Draft Dublin City Development Plan 2022-2028

Strategic Environmental Assessment (SEA) - Scoping Report

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Environmental Assessment **Built Environment**

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Contents

1 Introduction

1.1 Background to the Draft Plan

A Development Plan sets out an overall strategy for the proper planning and sustainable development of the City over a six year period. Dublin City Council (DCC) has initiated the preparation a Draft City Development Plan (Draft CDP) for Dublin City which, when adopted, will replace the current Dublin City Development Plan 2016-2022 (CDP 2016-2022). The new CDP 2022-2028 will be a strategic document setting the vision, direction and shape of the future development of the city for the benefit of all its citizens up to 2028 and which will identify zones where different land uses are considered to be appropriate.

This Development Plan will be prepared under the provisions of the Planning and Development Acts 2000, as amended (PDA 2000). The CDP will consist of a written statement with map(s) and appendices. Once adopted, the Dublin CDP will provide a six year statutory framework for guiding development and will assist in ensuring that future development is appropriately managed and occurs in a sustainable manner.

The preparation of the Draft Dublin City Development Plan 2022-2028 is required to undergo Strategic Environmental Assessment (SEA) in accordance with Directive 2001/42/EC[1] (the *SEA Directive*) and associated implementing national legislation on the *Assessment of the Effects of Certain Plans and Programmes on the Environment*.

This Report comprises a Scoping of the Draft CDP 2022-2028 for SEA, prepared to inform specified Environmental Authorities of the intention of DCC to prepare a Development Plan for Dublin City, which details the:

- requirement to carry out a SEA of the CDP;
- key environmental issues;
- likely significant environmental effects;
- assessment methods to be employed; and
- structure of the Environmental Report.

[1] EC (2001).

The Draft CDP is subject to Screening for the requirement for Appropriate Assessment (AA) as required by Article 6(3) of the Habitats Directive (92/43/EEC). Appropriate Assessment is an assessment of the implications of the plan, alone and in combination with other plans and projects, on the integrity of a Natura 2000 site, in view of its conservation objectives. The finding of the Screening is that the Draft CDP will be subject to Appropriate Assessment and a Natura Impact Report (NIR) will be prepared.

The Draft CDP is also subject to a Strategic Flood Risk Assessment (SFRA) which addresses the issues of assessment and management of flood risk in the plan area.

The content of any submissions or observations received as part of the Scoping consultation exercise will inform the preparation of the Draft CDP 2022-2028 and the associated SEA Environmental Report and. The Draft CDP, SEA Environmental Report, Natura Impact Report (NIR) and Strategic Flood Risk Assessment (SFRA) will be put on public display and made available for comment from statutory bodies, the public and interested parties.

The SEA Scoping Report is prepared on behalf of Dublin City Council (DCC) by Brady Shipman Martin, Environmental, Landscape and Planning Consultants.

2 Strategic Environmental Assessment

2.1 Introduction

SEA is a process for evaluating, at the earliest appropriate stage, the environmental quality and consequences of Plans or Programmes (P/Ps). The purpose is to ensure that the environmental consequences of P/Ps are assessed both during their preparation and prior to their adoption. The SEA process also gives specified Environmental Authorities, interested parties and the general public, an opportunity to comment on the environmental impacts of the proposed P/P and to be kept informed during the decision-making process.

SEA derives from European Communities Directive 2001/42/EC - *Assessment of Effects of Certain Plans and Programmes on the Environment* (the '*SEA Directive*'). Article 1 of the Directive states that:

> *"The objective of this directive is to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development, by ensuring that, in accordance with this directive, an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment."*

The SEA Directive was transposed into national legislation by the:

- European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (Statutory Instrument (S.I.) No. 435 of 2004), as amended by European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011, (S.I. No. 200 of 2011); and
- Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004), as amended by the Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011, (S.I. No. 201 of 2011).

The former regulations relate to SEA as it applies to plans or programmes prepared for "*agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications and tourism.*"[2]

[2] Section 9(1)(a) of S.I. No. 435 of 2004 as amended by S.I. No. 200 of 2011.

The latter regulations relate to SEA as it applies to plans or programmes where the context requires, "***a development plan**, a variation of a development plan, a local area plan (or an amendment thereto), regional planning guidelines or a planning scheme."*[3] (emphasis added).

Therefore, as the development plan the subject of this report is the Draft Dublin CDP 2022-2028, the latter *Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004),* as amended by *Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations (S.I. No. 201 of 2011),* apply.

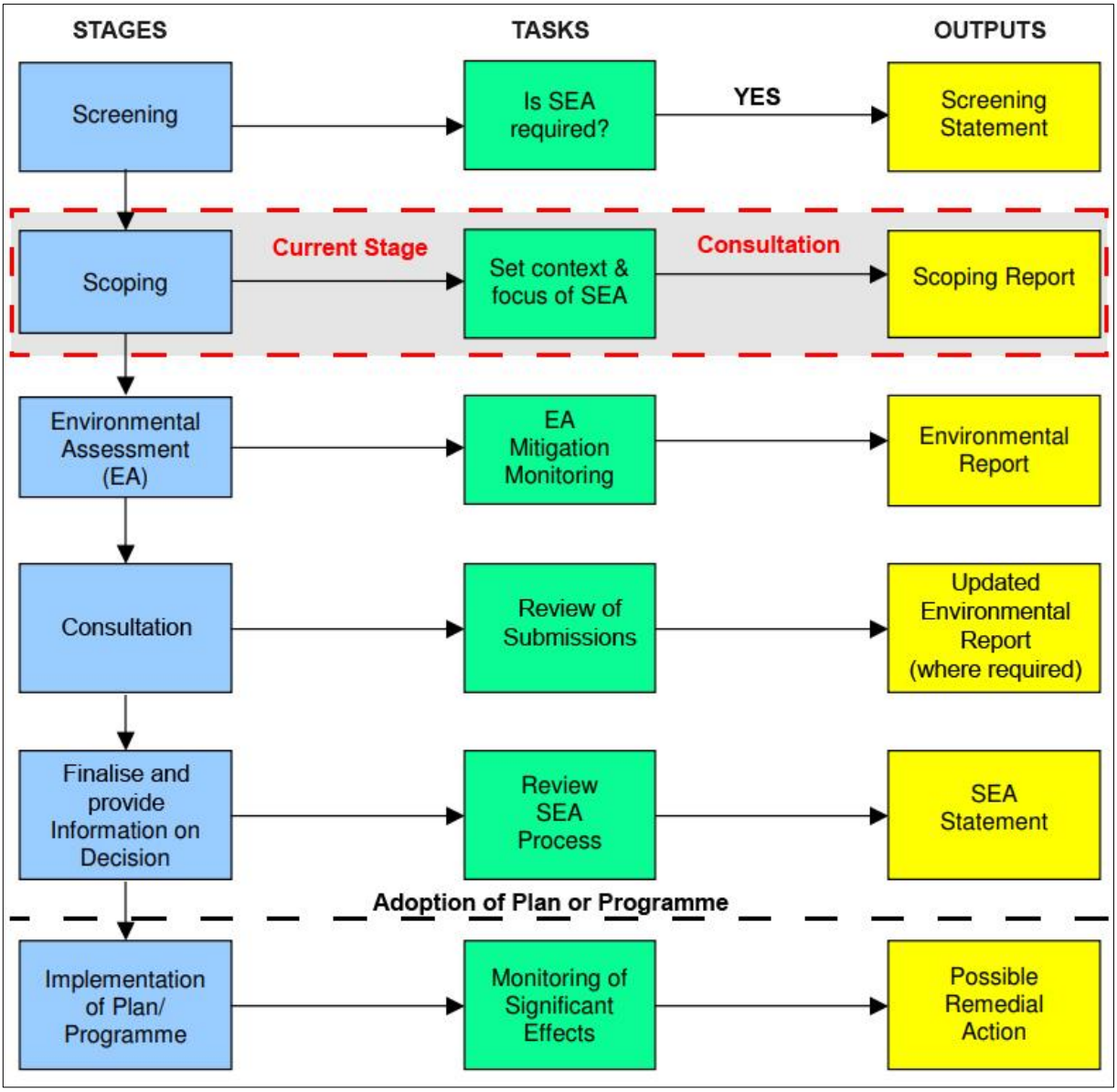
2.2 SEA Stages and Process

The key focus of SEA is to take environmental issues, and in particular '*likely significant environmental effects*' of a P/P, into consideration during the plan or programme making process. The Plan and associated SEA, Appropriate Assessment (AA) and Strategic Flood Risk Assessment (SFRA) documents are being prepared in an iterative manner, informing each other.

The key stages in the SEA process as outlined in the Environmental Protection Agency's (EPA) SEA Process Checklist and as they relate to the Draft CDP are outlined in Figure 2.1 and Table 2.1.

[3] Section 5(c) of S.I. No. 436 of 2004 as amended by S.I. No. 201 of 2011.

Figure 2.1: Overview of SEA Process (adapted from EPA SEA Process Checklist, 2008[4])



[4] EPA (2008).

Table 2.1: Outline of the SEA Process

Stage	Description	Status
1. Screening	The requirement to undertake a SEA is mandatory for certain Plan / Programme (P/P). Where SEA is not a mandatory requirement, the P/Ps is subject to a 'Screening process', to consider if it is *likely to have significant effects* on the environment, and therefore, if SEA is required. It is noted that in accordance with Circular Letter SEA 1/08 & NPWS 1/08[5], SEA for a P/P is also a mandatory requirement where the P/P requires Appropriate Assessment (AA) under Article 6(3) of the Habitats Directive (92/43/EEC[6]). SEA for a new city / county development plan is a mandatory requirement under Regulations S.I. 201 of 2011, where, as is the case in Dublin City, with a population of over 554,554 persons (2016 census), the Development Plan relates to a "*target population of the area is 10,000 persons or more*"	Complete
2. Scoping	Preparation of a SEA Scoping Report highlighting that the Environmental Report is required to include: ▪ Methods of assessment; ▪ Contents and level of detail in the Plan / Programme; ▪ The stage in the Plan or Programme-making process; and ▪ The extent to which certain matters are more appropriately assessed at different levels in the decision-making process in order to avoid duplication of environmental assessment. Scoping provides for consultation with the Environmental Authorities specified in Article 13D of PDR 2001 and the process allows for incorporation of the views of the Environmental Authorities within the P/P and the SEA Environmental Report. Section 3.16 of the *Guidelines for Regional Authorities and Planning Authorities* recommends that: '*at the end of the scoping procedure, the plan-making authority should prepare a brief scoping report of its conclusions as to what information is to be included in the environmental report, taking account of any recommendations from the environmental authorities*'.	Current Stage

[5] DEHLG (2008).
[6] EC (1992). *DIRECTIVE 92/43/EEC*.

Stage	Description	Status
3. Environmental Report	Preparation of a systemic identification and evaluation of alternatives and assessment of the *likely significant environmental effects* of implementing the P/P. The findings of the assessment, which is carried out at various stages in the P/P making (*e.g.* Draft, Amended Draft *etc*.), are provided in the SEA Environmental Report in accordance with Article 13E of S.I. No. 436 of 2004, as amended by Regulations S.I. No. 201 of 2011. The output from this stage is an Environmental Report which accompanies the Draft P/P required on public display.	Next Stage
4. SEA Statement	Completion / adoption of the Dublin CDP, taking account of *likely significant environmental effects*, any submissions or observations received from consultations and integration of mitigation and monitoring measures within the Plan. The Environmental Report is concluded and an SEA Statement is prepared in accordance with Article 13I of S.I. No. 436 of 2004, as amended by Regulations S.I. No. 201 of 2011, summarising: ▪ How environmental considerations have been integrated into the Plan / Programme; ▪ How the Environmental Report, and any submissions or consultations have been taken into account in the preparation of the Plan / Programme; ▪ The reasons for choosing the Plan / Programme; and ▪ The measures decided for monitoring the significant environmental effects of implementation of the Plan / Programme.	Final Stage

2.3 Screening for the Requirement for SEA (Stage 1)

The requirement to undertake a SEA is mandatory for certain P/Ps that are above specified thresholds (*e.g.* preparation of a new City Development Plan (CDP) with a population or target population greater than 10,000 persons).

Therefore, the Draft Dublin CDP will be subject to SEA and a SEA Environmental Report will be prepared and accompany the Draft Dublin CDP 2022-2028, Appropriate Assessment / Natura Impact Report (NIR) on public display.

2.4 SEA Scoping (Stage 2)

SEA Scoping (Stage 2) allows for consideration of the range and level of detail of the information to be included in the SEA Environmental Report as set out in Article 13D of S.I. No. 436 of 2004, as amended and by Article 13D of the Planning and Development Regulations 2001, as amended (PDR 2001). This ensures that the SEA is focused on the relevant environmental issues and examines issues at the appropriate level of detail.

Article 13D (b) S.I. No. 436 of 2004, as amended states that the Environmental Report is required to include information on:

- current knowledge and methods of assessment;
- contents and level of detail in the Plan;
- the stage of the Plan in the decision-making process; and
- the extent to which certain matters are more appropriately assessed at different levels in the decision-making process in order to avoid duplication of environmental assessment.

Section 3.16 of the *Guidelines for Regional Authorities and Planning Authorities*[7] recommends that '*at the end of the scoping procedure, the plan-making authority should prepare a brief scoping report of its conclusions as to what information is to be included in the environmental report, taking account of any recommendations from the environmental authorities*'.

Scoping also includes for consultation with the Environmental Authorities specified in Article 13A(4) of PDR 2001 and for incorporation of the views of the Environmental Authorities within the Plan or Programme and the SEA Environmental Report.

[7] DEHLG (2004).

The SEA Scoping Report will be issued to the following Environmental Authorities specified in Article 13D(2) of PDR 2001, see Table 2.2 below.

Table 2.2: List of Consultees for the Scoping Stage

Prescribed Environmental Authorities*	
Environmental Protection Agency (EPA)	Dún Laoghaire - Rathdown County Council (DLRCC)
Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media (formerly the Department of Culture, Heritage and the Gaeltacht)	Fingal County Council (FCC)
Department of the Environment, Climate and Communications (formerly the Department of Communications, Climate Action and Environment)	South Dublin County Council (SDCC)
Department of Agriculture, Food and the Marine	
Department of Housing, Local Government and Heritage (formerly the Department of Housing, Planning and Local Government)	

**For consultation under Article 13A(4) of Planning and Development Regulations 2001, as amended*

2.5 Appropriate Assessment (AA)

The Draft Dublin CDP is subject to Screening as required by Article 6(3) of the Habitats Directive (92/43/EEC) for the requirement for AA. Appropriate Assessment is an assessment of the implications of the plan, alone and in combination with other plans and projects, on the integrity of a Natura 2000 site, in view of its conservation objectives.

There are overlaps between the SEA and AA processes as both assessments consider the potential impacts of the Plan on biodiversity.

The Draft Dublin CDP will be subject to '*Stage 2 AA'* as required by Article 6(3) of the Habitats Directive (92/43/EEC) and a Natura Impact Report (NIR) will be prepared and accompany the Draft Dublin CDP and SEA Environmental Report on public display. The findings of the Stage 2 AA will be incorporated in the SEA, under the biodiversity assessment.

2.6 Strategic Flood Risk Assessment

The Draft CDP is subject to a Strategic Flood Risk Assessment (SFRA) which addresses the issues of assessment and management of flood risk in the plan area. The SFRA will be prepared in accordance

with the requirements of *The Planning System and Flood Risk Assessment Guidelines for Planning Authorities*[8].

The Guidelines adopt a sequential approach when integrating flood risk assessment into the process of policy and plan making based on avoidance, reduction and mitigation of risk. Zoning objectives would generally restrict development in at-risk areas. The SFRA for the proposed CDP will need to consider global warming and resultant increases in rainfall intensity / changed rainfall patterns, as well as increased threats to coastal areas.

2.7 SEA Guidance

The SEA Environmental Report will reflect the requirements of Directive 2001/42/EC *on the Assessment of the Effects of Certain Plans and Programmes on the Environment* (the SEA Directive) and the national implementing legislation, S.I. No. 436 of 2004, as amended by Regulations S.I. No. 201 of 2011, and the PDR 2001, as amended.

The following principal sources of guidance were used in the SEA process including in the preparation of the Environmental Report:

- DCCAE (2019). *Climate Action Plan 2019, To Tackle Climate Breakdown.* Department of Communication, Climate Action & Environment.
- DECLG (2013a). *Circular Letter PSSP 6/2011: Further Transposition of EU Directive 2001/42/EC on Strategic Environmental Assessment (SEA).*
- DECLG (2013b). *Circular Letter PL 9/2013: Article 8 (Decision Making) of EU Directives 2001/42/EC on Strategic Environmental Assessment (SEA) as amended*.
- DEHLG (2004). *Implementation of SEA Directive (2001/42/EC): Assessment of the Effects of Certain Plans and Programmes on the Environment.*
- DEHLG (2008). *Circular Letter SEA 1/08 & NPWS 1/08: Appropriate Assessment of Land Use Plans*.
- DEHLG (2009). *Guidelines for Planning Authorities. The Planning System and Flood Risk Management.*
- EC (2000). *Managing Natura 2000 Sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.*

[8] DEHLG (2009).

- EC (2001). Directive 2001/42/EC on the *assessment of Certain Plans and Programmes on the Environment.*
- EC (2002). *Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*.
- EC (2004). *Guidance on Implementation of Directive 2001/42/*EC.
- EC (2013). *Guidance on Integrating Climate Change and Biodiversity into Strategic Environmental Assessment.*
- EPA (2008). *SEA Process Checklist.*
- EPA (2013a). *Integrated Biodiversity Impact Assessment - Streamlining AA, SEA and EIA Processes: Practitioner's Manual. Strive Report Series No. 106*.
- EPA (2013b). *SEA Resource Manual for Local and Regional Planning Authorities*.
- EPA (2015). *Developing and Assessing Alternatives in Strategic Environmental Assessment - Good Practice Guidance.*
- EPA (2019a). *Good Practice Note on Strategic Environmental Assessment on the Waste Sector.*
- EPA (2019b). *Integrating Climatic Factors into the Strategic Environmental Assessment Process in Ireland - A Guidance Note.*
- EPA (2020a). *SEA of Local Authority Land Use Plans - Recommendations and Resources*. Updated 2020.
- EPA (2020b). *Guidance on Strategic Environmental Assessment (SEA) Statements and Monitoring.*
- EPA (2020c). *Good practice guidance on Cumulative Effects Assessment in SEA.*
- EPA (2020d). *Second Review of SEA Effectiveness in Ireland.*
- EPA (2020e). *SEA Pack*. Updated 2020.
- EPA (2020f). *SEA Spatial Information Sources Inventory.* Updated November 2020.
- EPA (2020g). *Ireland's Environment - An Integrated Assessment 2020.*
- EPA (2020l). *Ireland's Greenhouse Gas Emissions Projections for 2019-2040.*
- EPA (2021a). Environmental Mapping / Geographical Information System (GIS) tools at: http://gis.epa.ie/SeeMaps
- EPA (2021b). EPA Water Quality Reports: http://www.epa.ie/pubs/reports/water/waterqua/
- EPA (2021c). EPA Air Quality Reports at: http://www.epa.ie/pubs/reports/air/quality/

- EPA (2021d). EPA **Spatial Information Sources** at: http://www.epa.ie/pubs/advice/ea/
- EPA (2021e). EPA **SEA WebGIS Tool** at: https://gis.epa.ie/EPAMaps/SEA
- EPA (2021f). EPA **WFD Application** at: www.catchments.ie
- EPA (2021g). EPA **AA GeoTool** at: https://gis.epa.ie/EPAMaps/AAGeoTool
- ESM Webtool at: www.enviromap.ie
- NPWS (2009). *Appropriate Assessment of Plans and Projects in Ireland*.
- Planning and Development Regulations 2001, as amended.
- S.I. No. 201 of 2011 - Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011.
- S.I. No. 436 of 2004 - Planning and Development (Strategic Environmental Assessment) Regulations 2004.

3 Draft Dublin City Development Plan 2022-2028

3.1 Introduction

The current Development Plan is the Dublin City Development Plan 2016-2022. Dublin City Council (DCC) is required to prepare a new development plan and has initiated the preparation of the Draft Dublin City Development Plan 2022-2028, which once adopted will replace the current CDP. The Draft CDP 2022-2028 will shape the City's future development and will set out a shared vision to guide future development for the benefit of the City and all its citizens.

It is an objective of DCC to ensure continued consolidation of the City, sustainable patterns of development and the creation of a dynamic and vibrant City core complemented by well serviced and integrated neighbourhoods.

Dublin City covers an area of 115km^2 and has a population of 554,554 people (Census 2016). Dublin City is divided into five administrative areas, called Local Areas, which co-ordinate the delivery of services in the community. The City is bounded by adjoining counties of South Dublin, Fingal and Dún Laoghaire - Rathdown.

Since the adoption of the 2016 Development Plan, the City has experienced an upward trend in growth. Over the inter-censal five-year period from 2011 to 2016, the overall increase in the population of Dublin City was approximately 25,400 people or 4.6%[9]. The National Planning Framework (NPF) acknowledges the critical role that Dublin City plays in the country's competitiveness of the country and supports the growth in jobs and population in Dublin, anticipating that the City and suburbs will accommodate an extra 235,000 to 293,000 people by 2040.

DCC gave notice of its intention to review the existing Dublin City Development Plan 2016 - 2022 and to prepare a new CDP for the period 2022-2028 on Tuesday, 15 December 2020. Pre-draft public consultation was undertaken over an 8-week period from 15 December 2020 to 22 February 2021 and written submissions or observations were invited with regard to the review of the current CDP and the preparation of the new Dublin City Development Plan. The review and preparation of the new plan will take up to two years, finishing in late November 2022.

The new Development Plan will be prepared under the provisions of the Planning and Development Acts 2000, as amended (PDA 2000). The new CDP will consist of a written statement with map(s) and

[9] 554,554 persons (Census 2016), from 529,154 persons (2011 Census).

appendices, together with the associated SEA Environmental Report, SEA Statement, Appropriate Assessment Natura Impact Report (NIR) and Strategic Flood Risk Assessment (SFRA). Once adopted, the Final Development Plan will provide a six year statutory framework for guiding development and will assist in ensuring that future development is appropriately managed and occurs in a sustainable manner.

3.1.1 Background Review by Dublin City Council

Dublin City Council have undertaken a background review to ensure the proposed CDP will contribute towards environmental protection and sustainable development.

This background review was undertaken prior to the Pre-Draft Consultation Phase. The findings from this background review will be integrated into the Draft Plan and will contribute towards both environmental protection and management and sustainable development within the City. The background review included:

- Vision and Core Strategy;
- climate action;
- shaping the future growth and development of the City;
- housing;
- economy;
- retail;
- movement and transport;
- sustainable environmental infrastructure;
- green infrastructure;
- built heritage and archaeology;
- sustainable communities; and
- culture.

3.2 Outline of the Draft Plan

The Draft Plan will be set out in a series of volumes and comprises a written statement and development objectives for the Plan area. The Draft Plan will include a Core Strategy which sets out how the objectives in the Draft Plan are consistent, as far as practicable, with national and regional development objectives set out in the *National Planning Framework* (NPF) and the *Regional Spatial and Economic Strategy* for the Eastern and Midlands Region (RSES).

The preparation of the Draft Plan will have regard to key recent development trends and national, regional and local policy developments, in particular, the National Planning Framework (NPF) and National Development Plan, the Eastern Midlands Regional Spatial and Economic Strategy (RSES) and the Dublin Metropolitan Area Strategic Plan (MASP).

The Draft Plan will also addresses a wide range of interrelated economic, social and environmental issues set within an overall framework of achieving sustainable development, social inclusion and adapting to climate change.

3.2.1 Core Strategy

The aim of the Core Strategy[10] is to set out an evidence-based strategy for the future spatial development of the Development Plan area. The Core Strategy presents the medium to long-term evidence-based strategy for the spatial development of the City. It must show that the development objectives in the Plan, are consistent as far as practicable, with higher level national and regional development objectives.

The framework for the draft Core Strategy will be based on the key principles and objectives of the NPF, RSES including the MASP and specific planning policy requirements of the Ministerial Guidelines. It must apply a compact growth philosophy to the existing urban footprint of the City with particular focus on regionally identified residential and mixed-use communities along existing and proposed strategic transport corridors with the ability to deliver a reduced carbon footprint.

3.2.2 Vision

The long-term vision for Dublin, set out in the current CDP 2016-2022, carries a 25 - 30 year horizon. The words used to describe this vision of the Dublin City are:

> *"Sustainable, dynamic, resourceful, beautiful, compact, distinct character, vibrant culture, diverse, smart, green, innovative – based economy, socially inclusive, connected by exemplary public transport, interwoven with quality bio-diverse green space networks, zero carbon city, climate friendly and resilient city".*

This current Vision, encapsulating the current core strategy, aims to create:

- A Compact, Quality, Green Connected City;
- A Prosperous, Enterprising, Creative City and

[10] Planning and Development Act 2000 (2020). Updated 2020.

- A City of Sustainable Neighbourhoods and Communities.

The Plan also includes a series of zoning maps which form the basis for deciding the appropriate location for different types of development across the City and which underpin the decision-making process for planning applications.

3.3 Pre-draft Consultation

DCC gave notice of its intention to review the existing Dublin Development Plan 2016- 2022 and to prepare a new City Development Plan (CDP) for the period 2022-2028 on Tuesday, 15 December 2020. Pre-Draft public consultation was undertaken over an 8-week period from 15 December 2020 to 22 February 2021.

The Council encouraged members of the general public, businesses, residents' associations, community organisations, youth groups and children to have a say in influencing and helping to frame the general direction of the next City Development Plan.

Virtual Public Webinars were held on Monday 25 and Tuesday 26 January 2021.

A total of 752 no. submissions were received, in relation to the pre-draft Plan at that time. These submissions are summarised in the Chief Executive's Report (19 April 2021) and informed this scoping process. Submissions on the pre-draft plan where identified under key themes, including:

- Shaping the City.
- Climate Action.
- Quality Housing and Sustainable Neighbourhoods.
- City Economy.
- The City, Urban Villages and Retail.
- Sustainable Movement and Transport.
- Green Infrastructure, Open Space, Recreation and Natural Heritage.
- Built Heritage.
- Culture.
- Sustainable Environmental Infrastructure and Flooding.
- Other.

3.4 Alternatives

The SEA process requires the consideration of '*reasonable alternatives*' in terms of possible approaches available in the delivery of the Draft Plan. Alternatives should represent a range of different approaches within the statutory and operational requirements of the particular plan.

The Plan strategy options available to the local authority will be discussed in the formulation of the Draft Plan and assessed against the SEA Strategic Environmental Objectives (SEOs) in order to evaluate their overall potential environmental impact. A discussion of the merits or otherwise of each option will be provided in the Environmental Report and the reasons for the chosen option will be discussed.

Alternatives must be reasonable, realistic and capable of implementation and should represent a range of different approaches within the statutory and operational requirements of the plan. It should be noted that the position of the CDP within the plan hierarchy under the National Planning Framework (NPF) and the Regional Spatial and Economic Strategy (RSES) for the Eastern and Midlands Region significantly predetermines the scope of the strategic alternatives available. The content of the Plan and any alternatives derived are also predetermined by relevant sections of the PDA 2000. It is further acknowledged that as an urban area, where substantially all City lands are already zoned, alternatives based around additional zoning and its location are not available.

In developing alternatives the '*do-nothing*' approach is not considered a realistic option due to the statutory requirement to prepare a new Development Plan, taking account of key national and regional plans, guidelines and strategies.

Developing combinations incorporating the key elements of the Development Plan, i.e. the plan framework, plan structure and settlement strategy to include zoning shall provide the foundation for the formulation of alternatives at the next stage of the SEA process in the Environmental Report. As stated any alternatives considered will take account of national and regional policy objectives *e.g*. compact growth.

Each alternative will be assessed for possible significant effects on the environment. The alternatives will then be graded to determine which has the least amount of impact. It should be noted that the SEA is not a decision-making tool but a decision-informing tool and where alternatives with negative environmental effects are selected for other reasons (*e.g*. cost, policy drivers or public need), the SEA has an important role in identifying mitigation measures to avoid or reduce these effects.

4 Relationship to Relevant Plans and Programmes

4.1 Planning Context

The Draft Dublin City Development Plan (CDP) 2022-2028 will be prepared in accordance with the Planning and Development Acts 2000, as amended, which sets out the statutory requirements and content of a development plan. In accordance with the PDA 2000, the Development Plan is strategic in nature for the purposes of developing objectives to deliver an overall strategy for the proper planning and sustainable development of the City and has taken account of the statutory obligations of the Council and the relevant policies or objectives of the Government or Ministers of the Government.

4.2 Planning Hierarchy

The CDP is framed within a hierarchy of strategic action including plans and programmes and therefore is subject to higher level planning and environmental policies and objectives. This hierarchy of plans, programmes, policies, *etc*. sets the legislative and policy framework by which the CDP must be formulated.

In this instance, the Plan must comply with the requirements of the EU and National Planning and Development-related legislation, as well as higher level plans including *Project Ireland 2040: National Planning Framework* (NPF); the *Regional Spatial and Economic Strategy* (RSES) for the Eastern and Midlands Region and National Plans (refer to Tables 4.1 to 4.3). The objectives of the NPF is applied on a regional basis through statutory Regional Spatial and Economic Strategies. The RSES must accord with the NPF and in turn, local authority development plans which address further detailed local matters, must be in accordance with the RSES.

The Plan must also comply with wide range of theme related plans and programmes such as the *River Basin Management Plans, Regional Waste Management Plans etc*. (refer to Tables 4.3).

Being a city / county-level plan, the CDP sets the framework for lower-level plans, such as local area plans and other city and lower level plans and programmes (refer to Table 4.4).

Both the NPF and RSES, as well as the majority of other and lower level plans have also been subject to the Strategic Environmental Assessment (SEA) process.

4.3 Interaction with Other Relevant Plans and Programmes

There is a legislative framework for the protection of the environment and our natural resources. Where relevant these are referenced in the plan-making process for the CDP and the Draft Plan includes relevant objectives for integration with key aims and requirements.

Table 4.1 and Table 4.2 provides a list of the principal legislative and principal EU frameworks.

Table 4.1: Legislative Framework

Legislative Framework	
EU Level	
Strategic Environmental Assessment (SEA) Directive (2001/42/EEC)	EU Landfill Directive (1999/31/EC)
Environmental Impact Assessment Directive (2011/92/EU) as amended by (2014/52/EU)	Waste Framework Directive (2008/98/EC) as amended by Directive (EU) 2018/851
Habitats Directive (92/43/EEC)	Environmental Noise Directive (2002/49/EC)
Birds Directive (2009/147/EC) on the Conservation of Wild Birds, 1979	Environmental Liability Directive (2004/35/EC)
Water Framework Directive (WFD) (2000/60/EC)	Air Quality Fourth Daughter Directive (2004/107/EC)
Flood Directive (2007/60/EC)	Air Quality Clean Air For Europe (CAFÉ) Directive (2008/50/EC)
Marine Strategy Framework Directive (2008/56/EC)	Directive 2009/28/EC (on the promotion of the use of energy from renewable sources)
Groundwater Directive (2006/118/EC)	Renewable Energy Directive 2018/2001/EU
Drinking Water Directive (98/83/EC)	Energy Performance of Buildings Directives 2010/31/EU and 2018/844
Urban Wastewater Directive (91/271/EEC)	Energy Efficiency Directive (2012/27/EU)
Nitrates Directive (91/676/EC)	Sewage Sludge Directive (86/278/EEC)
Seveso III Directive (2012/18/EU)	
National Level	
Planning and Development Acts 2000, as amended	The National Monuments Act 1930-2004
Planning and Development Regulations 2001, as amended	Climate Action and Low Carbon Development Act 2015
European Communities (Birds and Natural Habitats Regulations) 2011 (S.I. No. 477 of 2011)	Climate Action Bill 2020

Legislative Framework	
Wildlife Act 1976, as amended	Climate Action and Low Carbon Development (Amendment) Bill 2020
Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436/2004) as amended by S.I. 201 of 2011	Roads Act 1993, as amended
The Water Services Act (2007 & 2013)	Waste Management Act 1996 as amended

Table 4.2: EU Frameworks

EU Frameworks	
Renewable Energies in the 21st Century: Building a More Sustainable Future	A New Circular Economy Action Plan for a Cleaner More Competitive Europe (2020)
EU 2030 Climate and Energy Package	European Landscape Convention 2000
EU Energy Road Map 2050	EU Biodiversity Strategy 2030

Tables 4.3 and 4.4 provide a working list of some of the principal plans, programmes and guidelines influencing the formulation of the CDP policy, either directly or through European, National and / or city / county level.

Table 4.3: Relevant National & Regional Plans, Programmes and Guidelines

National & Regional Plans, Programme & Guidelines	
Project 2040: National Planning Framework (NPF)	Draft Bioenergy Plan (2014)
Regional Spatial and Economic Strategy (RSES) for the Eastern and Midlands Region (EMR)	Offshore Renewable Energy Development Plan (2018)
Metropolitan Area Strategic Plan for Dublin (MASP) (June 2019)	Draft Revised Wind Energy Development Guidelines (2019)
Ireland's Environment - An Assessment (2020)	Draft Statutory Climate Change Adaptation Plan for the Transport Sector (2019)
National Mitigation Plan 2017	National Air Pollution Control Programme (NAPCP) (2019)
Local Area Plans - Guidelines for Planning Authorities (2013)	Draft National Clean Air Strategy
Our Sustainable Future - A Framework for Sustainable Development for Ireland (2012) and Progress Report 2015	Traffic and Transport Assessment Guidelines (2014)

National & Regional Plans, Programme & Guidelines	
National Adaptation Framework (2018)	Grid Development Strategy - Your Grid, Your Tomorrow. Eirgrid
Delivering Homes, Sustaining Communities. Statement on Housing Policy (2007)	Tomorrow's Energy Scenarios 2017: Planning our Energy Future
Action Plan for Housing and Homelessness - Rebuilding Ireland (2016)	Transport 21, as superseded by the Department of Public Expenditure and Reform document titled Infrastructure and Capital Investment (2012-2016)
National Biodiversity Action Plan 2017-2021	National Policy Framework for Alternative Fuel Infrastructure in Transport in Ireland (2017-2030)
Management Plans for Natura 2000 sites	Integrated Implementation Plan (2019-2024) (Transport)
All-Ireland Pollinator Plan 2015-2020	NTA Transport Strategy 2016-2035
River Basin Management Plan for Ireland 2018-2021	Smarter Travel - A Sustainable Transport Future - Transport Policy for Ireland 2009-2020
National CFRAMS Programme (2011)	The Greenway Strategy - Strategy for the Future Development of National and Regional Greenways (2018)
The Planning System and Flood Risk Management for Planning Authorities (2009)	Architectural Heritage Protection Guidelines for Planning Authorities (2011)
Eastern Catchment Flood Risk Assessment and Management (CFRAM) Study (2011-2016)	Heritage Ireland 2030
Water Services Strategic Plan. A Plan for the Future of Water Services (2015) (Irish Water)	Realising Our Rural Potential - Action Plan for Rural Development (2018)
Draft National Marine Planning Framework	Rural Development Programme (2014-2020)
National Marine Research & Innovation Strategy 2017-2021	National Landscape Strategy 2015-2025
National Policy Position on Climate Action and Low Carbon Development (2014)	Eastern Midlands Region Waste Management Plan 2015-2021
National Climate Action Plan 2019-2024	National Hazardous Waste Management Plan (2014)
National Energy Efficiency Action Plan for Ireland #4 (2017-2020)	A Waste Action Plan for a Circular Economy - National Waste Policy for 2020-2025
Ireland's National Renewable Energy Action Plan (2018)	Tourism Action Plan 2019-2021
National Energy and Climate Plan 2021-2030	Food Harvest 2020 / FoodWise 2025

National & Regional Plans, Programme & Guidelines	
National Renewable Electricity Policy and Development Framework (2016)	National Broadband Plan (2019) and National Digital Strategy (2018)
Ireland's Transition to a Low Carbon Energy Future 2015-2035	Ready, Steady, Play: National Play Strategy Guidelines (2019)
White Paper On Energy: Ireland's Transition to a Low Carbon Energy Future 2015-2030	
Section 28 Guidelines	
Design Manual for Urban Roads and Streets (2019)	Urban Development and Building Heights: Guidelines for Planning Authorities (2020)
Sustainable Urban Housing: Design Standards for New Apartments (2020)	Guidelines for Local Authorities and An Bord Pleanála on Carrying Out Environmental Impact Assessments (2018)
Part V of the Planning and Development Act 2000 – Guidelines (2017)	Interim Guidelines for Planning Authorities on Statutory Plans, Renewable Energy and Climate Change (2017)
Local Area Plans: Guidelines for Planning Authorities (2013)	Development Contributions: Guidelines for Planning Authorities (2013)
Retail Planning: Guidelines for Planning Authorities (2012)	Architectural Heritage Protection: Guidelines for Planning Authorities (2011)
Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities (2009)	The Planning System and Flood Risk Management: Guidelines for Planning Authorities (2009)
Sustainable Residential Development in Urban Areas (Cities, Town and Villages): Guidelines for Planning Authorities (and the accompanying Urban Design Manual: a best practice guide) (2009)	The Provision of Schools and the Planning System: A Code of Practice (2008)
Development Management: Guidelines for Planning Authorities (2007)	Development Plans: Guidelines for Planning Authorities (2007)
Wind Energy Development: Guidelines for Planning Authorities (2006)	Implementation of the SEA Directive: Guidelines for Regional Authorities and Planning Authorities (2004)
Quarries and Ancillary Activities: Guidelines for Planning Authorities (2004)	Childcare Facilities: Guidelines for Planning Authorities (2001)
Telecommunications Antennae Support Structures: Guidelines for Planning Authorities (1996)	Tree Preservation Guidelines (1994)

Table 4.4: Relevant Local Plans and Programmes

Local Plans and Programmes	
Dublin City Capital Programme 2019-2021	Dublin City Heritage Plan
Local Economic and Community Plan 2016-2021	The Geological Heritage of Dublin City: An audit of County Geological Sites in Dublin City 2014
Dublin City Biodiversity Action Plan 2015 - 2020 (update due in 2021)	Dublin Agglomeration Environmental Noise Action Plan 2018-2023. Volume 1: DCC
Dublin City Invasive Alien Species Action Plan (2016-2020)	The Heart of Dublin: City Centre Public Realm Masterplan 2016 - 2034[11]
Dublin City Parks Strategy 2019-2022	Dublin City Sport and Wellbeing Strategy 2017-2020
Dublin City Tree Strategy 2016-2020	STRIDE 2017-2020
Dublin Tree Canopy Study 2017	Draft Dublin City Play Plan 2018-2025
Dublin Port Masterplan 2012-2040	2012 Your City, Your Space; Dublin City Public Realm Strategy
Dublin City Climate Change Action Plan 2019 - 2024	
To be published in 2021	
New Invasive Alien Species Action Plan	Dublin City Play Plan

[11] Note: The Public Realm programme is aligned over three Development Plans to 2034

5 Environmental Baseline and Issues

5.1 Introduction

Baseline data assists in assessing the current state of the environment, facilitating the identification, evaluation and subsequent monitoring of the effects of the Plan. Thus, this information creates a platform whereby existing issues relevant to the Dublin City Development Plan area can be quantified, where possible, or qualified thereby ensuring that the implementation of Dublin CDP does not exacerbate identifiable problems.

Baseline data will be collected for the various environmental receptors described in the SEA Directive *i.e.* biodiversity, fauna, flora, population, human health, soil, water, air, climate factors, material assets, cultural heritage including architectural and archaeological heritage, and landscape and the interrelationship between the above factors. An overview of the various receptors and the issues of concern raised at the initial public consultation phase of the Plan's preparation were considered and influenced the preparation of the Scoping Report.

An Issues Paper prepared by Dublin City Council (DCC) and outlining the relevant items for discussion prior to the formulation of the Plan also informs the issues to be considered in the CDP. This document was made available to the public during the initial consultation phase of the Plan's preparation. All submissions received were reviewed. Some of the issues raised are outlined here. Submissions made during the SEA Scoping stage will be considered and where appropriate will influence the scope of the assessment undertaken, the findings of which will be included in the SEA Environmental Report.

This is a first step in the process of evaluating the sensitivity of the environment. The SEA Directive requires that information is provided on '*any existing environmental problems which are relevant to the Plan or programme*'. Information is therefore provided on existing environmental problems which are relevant to the Plan, thus helping to ensure that the Plan does not exacerbate any existing environmental problems in the study area.

The environmental aspects are described in line with the legislative requirements, under the following headings:

- Biodiversity (including Flora & Fauna);
- Population and Human Health;

- Land, Soils and Geology;
- Water Quality;
- Air, Noise and Climate;
- Cultural Heritage;
- Landscape;
- Material Assets;
- Interaction of the foregoing; and
- Cumulative Impacts.

5.1.1 Likely Evolution of the Environment in the Absence of a New Development Plan

To date the current Plan (2016-2022) has contributed towards environmental protection and sustainable development within the DCC administrative area. While a new development must be prepared and adopted, if this were not to take place and the current plan expired, this would potentially result in a deterioration of the City's planning and environmental protection framework.

Although higher level environmental protection objectives (including the various EU Directives and transposing Irish Regulations) would still apply, the deterioration of this framework would mean that new development would be less coordinated and controlled. Such development could result in an increase in the occurrence of *negative / adverse* effects on all environmental components, especially those arising cumulatively. Cumulative effects occur as a result of the addition of many small impacts to create one larger, more significant, impact.

Potentially negative / adverse effects from both the construction and operation of development and their associated infrastructure include:

- Loss of / damage / fragmentation to biodiversity in designated sites (*i.e.* European sites) and Annexed habitats and species, listed specs, ecological connectivity and non-designated habitats; and disturbance to biodiversity and flora and fauna, due to the development of lands.
- Loss of / damage / fragmentation to existing green infrastructure and associated ecosystem services, ecological connectivity and non-designated habitats.
- Loss of / damage / fragmentation to biodiversity and flora and fauna that help contribute to protecting natural capital and the environmental vectors of air, water and soil.
- Habitat disturbance (due to noise, lighting *etc*.) and displacement of protected species.

- Negative / adverse impacts to **human health** as a result of damage or loss to natural capital and environmental vectors including air and water.
- Loss / damage / degradation or loss of the **hydrogeological** and ecological function of soil resources.
- Negative / adverse impacts upon the status of **waterbodies** (including **groundwater**, **surface water, lakes** and **coastal waters**) arising from changes in quality, flow and / or morphology.
- Not adequately treating surface water run-off that is discharged to **waterbodies** and not providing appropriate wastewater treatment.
- Increases in the risk and extent of **flooding**.
- Failure to comply with **drinking water** regulations and serve new development with adequate drinking water (water services infrastructure and capacity is needed to ensure the mitigation of potential conflicts).
- Potential negative / adverse interactions between **waste, soil, water, biodiversity** and **human health**.
- Failure to reduce **carbon emissions** in line with, national and European environmental objectives.
- Potential effects on protected and unknown **archaeology** and protected **architecture** arising from the construction and operation of development.
- Negative / adverse visual impacts and / or conflicts with the appropriate protection of designations relating to the **landscape**.
- **Waste** levels would increase.

5.1.2 Ireland's Environment - An Integrated Assessment 2020

The seventh *State of the Environment Report* published by the EPA indicates that the overall quality of Ireland's environment is not what it should be, and the outlook is not optimistic unless we accelerate the implementation of solutions. The environmental challenges that Ireland cut across different environmental topics, such as climate, air, soil, water, biodiversity and waste, and across organisations and sectors, business and all levels of society.

Unspoilt areas are being squeezed out and Ireland is losing pristine waters and the habitats that provide vital spaces for biodiversity. Climate change is impacting the established economic, social and natural structures of our world.

The COVID-19 pandemic has had a huge impact on Ireland's economy, however, the degree to which this impact will impede national environmental policy ambitions, including the transition to a climate-neutral economy, will be seen in the future. The key environmental challenges or messages identified by the report are:

SOE[12] 1: Environmental Policy Position	A national policy position for Ireland's environment. There are many interlinkages and dependencies between environmental policies and legislation.
SOE 2: Full Implementation	Full implementation of, and compliance with, existing environmental directives and legislation is a must to protect the environment. A review of environmental governance is needed to develop structures to achieve full implementation.
SOE 3: Health and Wellbeing	Managing the environmental and radiological risks to health from chemicals and other pollutants is still a major part of environmental protection. Green and blue spaces as well as quiet areas also need to be protected as they provide social spaces for communities and enable a connection to nature, with evidence showing that spending time in such spaces is good for health.
SOE 4: Climate	Systemic change is required for Ireland to become the climate-neutral and climate resilient society and economy that it aspires to be. More Urgency is needed to deliver actions on climate mitigation and adaptation and to ensure that Ireland meets its international obligations to reduce greenhouse gas (GHG) emissions.
SOE 5: Air Quality	Adoption of measures to meet the World Health Organization air quality guideline values should be the target to aim for in the Clean Air Strategy.
SOE 6: Nature	Nature and wild places are at risk in Ireland and need to be better safeguarded, both locally and in protected areas. The next Biodiversity Action Plan needs to be more ambitious and identify the pathway to transformative change for nature protection in Ireland.
SOE 7: Water Quality	The water quality in Ireland's rivers, lakes and estuaries needs to be better protected through evidence-based measures, integrated water catchment-based projects and initiatives and by reducing the amount of nutrients ending up in water courses.
SOE 8: Marine	As an island nation with an extensive marine area, Ireland needs to ensure that robust governance and legal frameworks are in place to protect the marine environment.

[12] State of Environment

SOE 9: Clean Energy	The emissions from the combustion of mainly imported fossil fuels are damaging for our health and our environment and drive climate change. The transition from reliance on fossil energy to a clean energy future for heating, electricity and transport is essential for the protection of human health, the climate and the environment and has multiple benefits for sustainable development and energy security.
SOE 10: Environmentally sustainable Agriculture	A more holistic farm management and water catchment-level management approach, encompassing all environmental pressures, will be fundamental to progress towards a more environmentally sustainable and carbon-neutral food production system.
SOE 11: Water Services	Action is needed nationally to address the underlying causes for the delays in delivering improvements in drinking water and urban wastewater infrastructure. Addressing the legacy of under-investment and fixing the shortcomings highlighted in successive EPA reports on drinking water and urban wastewater need to be prioritised. The resilience of water-related infrastructure must also improve to guard against the impacts of weather events and climate extremes on water services and the water environment.
SOE 12: Circular Economy	Changing our behaviours on resource consumption, waste management and recycling are actions that everybody, from business to individuals, can take to protect the environment.
SOE 13: Land Use	The development of an integrated national approach to land mapping could support better decision-making on land use and management practices. It could contribute significantly to mapping land use change and managing competing pressures on the environment, such as agriculture, urbanisation, tourism and recreation, energy projects, carbon sinks, ecosystem services and space for nature.

5.1.3 UN Sustainable Development Goals

The Dublin CDP 2022-2028 will contribute towards the *2030 Agenda for Sustainable Development* and the Sustainable Development Goals (SDGs). The 17 no. SDGs were adopted by all UN Member States in 2015, as part of the *2030 Agenda*, which set out a 15-year plan to achieve the Goals. Implementation of the Dublin CDP will contribute to a number of these Sustainable Development Goals, such as:

Goal 3	Good health and wellbeing.
Goal 6	Clean water and sanitation.
Goal 7	Affordable and clean energy.
Goal 8	Decent work and economic growth.
Goal 11	Sustainable cities and communities.
Goal 13	Climate action.
Goal 15	Life on land.

5.2 Biodiversity

5.2.1 Introduction

Biodiversity plays a significant role in the provision of clean air, water, healthy soils and food as well as visually contributing to a plan area with its natural beauty and heritage. Ireland has a rich diversity of ecosystems and wildlife in its terrestrial, freshwater and marine environments. However, over the last few decades, human impacts on biodiversity have accelerated and resulted in increased damage and loss of habitats and species, the diversification of wildlife and the degradation of our environment[13]. On a global scale, biodiversity loss has been identified as one of the biggest threats facing humanity in the next decade.

Biodiversity is vulnerable to climate change as it accelerates the destruction of the natural world through droughts, flooding and wildfires, while the loss and unsustainable use of nature are in turn key drivers of climate change. However biodiversity and nature are also vital in the fight against climate change.

5.2.2 Overview of Biodiversity in Dublin City

Dublin City is a large urban environment, with an administrative footprint of 115km^2, which is partially built on reclaimed or in-filled lands.

Dublin City is shaped by its natural and man-made features and is endowed with a spectacular setting on Dublin Bay, and a wealth of amenities. The River Liffey, together with the areas between the canals, containing both the Old City and the Georgian squares, all help to convey the city's strong character and identity.

Dublin City has a rich diversity of ecosystems and wildlife in its terrestrial, freshwater and marine environments.

The biodiversity of Dublin City is outlined in the *Biodiversity Action Plan 2015-2020* (See Section 5.2.3.1) and includes the wildlife and habitats found at North Bull Island and along the City's coastline; the Phoenix Park and all public parks; the rivers, canals, and their riparian zones which traverse the City; open spaces linked to historic, educational and other public buildings; roadsides, railway tracks and footpaths; residential 'greens', private gardens, walls and buildings.

[13] DCHG (2017).

Dublin City has c. 70km of inland waterways (rivers and canals) and 23km of coastline[14] Dublin City's waterways and their riparian zones (river banks and towpaths) and the City's coastline are important wildlife habitats, supporting fish, rare plants, river birds, mammals, and invertebrates, in addition to their function as corridors for connecting wildlife throughout the City. Dublin's rivers, canals and coastlines also provide significant recreational amenities for the city.

Dublin Bay is a natural harbour at the confluence of several river basins and contains a variety of ecosystems that are biologically diverse and of international and national importance for the species which inhabit them.

Dublin City supports a range of flora and fauna, which is afforded legal protection under Irish and European legislation. Species include the Common Pipistrelle Bat, the Light-Bellied Brent Goose and the Kingfisher. Species legally-protected by the Flora Protection Order include Hairy St. John's-wort which is found in the Phoenix Park and the Hairy Violet.

Key ecological sensitivities within DCC administrative area include those relating to:

- Special Areas of Conservation (SAC), Special Protection Areas (SPAs), which are designated within / adjacent to the Plan area.
- Proposed Natural Heritage Areas (pNHA).
- Ecological networks and connectivity.
- Aquatic and riverine ecology associated with various rivers and their tributaries and riparian buffer zones. Canals, wetlands and hedgerows.
- Land cover mapping - CORINE.
- UNESCO Biosphere Reserve.
- Certain entries to the Water Framework Directive Register of Protected Areas.
- Designated Shellfish Waters.
- Salmonid Waters.
- RAMSAR Site.
- Wildfowl Sanctuary.
- Nature Reserves.
- Tree Preservation Orders (TPOs).

[14] DCC (2015).

- Other sites of high biodiversity value or ecological importance.

5.2.3 Biodiversity Action Plan

The *National Biodiversity Action Plan (NBAP)* for Ireland provides a framework for government, civil society and private sectors to track and assess progress towards Ireland's Vision for Biodiversity over a five-year timeframe from 2017 to 2021. The NBAP notes that a significant proportion of Ireland's biodiversity is in a vulnerable state. The main threats and pressures to biodiversity in Ireland are from agriculture, forestry and fisheries, natural system modifications (including drainage), mining and quarrying (including peat extraction), climate change, pollution, and invasive species[15].

In preparing the Dublin CDP, measures have been considered to enhance ecological biodiversity as outlined in the NBAP 2017-2021. NBAP targets relevant to the Plan are:

- enhance appreciation of the value of biodiversity and ecosystem services;
- optimise opportunities to benefit biodiversity;
- aim to reduce principal pollutant pressures on terrestrial and freshwater biodiversity;
- optimise benefits for biodiversity in Flood Risk Management Planning and drainage schemes;
- promote the control of non-native invasive species; and
- promote sustainability in the aquaculture industry.

5.2.3.1 Biodiversity Action Plan for Dublin City 2015-2020

Developed by DCC, the main aim of the *Biodiversity Action Plan for Dublin City* is the conservation of biodiversity. The four themes within the plan are outlined as follows:

- Strengthen the knowledge base for the conservation and management of biodiversity, and protect species and habitats of conservation value within Dublin City.
- Strengthen the effectiveness of regional collaboration for biodiversity conservation in the greater Dublin region.
- Enhance opportunities for biodiversity conservation through green infrastructure, and promote ecosystem services in appropriate locations throughout the City.
- Develop greater awareness and understanding of biodiversity, and identify opportunities for engagement with communities and interest groups.

A new Biodiversity Action Plan for Dublin City is to be prepared in 2021.

[15] DCHG (2017).

5.2.4 Ecological Networks and Connectivity

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 and it recognises the need for the management of these areas through land use planning and development policies.

The networks are considered imperative in connecting areas of biodiversity within the city / county to each other, thus avoiding the creation of isolated islands of habitat. These corridors are particularly important for mammals, small birds and bats. Ecological networks 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.

There is a distinct urban component within Dublin City's biodiversity, most notably plant species. However, there are also non-urban, semi-natural components, such as North Bull Island, parts of Phoenix Park, and the City's rivers, canals, and larger public parks[16].

Dublin City's ecological network is based on two main areas: Dublin Bay and Phoenix Park, which have sufficient size and scale to support natural and semi-natural habitats, which are connected to each other and to the ecological networks of neighbouring local authorities, by the City's waterways and associated public parks and open spaces.

The City has a number of undeveloped or protected corridors of land, which act as links from the surrounding countryside into the City, from South Dublin, Fingal and Dún Laoghaire - Rathdown. These ecological networks and important corridors include:

- Liffey Valley, connecting Wicklow, Kildare, South Dublin, Fingal and Dublin City.
- Grand Canal connects the River Shannon to Dublin City and River Liffey / Dublin Bay.
- Royal Canal connects the River Shannon to Dublin City and River Liffey / Dublin Bay.

Other corridors include:

- Rivers Tolka, Dodder, Camac, Poddle, Nanniken, Mayne and Santry.

[16] DCC (2015).

5.2.4.1 Ecosystem Services

Ecosystem services are the benefits that natural environments supply to human beings either directly or indirectly. The National Biodiversity Plan has adopted four main categories of ecosystem services, namely provisioning services, regulating services, supporting services, and cultural services.

- **Provisioning services** refer to products obtained from ecosystems, such as food, fibre, fuel, clean water, medicines and genetic resources.
- **Regulating services** refer to the benefits of managing ecosystem processes, such as carbon sequestration, flood control, water purification, waste decomposition, and pest control.
- **Supporting services** are those which are necessary for the production of all other ecosystem services, and include soil fertility and crop pollination.
- **Cultural services** are the nonmaterial benefits people obtain from ecosystems through cognitive development, inspiration, recreation, and aesthetic experiences.

5.2.5 Green and Blue Infrastructure

The European Green Infrastructure Strategy promotes the development of Green Infrastructure and guides its implementation at EU, regional, national and local levels.

Green infrastructure can be defined as an interconnected network of natural space that conserves natural ecosystem values and functions and provides associated benefits to human populations. Green infrastructure refers to our green spaces including parks, gardens, open amenity space, cemeteries, woodlands, hedgerows of biodiversity and heritage importance which form barony, parish or townland boundaries.

Blue infrastructure refers to waterways and waterbodies such as rivers, canals and the sea. Blue infrastructure refers to waterways and waterbodies such as rivers, canals and Dublin Bay.

Green and blue infrastructure plays an essential role in creating a more healthy and liveable city. These natural assets provide a platform for community activities, social interaction, recreation and physical activity, providing sustainable drainage solutions, facilitating biodiversity and wildlife habitats, carbon capture and creating connectivity.

5.2.5.1 Dublin City's Existing Green and Blue Infrastructure

Dublin City has the benefit of many natural assets including over 200 public parks forming 17% of the land area of Dublin City. The City's Strategic Green / Blue Network / systems are:

- Core Areas - Dublin Bay (and its associated terrestrial, estuarine and marine ecosystems) including all Natura 2000 sites and the Phoenix Park, a flagship park which lies adjacent to the River Liffey).
- Hubs - parks and open spaces - cemeteries, as well some privately-owned green spaces.
- Corridors (*e.g.* rivers and canals). These include:
    - River Mayne: Fr. Collins Park, River Mayne Linear Park flowing into Baldoyle National Nature Reserve and Natura 2000 sites.
    - River Santry / Nanniken: Oscar Traynor Road playing grounds, Springdale Road, Silloge Golf Course, Stardust Memorial Park, St. Anne's Park and flowing into Dublin Bay Natura 2000 sites.
    - River Tolka: Tolka Valley Park, National Botanic Gardens, Griffith Park, Fairview Park, flowing into Tolka Estuary Natura 2000 site.
    - River Liffey: Liffey Valley SAAO and NHA upstream, flowing into South Dublin Bay Natura 2000 sites, Liffey Valley Park, Islandbridge War Memorial Gardens.
    - River Dodder: beginning at Glenasmole Valley Natura 2000 site and NHA, flowing into River Liffey and Dublin Bay Natura 2000 sites.
    - River Poddle: Poddle Park, Mount Argus Park, flowing into River Liffey and Dublin Bay Natura 2000 sites.
    - River Camac: flowing into River Liffey and Dublin Bay Natura 2000 sites.
    - Royal Canal pNHA and Grand Canal pNHA.

These Core, Hubs and Corridors are connected to each other, and to the Green Infrastructure Networks of neighbouring local authorities, by the City's waterways (Rivers Liffey, Dodder, Poddle, Santry, Tolka, Nanniken and Camac) associated public parks and open space areas.

Dublin City's streets are also an important component of the City's Green Infrastructure Network.

5.2.6 European Sites

Dublin City (including adjacent Plan areas), include a number of areas designated for protection under the EU Habitats Directive (92/43/EEC) which form part of a European network of important ecological sites known as the Natura 2000 network. These include Special Areas of Conservation (SACs), which are legally protected under the EU Habitats Directive (92/43/EEC) and are selected for the conservation of Annex I habitats and Annex II species, and Special Protection Areas (SPAs), which are

protected under the European Union Directive on the Conservation of Wild Birds 2009/147/EC. In Ireland, SACs and SPAs are known as European sites.

There are four European sites that either lie within or directly abuts the Plan Area. Table 5.1 lists the European sites located within or directly abuts the Plan Area, as well as any European sites within 15km of the Plan Area, particularly where ecological links (source-pathway-receptors) exist between the area of the Plan and other European sites.

Table 5.1: European Sites located in and within a 15km of the Plan Area[17]

European Sites located in and directly abuts the Plan Area			
Site Code	**Special Areas of Conservation**	**Site Code**	**Special Protection Areas**
000206	North Dublin Bay	004006	North Bull Island
000210	South Dublin Bay (abuts the Plan Area)	004024	South Dublin Bay and River Tolka Estuary (abuts the Plan Area)
European Sites within a 15km buffer of the Plan Area			
Site Code	**Special Areas of Conservation**	**Site Code**	**Special Protection Areas**
000202	Howth Head	004113	Howth Head Coast
003000	Rockabill to Dalkey Island	004172	Dalkey Islands
000199	Baldoyle Bay	004016	Baldoyle Bay
002193	Ireland's Eye	004117	Ireland's Eye
000205	Malahide Estuary	004025	Malahide Estuary
000208	Rogerstown Estuary	004015	Rogerstown Estuary
000204	Lambay Island	004069	Lambay Island
001398	Rye Water Valley / Carton	004040	Wicklow Mountains
001209	Glenasmole Valley		
002122	Wicklow Mountains		
000725	Knocksink Wood		
000713	Ballyman Glen		

Any potential for adverse effects on European sites will be fully addressed in the Natura Impact Report (NIR) that will accompanies the Draft Plan and will be on public display.

[17] EPA AA Maps (2021).

5.2.7 Natural Heritage Areas (NHA) and Proposed Natural Heritage Areas (PNHA)

Nationally Designated Sites include **Natural Heritage Areas (NHAs)** which are legally protected areas that are considered important for their habitats or which holds species of plants and animals whose habitat needs protection, including geological / geomorphological sites in need of protection through NHA designation. NHAs are designated under the Wildlife (Amendment) Act 2000[18]. There are no NHAs within or adjoining the plan boundary.

Proposed NHAs (pNHAs) were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. This network of NHAs and pNHAs provides supporting or stepping stone functions to the SAC and SPA network.

There are six proposed Natural Heritage Areas (pNHAs) in and within the vicinity of the Plan Area, refer to Table 5.2.

Table 5.2: pNHAs in and within the vicinity of the Plan Area[19]

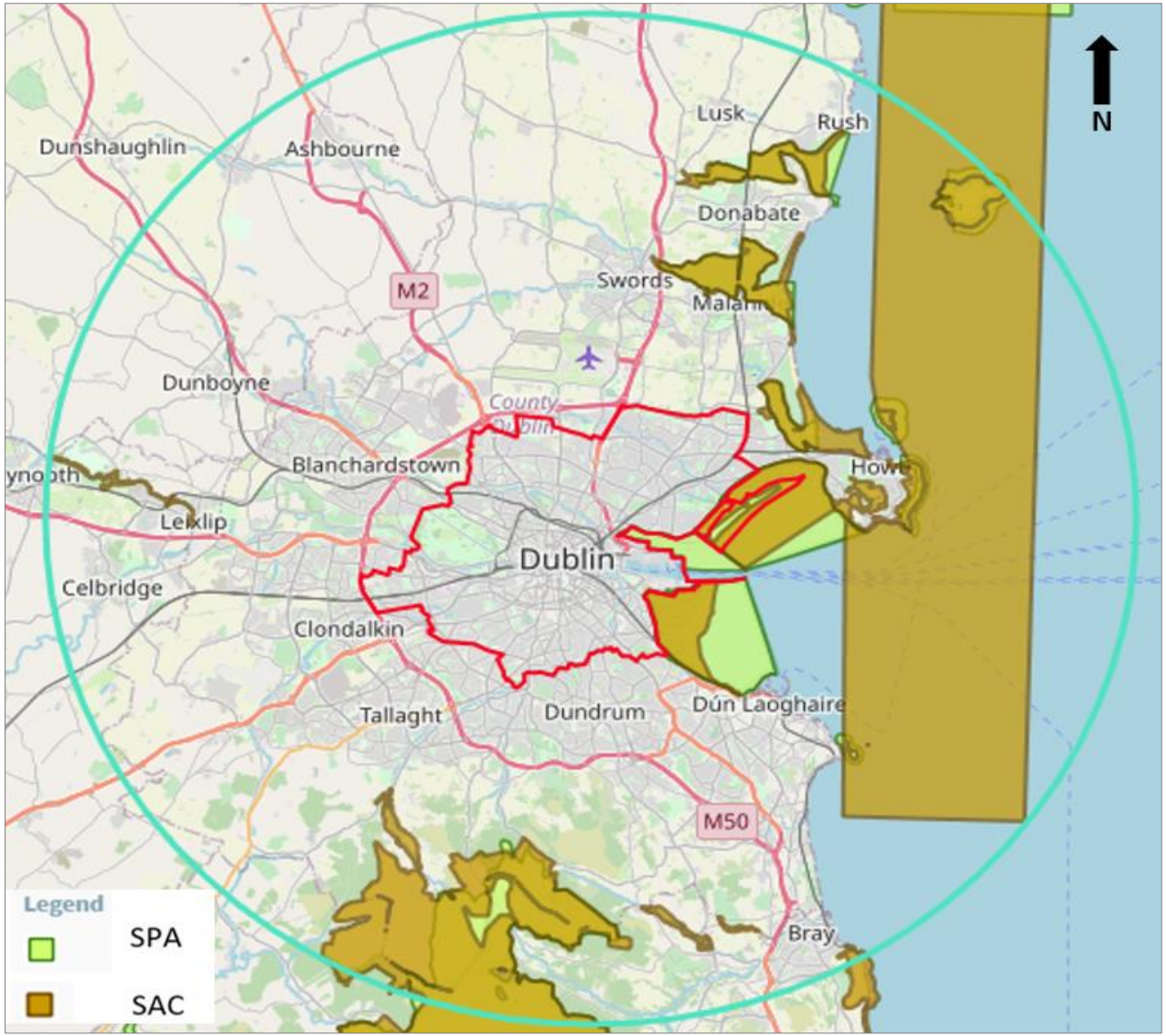
proposed Natural Heritage Areas **in and within the vicinity of** the Plan Alan		
Site Code	pNHA Site Name	Distance from the Draft Plan
000206	North Dublin Bay	Within the Plan Area
000210	South Dublin Bay	Abuts the Plan area
000201	'Dolphins' Dublin Docks near Pigeon House Harbour	Within the Plan Area
002103	Royal Canal	Within the Plan Area
002104	Grand Canal	Within the Plan Area
000128	Liffey Valley	Within / abuts the Plan Area

5.2.8 CORINE Land Cover Mapping

The CORINE land cover mapping (2018) for Dublin City classifies land cover under various headings as shown on Figure 5.2. The most common land covers within the Plan area are *artificial surfaces / urban fabric,* with *artificial surfaces / Industrial and commercial units* around Dublin Port and along the northern and western boundary. *Artificial non-agricultural vegetated areas / green urban areas* are located at the Phoenix Park and along coastal areas including Bull Island.

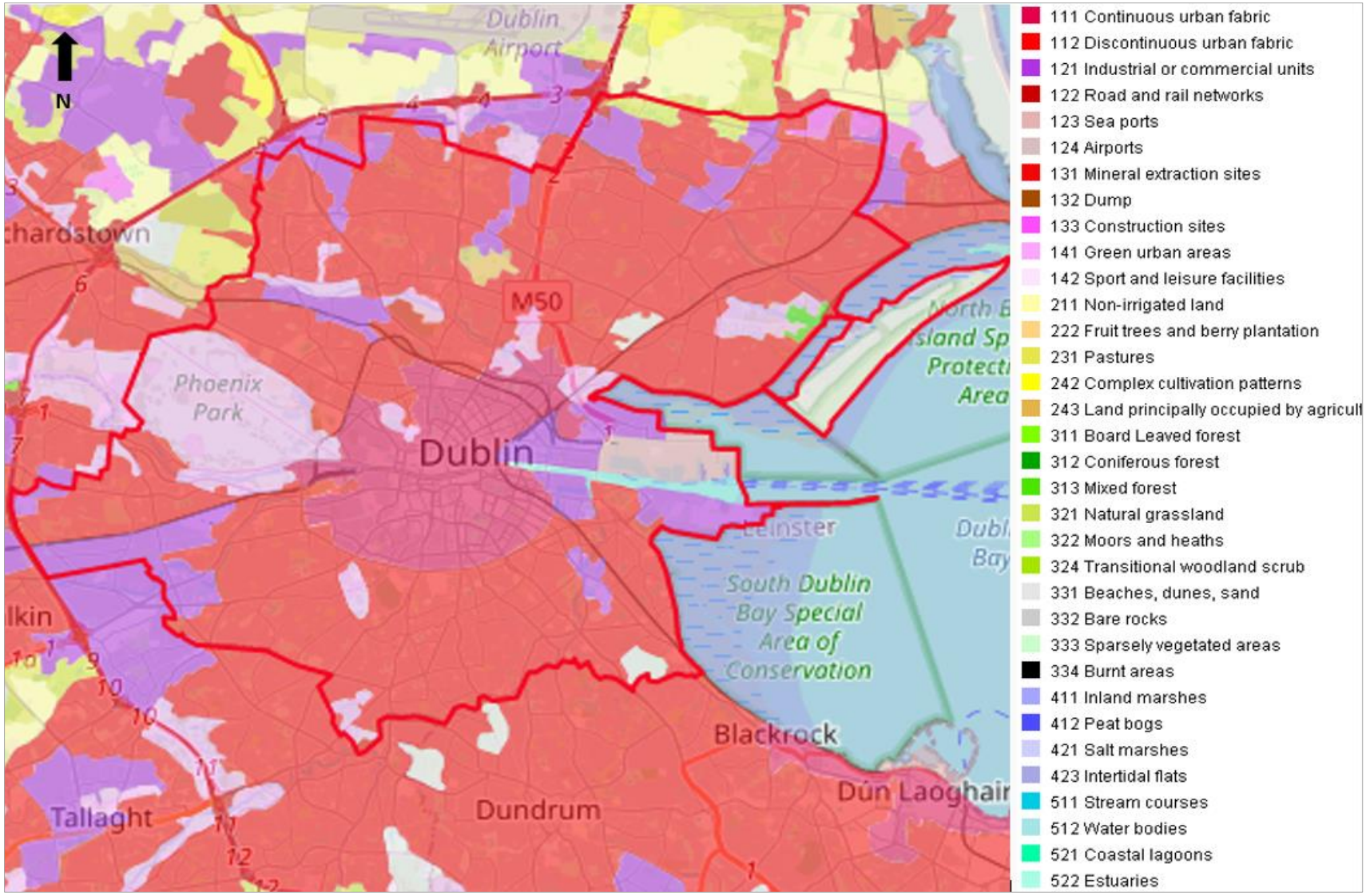
[18] NPWS (2021). *Protected Sites* online.
[19] only those which don't overlap with European sites are listed

Figure 5.1: European Sites located in and within a 15km of the Plan Area[20]



[20] EPA AA Maps (2021). *Source OpenStreet Maps*.

Figure 5.2: CORINE Land Cover 2018[21]



[21] EPA Maps (2021). *Source OpenStreet Maps*.

5.2.9 UNESCO Biosphere Reserve

In 1981, UNESCO recognised the importance of Dublin Bay by designating North Bull Island as a Biosphere because of its rare and internationally important habitats and species of wildlife. In 2015 the designation was extended to the wider Dublin Bay reflecting the Bay's significant environmental, economic, cultural and tourism importance.

The Biosphere which now covers Dublin Bay, reflects its significant environmental, economic, cultural and tourism importance, and extends to over 300km². Over 300,000 people live within the newly enlarged Biosphere. It is the world's only Biosphere to include substantial areas of a capital City.

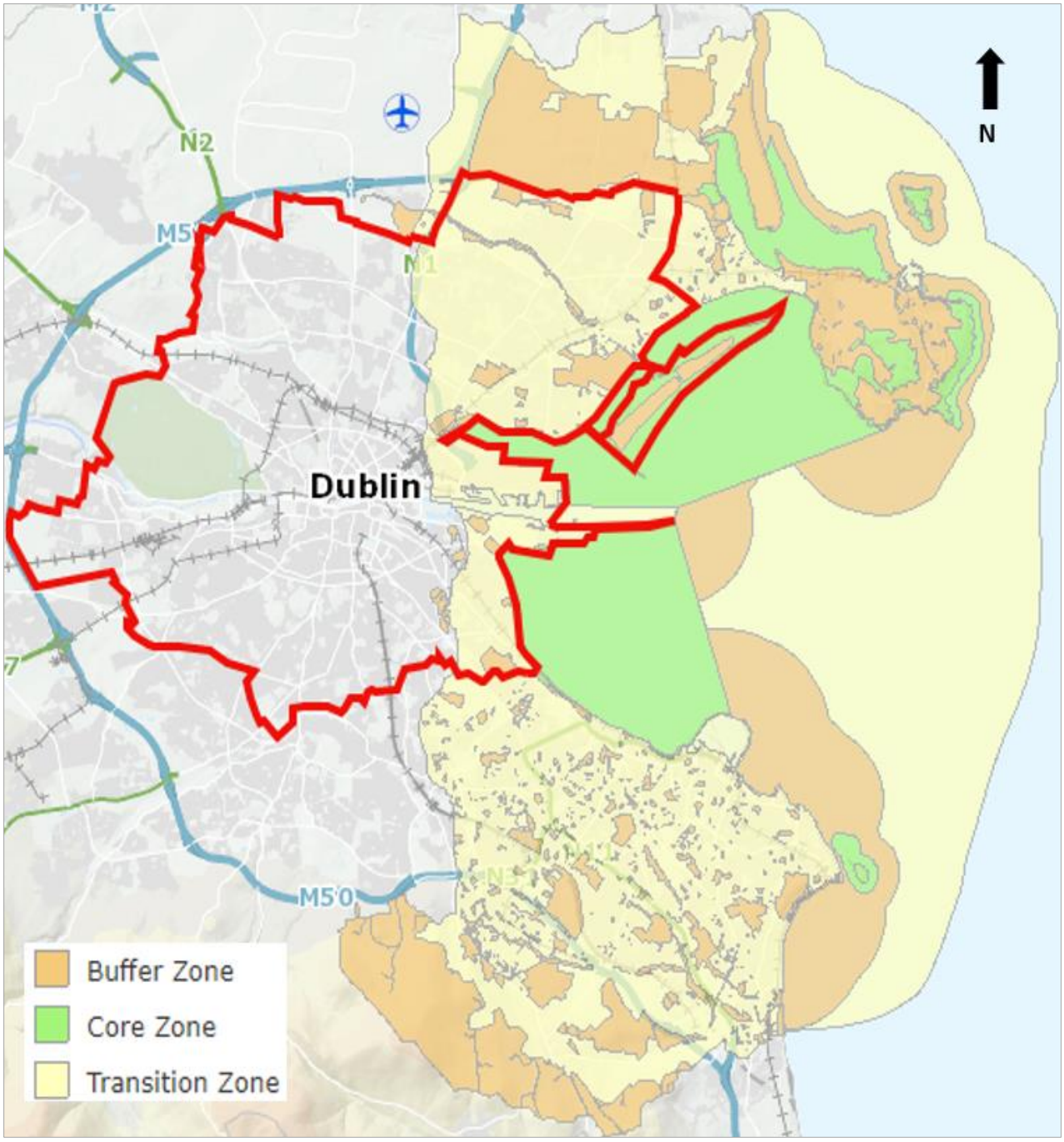
The Biosphere designation itself brings no new regulations; its aims are achieved by people working together within the existing national and international legislative framework. All Biospheres have three goals:

- Conservation: promoting the protection of landscapes, habitats, wildlife and cultural values
- Learning: supporting education and research, for a better understanding of nature and global issues
- Development: fostering a sustainable economy and society for people living and working in the area.

The Biosphere is divided into three distinct zones, which are managed in different ways:

- The Core Zone: This consists of protected areas, which are managed for the conservation of landscapes and biodiversity. It includes the Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) at North Bull Island, the Tolka Estuary, North Dublin Bay and South Dublin Bay, among others.
- The Buffer Zone: This surrounds the core and comprises 82km² of public and private green spaces such as parks, greenbelts and golf courses, which surround and adjoin the core zones.
- The Transition Zone: This zone comprises 173km² and forms the outer part of the Biosphere. It includes residential areas, harbours, ports and industrial and commercial areas. Dublin Port Company, is a member of the Dublin Bay Biosphere Partnership and it maintains pontoons within the port to providing nesting spaces for Common and Arctic terns, which are protected species under the EU Birds Directive.

Figure 5.3: Dublin Bay UNESCO Biosphere[22]



5.2.10 WFD Register of Protected Areas

Under the requirements of the Water Framework Directive (WFD) a number of waterbodies (or parts of) must have extra controls on their quality by virtue of how their waters are used by people and by wildlife have been listed on Registers of Protected Areas (RPAs). This register is split into five categories as outlined by the EPA:

[22] AIRO Environmental Sensitivity Mapping (2021).

- **Areas** designated for the **abstraction of water** intended for human consumption under Article 7;
- Areas designated for the **protection of economically significant aquatic species** (i.e. shellfish);
- Bodies of **water designated as recreational waters**, including areas designated as bathing waters under Directive 76/160/EEC;
- **Nutrient-sensitive areas**, including areas designated as vulnerable zones under Directive 91/676/EEC and areas designated as sensitive areas under Directive 91/271/EEC; and
- Areas designated for the **protection of habitats** or species where the maintenance or improvement of the status of water is an important factor in their protection, including relevant European sites (Natura 2000) designated under Directive 92/43/EEC and Directive 79/409/EEC.

A number of these protected areas are present within Dublin City and these are:

- **Rivers** for the **abstraction of drinking water** (River Liffey).
- The associated **groundwater body** for the **abstraction of drinking water** (Dublin Urban Groundwater body).
- **Bathing** locations (Dollymount, Merrion Strand and Sandymount).
- **Nutrient Sensitive Areas** (River Liffey, Liffey Estuary and Tolka Estuary);
- There are also a number of **water dependent habitats** in the Plan Area which have been listed on RPAs – these relate to designated SACs and SPAs (see Section 5.2.6).

5.2.11 Designated Shellfish Waters

The EU Shellfish Waters Directive (2006/113/EC) aims to protect and improve shellfish waters in order to support shellfish life and growth.

Pollution reduction programmes are in operation for these areas. The identified pressures on these designated waters include urban wastewater systems, on-site wastewater treatment systems and port activities.

The coastal waters provide an important resource, supporting and generating employment and recreational activities and must be protected.

Under Article 5 of the Shellfish Water Directive, Malahide Shellfish Area, located c. 3.2km to the north-east of Dublin City's boundary, has been designated as shellfish growing waters. A pollution-

reduction programme was established by the minister for the Environment, Community and Local Government to protect these waters and improve water quality.

5.2.12 Salmonid Waters

The Salmonid Regulations (S.I. No. 293 of 1988) designate the waters capable of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char *(Salvelinus*) and whitefish (*Coregonus*) as protected. Thirty-four rivers, tributaries and lakes are listed and protected under these Regulations that prescribe quality standards for salmonid waters, sampling programmes and methods of analysis and inspection to be used by local authorities to determine compliance with the standards.

The River's Liffey, Tolka and Dodder are highly significant regional salmonid catchments. There are three waterbodies within the Plan Area which support important fisheries, there are the Grand Canal, and the Rivers Liffey and Dodder. The latter two support Atlantic Salmon (*Salmo salar*, Annex II of the Habitats Directive), and brown and sea trout. In addition some protected species such as White Clawed Crayfish are to be found in the Grand Canal. The canal also supports a large amount of coarse fish.

5.2.13 Other Designations

5.2.13.1 RAMSAR Site

North Bull Island and Sandymount Strand are listed sites in Dublin City under the RAMSAR[23] Convention of 1971 (signed by Ireland in 1985) as wetlands of international importance, particularly for wildfowl habitats. It is a voluntary treaty of which Ireland is a signatory.

5.2.13.2 Wildfowl Sanctuaries

Wildfowl sanctuaries are areas that have been excluded from the '*Open Season Order'* so that game birds can rest and feed undisturbed. There are 68 no. sanctuaries in the State[24]. Shooting of game birds is not allowed in these sanctuaries. North Bull Island Wildfowl Sanctuary (WFS-19) is located within the Plan Area.

[23] The Convention on Wetlands, called the RAMSAR Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. https://www.RAMSAR.org/
[24] NPWS (2021). *Wildfowl sanctuaries.*

5.2.13.3 Nature Reserves

A nature reserve is an area of importance to wildlife, which is protected under Ministerial order. North Bull Island and Baldoyle Estuary are both designated national nature reserves under the terms of the Wildlife Act.

5.2.13.4 Flora Protection Order

The making of a Flora Protection Order under the Wildlife Act provides protection for nationally important sites for protected plants. North Bull Island is listed for lesser centaury, hemp nettle and meadow saxifrage. The Royal Canal is listed for opposite-leaved Pondweed.

5.2.14 Other Sites of Biodiversity Value

Other sites of biodiversity value include a Special Amenity Area Order (SAAO) and Tree Preservation Orders (TPOs).

The objective of the Special Amenity Area Order (SAAO) is primarily to protect areas of outstanding natural beauty or special recreational value whilst having regard to any benefits for nature conservation. North Bull Island is a National Special Amenity Area, representing a landscape of national importance for its aesthetic and recreational value; Bull Island is one of three such designations in Ireland and was designated under Special Amenity Area Order (SAAO) in 1994.

Tree Preservation Orders can be made in the interest of amenity or the environment and allow for the protection of individual or groups of trees, refer to Section 5.8.5.

5.2.15 Existing Biodiversity Issues

Ireland is currently experiencing a decline in floral and faunal populations. Implementation of measures to achieve the requirements of the Habitats Directive and the objectives of the Water Framework Directive (WFD) are likely to benefit protected sites in the future. Developments and activities associated with urban developments, tourism and recreation, ports, coastal and fluvial flood defence schemes as well as a wide range of infrastructural works (including road works, water and wastewater disposal) that are located within, or close to, ecologically sensitive sites and species can give rise to significant environmental pressures.

Invasive species have been and to some extent still are a significant challenge in the City. DCC recognised this issue in 2016 when it adopted the *Dublin City Invasive Species Action Plan 2016-2020*. Actions proceeding from this plan have had considerable success with widespread treatment and

removal of Japanese knotweed and Himalayan Balsam from DCC lands in parks and especially along the River Dodder. Control of invasive species is an on-going action.

Existing biodiversity issues / pressures and threats on Ireland's habitats and species, which are also relevant to the Dublin City administrative area, include[25]:

- **Development -** construction and use of residential, commercial, industrial and recreational infrastructure and areas (For example development on greenfield sites, the construction and development of the road network and changes in farming practices).
- **Transport systems** - Development / operation of the transport systems (For example the construction and development of the road network, port / shipping activities and light and noise pollution).
- **Energy and infrastructure development** - (For example construction of roads, gas, power, water and wastewater, also windfarms, etc.).
- **Green Infrastructure** - protecting the existing green infrastructure network from fragmentation and loss due to pressures of urban development within and adjoining the network
- **Ecosystem Services -** recognising and promoting the value of ecosystem services that the green infrastructure network provides to the City.
- **Climate Change -** (For example the loss of wetlands and dunes, due to climate change events *i.e.* storms and flood events.).
- **Human-induced changes in water regimes** - (For example wastewater treatment systems in the vicinity of significant waterbodies and shellfish waters. Contamination arising through poor working practices, leakages or accidental spillage of materials).
- **Mixed source pollution** - (For example emissions from transport, heating homes, leachate from landfills, pollution from wastewater treatment systems, eutrophication and acidification from forestry).
- **Alien and problematic species -** (For example the loss of biodiversity as native species are shaded out, but also diseases and pathogens).
- **Natural processes** - (excluding catastrophes and processes induced by human activity) (For example erosion of soft coastal areas).

[25] DCHG (2019).

- **Geological events, natural catastrophes -** (For example flooding, storms / extreme weather events).
- **Awareness** - increasing awareness of biodiversity through enhanced interpretation on-site and through visitor facilities.
- **Land Management -** conversion of land / sites and sealing of soils can release CO_2 into the atmosphere and further reduce areas of 'carbon sinks'.
- **Invasive Species** - continued control and management of invasive species.

5.3 Population & Human Health

5.3.1 Introduction

Since the adoption of the current Plan, Dublin City has experienced significant population growth and economic development and is home to over half a million people. The City has seen strong performance in the technology and financial services sector and a major international technology hub has developed in Dublin Docklands. There has been a significant increase in housing delivery and employment floor space and the regeneration of a number of key sites across the City.

The RSES identifies there are some challenges for the region, as there is a need to sustain economic growth whilst transitioning to a low carbon society and the requirement to align population growth with the location of homes and jobs whilst creating healthy attractive places and an enhanced quality of life.

5.3.2 Population

The National Planning Framework (NPF) outlines that by 2040 there will be roughly an extra one million people living in Ireland. The NPF identifies a target population of 1.4 million people in Dublin City and Suburbs (this extends beyond the DCC administrative boundary) for 2031, an increase of some 220,000 people, and a target of 1.65m in the Metropolitan Area Strategic Plan (MASP), an increase of some 250,000 (18%) people.

The provision of additional housing over the Draft Plan period will be dictated by the Core Strategy that guides where new development should be allocated in accordance with national and regional strategies and policies, including the NPF and the *Regional Spatial and Economic Strategy (RSES) for Eastern and Midland Region.*

With a total population of nearly 1.2 million people in 2016, Dublin City and Suburbs accounts for about half of the Eastern & Midland Region's population or a quarter of the national population, as well as being the largest economic contributor in the State[26]. The metropolitan area of Dublin covers a wider area[27] and is home to 1.4 million people or three out of five people living in the Region. Between 2006 and 2016 the metropolitan population increased by around 160,000 people or 13%, which was slightly higher than the State, but lower than the average growth rate in the Eastern and Midland Region, which grew by around 15% over the same period.

[26] Eastern & Midland Regional Assembly.
[27] Swords, Malahide, Maynooth, Leixlip, Celbridge, Bray and Greystones.

Since the adoption of the 2016 Development Plan, the City has experienced an upward trend in growth. The 2016 Census results showed that the population for Dublin City was population of 554,554 persons (Census 2016), an increase of 4.6% from the 2011 Census (529,154 persons). The National Planning Framework (NPF) acknowledges the critical role that Dublin City plays in the country's competitiveness and supports Dublin's growth in jobs and population, anticipating that the City and suburbs will accommodate an extra 235,000 to 293,000 people by 2040. The 2019 CSO population estimates for Dublin City is 586,152 persons, an increase of 5.39% from the 2016 Census (c. 31,598 persons).

Population growth in the City however, was spatially uneven with the largest proportional increase occurring in Dublin Central (incorporating neighbourhoods such as North Wall, East Wall, Drumcondra and Ballybough) where the population rose by 5,673 (+7.8%). The lowest proportional increase was in Dublin South Central (+2.5%) which incorporates the neighbourhoods including Liberties, Inchicore, Chapelizod, Ballyfermot, Bluebell, Drimnagh, Rialto and Walkinstown. The population of the City is projected to increase by between 58,000 to 70,000 people up to 2026.

Based on the Regional Spatial and Economic Strategy 2031[28], the 2016 Census, population projections published by the CSO in 2019, the population of Dublin City is expected to increase between c. 26,400 - 35,880 persons during the 2022 - 2028 Plan period.

5.3.2.1 Socio-Economic Trends

According to the Census 2016 data, the socio-economic profile of Dublin City has a number of key characteristics. These trends will have implications for how the City grows and develops over the next Plan period:

- In Dublin City, the young dependency ratio was one of the lowest nationally at 20.9%, indicating a low ratio of young people aged up to 14 years to working age people. The total dependency ratio for Dublin City was 39%. This was one of the lowest dependency ratios nationally and notably lower than the State (53%) or neighbouring counties in the Eastern and Midlands Region.
- The proportion of persons over the age of 15 who were at work was 56.4%. In terms of Labour Force participation, rates in Dublin are relatively high at 64.7%. The largest socio-economic group in Dublin City in 2016 was '*Non-manual*' which, accounted for 20% of the workforce.

[28] as amended July 2020

'*Own account workers'* and '*Unskilled* 'made up 4% each and were the lowest proportion of all persons. 36.2% of Dublin City residents were classified as employers, managers or professionals in 2016 which was generally in line with South Dublin (36.3%) and the State (35.7%) but below that of Fingal (42.2%) and significantly below that of Dún Laoghaire - Rathdown (56%).

- According to CSO data, there were seven unemployment blackspots within the administrative area of Dublin City[29]. This places Dublin City as having the third highest number of unemployment blackspots in the State. The average unemployment rate in those seven Dublin City black spots was just over 30% compared to the county unemployment rate of 12.9%.

5.3.3 Human Health

Human health has the potential to be impacted upon by environmental factors such as air, water or soil through which contaminants could accumulate and have potential to cause harm through contact with human beings. Hazards or nuisances to human health can arise due to exposure to these vectors, for example arising from incompatible adjacent land uses. The impact of development on human health is also influenced by the extent to which new development is accompanied by appropriate infrastructure and the maintenance of the quality of water, air and soil. It is also appreciated that new development or environmental change can elevated stress and effect mental health of local populations.

There are strong links between income and health, as it is recognised that the sustainability of current and future economic activity is an important element in protecting and promoting population health and in reducing poverty and deprivation. However, emphasising economic growth without due regard for social and environmental consequences of such growth can have negative impacts on health both for the population as a whole and for groups within the population.

Access to multiple public transport modes and maximizing the movement of people via sustainable modes (including walking) is important for human health. A shift to using multiple public transport modes, which can incorporate walking, means less energy consumption, fewer emissions and more active, healthy and social communities.

[29] Blackspots are defined as 'Electoral Divisions whose labour force exceeded 200 persons and where the unemployment rate Calculated on a Principal Economic Status basis exceeded 27%.

There needs to be particular attention to the environmental issues and sustainability endeavours to protect human health as the local economy develops. While employment is generally good for health, there can be negative impacts, usually related to the quality of the working environment and nature of work undertaken.

External factors*, e.g.* coronavirus (Covid-19), can also have a major impact on human health - both physical and mental. In public mental health terms, the main psychological impact to date is elevated rates of stress or anxiety and its effects on many people's usual activities, routines or livelihoods[30] (*i.e.* quarantine / cocooning / lockdown, loss of employment, travel / movement restrictions, lack of physical contact with other family members, friends and colleagues and working from home / home-schooling children to mention a few).

5.3.3.1 Infrastructure / Amenity and Human Health

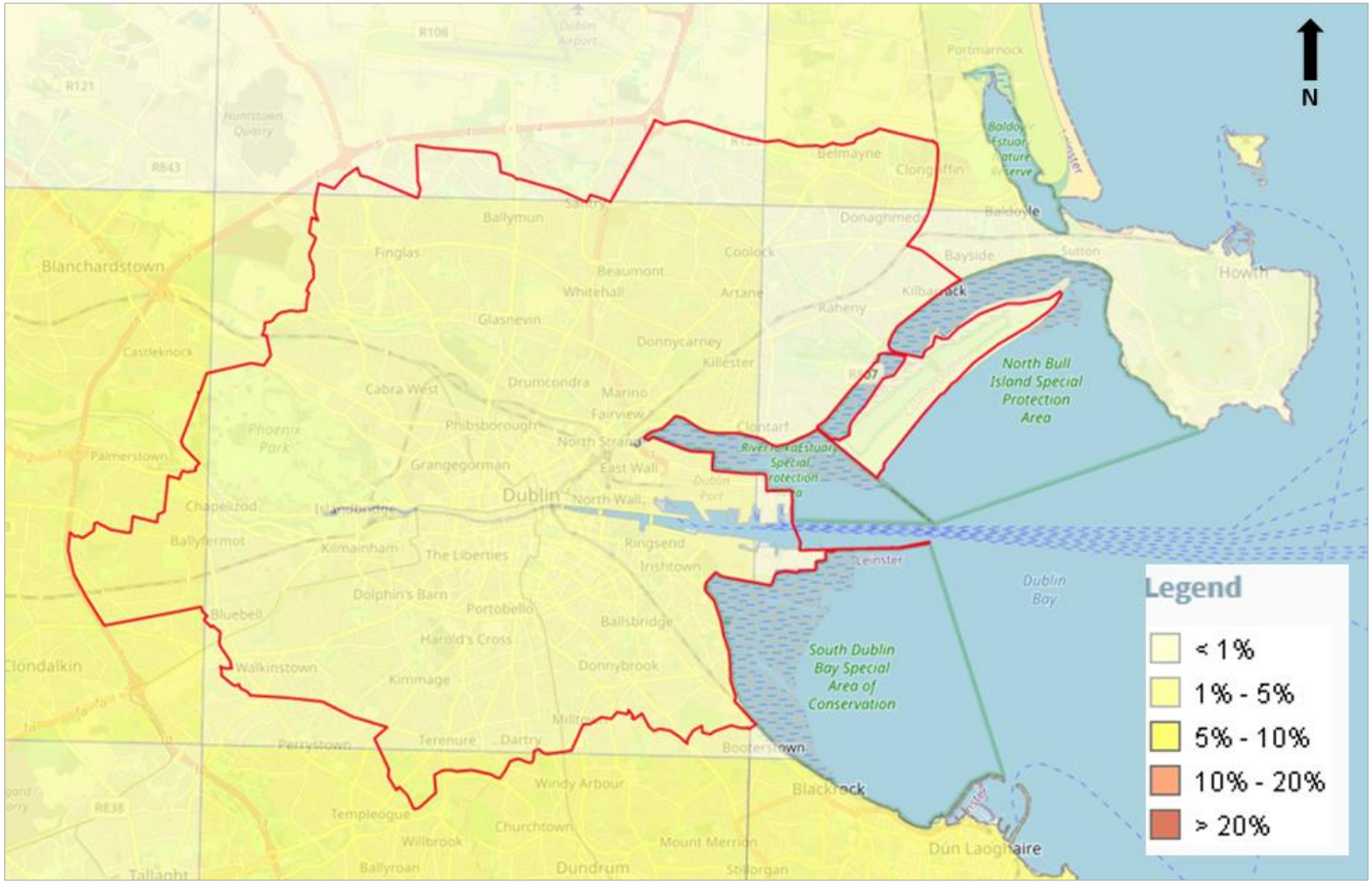
In Dublin City, green and blue infrastructure alongside playgrounds and sports facilities provide residents, businesses and visitors with important social, physical and environmental benefits including promoting health and wellbeing for all age groups and abilities.

5.3.3.2 Radon and Human Health

The greatest health risk from radiation in Ireland is caused by radon. Radon is a radioactive gas, which is naturally produced in the ground from the uranium present in small quantities in all rocks and soils. Tiny radioactive particles are produced by the gas which when inhaled can cause lung cancer. The risk of contracting lung cancer as a result of Radon depends on how much Radon a person has been exposed to over a period of time.

[30] WHO (2020). *Mental health and COVID-19.*

Figure 5.4: Radon Levels in Dublin City[31] [32]



[31] EPA Maps (2021). *Source OpenStreet Maps*.
[32] This map shows a prediction of the number of homes in a given grid square that exceed the national Reference Level. Grid squares in which the predicted percentage of homes is 10% or greater are called High Radon Areas.

5.3.4 Population & Human Health Issues

The EPAs latest report, *Ireland's Environment - An Integrated Assessment 2020*[33], reveals that the overall quality of Ireland's environment is not what it should be, and the outlook is not optimistic. Such challenges outlined in the report include the protection of health and wellbeing, but also the greater awareness about the positive benefits of a clean environment for health and wellbeing.

The COVID-19 crisis that began in March 2020, has highlighted the importance of the natural environment in our local areas. The current limitations and social distancing requirements brought about as a result of COVID-19 have further highlighted the continuing need for the provision and access to these assets in our urban areas.

Existing population and human health issues / pressures on the population of the Dublin City administrative area, include:

- Flooding - Dublin City is vulnerable to fluvial and coastal flooding events which occur as a result of storm events, see Section 5.5.7 of this report).
- Underutilised Lands - Large areas of the City that are well served by existing / proposed infrastructure and public transport remain undeveloped or underdeveloped. Concentrations of underutilised lands are evident in a number of areas of the City (Liberties, North-East Inner City[34]).
- Radon - Radon levels in the City have been collated from the Radiological Protection Institute of Ireland and are shown in Figure 5.4.
- Health and Well-being - addressing deficits of green space due to the historic development of the City and retrofitting green infrastructure into existing built-up areas.
- Access - locating / developing access to lands presently not being used to facilitate community and allotment gardening in the City. The '*Access to and the use of Blue / Green Spaces in Ireland during a Pandemic'* study highlighted significant differences between socio-economic groups in relation to the amount of time spent outdoors in blue / green spaces during the pandemic with the lowest income group reporting the lowest average number of days.
- Information on the status of drinking water, urban wastewater climate change are provided in other sections of this report.

[33] EPA (2020g).
[34] DCC (2020f).

5.4 Soils & Geology

5.4.1 Introduction

Land is the solid surface of the Earth that is not permanently covered by water, while soil is the ecosystem in the uppermost layer of the ground in which plants can grow. Soil is composed of mineral particles, organic matter, water, air and living organisms[35]. Land degradation is a global problem, often caused by a combination of factors such as poor land management and unsustainable development. Land degradation may exacerbate the impacts of natural disasters[36].

The upper most layer of the earth's surface is generally termed **'soil'.** It comprises for the most part organic matter, minerals and fine to course grained weathered rocks. The variability in the constituent parts and the percentage content of each in the soil matrix results in differing characteristics. This has implications for suitable land use and the appropriateness for differing land use practices.

Geology encompasses the understanding and study of the solid and liquid matter that constitutes the earth and the processes by which they are formed, moved and changed. Its understanding is necessary to fully appreciate the geological factors that shape and influence the world and its particular structure.

5.4.2 Legislation

Currently, there is no legislation which is specific to the protection of soil resources. In 2014, the proposal for a Soil Framework Directive was withdrawn. The importance of sustainable soil management was recognised in the Seventh Environment Action Programme, where sustainable land management is to be achieved by 2020.

The *Pesticides Framework Directive (2009/128/EC)* controls the storage, use and disposal of pesticides to minimise risk to health and environment from their usage.

5.4.3 Soils

Soil is a non-renewable resource that performs many vital functions: food, storage, filtration and transformation of many substances including water, carbon, and nitrogen.

[35] European Commission (2021).
[36] European Commission (2021).

The soil cover is Dublin is derived from glacial till of Irish Sea origin, with limestone and shale and is largely comprised of *'grey-brown podzolics'*[37]. Lighter-textured *'grey-brown podzolics'* are good all-purpose soils, while heavier-textured members are highly suited to pasture production, responding well to manurial and management practices. The coast of Dublin has a layer of alluvium overlying the topsoil, which is a result of the low-lying status of the City. This sequence of soils remains only in undisturbed areas of the coast. As Dublin is a built-up city, much of the topsoil and alluvium has been removed.

However, inner city soils typically have higher levels of potentially harmful elements and organic pollutants than areas towards the outer city. This is due to the historical industrial activities as well as fossil fuel burning and use of leaded paints and fuels. Polycyclic aromatic hydrocarbons (PAHs) are also present in the soil, reflecting historic coal burning and other historic industrial emissions, as well as more modern transport-related emissions. The presence of polychlorinated biphenyls (PCBs) is likely associated with historic industrial activities and paint particles in the soil[38].

The majority of soils in Dublin city are characterised under the Soil Information System (SIS) as 'urban' soils, i.e., soils that have been disturbed, moved and manipulated by human activities, see Figure 5.5. Urban soils are generally overlain by a non-agricultural, man-made layer formed from mixing, infilling or contamination by industrial uses. At the fringes of the City, the soil is characterised as fine, loamy drift with limestones and siliceous stones, particularly underlying the Phoenix Park, with river and lake alluviums in the Tolka and Liffey valleys, see Figure 5.6.

The potential for disturbance of soils during infrastructural development can lead to the loss of soils along with compaction of soils due to operations of heavy machinery. Loss of soils and sediment to water courses can lead to sediment issues such as an increase in suspended solids, which can impact on water quality. Human activity is also a significant driver of soil degradation through poor or inappropriate land management practices.

5.4.3.1 Infilled / Reclaimed Land

A significant portion of Dublin City is built on infilled or reclaimed land. The reclamation began back in the eighteenth century.

- The North Docklands were reclaimed between 1717 and 1729.

[37] Geological Survey, Ireland (GSI).
[38] DCC (2016*).*

- North Lotts and East Wall were reclaimed by the end of the 1750s.
- A bank was constructed along the present South Lotts Road by 1760. The area between these banks was gradually reclaimed together with adjoining areas of the Dodder Estuary.
- A 1km stretch of land between the City centre and the River Dodder was reclaimed between 1917 and 1927.
- The dry dock between the Grand Canal Dock and the Dodder was filled in 1918. Reclamation continued progressively in an easterly direction from the beginning of the nineteenth century.

Many of the City's parks were built over landfill sites, including Ringsend Park, Fairview Park and Tolka Valley Park.

5.4.3.2 Contaminated Soils

In the absence of mitigation, contaminated materials have the potential to adversely impact upon human health, water quality and biodiversity including habitats and species. Due to the mixture of historic industrial land uses and land reclamation in Dublin, there are some contaminated sites which can cause environmental problems.

Much of this contaminated land lies within the Docklands area where there is a range of potential contaminants within the fill material used in land reclamation, such as builders' rubble, ash and possibly hazardous waste. Contaminated land requires appropriate remediation of the site prior to any development, ensuring there is no migration of contaminated material during remediation or measures to handle landfill gases.

Disturbance of contaminated soils in urban areas like Dublin City, especially sites of historic contamination/or brownfield / industrial lands could result in potential for water pollution and further potential land contamination.

5.4.3.3 Extractive Industries

Extractive industries by their nature can give rise to detrimental environmental and residential amenity effects including traffic generation, vibration, dust, noise, water pollution, visual intrusion and loss of groundwater supplies.

There are no active extractive industries / quarries in Dublin City. There were a number of small quarries in the outer city suburbs that closed in the past 50-60 years as housing expanded. These

include sites at: Cabra (Quarry Road), Crumlin (Sundrive Park), Kimmage Road Lower, Kilmainham and Artane. Rockfield Park in Artane was named by residents after old quarry excavations in the area.

5.4.3.4 Seveso Sites

The Seveso III Directive (European Directive 2012/18/EU) and the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2000 (S.I. No. 476 of 2000) apply to companies where dangerous substances are present in quantities equal to or above specified thresholds. There are two thresholds, a lower one of 50 tonnes (‘*lower tier sites’*) and a higher one of 200 tonnes (‘*upper tier sites*’). Lower tier sites are required to have a Major Accidents Prevention Policy and a Safe Work Systems Plan. Upper tier sites are required to carry out, in conjunction with the local competent authority (which includes the Health Service Executive (HSE), the Local Authority and An Garda Síochána) a Major Accidents External Emergency Plan.

In the DCC administrative area there are eight Upper Tier sites and six Lower Tier sites[39]. A further three sites (one Upper and two Lower) are located outside the DCC administrative area, but are within the consultation zone distance of lands within the City, which is the area where planning applications must be referred to the Health & Safety Authority (HSA) and are within development distance of Dublin City. Refer to Table 5.3.

[39] HSA (2021).

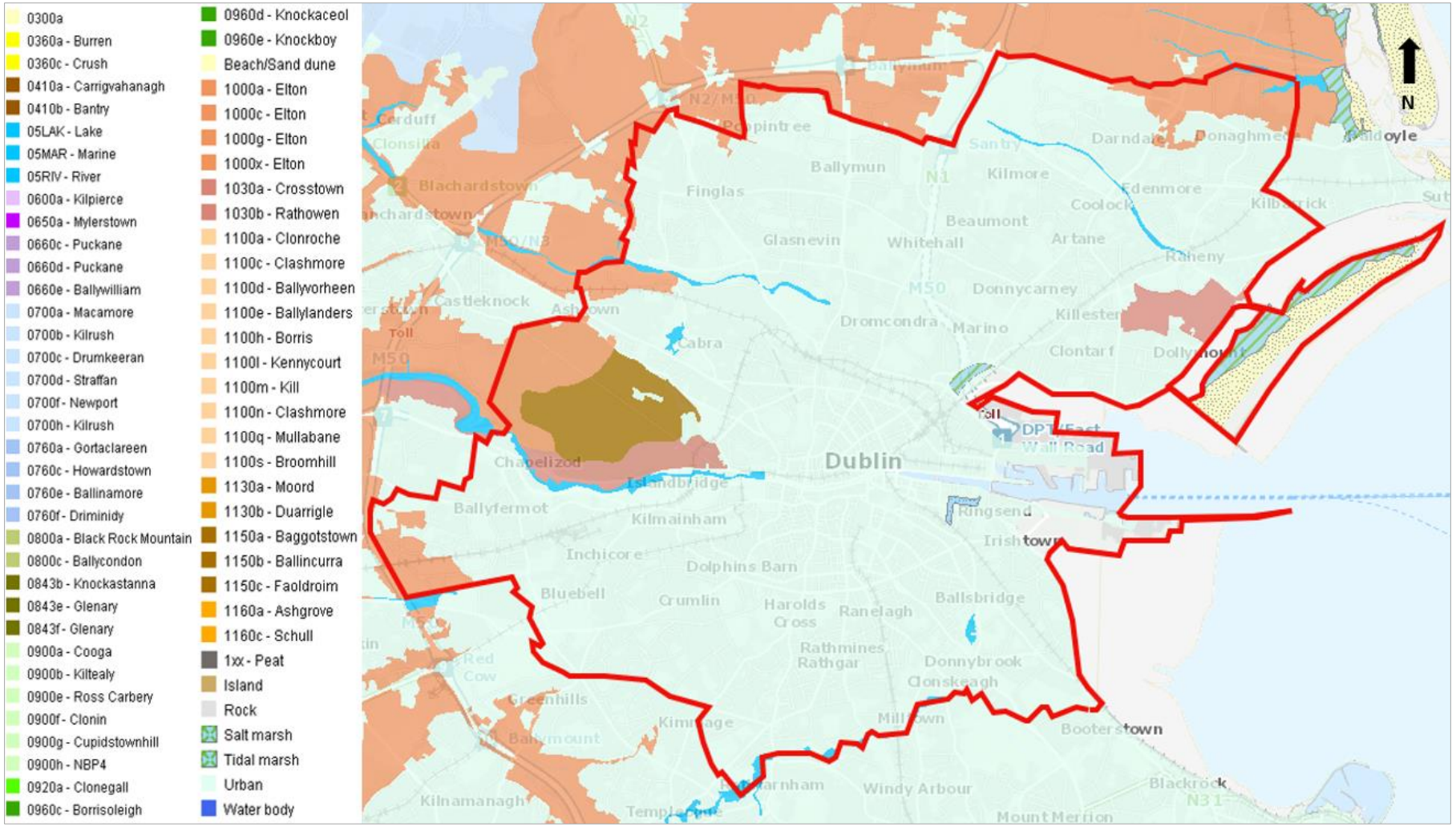
Table 5.3: Seveso Sites in Dublin City Administrative Area

Upper Tier Seveso Sites	
Site Name	**Address**
Calor Teoranta / Calor Gas	Tolka Quay, Dublin Port, Dublin 1
Fareplay Energy Ltd. / Circle K Energy Ltd.	Fareplay Terminal Dublin, Promenade Road, Dublin Port, Dublin 3
Indaver Ireland Ltd.	Tolka Quay Road, Dublin Port, Dublin 1
Tedcastles Oil Products / TOP Oil	Yard 1, Promenade Road, Parish of St. Thomas, Dublin 3
Tedcastles Oil Products / TOP Oil	Yard 2, Tolka Quay Road, Dublin Port, Dublin 1
National Oil Reserves Agency Ltd. / NORA	Shellybanks Road, Ringsend, Dublin 4
National Oil Reserves Agency Ltd. / NORA	Poolbeg Tankfarm, Pigeon House Road, Dublin 4
Valero Energy Ireland Ltd.	Dublin Joint Fuels Terminal, Alexandra Road, Dublin Port, Dublin 1
Lower Tier Seveso Sites	
Circle K / Fareplay Energy Ltd.	Terminal 1, Alexandra Road, Dublin Port, Dublin 1
Circle K / Fareplay Energy Ltd.	Yard 3, Alexandra Road, Dublin Port, Dublin 1
Electricity Supply Board	North Wall Generating Station, Alexandra Road, Dublin 1
Synergen Ltd. t/a ESB Dublin Bay Power	Pigeon House Road, Ringsend, Dublin 4
Iarnród Éireann	Alexandra Road, Dublin Port, North Wall, Dublin 1
Iarnród Éireann	Iarnród Éireann Maintenance Works, Inchicore, Dublin 8
Sites Outside DCC Boundary but within Consultation Distance of DCC	
BOC Gases Ireland Ltd. (Upper Tier)	PO Box 201, Bluebell Industrial Estate, Dublin 12
Kayfoam Woolfson (Lower Tier)	Bluebell Industrial Estate, Bluebell Avenue, Naas Road, Dublin 12
Irish Distillers Ltd. / Pernod Ricard (Lower Tier)	Robinhood Road, Fox & Geese, Clondalkin, Dublin 22

5.4.3.5 Landslides

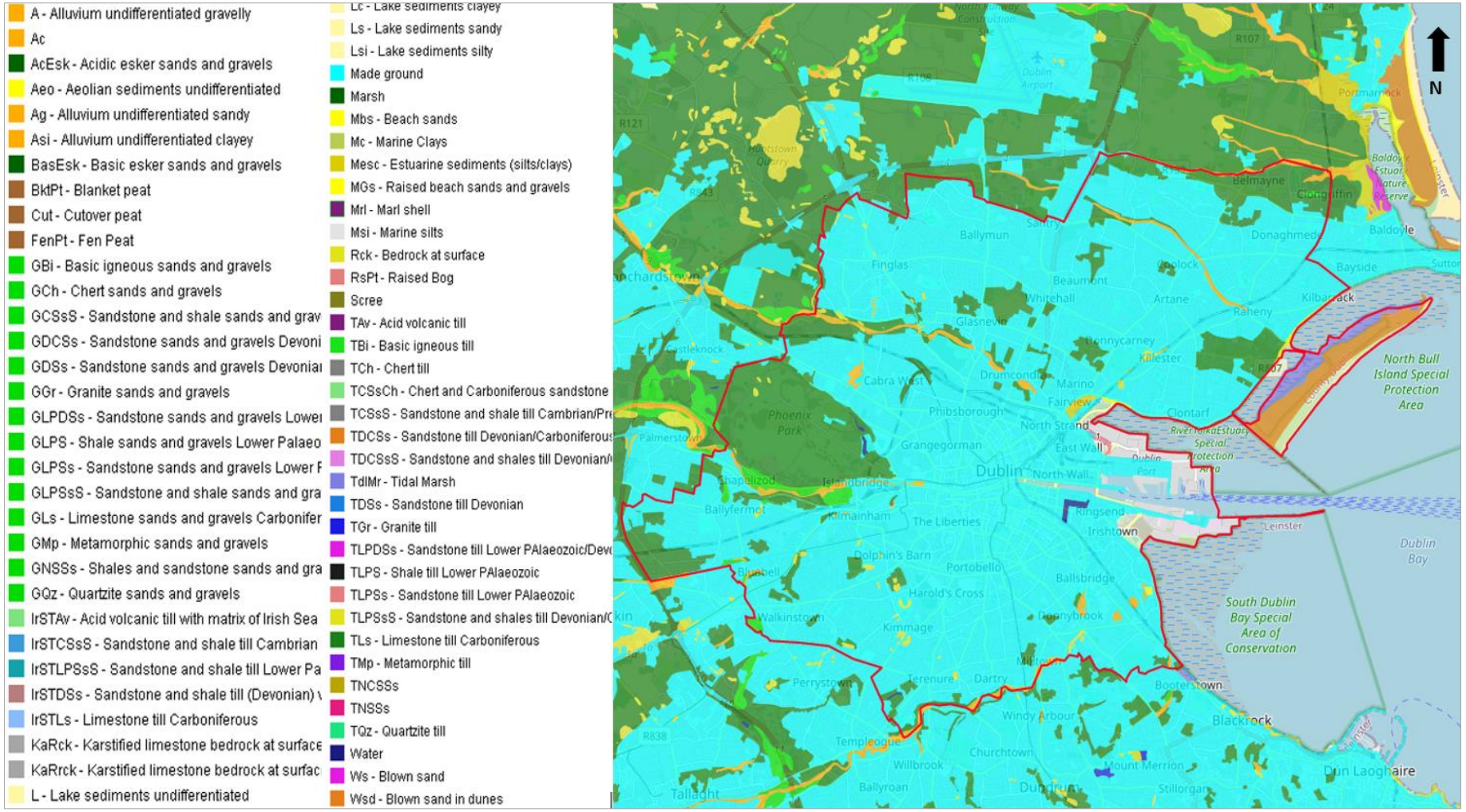
Dublin City has a low landslide risk as much of the city is, by its nature, has made ground. According to Geological Survey, Ireland *landslide susceptibility mapping*, the majority of the City has *zero landslide susceptibility,* with the risk rising to '*low*' at the outskirts of the city and heading outside the administrative boundary. There are small patches of '*moderate*' landslide susceptibility along the southwest edges of the Phoenix Park. There are no recorded landslides within the Dublin City boundary.

Figure 5.5: Soil Information System (SIS) National Soils Map for Dublin City[40]



[40] AIRO Environmental Sensitivity Mapping (2021).

Figure 5.6: Teagasc Subsoils Map for Dublin City[41]



[41] EPA Maps (2021). *Source OpenStreet Maps*.

5.4.4 Geology

Geological Survey, Ireland (GSI) provides information available on bedrock, subsoil, aquifer classifications and vulnerability. Numerous natural factors influence the composition of soils, notably bedrock, climate and topography. Geological understanding and interpretation is best achieved on the ground at sites where rocks and landforms are displayed.

The landscape of Dublin has been largely defined by the bedrock formations of the area, with limestone to the north and granite to the south. The more easily solubilised, less resilient limestone has eroded gradually, leaving a well-defined bay. The bay is restricted to the north and south where the limestone meets more resistant rocks (granite to the south and shale and conglomerate to the north). The changes in the bedrock geology are fault-controlled to the south of the bay. A large fault, known as the *Rathcoole Fault*, forms the southern margin of the basin where there is an unconformity between the granite and the limestone. To the north of the bay, there is a natural succession from the muddy *limestones* to the north into the *calp limestone* around the area of Sutton Cross.

Much of Dublin is dominated by rocks of *Carboniferous age*. During the early *Carboniferous* period, the eastern part of Ireland underwent uplift and erosion. Following this, there was a period of general subsidence in the area. This subsidence permitted the sea to invade the lower ground from the south during the *Carboniferous* age. Continued subsidence resulted in shallow and then deeper marine sediments accumulating across most of Dublin City and the county. The depth of the sea and type of seabed varied from place to place, as did the rate of sedimentation and so a variety of carbonate sediments were produced in the area.

The *calp limestone*, which covers most of Dublin, was deposited in the basins that formed over 300 million years ago. Thick sequences of muds and muddy limestones accumulated in the basins, sometimes showing graded bedding. The *calp Limestone* itself is comprised of dark grey, fine-grained, graded limestone with interbedded black, poorly fossilised shales.

Most of the *Carboniferous* rock, *i.e.,* the *limestone* forms low ground and is covered by a thick layer of Quaternary (2.6 million years ago to present) sediments. The deposits along the northern section of the bay are predominantly sand overlying gravels and clay. As one moves towards the City centre, the depth of the deposits increases and depths of 10m or greater of sands, gravels and estuarine muds have been recorded in Ringsend and East Wall.

The Irish Geological Heritage (IGH) Programme is currently identifying and selecting the very best national sites for Natural Heritage Area (NHA) designation, to represent the country's geology. The IGH is also identifying many sites of national or local geological heritage importance, which are classed as County Geological Sites (CGS), although these will not receive statutory protection of NHA sites. CGS do not receive statutory protection like Natural Heritage Areas (NHA) but receive an effective protection from their inclusion in the planning system. Some of these sites overlap with SACs and some are already pNHAs.

The audit of County Geological Sites in Dublin City was completed in 2014, which identifies 12 no. geological sites of interest in the City. CGSs represent sites of particular local or national geological importance and are adopted under the National Heritage Plan; however, these sites are not covered by the statutory protection of Natural Heritage Areas. CGSs represent important aspects of geological heritage conservation. The list of County Geological Sites for protection is set out in Table 5.4 below.

Table 5.4: Geological Heritage Sites in Dublin City[42]

No.	IGH[43] Theme	Site Name	Description
1	IGH7 Quaternary, IGH14 Fluvial and Lacustrine Geomorphology, IGH16 Hydrogeology	Phoenix Park	This site forms an extensive, 707 hectare natural landscape within the confines of the City of Dublin.
2	IGH 8 Lower Carboniferous, IGH 14 Fluvial and Lacustrine Geomorphology	River Dodder	A weir built on natural exposures of thick limestone beds in the channel of the River Dodder.
3	IGH13 Coastal Geomorphology	North Bull Island	North Bull Island, about 5 km long and 800 m wide, is located in Dublin Bay, lying roughly parallel to the shore off Clontarf (including Dollymount), Raheny, Kilbarrack, and facing Sutton. The island, as well as the beach known as Dollymount Strand running its entire length, is a very recent, and inadvertent, result of human intervention in the bay in the last 200 years.
4	IGH14 Fluvial and Lacustrine Geomorphology	River Poddle	This site comprises a river which flows northwards through Dublin City and into the Liffey; most of its course has been diverted underground. The river flows across low permeability glacial till along its course, having formed in postglacial times over the last 11,000 years.
5	IGH 15 Economic Geology	Glasnevin Cemetery	Very large public cemetery of 120 acres. The cemetery was first used in 1832, and has been in constant use since. The rocks used in gravestones and memorials are of many different types and ages.
6	IGH 15 Economic Geology	GPO (General Post Office)	The General Post Office Building in the centre of O'Connell Street, in particular the doorways and marble panelled interior area for customers. This is a Georgian building of modern historical vintage, opened in the early1800s. The marble panelling of note here was fitted in 1928 during restoration of the building following the damage done during the 1916 Rising.
7	IGH 15 Economic Geology	Museum Building, TCD	The Museum building of Trinity College Dublin, in particular the original interior. The building was completed in 1857.

[42] GSI (2021).
[43] Irish Geological Heritage

No.	IGH[43] Theme	Site Name	Description
8	IGH 15 Economic Geology	Oscar Wilde Statue	A life size statue of Oscar Wilde, on Merrion Square, made of sculpted rocks, placed on top of a very large boulder of quartz. An extremely striking statue of Oscar Wilde is an artwork in its own right. It is of particular geological interest because the life size statue is almost entirely made of different ornamental rock types, fashioned to create a realistic representation.
9	IGH 15 Economic Geology	51 St. Stephen's Green	The entrance lobby of the building is original from mid 1800s, and displays a demonstration set of Irish marbles. The lobby of the present day offices at 51 St. Stephen's Green is the original entrance for what was the Museum of Irish Industry, sited here although the building has been remodelled behind the facade. The lobby contains large polished panels of numerous Irish marbles and polished building stones, which are of many different geological ages.
10	IGH 15 Economic Geology	Dublin City Walls	Three remaining sections of the Medieval city walls of Dublin City. The walls are composed of local Calp limestone of Carboniferous age, but built between 1100 and 1125, also incorporating some later historic re-facings and additions including the 20th Century addition of a crenelated parapet at Cook Street.
11	IGH 16 Hydrogeology	Temple Bar Street Well	An historic street well in the middle of Temple Bar. The Temple Bar Street Well is thought to date from between 1680 and 1720, and was dug to supply freshwater for the local inhabitants of the city, which had become protected by embankments. The water was groundwater that flowed into this area of previously saline groundwater.
12	IGH 16 Hydrogeology	Guinness Wells	The Guinness Brewery has always depended upon the availability of water. It requires water for the product and the processes in making beer. Water was also required for transport of raw materials to the brewery, and distribution of product within Ireland and for export overseas. There were several historic sources of water near the site; the River Liffey, the River Camac and the City Basins fed by water from the Grand Canal. However, Guinness' realised that river and canal water quality was variable. They made significant efforts to obtain a high quality water supply from the groundwater system below their site. They started in the 19th Century digging wells and drilling boreholes. There were at least eight historic wells and boreholes on the site. One borehole was a major feat of Victorian technology. Over several years they excavated a borehole down to 1,531.5 feet below Ordnance Datum (Poolbeg) about 85 metres north of Market Street. This is probably still the deepest water supply borehole constructed in the country. Even with this great depth, the yield of water from the Calp Limestone was relatively small. It is reported that they obtained a yield of 1000 gallons per hour. Guinness' dug and bored several wells into the coarse permeable gravels associated with the modern and palaeo channels of the River Liffey. One of these composite wells in the northern part of the site has recently been brought back into use. It is called the Cooperage Well. It currently provides a yield of 22,000 gallons per hour or 100 cubic metres per hour.

5.4.5 Soils & Geology Issues

Changes to land and soils from both natural processes and human activities contribute to their dynamic and evolving nature. The physical, biological and / or chemical degradation of soils, can cause direct loss of soil, and indirectly impact ecologically essential soil processes, reduce productive capacity and deplete soil quality and biodiversity.

Existing soil and geology issues / pressures and threats on land within the Dublin City administrative area, include:

- Soil - the loss / damage of soil from the construction of sites for development.
- Soil - contamination can occur from unauthorised waste-related activities, leakages and accidental spillages of chemicals. Technical and financial constraints on development and the threat contaminated soils pose to the health of the population.
- Soil - disturbance of contaminated soils could result in potential for water pollution and potential further land contamination.
- Soil - pressure from land-use change, erosion, disposal of organic wastes to soils, industry and urbanisation.
- Soil sealing - covering of the ground by an impermeable material. Soil sealing can potentially put biodiversity at risk, increase the risk of flooding and prevents natural drainage.
- Groundwater - rock types in the City area that provides for a productive groundwater aquifer.
- Geological Heritage - the protection of sites of geological importance within the City, see Table 5.4.
- Climate Change - carbon stored in soils plays an important role in maintaining soil functionality, in water and air quality and in climate change. Proper land use management is essential to prevent carbon stored in soil from being released into the atmosphere.
- Land Management - conversion of land / sites can release CO_2 into the atmosphere and further reduce areas of 'carbon sinks'.

5.5 Water Quality

5.5.1 Introduction

Water is fundamental to all life; for humans, plants and animals alike. It is also critical in economic terms in generating and sustaining wealth in a number of key areas such as fishing, power generation, industry, transport and tourism. However, it is also a fragile resource requiring continued protection.

Nearly half of the surface waters in Ireland are failing to meet the legally binding water quality objectives set by the EU Water Framework Directive because of pollution and other human disturbance[44]. The 2019 EPA assessment of water quality in Ireland, finds that there has been an overall decline in surface water quality, especially in rivers, between 2004 and 2012[45].

For the purposes of this section, the water environment is taken to include natural features such as lakes, rivers, streams (all surface waterbodies) and ground waterbodies. In addition flooding is also dealt with in this section. Wastewater treatment and drinking water are discussed under Material Assets in Section 5.9.

Larger rivers such as the River Liffey, Tolka and Dodder have had a considerable impact on the landscape of the City. While sections of smaller rivers such as the Camac, Santry and Nanniken have been culverted, open channel sections make a positive contribution to biodiversity value of local parks and the river corridor in the City. Dublin City also has a number of transitional waterbodies (estuaries) and the entirety of Dublin City's coastline falls within Dublin Bay. Dublin City has no natural lakes.

DCC is responsible for surface water management and aquifer protection in the City, with the Office of Public Works (OPW) having responsibility for flood risk management.

5.5.2 Legislation

5.5.2.1 Water Framework Directive (WFD)

The EU Water Framework Directive (WFD) (2000/60/EC) establishes a framework for the protection of both surface water and groundwater waterbodies. This Directive was transposed into Irish law under the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003). This

[44] EPA (2020g).
[45] EPA (2019d).

legislation requires governments to take a holistic approach to managing all their water resources based on natural geographic boundaries, *i.e.* the river catchment or basin.

The WFD establishes a common framework for the sustainable and integrated management of all waters covering groundwater, inland surface waters, transitional waters and coastal waters. The WFD requires Member States to manage all of their waters and ensure that they achieve at least *'good status'* by 2015 and beyond. The ultimate deadline for Member States for achievement of *'good'* status is 2027 at the latest.

5.5.2.2 Groundwater Directive

The EU Groundwater Directive (2006/118/EC) was adopted by the European Parliament in June 2006. The Groundwater Directive uses a holistic approach to groundwater by addressing the relationships between groundwater, surface water and ecological receptors. The Groundwater Directive complements the WFD setting up environmental objectives of *'good'* groundwater quantitative and chemical status, as well as ensuring a continuity to the Directive 80/68/EEC on the protection of groundwater against pollution caused by dangerous substances, which is due to be repealed by the end of 2013[46].

5.5.3 River Basin Management Plan

For the purpose of implementing the WFD, Ireland was divided into eight River Basin Districts (RBDs) or areas of land that are drained by a large river or number of rivers and the adjacent estuarine / coastal areas. The first cycle of the River Basin Management Plan (RBMP) ran from 2009-2015, where the eight RBDs devised separate plans with the objective of achieving at least '*good*' status for all waters by 2015.

The second cycle of the RBMP 2018-2021, is currently underway and all eight RBDs have merged to form one national RBD. The RBMP sets out the actions that Ireland will take to improve water quality and achieve *'good'* ecological status in waterbodies (rivers, lakes, estuaries and coastal waters) by 2027.

Water quality data is also collected by the EPA to provide an overall status of water quality. The monitoring programme, as part of the WFD, assesses water quality but also water trends of rivers in relation to their ecological status and includes biological, physico-chemical and hydromorphological

[46] EC (2019).

status. The WFD status of rivers ranges from *'high'* to *'bad'*. The EPA also undertakes water quality surveys for transitional and coastal waterbodies.

A catchment is an area of land contributing to a waterbody, with all the water ultimately running off to a single outlet. The WFD requires water quality management to be based on natural river catchments *i.e.* by reference to the natural, environmental unit rather than by reference to administrative or legal boundaries, which often fragment river catchments. Table 5.5 lists the WFD Catchments and WFD Sub-Catchments in the Plan Area.

Table 5.5: WFD Catchments and Sub-Catchments in the Plan Area[47]

Catchment (WFD Catchment Code)	Sub-catchment Name (WFD Sub-catchment Code)
Liffey and Dublin Bay (09)	Mayne_SC_010
	Tolka_SC_020
	Liffey_SC_100
	Liffey_SC_090
	Dodder_SC_010

5.5.4 Surface Water Quality Status

The WFD defines '*overall surface water status*' as the general status of a body of **surface water**, determined by the poorer of its ecological status and its chemical status. In order to achieve '*good surface water status*' both the ecological status[48] and the chemical status[49] of a surface waterbody need to be at least '*good*'.

The latest EPA reports on water quality are the '*Water Quality in Ireland 2013-2018*' report (2019) and '*Water Quality in 2019 - An Indicators Report*' (2020). These reports contains the most up-to-date and comprehensive assessments of the ecological health of Ireland's rivers, lakes, canals, groundwaters, transitional waters and coastal waters collected over a six-year period between 2013-2018 and 2019.

[47] EPA Maps (2021).
[48] **Ecological status** is an expression of the structure and functioning of aquatic ecosystems associated with surface waters.
[49] **Chemical Status** is a pass/fail assignment with a failure defined by a face-value exceedance of an Environmental Quality Standards (EQS) for one or more Priority Action Substances (PAS) listed in Annex X of the Water Framework Directive (WFD).

The last full EPA assessment of water quality (*Water Quality in Ireland* 2013-2018) found that just over half of the rivers and lakes were in satisfactory ecological health and overall water quality had declined since the previous assessment. The latest EPA report results show that 52.8% of surface waterbodies assessed (2,703) are in satisfactory ecological health being in either *'good'* or *'high'* ecological status. The remaining 47.2% of surface waterbodies are in *'moderate'*, '*poor',* or *'bad'* ecological status. This compares with 55.4% at satisfactory status for the last assessment period of 2010-2015, a decrease of 2.6%[50]. The number of seriously polluted '*bad'* status river waterbodies has increased to nine having reached a low of six waterbodies in the last assessment 2010-2015[51].

The main problem damaging Irish waters is the presence of too much nutrients such as phosphorus and nitrogen which come primarily from agriculture and wastewater.

The EPA, '*Water Quality in Ireland 2013-2018'*, report shows there has been an overall decline in '*high'* status waters which reflects the general decline in high quality biological river sites seen in recent decades. These near pristine unpolluted waters are vital for the survival of sensitive aquatic species and the protection of aquatic biodiversity[52].

The EPA report indicates that of the monitored **transitional waterbodies,** 30 transitional waterbodies (38%) are in '*high'* or *'good'* ecological status and 49 (62%) are in *'moderate'* or worse ecological status. Six of these waterbodies are in *'bad'* ecological status and 14 are in *'poor'* ecological status.

The EPA report indicates that for **coastal waters**, 36 monitored coastal waterbodies (80%) are in '*high'* or *'good'* ecological status, with nine (20%) at less than *'good'* status. The majority (93%) of the surface area of coastal waters are in '*high'* or *'good'* ecological status.

5.5.4.1 Surface Water Quality Status in Dublin City

The WFD status of the **river waterbodies** in Dublin City ranges from '*moderate*' to '*poor"* during the 2013-2018 monitoring period. The EPA, '*Water Quality in Ireland Report 2013-2018'*, report indicates that in Dublin City, 2% of its rivers had a *'moderate'* status. However, there are a number river waterbodies that are 'unassigned', as their waterbodies status is under review. The main rivers in Dublin City are the:

- River Liffey;

[50] EPA (2019d).
[51] EPA (2019d).
[52] EPA (2019d).

- River Tolka;
- River Santry;
- River Dodder; and
- River Camac.

The River Liffey is the main river that flows through Dublin City. The source of the River Liffey is located in Wicklow and the river drains lands in Wicklow, Kildare, South Dublin, Fingal and Dublin City. The River Liffey water quality status ranges from *'moderate'* to unassigned as it flows through Dublin City in an eastern direction.

The River Tolka rises near Dunshaughlin in Co. Meath and flows in a south-easterly direction for c. 14 miles before entering the sea at Clontarf on the north side of Dublin City. The River Tolka water quality status ranges from *'poor'* to unassigned as it flows through Dublin City.

The source of the River Santry is near Harristown and Dubber in North Dublin and flows in a south-easterly direction before it reaches the sea at the eastern "lagoon" behind North Bull Island. The River Santry water quality status ranges from *'poor'* to unassigned as it flows through Dublin City.

The source of the River Dodder is located just inside Wicklow, and drains lands in South Dublin, Dún Laoghaire - Rathdown and Dublin City. The River Dodder water quality status is *'moderate'* as it flows in a northern direction through Dublin City.

The source of the River Camac is in South Dublin, but also drains lands in Dublin City. The River Camac water quality status is '*poor'* as it flows in a north-easterly direction through Dublin City to the River Liffey at Heuston, refer to Figure 5.7.

Other river corridors within the City include, the River Poddle, River Nanniken and the River Mayne, refer to Figure 5.7.

The Liffey, the Dodder, and the Tolka, support healthy stocks of various fish species, including the salmonid species, trout and salmon. The return of the latter species to the River Dodder and River Tolka in recent years reflects improvements in water quality. These watercourses also harbour a number of animal species protected under the EU *Birds and Habitats Directives*, namely kingfisher, otter, river lamprey and white-clawed crayfish.

The River Camac supports otter and crayfish, while in addition otters still occur as well on both the River Santry and the River Mayne on the north eastern boundary of the DCC area. It is important therefore that a high water and therefore high ecological quality is maintained in these rivers.

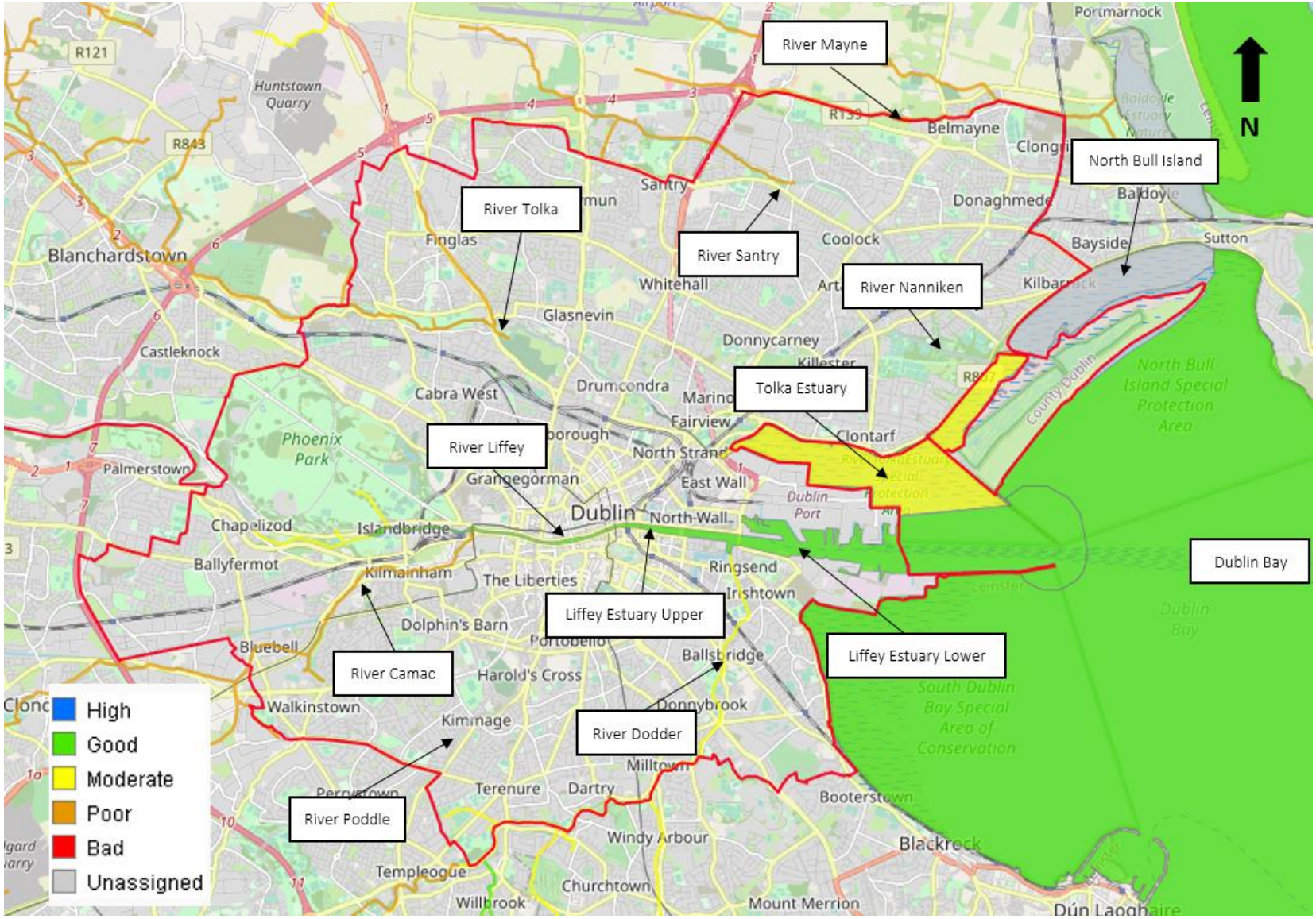
The WFD status of the **transitional waterbodies** in Dublin City ranges from '*good*' to '*moderate*' during the 2013-2018 monitoring period. The transitional waterbodies in Dublin City are the:

- Liffey Estuary Upper (IE_EA_090_0400);
- Liffey Estuary Lower (IE_EA_090_0300);
- Tolka Estuary (IE_EA_090_0200); and
- North Bull Island (IE_EA_090_0100).

The Liffey Estuary Upper and Liffey Estuary Lower has a *'good'* status during the 2013-2018 monitoring period. The Tolka Estuary had a *'moderate'* status and North Bull Island was unassigned during the same period, refer to Figure 5.7.

The WFD status of Dublin Bay **Coastal Waterbody** (IE_EA_090_0000) had a *'good'* status during the 2013-2018 monitoring period, refer to Figure 5.7.

Figure 5.7: WFD Waterbody Status for Dublin City 2013-2018[53]



[53] EPA Maps (2021). *Source OpenStreet Maps*.

5.5.5 Groundwater

5.5.5.1 Groundwater Quality

Groundwater is important for a drinking water supply as well as the supply to surface waters. The National Groundwater Monitoring Programme assesses the general state of groundwater quality and groundwater levels and flows[54].

Groundwater WFD Quality Status in Dublin City (2013 to 2018) was generally '*good*'[55] and therefore, the Dublin CDP must protect groundwater from deterioration.

5.5.5.2 Aquifer Vulnerability and Productivity

Groundwater aquifers form important sources of drinking water both locally and regionally. Much of the summer seasonal flow in many rivers is also derived from groundwater sources. To maintain high quality water resources within the Plan Area, it is important that development is controlled and managed appropriately, in particular in areas of high groundwater vulnerability to avoid transmission of pollutants into important aquifers.

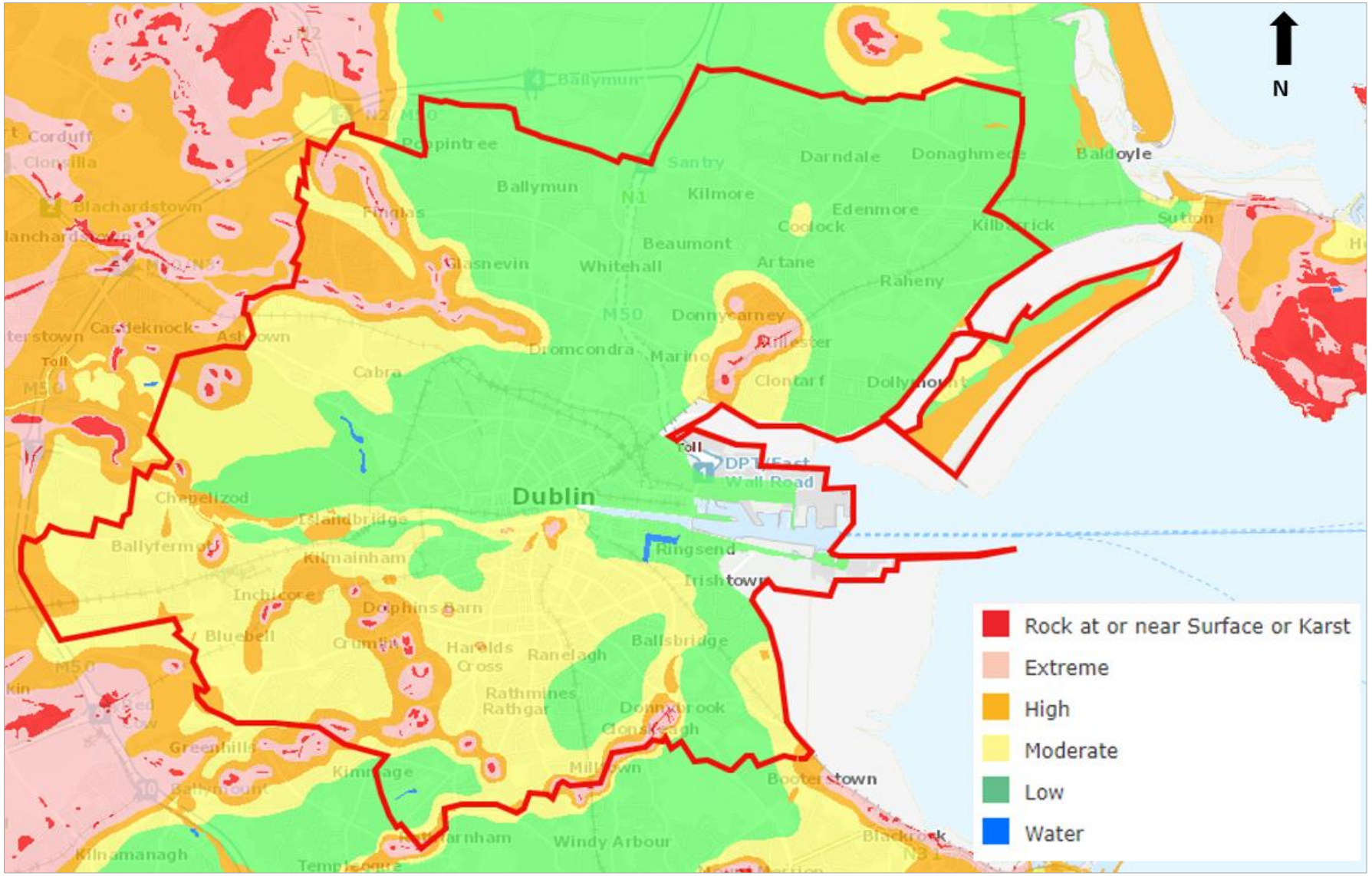
The GSI rates aquifers according to both their productivity and vulnerability to pollution. Groundwater vulnerability maps are based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays), and the presence of karst features. Groundwater is most at risk where the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes. Aquifer vulnerability is the ease with which pollutants of various kinds can enter into groundwater. The vulnerability of aquifers underlying Dublin City are generally classified as being of:

- *Extreme* vulnerability and *Extreme (Rock at or near surface or karst),* in small pockets in the north-west and in the south;
- *High* and *Moderate* vulnerability, large areas along the south and to the north-west; and
- *Low* vulnerability, in the north and north City centre.

Dublin City is underlain mainly with a '*locally important aquifer – Bedrock which is Moderately Productive only in Local Zones'.* The groundwater aquifer vulnerability of Dublin City is shown in Figure 5.8 and the Bedrock Aquifer of Dublin City is shown in Figure 5.9.

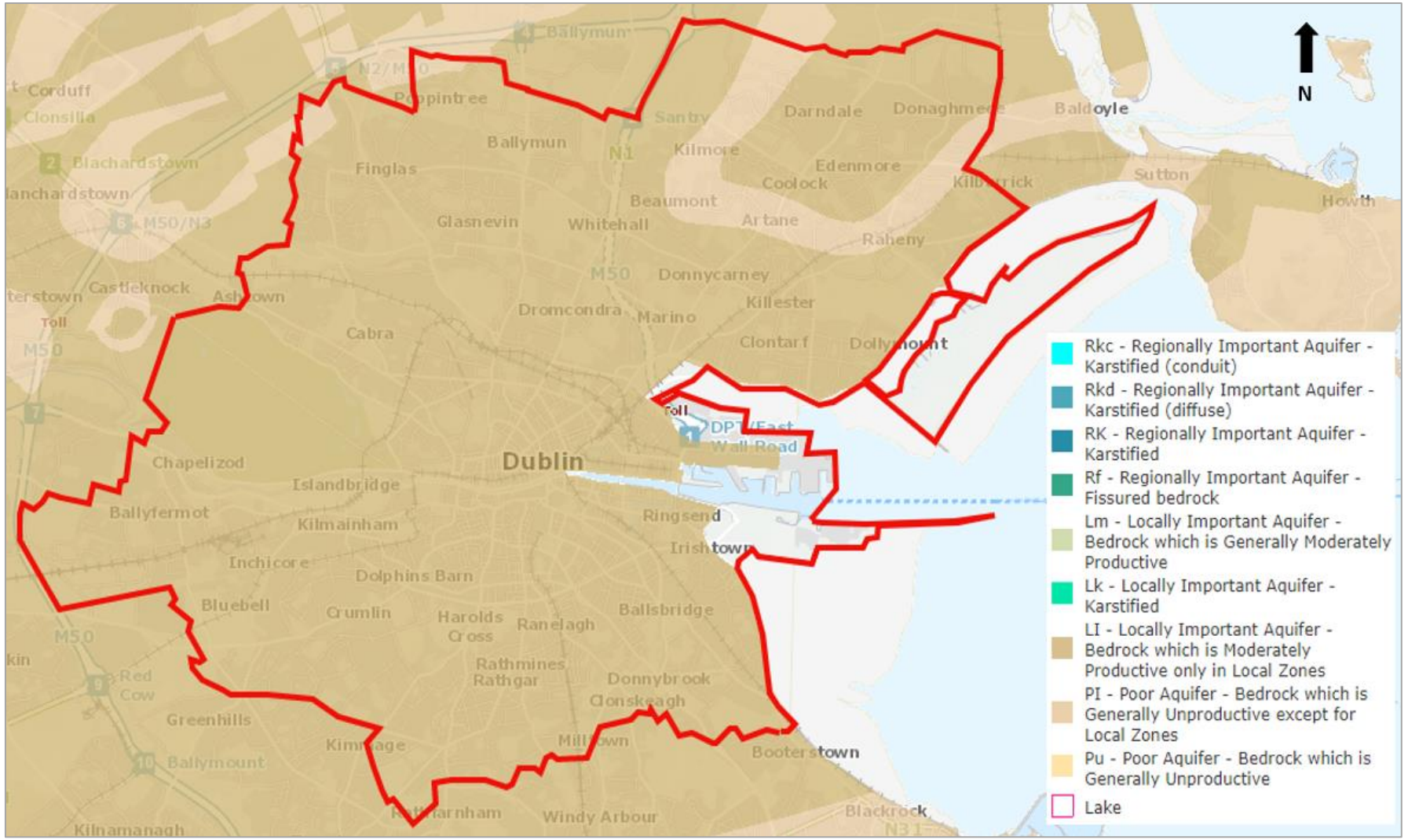
[54] EPA (2018).
[55] EPA Maps (2021).

Figure 5.8: Groundwater Aquifer Vulnerability in Dublin City[56]



[56] AIRO Environmental Sensitivity Mapping (2021).

Figure 5.9: Bedrock Aquifer in Dublin City [57]



[57] AIRO Environmental Sensitivity Mapping (2021).

5.5.6 Coastal Waters

Coastal Waters are important for tourism, for bathing locations and for supporting marine wildlife. The process for monitoring and assessing **bathing** water quality is set out in the EU Bathing Water Directive (2006/7/EC) and transposed into Irish Legislation as the Bathing Water Regulations S.I. No. 79 of 2008.

Dublin City's coastline is also a valuable amenity, and any recreational amenities along the coastline should be sustainably designed and carefully sited.

In line with Directive 2014/89/EC (establishing a framework for maritime spatial planning), the Department of Housing, Local Government and Heritage is currently preparing a National Marine Planning Framework (NMPF)[58]. Marine Spatial Planning (MSP) looks at how we use the marine area and planning how best to use it into the future. MSP will try to balance the different demands for using the sea including the need to protect the marine environment. It's about planning when and where human activities take place at sea and ensuring these activities are as efficient and sustainable as possible.

5.5.6.1 Bathing Waters

Bathing water is the term used for those locations where swimming or recreational use of beaches and lakes is practiced. In Ireland, bathing water information is compiled by the EPA from data submitted from local authorities. During the bathing season (1st June to 15th September), water quality at each bathing area must comply with the minimum EU mandatory value and all bathing areas should endeavour to achieve the stricter EU guide values[59].

There are three designated bathing waters within the Dublin City Council area at Dollymount Strand, Merrion Strand and Sandymount Strand. Regular monitoring of bathing water quality is carried out during the bathing season, which runs from the 1st June to 15th September annually.

The most recent report on bathing water quality '*Bathing Water Quality in Ireland - A Report for the Year 2019'*[60] sets out the status of Irish Seawater and Freshwater Bathing areas. During the 2019

[58] National Marine Planning Framework. Available at: https://www.gov.ie/en/publication/a4a9a-national-marine-planning-framework/
[59] Bathing water is assessed for compliance with two sets of EU standards, as specified in the Directive (2006/7/EC), minimum quality standards (EU mandatory values) and more stringent quality targets (EU guide values).
[60] EPA (2019e).

Annual Water Quality monitoring period, Dollymount Strand had *'excellent'* water quality status, while Merrion Strand a '*poor*' status and Sandymount Strand had *'sufficient'* water quality status.

There were no designated blue flag beaches or marinas in Dublin City for 2020.

5.5.7 WFD Registers of Protected Areas

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

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

See Section 5.2.10 for the full list of RPAs in the Plan Area.

5.5.8 Sustainable Urban Drainage Systems (SuDS)

Surface water on all new development sites should be managed through Sustainable urban Drainage Systems (SuDS). SuDS aims to reduce the rate and quantity of surface water runoff, and improve water quality from the site. SuDS can provide an opportunity to enhance biodiversity and amenity.

The objective of SuDS in new developments is to replicate, as closely as possible, the surface water drainage regime to the predevelopment *'greenfield'* situation. This is achieved through the use of surface water source control and site control measures. Source control measures include rainwater harvesting, natural infiltration, infiltration trenches, filter drains, filter strips, swales and permeable paving. Site control measures include attenuation by means of tanks or retention ponds. The surface water runoff rate from the site must be limited to the *'greenfield'* runoff rate to reduce the risk of flooding.

5.5.9 Flooding & Flood Risk

Floods are usually caused by a combination of events including overflowing river banks, heavy rains, coastal storms or blocked or overloaded drainage systems and an increase in development and impermeable surfacing.

Flood risk can be defined as the probability of flooding multiplied by the consequences of flooding. In *'The 'Planning System and Flood Risk Management', Guidelines for Planning Authorities*, the probability of a flood event taking place is recognised through the classification of Flood Zones which indicate a high, moderate or low risk of flooding from fluvial or tidal sources. The Office of Public Works (OPW) is the lead State body for flood risk management.

The National *Catchment Flood Risk Assessment and Management* (CFRAM) Programme has been the principle vehicle to deliver on Ireland's commitments under the EU Floods Directive (2007/60/EC)[61]. The CFRAM Programme identified significant flood risk communities under a national screening exercise, known as Areas for Further Assessment (AFAs). The Eastern CFRAM study commenced in in 2011 and ran until the end of 2016.

The National Development Plan (NDP) 2018-2027 is committed to provide funding for flood relief schemes, with annual Capital funding for flood relief for the OPW.

Dublin City is susceptible to different types of flood risk, including:

- Fluvial - Flooding occurs when a river overtops its banks due to a blockage in the channel or the channel capacity is exceeded.
- Pluvial - Flooding occurs when overland flow cannot infiltrate into the ground, when drainage systems exceed their capacity or are blocked and when the water cannot discharge due to a high water level in the receiving watercourse.
- Coastal flooding - which is caused by higher sea levels than normal, largely as a result of storm surges, resulting in the sea overflowing onto the land. Coastal flooding is influenced by the following factors, which can work in combination: high tide level; storm surges; and wave action.
- Estuarine flooding - which occurs due to a combination of tidal (coastal) and fluvial flooding, *i.e.* the interaction between rivers and the sea. A combination of high flow in rivers and a high

[61] OPW (2020).

tide will prevent water flowing out to sea, causing increase in water levels inland, which may flood over river banks.

In 2018, the OPW published the *Flood Risk Management Plan for the Liffey and Dublin Bay River Basin*, which set out the strategy for the cost-effective, sustainable and long-term management of flood risk in the River Basin. DCC strives to implement flood alleviation measures that include nature and have multiple benefits beyond flood defence, such as providing new spaces for recreation and habitats for birds and animals.

In terms of infrastructural investment, the DCC has advanced a number of projects across the City over the last number of years. According to the *Annual Progress Report 2020* for the *DCC Climate Change Action Plan 2019-2024*, there are approximately 15 flood alleviation projects under way in the city. The projects are at various stages[62].

In line with *The Planning System and Flood Risk Management Guidelines for Planning Authorities (2009),* a Strategic Flood Risk Assessment (SFRA) of Dublin City will be carried out to inform the preparation of the Draft Plan. The SFRA is taking place concurrently with the preparation of the Plan and SEA and will inform both, including integration of flood risk management considerations into the Draft Plan.

It should be noted that the Government has established an Inter-Departmental Group on *Coastal Change Management* to scope out an approach for the development of a national coordinated and integrated strategy to manage the projected impact of coastal change to coastal communities, economies, heritage, culture and environment. The Inter-Departmental Group[63] and will bring forward options and recommendations for the Government to consider.

5.5.10 Water Quality Issues

The principal threat to water is pollution which can adversely impact on all parts of the water cycle from groundwater to rivers, lakes estuaries and coastal waters.

Any development as part of the Draft Dublin CDP has the potential to impact waterbody status, water usage, flood risk and generate wastewater. The CDP must fully meet the requirements of the WFD

[62] The Annual Progress Report for the Climate Change Action Plan has been prepared by the Dublin City Council Climate Action team in conjunction with the Dublin energy agency Codema and the Dublin Metropolitan Climate Action Regional Office (CARO) and in partnership with the Environment Strategic Policy Committee and the Elected Members of Dublin City Council.
[63] jointly chaired by the Department of Housing, Planning and Local Government and the OPW.

and the Groundwater Directive and aim to drive improvement to water quality in both the short and long-term.

Existing water quality issues / pressures and threats on waterbodies within and adjacent to the Dublin City administrative area, include:

- Water - the surface waterbodies in Dublin City need to be improved to achieve *'good'* ecological status in waterbodies by 2027.
- Water - water contamination arising through poor working practices, leakages or accidental spillage of materials if efficient pollution control measures are not fully implemented and maintained.
- Water - pressure on water sources also comes from land-use changes, industry, urbanisation, and erosion.
- Water - upstream pollution, combined sewer overflows, misconnection of wastewater from individual houses and urban run-off plus culverting / changes to river channels.
- Groundwater - the development of a wastewater leak detection programme and the implementation. Groundwater WFD Quality Status in Dublin City was generally *'good'* and they need to be protected to prevent deterioration.
- Surface, ground & coastal waters - are at risk of pollution from wastewater treatment systems (including septic tanks) in the vicinity of waterbodies.
- Bathing Water - bathing water quality at Merrion Strand had a *'poor'* status and Sandymount Strand had '*sufficient*' water quality status. These bathing waters need to be improved.
- Flood Risk - to be considered in Development Plan SEA documents as a key environmental criteria.
- Flooding - there is historic and predictive evidence of elevated levels of flood risk from fluvial and pluvial sources at various locations across the City.

5.6 Air Quality, Noise & Climate Change

5.6.1 Introduction - Air Quality

Air quality legislation in Ireland highlights the need '*to avoid, prevent or reduce harmful effects on human health and the environment as a whole*'. In addition, it requires that Local Authorities where appropriate '*shall promote the preservation of best ambient air quality compatible with sustainable development'*.

5.6.2 Air Quality - Legislation / Policy / Guidance

EU legislation on air quality requires that Member States divide their territory into zones for the assessment and management of air quality, where reporting of national air pollutants and air quality is an obligation for all European member states.

5.6.2.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or "*Air Quality Standards*" are health or environmental-based levels for which additional factors may be considered.

The applicable standards in Ireland include the *Air Quality Standards Regulations 2011*, which incorporate EU Directive 2008/50/EC, which has set limit values for NO_2, PM_{10}, $PM_{2.5}$, benzene and CO. Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions.

5.6.2.2 National Emission Ceilings Directive

The National Emission Ceilings (NEC) Directive (2016/2284/EU)[64], Annex II, set emissions reduction commitments for 2020 and 2030, based on a reduction from 2005 emissions, for the five main air pollutants.

5.6.2.3 National Clean Air Strategy

The *National Clean Air Strategy* will provide an overarching policy framework within which clean air policies can be formulated and given effect in a manner consistent with national, EU and international policy considerations and priorities. The development of this first *National Air Pollution Control*

[64] The new NEC Directive (2016/2284/EU), which entered force on 31 December 2016, replaces earlier NEC directive (2001/81/EC).

Programme (NAPCP) is being undertaken in parallel with a number of other relevant national policy frameworks in Ireland.

The Local Authorities in the Dublin Region have prepared the *Air Quality Management Plan* for *improvement in levels of Nitrogen Dioxide in ambient air quality* for submission to the EPA[65]. Ambient air quality monitoring is carried out in the Dublin Region by the four local authorities under the direction of the EPA. This involves monitoring for a range of air pollutants specified under European Union rules to ensure that legal standards for air quality are met. Nitrogen Dioxide levels in the Dublin Region are primarily associated with traffic emissions. Nitrogen Dioxide is a significant air pollutant as short-term exposure 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.

5.6.2.4 Greenhouse Gas Emission

The EPA's 2020 publication *Ireland's Greenhouse Gas Emission Projections 2019-2040*[66] provides an assessment of Ireland's progress towards achieving its emission reduction targets set down under the EU Effort Sharing Decision (Decision No 406/2009/EC) between 2013-2020 and a longer-term assessment based on current projections. Ireland's 2020 target was to achieve a 20% reduction of non-Emission Trading Scheme (non-ETS) sector emissions (*i.e.* transport, the built environment) on 2005 levels with annual limits set for each year over the period 2013-2020.

Ireland's 2030 target under the Effort Sharing Regulation is a 30% reduction of emissions compared to 2005 levels by 2030. The key insights identified include:

- There is a long-term projected decrease in greenhouse gas (GHG) emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the NDP *2018-2027.*
- Fossil fuels *(i.e.* coal, peat and gas) continue to be key contributors to emissions from the power generation sector. However, a significant reduction in emissions over the longer term is projected as a result of the expansion of renewables (*e.g.* wind, solar), with a move away from coal and peat.

[65] DCC, SDCC, FCC, DLRCC. *Air Quality Management Plan.*
[66] EPA (2020l).

- Growth in emissions from the transport sector continues to be projected which is largely attributed to fuel consumption from diesel cars and diesel freight. A decrease in emissions over the longer-term, most notably in the With Additional Measures scenario, is largely attributed to assumed accelerated deployment of 500,000 electric vehicles and the impact of greater biofuel uptake.
- Agriculture emissions are projected to continue to grow steadily over the period which is mainly a result of an increase in animal numbers particularly for the dairy herd.
- The implementation of additional energy efficiency measures included in the NDP will see a significant reduction in emissions in the residential, commercial / public services and manufacturing sectors over the projected period.

5.6.3 Air Quality Monitoring

The EPA manages the national ambient air quality monitoring network and measures the levels of a number of atmospheric pollutants. Following a review of ambient air quality monitoring in Ireland, the current national monitoring programme was launched at the end of 2017. The programme is providing more comprehensive, real-time, localised air quality information that is linked to public health advice[67].

The current trends in air quality in Ireland are reported in the latest EPA publication (2020) '*Air Quality in Ireland 2019*'[68]. The report indicates that air quality levels at monitoring sites in Ireland were below the EU legislative limit values in 2019, however, there was one exceedance of EU annual average limit values in 2019 at one urban traffic station in Dublin due to pollution from transport.

Ireland was above World Health Organization (WHO) air quality guideline value levels at 33 no. monitoring sites, mostly due to the burning of solid fuel in our cities, towns and villages. However, the report indicates that Ireland will exceed EU limit values for NO_2 in the near future. There are four national air quality designated zones in Ireland, these are:

- Zone A is the Dublin conurbation;
- Zone B is the Cork conurbation;
- Zone C comprises of 23 large towns in Ireland with a population of >15,000; and
- Zone D is the remaining area of Ireland.

[67] EPA (2020g).
[68] EPA (2020i).

Dublin City is located within Zone A, within the '*Dublin conurbation*' zone[69]. The main sources of air pollution are domestic solid fuel burning, diesel fuelled vehicle emissions, industry and even natural sources such as sea salt and wind-blown dust.

The air quality index for health (AQIH) regions are calculated on an hourly basis at various locations around Ireland[70]. The AQIH is a number from one to ten that tells you what the air quality currently is in the station. A reading of ten means the air quality is *very poor* and a reading of one to three inclusive means that the air quality is *good*. The AQIH is based on measurements of five air pollutants all of which can harm health. The five pollutants are:

- Ozone gas;
- Nitrogen dioxide gas (combustion of fossil fuels);
- Sulphur dioxide gas (combustion of fossil fuels);
- $PM_{2.5}$ particles (combustion of fossil fuels); and
- PM_{10} particles (combustion of fossil fuels).

There are a number of AQIH monitoring locations in Dublin City at Ringsend, Pearse Street, Winetavern Street, Rathmines, St. John's Road Kilmainham, Davitt Road Inchicore, Ballyfermot, Phoenix Park, Finglas, Marino, St. Anne's Park and Dublin Port[71]. The results from the monitoring sites are updated every two to five minutes with the calculated AQIH and displayed on the Air Quality Map which shows if air quality is *good, fair, poor* or *very poor*. The current *Air Quality Index Region* for Dublin City is *good*[72].

The EPA monitors air pollutants levels and compares them to EU legal limit values and WHO guideline values. These pollutants are:

- Particulate matter - $PM_{2.5}$ and PM_{10}
- Nitrogen oxides - NO_2 and NO
- Sulphur dioxide (SO_2)
- Ozone (O_3)
- Carbon monoxide (CO)

[69] EPA Maps (2021).
[70] The AQIH is calculated on an hourly basis using representative sampling from each region. (Dublin, Cork, large towns, small towns, rural east and rural west.
[71] EPA (2021e).
[72] EPA Maps (2021).

- Benzene and ozone precursors
- Benzo(a)Pyrene, a Polycyclic Aromatic Hydrocarbon (PAH) - both in PM_{10} and deposition
- Heavy metals - both in PM_{10} and deposition
- Chemical composition of $PM_{2.5}$
- Mercury.

Annual average $PM_{2.5}$ concentrations were modelled for Dublin in 2017. The $PM_{2.5}$ mapping clearly indicates that Dublin City was above the WHO guideline values[73] for $PM_{2.5,}$ refer to Figure 5.10. These indicative results support monitoring carried out by them EPA and the conclusion of previous Air Quality in Ireland reports[74].

In 2019, levels of sulphur dioxide (SO_2), carbon monoxide (CO), and particulate matter (PM_{10} and $PM_{2.5}$) are all within acceptable EU levels, however, EU levels of nitrogen dioxide (NO_2), was breached at one monitoring local.

Also in 2019, DCC expanded its air quality monitoring network to include six local monitoring stations in addition to those already operating within the EPA national network[75]. These stations specifically monitor pollution in areas not covered by the national network.

In February 2020, DCC in conjunction with the other local authorities in Dublin signed up to the *Breathe Life Commitments* which essentially commits the City to meeting the more stringent WHO air quality guideline values as distinct from meeting mandatory EU limit values by 2030[76].

In early 2020, the Council launched the website www.dublincityairandnoise.ie which consolidates online access in real time to the City's ambient air and noise monitoring network and also provides archived data.

DCC will support the implementation of the *'Air Quality Management Plan'* in cooperation with the other Dublin Local Authorities.

5.6.3.1 Licenced Facilities

A system of **Integrated Pollution Prevention and Control (IPPC)** licensing came into effect in Ireland on 12 July 2004. The primary aims of IPPC licensing are to prevent or reduce emissions to air, water and

[73] 10µg/m^3 annual mean and 25µg/m^3 24-hour mean
[74] EPA (2019f). *Air Quality in Ireland 2018*.
[75] DCC (2020a).
[76] Breathe Life (2021): https://breathelife2030.org/

land, to reduce waste and to use energy efficiently. An IPPC licence is a single integrated licence which covers all emissions from the facility and its environmental management. The IPPC system replaces Integrated Pollution Control (IPC).

There are a number of IPPC licensed facilities in Dublin City, located in Dublin Port and industrial estates at the northern, western and southern boundary of the City Council with Fingal County Council and South Dublin.

5.6.4 Nitrogen Dioxide (NO_2) Levels in Dublin

Nitrogen dioxide (NO_2) is an air pollutant associated with urban areas. It is strongly linked with traffic emissions. High levels affect our lung health.

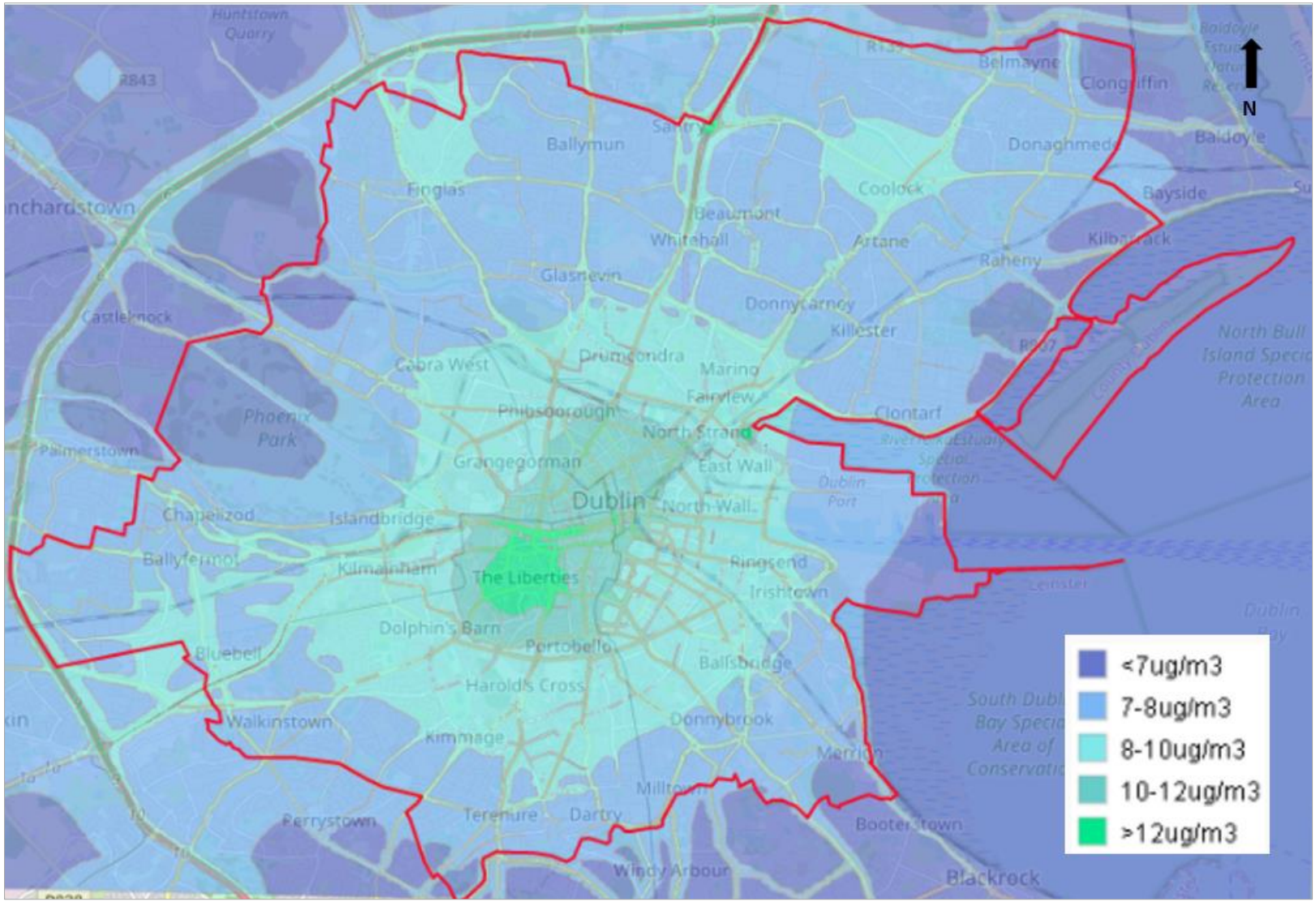
The EPA's 2019 publication *Urban Environmental Indicators: Nitrogen dioxide levels in Dublin*[77] provides new evidence on levels in Dublin. The findings represent an early warning of potential exceedances of EU limit values in Dublin – long-term exposure to these levels of NO_2 is a cause of concern for people's health and action needs to be taken now to address these findings. Three main findings in the report are:

1. Highest levels of NO_2 are at locations with heavier traffic. This clearly shows the impact traffic has on the levels of NO_2 in areas close to busy roads in Dublin.
2. There are many areas where NO_2 is problematic – In particular places, NO_2 levels were high suggesting they may be over the EU limit. Some of these areas include: certain city centre streets; the M50 motorway, and; the entrance to and exit from the Dublin Port Tunnel.
3. Levels of NO_2 are well within the EU limits in many residential areas – Away from busy roads the levels of NO_2 drop significantly and are well beneath the recommended EU limits in many residential areas.

In order to improve the availability of real-time air quality data to the public, EPA is setting up new permanent monitoring stations in partnership with DCC and Trinity College Dublin. If further monitoring confirms that the EU limit values of NO_2 have been exceeded, local authorities in Dublin and its suburbs will be legally required to prepare air quality action plans to address the causes and provide solutions in the affected areas.

[77] EPA (2019c).

Figure 5.10: Modelled $PM_{2.5}$ Concentrations for Dublin in 2017[78]



[78] EPA Maps (2021). *Source OpenStreet Maps*.

5.6.5 Introduction - Noise

In general, low environmental sound levels can contribute significantly to the good health and quality of life for the population in Dublin City.

5.6.6 Noise - Legislation / Policy / Guidance

The objectives of EU and Irish noise legislation is '*to avoid, prevent or reduce harmful effects on human health and the environment as a whole*', and this includes noise nuisance. The Noise Directive - Environmental Noise Directive (END) 2002/49/EC relating to the assessment and management of environmental noise - is part of an EU strategy setting out to reduce the number of people affected by noise in the longer term and to provide a framework for developing existing community policy on noise reduction from source. The Directive requires competent authorities in Member States to draw up:

- Strategic noise maps for major roads, railways, airports and agglomerations, using harmonised noise indicators and use these maps to assess the number of people which may be impacted upon as a result of excessive noise levels; and
- Action plans to reduce noise where necessary and maintain environmental noise quality where it is good; and inform and consult the public about noise exposure, its effects, and the measures considered to address noise.

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

5.6.6.1 Environmental Noise Guidelines

In 2018, the World Health Organisation (WHO) published the Environmental Noise Guidelines for the European Region. The WHO Guidelines have set out how noise pollution in towns and cities is increasing and how excessive noise (particularly from transport sources), has negative impacts on human health and wellbeing, adversely affecting sleep and cardiovascular and metabolic function.

5.6.6.2 Noise Guidance for Marine Mammals

In 2014, the Department of Arts, Heritage and the Gaeltacht (DAHG), launched the '*Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters*'[79]. The guidance sets out to address several key potential sources of anthropogenic sound that may impact

[79] DAHG (2014).

detrimentally upon marine mammals in Irish water and a risk methodology to asses any plan or proposed development. The aims of this guidance is to:

- Give an understanding of selected sound sources introduced into the environment by specific human activities, which may impact detrimentally on protected marine mammal populations or individuals of those species
- Describe a structured, staged process for the informed assessment of risk and decision making with regard to such sources.
- Outline practical risk avoidance and / or risk reduction measures which in the Department's view must be considered in order to minimise the potential effects of sound sources on the natural ecology of marine mammal species whether in Ireland's extensive and diverse coastal / marine waters or in designated conservation sites therein.

5.6.7 Dublin Agglomeration Noise Action Plan 2018-2023

The Dublin Agglomeration Noise Action Plan 2018-2023 (NAP)[80] has been prepared jointly by the four Local Authorities[81] in the Dublin Agglomeration. The Plan will be implemented through a staged process over five years.

As part of the initiative to manage sound levels around Dublin, DCC have designated eight *Quiet Areas* which are to be protected from future increases in environmental noise. These sites were chosen partly because of the sound levels in the areas and partly because they provide some value to the citizens of Dublin. The following areas are designated *Quiet Areas*:

- Blessington Basin, Blessington Street;
- Edenmore Park, Raheny;
- Mount Bernard Park, Shandon Park, Phibsborough;
- Dollymount SSA, Clontarf – terrestrial area only;
- St. Anne's Park, Raheny;
- Palmerston Park, Dartry;
- Ranelagh Gardens, Ranelagh; and
- The Cabbage Gardens, Cathedral Lane, Dublin 2.

[80] NAP has been prepared in accordance with the requirements of the *Environmental Noise Regulations 2006*, S.I. No. 140 of 2006
[81] Dublin City Council, Dún Laoghaire-Rathdown County Council, Fingal County Council and South Dublin County Council.

5.6.8 Noise Mapping

The Environmental Noise Directive (END), requires Member States to prepare and publish, every five years, strategic noise maps and noise management action plans. The aim of the END is to provide a common framework to avoid, prevent or reduce, on a prioritised basis, the harmful effects of exposure to environmental noise through the preparation of strategic noise maps and the development and implementation of action plans.

The strategic noise mapping of the major roads across Ireland was undertaken by the National Roads Authority (NRA) with the support of the local authorities within whose functional areas the major roads were located. They provide supplementary information relating to the Noise Action Plans developed in 2013 for the major roads in Ireland as part of the second round of the implementation of the EC Directive 2002/49/EC.

Daytime and night-time noise mapping of major roads have been prepared using EPA recommended noise limits which identified local '*hot spots*' (noise sensitive areas) in terms of population exposure. The identification of noise sensitive areas allows for the application of protectives measure or mitigation measures in advance of further development, refer to Figures 5.11 and 5.12.

The main priority of the END is to reduce environmental noise exposure in residential areas. To this effect, the Dublin CDP should ensure this requirement is complied with and as appropriate, the Dublin CDP should promote the implementation of END and associated national regulations[82].

Consideration should also be given to protect, where relevant, any designated quiet areas in open country.

5.6.8.1 Noise Action Plan for Dublin Airport 2019-2023

The zone of operation for Dublin Airport overlaps with Dublin City. Variation No. 1 of the Fingal County Development Plan 2017-2023, which was made in response to the publication of the *Noise Action Plan for Dublin Airport 2019-2023*, identifies lands to the north of the city which fall within Dublin Aircraft Noise Zones C and D and have the potential for noise exposure arising from airport operations. In Zone C, it is an objective to manage noise sensitive development in areas where aircraft noise may give rise to annoyance and sleep disturbance, and to ensure, where appropriate, noise

[82] *It is noted that DCC will have to produce an updated Noise Action Plan and Noise Map under the END for the City by 2022 and the timing of this update will need to be assessed against the statutory timeline for the preparation of the Development Plan.*

assessment is undertaken and noise insulation is incorporated in order to deliver good acoustic design. In Zone D, if a residential development comprises 50 units or more, or incorporates non-residential noise sensitive uses, it may be necessary for the applicant to demonstrate that a good acoustic design has been followed.

The Dublin Airport noise management process is based on three key themes

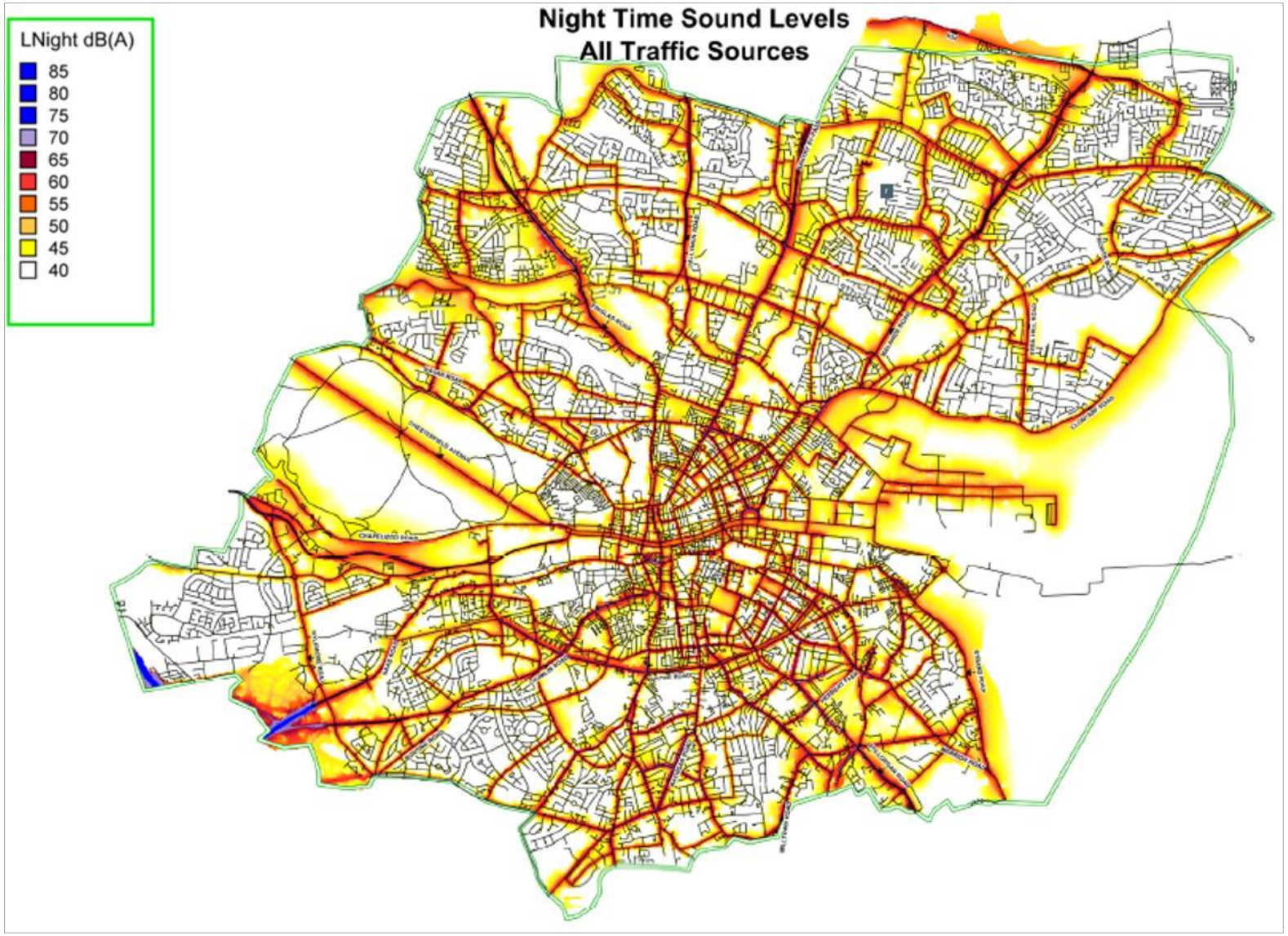
- Manage: continue to operate noise management schemes to achieve the quietest practicable aircraft operations on Noise Preferential Routes, and minimise noise from other activities such as construction;
- Monitor: continue to monitor noise using best practicable methods; and
- Engage: continue to meet with our neighbours and partners to involve, engage and inform, and continue to communicate with stakeholders.

Dublin Airport utilises a number of techniques to mitigate the impact of noise on the wider community. Dublin Airport continually monitors the effectiveness of control measures associated with noise management, altering or improving these measures as and when required.

Figure 5.11: Dublin City Noise Mapping (24-hour Lden)[83]

[83] DCC (2016b).

Figure 5.12: Dublin City Noise Mapping (24-hour Lnight)[84]



[84] DCC (2016b).

5.6.9 Introduction - Climate Change

Climate Change is a phenomenon that has widespread economic, health and safety, food production, security, and other dimensions. Climate change refers to a long-term, large scale change in global or regional climate patterns. In recent years, global temperatures have been rising. Urgent action is needed to address climate change and to move Ireland towards a low carbon, climate resilient economy and society.

The ever increasing rate of carbon dioxide combustion, and the emission of other greenhouse gases (GHG) such as methane and nitrous oxide since the industrial revolution, has resulted in the 'greenhouse affect'. Most greenhouse gases emissions are related to the energy generation, transport, agriculture, and industry sectors.

In Ireland, the expected effects of Climate Change are increased frequency of extreme weather events within the next century. This will include a 20%-30% increase in precipitation, greater rainfall intensity coupled with flash floods and an average annual temperature increase of ~2°C. The potential impacts of Climate Change could have serious consequences for both people and infrastructure along Ireland's coastal areas as well as its rivers[85].

Climate mitigation refers to efforts to reduce or prevent emission of greenhouse gases. Mitigation can mean using new technologies and renewable energies, making older equipment more energy efficient, or changing practices and behaviours e.g. encouraging more walking and cycling by providing footpaths and cycle paths.

Climate adaptation is focused on anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage or taking advantage of opportunities that may arise. Examples include water conservation, ensuring buildings are designed for future climate conditions and weather events, building flood defences, planting crops and trees suitable to new climate, and avoiding unnecessary development in coastal areas at risk of coastal erosion and flooding.

[85] GOI (2019b).

5.6.10 Climate Change - Legislation / Policy / Guidance

5.6.10.1 Climate Agreements

Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) in April 1994 and the *Kyoto Protocol* in principle in 1997 and formally in May 2002[86]. For the purposes of the EU burden sharing agreement under Article 4 of the *Doha Amendment* to the *Kyoto Protocol*, in December 2012, Ireland agreed to limit the net growth of the six Greenhouse Gases (GHGs) under the *Kyoto Protocol* to 20% below the 2005 level over the period 2013 to 2020[87]. The UNFCCC is continuing detailed negotiations in relation to GHG reductions and in relation to technical issues such as Emission Trading and burden sharing.

The most recent Conference of the Parties to the Convention (COP25) took place in Madrid, Spain from the 2nd to the 13th of December 2019 and focussed on advancing the implementation of the Paris Agreement. The Paris Agreement was established at COP21 in Paris in 2015 and is an important milestone in terms of international climate change agreements.

The EU in 2014, agreed the "2030 *Climate and Energy Policy Framework*"[88]. The European Council endorsed a binding EU target of at least a 40% domestic reduction in greenhouse gas emissions by 2030 compared to 1990. The target will be delivered collectively by the EU in the most cost-effective manner possible.

The *Climate Action and Low Carbon Development Act 2015*[89] was developed to provide for the approval of plans by the government in relation to climate change and to enable achievement of the national transition objective of achieving decarbonisation by 2050. Under this Act the *National Mitigation Plan*[90] and the *National Adaptation Framework*[91] were established.

5.6.10.2 National Policy Position 2014

In 2014, the Government adopted the *National Policy Position on Climate Action and Low Carbon Development*. The National Policy Position provides a high-level policy direction for the adoption and implementation by Government of plans to enable the State to pursue the transition to a low carbon, climate resilient and environmentally sustainable economy by 2050. It sets out the context for the

[86] UNFCC (1997) and UNFCC (1999).
[87] UNFCC (2012).
[88] European Commission (2014).
[89] Government of Ireland (2015).
[90] The Plan was quashed by the Supreme Court on 31 July 2020 (Appeal No. 205/10)
[91] DCCAE (2017) & (2018).

objective, clarifies the level of greenhouse gas mitigation ambition envisaged and establishes the process to pursue and achieve the overall objective.

5.6.10.3 Climate Action and Low Carbon Development Act 2015

The Climate Action and Low Carbon Development Act 2015 seeks to address the issue of climate changes and establishes the national goal to move to a low carbon, climate resilient and environmentally sustainable economy. The Act sets out a roadmap for Ireland's transition towards a low carbon economy and details mechanisms for the implementation of the '*National Low Carbon Transition and Mitigation Plan'*[92], to lower Ireland's level of greenhouse emissions and a '*National Climate Change Adaptation Framework'*[93].

5.6.10.4 National Mitigation Plan 2017

(The Plan was quashed by the Supreme Court on 31 July 2020 (Appeal No. 205/10)

Ireland's long-term climate policy framework is set out in the 2017 National Mitigation Plan. The National Mitigation Plan[94] sets out the initial steps to achieve the level of decarbonisation required.

5.6.10.5 National Adaptation Framework 2018

The National Adaptation Framework (NAF) was published in 2018 and sets out the national strategy which seeks to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. The NAF was developed under the *Climate Action and Low Carbon Development Act 2015*.

5.6.10.6 Climate Action Plan 2019

The *Climate Action Plan 2019, To Tackle Climate Breakdown* sets out a course of action over the coming years to address this issue[75]. The Plan sets out a 'roadmap' to achieve a net zero carbon energy system by 2050. The Climate Action Plan builds on the policy framework, measures and actions set out in the National Mitigation Plan, Project Ireland 2040 and the draft National Energy and Climate Plan in order to create a resilient, vibrant and sustainable country.

The Plan seeks to identify the nature and scale of the challenge and outlines the current situation key sectors including electricity, transport, built environment and industry. The Plan sets out governance

[92] DCCAE (2017).
[93] DCCAE (2018).
[94] The Plan sets out the Government's approach to reducing greenhouse gas emissions

arrangements including carbon-proofing our policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas.

The Plan acknowledges that Ireland has to date been very successful in deploying renewable electricity. As of the 28th of March, 2019, the Irish government has confirmed that Ireland will now aim for at least 70% of Ireland's electricity supply to be generated from renewables by 2030. This aim is increased from the previous target for 2030 which was 55% (RES-E) in Project Ireland 2040.

5.6.10.7 European Green Deal

The *European Green Deal* [95] is Europe's new growth strategy and acts as a roadmap for making Europe the first carbon neutral continent by 2050 whilst also enabling the EU to achieve its commitment under the Paris agreement. The Climate Action Bill 2020 transposes the European Green Deal into Irish law.

5.6.10.8 Climate Change and Flooding Risk Management

The OPW published the '*Flood Risk Management 2015-2019*' report as part of the Department of Communication, Climate Action and Environment's (DCCAE) '*Climate Change Sectoral Adaptation Plan*'[96].

The *Flood Risk Management Climate Change Sectoral Adaptation Plan* outlines the potential impacts of climate change on flooding and flood risk management, identifies objectives for an effective, sustainable and coordinated approach to adaptation, and recommends further actions required to meet the long-term goal for adaptation in flood risk management.

5.6.11 Climate Change Mitigation and Adaption

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change and uses the following definitions:

Climate Mitigation is defined as *'a human intervention to reduce the sources or enhance the sinks of greenhouse gases'*

Climate Change Adaptation is defined as '*the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial*

[95] Launched by the European Commission in 2019
[96] Term 2080s used to describe the period covering 2071-2100. Increases are measured with respect to the period 1961-1990.

opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects'.

The National Mitigation Plan (refer to Section 5.6.10.4), represents an initial step to set Ireland on a pathway to achieve the level of decarbonisation required.

The National Adaptation Framework (refer to Section 5.6.10.5), sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts.

The Climate Action Plan 2019 (refer to Section 5.6.10.6), is an all of Government plan to tackle climate change and bring about a step change in Ireland's climate ambition over the coming years.

The use of alternative fuels, including electricity, forms a significant part of government policy to reduce emissions, including from transport. Greater use of alternative fuels, including renewable energy, has the potential to further contribute towards energy security.

The 2019 emission projections do not consider the impact of new policies and measures that will be included in the forthcoming Government Climate Plan. It is anticipated that future emission projections will include the additional impact of the Government Climate Plan.

The *Climate Change Advisory Council's Annual Review 2020*[97] identified that Ireland will not meet its 2020 targets and will require huge efforts to meet its EU 2030 targets, notwithstanding progress made in the development of the Climate Action Plan and the ambition contained in the Programme for Government. The Council emphasises that Ireland needs to increase its mitigation efforts in implementation and delivery, not only to meet legislated EU targets but also to set in train the actions required to meet our 2050 ambitions. Projections show that we can meet our legislated EU 2030 targets but there is absolutely no room for complacency.

National emissions reduced by 0.1% from 2017 to 2018 largely due to progress in the Electricity sector. Other sectors have not delivered emissions reductions on the scale required. However, it must be noted that additional measures within the recent Programme for Government are not included.

The NPF, the RSES and the *DCC Climate Change Action Plan 2019,* outline land use aspects / themes of climate action and how the planning system can be utilized to effect positive change and action.

[97] Climate Change Advisory Council (2020).

The following themes are where change can be made in order to positively address climate change and reduce greenhouse gases:

- Sustainable Settlement Patterns
- Compact Growth and Urban Regeneration
- Integrated Transport and Land Use.

5.6.11.1 Climate Change Adaptation

In 2019, the Department of Transport, Tourism and Sport (DTTS) released a new plan - *Developing Resilience to Climate Change in the Irish Transport Sector*[98]. This Plan seeks to assess the state of our preparedness for the predicted changes to Ireland's climate in the years to come. The transport sector in Ireland is inherently sensitive to the effects of climate change and the impacts of numerous recent severe weather events on key transport infrastructure and services. Adaptation planning is crucial for the transport sector as a key player in the Irish economy.

As an island nation, Ireland's network of 25 no. ports constitutes infrastructure of strategic economic importance to the State. In the Plan, the potential climate change vulnerabilities to ports (but including other transport infrastructure) were identified as precipitation; flooding; high winds; storm surges; heatwaves; cold spells; and sea level rise. The high priority impacts identified in the Plan in relation to ports are:

- Sea level rise and increased occurrence of coastal storms will put port infrastructure at risk.
- Damages to port infrastructure from freezing weather events.
- Service disruption.
- Changing patterns of siltation.

Port infrastructure will be at particular risk under projected sea level changes and storm surge. The key impacts identified include: damages to port infrastructure, navigations and safety equipment; damages to vessels while in port and impacts on safety of passengers while embarking, in transit, and disembarking.

[98] DTTS (2019).

5.6.12 Climate Action Requirements for Development Plans

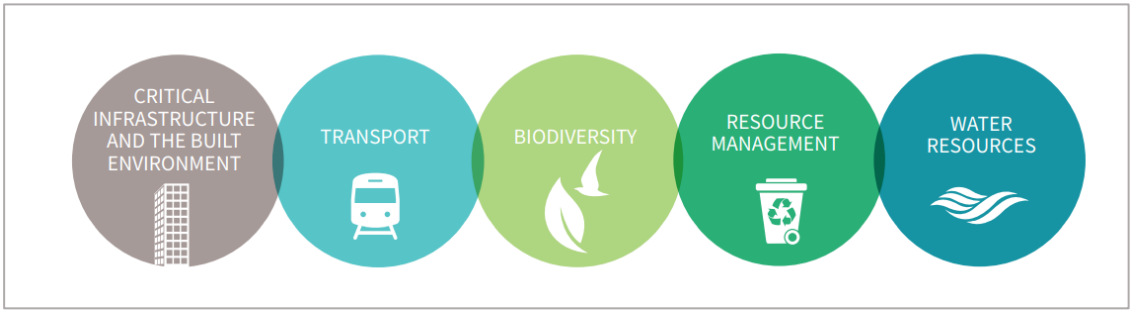
The NPF, Regional Spatial and Economic Strategy (RSES) for Eastern and Midland Region, the Climate Action Plan 2019 and Dublin City Council Climate Change Action Plan 2019, all outline support for climate action requirements for Development Plans.

The RSES states '*RPO 3.6 City and county development plans shall undergo assessment of their impact on carbon reduction targets in their preparation, and shall include measures to monitor and review progress towards carbon reduction targets'.*

In 2017, the Department of Housing, Planning, Community and Local Government, published the *'Interim Guidelines for Planning Authorities on Statutory Plans, Renewable Energy and Climate Change'* report. This report identifies that Development Plans play a critical part in translating overall national policy on energy, renewable energy and wind energy in a manner that supports the achievement of Ireland's binding international obligations relating to climate change and renewable energy, and taking account of local circumstances. This report also states that central and local government need to work together in achieving these targets.

5.6.13 DCC Climate Change Action Plan 2019-2024[99]

The *DCC Climate Change Action Plan* outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management.



The plan has four key targets:

1. 33% better energy use by the Council by 2030;
2. 40% reduction in the Council's greenhouse gas emissions by 2030;

[99] Dublin City Council & Codema (2019).

3. to make Dublin a climate resilient region, by reducing the impacts of future and current climate change related events; and
4. to actively engage and inform citizens on climate change.

The Climate Action Regional Office (CARO) covering the four Dublin Local Authorities was established in 2018 with Dublin City Council as the lead Authority. CARO is focusing on climate-related projects, research, funding, the development of regional specialisms and addressing mitigation.

5.6.13.1 DCC Climate Mitigation and Adaptation

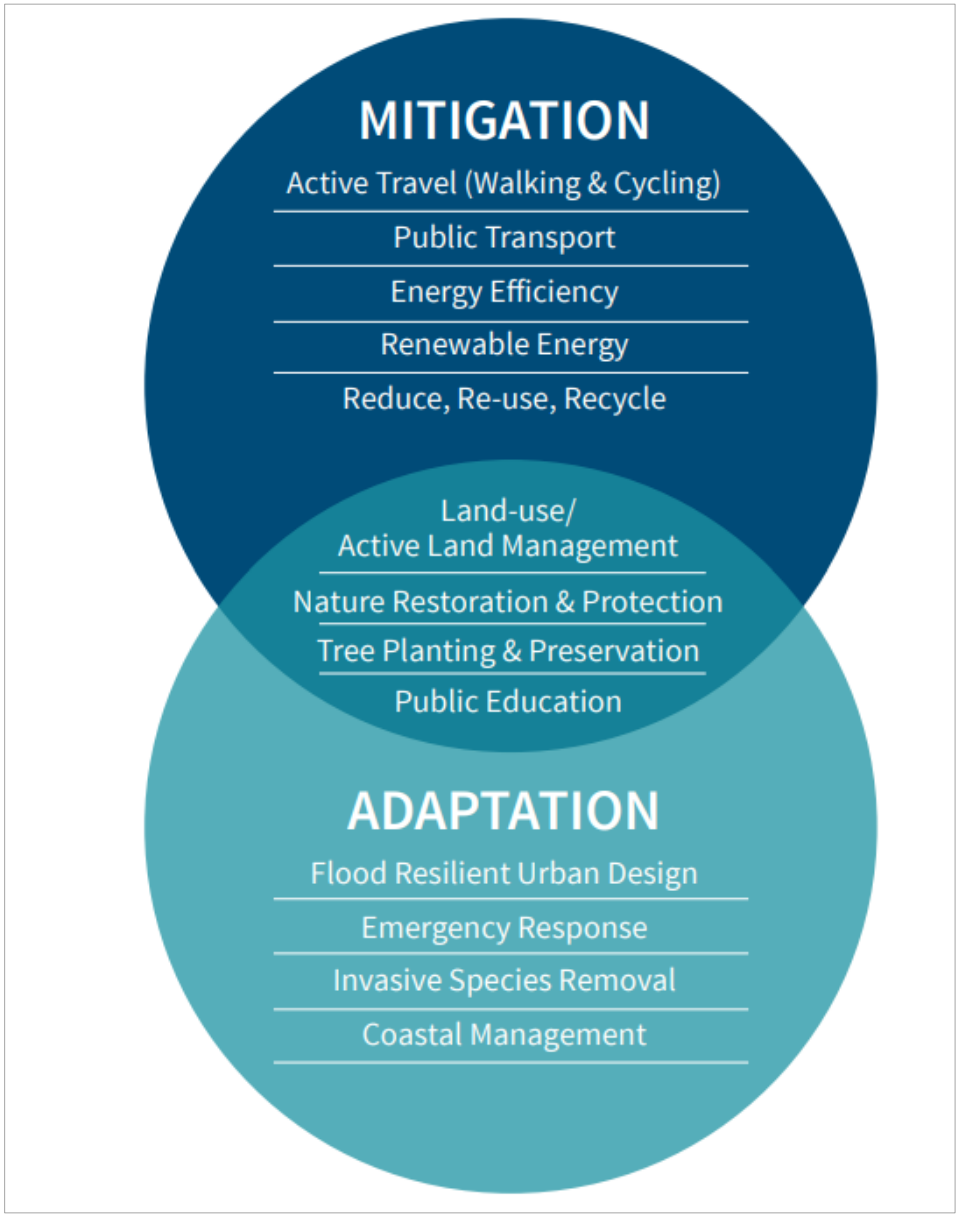
The *DCC Climate Change Action Plan 2019* provides examples of climate mitigation and adaptation projects for their climate programme. For example **Climate Mitigation** projects include:

- Participation in Regional and National Electric Vehicle (EV) working groups.
- Collaboration with energy agencies (where in place) and SEAI on energy related projects.
- Identifying and assisting local authorities with projects eligible for the National Climate Action Fund.

For example **Climate Adaptation** projects include:

- Assisting local authorities with implementation and reporting of Climate Change Adaptation / Action Plans including implementation guidance.
- Preparation of guidance such as guidance document for adaptation of regional & local road.
- Participation on National Working Groups such as new Coastal Change Strategy Steering Group.

Figure 5.13: Examples of some Mitigation and Adaptation Solutions and their Crossovers[100]



5.6.14 Climate Issues in Dublin City

Dublin's energy agency Codema has produced an adaptation baseline in line with the guidelines contained in the *Local Authority Adaptation Strategy Development Guidelines 2018* and the *National Adaptation Framework*.

Dublin City covers an area of 115km^2 and has a population of 554,554 people (Census 2016). Dublin City is divided into five administrative areas, called Local Areas, which co-ordinate the delivery of services in the community.

[100] Dublin City Council Climate Change Action Plan 2019-2024

The geographic and demographic characteristics make Dublin City sensitive to a set of climate change risks, which differ from rural, landlocked or sparsely populated regions. As a City, Dublin creates its own unique micro-climate and this can intensify current and future climate impacts. An example of this is the urban heat island effect, making it warmer than the surrounding semi-urban and rural areas. This is mainly due to heat absorption from built-up areas in the City, waste heat generated from urban activities and a lack of tree cover. Flood risks are also higher in cities due to the amount of impervious surfaces and lack of vegetation (pervious surfaces); this results in enhanced rainwater run-off, which may result in flooding.

Risks in cities are exacerbated, which means we need to assess the impacts of not only extreme weather and climatic events, but also climatic trends, such as urban flooding, sea level rise and increasing temperatures. These events and trends should not be considered as independent, as they influence each other. The slow, gradual increase in temperatures and sea level rise will contribute to the increased frequency and intensity of extreme weather events and flooding.

Dublin City has experienced an increase in extreme weather events. Dublin City has experienced extreme weather events within the last 15 years. In February and March 2018, Dublin City experienced its greatest snowfall since the winter of 1982, with depths of up to 55cm. This was coupled with extreme cold and blizzard-like conditions, as a result of Storm Emma coming from the Atlantic, and the 'Beast from the East', which also impacted most of Europe.[101]

Met Éireann issued it's first-ever Status Red warning for snow nationwide. High demands were placed on the country's water network, with as many as 1.2 million households and businesses in and around the City affected by water outages or curtailments in the days after Storm Emma.

Dublin's rainfall is also changing - in the last decade, the number of days with rainfall greater than 0.2mm has been gradually increasing, as are days with over 10mm of rain. Data from Met Éireann shows that from 1961-2010, there was a 5% increase in average yearly rainfall[102].

Rising temperatures impact the City's air quality, which degrades as the concentration of pollutants increase. In the summer of 2018, Ireland experienced extreme temperatures, which caused heat wave and drought conditions, and resulted in a hosepipe ban for most of the summer, due to water shortages throughout the country. The frequency of extreme cold spells in Ireland has increased, and

[101] Dublin City Council Climate Change Action Plan 2019-2024.
[102] Dublin City Council Climate Change Action Plan 2019-2024.

this presents additional risks to Dublin City. During Storm Emma, prolonged periods of cold resulted in water pipes freezing and then bursting as the temperatures started to rise, which left homes in the City without water. Extreme weather events pose significant risks to critical assets such as electricity infrastructure.

Met Éireann predicts that Ireland as a whole will experience wetter and milder winters, with a 10-15% increase in rainfall, and drier summer[103].

5.6.15 Air Quality, Noise & Climate Change Issues

Ireland's air quality currently is good, relative to other EU Member States, but maintaining this standard is a growing challenge. In urban areas, concern has shifted to a range of pollutants associated with domestic fossil fuel use and road traffic which may be considered relatively new in the context of air quality control. The key issue regarding air quality for the CDP lands is likely to be the impact on air quality from domestic fossil fuel use and local traffic.

Existing air quality issues/pressures and threats on air quality within and adjacent to the Dublin City administrative area, include:

- Air emissions - associated with the high use of the private car.
- Air emissions - associated with the burning of fossil fuels to heat homes / buildings, emissions from the construction industry and industrial activities.

Noise pollution is considered to be one of the most damaging and prevalent forms of nuisance and pollution within urban areas. High levels of traffic noise especially can have a detrimental effect on the quality of life, and on human health.

Existing noise issues to local areas and communities within and adjacent to the Dublin City administrative area, include:

- High noise levels - areas of high noise.
- Noise levels - noise associated with increased traffic on major roads.
- Noise levels - increasing traffic volumes affect the acoustic environment.
- Development - new development such as roads, housing developments and industry, must adhere to international best practice standards for noise attenuation.

[103] Dublin City Council Climate Change Action Plan 2019-2024.

The potential effects of **Climate Change** resulting in an increase in the frequency and severity of flooding and storms events must also be considered in the CDP. Severe rainfall and storms events as a result of Climate Change could adversely impact Dublin City, leading to water shortages, residential flooding and disruption and damage to infrastructure.

According to the *Dublin City's Climate Change Action Plan 2019*, nature based solutions are critical for climate change mitigation/adaptation. They can play an important role in protecting and enhancing biodiversity and ecosystems, flood prevention and carbon sequestration, but also in terms of temperature regulation, water quality, erosion prevention and filtering pollutants from the air and water.

Existing climate change issues / pressures and threats within and adjacent to the Dublin City administrative area, include:

- **Policy** - the need to incorporate and implement strategic goals from higher level plans and programmes.
- **Biodiversity** - direct and indirect impacts on biodiversity from flooding, temperature changes, sea level rise, etc.
- **Population** - population growth and the need for transportation and transport networks, energy, housing and waste disposal.
- **Population -** the threat of extreme weather events (storms / cold spells / heat waves), sea level rise and pluvial and fluvial flooding.
- **Flooding** - direct and indirect impacts from flooding with impacts for populations, development, etc.
- **Air emissions** - associated with the burning of fossil fuels to heat homes / buildings, emissions from the construction industry and industrial activities.
- **Air emissions** - associated with the high use of the private car.
- **Land use changes** - the loss / damage of soil / land from the construction of sites for development.

5.7 Cultural Heritage

5.7.1 Introduction

The physical traces left in the landscape by previous generations in archaeological monuments and sites and in historic buildings, townscapes and vernacular structures forms part of the tangible cultural heritage linking the past and present.

Dublin is an ancient city with many sites of archaeological, architectural and cultural heritage importance. As a vibrant and expanding city, there is a continuing need to balance day-to-day operations with protection of the cultural resource that is so much a part of the fabric of Dublin.

Within Dublin City, there are a number of methods to protect the integrity of cultural assets including appropriate zonings:

- Architectural Conservation Areas (ACAs).
- Record of Protected Structures (RPS).
- Record of Monuments and Places (RMPs).
- Conservation Areas (for example along the Liffey Quays).

Archaeological Heritage refers to sites, monuments and complexes imprinted in the landscape and area protected under the national monuments Act 1930-2004.

Architectural Heritage refers historic or modern buildings of architectural, technological or social importance.

5.7.1.1 Dublin City Heritage Plan

The *Dublin City Heritage Plan* provides strategic support to DCC and other stakeholders by delivering or contributing to a wide range of initiatives aimed at improving the management, understanding and appreciation of Dublin City's heritage.

The new *Dublin City Heritage Plan* will identify new ways to research, support and manage our heritage and identify opportunities to engage communities across the City and suburbs with our built environment, or archaeological monuments, and our cultural heritage and intangible cultural heritage. The Heritage Plan will be prepared in tandem with the CDP and the policies and objectives of the Plan will complement and reinforce those in the Heritage Plan.

5.7.2 Archaeological Heritage

Archaeological heritage is a non-renewable resource which helps us to understand how cultures and past societies developed. It consists of material remains in the form of sites and monuments, as well

as artefacts or moveable objects. **'Monuments'** refer to manmade structures or natural features altered by man while 'sites' are normally situated below ground and may have no visible surface features at all.

The archaeological heritage of an area includes structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other types as well as their context, whether situated on or under land or water.

The National Monuments Acts 1930-2004 provide for the protection of archaeological heritage. At present, a monument is protected in one of four ways[104]:

- It is recorded in the Record of Monuments and Places (RMP).
- It is registered in the Register of Historic Monuments (RHM).
- It is a national monument subject to a preservation order (or temporary preservation order).
- It is a national monument in the ownership or guardianship of the Minister for Culture, Heritage and the Gaeltacht or a Local Authority.

Archaeological heritage is protected under the National Monuments Acts (1930-2004), Natural Cultural Institutions Act 1997 and the Planning Acts. The **Record of Monuments and Places** (RMP) is an inventory, was established under Section 12 of the National Monuments (Amendment) Act 1994 and structures, features, objects or sites listed in this Record are known as Recorded Monuments.

Dublin City is rich in archaeology and has a diverse range of monuments covering a number of historic eras. Dublin City is of high archaeological potential due to the potential for the presence of hitherto unknown sub-surface archaeological remains.

Dublin originated first as two separate monastic enclosures (Átha Cliath and Linn Dubh), and then as a fortress for Viking ships on the Liffey. After the Anglo-Norman invasion of 1170, the walled city expanded reclaiming land at wood quay and large suburbs developed to the north (Oxmantown), to the south and west around Ship Street and St. Patrick's Cathedral and the Liberties. On the outskirts were villages such as Chapelizod, Finglas and Donnybrook, etc. Much of the medieval city was still intact in 1610 when John Speed mapped it for the first time. During the eighteenth century however, the Wide Streets Commission reshaped the old medieval city, and created a network of main thoroughfares by wholesale demolition or widening of old streets or the creation of entirely new

[104] Different levels of protection apply to a monument depending on which of the four categories it falls under.

ones. However, much remains that is of value and which can be reinforced or stitched back together and presented in the city's renewal.

The River Liffey in Dublin has been the focus of continuous human activity from prehistory to modern times. This is evidenced by archaeological discoveries of prehistoric burial, cooking and fishing structures, and deep waterlogged Viking and medieval urban layers, upstanding churches, buried foundation remnants of post-medieval structures and human burials[105].

The City's archaeological complexity is signified by the Sites and Monuments Record, which lists 857 no. sites in the historic core[106]. Dublin has now seen over 50 years of intensive archaeological investigation, with over 2,500 development-led investigations taking place. The deep, wet, anoxic sub-surface archaeological features and deposits within the historic core are of international significance and are vulnerable to loss through rescue excavation, destruction and dewatering.

5.7.3 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*.

5.7.3.1 Record of Protected Structures

Section 10 of the Planning & Development Act 2000 (as amended) places an obligation on all Local Authorities to include in their Development Plan objectives for the protection of structures, or parts of structures, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. These buildings and structures are compiled on a register known as the Record of Protected Structures (RPS). A Protected Structure, unless otherwise stated in the RPS, includes:

- the interior of the structure;
- the land lying within its curtilage;
- any other structures within the curtilage, and their interiors; and
- all fixtures and features which form part of the interior or exterior of any of these structures.

[105] DCC (2020b).
[106] DCC (2020b).

There are currently just over 9,000 structures listed for protection in the Record of Protected Structures. These structures include individual houses, warehouses, shop fronts, churches, boundary walls, bridges, building exteriors etc.

In addition to the Record of Protected Structures, structures of architectural heritage merit, although not put forward for inclusion in the Record of Protected Structures (RPS) may be of local value and may continue to contribute to the identity of a particular area of the City. The Draft Plan will continue to actively seek to protect buildings / structures of heritage value, which may not be protected, but which make a positive contribution to the area and identity of the City. The contributions of any features, which give identity to and enhance that uniqueness, will be given recognition in the preparation of the Draft Plan.

There are 8,412 no. structures on the Record of Protected Structures in the Plan area[107].

5.7.3.2 Architectural Conservation Areas

An Architectural Conservation Area (ACA) is a place, area, group of structures or townscape, taking account of building lines and heights, that is of special architectural, historical, archaeological, artistic, cultural scientific, social or technical interest or that contributes to the appreciation of a protected structure, and whose character is an objective of a Development Plan to preserve. It should be noted that not all buildings or structures within an ACA are contained within the RPS. The ACAs also offer protection to surrounding structures which combine to create a specific character, street pattern or layout which is worthy of recognition. There are currently 24 no. ACAs in Dublin City as listed in Table 5.6 below.

[107] As of March 2021.

Table 5.6: Architectural Conservation Areas (ACAs)

Architectural Conservation Areas	
Capel Street and environs	Hollybrook Road
Chapelizod and environs	Marino Casino
Colliers Avenue	Mountjoy Square
Crumlin	O'Connell Street
Dartmouth Square and environs	Phibsborough Centre
De Courcy Square	Ranelagh Avenue
Elmpark Avenue and Elmwood Avenue	Sandymount Village
Fitzwilliam Square and environs	South City Retail Quarter
Grafton Street and environs	Temple Place
Great Western Square	Thomas Street and environs
Haddon Road - Victoria Road	Westmoreland Park
Belmont Avenue / Mount Eden Road	North Great George's Street

5.7.3.3 Conservation Areas

The main conservation areas in the City are primarily the Georgian squares, Liffey Quays, and the corridors of the River Dodder, Grand Canal and Royal Canal. Conservation Areas designation comprises:

- Z8 Georgian Conservation Areas.
- Z2 Residential Conservation Areas.
- Red-hatched Conservation areas covering the Quays / Rivers / Canals.

The Z8 Georgian Conservation Areas, red-lined Conservation areas and Z2 Residential Conservation Areas are extensive throughout the City. Designated Conservation Areas included extensive groupings of buildings or streetscapes and associated open spaces and include(parts of) the medieval / walled city, the Georgian Core (in recognition of Dublin's international importance as a Georgian City), the 19th and 20th century city and the city quays, rivers and canals. The special interest / value of Conservation Areas lies in the historic and architectural interest and the design and scale of these areas.'

5.7.4 Other Heritage Areas in Dublin

5.7.4.1 Industrial Heritage

'*Industrial Heritage*' refers to everything from the extraction of raw materials, manufacturing and processing into usable forms or finished products, public utilities, transport, communications and energy production. Over the past number of years there has been a growing public awareness of Ireland's industrial heritage, and a number of sites have been restored and are now open to the public as tourist and educational attractions.

The Guinness Brewery is one of Dublin's most important industrial heritage sites and Guinness is identified as a significant brand internationally and is inextricably linked with the capital. The Royal Canal in Dublin City is another example of a tourist and educational attraction based on industrial heritage in Ireland. However, industrial heritage is currently a critically underutilised and undervalued aspect of Dublin's built heritage.

Recording and conserving the city's built heritage is a key issue, as a substantial portion of Dublin's industrial heritage has already disappeared without record. Industrial buildings are not always of high architectural significance and so are poorly represented on the Record of Protected Structures for this reason. The National Monuments Act (amended) protects sites and monuments down to, but not after, 1700AD. In this way, industrial heritage has continually fallen between the two primary statutory instruments for protection of built heritage. DCC has undertaken an inventory of industrial heritage and the Dublin City Industrial Heritage Record (DCIHR) and the current CDP has regard to this record.

5.7.4.2 UNESCO World Heritage

The Historic City of Dublin is currently on Ireland's Tentative List of UNESCO World Heritage Sites. DCC and the Heritage Council are working on an agenda which seeks to identify the sociological and cultural characteristics which are unique features of Dublin.

5.7.5 Cultural Heritage Issues

Construction activities have the potential for direct negative impacts on heritage features and their setting. Development of infrastructure, in addition to development resulting from economic growth and increasing population, can potentially impact on the integrity of sites or features of architectural, archaeological or cultural heritage interest.

Existing cultural heritage issues / pressures and threats within and adjacent to the Dublin City administrative area, include:

- Development - development of infrastructure resulting from economic growth and increasing population, can potentially impact on the integrity of sites or features and their views to / from architectural, archaeological or cultural heritage interest.
- Development - in close proximity to sites and areas of cultural heritage may adversely impact upon the cultural landscape setting.
- Development - can adversely impact on community's sense of place.
- Architecture - impact on heritage streetscapes of regional and local importance.
- Archaeology - impact on archaeological monuments and their settings including undiscovered sites / features.
- Landscapes - there is a need to identify and protect culturally important landscapes.
- Tourism - demand for development in areas of tourism and along the coastline including amenities, can potentially impact cultural heritage sites and features.

5.8 Landscape & Visual

5.8.1 Introduction

The concept of landscape encompasses all that can be seen by looking across an area of land, *i.e*. it is the visible environment in its entirety. Landscape is the context in which all change takes place and helps to create a unique sense of place or identity within an area. The landscape supports a wide range of ecological habitats despite growth in its resident population. The interaction of all of these elements influences landscape character for future generations.

The landscape in Dublin City is characterised by its predominantly urban fabric, its diverse styles of building of varying heights and its green infrastructure. The City landscape consists of the public and private landscape and it fulfils an array of environmental, ecological, social, recreational and aesthetic functions of the developing City.

The City park system forms one of the most recognisable components of the modern city landscape, including Dublin City. Dublin City evolved primarily from lands that were originally in private ownership, such as the Phoenix Park and squares such as Mountjoy Square.

5.8.2 Legislation / Policy / Guidance

The *European Landscape Convention*, also known as the Florence Convention, promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues. The convention was adopted on 20 October 2000 in Florence (Italy) and came into force on 1 March 2004[108].

The *National Planning Framework, Project Ireland* 2040 outlines that Ireland's landscape has a wealth of natural and cultural assets which support our quality of life. Therefore the protection, management and planning of the landscape is also interconnected with the National Landscape Strategy for Ireland, and a national landscape character assessment, will provide consistency in how we characterise and connect with the landscape. The National Policy Objective 61 is:

> *"Facilitate landscape protection, management and change through the preparation of a National Landscape Character Map and development of guidance on local landscape character assessments, (including historic landscape characterisation) to ensure a consistent*

[108] Council of Europe.

approach to landscape character assessment, particularly across planning and administrative boundaries".

A *National Landscape Strategy for Ireland 2015-2025*[109] was published, in line with Ireland's obligations under the European Landscape Convention. The key objectives of this Strategy are the recognition of landscape in law and the provision of a policy framework to put measures in place for the management and protection of landscape and the production of a national Landscape Character Assessment (LCA).

The *City Landscape Plan, Dublin City Council's Parks Strategy* which forms part of the DCC's Parks strategy is intended as a precursor to the future development of more detailed landscape plans for the City including historic landscapes for conservation.

5.8.3 Landscape Conservation Areas

Landscape Conservation Areas (LCAs) can be made by order for the preservation of the landscape. There are no LCAs within the City administrative area.

5.8.4 Landscape of Dublin City

Dublin City is located on the River Liffey, with the Dublin Mountains to the south, Howth peninsula to the north, and Dublin Bay to the east. Dublin City is located in a unique setting, and it is critical to retain existing key landscapes and open spaces which offer so much to the city in terms of amenity and character.

Within Dublin City, there are outstanding landscapes of national importance including a National Special Amenity Area at North Bull Island (refer to Section 5.2.14), views northward to the National Special Amenity Area at Howth Head (within Fingal area) and a National Historic Park - the Phoenix Park. The Liffey Valley where it adjoins the City within Fingal and South Dublin plan areas is also a National Special Amenity Area.

DCC currently manages approximately 1,400ha of public open space. The public landscape primarily composed of:

- parks and golf courses;
- transport corridor landscape (road and rail);
- canals, rivers and coastline;

[109] DAHG (2015). *National Landscape Strategy 2015-2025.*

- street trees and civic decoration; and
- public housing / buildings / office landscape.

The private landscape is under the management of individuals, institutions and commercial entities and is primarily composed of:

- private parks (*e.g.* Fitzwilliam Square);
- institutional landscape (*e.g*. school grounds);
- commercial landscape (*e.g.* private golf courses, shopping centres, hotels etc.); and
- residential landscape (*e.g*. private gardens, apartment landscape).

5.8.5 Tree Preservation Orders

Tree Preservation Orders (TPOs) may be made under Section 45 of the Local Government (Planning and Development) Act, 1963 and subsequent acts. Part XIII of the Planning and Development Act, 2000 sets out the provisions for TPOs.

A TPO can be made if it appears to the planning authority to be desirable and appropriate in the interest of amenity or the environment. A TPO can apply to a tree, trees, group of trees or woodland. The principle effect of a TPO is to prohibit the cutting down, topping, lopping or wilful destruction of trees without the planning authority's consent. These trees have been designated due to their landscape, amenity and ecological value. The trees may only be removed if they are a risk to public health and safety or in the interest of design. There are currently six Tree Preservation Orders (TPOs) in the Plan area:

- Dublin Corporation Tree Preservation (Watermill Road / All Saints Drive, Adjoining St. Anne's National School) Order 1989.
- Dublin Corporation Tree Preservation (St. Patrick's House) Order 1994.
- Dublin City Council Tree Preservation Order (No.1) 2008 Dartmouth Square Park, Dublin 6.
- Dublin City Council Tree Preservation Order (No.2) 2008 Dartmouth Square Park, Dublin 6.
- Dublin City Council Tree Preservation Order (No.3) 2008 Dartmouth Square Park, Dublin 6.
- Dublin City Council Tree Preservation Order (No.4) 2008 Dartmouth Square Park, Dublin 6.

5.8.6 Key Views and Prospects (indicative) for Dublin City

Figure 5.14 shows the key views and prospects (indicative) for Dublin City under the current Plan.

5.8.7 Landscape & Visual Issues

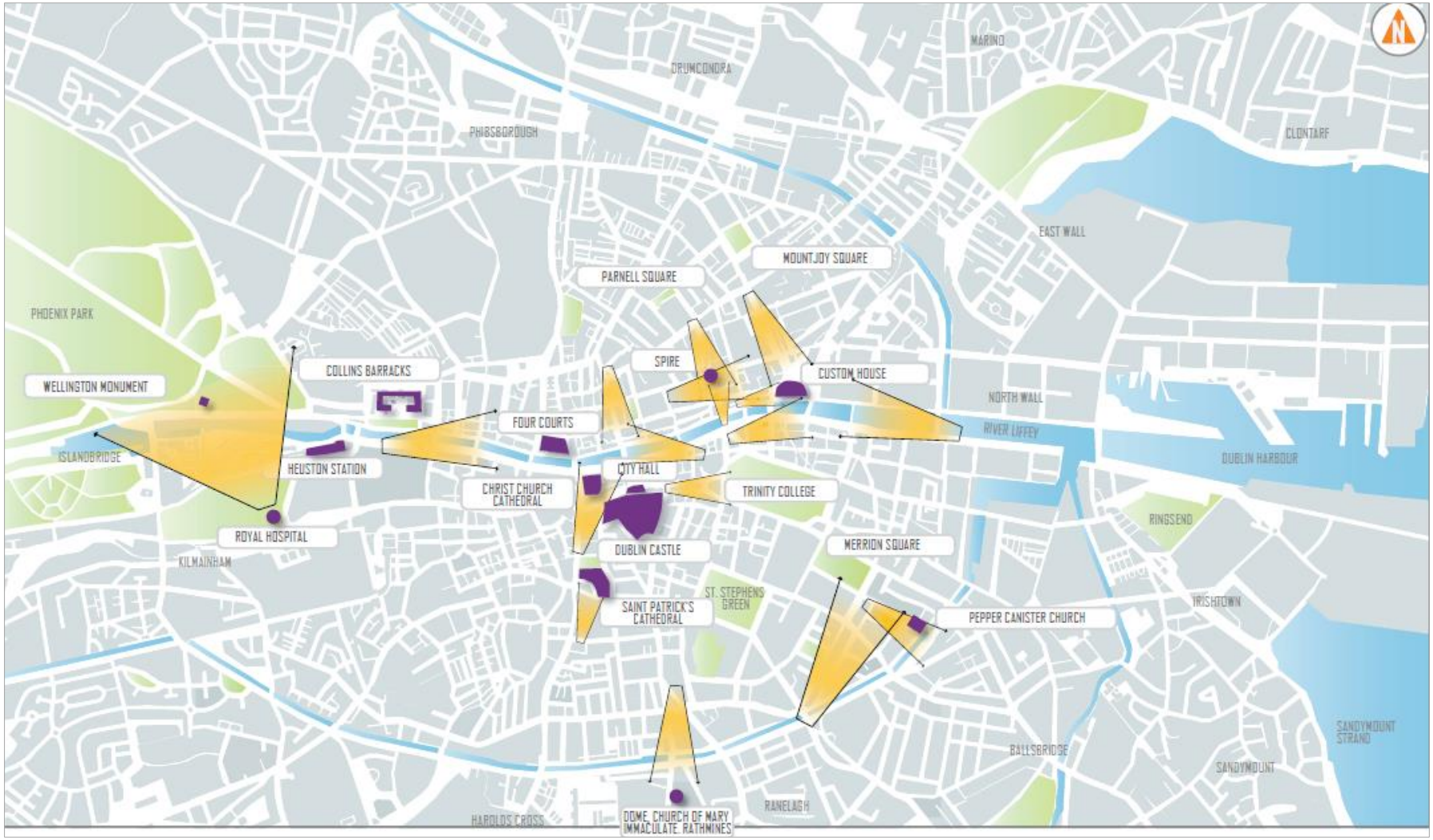
Landscape can be considered a dynamic rather than static asset. It is constantly changing, and its changes are driven by nature itself, by direct human intervention, and indirectly through the consequences of human activity, notably Climate Change. All physical development undertaken by human impacts on the landscape

Areas of a highly sensitive landscape have a low capacity to absorb new development and this can be a challenge to locate new development in these areas without it becoming unduly obtrusive.

Existing landscape and visual issues / pressures and threats within and adjacent to the Dublin City administrative area, include:

- Development - development and housing are having adverse and visual impacts on the landscape.
- Housing - visual impact with greatest pressure for expansion of settlements.
- Green Infrastructure - protecting the existing green infrastructure network from fragmentation and loss due to pressures of urban development within and adjoining the network
- Health and Well-being - addressing deficits of green space in some neighbourhoods due to the historic development of the City and retrofitting green infrastructure into existing built-up areas.
- Ecosystem Services - recognising and promoting the value of ecosystem services that the green infrastructure network provides to the City.

Figure 5.14: Key Views and Prospects (Indicative) for Dublin City (Extract from the Current CDP)[110]



[110] DCC (2016).

5.9 Material Assets

5.9.1 Introduction

Material assets are resources that are valued and intrinsic to a development and the surrounding area. Material assets may be of either natural or human origin and the value may arise for economic or cultural reasons. Material assets include water supply, wastewater treatment infrastructure, waste disposal including recycling, transport infrastructure (road, rail, airports and ports), energy and supply networks and telecom services. Material assets also includes economic assets such as coastal and water resources which support fisheries and aquaculture.

The sustainable growth of the City is dependent on the provision of services and infrastructure. A Plan led approach, in accordance with the City Council's Core Settlement and Housing Strategy is required for the delivery of such services in order to ensure there is adequate capacity to support the future development of the City.

5.9.2 Water Services

5.9.2.1 Water Supply & Water Services

There have been significant changes in responsibilities for water supply and wastewater treatment services. As of January 2014 Irish Water replaced local authorities as a single provider of water supply and wastewater services. The future development of Dublin City's water supply and wastewater treatment infrastructure is largely dependent on the Irish Water Services *Capital Investment Programme* (CIP), and the availability of funding therein.

Irish Water have prepared the Water Services Strategic Plan (WSSP), '*A Plan for the Future of Water Services*' and it provides for the first time at national level an opportunity to consider the way water services are delivered in Ireland. The WSSP sets out strategic objectives for the delivery of water services over the next 25 years up to 2040.

Irish Water is now developing its first *National Water Resources Plan (NWRP*) that will outline the move towards a sustainable, secure and reliable drinking water supply for Ireland over the next 25 years. The preparation of the NWRP provides, an opportunity to strategically plan the way that water services are delivered in Ireland at a national level.

Currently, the Dublin Region Water Supply Area is defined by the combined areas served by the Dublin Region Water Supply Schemes, operated by the local authorities on behalf of Irish Water, namely[111]:

- Liffey Water Treatment Plant at Ballymore Eustace (Dublin City Council);
- Liffey Water Treatment Plant at Leixlip (Fingal County Council);
- Vartry Plant at Roundwood (Dublin City Council);
- Dodder Plant at Ballyboden (Dublin City Council); and
- Bog of the Ring Groundwater (Fingal County Council).

As part of the *Water Supply Project, Eastern and Midlands Region (WSP*), Irish Water, has plans – currently as a preferred option[112] – to abstract water from the Parteen Basin on the Lower River Shannon and to pipe the water to a new reservoir at Peamount in South County Dublin, from where it would connect to the Greater Dublin network.

There is an ongoing issue with security of water supply in the Dublin and Mid-East Regions. Consultation with IW has revealed that a supply demand deficit linked to population growth, leakage and climate change remains the primary challenge to the delivery of a safe, secure, sustainable and reliable water supply[113].

5.9.2.2 Drinking Water Quality

Irish Water is responsible for providing and developing public water services; and ensuring drinking water quality meets the standards in the Drinking Water Regulations. The EPA is the drinking water quality regulator, responsible for enforcing the *Drinking Water Regulations*.

The latest *Drinking Water Quality in Public Supplies 2019*[114] was published by the EPA in 2020. The report outlines the most important issues which should be addressed on a national level, to protect and improve public drinking water supplies, these are:

- delays in fixing significant problems at supplies;
- to keep water free of harmful bacteria (disinfection);
- minimise harmful disinfection by products (trihalomethanes);
- eliminate lead from the network;

[111] DCC (2016).
[112] Irish Water (2021).
[113] DCC (2020a).
[114] EPA (2020k).

- prevent pesticides from entering waters; and
- manage risks to our public water supplies.

The reports notes that the quality of drinking water in public supplies remains high. Over the 12 years of the EPA's *Remedial Action Lists (RALs)*[115], the number of supplies on the List has decreased from year to year. Effective disinfection is the most fundamental part of the water treatment process and the part with the greatest potential to impact on public health.

At the end of January 2021, 46 no. supplies remain on the RAL which collectively supply water to 1,006,104 consumers[116]. However, none of the water Dublin Region Water Supply Schemes were on the RAL.

5.9.3 Wastewater Services

The EPA's *Water Quality in Ireland 2013-2018*[117] highlights that one of the key causes of water pollution is from point sources including discharges from wastewater treatment plants.

There have been significant changes in responsibilities for water supply and wastewater treatment services. As of January 2014 Irish Water replaced local authorities as a single provider of water supply and wastewater services.

Dublin City's wastewater is currently treated at Ringsend Wastewater Treatment Plant (WwTP). Planning permissions for a major upgrade at Ringsend WwTP were granted in 2012 and 2019, respectively. The upgrade is currently underway and will facilitate the existing plant meeting future wastewater treatment requirements, which will allow for growth in both population and industry. The project is being delivered on a phased basis, and when works are complete in 2025, Ringsend will have the capacity to treat the wastewater for a population equivalent of 2.4 million while achieving the standards of the Urban Waste Water Treatment Directive.

The Greater Dublin Drainage (GDD) Project involves the development of a new regional wastewater treatment facility and associated infrastructure including pipelines to serve the Greater Dublin Area (GDA and parts of the surrounding counties of Kildare and Meath. The GDD project is acknowledged as a critical piece of national infrastructure and has been identified in the National Planning Framework (NPF) as a National Strategic Outcome of the National Development Plan. The project will

[115] Under Section 58 of the Environmental Protection Agency Act 1992.
[116] EPA (2021f).
[117] EPA (2019d).

have the capacity to provide wastewater treatment for the equivalent of half a million people to support the needs of a growing population and economy in Dublin and the surrounding counties, whilst also contributing to system resilience and flexibility.

The GDD project will assist the Dublin local authorities in delivering on their plans for future development; not just in terms of local spatial planning policy but also in supporting consolidation of the metropolitan area, sustainable population growth, economic prosperity and continued confidence for investors in the long-term. An Bord Pleanála granted a Strategic Infrastructure Development permission for GDD in 2019, but that decision was quashed (in November 2020) following legal challenge. Decisions on next steps are still on-going in the courts, however, the project's strategic importance remains unchanged.

The GDD and Ringsend WWTP Project as critically important infrastructure given their objective to provide long-term sustainable wastewater drainage and treatment to support the continued development of the Greater Dublin Area.

5.9.3.1 Surface Water Drainage

Surface water can be proactively managed through measures such as Sustainable Urban Drainage Systems (SuDS). SUDS can minimise the quantity and increase the quality of surface water runoff as well as mitigating adverse impacts of climate change.

SUDS such as green roofs, permeable paving and attenuation areas contribute towards slowing surface water run-off, thereby alleviating flooding and helping to clean the water before it reaches our rivers. This 'green infrastructure approach' has an increasing role to play in surface water management, reducing reliance on more traditional hard engineered solutions and contributing to flood management , climate action and measures to enable WFD compliance.

Significant developments permitted in the City since the adoption of the 2016 Plan have been required to use SuDS, such as green roofs, rainwater harvesting, permeable paving and Stormwater Management Plans, in order to reduce surface water run-off[118].

Irish Water Drainage Area Plans (DAPs) are being progressed for the wastewater networks in Dublin City. These studies are modelling the existing sewer network / future scenarios and will develop solutions to overcome the current constraints.

[118] DCC (2020a).

- City Centre Sewerage Scheme DAP – work on this plan is ongoing and is expected to be complete by the end of 2021.
- Ringsend Main Lift Pumping Station DAP – Work on this will be ongoing over the next few years. Estimated to be completed in 2025.
- Sutton Pumping Station DAP – Part of the city's sewage flows to this strategic station in Sutton which, then pumps forward to the Ringsend plant. Work on this plan will take a number of years to complete estimated date for full completion of the plan is 2025.

5.9.4 Utilities

Gas and electricity are the energy utilities which have traditionally supported homes and businesses across Dublin City.

ESB Networks and EirGrid are the utility providers responsible for the electricity distribution and transmission systems. EirGrid manages the higher capacity electricity network which supply's power to industry and businesses that use large amounts of energy and electricity, whilst the ESB manages and operates the distribution network supplying electricity to homes, businesses, schools and institutions.

The Dublin region is the major load centre on the Irish transmission system, accounting for approximately one third of total electricity demand. The Dublin Port hinterland and Poolbeg Peninsula is an electricity generation and transmission / distribution network hub.

EirGrid has a number of ongoing and planned projects in the Greater Dublin Area for the purpose of reinforcing the transmission and distribution networks. The projects that are specific to Dublin City Council's area are as follows:

- Inchicore 220 kV Station Upgrade;
- Belcamp - Shellybanks New 220 kV Cable;
- Inchicore - Maynooth No. 1 and 2 220 kV Line Uprate; and
- Poolbeg 220 kV Station - Installation of 100 Mvar Voltage Support.

Gas Networks Ireland (GNI) are the utility provider responsible for the supply, transmission and distribution of natural gas. GNI operates and maintains a modern gas network in Dublin City whilst Ervia is responsible for the delivery of gas infrastructure and services through GNI.

5.9.4.1 Public Lighting

Public lighting is an important component of placemaking and is essential for the operation of the City. While the city is generally an illuminated area, excessive light pollution can arise when external lighting is not properly designed or managed.

5.9.5 Energy

The Department of Communication, Climate Action and Environment (DCCAE) is responsible for the development of Ireland's energy and climate policies. Ireland's long-term energy policy framework is set out in the *2015 Energy White Paper, Ireland's Transition to a Low Carbon Energy Future 2015-2030.* The Paper sets out a framework to guide Irish energy policy in the period up to 2030 and sets out a vision for a transformation of Ireland's energy systems.

In 2014 the European Council adopted a new framework, the *2030 Climate and Energy Framework,* which includes EU-wide targets and policy objectives for the period from 2021 to 2030. The 2030 framework proposes new targets and measures to make the EU's economy and energy system more competitive, secure and sustainable[119]. The 2030 framework aims to help the EU address issues such as:

- taking the next step towards the goal of reducing greenhouse gas emissions by 80-95% below 1990 level by 2050;
- high energy prices and the EU economy's vulnerability to future price rises, especially for oil and gas;
- the EU's dependence on energy imports, often from politically unstable areas;
- the need to replace and upgrade energy infrastructure and provide a stable regulatory framework for potential investors; and
- agree on a greenhouse gas reduction target for 2030.

The *National Energy & Climate Plan (NECP) 2021-2030*[120] takes into account energy and climate policies developed to date, demographic and economic growth (outlined in Project 2040) and includes all of the climate and energy measures set out in the NDP 2018-2027.

The built environment accounted for 12.7% of Ireland's greenhouse gases in 2017. It is important that we improve the energy efficiency of our buildings, including homes, workplaces and schools, by

[119] European Council (2017). *The 2030 Climate and Energy Framework.*
[120] DCCAE (2018).

meeting higher energy performance standards and by increasing retrofit activity. This will reduce Ireland's dependence on fossil fuels, but will also improve our living standards by making our buildings healthier, safer, and less costly to heat.

The NPF identifies the Transition to a Low Carbon and Climate Resilient Society as one of ten National Strategic Outcomes (NSO) or priorities to guide future development. The NPF identifies the improvement of energy sustainability / resource efficiency as being a key future growth enabler for Dublin and district heating as being a way to achieve it.

The RSES identifies decentralised energy (energy generated off the main grid) as critical to the Regions' energy supply and could ensure that the Region can become more self-sufficient in relation to its energy needs.

The RSES notes that generating electricity supply from indigenous renewable sources requires:

- facilitating the provision of appropriate renewable energy infrastructure and technologies and deeper cooperation with Northern Ireland and the EU;
- expansion and upgrading of the grid with the aim of increasing the share of variable renewable electricity that the all-island system can accommodate;
- onshore wind, bioenergy, solar and offshore energy;
- effective community engagement including support for micro generation;
- moving from carbon intense fossil fuel generation to lower emissions fuels;
- increasing the use of electricity and bioenergy to heat our homes and fuel our transport; and
- the need to ensure sufficient electricity to meet increased demand.

The strategy set out in the RSES supports an increase in the amount of new renewable energy sources in the Region, which includes Dublin City. This includes the use of wind energy – both onshore and offshore, biomass, and solar photovoltaics and solar thermal, both on buildings and at a larger scale on appropriate sites in accordance with National policy and the Regional Policy Objectives.

5.9.5.1 Renewable Energy Potential

In December 2018, the recast Renewable Energy Directive 2018/2001/EU entered into force, as part of the *Clean Energy for all Europeans package*. 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).

Central to the reduction in greenhouse gas emissions will be the continued transition from the use of fossil fuels as an energy source to a more renewable energy focused system which harnesses the potential from energy sources appropriate in Dublin City such as biomass and solar power[121].

A key project in Dublin City that has contributed towards the decarbonisation of the electricity supply is the *Covanta Waste-to-Energy Facility*, which became fully operational on 30 November 2017. The Waste-to-Energy Facility converts waste that cannot be reused or recycled into clean energy. Data from EirGrid indicate that the plant is generating approximately 300GWh of electricity, this amounts to approximately 1% of the electricity supply. This translates into enough electricity for over 100,000 homes.

Based on SEAI analysis, February 2020 provided a record-breaking month with 56% of energy demand met by wind energy, the highest monthly total since records began. In the 12 months to end of January 2020, wind and other renewable sources, hydro, solar and biomass accounted for 37% of demand. This is an encouraging trend, but further acceleration of deployment is necessary to achieve the Government's target for electricity of 70% from renewables by 2030.

DCC works with CODEMA (City of Dublin Energy Management Agency) which aims to accelerate Dublin's low-carbon transition in order to mitigate the effects of climate change and improve the lives of citizens.

5.9.5.2 Waste Energy - District Heating

The NPF deals with district heating under the theme of waste management, stating that '*District heating networks will be developed, where technically feasible and cost effective, to assist in meeting renewable heat targets and reduce Ireland's GHG emissions*'.

The RSES outlines that Local authorities should harness the potential of renewable energy in the region, across the technological spectrum, with RPO 7.35 to RPO 7.38 of the RSES outlining the objectives to decarbonising the energy sector for the region.

District heating is an emerging renewables-based thermal energy system of heat energy distribution which offers an alternative public utility to traditional gas. It has the potential to be an efficient and cost-effective heat energy source which uses networks from a variety of potential renewable energy sources and technologies, such as waste incineration, combined heat and power (CHP) and

[121] DCC (2020e).

geothermal or energy. The use of renewable waste energy solutions to provide heating and hot water to homes and businesses contributes to sustainability as it reduces the demand for, and consumption of, energy while using a renewable form of fuel, contributing to the overall decarbonisation of the energy sector.

The *Dublin City Development Plan 2016-2022* sought to utilise waste heat produced in generating electricity and to facilitate the roll-out of energy efficiency initiatives, such as district heating and combined heat and power, which would bring social and environmental benefits. The Plan also committed to ensuring the successful implementation of the Dublin District Heating System (DDHS) as a critically important piece of infrastructure over the lifetime of the 2016-2022 Development Plan.

5.9.6 Telecommunications

The *Dublin City Development Plan 2016-2022* introduced the concept of the Smart Dublin Framework as a means of using technological innovation to address priority challenges facing Dublin by using the City as a test-bed for such technologies.

The *National Broadband Plan (2019)* seeks to deliver high-speed broadband services to all businesses and households across Ireland ensuring that those living and working in rural areas have the same digital access and opportunities as those in rural areas. Since its publication, significant investment has been made in upgrading and modernising networks which support the provision of broadband and telecommunications services, with significant additional investment expected over the coming years.

The *National Digital Strategy (2018)* is intended to assist Ireland in maximising the socio-economic benefits from the digitisation trend and has informed both the NPF and the RSES.

DCC owns a substantial telecoms ducting network in the Dublin Docklands area. This network is of economic importance, providing telecoms services to some of the world's largest financial services companies and a growing cluster of the most successful high tech companies in the digital media and internet sectors. DCC have continued to work on putting in place a more robust system to manage the current infrastructure and to develop the network into a world class telecoms infrastructure – by installing an open access platform - in order to meet future demands.

5.9.7 Transport

Transport is fundamental to how we live and work. A well performing transport system is essential to the functioning of society and the economy as a whole. The maintenance and delivery of an efficient, integrated and coherent transport network is essential to the future economic, social and physical development of the City.

The Metropolitan Area Strategic Plan (MASP) for the Dublin metropolitan area sets out a 12-year strategic planning and investment framework for the area to 2031, with a long term horizon to 2040 to align with the timeframe of the NPF. MASP comprises an integrated land-use and transportation strategy and identifies strategic corridors based on their capacity to achieve compact sustainable and sequential growth along key public transport corridors.

The Department of Transport, Tourism and Sport is launching a review *Ireland's Sustainable Mobility (Active Travel and Public Transport) Policy* (public consultation closed in early 2020). A review of the public transport policy is needed to *"ensure services are sustainable into the future and are meeting the needs of a modern economy".*

Increasing capacity on public transport including bus corridors, DART, suburban railway lines and Luas will continue to reduce the reliance on private car usage and provide opportunities for people to alter their travel behaviour and increase modal shift to more sustainable modes. Promoting modal change also encourages active travel (i.e. walking and cycling) in general and as a means to access public transport routes. The Covid-19 pandemic has highlighted the need to accelerate a shift to active travel in particular, with a consequent upscaling in infrastructure provision for pedestrians and cyclists.

Transport infrastructure in the City has the potential to support reductions in energy demand from the transport sector, including through electrification of modes. Emissions from transport account for approximately 20% of CO_2 emissions at national level.

The *National Planning Framework, Project Ireland 2040* and the *Transport Strategy for the Greater Dublin Area (GDA) 2016-2035* have set out a number of transport projects that will serve the Plan Area. Three key projects include:

- The Bus Connects Dublin Area Bus Network Redesign project[122] from 2021.

[122] NTA (2021a).

- The Bus Connects Core Bus Corridor project[123] with a targeted timeline of 2022 – 2027 for delivery.
- The extended Luas Tram line to Finglas anticipated to be delivered by 2028.

Table 5.7 below outlines the projects are included in the NTA's *Transport Strategy for the GDA 2016-2035*.

Table 5.7: Projects in the NTA's Transport Strategy for the Greater Dublin Area

Transport Strategy for the Greater Dublin Area	
Heavy Rail Infrastructure	
Reopen the Phoenix Park Tunnel Link for passenger services, which will link the Kildare / Cork line to the City centre.	Develop a new train control centre to manage the operation of the rail network.
Complete the City centre Re-signalling programme, (to provide additional train paths through the City centre).	Construct additional train stations in developing areas with sufficient demand.
Implement the DART Expansion Programme, which will provide DART services as far north as Drogheda; to Hazelhatch on the Kildare Line[124]; to Maynooth in the west and to the M3 Parkway.	Implement a programme of station upgrades and enhancement.
	Ensure an appropriate level of train fleet, of an appropriate standard, to operate on the rail network.
Light Rail Infrastructure	
New Metro North (Metrolink) - from the south City centre to Swords and serving Dublin Airport.	Extension of LUAS Green Line to Bray, providing a second rail alternative to Bray.
LUAS Green Line Capacity Enhancement - between St. Stephen's Green and Bride's Glen (in advance of Metro South).	Extension of LUAS Cross City to Finglas.
	LUAS Cross City connecting St. Stephen's Green to Broombridge.
Metro South - LUAS Green Line Capacity Upgrade from the south City centre to Bride's Glen, completing a full north-south high-capacity high-frequency cross-city rail corridor.	LUAS to Lucan - high capacity link to the Lucan's large residential area with the City centre.
	LUAS Red Line extension to Poolbeg – linking the north Docklands to the south of the Liffey.

[123] NTA (2021b).
[124] including a tunnel connection from the Kildare Line to link with the Northern / South-Eastern Line known as Dart Underground.

Transport Strategy for the Greater Dublin Area	
Road Infrastructure	
Development of a road link from the southern end of the Dublin Port Tunnel to the South Port area.	Various signage, safety interventions, junction improvements and local reconfigurations on the national road network.
Provision of additional service areas on the national road network in line with national policy.	

5.9.7.1 Public Transport

Public transport is crucial for the City and the region as it has the greatest potential to move the highest volume of people, and the delivery of public transport infrastructure in co-operation with the relevant transport agencies continues to be of utmost importance.

Dublin City, has been successful in changing travel behaviour over time, particularly with regard to commuting by private car, the mode share for which was 28% end of 2019, meaning that 72% of people travelled into the City by sustainable modes in that time[125]. The existing public transport network currently comprises bus, DART and the LUAS lines.

In recent years, the City has benefited from improvements in public transport, such as improvements in the bus network and expansion of the LUAS network, all of which has contributed to a 50% mode share for public transport[126].

The **DART** line runs through the Dublin City Council area from Malahide in the north (Fingal) to Greystones in the south (County Wicklow). Implementation of the **DART+ Programme**[127], will see expansion of the existing DART network from c.50km to 150km through the electrification and upgrade of existing lines transforming commuter train travel in the Greater Dublin Area (GDA). This transformative programme will deliver frequent, modern, electrified services between Dublin City Centre (Connolly and Spencer Dock) and Maynooth and M3 Parkway; Hazelhatch and Celbridge; Drogheda and Greystones.

There are two existing **LUAS** lines running through the DCC area. The Red Line runs in an east-west direction through the City centre, north of the River Liffey, before travelling south-west to Tallaght,

[125] DCC (2020c).
[126] DCC (2020c).
[127] Iarnród Éireann (2021).

with a line to Citywest and Saggart. The Green Line runs from Bride's Glen (Cherrywood) and Sandyford through Stephen's Green and the City centre to Broombridge. The LUAS Green line intersects with the Red Line at O'Connell Street / Abbey Street[128].

The proposed **Metro Link**[129] proposes a high-capacity, high-frequency rail line running primarily underground from Swords to Charlemont, linking Dublin Airport, Irish Rail, DART, Dublin Bus and LUAS services. The proposed c. 19km Metro Link will have 16 stations.

The Covid-19 pandemic has necessitated a swift change in how people move around the City over a short period. The Covid-19 pandemic has highlighted the need to accelerate a shift to active travel in particular. There been widespread acknowledgement that current transport trends are unsustainable and in order to meet future travel demand, change is needed.

5.9.7.2 Cycling & Walking Infrastructure

Cycling and walking is environmentally friendly, fuel-efficient and a healthy mode of transport to work, school, shopping and for recreational purposes. Cycling and walking are considered an efficient, fast and relatively inexpensive form of transport. Active walking and cycle infrastructure supports active health initiatives and healthy communities and significantly assist our transition to a lower carbon society.

Within Dublin City, the cycle network continues to be expanded and work is progressing on the road and bridge infrastructure projects identified. The pedestrian network continues to be improved and expanded and construction is due to commence shortly on several City centre public realm projects.

Cycling and walking have also increased in the period 2006-2019. An examination of the cordon counts shows that there has been a significant increase in active travel demonstrated by a 171% increase in cycling within the area enclosed by the two canals in the 13-year period from 2006 to 2019. Walking has also continued to increase year on year with almost double the number of people walking across the canal than those cycling in November 2019, a 44.3% increase since 2006[130].

Under the National Planning Framework: '*Delivery of the metropolitan cycle network set out in the Greater Dublin Area Cycle Network Plan inclusive of key commuter routes and urban greenways on*

[128] DCC (2020c).
[129] METRO LINK (2021).
[130] DCC (2020c).

the canal, river and coastal corridor' is one of the transport projects outlined as key future growth enablers for Dublin.

With respect to the DCC administrative area, the most recent launch of the NTA's National Cycle Network was the *Royal Canal Premium Cycle Route Phase 2* scheme which officially opened to the public in July 2020. The Dublin City section of the Greenway will provide a high quality walking and cycling route of over 7km linking Ashtown to the North Quays at the Samuel Beckett Bridge once completed.

The City has continued to prioritise public realm with the launch of the corporate public realm masterplan for the City core *The Heart of the City in 2016*. *The Heart of the City,* aims for a pedestrian friendly city core where more space, permeability and opportunities for routes for pedestrians are promoted.

During the Covid-19 pandemic, the temporary reallocation of additional space for pedestrians and cyclists appears to have been generally welcomed although it is acknowledged that this has presented challenges in some areas as kerb side servicing has been impacted. In particular, the City Centre is the most challenging area for pedestrians having regard to the volume of people moving around the City. Over 90% of people moving in the City Core are doing so on foot. There is currently insufficient space to accommodate normal (Covid-19 notwithstanding) pedestrian flows.

5.9.8 Dublin Port

Dublin Port continues to play a significant role in the economy of the City. Dublin Port handles almost 50% of all trade in the Republic of Ireland and is a key strategic access point for Ireland and the Dublin area.

The RSES notes the importance of high quality international connectivity to support enterprise and economic development. Dublin Port is a significant economic generator for the City both in terms of trade and tourism.

In 2019, Dublin Port had a throughput of over 1.9 million passengers, 158 no. cruise liners and dealt with 9.4 million tonnes of exports. In 2015, permission was granted for the Alexander Basin Redevelopment Project. Construction is now well underway for the c. €230 million infrastructural investment at the port, along with conservation works related to the port's Victorian industrial heritage. The redevelopment comprises significant landside restructuring to quays and berths etc. to

facilitate larger vessels and also enhance the port's current cruise vessel experience. The investment will help future-proof the port in terms of being able to facilitate larger sized vessels into the future (in terms of both length and draft) and provide for increased capacity[131].

Permission has also recently been granted by An Bord Pleanála for the MP2 Project, the second major capital development project from *Dublin Port's Masterplan 2040*, for phased development works within existing port lands in the north eastern part of the port estate[132].

5.9.9 Waste Management

One of the key drivers for a sustainable economy is the concept of a '*circular*' economy. A circular economy aims to reduce waste and ensure that materials are used as efficiently as possible. A circular economy involves:

- getting the most from products by using them as fully as possible;
- sharing items with others to re-use where possible; and
- increasing the levels of recycling to at least recover the value of the materials used to make these products[133].

For businesses: a circular economy reduces costs, improves the raw material supply chain and offers opportunities such as new business models and markets.

For individuals: a circular economy offers a sustainable lifestyle with reduced environmental impact and lower household bills.

The European Commission's Circular Economy Action Plan: *A New Circular Economy Action Plan for a Cleaner More Competitive Europe,* March 2020*,* forms one of the main blocks of the European Green Deal*. A Waste Action Plan for a Circular Economy*[134] was published in 2020 and outlines Ireland's National Waste Policy for 2020-2025.

The *Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021* provides a framework for the prevention and management of waste in a sustainable manner in 12 no. local authority areas. The Eastern-Midlands Region comprises Dublin City Council, Dún Laoghaire-Rathdown, Fingal, South Dublin, Kildare, Louth, Laois, Longford, Meath, Offaly, Westmeath and Wicklow County Councils.

[131] DCC (2020d).
[132] DCC (2020d).
[133] EPA (2020j). *Sustainable Economy.*
[134] DCCAE (2020).

The three key objectives of the *Eastern-Midlands Region Waste Management Plan* are:

1. Prevent waste: a reduction of one per cent per annum in the amount of household waste generated over the period of the plan.
2. More recycling: increase the recycle rate of domestic and commercial waste from 40 to 50 per cent by 2020.
3. Further reduce landfill: eliminate all unprocessed waste going to landfill from 2016.

5.9.9.1 Dublin City Waste Management / Litter Management

The Covanta Waste-to-Energy Facility at Poolbeg is a significant part of the waste management infrastructure of the city. Since coming online in 2017, the facility has processed over 2,000,000 tonnes of waste, which could not otherwise be recovered or recycled – the majority coming from the greater Dublin area. In this timeframe, the facility has also exported over 1.5million Mwh of electricity into the National Grid, enough power for over 100,000 households each year.

The City's waste collection is undertaken by private operators and includes the following kerbside services: residual, mixed / dry recyclable and organic waste (food waste and light garden waste) collections.

In 2016, the implementation of the Council's 2016-2018 Litter Management Plan put an increased emphasis on smart evidence-based resource deployment. The Plan led to novel initiatives including an upgrade of the City's public litter bins to smart solar-compactor bins.

In 2020, DCC published the *Litter Management Plan 2020-2022*[135]. The Plan provides a framework for the prevention and management of waste in a sustainable manner with three key objectives to:

- *Prevent waste: a reduction of one per cent per annum in the amount of household waste generated over the period of the plan.*
- *More recycling: increase the recycle rate of domestic and commercial waste from 40% to 50% by 2020.*
- *Further reduce landfill: eliminate all unprocessed waste going to landfill from 2016.*

[135] This Plan was informed by *The EMR Waste Management Plan* which was jointly prepared by the local authorities of the region.

5.9.10 Minerals and Aggregates

Notwithstanding the developed urban nature of the Plan area, it is worth noting that there are a number of 'mineral localities' within the DCC administrative area. These townlands include: Pelletstown (non-metallic), Crumlin (non-metallic), Rathland West (non-metallic), Rathgar (non-metallic) Clontarf (non-metallic), Elmpark (metallic) and Clontarf (metallic).

Geological Survey, Ireland (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. These include:

- Aggregate Potential Mapping;
- Quaternary and Physiographic mapping;
- Bedrock mapping; and
- National Aquifer and Recharge mapping.

5.9.11 Green Infrastructure

Green and blue infrastructure plays an essential role in creating a more healthy and liveable city. These natural assets provide a platform for community activities, social interaction, recreation and physical activity, providing sustainable drainage solutions, facilitating biodiversity and wildlife habitats, carbon capture and creating connectivity.

The current limitations and social distancing requirements brought about as a result of COVID-19 have further highlighted the continuing need for the provision and access to these assets in our urban areas. Dublin *City's Strategic Green Network* are outlined in Section 5.2.5.1.

5.9.12 Material Assets Issues

The development of the Draft Dublin CDP will result in increasing demand for water, wastewater treatment, waste management, transport infrastructure/links and energy and telecommunications services.

Existing material assets issues / pressures and threats within and adjacent to the Dublin City administrative area, include:

- Water Supply and Wastewater Services - new developments, (including housing, offices and retail development), will generate pressure on existing water and wastewater sources to meet demands.

- **Water Supply -** ongoing issues with security of water supply in the Dublin and Mid-East Regions for existing users.
- **Water Supply** – on-going investment in water conservation / leak detection and fixing.
- **Wastewater Services -** new developments, should only be permitted where there is adequate capacity in the wastewater infrastructure in accordance with urban wastewater treatment disposal requirements and standards. Currently, municipal wastewater discharges are creating significant pressure on the receiving waterbodies.
- **Energy** – reduction of reliance on fossil fuels, increased use of renewable energy resources
- **Telecommunications -** the rollout of connectivity in the urban environment can be complex. Lack of coordination between infrastructure and utility providers can lead to the spatially inefficient and uncoordinated provision of utilities and connectivity infrastructure.
- **Transport -** the movement of people is key to the success of new development and areas, where adequate transport infrastructure (*i.e*. road, rail, cycle and pedestrian routes) to these developments and accessibility throughout the development / area (safe footpath and cycle paths) is fundamental to the development of Dublin City.
- **Waste -** population growth and development, and challenges in providing sustainable recycling infrastructure continues to put pressures on the local authorities to provide better waste management and access to waste services. According to CSO figures, some 500,000 homes in Ireland do not implement waste prevention practices[136].
- **Light Pollution** - can arise when external lighting is not properly designed or managed which can in turn lead to inappropriate or excessive light spillage.
- **Utilities –** provision, protect and maintenance of adequate utilities to support existing and envisaged development.

[136] CSO (2016).

5.10 Interactions and Cumulative Impacts

The environment is both complex and dynamic and the various elements of the environment interact in an equally complex and dynamic manner. The permutations can be numerous, however, at a basic level the principal interactions can be either qualified or quantified in most instances. Interactions between various elements of the plan will be considered in the SEA Environmental Report (Stage 3).

As noted in the EPA publication, '*Good Practice Guidance on Cumulative Effects Assessment in Strategic Environmental Assessment*', in Ireland, "*key cumulative effects – where environmental receptors are at, or near, their thresholds or their capacity to assimilate more change – include climate change; water management, including flood risk management; air quality; and biodiversity, including peatlands and wetlands. Land-use change over time is irrevocably changing Ireland's landscape*." There may also be more locally significant cumulative effects; for example, loss of tranquillity and amenity affecting people's health and wellbeing.

The cumulative impact assessment in the Environmental Report will focus on the key cumulative issues of climate change, water quality, flood risk, air quality, biodiversity and landscape, together with any other locally significant cumulative effects.

5.11 Mitigation and Monitoring

Where significant adverse impacts are identified during the SEA process, relevant and appropriate mitigation measures will be provided in the Environmental Report. In order to ensure implementation of the recommended measures, monitoring arrangements will be provided and will include, where feasible, details as to the frequency of monitoring, and analysis and reporting on monitoring. As part of the monitoring programme, relevant and appropriate thresholds will be included to determine when remedial action is required for the particular aspect of the environment being monitored.

6 Draft Strategic Environmental Objectives (SEOs)

6.1 Strategic Environmental Objectives

A series of Strategic Environmental Objectives (SEOs) will be prepared in line with current guidance and also with specific reference to the SEA for the Draft CDP. The SEOs provide a basis for the assessment of the environmental effects of the Draft CDP and are framed in such a manner as to enable the Draft CDP to be fully assessed in environmental terms.

SEOs are distinct from objectives within the Draft CDP, although they will often overlap and are developed from international, national and regional policies which generally govern environmental protection objectives. Appropriate targets and indicators will be developed in the SEA Environmental Report. The scoping aspect of the SEA process affords an opportunity for consultees to provide input to the range and detail of the environmental objectives.

Set out in Table 6.1 are the draft Strategic Environmental Objectives (SEOs) that are being considered to test the potential environmental impacts of the Draft City Development Plan. These objectives are based on the current understanding of the key environmental issues identified. The detailed assessment criteria are examples of the issues that will be considered during the assessment of whether the plan, including the proposed alternatives, meets the proposed SEA objectives. The list is based on the environmental topics set out in *Annex 1(f)* of the SEA Directive, which may be significantly impacted upon by the Plan. The effects on these topics will address the secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative impacts.

6.2 Strategic Environmental Indicators and Targets

The overall purpose of environmental indicators in SEA is to provide a way of measuring the environmental effect of implementing the Draft Dublin CDP. Indicators are also used to track the progress in achieving the targets set in SEA as well as the Draft CDP.

SEA Indicators and Targets (see draft proposals in Table 6.1) will be identified as part of the SEA process. While these will have regard to the existing indicators and targets proposed in the adopted CDP 2016-2022, any target that is set must be attributable to the implementation of the Draft Dublin City Development Plan 2022-2028.

Table 6.1: Draft Strategic Environmental Objectives (SEOs) for Dublin City Council

Theme	Draft Objectives	Draft Targets
Biodiversity (Flora & Fauna) (B)	Preserve, protect, maintain and where appropriate, restore the terrestrial, aquatic and soil biodiversity, of international, EU and nationally designated sites, protected species and habitats.	▪ Preparation of a Green Infrastructure strategy for the city / county. ▪ Ensure that biodiversity is integrated into all decision making across the Plan. ▪ Finalise the Draft Biodiversity Action Plan and implement the revised Plan. ▪ Submission of Screening Report or Natura Impact Statement for proposed developments with planning applications in / and / or near European Sites. ▪ Screen for and undertake SEA and AA as relevant for new Council policies, plans, programmes etc. ▪ No loss of protected habitats and species during the lifetime of the Plan. ▪ Prevent the introduction or spread of invasive or alien species. ▪ Finalise a new *Invasive Alien Species Action Plan*. ▪ Setting new development back from rivers / riparian Zone / opportunity for river restoration in appropriate locations.
	Ensure no adverse effects on the integrity of any European site, regarding its qualifying interests, associated conservation status, structure and function.	
	Maintain and where appropriate, enhance the biodiversity value of local designated and non-designated ecological areas, heritage areas and natural capital, 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.	
Population & Human Health (PHH)	Promote economic growth to encourage retention of working age population and funding of sustainable development and environmental protection.	▪ Review of progress on implementing the Plan objectives to demonstrate the successful implementation of measures relating to the promotion of economic growth. ▪ Increase in the number of green spaces and amenities available to the public.
	Provide high quality residential, community, working and recreational environments with access to sustainable transport options.	

Theme	Draft Objectives	Draft Targets
	Ensure that existing population and planned growth is linked with the required infrastructure and the services.	▪ Improved trends in quality of life related to these matters, including no spatial concentrations of health problems arising from environmental factors as a result of implementing the Plan. ▪ Increase the number of active travel routes (cycling / walking) available to the population, from CSO 2016 figures.
	Protect human health and wellbeing from environment-related pressures.	
Land, Soils & Geology (LSG)	Safeguard sensitive soil, resources and geological heritage sites against pollution and degradation.	▪ Target reuse of brownfield sites. ▪ Achieve the 50% target for growth on infill as per NPF. ▪ Dispose of contaminated material in compliance with EPA guidance and waste management requirements.
	Promote the sustainable use of infill and brownfield sites over the use of greenfield within the City.	
	Safeguard designated geological sites.	
Water Quality (W)	Protect and where necessary improve and maintain water quality and the management of watercourses and groundwater and coastal waters in compliance with the requirements of the Water Framework Directive and Marine Strategy Framework Directive objectives and measures.	▪ Not to cause deterioration in the status of any surface water or affect the ability of any surface water to achieve *'good status'*. ▪ Implement of the objectives of the second cycle of the River Basin Management Plan by 2021. ▪ Not to permit development where it would result in a WWTP exceeding the terms of its discharge license. ▪ Setting new development back from rivers / riparian Zone / opportunity for river restoration in appropriate locations. ▪ Encourage future population growth in areas served by Urban WWTP and public water supplies.
	Avoid inappropriate development in areas at risk of flooding and areas that are vulnerable to current and future erosion.	
	Integrate sustainable water management solutions (such as SuDS, porous surfacing and green roofs) into development proposals.	

Theme	Draft Objectives	Draft Targets
		▪ Minimise developments on lands which pose - or are likely to pose in the future - a significant flood risk.
Air Quality & Noise (AN)	To avoid, prevent or reduce harmful effects on human health and the environment as a whole resulting from emissions to air from all sectors with particular reference to emissions from transport, residential heating and industry.	▪ Provide for increased use of public transport. ▪ Increase number of cycle lanes and pedestrian routes in the Plan area / City. ▪ Improve ambient air quality trends, particularly in relation to transport-related emissions of NOx and particulate matter through reduction of private vehicle usage. ▪ An increase in the percentage of the population travelling to work or school by public transport or non-mechanical means. ▪ Progress the Dublin City District Heating System
	Minimise travel related emissions and encourage a modal change from car to more sustainable forms of transport.	
	Promote continuing improvement in air quality through the reduction of emissions and promotion of renewable energy and energy efficiency.	
	Aim to meet Air Quality Directive standards for the protection of human health - Air Quality Directive.	
	Significantly decrease noise emissions associated with traffic and transport and other noise related industry etc.	
Climate Change (CC)	Minimise contribution to Climate Change by adopting mitigation and adaptation measures.	▪ Achieve transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. ▪ Increased density and penetration of the public transport network including frequency of service – e.g. for urban and rural bus services.
	Integrate sustainable design solutions into the City's infrastructure (e.g. energy efficient buildings; green infrastructure).	

Theme	Draft Objectives	Draft Targets
	Contribute towards the reduction of greenhouse gas emissions in line with national targets.	▪ Increase in the proportion of people resident in the City reporting regular cycling / walking to school and work above CSO 2016 figures. ▪ Decrease in the proportion of journeys made by residents of the City using private fossil fuel-based car compared to 2016 levels. ▪ Contribute towards the target of the Renewable Energy Directive (2018/2001/EU), for all Member States to reach a 10% share of renewable energy in transport by 2020. ▪ Contribute towards the reduction in carbon dioxide (CO_2) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors. ▪ To promote reduced energy consumption and support the uptake of renewable options and a move away from solid fuels for residential heating.
	Encourage and promote development resilient to the effects of climate change.	
	Promote the use of renewable energy, energy efficient development and increased use of public transport.	
Material Assets (MA)	Make best use of existing infrastructure, promote the sustainable development of new infrastructure to match population distribution and protect existing assets, to meet the needs of Dublin City's population.	▪ Aim to facilitate, as appropriate, Irish Water in developing water and wastewater infrastructure. ▪ Improvements to existing water and wastewater infrastructure, including leak detection / fixing. ▪ New developments to be connected to and adequately and appropriately served by wastewater treatment over the lifetime of the Plan.
	Promote the circular economy, reduce waste, and increase energy efficiencies.	
	Ensure there is adequate sewerage and drainage infrastructure in place to support new development.	

Theme	Draft Objectives	Draft Targets
	A reduction in energy demand from the transport sector and support moves to electrification of road and rail transport modes.	▪ Reduction in the quantities of waste sent to landfill. Increase in the quantities of waste sent for recycling / recovery. ▪ Increase in provision of cycle lanes and pedestrian routes. ▪ Increase the number of active travel routes (cycling / walking) available to the population, from CSO 2016 figures.
Cultural Heritage (CH)	Protect places, features, buildings and landscapes of cultural, archaeological and / or architectural heritage from impact as a result of development.	▪ No permitted development which involves loss of cultural heritage, including protected structures (Record of Protected Structures), archaeological sites, Architectural Conservations Areas (ACAs) and landscape features. ▪ To increase the number of uninhabited and derelict structures that are restored.
Landscape & Visual (LV)	Protect and maintain the special qualities of the landscape character of Dublin City.	▪ Ensure no significant disruption or adverse visual impacts on the natural or historic / cultural landscapes or features of Dublin City.

7 What Happens Next?

This Scoping Report provides draft baseline data for the Draft Dublin CDP which will be circulated to all specified Environmental Authorities.

The Environmental Authorities are invited to contribute to the scope and level of detail of the information to be included in the SEA Environmental Report by suggesting baseline data, survey techniques and potential impacts that should be considered as part of the SEA process and in the preparation of the Environmental Report.

Following the consultation period the SEA Environmental Report on the Draft Dublin CDP will be prepared and will accompany the Draft Plan on public display. The SEA Environmental Report will be presented in accordance with relevant legislation and guidelines and will contain the following principle chapters / sections:

- Non-Technical Summary (NTS)
- Introduction
- Methodology
- Review of Relevant Policies, Plans and Programmes
- Environmental Baseline
- SEA Objectives, Targets & Indicators
- Description of Alternatives
- SEA of Dublin City Development Plan
- Mitigation Measures
- Monitoring Programme
- Conclusion.

8 Conclusion

This Scoping Report has indicated potential environmental issues that will require careful consideration in the making of Draft Dublin CDP 2022-2028.

The Strategic Environmental Assessment process will assess the impact of the Draft Dublin CDP, its policies and objectives on all aspects of the environment, either directly and indirectly, whether *positive* or *negative*. Where necessary or required, mitigation measures will be proposed in order to alleviate any potential negative impact. Ultimately, the process will facilitate the broad aim of achieving sustainable development within Dublin City over the lifetime of the Dublin CDP.

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