reduction	-82%	-86%	-10%	-24%

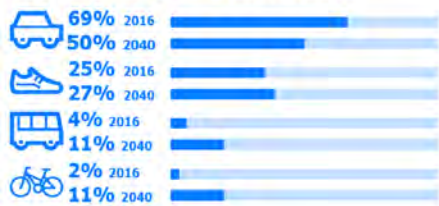
- **Strategy Outcomes - Mode Share**

The WMATS is forecast to lead to a significant reduction in car mode share for the study area as a whole, reducing from 72% in 2016 to 56% in 2040 with the WMATS in place, as indicated below.

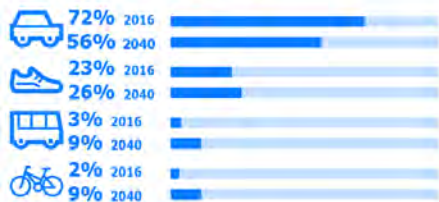
For the AM Peak period, the corresponding figures are 69% and 50%.

All other modes increase with the highest proportional increase being seen in cycling, from 2% to 11%.

AM Peak Mode Share 2016 - 2040



Mode Share 2016 - 2040



- **Strategy Outcomes - Targets for Cycling and Walking**

Notwithstanding the outputs above, which are the result of a modelling exercise only, the NTA, in conjunction with the local authorities will aim to meet the walking and cycling mode split targets set out below up to 2040.

	Walking	Cycling
WMA Baseline	23%	2%
WMA Modelled Outcome	26%	9%
WMA Target	30-35%	10-15%

The cycle infrastructure proposed under the Strategy will deliver a comprehensive and safe network of cycling routes serving all of the key areas and destinations, and with the capacity for large volumes of cyclists.

With that infrastructure in place, the level of usage will be determined by the willingness to use cycling instead of other modes, in particular the car mode. Accordingly, the cycling target is ambitious and meeting it will require high levels of cooperation from all stakeholders in the region. The higher targets for Waterford City and Suburbs reflect the greater potential for these modes due to the number of shorter trips being undertaken.

It should be noted that the modelled output in relation to cycling mode share, doesn't take account of uplifts from behavioural change programmes and targeted information campaigns, which are difficult to account for in a strategic transport model. With the addition of these measures, an increased mode share for cycling will be delivered. However, it should also be noted that the implementation of demand management measures which aim to encourage the use of alternatives to the private car further, will be required to support these higher levels of uptake.

Table 5.1 details the various types of environmental effects likely to arise with respect to the Strategy 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 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 summary at Section 6). These mitigating provisions together with the contribution that the Strategy will make to sustainable mobility (and associated interactions with emissions, air and climate, noise, human health and compact land use) means that the Strategy facilitates various significant positive effects upon the protection and management of environmental components.

Table 5.1 Overall Effects Arising from the Strategy

Environmental Component	Likely Environmental Effects, as a direct result of development and activities under the Strategy and in combination with the wider planning framework			SEOs
	Significant Positive Effect likely to occur	Potentially Significant Adverse Effect, if unmitigated	Residual Adverse Effect ⁸	
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. 	A C
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. 	PHH
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 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) 	BFF

⁸ 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	Likely Environmental Effects, as a direct result of development and activities under the Strategy and in combination with the wider planning framework			SEOs
	Significant Positive Effect likely to occur	Potentially Significant Adverse Effect, if unmitigated	Residual Adverse Effect ⁸	
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 	MA
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/estuarine erosion. 	S
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. 	W
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). 	L
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 and cycling. 	<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. 	CH

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 Southern 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
- NO_x, SO_x, 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 17 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
17. 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>
17. 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>
17. 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; • The National Biodiversity Action Plan; • Architectural Conservation Areas; and • Relevant landscape designations. <p>Where developments, arising from this strategy, do not require Environmental Impact Assessment, impacts to biodiversity will be assessed by the preparation of a non-statutory Ecological Impact Assessment (EcIA).</p>
17. Environmental Protection and Management	<p>Corridor and Route Selection Process The following Corridor and Route Selection Process will be undertaken for relevant 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; • 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.

Strategy Section No.	SEA/AA Recommended Text
17. 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 for overriding public interest, restricted to reasons of human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest. In this case, it will be a requirement to follow procedures set out in legislation and agree and undertake all compensatory measures necessary to ensure the protection of the overall coherence of Natura 2000.
17. 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)⁹.</p>
17. 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 following documents (and any superseding revisions of same): National Energy and Climate Plan (2021); the Waterford Climate Change Adaptation Strategy (2019); the Climate Action Plan (2021); the National Climate Change Adaptation Framework (2018); and the Department of Transport's Climate Change Sectoral Adaptation Plan for Transport Infrastructure (2019), 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>
17. 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 and Table 5.1 of the AA Natura Impact Statement are complied with.</p>

⁹ 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.