Comhairle Contae Fhine Gall
Fingal County Council

An Roinn um Pleanáil agus
Infrastruchtúr Straitéiseach
Planning and Strategic
Infrastructure Department

Feasibility Study

Dunsink Lands, Co. Dublin

In accordance with
Objective Blanchardstown 13,
Fingal Development Plan 2017 – 2023

February 2022

Prepared in association with:
Transport Insights, in partnership with MacCabe Durney Barnes
Atkins Consulting Engineers

Contents

Section 1: Introduction and Background

1.1 Basis for the Feasibility Study

This Fingal County Council Feasibility Study relates to the lands at Dunsink, Co. Dublin. The Feasibility Study has been produced by Fingal County Council (FCC) in accordance with Objective Blanchardstown 13 of the Fingal County Development Plan 2017-2023 (FDP) which states the following:

Carry out a feasibility study of lands at Dunsink to include a full investigation of requirements in terms of infrastructure, water, access, drainage within three years of the adoption of this Development Plan and any remedial measures associated with the former landfill area to inform the future designation of these lands for development. This will be carried out in consultation with necessary statutory agencies and appropriate stakeholders to facilitate the orderly and appropriate release of lands at Dunsink.

This study relates to the feasibility of the development of a long-term strategic development landbank supported by national, regional and local policy to support transit orientated development on publicly owned lands on an infill site within the existing built-up area.

The future development of the landbank requires determination of the appropriate infrastructure to ensure that the vision for the lands can be appropriately implemented. In particular, ensuring sustainable transport options and sustainable urban drainage solutions are a key factor in determining the feasibility of the lands for future development. As such, 2 studies have been carried out to inform this Feasibility Study, namely;

- A Surface Water Management Plan including a Flood Risk Assessment and a Sustainable Drainage Strategy
- A Transport Appraisal Report

These studies are contained in Appendix A and B of this Feasibility Study.

These studies have been carried out to ensure that the development of the lands can deliver qualitative lasting impacts. By carrying out these studies in advance of pursing the next stage in the long-term delivery of development of these lands, it will ensure that development on the lands will support and outweigh the initial public investment involved.

The long-term development of the Dunsink lands can contribute towards one of the main aspirations set out in national policy to achieve transformational, place-based change through an acceleration of the way we live towards a more sustainable setting.

The Dunsink landbank, in conjunction with DART upgrade and other long-term transit orientated development along the DART line within the administrative area of Dublin City Council, will have a transformational benefit for progressing sustainable development in

Dublin City and suburbs in compliance with national and regional policy objectives, in particular NSO 1, NPO's 3a and 3b and RPO 4.3.

This Feasibility Study identifies any significant infrastructure requirements that would be required to achieve the vision for the lands so that a clear and reasoned approach can be taken to later stages in preparing the lands for development to achieve full economic value from investment in public infrastructure. Investment has already taken place in the area, for example in relation to transportation as part of the NTA's GDA Transport Strategy, smarter travel, the GDA cycle network plan and investment in recreation and amenity such as the Tolka Valley Park and the Royal Canal Way.

The strategic location and development potential of lands at Dunsink is recognised within the Regional Spatial and Economic Strategy (RSES) and the Fingal Development Plan 2017-2023. The feasibility study area is 435.9 hectares and forms part of the townlands of Ashtown, Castleknock, Dunsink and Scribblestown. The lands are characterised by their current use for predominantly agricultural and recreational amenity purposes.

This area provides a unique opportunity to significantly consolidate a strategic site within the Dublin Metropolitan Strategic Plan (MASP) area in a sustainable manner underpinned by high quality public transport given the site benefits in close proximity to the existing heavy rail network at Ashtown and the proposed extension to the Luas to Finglas. In addition, commercial development would benefit from access to the nearby M50 motorway.

While recognising these lands as a potential strategic landbank for the County, it is acknowledged that the current infrastructural constraints on these lands require further detailed investigation that should inform any future decision to zone these lands for a mixed-use urban district. Any future development of these lands will require Strategic Development Zone (SDZ) status, or other relevant planning-related designation.

The scale and extent of the study area is significant and has great potential to provide high quality new housing and commercial development within the County. However, there are significant challenges in delivering such lands, including provision of physical and social infrastructure, fragmented land ownership and the challenges of implementation.

1.2 Context and Location

The study area is located within the M50 motorway cordon and is circa 7km from Dublin City Centre. It is located north of River Road, south of Cappagh Hospital, west of the settlement area of Finglas and east of the M50. The lands are located between Blanchardstown urban area to the west, and the Finglas and Ashtown/Pelletstown parts of Dublin City to the east and south respectively. Sports Campus Ireland is situated directly west of the M50, with the Royal Canal and Phoenix Park located in close proximity to the south. The lands are to the southeast of the M50/N3 junction, west of the M50/N2 junction and north of the Royal Canal. The southwestern boundary is defined by the Sligo/Maynooth rail line and the Royal Canal. The southeastern boundary is defined by the Tolka River set in parkland, which forms part of the larger Tolka Valley Park.

The subject lands in their entirety are largely undeveloped, with the exception of their northern, eastern, and southern fringes. At present, the majority of the study area is zoned OS – Open Space and HA - High Amenity. There are 2 small pockets of CI – Community Infrastructure zoning in the eastern and southern section of the lands. There is also a larger area of CI zoned lands in the northern section of the lands. There is also an area of RS – Residential zoned lands in the north eastern section of the lands and 5 areas of Traveller Accommodation dispersed throughout the lands. There is a strip of HT – High Technology lands along the southern section of the lands. There are 10 Protected Structures recorded in the study area as per the Fingal Development Plan 2017-2023. There are also 2 Recorded Monuments in the study area.

The area adjoining the study area within Dublin City Council's administrative area has been the subject of plans to provide for high density public transport orientated development at Ashtown/Pelletstown. The development of the Dunsink lands would allow for the sustainable integration of this infill site into the existing built-up footprint of Dublin City.

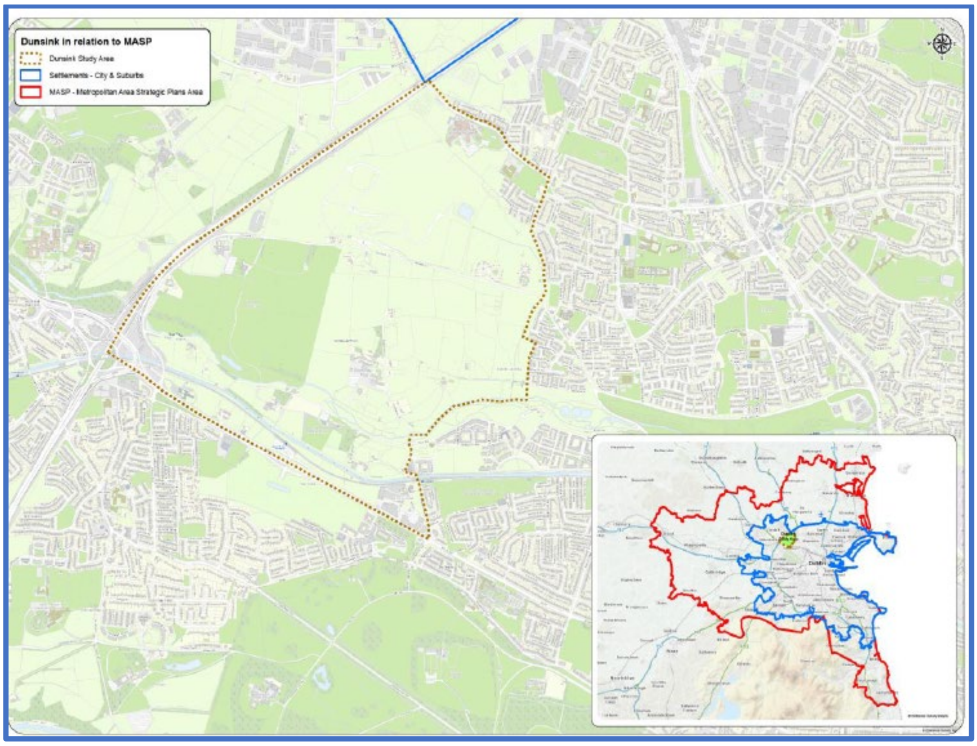
The subject lands have the benefit of being served by existing infrastructure and natural assets, in particular relating to public transport, amenity and recreation as follows:

- There is an existing train station within the study area – Navan Road Parkway, located on the southern boundary. There is also a train station located outside the study area but immediately adjacent to its south eastern boundary – Ashtown Station. These stations are located on the Maynooth line heavy rail network providing DART and commuter rail services to Dublin City and also serving Hansfield, Dunboyne and Pace.

- The Tolka River and Tolka Valley Park traverse the study area close to its southern boundary.

- The Royal Canal traverses the study area along its southern boundary as does the National Transport Authority's Greater Dublin Area National Cycle Route.

Map 1: Location of study area



Although most of the study area remains relatively undeveloped in nature, there are certain institutional and educational sites of importance in addition to some residential and commercial development.

Dunsink Observatory

Dunsink Observatory is the oldest scientific institution in Ireland. Built in 1783-1785 for the first Andrews' Professor of Astronomy in Trinity College Dublin, the observatory is situated on a hill 8km northwest of Dublin's city centre, where it first housed the Astronomy section of the School of Cosmic Physics in the Dublin Institute for Advanced Studies. The Observatory is associated with Sir William Rowan Hamilton, the discoverer of quaternion mathematics and eminent 19th Century mathematician and physicist. The Dunsink Observatory operates as part of the Astronomy & Astrophysics Section of the Dublin Institute for Advanced Studies (DIAS). This unique scientific and cultural feature is an asset for the future development of the area.

Teagasc Ashtown Food Centre

An important centre for technical research, training and innovation in the food industry. The site includes a conference centre and associated facilities. Dunsinea House associated with the Rathborne family of candle-making fame is situated on the grounds.

Elm Green House

A five-bay two-storey over basement 19th century house (Protected Structure I.D. 0686) which is now the clubhouse of Elmgreen public golf course – an 18-holecourse, pitch and putt course and floodlit driving range facility.

Residential Development

This ranges from one off residential houses to small travellers housing schemes to a nursing home. Dunsinea Manor, a Georgian house associated with the Rathborne family is located within the study area.

Commercial, Health and Educational Development

There are a small number of commercial developments located within the Dunsink area. These are mainly associated with the motor services sector, e.g. P Walsh Auto Service and Metro Motors –car maintenance and repair services. Along the Navan Road section of the lands is the Travelodge Dublin Phoenix Park Hotel, a filling station, the Navan Road Parkway Railway Station, and several commercial/ retail properties, all accessed either from the south via the R147 Navan Road or from the east via Ashtown Road. The south-eastern corner of these lands is taken up by the Revenue Commissioners (Fingal District) building. The National Orthopaedic Hospital, Cappagh, and New Cross College are located in the northern section of the subject lands.

Recreational Development

Elm Green Golf Course covers a large part of the western portion of the site. Phoenix Soccer Club is located off Scribblestown Avenue with Coolmine Rugby Club located just outside of the area off River Road.

1.3 Existing Environment

The most significant environmental features within the area are:

The River Tolka

The River Tolka is located on the southern boundary which flows into Dublin Bay. The associated river valley is a significant and sensitive ecological corridor. It is a proposed Natural Heritage Area and an important water resource. The area, particularly where it runs parallel to the north of River Road, is undisturbed and enclosed from public view and access, and, is suited to wildlife and nature preservation. The topography, access and landscape of the lands immediately adjoining the Tolka River are unsuited to extensive outdoor recreation, however managed public access could be provided in a sensitive manner. Any development which impacts on the River Tolka will have knock-on effects on the SPAs and SACs which are located downstream in Dublin Bay.

The former Dunsink Landfill

The former Dunsink Landfill is positioned between Dunsink Lane and the M50 motorway. The landfill has been closed since the late 1990's. The post-closure remediation and restoration phases of the landfill are now complete. There remains a high mound capping the landfill which provides extensive and scenic views to the wider Dublin City and county area. It is intended to transform the site to an extensive recreational and amenity landscape for the public. The landfill use has historically dominated the adjoining land uses and compounded the isolated geographical and administrative position of the area.

1.4 Existing Infrastructure

Transport

The subject lands and are currently served by 2 no. rail stations, namely Navan Road Parkway and Ashtown Stations, on the Maynooth Rail Line which passes through the Dunsink study area lands, adjacent to its southern boundary. Commuter rail services from these stations connect the Dunsink study area to major train stations in Dublin City from where transfers can be made to the wider light (Luas) and heavy (DART, Commuter and InterCity) rail network. Commuter rail services operating from these stations also connect the Dunsink Study Area to Maynooth to the west and other intermediate stations. The Dublin to Sligo InterCity Rail Line runs through the study area, co-utilising infrastructure with commuter rail services from Maynooth to Dublin City Centre.

There is no light rail infrastructure in the immediate vicinity of the study area, however Broombridge Station, which is served by both commuter trains and Luas Green Line services, is located ca. 2.3 kilometres to the east of the subject lands, and can be reached directly from both Navan Road Parkway and Ashtown Stations via commuter rail services.

The bus routes currently serving the study area lands run along the roads demarcating its northern, eastern, and southern boundaries, i.e. Cappagh Road, Ratoath Road, and River Road, and the R147 Navan Road respectively. Bus priority measures in form of bus lanes are also provided on the R147 Navan Road. The Navan Road corridor which adjoins the study area lands' southern boundary, accommodates a number of bus services, namely the 38, 38A, 38B, 39, 39A, 39X and 70. In addition to the local bus services, the study area is served by a wide range of regional and long-distance bus services which operate along the R147 Navan Road corridor. These services are operated by both public (Bus Eireann) and private companies.

The subject lands currently lack comprehensive cycling infrastructure and there appears to be good scope for integrated cycling infrastructure providing sustainable access to public transport facilities (bus and rail) which are concentrated towards the south and southeast of the lands. The existing walking infrastructure within the subject lands is very limited and does not provide direct connectivity within the different parts of the lands.

Further details on proposed public transport infrastructure and services are contained in the accompanied Area Based Transport Assessment.

Water Services

The services available currently in the Dunsink area – water supply, foul sewer and surface water drainage, are severely restricted. There are water mains located within the central and southern sections of the study area. There are also foul sewers located in the southern and north-eastern sections of the study area. A review of the existing public drainage GIS mapping for existing storm sewers shows no proof of existing public storm drainage networks inside the majority of the study area.

The surrounding network is only present at the fringes of the area on the Ratoath Road and at Ashtown. The regional 9C sewer which serves the Blanchardstown catchment runs along the southern boundary of the area, however this sewer ultimately discharges to the Ringsend Waste Water Treatment. The phased upgrade of the Ringsend WWTP Project and Greater Dublin Drainage Project are key wastewater infrastructure investment priorities in the short-to-medium term.

The Tolka River Valley fulfils an important role in flood alleviation and there are sections of the valley that are designated flood plain to provide additional capacity in major flood events. The wider Dunsink area does not have an existing surface water drainage system to support new urban development.

1.5 Feasibility Study Requirement

Objective Blanchardstown 13 of the Fingal Development Plan 2017-2023 requires the preparation of this feasibility study in order to identify the necessary physical infrastructure required to realise the full development potential of these lands.

1.6 Layout of Feasibility Study

This Feasibility Study contains the following sections:

Section 1 comprises this introduction;
Section 2 comprises the planning policy context for the document;
Section 3 comprises details of the two studies carried out for this study. The studies in full are enclosed as appendices to the study;

Section 4 comprises the conclusion and final recommendation of the study.

Section 2: Planning Policy Context

This Feasibility Study is underpinned by national, regional and local policy context in relation to the consolidation and sustainable use of lands within the existing built-up area of cities well served by sustainable modes of transport.

A high-level policy context is provided below. It should be noted that the accompanying studies provide a more detailed account of the relevant policy context by which the respective studies are guided.

2.1 National Policy

Project Ireland 2040, National Development Plan 2021-2030

The National Development Plan 2021-2030 (NDP), published in October 2021, is the overarching plan with a 10-year time horizon that shall guide national, regional and local planning up to the year 2030. This document sets out the strategy and investments necessary in order to promote sustainable growth in Ireland over the lifetime of the Plan. The study area aligns with NDP objective to identify priority areas for public investment with a strategic importance in terms of the economy's long-term growth, development and sustainability needs.

The intent of this Feasibility Study aligns with the high-level strategic plan set out in Project Ireland 2040, in particular the goals expressed through the following National Strategic Objectives and supported by the strategic investment priorities that follow:

NSO 1: Compact growth – the study area has the potential to provide for the carefully managed sustainable growth of a compact urban area and creation of an attractive place for people to live on a largely publicly owned land bank. The lands are suitable and capable of providing housing, jobs, amenities and services, subject to a streamlined and co-ordinated approach to their development, supporting existing and proposed investment in infrastructure. This will assist in achieving a NPF priority to activate strategic areas and achieve effective density and consolidation, rather than more sprawl of urban development.

NSO 4: Sustainable mobility – the study area supports the use of public transport and supports the investment in DART electrification of the rail line by increasing the population living adjacent to an existing train line and train stations, thereby supporting the move, by 2040 to cities and towns that enjoy a cleaner, quieter environment free of combustion engine driven transport systems. The study area also supports investment in the GDA cycle network which traverses the lands providing a direct and convenient cycle route to employment centres in Dublin City Centre and Dublin Docklands.

NSO 7: Enhanced Amenity and Heritage – NPF NSO 7 seeks to ensure that our cities, towns and villages are attractive and can offer a good quality of life. Development of the lands at Dunsink can support this by capitalising on existing natural assets within the lands providing for high quality recreational infrastructure, including the Tolka Valley Park and Royal Canal Greenway as well as through a well-designed public realm supported by compact urban development. The existing natural assets on the lands can provide intrinsic value in defining the character of this urban area and adding to its attractiveness and sense of place.

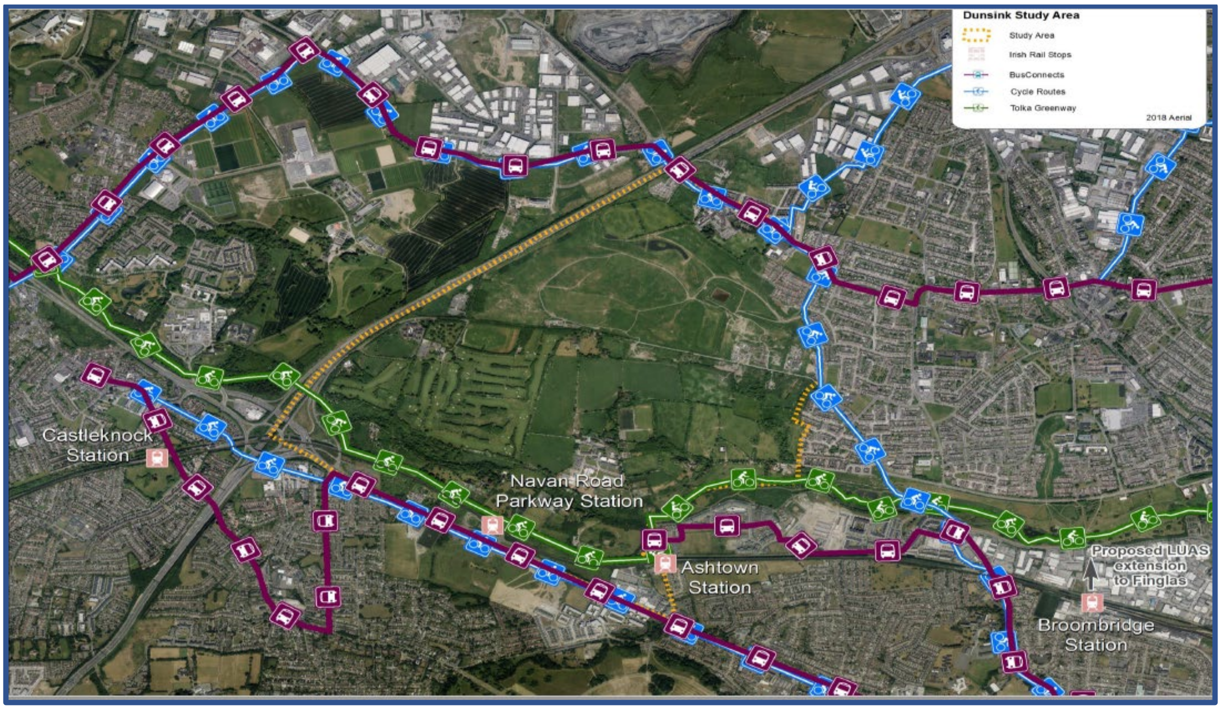
NSO 9. Sustainable Management of Water and other Environmental Resources – This Feasibility Study includes a surface water management plan for the lands to provide for sustainable urban drainage systems. This will contribute towards the conservation and enhancement of water resources.

A number of major national infrastructure projects included in the National Development Plan for appraisal and delivery which directly service the site include DART and LUAS expansion, BusConnects, and delivery of housing including social and affordable housing.

Project Ireland 2040 sets out within the National Planning Framework and National Development Plan proposals for a DART expansion programme including investment in new train fleet, new infrastructure and electrification of existing lines with an estimated completion date of 2027. This is to include provision of fast, high-frequency electrified services on the Maynooth Line which travels through the Dunsink lands. Project Ireland 2040 also includes proposals for Luas Green Line extension from Broomfield to Finglas located proximate to the Dunsink lands.

The map below outlines an overview of existing and proposed infrastructure outlined above and serving the Dunsink lands.

Map 2: Overview of existing and proposed infrastructure serving the study area



National Planning Framework (2018)

The NPF identifies the need for the growth of Dublin to be accommodated within and close to the City and the need for the better management of overspill into surrounding counties. The Framework also identifies that infrastructural bottlenecks need to be addressed in order to increasing the quality of life of citizens and increasing housing supply in the right locations. Compact growth is also a cornerstone of the Framework and sets a target for 40% of future housing development nationally to be delivered within and close to the existing footprint of built-up areas (National Policy Objective 3a) and making better use of underutilised land. At least 50% of all new homes are targeted to be delivered within and in the suburbs of Dublin, Cork, Limerick, Galway and Waterford. The NPF is a long-term Framework that sets out how Ireland can move away from the current '*business as usual'* pattern of development and disrupt past trends of development. This disruptive policy approach seeks growth of Ireland's five main cities, including accommodating growth in Dublin with a focus on the primary growth corridor located inside the M50 motorway.

The shared set of National Strategic Outcomes (NSO's) in the NPF and supported in the NDP, provide a solid foundation to deliver transformational change over the coming years. NSO 1 – Compact Growth policy requires delivery of residential development within existing built-up areas of our cities with a focus on infill development, integrated transport and promoting regeneration and revitalisation of urban areas, to secure a more sustainable future for our settlements and for our communities. This vision is given further detail in NPO 3a and 3b, setting out that a greater proportion of future housing development shall be targeted to be within and close to the existing 'footprint' of built-up areas. The NPF vision seeks to make better use of under-utilised land and buildings, including 'infill' and publicly owned sites, with higher housing and jobs densities, better serviced by existing facilities and public transport.

The study area complies with the objective of achieving the NPF brownfield/infill development target for cities – the site is an infill location within the existing 'footprint' of the built-up area of Dublin inside the M50. The site is largely publicly owned with the potential for higher density housing served by existing public transport. The development of these largely state owned lands will play a vital role in re-imagining and reshaping the north-western sector of the area of the city within the M50, including lands within the DCC administrative area to the east.

In terms of strategic investment priorities, the study area has the potential to contribute towards fulfilment of the following priorities (NPF p. 13):

1 Housing and Sustainable Urban Development
4 Environmentally Sustainable Public Transport
7 Culture Heritage and Sport
8 Climate Action
9 Water Infrastructure

The Feasibility Study will address active land management in terms of identifying the servicing requirements of this strategic land bank located within the built-up area of the city area which is currently underutilised. Development of the lands has the potential to address housing affordability, tackle social disadvantage, anti-social behaviour, dereliction and littering in the area, capitalise on existing infrastructure allowing for sustainability – much of the infrastructure for which is already in place, and contribute towards a transition to a low carbon and climate resilient society.

The proposal supports the NPF objective for a major uplift of the delivery of houses within the existing built-up areas of cities. The development of these lands will directly contribute towards the achievement of NPF objectives NPO 3a and 3b which will necessitate a significant and sustained increase in urban housing output and apartment type development in particular.

The preparation of a Transport Appraisal Report will directly contribute towards achieving NPF NPO'S 13, 27 and 33 as follows:

NPO 13: In urban areas, planning and related standards, including in particular building height and car parking will be based on performance criteria that seek to achieve well-designed high quality outcomes in order to achieve targeted growth. These standards will be subject to a range of tolerance that enables alternative solutions to be proposed to achieve stated outcomes, provided public safety is not compromised and the environment is suitably protected.

NPO 27: Ensure the integration of safe and convenient alternatives to the car into the design of our communities, by prioritising walking and cycling accessibility to both existing and proposed developments and integrating physical activity facilities for all ages.

NPO 33: Prioritise the provision of new homes at locations that can support sustainable development and at an appropriate scale of provision relative to location.

Preparation of a Surface Water Management Plan including flood risk assessment and a sustainable drainage strategy will directly contribute towards achieving NPF NPO'S 57 as follows:

NPO 57: Enhance water quality and resource management by:

- Ensuring flood risk management informs place-making by avoiding inappropriate development in areas at risk of flooding in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities;
- Ensuring that River Basin Management Plan objectives are fully considered throughout the physical planning process;
- Integrating sustainable water management solutions, such as Sustainable Urban Drainage (SUDS), nonporous surfacing and green roofs, to create safe places.

Climate Action Plan 2019

The Climate Action Plan 2019 (CAP) includes measures to deliver outcomes set out in Project Ireland 2040, including ensuring that we provide good public transport, cycling and walking infrastructure, so people are less reliant on travel by private car, thereby cutting congestion. The actions set out in the CAP support development such as that envisaged for the study area which can have a cumulatively positive downward impact on greenhouse gas emissions, as well as a range of other environmental, social, and economic benefits. Actions set out in the CAP support the following aims which the future development of the study area can achieve:

- Reduced travel distances and greater proximity to employment and services, which will enable a greater proportion of journeys by bike or on foot (zero emissions)
- Greater urban density, which when combined with the point above, will ensure more viable public transport (less emissions per person than by individual vehicle)
- Greater sustainable mode share, which will enable cities and towns to densify, as development will not be dependent on road capacity nor car parking requirements, and less land will be required for the latter

- Higher density residential development, which tends to comprise smaller units and therefore require less energy to heat.

- Closer proximity of multi-storey and terraced buildings, which will require less energy and make renewables-based systems of energy distribution such as district heating, or area-wide technology upgrades, more feasible

2.2 Regional Policy

Regional Spatial and Economic Strategy (RSES) and the Metropolitan Area Strategic Plan (MASP)

The aforementioned national level policy is given effect at regional level within the Eastern and Midlands Regional Authority RSES, the vision of which is "*To create a sustainable and competitive Region that supports the health and wellbeing of our people and places, from urban to rural, with access to quality housing, travel and employment opportunities for all*". The objectives to achieve this vision as set out in the RSES include continued population and economic growth within the Metropolitan area of Dublin with a focus on promoting active travel and development of strategic amenities to provide for sustainable communities.

Regional Policy Objectives RPO 4.3 seeks to support the consolidation and re-intensification of infill/brownfield sites to provide high density and people intensive uses within the existing built up area of Dublin City and suburbs and ensure that the development of future development areas is co-ordinated with the delivery of key water infrastructure and public transport projects.

The strategic location and development potential of lands at Dunsink is recognised within the RSES. In recognition of the sites potential, Dunsink is identified in the Metropolitan Area Strategic Plan (MASP) as '*a major greenfield land bank with long term potential to develop a new district centre' (Table 5.1 p. 104)*. The lands are specifically mentioned in the MASP, thus demonstrating a clear and direct link between the proposal to provide for residential development on the lands and the content of the MASP.

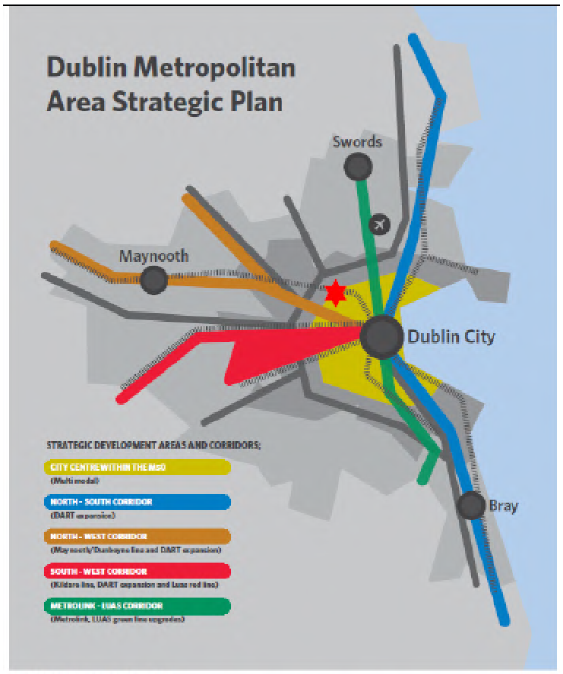
The RSES MASP specifically references the study area, stating that "*the proposed DART Underground and LUAS extensions to Finglas and Lucan subject to appraisal and delivery post 2027, will unlock long-term capacity including strategic landbanks such as Dunsink*". (*S. 5.4 p.102*).

Development of the study area will have the capacity to support mixed use Integrated Urban Development which will benefit from and support existing infrastructure in the area. This includes public transport and multi-modal interchanges from infrastructure that is already in place or planned to be provided for as part of Project Ireland 2040, with a particular focus on sustainable modes such as walking, cycling, rail and bus enabling enhanced accessibility.

Development of the study area will provide for active regeneration in an area which is currently under-utilised and subject to anti-social behaviour and littering. In addition, due to its focus on existing and proposed sustainable transport modes including direct links to Dublin City Centre, the study area has the potential to promote the transition to a low carbon and climate resilient society through sustainable commuting patterns and high-density urban living environment surrounded by existing green infrastructure assets.

A large part of the landbank is owned by Fingal County Council. The proposal therefore has significant potential to provide for improved housing supply and affordability.

Map 3: MASP map and study area



Approximate Location of Dunsink Lands

Figure 1: Extract from EMRA RSES MASP relating to study area (Table 5.1, p. 104)

TABLE 5.1 Strategic Development Areas and Corridors, Capacity Infrastructure and Phasing

Corridor	Residential	Employment/ Mixed Use	Phasing/Enabling infrastructure
City Centre within the M50 (Multi-modal) **Population capacity** Short 35,000 Medium 10,000 Long 15,000 **Total 60,000**	**Docklands** build out of North Lotts and Grand Canal Docks with further physical and social regeneration of Poolbeg and northeast inner-city lands	Further development of people intensive high tech and services-based business districts in Docklands and Poolbeg	**Short to Medium term** Dodder bridge, LUAS extension to Poolbeg, local and wider area water upgrades, waste water upgrades and district heating
	City centre regeneration of older social housing projects (former PPPs), Parkwest-Cherry Orchard, Ballymun, Ashtown-Pelletstown and St James – Heuston lands	Regeneration of Diageo lands, health and education related employment at St James and Grangegorman campus	**Short to Medium term** Waste water upgrades, social infrastructure **Long term** Long term capacity supported by DART underground
	Naas Road /Ballymount – significant brownfield lands in South Dublin and Dublin City Council areas, with potential for residential development and more intensive employment/ mixed uses	Re-intensification of underutilised lands including Naas road and older industrial estates, subject to feasibility study	**Medium to Long term** Multi-modal public transport, new Luas stop, site assembly, waste water upgrades and local area water network upgrades
	Dunsink – major greenfield landbank with long term potential to develop a new district centre	Subject to feasibility	**Long term** LUAS extension to Finglas, access, site conditions, feasibility

2.3 Local Policy

Fingal Development Plan 2017-2023

The Fingal County Development Plan sets out a long-term vision for the development of the Dunsink lands with its Development Strategy for Blanchardstown including to '*Promote lands at Dunsink as a longer term strategic area suitable for mixed use development'*. This is further elaborated upon in the FDP Objective BLANCHARDSTOWN 13 as follows:

Carry out a feasibility study of lands at Dunsink to include a full investigation of requirements in terms of infrastructure, water, access, drainage within three years of the adoption of this Development Plan and any remedial measures associated with the former landfill area to inform the future designation of these lands for development. This will be carried out in consultation with necessary statutory agencies and appropriate stakeholders to facilitate the orderly and appropriate release of lands at Dunsink.

This vision is supported by the following local objectives located within/relevant to the study area:

- Local Objective 129 '*Provide for a pedestrian/cyclist link between the Tolka River and the Royal Canal'*.

- Local Objective 134 '*Provide for the development of a linear park along the Tolka River Valley'.*
- Local Objective 135 '*Provide a footbridge over the N3 at an appropriate location between the Auburn Avenue junction with the N3 and the Phoenix Park interchange'.*
- Local Objective 136 '*Facilitate pedestrian access from Coolmine Rugby Club grounds over the Canal adjacent to the Phoenix Park [Navan Parkway] Railway Station'.*
- *Provide new Regional Parks at the following locations: Baleally Lane, Mooretown/Oldtown (Swords), Baldoyle, and* ***Dunsink*** *subject to Appropriate Assessment screening*

These objectives recognise the strategic location of the land bank and its potential to provide for a district centre to include large scale residential development and supporting facilities and uses.

In addition, Objective WM16 of the Fingal Development Plan 2017-2023 states; Ensure *the full restoration of the Balleally landfill site and the development of both it and the former Dunsink landfill into amenities for recreation and nature conservation. Undertake this process in co-operation with all relevant stakeholders and in compliance with all legislative and regulatory requirements.*

The vision for the Dunsink lands aligns with the ambitions of Dublin City Council on adjoining lands to the south east to provide for high density public transport orientated development at Ashtown/Pelletstown where lands are identified as a Key Developing Area and Pelletstown has been designated a Strategic Development Regeneration Area dedicated to comprehensive development or regeneration.

An increase in the proportion of more compact forms of growth has the potential to make a transformational difference by bringing new life, addressing anti-social behaviour currently in this area, contribute to the viability of public transport and other infrastructure, increase housing supply and enable more people to be closer to employment and recreational opportunities as well as walk or cycle more and use the car less. Along with transport demand, higher densities and shorter travel distances will also reduce energy demand and use and make renewable based systems of energy distribution such as district heating, more feasible. This has significant potential to help to reduce energy demand and use thus bringing about transformational change.

It is within the context of this strategic national, regional and local vision that this feasibility study has been prepared for the Dunsink lands for transit orientated development, with a particular focus at this stage on transportation and sustainable urban drainage.

Map 4: Aerial view of study area

Section 3 Studies

Two studies have been carried out as part of this Feasibility Study. These studies are enclosed in Appendix A and Appendix B. The two studies are as follows:

3.1 Dunsink Surface Water Management Plan (SWMP)

This Surface Water Management Plan (SWMP) was commissioned by Fingal County Council and prepared by Atkins Consulting Engineers for Lands in Dunsink Co. Dublin. The purpose of the SWMP is to determine the extents of flood risk for lands the subject lands at Dunsink and to develop an associated sustainable drainage strategy for surface water.

This SWMP consists of two parts:

- Strategic Flood Risk Assessment
- Sustainable Drainage Strategy

Strategic Flood Risk Assessment:

The Stage 3 Strategic Flood Risk Assessment has been carried out in accordance with “The Planning System and Flood Risk Management Guidelines for Planning Authorities” November 2009. The Strategic Flood Risk Assessment (SFRA) provides an assessment of flood risk within the subject lands. A review of available flood risk information was undertaken to identify any potential sources of flooding including surface water management issues related to the area. The assessment included identification of the sources of flooding and the potential impact of climate change for the Mid-Range Future Scenario (MRFS) and the High- End Future Scenario (HEFS).

The fluvial flood risk analysis shows a potential 1 in 100 year and 1 in 1000 year flood extent within the study area from the River Tolka in the southern area. As described in Section 3.5 of the SFRA the 1 in 100 year fluvial event equates to a Flood Zone A where only water compatible development is permitted without a Justification Test. Highly vulnerable development and less vulnerable development is deemed not to be suitable within Flood Zone A. The 1 in 1000 year event equates to a Flood Zone B where both water compatible development and Less vulnerable development is permitted. Highly vulnerable development requires a Justification Test to assess the suitability of the proposed development. Where any proposed development is located within Flood Zone A or Flood Zone B a Justification Test will be required, except for water compatible development.

A portion of the study area is at risk from pluvial flooding during both the 1 in 100 and 1 in 1000 year extreme rainfall events. There are no restrictions to land use regarding pluvial flood risk from the OPW guideline. However, it is stated within the OPW guidelines that the core objective of the guidelines is to avoid inappropriate development in areas at risk of flooding and avoid new developments which could increase flood risk elsewhere, including that which may arise from surface water run-off. Therefore, any proposed development within the plan area should be flood resilient and not increase flood risk to surrounding properties or lands.

In terms of the Strategic Flood Risk Assessment, the following recommendations are made in respect of any proposed development within the Dunsink study area.

1. Any development proposed within the plan area should be subject to a site-specific flood risk assessment in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009'. Proposals within areas of flood risk shall apply the Justification Test to ensure development is appropriate and does not cause an increased flood risk elsewhere.

2. Existing watercourses shall be maintained and protected as open channels as these provide a drainage conveyance function. Any proposals to alter the route or dimensions of these shall be subject to detailed hydraulic modelling as part of a site specific flood risk assessment.

3. A riparian corridor of 10m minimum offset from each side of the channel banks on the Scribblestown Stream shall be provided.

4. A riparian corridor of 30m minimum offset from each side of the channel banks on the River Tolka shall be provided.

5. Proposed development within the study area should take site drainage into consideration to ensure no excess runoff is generated which could result in an increased flooding risk to surrounding lands.

Sustainable Drainage Strategy:

The purpose of the Sustainable Drainage Strategy (SDS) report is to set out the criteria to ensure the appropriate measures are taken to achieve the requirements set out under the Water Framework Directive (WFD). The WFD promotes the use of Sustainable Drainage Systems (or SuDS) for the management of surface water runoff including the improvement of water quality and to minimise the downstream negative impacts of increased water quantity.

The SDS also demonstrates the objectives set out in the current Fingal development Plan 2017 – 2023, requirements set out in GDSDS and best practice guidelines provided by the CIRIA SuDS Manual. The use of SuDS allows for the reduction of surface water volume quantities from the study area to manage downstream flood risk and also reduce the risk of runoff causing pollution. SuDS can also have a positive impact on both biodiversity and amenity.

Any future development within the Plan area will be required to provide SuDS solutions and attenuate runoff within the site and existing network of drainage ditches, without adversely affecting the risk of downstream water quality and quantity downstream. The site layout and outline SuDS elements in this SDS need to be further considered as part of any further development of the site.

This SDS outlines the approach and criteria that should be carried out when developing an area within the overall site area. The report considers design requirements for managing surface water quantity, improving surface water quality, increasing amenity and biodiversity values of the site.

A flood flow route should be considered as part of any future development within the site and ensure that vulnerable development areas are considered in accordance with the requirements set out in the Flood Risk Assessment.

The report has provided guidance based on the maximum allowable discharge rates from each catchment and maximum attenuation requirements. It is likely that as proposals are developed these rates and volumes may change depending on the extent of SuDS components incorporated into the design.

The following recommendations are made for the development of SuDS and SDS for the overall Plan Area.

1. Any future proposed development in the site area is to consider the existing site flow routes as indicated in Figure 9 – Flow Route Analysis of the SDS
2. Site-specific testing including suitability for infiltration to ground and existing groundwater levels should be carried out as part of any proposed development.
3. The Lands within the EPA licence ref; W0127-01 (Figure 7) should be retained as Open Space.
4. The impact from the Dunsink landfill is to be considered as part of any SuDS design particularly where high groundwater table is encountered.
5. The existing stormwater attenuation area in catchment F is allocated for lands to the south of the study area, no stormwater runoff from catchment F is to be attenuated within it.
6. No SuDS features should be located within existing Flood Zones as identified in the Flood Risk Assessment.
7. SuDS are to be included as part of any future development in the site area and will provide a treatment train through the sub-catchment as indicated in Figure 10 – Sub Catchments of this report. Additional catchments sub be provided within each sub catchments to ensure surface water treatment is carried out at the source.
8. Any proposed development within catchment F to the Southern Boundary of the site is to fully consider an impact on the existing canal and railway line. Full engagement should be carried out with Inland Waterways and Irish Rail.

9. Any proposed development surrounding catchment B should take into consideration any potential negative impact from the existing landfill including leachate and / or gas collection system.
10. Riparian corridors are to be provided along any existing rivers or streams within the site area. The Riparian corridor should be in accordance with the requirements set out in the GDSDS and Fingal County Council Development Plan. Existing Flood plains should also be considered to ensure no reduction in Biodiversity within the site.
11. Final discharge rates are to be agreed with Fingal County Council. It should be considered that large open space areas which are not positively drained should not form part of the maximum allowable discharge rate for any proposed development.
12. Final outfall locations from a proposed development is to be agreed with Fingal County Council as part of the initial consultation process.
13. An Outline Construction Management Plan (OCMP) should be considered as part of the proposed drainage design.
14. Construction of all SuDS components should take account of guidance provided in the CIRIA manual C768 'Guidance on construction of SuDS'

Therefore, this no impediment to rezoning the lands from their current land uses in the FDP 2017 – 2023 to a zoning which facilitates development subject to compliance with the recommendations outlined above.

3.2 Dunsink Transport Appraisal Report

Fingal County Council (FCC) commissioned Transport Insights, in partnership with MacCabe Durney Barnes, to undertake a Transport Appraisal for the lands at Dunsink. The main goal of the Appraisal is to identify potential transport challenges and identify the interventions that would be required if the land was zoned and subject to development in line with the objectives of the NPF, RSES, Fingal Development Plan (FDP) 2017-2023 and other local planning policies. As such, the findings of this Appraisal will inform FCC in relation to the nature, scale, location and timing of delivery of future development within the study area and identify the transport infrastructure and service requirements to support the realisation of such development.

The goal of the Transport Appraisal was to undertake an assessment for the Dunsink Study Area in the context of its local context in addition to the wider Greater Dublin Area (GDA) level. It considered whether or not appropriate and meaningful integration of land use objectives and transport planning could be advanced in line with national, regional and local policies.

The Appraisal represents a key input to the overarching Dunsink Feasibility Study and shall inform FCC's potential rezoning of the Dunsink Study Area within the ongoing update of the Fingal Development Plan. The Appraisal approach was formulated in such a way that it conforms to the process by which the first two stages of an Area Based Transport Assessment

(ABTA) would be undertaken.

As an input to the Appraisal, a Baseline Assessment was undertaken, and a Baseline Assessment Report (Area Based Transport Assessment) subsequently produced. This Report is contained in Appendix 1 of the Transport Appraisal. This Report assessed baseline conditions within the Dunsink Study Area and its environs, including existing and committed transport infrastructure and services, existing traffic characteristics and travel patterns within and in the vicinity of the lands.

A subsequent workshop was also undertaken with FCC in order to confirm and identify development opportunities, constraints, developable areas etc. The findings of this workshop informed further work on the Appraisal, namely drafting of a development vision and transport objectives, preparation of proposed Dunsink Study Area development scenarios and completion of outline travel demand analysis. This Report provides an overview and summary of the Transport Appraisal and its findings.

The purpose of an ABTA is to address the need to incorporate national and regional transport policies and objectives into local level land use planning in accordance with Transport Infrastructure Ireland (TII) and National Transport Authority (NTA) guidance documents. The intended effect of an ABTA is to ensure that the assessment of transport demand and its associated impact plays a central role in informing the development proposals. It is noted that the Appraisal conforms to the first two stages of an ABTA only.

The Appraisal has identified a vision for Dunsink, in consultation with FCC. The development vision for Dunsink is as follows:

“Development of a low-carbon mixed-use transit-orientated urban quarter which prioritises active travel and public transport modes both within and outside, is well connected to the wider City via high quality public transport and active travel infrastructure and seeks to protect and enhance the environmental and historic character of the area.”

Three planning and development scenarios have been developed to inform the study and facilitate further stages in the planning process. These are detailed in Section 9 of the Appraisal Report. The scenarios are established for the period up to 2042 as this reflects the timeframe for the Draft Transport Strategy for the Greater Dublin Area 2022-2042, which was under preparation by the NTA at the time of developing these scenarios. The timeframe is divided into Phase 1 up to 2035 and Phase 2 up to 2042. All scenarios have been developed to respect higher level policies in the NPF and Eastern and Midlands RSES.

Each scenario is phased and the Appraisal Report provides the key information in terms of development capacity for each scenario. In summary, these include:

Scenario 1 – Suburban extension, which involves the extension of the existing suburban built up area. It would require a series of neighbourhood centres within a five-minute walk distance of residential communities and has commercial development around the train station. It utilizes existing infrastructure.

Scenario 2 – 10 Minute Urban Quarter, which seeks to have all community facilities and services accessible within a 10 minute walk or cycle from homes or are accessible by public transport services connecting people to larger scaled settlements. It involves the provision of a district centre close the railway station, which would serve the new quarter, which would include commercial and other employment uses. Community and local services would be provided through a number of neighbourhood centres. A new spine road from the N3 (Navan Road) provides relevant access to overall area. Existing train services can be utilized and enhanced.

Scenario 3 – High Density Urban District, which proposes a high-density urban quarter with mx of residential, commercial and retail uses. A centrally located district centre would be accommodated and new infrastructure includes a north-south link road and an east-west high-capacity public transport link which would intersect the lands.

An outline travel demand analysis was undertaken in order to identify the potential travel demand associated with development of the subject lands. These preliminary travel demand estimates relate to the 3 no. development scenarios, and indicate that daily total trips to and from the subject lands could range from ca. 34,000 to ca. 66,000, depending on the development scenario. It is also noted that in order to facilitate access to public transport, upfront provision of public transport services, specifically bus services, would be required in the vicinity of and within the study area in order to achieve sustainability.

The Transport Appraisal Report identifies physical constraints which will affect the nature, scale and location of future development within the study area. These include the former landfill; Road, rail and canal infrastructure; Sensitive landscape; Tolka Valley; M50 Corridor; Cultural Heritage; Existing urban development; other dispersed development and ecology and biodiversity. Transport constraints have also been identified, including public transport accessibility, active modes accessibility and road access.

Three planning and development scenarios have been developed to considered to inform the study and facilitate further stages in the planning process. These scenarios are:

- Scenario 1 – Suburban Extension;
- Scenario 2- 10 Minute Urban Quarter; and
- Scenario 3 – High Density Urban District.

The scenarios are established for the period up to 2042 in line with the horizon year of for the Draft Transport Strategy for the Greater Dublin Area 2022-2042, which was under preparation by the NTA at the time of developing these scenarios. The timeframe is divided into Phase 1 up to 2035 and Phase 2 up to 2042. All scenarios have been developed to respect higher level policies in the NPF and Eastern and Midlands RSES.

It is also noted that in order to facilitate access to public transport, upfront provision of public transport services, specifically bus services would be required in the vicinity of and within the DSA in order to achieve sustainability.

The Transport Appraisal Reports identifies the requirements for a future zoning which facilitates development.

Section 4 Conclusion and Final Recommendations

4.1 Conclusion:

This Feasibility Study has been completed for the lands at Dunsink, Co. Dublin. The Feasibility Study has been produced by Fingal County Council (FCC) in accordance with Objective Blanchardstown 13 of the Fingal County Development Plan 2017-2023 (CDP) which states the following:

Carry out a feasibility study of lands at Dunsink to include a full investigation of requirements in terms of infrastructure, water, access, drainage within three years of the adoption of this Development Plan and any remedial measures associated with the former landfill area to inform the future designation of these lands for development. This will be carried out in consultation with necessary statutory agencies and appropriate stakeholders to facilitate the orderly and appropriate release of lands at Dunsink.

This study relates to the feasibility of the development of a long-term strategic development landbank supported by national, regional and local policy to support transit orientated development on publicly owned lands on an infill site within the existing built-up area.

Two studies have been carried out to inform this Feasibility Study, namely;

- A Surface Water Management Plan including a Flood Risk Assessment and a Sustainable Drainage Strategy
- A Transport Appraisal Report

In their recommendations, the studies have provided comprehensive criteria that must be complied with/addressed prior to development taking place on the subject lands. The studies have not included recommendations that prohibit development of these lands but have included a suite of recommendations that must be adhered to ensure the sustainable development of the lands.

The Surface Water Management Plan (SWMP), which includes a Strategic Flood Risk Assessment and a Sustainable Drainage Strategy has provided a number of recommendations regarding both studies. With regard to flood risk, the recommendations highlight the requirement for a site specific flood risk assessments for developments in the area, criteria to be adhered to for watercourses, minimum distance riparian corridors for Scribblestown Stream and River Tolka and the importance of site drainage.

The Sustainable Drainage Strategy recommends a number of measures that would need to be implemented for any future development proposals on this land.

The Transport Appraisal developed 3 scenarios to inform the feasibility study and facilitate further stages in the planning process. Each scenario is phased, and the Appraisal provides the key information in terms of development capacity for each scenario. In summary, these include:

Scenario 1 – Suburban extension, which involves the extension of the existing suburban built up area. It would require a series of neighbourhood centres within a five-minute walk distance of residential communities and has commercial development around the train station. It utilizes existing infrastructure.

Scenario 2 – 10 Minute Urban Quarter, which seeks to have all community facilities and services accessible within a 10 minute walk or cycle from homes or are accessible by public transport services connecting people to larger scaled settlements. It involves the provision of a district centre close the railway station, which would serve the new quarter, which would include commercial and other employment uses. Community and local services would be provided through a number of neighbourhood centres. A new spine road from the N3 (Navan Road) provides relevant access to overall area. Existing train services can be utilized and enhanced.

Scenario 3 – High Density Urban District, which proposes a high-density urban quarter with mx of residential, commercial and retail uses. A centrally located district centre would be accommodated and new infrastructure includes a north-south link road and an east-west high-capacity public transport link which would intersect the lands.

4.2 Recommendation

The purpose of this feasibility study is to investigate whether or not the Dunsink lands could be a potential strategic landbank for the County. Following analysis of the plans/reports that inform this feasibility study, it is clear that the Dunsink lands can fulfil this role as a strategic landbank for the County and in doing so can accommodate a new urban neighbourhood.

It should be noted that this feasibility study is the first step in unlocking the potential of Dunsink. Both the Surface Water Management Plan and the Transport Appraisal Report have not identified any insurmountable barriers or obstacles that would prevent Dunsink from fulfilling this strategic role, but it should be acknowledged that this land bank will require a separate statutory process such as a Local Area Plan (LAP), a Strategic Development Zone (SDZ), or other relevant planning-related designation/process in order to have public engagement and participation, appropriate specialist studies and provide the appropriate level of detail to guide development and unlock the potential that these lands have.

Considering the potential for significant residential development to be delivered at this location, the significant scale of potential development providing several thousand new homes as a new urban neighbourhood, which will have to be aligned and supported by significant water services, transport and other infrastructural investment and the extended timescale needed to deliver such infrastructure, it is considered appropriate to designate the Dunsink Study Area as Strategic Long Term Reserve lands.

The realisation of the vison for these lands requires certainty in terms of zoning status to ensure the required long-term planning and investment can begin. A strategic long term reserve designation is an appropriate mechanism to achieve this by highlighting FCC's vision for these lands and the role they can play for the County in the future.

Appendices

Appendix A - Surface Water Management Plan

Appendix B – Area Based Transport Assessment

ATKINS

Member of the SNC-Lavalin Group

Surface Water Management Plan

Lands at Dunsink, Co. Dublin

Comhairle Contae Fhine Gall
Fingal County Council

February 2022

Notice

This document and its contents have been prepared and are intended solely as information Fingal County Council and use in relation to the Surface Water Management Plan for the lands at Dunsink, Co. Dublin

WS Atkins Ireland Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 0.0	Final	A.Corrigan	G. Hanratty	A. Corrigan	G.Hanratty	21.02.22

Client signoff

Client	Fingal County Council
Project	Surface Water Management Plan
Job number	5203335
Client signature / date	

Introduction

This Surface Water Management Plan (SWMP) was commissioned by Fingal County Council and prepared by Atkins Consulting Engineers for Lands in Dunsink Co. Dublin. The purpose of the SWMP is to determine the extents of flood risk for lands the subject lands at Dunsink and to develop an associated sustainable drainage strategy for surface water.

This SWMP consists of two parts:

- Strategic Flood Risk Assessment
- Sustainable Drainage Strategy

Strategic Flood Risk Assessment

The Stage 3 Strategic Flood Risk Assessment has been carried out in accordance with “The Planning System and Flood Risk Management Guidelines for Planning Authorities” November 2009.

The Strategic Flood Risk Assessment (SFRA) provides an assessment of flood risk within the subject lands. A review of available flood risk information was undertaken to identify any potential sources of flooding including surface water management issues related to the area. The assessment included identification of the sources of flooding and the potential impact of climate change for the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS).

Sustainable Drainage Strategy

The purpose of the Sustainable Drainage Strategy (SDS) report is to set out the criteria to ensure the appropriate measures are taken to achieve the requirements set out under the Water Framework Directive (WFD). The WFD promotes the use of Sustainable Drainage Systems (or SuDS) for the management of surface water runoff including the improvement of water quality and to minimise the downstream negative impacts of increased water quantity.

The SDS also demonstrates the objectives set out in the current Fingal development Plan 2017 – 2023, requirements set out in GDSDS and best practice guidelines provided by the CIRIA SuDS Manual.

Strategic Flood Risk Assessment

Lands at Dunsink, Dublin 15

Fingal County Council

December 2021

Notice

This document and its contents have been prepared and are intended solely as information for Fingal County Council and use in relation to Strategic Flood Risk Assessment for Lands at Belcamp, Co Dublin.

WS Atkins Ireland Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 60 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Draft	N. OMalley	G. Hanratty	A. Corrigan	G. Hanratty	01/11/2021
Rev 2.0	Draft	N. OMalley	G. Hanratty	A. Corrigan	G. Hanratty	05/11/2021
Rev 3.0	Issue	N. OMalley	G. Hanratty	A. Corrigan	G. Hanratty	15/12/2021

Client signoff

Client	Fingal County Council
Project	Strategic Flood Risk Assessment
Job number	IE2316
Client signature / date	

Contents

Tables

Figures

1. Introduction

Atkins Ireland was commissioned by Fingal County Council to prepare a Surface Water Management Plan (SWMP) for the Dunsink Feasibility Study Area to inform the development plan for the lands in Dunsink, County Dublin.

1.1. Purpose

The purpose of this report is to prepare a Strategic Flood Risk Assessment for lands in the Dunsink area to inform the future designation of these lands for development. This report will inform the design and layout of new development on the subject lands. The Strategic Flood Risk Assessment will include a Stage 1, Stage 2 and Stage 3 assessment in accordance with “The Planning System and Flood Risk Management Guidelines for Planning Authorities” November 2009.

The Strategic Flood Risk Assessment (SFRA) provides an assessment of all types of flood risk within the study area. A review of available flood risk information was undertaken to identify any flooding or surface water management issues related to the study area that warranted further investigation. The assessment shall include identification of the sources flooding and the potential impact of climate change for the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS).

2. Study Area Details

2.1. Study Area Location

The study area is located to the south of the M50 motorway, immediately east of the M50/N3 junction, south-west of the M50/N2 junction and north of the Royal Canal as shown in Figure 1 below. The eastern and south-eastern boundary of the study area adjoins the administrative area of Dublin City Council.

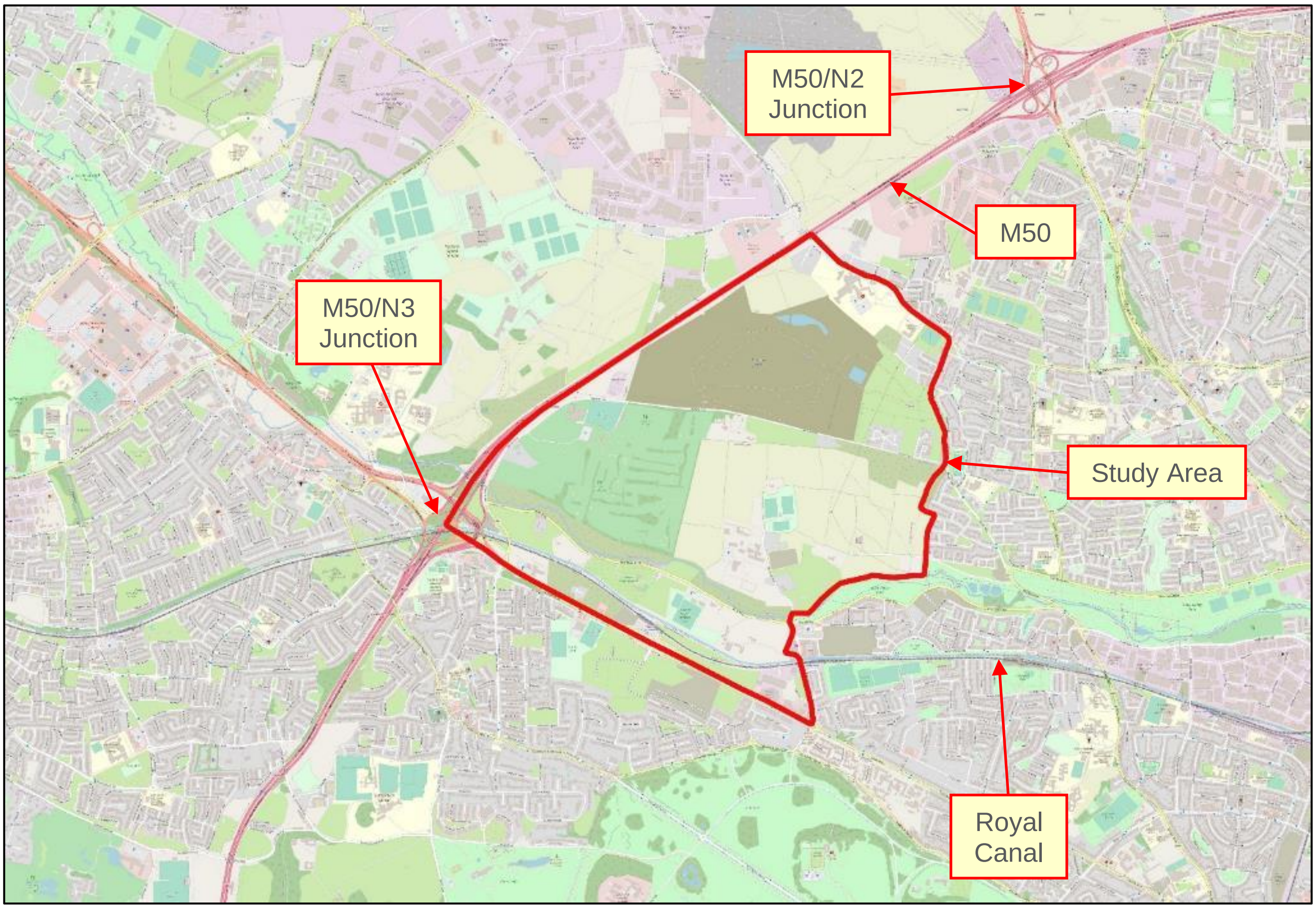


Figure 1 - Location of Dunsink Study Area

2.2. Study Area Description

The total study area is approximately 430 hectares. The study area contains the former Dunsink landfill which has been closed since the late 1990's. Gas is being collected at Dunsink landfill and is being used to generate electricity which is fed into the national grid. The River Tolka and Tolka Valley are located within the study area close to the southern boundary of the study area. The Royal Canal also traverses these lands along its southern boundary. There is an existing train station (Navan Parkway) located along the southern boundary of the study area.

The lands slope from the northern boundary towards the southern and eastern boundaries. Existing ground elevations within the study area range from approximately 98.54m OD (Malin) in the northern area to 26.05m OD (Malin) in the eastern area.

2.3. Existing Drainage

The most immediate hydrological features in the vicinity of the study area are the River Tolka and the Royal Canal, which are located in the southern area of the site. There is also a small tributary of the River Tolka called the Scribblestown Stream, located along the eastern boundary of the study area as shown in Figure 2 below.

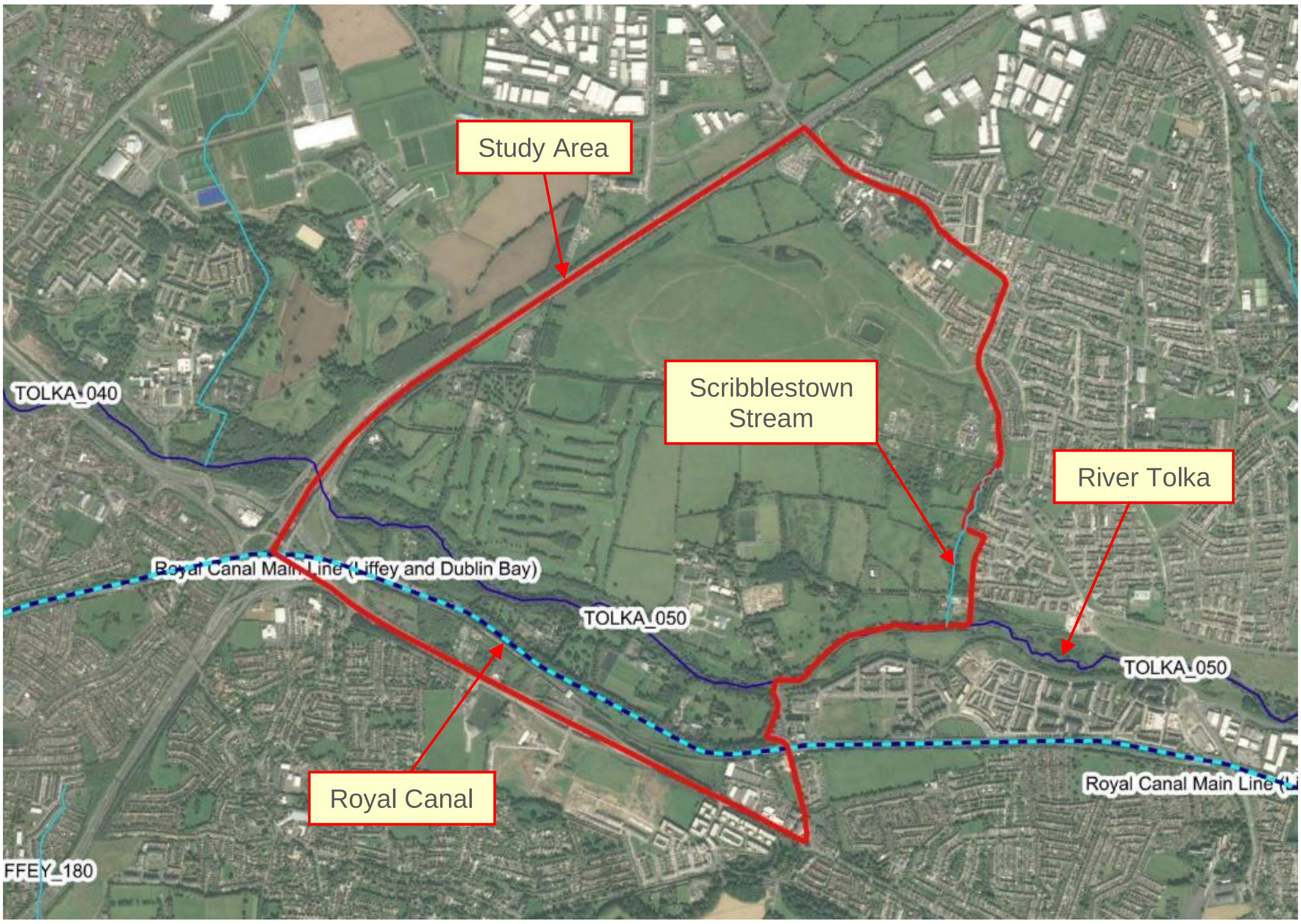


Figure 2 – Existing Drainage Features

At this location, the River Tolka generally flows in a north-west to south-east direction. As illustrated in Figure 3 below the total catchment area of the River Tolka is estimated to be 126.054km^2 to a point located approximately 900m beyond the eastern boundary of the study area. Assessment of the upstream catchment area indicates that the catchment is predominantly rural in nature with urban development accounting for 16.4% of the upstream catchment area.

The Scribblestown Stream generally flows in a north to south direction. As illustrated in Figure 3 below the total catchment area is estimated to be 2.738km^2 to the point where it joins the River Tolka along the eastern boundary of the study area. Assessment of the upstream catchment area indicates that the land use is moderately developed with urban development accounting for 60.6% of the upstream catchment area.

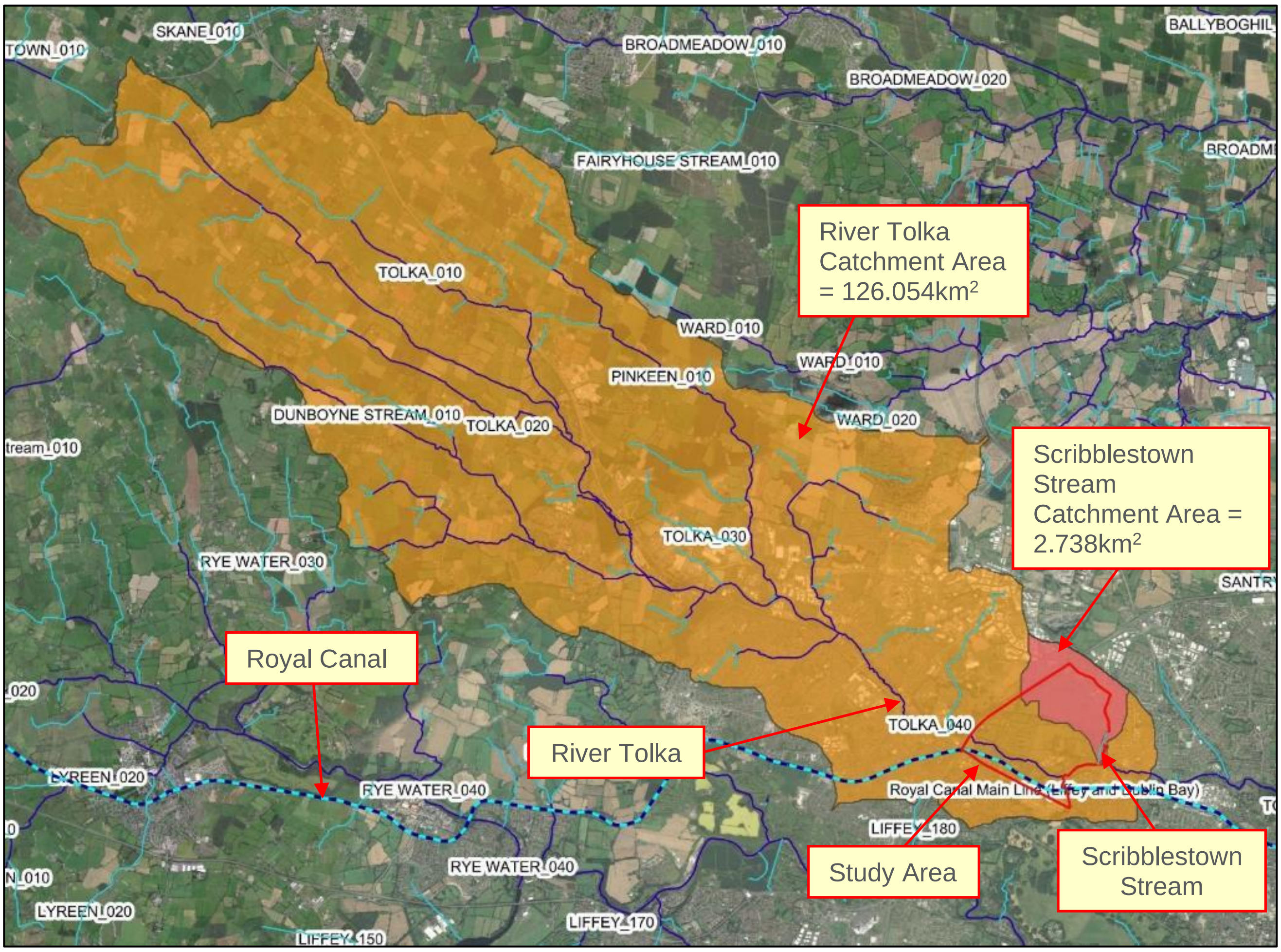


Figure 3 - Watercourse Catchment Areas

2.4. Environment

There are no Natura 2000 sites located within the study area; however, as shown on Figure 4 below the following sites have been identified:

- South Dublin Bay and River Tolka Estuary Special Protection Area (SPA) is located 6.6km east of the study area;
- North Bull Island Special Protection Area (SPA) is located 9.5km east of the study area;
- North Dublin Bay Special Area of Conservation (SAC) is located 9.5km east of the study area.
- South Dublin Bay Special Area of Conservation (SAC) is located 8.9km south-east of the study area.

These SPAs and SACs are hydrologically linked to the study area, therefore, the management of flood risk within the study area must have regard to potential negative impacts to this environment. Under Article 6(3) of the EU Habitats Directive, an “Appropriate Assessment” (AA) is required where any plan or project, either alone or ‘in combination’ with other plans or projects, could have an adverse effect on the integrity of a Natura 2000 site.

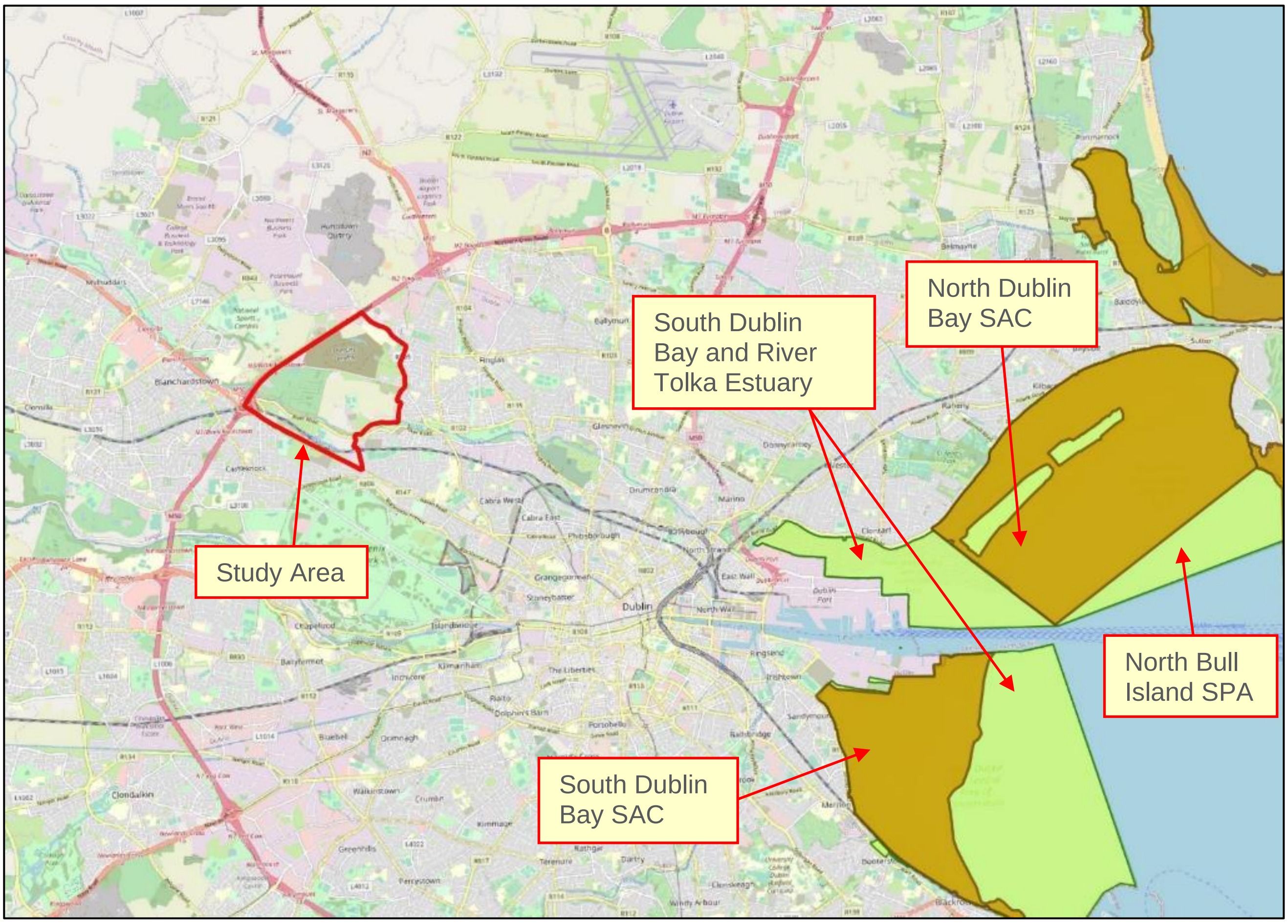


Figure 4 – Natura 2000 Sites in the vicinity of the Study Area

Natural Heritage Areas (NHAs) are sites of national importance for nature conservation and are afforded protection under planning policy and the Wildlife Acts, 1976-2012. Proposed NHAs (pNHAs) are published sites identified as of similar conservation interest but have not been statutorily proposed or designated. The nearest NHA/pNHAs to the study area are shown on Figure 5 and discussed below:

- Royal Canal (proposed NHA) is located within the boundary of the study area;
- Liffey Valley (proposed NHA) is located 1.9km south of the study area.

Royal Canal (proposed NHA) is hydrologically linked to the study area. Therefore, the management of flood risk within the study area must have regard to potential negative impacts to this environment.

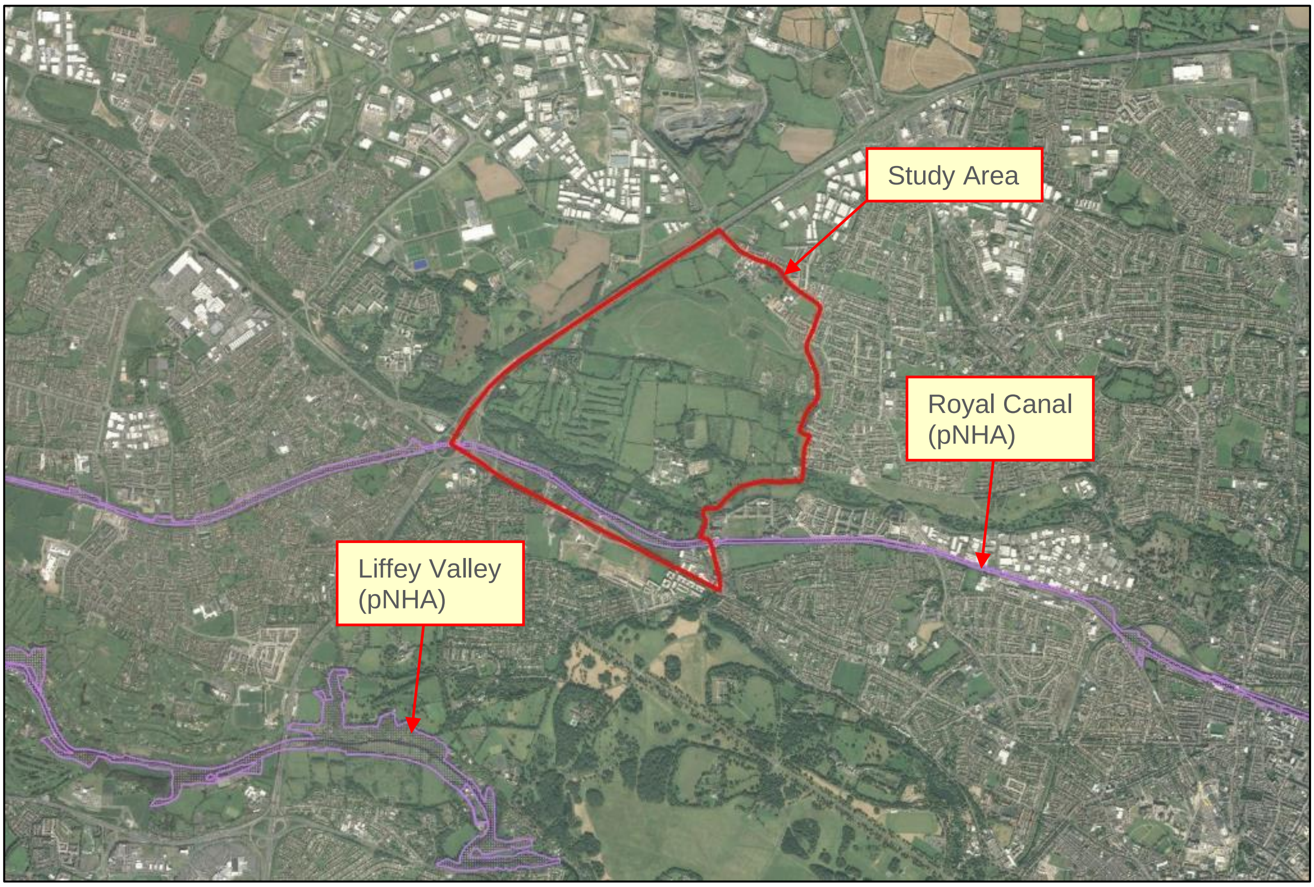


Figure 5 - Proposed NHA in the vicinity of the Study Area

2.5. Proposed Development

The Fingal County Council Development Plan 2017 – 2023 zoning map for the Dunsink area is shown below in Figure 6. The study area contains the following zoning areas and associated zoning objectives in order of greatest area:

- OS – Open Space. Objective: Preserve and provide for open space and recreational amenities.
- HA – High Amenity. Objective: Protect and enhance high amenity areas.
- HT – High Technology. Objective: Provide for office, research and development and high technology/high technology manufacturing type employment in a high quality built and landscaped environment.
- CI – Community Infrastructure. Objective: Provide for and protect civic, religious, community, education, health care and social infrastructure.
- RS – Residential. Objective: Provide for residential development and protect and improve residential amenity.
- GB – Green Belt. Objective: Protect and provide for a Greenbelt.

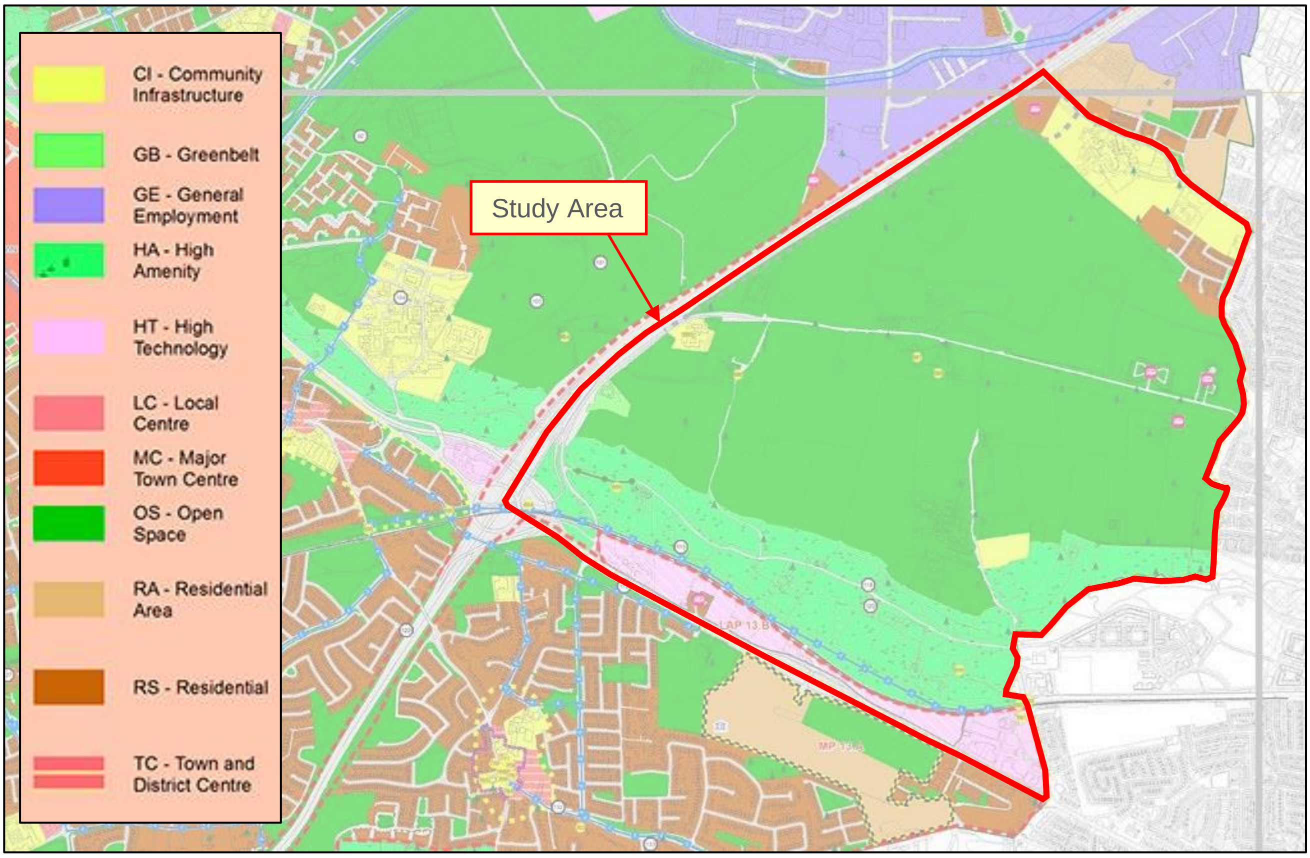


Figure 6 - Fingal Land Zoning Map

3. Approach and Methodology

3.1. Introduction

This SFRA study has been undertaken in consideration of the following guidance document: - 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009'.

3.2. Definition of Flood Risk

The definition of flood risk is an expression of the combination of the flood probability or likelihood and the magnitude of the potential consequences of the flood event.

Flood risk is then normally expressed in terms of the following relationship:

Flood Risk = Likelihood of flooding x Consequences of flooding

3.2.1. Likelihood of Flooding

This is normally defined as the percentage probability of a flood of a given magnitude or severity occurring or being exceeded in any given year. For example, a 1% Annual Exceedance Probability (AEP) indicates the severity of a flood that is expected to be exceeded on average once in 100 years, i.e. it has a 1 in 100 (1%) chance of occurring in any one year. Annual Exceedance Probability is the inverse of return period as shown in Table 3-1 below.

Return Period (Years)	Annual Exceedance Probability (%)
1	100
10	10
50	2
100	1
200	0.5
1000	0.1

Table 3-1: Correlation between Return Period and AEP

3.2.2. Consequences of Flooding

The consequences of flooding depends on the hazards associated (e.g. depth of water, speed of flow, rate of onset, duration, wave action effects, water quality), and the vulnerability of people, property and the environment potentially affected by a flood (e.g. the age profile of the population, the type of development, presence and reliability of mitigation measures, etc).

3.3. Objectives and Principles of the OPW Guidelines

The core objectives of the OPW Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding.
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off.
- Ensure effective management of residual risks for development permitted in floodplains.
- Avoid unnecessary restriction of national, regional or local economic and social growth.
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure that the requirements of EU and National Law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

The principle actions when considering flood risk management in the planning system are:

- Flood hazard and potential flood risk from all sources should be identified and considered at the earliest stage in the planning process and as part of an overall hierarchy of national responses coupled to regional appraisal and local and site-specific assessments of flood risk.
- Development should preferentially be in areas with little or no flood hazard thereby avoiding or minimising the risk. Development in the context of these guidelines includes all construction, such as transport and utility infrastructure as well as residential and other buildings.
- Development should only be permitted in areas at risk of flooding when there are no alternative, reasonable sites available in areas at lower risk that also meet the objectives of proper planning and sustainable development should be considered first.
- Where development is necessary in areas at risk of flooding an appropriate land use should be selected.
- A precautionary approach should be applied, where necessary, to reflect uncertainties in flooding datasets and risk assessment techniques and the ability to predict the future climate and performance of existing flood defences. Development should be designed with careful consideration to possible future changes in flood risk, including the effects of climate change and / or coastal erosion so that future occupants are not subject to unacceptable risks.
- Decisions on the location of development may be required before development plans have been fully reviewed in accordance with these Guidelines and prior to the availability of appropriate flood risk mapping.
- Land required for current and future flood management, e.g. conveyance and storage of flood water and flood protection schemes, should be proactively identified on development plan and LAP maps and safeguarded from development.
- Flood risk to, and arising from, new development should be managed through location, layout and design incorporating Sustainable Drainage Systems and compensation for any loss of floodplain as a precautionary response to the potential incremental impacts in the catchment.
- Strategic Environmental Assessment (SEA) of regional planning guidelines, development plans and local area plans should include flood risk as one of the key environmental criteria against which such plans are assessed where flood risk has been identified. The SEA process provides an opportunity to assess and consider flood risk with respect to other planning and environmental considerations and should be used to show how the sequential approach to managing flood risks has been executed.

3.4. Flood Risk Assessment

The OPW Guidelines recommend that Flood Risk Assessments (FRA) be carried out to identify the risk of flooding to land, property, and people. The assessment of flood risk requires an understanding of where the water comes from (i.e. the source), how and where it flows (i.e. the pathways) and the people and assets affected by it (i.e. the receptors). The Source-Pathway-Receptor Model is shown in Figure 7 below:

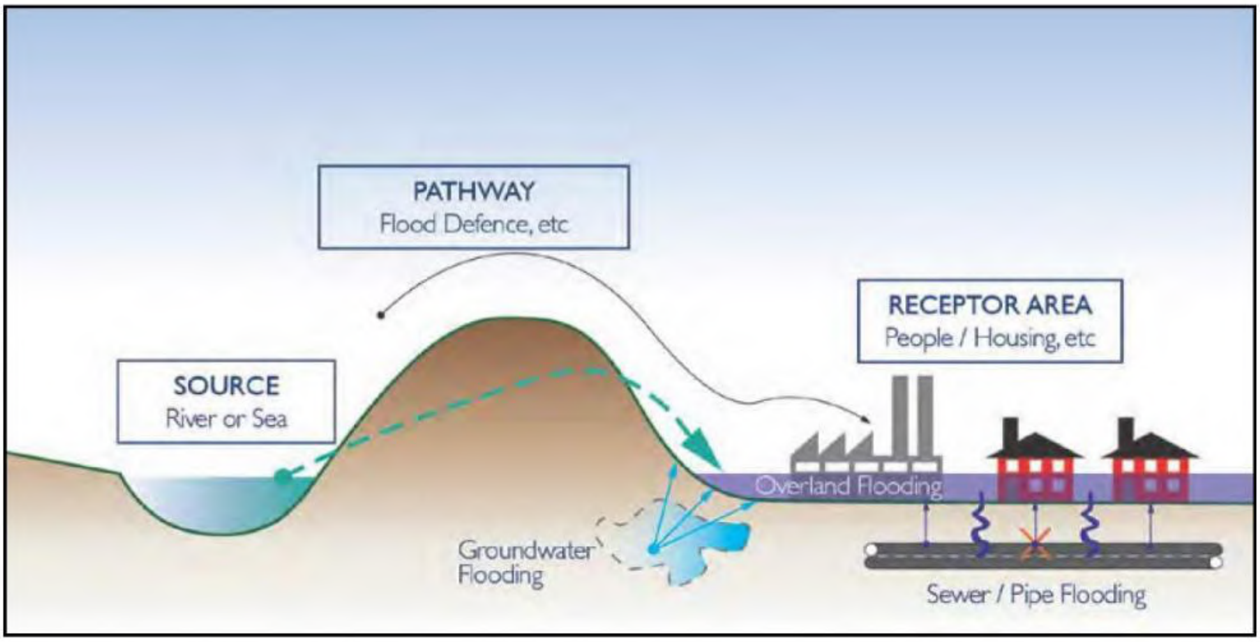


Figure 7 - Source-Pathway-Receptor Model

3.5. Flood Zones

The OPW Guidelines defines flood zones as geographical areas within which the likelihood of flooding is in a particular range and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning. There are three types or levels of flood zones defined for the purposes of these Guidelines:

- Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding).
- Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding).
- Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

The flood zones are generated without the inclusion of climate change factors and should ignore the presence of any flood defences present.

3.6. Climate Change

The impact of climate change is expected to increase flood risk. This may lead to more frequent flooding and increase the depth and extent of flooding. There is a great deal of uncertainty in relation to the potential effects of climate change, and therefore a precautionary approach should be adopted. Examples of the precautionary approach include:

- Recognising that significant changes in the flood extent may result from an increase in rainfall or tide events and accordingly adopting a cautious approach to zoning land in these potential transitional areas.
- Ensuring that the levels of structures designed to protect against flooding, such as flood defences, land-raising or raised floor levels are sufficient to cope with the effects of climate change over the lifetime of the development they are designed to protect; and
- Ensuring that structures to protect against flooding and the development protected are capable of adaptation to the effects of climate change when there is more certainty about the effects and still time for such adaptation to be effective.

3.7. The Sequential Approach and Justification Test

The OPW Guidelines recommend using a sequential approach to planning to ensure the core objectives are implemented. Development should be avoided in areas at risk of flooding. Where this is not possible, a land use that is less vulnerable to flooding should be considered. If the proposed land use cannot be avoided or substituted, a Justification Test must be applied, and appropriate sustainable flood risk management proposals should be incorporated into the development proposal. The broad philosophy of the Sequential Approach in flood risk management is shown in Figure 8 below.

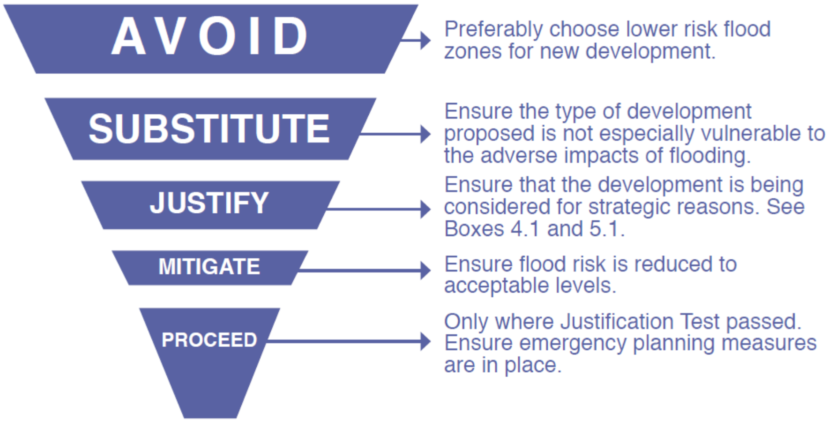


Figure 8 - Sequential Approach Principles in Flood Risk Management

The justification test has been designed to rigorously assess the appropriateness of developments that are being considered in areas of moderate or high flood risk. The test compromises of two processes:

- The first is the plan-making justification test, which is used at the plan preparation and adoption stage where it is intended to zone or otherwise designate land which is at moderate or high risk of flooding.
- The second is the development management justification test, which is used at the planning application stage where it is intended to develop land at moderate or high risk of flooding for uses or development vulnerable to flooding that would generally be inappropriate for that land.

Table 3-2 below illustrates those types of development that would be required to meet the justification test. Inappropriate development that does not meet the criteria of the justification test should not be considered at the plan-making stage or approved within the development management process.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less Vulnerable Development	Justification Test	Appropriate	Appropriate
Water-Compatible Development	Appropriate	Appropriate	Appropriate

Table 3-2: Justification Test Matrix

4. Stage 1 - Flood Risk Identification

A Stage 1 flood risk identification includes an assessment of the existing information available to identify any potential flooding or surface water management issues related to the study area that may warrant further investigation.

The information gathered as part of this screening exercise identifies the primary, secondary and residual flood risks to the study area.

4.1. Information Sources Summary

The following information sources, illustrated below in Table 4-1, were consulted as part of the flood risk identification:

Source	Comment
Topography	
OS Mapping	Mapping identifies the hydrological features in the vicinity of the study area.
Historical Mapping	OS Historical 6 inch and 25-inch mapping was obtained
EPA Contour Mapping Dataset	EPA contour data was assessed for this study
Flood Data	
OPW Preliminary Flood Risk Assessment (PFRA) Maps	Fluvial, pluvial, coastal and groundwater flood mapping has been reviewed
OPW Flood Maps Website	Flooding records were checked to identify historic flooding in the study area.
Flood Risk Assessment and Management Study (FRAMS)	Fluvial and tidal maps have been reviewed. The study area is not located in a tidal area and therefore has not been assessed.
Dublin Pluvial Study	The pluvial mapping has been reviewed.
Irish Coastal Protection Strategy Study (ICPSS)	The coastal maps have been reviewed. The study area is not located in a coastal area.
SFRA for Fingal Development Plan (2017-2023)	The Fingal Development Plan has been reviewed.
News Reports	An internet search was performed to identify any news reports of flooding in and around the study area.
Drainage Data	
Irish Water / Fingal County Council Drainage Records	Irish Water drainage records have been reviewed.
EPA Hydrometric Data	There are no hydrometric stations located within 1km of the study area.
Ground Conditions	
Geological Survey of Ireland (GSI) Maps	GSI maps have been reviewed.

Table 4-1: Flood Risk Identification

4.2. Topography

4.2.1. OS Mapping

The current Ordnance Survey Ireland mapping for the study area has been reviewed. There are several hydrological features identified as shown in Figure 9 below:

Figure 9 - OS Mapping

4.2.2. Historical Mapping

Available historic mapping for the area was consulted, as this can provide evidence of historical flooding incidences or occurrences. The maps that were consulted were the historical 6-inch maps (pre-1900), and the historic 25-inch map series. These maps do not indicate any area of historical flooding within or adjacent to the study area.

4.2.3. EPA Contour Mapping

The EPA 20-metre contour dataset was used to check the suitability of the catchment boundaries derived for the River Tolka and the Scribblestown Stream. Both catchment areas were deemed to accurately represent the contributing areas of the watercourses.

4.3. Flood Data

4.3.1. OPW Preliminary Flood Risk Assessment (PFRA) Maps

Preliminary Flood Risk Assessment (PFRA) Mapping for Ireland was produced by the OPW in 2011. OPW PFRA flood mapping illustrates indicative flood zones within this area of Dublin City. Figure 10 below illustrates an extract from the indicative flood map in the vicinity of the study area. The PFRA flood mapping indicates areas of indicative pluvial flooding mapped within the study area. An area of indicative fluvial flooding associated with the River Tolka is also mapped within the southern section of the study area. These maps were developed using a low-resolution digital terrain model (DTM) and illustrated flood extents are intended to be indicative only. The original PFRA mapping for this area is included in Appendix A.

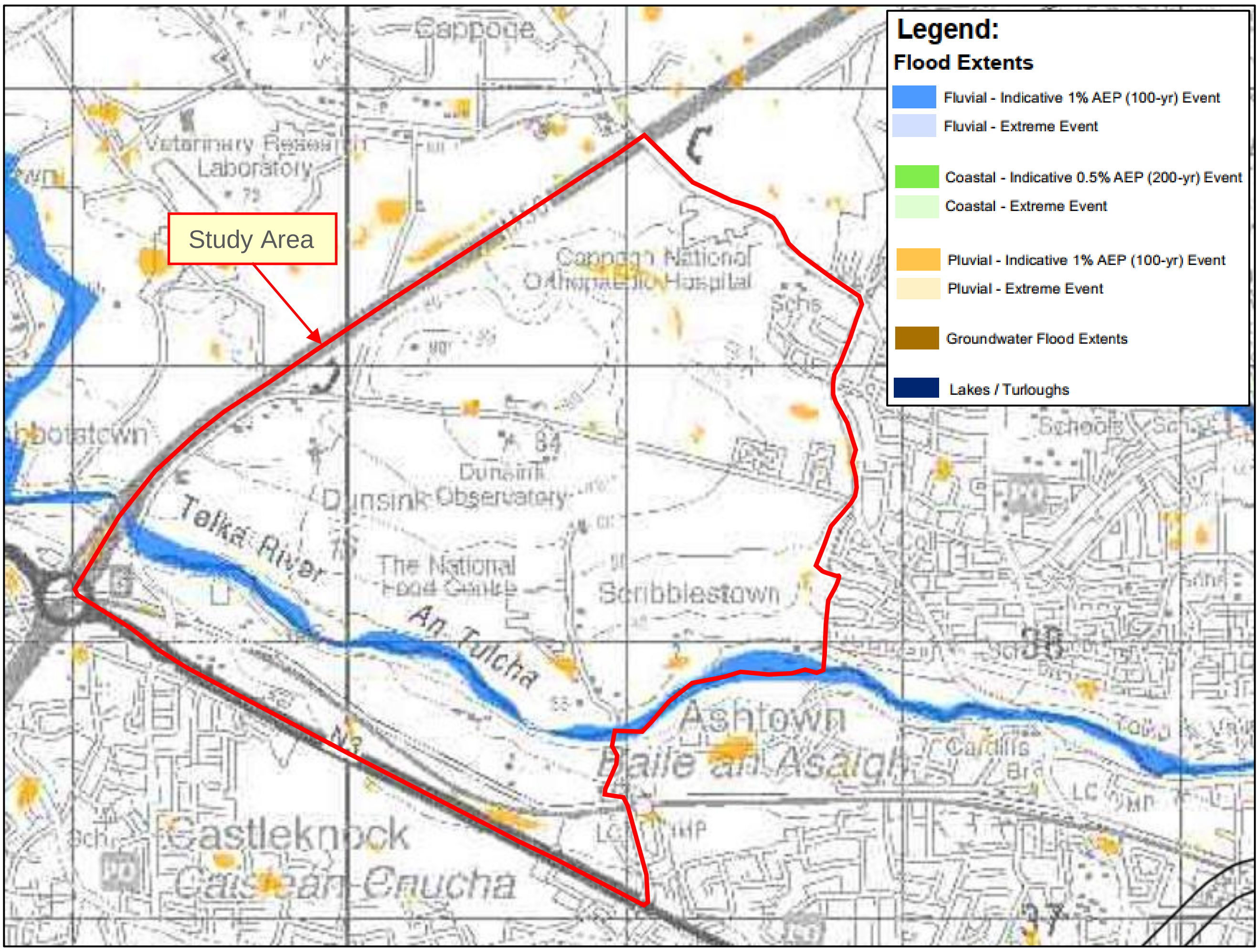


Figure 10 - OPW PFRA Mapping

4.3.2. Past Flood Events

The OPW Flood Info Website (www.floodinfo.ie) was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrences in the vicinity of the study area. This identifies one past flood event and two single flood points within a 2.5km^2 radius of the centre of the study area as described below:

- Past Flood Event – flooding in the Tolka Catchment in November 2002;
- Flood Point – report on flooding on the N3 near Blanchardstown Town Centre from 13th -15th November 2002;
- Flood Point – report on flooding at Glendhu Park, Cabra on 24th October 2011.

The OPW past flood event mapping for this area is included in Appendix B.

4.3.3. River Tolka Flooding Study (2003)

The Greater Dublin Strategic Drainage Study (GDSDS) was completed in 2005. As an extension of this study, the River Tolka Flooding Study was commissioned by Dublin City Council, in association with Fingal County Council, Meath County Council and the Office of Public Works in 2002. The River Tolka Flooding Study identified that substantial areas of urban development in the study area are at risk of repeat flooding from the River Tolka. The report outlined the works required to reduce this risk to less than 1% Annual Exceedance Probability (AEP). These works comprise the River Tolka Flood Alleviation Scheme. Figure 11 and Figure 12 below illustrate an extract from the flood study in the vicinity of the study area. The original River Tolka Flood Study mapping for this area is included in Appendix C.

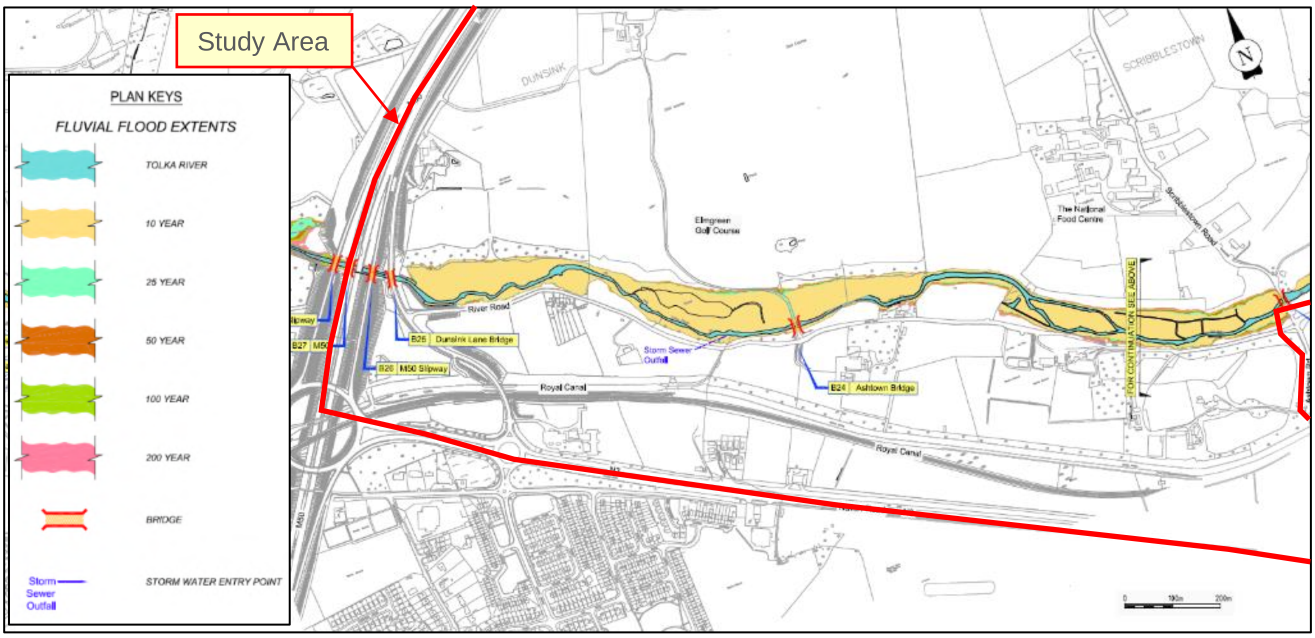


Figure 11 – River Tolka Flooding Study Mapping

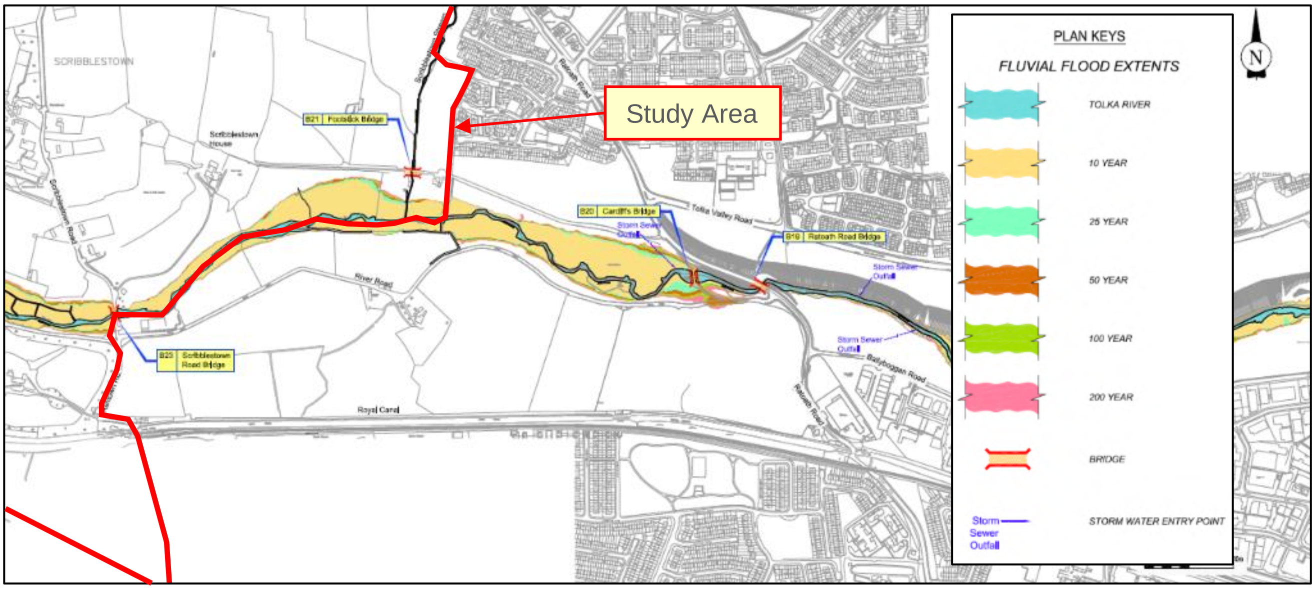


Figure 12 – River Tolka Flooding Study Mapping

4.3.4. Flood Risk Assessment and Management Study (FRAMS)

The Fingal East Meath Region Flood Risk & Management Study (FEM-FRAMS) was undertaken by the OPW, and the final version of the flood maps were issued in November 2017. These maps for the Dunsink area are currently under review following an objection/submission and/or further information received.

4.3.5. Dublin Pluvial Study

The Dublin Pluvial Study was completed in 2016. The maps associated with this study were developed using a low-resolution digital terrain model (DTM) and illustrated flood extents are intended to be indicative only. These maps do not consider the occurrence of watercourses or drainage channels that may be present. Figure 13 below illustrates the extent of pluvial flooding in the vicinity of the study area. The pluvial flood mapping indicates areas of flooding mapped within the central and eastern sections of the study area. The western section of the study area is located outside of the boundary of the Dublin Pluvial Study. The original pluvial mapping for this area is included in Appendix D.

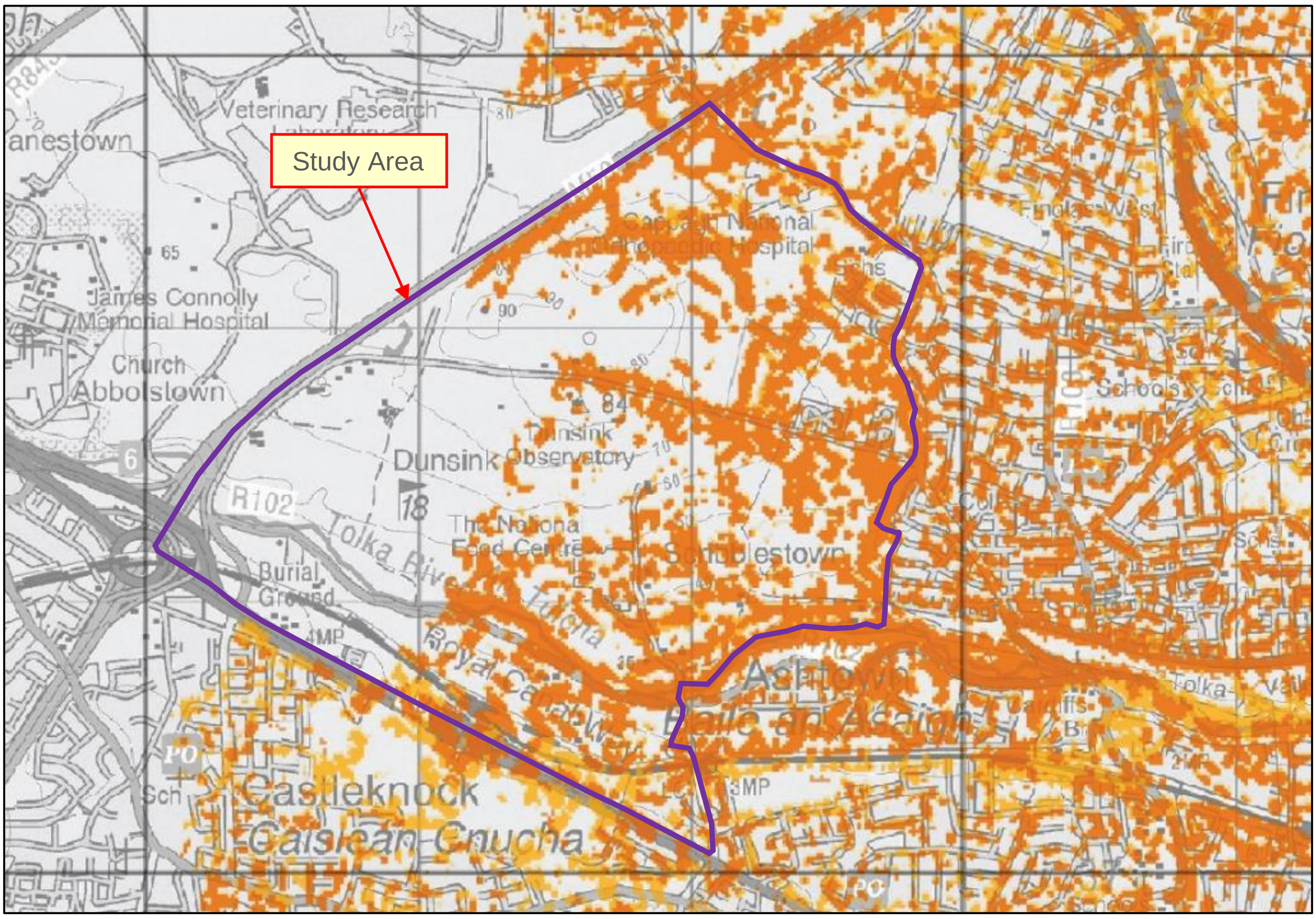


Figure 13 - Dublin Pluvial Flood Maps

4.3.6. SFRA for Fingal Development Plan (2017-2023)

The Fingal Development Plan Strategic Flood Risk Assessment (2017-2023) flood zone maps are largely derived from FEMFRAM and the Tolka Flooding Study mapping. These maps are the most comprehensive flood maps produced for Fingal since the introduction of the Guidelines and the Floods Directive. Flood extents for areas that are outside of the scope of the FEMFRAM and Tolka Study are supplemented by fluvial mapping from the earlier OPW Preliminary Flood Risk Assessment (PFRA) Report. The Flood Zone mapping is based on the best currently available data and a more detailed, site specific FRA may generate localised flood extents. Figure 14 below illustrates an extract from the strategic mapping in the vicinity of the study area.

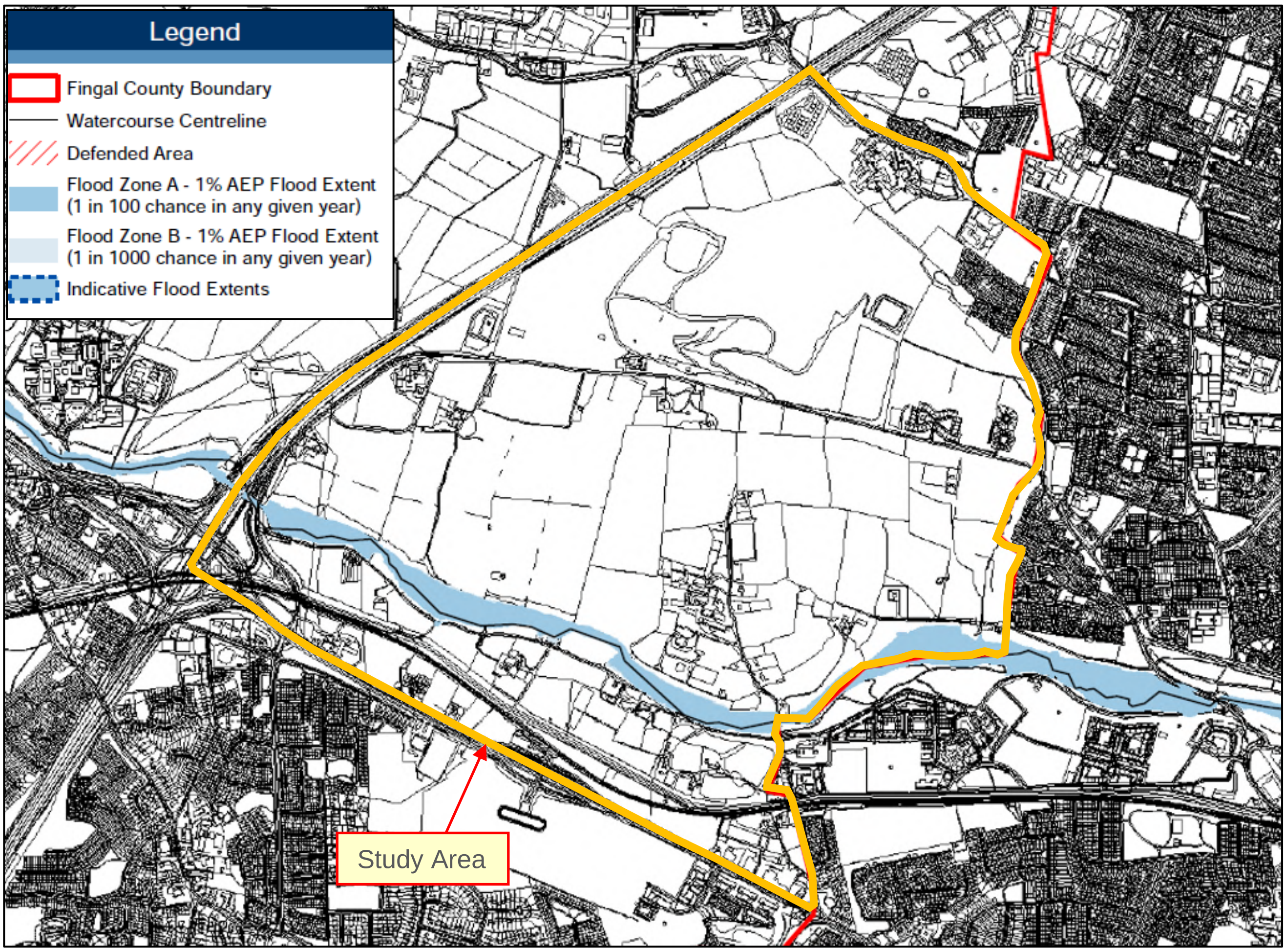


Figure 14 – Strategic Fluvial Flood Zone Mapping

4.3.7. News Reports

A news article from the Irish Times on November 16th 2002 states that more than 200 people were evacuated from their homes in north Dublin when the River Tolka burst its banks, which affected areas of north Dublin city and county from Portmarnock, to Drumcondra and Blanchardstown. The article does not specifically mention the Dunsink area.

4.3.8. National Indicative Fluvial Mapping

This mapping set has been produced for catchments greater than 5km^2 in areas for which flood maps were not produced under the National CFRAM Programme. Flooding from other reaches of river may occur, but has not been mapped, and so areas that are not shown as being within a flood extent may therefore be at risk of flooding from unmodelled rivers as well as from other sources. Figure 15 below illustrates an extract from the mapping in the vicinity of the study area.

Figure 15 – National Indicative Fluvial Mapping

4.4. Drainage Data

Drainage records in and around the study area were obtained from Irish Water. As illustrated below in Figure 16 there are water mains located within the central and southern sections of the study area. There are also foul sewers located in the southern and north-eastern sections of the study area.

The topography of the ground slopes from the centre of the study area towards the boundaries, therefore any potential flooding from drainage waters would flow either away from or beside the study area. Pluvial flooding from drainage infrastructure is not deemed to be a significant flood risk to the study area.

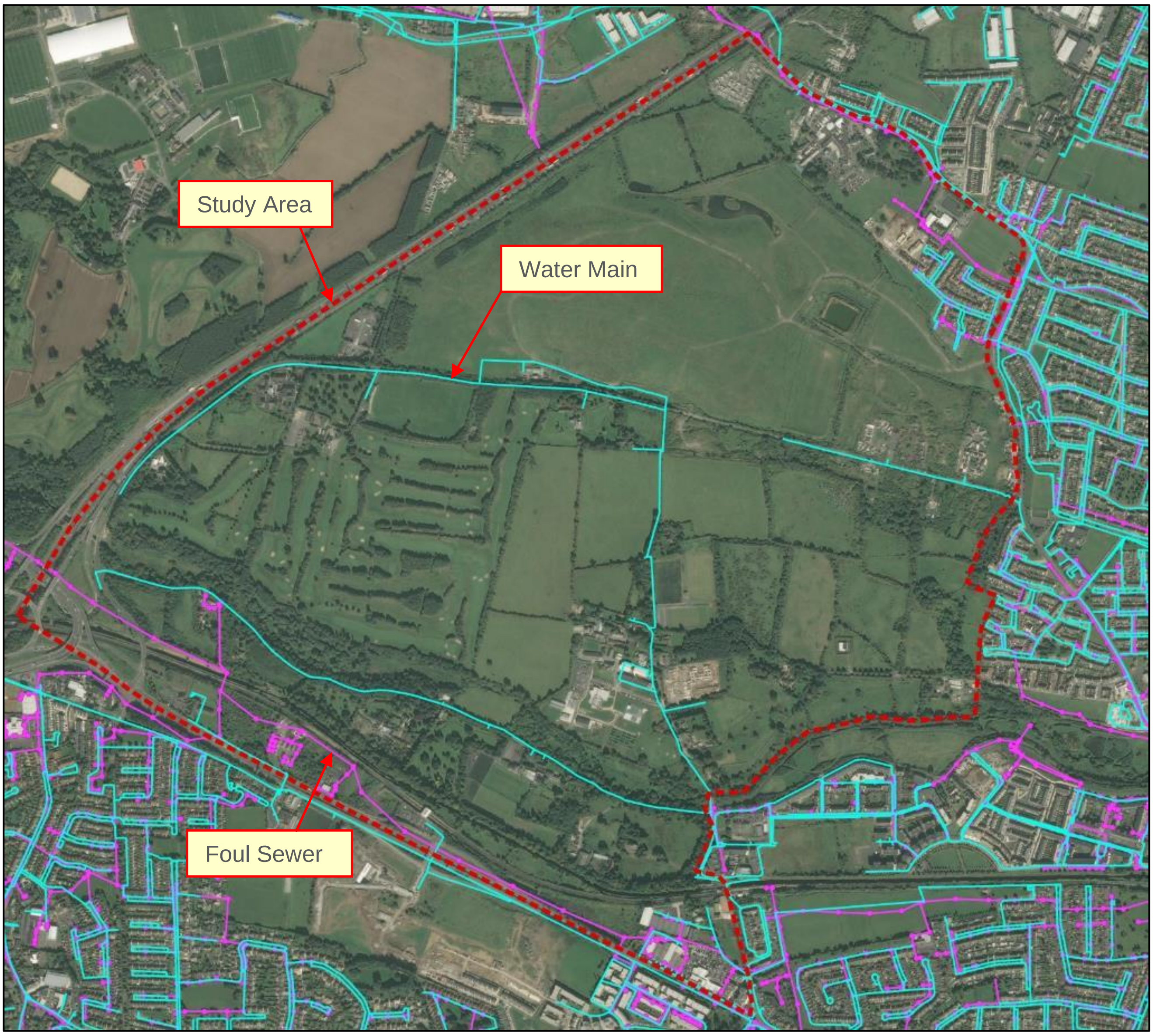


Figure 16 - Drainage Records

4.5. Ground Conditions

The Geological Survey of Ireland (GSI) subsoils mapping was consulted to assess the extent of any alluvial deposits in the vicinity of the study area. Alluvial soils can indicate that an area has a history of flooding in the recent geological past.

The mapping indicates that the study area is predominantly underlain by till derived from carboniferous limestone. There are also areas of made ground, carboniferous limestone sand and gravel, bedrock at surface and alluvium deposits as shown below in Figure 17.

Figure 17 – GSI Subsoil Mapping

5. Stage 2 – Initial Flood Risk Assessment

5.1. Initial Assessment

Table 5-1 below summaries the possible flooding mechanisms in consideration of the study area.

Source/ Pathway	Significant	Comment/ Reason
Tidal/ coastal	No	The study area is not located within a coastal or tidally influenced region.
Fluvial	Yes	The River Tolka runs along the southern section of the study area, while the Scribblestown Stream runs along a portion of the eastern boundary of the study area.
Pluvial (Urban Drainage)	No	The urban drainage/water supply infrastructure located in the vicinity of the site is deemed to not be a significant risk to the study area, as discussed above in Section 4.4.
Pluvial (Overland Flow)	Yes	The Dublin Pluvial Study indicates the study area may be at risk from surface water flooding.
Blockage	Yes	There are several hydraulic structures located on both the River Tolka and the Scribblestown Stream.
Groundwater	No	There are no significant springs or groundwater discharges mapped or recorded in the immediate vicinity of the study area.

Table 5-1: Possible Flood Mechanism

In consideration of the information collated as part of the flood risk identification stage, it is required to develop a more detailed and robust analysis of the potential flood mechanisms in the study area. The specific flood risk to the study area is assessed in the subsequent Stage 3 Detailed Flood Risk Assessment.

6. Stage 3 – Detailed Flood Risk Assessment

6.1. Introduction

In consideration of the information collated as part of the Stage 2 Initial Flood Risk Assessment, a more detailed and robust analysis of the potential flood mechanisms in the vicinity of the study area is required.

There are two major sources of flood risks identified within the study area:

- Fluvial flood risk from the River Tolka and the Scribblestown Stream to the south and east of the study area.
- Pluvial flood risk from an extreme rainfall event.

To provide an accurate and present-day assessment of flood risk to the study area fluvial and pluvial models have been developed using Flood Modeller Pro software. Flood Modeller can simulate the flow of water through river channels and across floodplains using a range of one and two dimensional hydraulic solvers. This makes it suitable to model both the fluvial flood risk from the streams and drains and the pluvial flood risk from a rainfall event. Flood Modeller Pro is a robust and well-regarded application and is in widespread use by engineering consultants, hydrologists, and relevant authorities throughout the world. The program also supports hydraulic structures such as bridges, culverts, and weirs and can also analyse floodplain storage. It is well regarded for use in the application of river and flood plain modelling.

6.2. Model Coverage

LiDAR data for the entire study area and surrounding lands was obtained from Ordnance Survey of Ireland (OSI). Two types of models have been developed to assess the two sources of flooding discussed above. A linked 1d-2d hydraulic model has been developed to assess the fluvial flood risk from the two watercourses around the study area. A 2d surface water runoff model has also been created to assess the pluvial flood risk to the study area. The extents of these models are described in detail below.

6.2.1. Fluvial Model

River cross-section survey data was collected in August 2021 along the River Tolka and the Scribblestown Stream. The locations of these cross sections are illustrated below in Figure 18. The survey included the level of the top and bottom banks, channel inverts, and additional spot levels extending out from the bank tops. This cross-sectional data was then incorporated into Flood Modeller to create the 1d river reach along each of the watercourses modelled.

There are also several hydraulic structures within the channel of the watercourses, which were also surveyed and incorporated into the 1d hydraulic model. The location of these structures is illustrated below in Figure 19 and the details are described in Table 6-1 below. There are in total seven structures incorporated in the hydraulic model, including five on the River Tolka and two on the Scribblestown Stream.

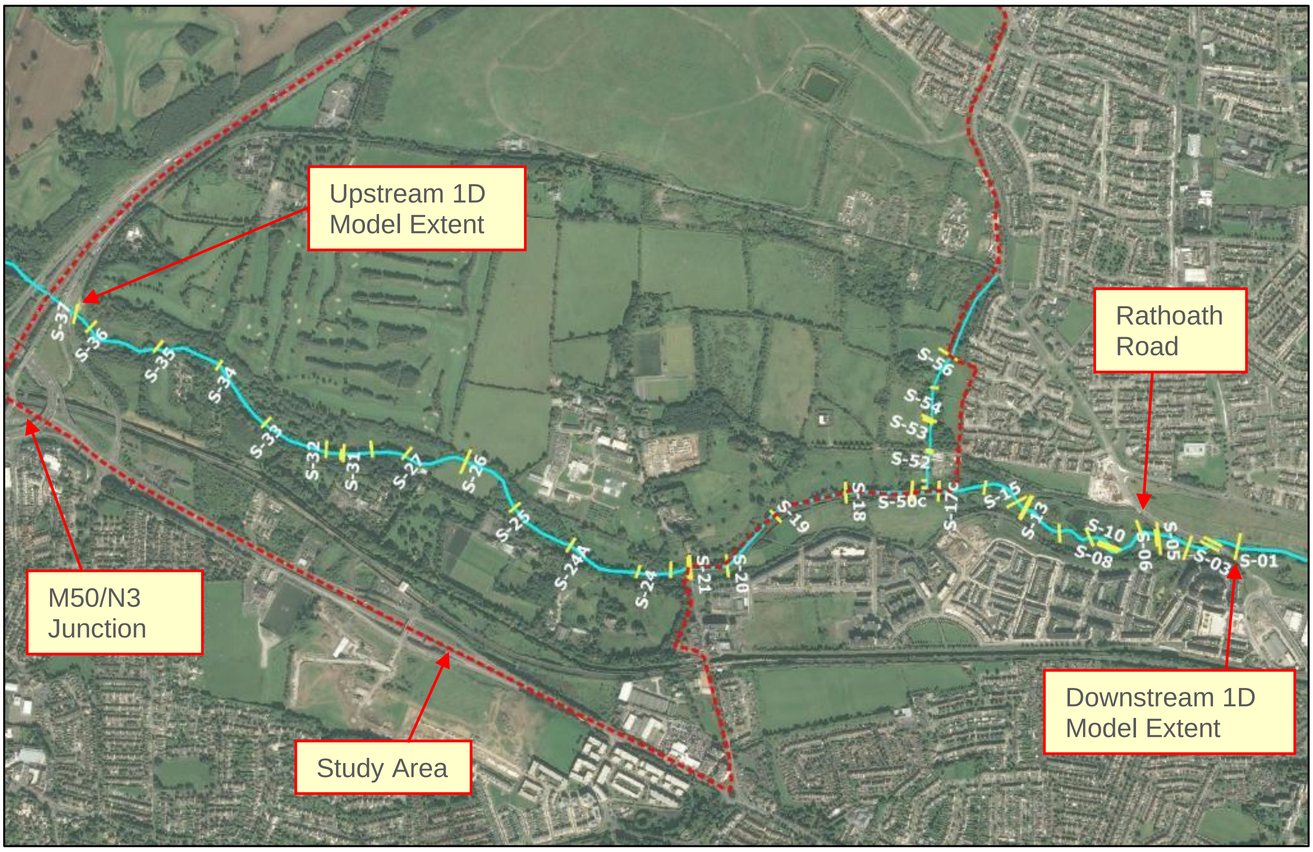


Figure 18 – 1D Model Cross Section Locations

Figure 19 – 1D Model Hydraulic Structure Locations

Structure Ref	Watercourse	Modelled Shape	Total Cross Section Area (m^2)	Upstream Invert Level (m OD)	Downstream Invert Level (m OD)
S-31	River Tolka	Two Arch Bridge	37.46	31.08	30.97
S-22	River Tolka	Two Arch Bridge	17.64	27.41	27.37
S-14	River Tolka	Bridge and Five Box Culverts	62.57	23.97	23.82
S-06	River Tolka	Three Arch Bridge	17.74	21.57	21.78
S-03	River Tolka	Bridge	38.00	21.30	20.99
S-54	Scribblestown Stream	Arch Culvert	1.41	31.99	31.74
S-52	Scribblestown Stream	Rectangular Culvert	5.40	28.48	28.53

Table 6-1: Hydraulic Structures incorporated into 1D Fluvial Model

6.2.2. Pluvial Model

The pluvial model extents have been defined based on the area where rainfall runoff may contribute to flooding in the study area. LiDAR data was analysed to determine the likely flow paths water would take in the event of an extreme rainfall event.

The topographic data shows the ground levels slope from a high point in the northern section of the study area to the boundaries, with the low point located in the River Tolka. Therefore, the outlet for the 2d pluvial model was placed along the south-eastern boundary of the site and a normal depth boundary was applied to the downstream extent with a value equal to the slope of the topography.

The main sources of drainage within the study area are the River Tolka and the Scribblestown Stream. Rainfall runoff flowing within the study area would likely be intercepted by these watercourses. The contributing area is illustrated below in Figure 20.

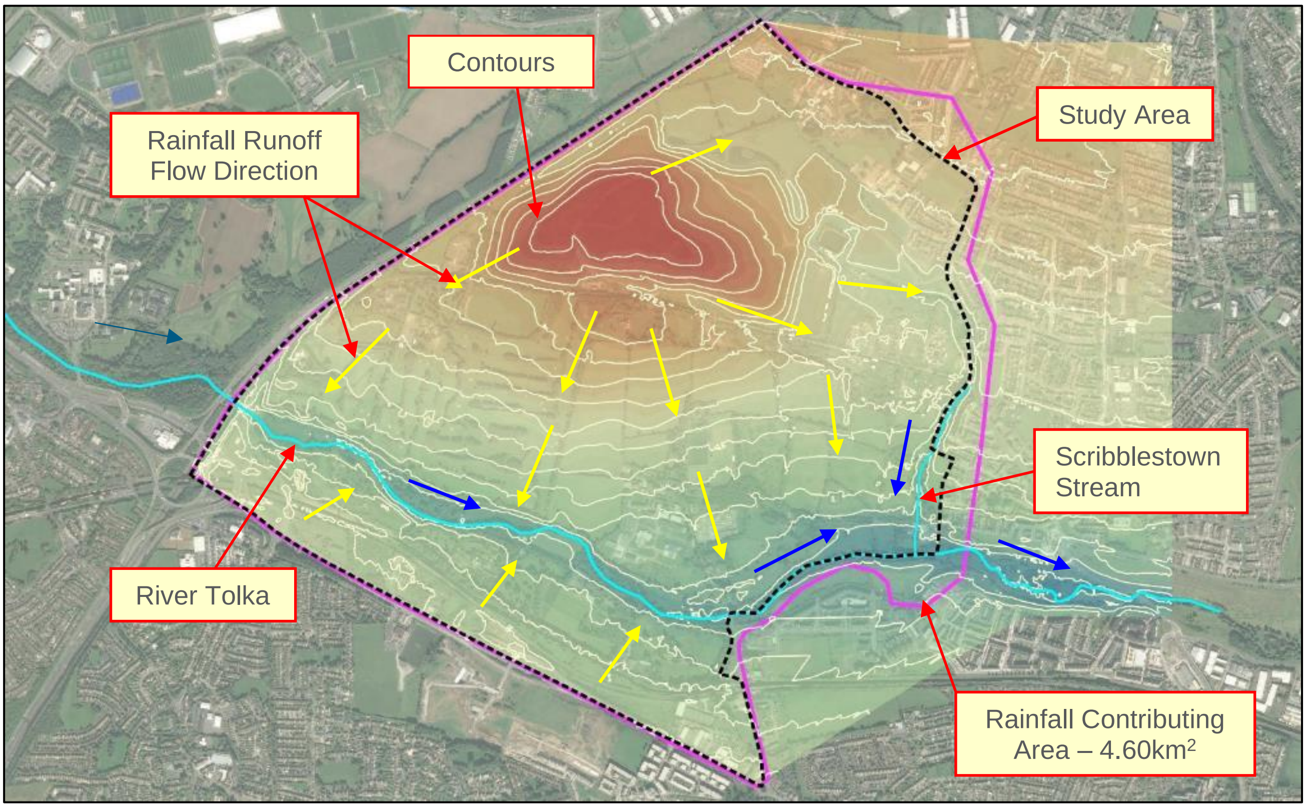


Figure 20 - Pluvial Model Contributing Area

6.3. Fluvial Flood Risk

6.3.1. Hydrology

The following sections present an analysis and assessment of the estimated 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood event in the watercourses located within and around the study area.

The catchment areas for the River Tolka and Scribblestown Stream have been delineated utilising using topographical contour information as well as the OPW Flood Studies Update (FSU) web portal flood frequencies tool. Four hydrological estimation points have been defined on these watercourses as follows and are shown on Figure 21 below:

- River Tolka Upstream Catchment Area = 115.917km^2
- Scribblestown Stream Catchment Area = 2.738km^2
- River Tolka Intervening Catchment Area at Ashtown = 4.224km^2
- River Tolka Intervening Catchment Area at Cardiffsbridge = 2.142km^2

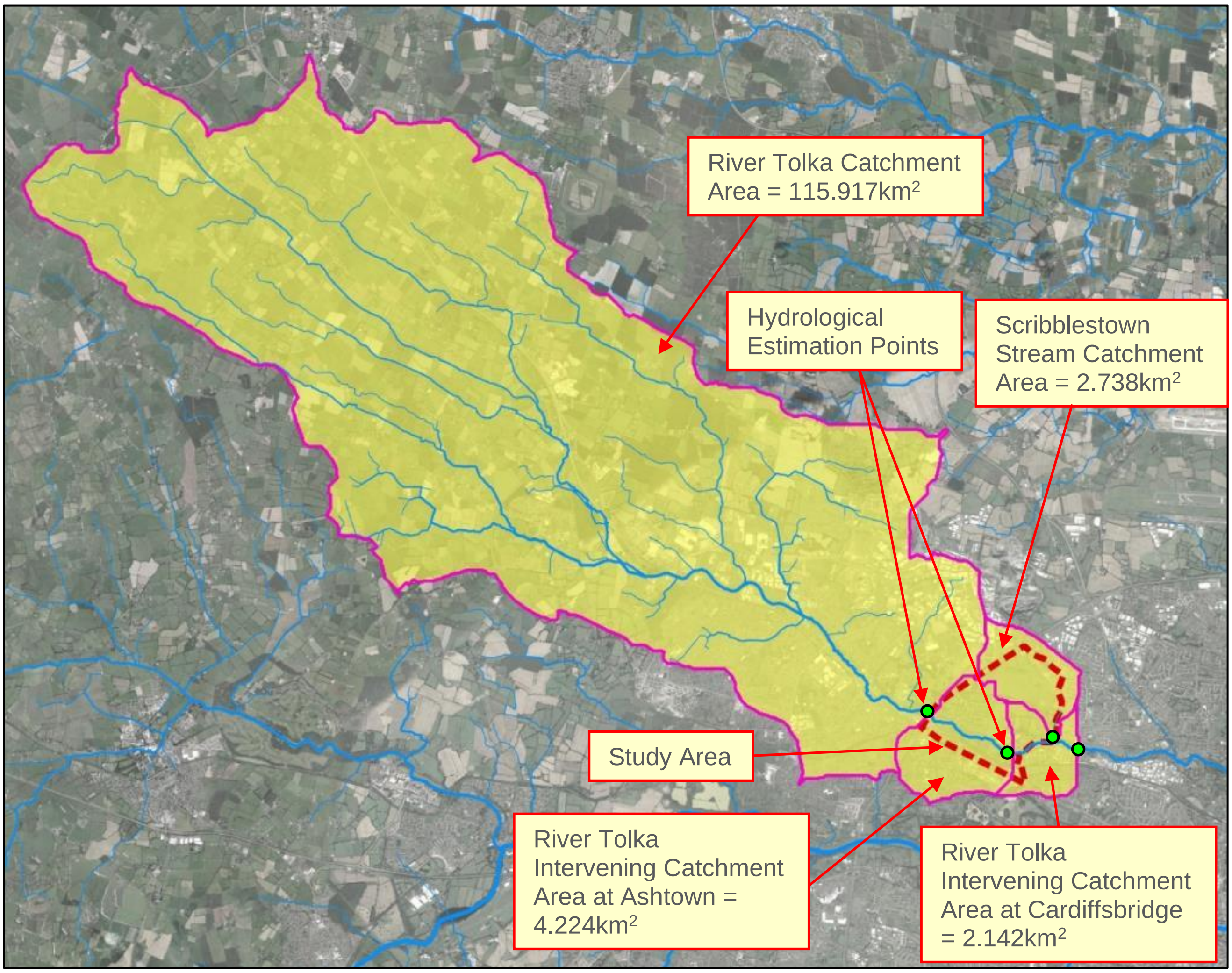


Figure 21 – Catchment Areas

6.3.1.1. Estimation of Peak Flow in River Tolka Upstream Catchment

As the River Tolka upstream catchment area is in excess of 25km^2, the OPW Flood Studies Update (FSU) portal software methodology can be applied. The FSU portal allows for the estimation of peak flows through three stages of calculations:

- estimation of Index Flood
- estimation of appropriate growth curve
- flood frequency curve derivation

These stages vary depending on whether the catchment is gauged or ungauged. In the case of ungauged catchments, the Index Flood, or QMED, is first calculated based on the chosen catchments characteristics. This value is then correlated using flow data recorded on a catchment with similar characteristics. This second catchment is called the pivotal site. A pivotal site must be selected when the catchment being analysed is ungauged. This allows the FSU software to incorporate data from the gauged pivotal site into the ungauged selected site where necessary. All pivotal sites are hydrometric gauging stations that were used in the supporting analysis for the FSU methodology and the annual maximum (AMAX) series data at these stations has been quality checked and classified. The chosen pivotal site should ideally lie a short distance either upstream or downstream of the selected site, although any site within the country can be deemed suitable if hydrologically similar enough to the selected site.

Once the value of QMED has been established, an appropriate growth curve is constructed. Where the site in question is ungauged, this is accomplished within the FSU software by tabulating gauging stations on catchments with similar hydrological characteristics and creating a pooled flood frequency analysis curve.

Pooling is required to avoid on the reliance on a single flood frequency curve when extrapolating long return period events.

The flows along the River Tolka within the vicinity of the study area used the Botanic Gardens gauge, which is located on the River Tolka 3.3m downstream of the study area boundary. This gauge is not located include in the FSU dataset but is seen as a reliable dataset for use in this instance. The Botanic Gardens gauge was installed in 1999 and is still active. At the time of the FSU development, the gauge history was too short for FSU inclusion, however as of 2021 there are 20 years of decent well calibrated data. If FSU development criteria had been applied today, Botanic Gardens would be included, and the website would have forced the selection of it based on the encoded rules of a downstream site. Several significant flood events have occurred through its operating period and is therefore believed to have greater certainty in the stage-discharge curve for high flows.

Table 6-2 below shows the calculated QMED flows for the River Tolka using the pivotal site.

River Tolka QMED $_{Rural}$ (m^3/s)	15.82
Pivotal Site QMED (m^3/s)	27.85
Pivotal Adjustment Factor	1.536
River Tolka Adjusted QMED (m3/s)	24.30
River Tolka QMED $_{Urban}$ (m^3/s)	**29.75**

Table 6-2: River Tolka Upstream Catchment Predicted QMED Flow

Once the value of QMED has been established, an appropriate growth curve is constructed. A number of growth curve distributions were tested for the catchment, with the Generalised Logistical (GLO) distribution being selected as the most suitable for this location. The resulting growth curve values are listed in Table 6-3 below:

Flood Return Period (Years)	2	5	10	20	30	50	100	1000
Growth Curve Factor (QT/QBAR)	1	1.28	1.47	1.66	1.78	1.93	2.16	3.05

Table 6-3: Growth Curve Factors

Table 6-4 below lists the estimated peak flood flow in the River Tolka at the point of interest for the various return period events:

Flood Return Period (Years)	2	5	10	20	30	50	100	1000
River Tolka Upstream Catchment Flow (m3/s)	29.75	38.08	43.73	49.38	52.95	57.41	64.25	90.73

Table 6-4: Estimated Peak Flows in the River Tolka for Different Return Periods

6.3.1.2. Estimation of Peak Flow on Scribblestown Stream & River Tolka Intervening Areas

The methods described in the Flood Studies Report (FSR) (NERC 1975) and the Institute of Hydrology Report 124 (1994) have been employed to estimate the mean annual flow within the vicinity of the study area for the Scribblestown Stream as well as the River Tolka intervening areas at Ashtown and Cardiffsbridge. The OPW Flood Studies Update (FSU) portal has not been considered due to small catchment sizes (<25km^2) of the watercourses under assessment.

The mean annual flood, Q_{bar} (m^3/s) is estimated by utilising any of the two multiple parameter regression equations detailed in the Flood Studies Report (FSR) and Flood Studies Supplementary Reports (FSSR) and the Institute of Hydrology Report (IH) No. 124 'Flood Estimates for Small Catchments' regression equation. These equations are listed below.

$$Qbar\ Rural = 0.00066 \times Area^{0.92} \times SAAR^{1.22} \times SOIL^{2.0} \qquad \text{EQN 1.5 (FSSR)}$$

$$Qbar\ Rural = 0.0288 \times Area^{0.90} \times RSMD^{1.23} \times SOIL^{1.77} \times STMFRQ^{0.23} \qquad \text{EQN 1.6 (FSR)}$$

$$Qbar\ Rural = 0.00108 \times Area^{0.89} \times SAAR^{1.17} \times SOIL^{2.17} \qquad \text{EQN 7.1 (IH124)}$$

The parameters at each flow estimation point are described below in Table 6-5.

Flow Estimation Point	Catchment Area (km^2)	SAAR[1] (mm)	STMFRQ[2]	RSMD[3] (mm)	SOIL[4]
Scribblestown Stream	2.738	798.85	1	30.09	0.3
River Tolka Intervening Area at Ashtown	4.224	801.34	1	30.20	0.3
River Tolka Intervening Area at Cardiffsbridge	2.142	798.48	1	30.08	0.3

Table 6-5: Catchment Descriptors for Flow Estimation Points

[1] The Standard Annual Average Rainfall (SAAR) value was derived from Met Éireann data. The SAAR value for the drains was taken from the nearest or downstream watercourse.

[2] The Stream Frequency (STMFRQ) of the catchment is equal to the number of channel junctions within the catchment divided by the catchment area.

[3] The 5-year, 1-day rainfall excess (RSMD) for the catchment and is estimated using the following equation $\mathrm{RSMD} = 2.48^{\sqrt{SAAR}-40}$

[4] A number depending on the soil type and relating to the winter rain acceptance potential of the soils in the catchment. Values for SOIL are obtained from map I. 4.18 (I) in the FSR.

For the purpose of this assessment the most conservative Qbar estimate was selected at each flow estimation point. The FSSR equation was selected for all three locations. The applicable factorial standard error was also applied to each of these flow estimate points and is listed below in Table 6-6.

Flow Estimation Point	Q_{bar} (m^3/s)	Regression Equation Applied	Factorial Standard Error (f.s.e.)	Max Q_{bar} Rural (m^3/s)
Scribblestown Stream	0.521	FSSR	1.58	0.824
River Tolka Intervening Area at Ashtown	0.780	FSSR	1.58	1.232
River Tolka Intervening Area at Cardiffsbridge	0.416	FSSR	1.58	0.657

Table 6-6: Rural Qbar Flow Estimates

The effect of urbanisation has also been applied to the hydrological estimation points illustrated above in Figure 21. The ratio of runoff flows generated by urban areas to those generated by rural areas can be estimated by utilising the multiple parameter equation, EQN 7.4, detailed in the Institute of Hydrology Report No. 124 'Flood Estimation for Small Catchments'. This equation is as listed below:

$Qbar_{Urban}/Qbar_{Rural}$ = (1+Urban%)2NC x (1+Urban%((21/CIND)-0.3) EQN 7.4 (IH124)

Therefore,

$Qbar_{Urban} = Qbar_{Rural} \times Qbar_{Urban}/Qbar_{Rural}$

The required catchment descriptors are illustrated below in Table 6-7.

Flow Estimation Point	Catchment Area (km^2)	Urban[5] (%)	NC[6]	CWI[7] (mm)	CIND[8]
Scribblestown Stream	2.738	60.6	0.728	115.3	28.0
River Tolka Intervening Area at Ashtown	4.224	40.0	0.728	115.3	28.0
River Tolka Intervening Area at Cardiffsbridge	2.142	45.6	0.728	115.3	28.0

Table 6-7: Catchment Descriptors for Urbanisation

[5] The Urban % represents the portion of catchment area that is urbanised. The Corine 2006 landcover dataset was used to determine the percentage of artificial surfaces within each catchment. To confirm that these areas are urbanised background satellite imagery was used to check the current land use.

[6] The rainfall continentally factor (NC) is estimated from the SAAR value using the following equation NC = *0.92 – 0.00024SAAR, for 500 ≤ SAAR ≤ 1100mm*

[7] The catchment Wetness Index (CWI) and is necessary for calculating CIND and is estimated from Figure 22 below.

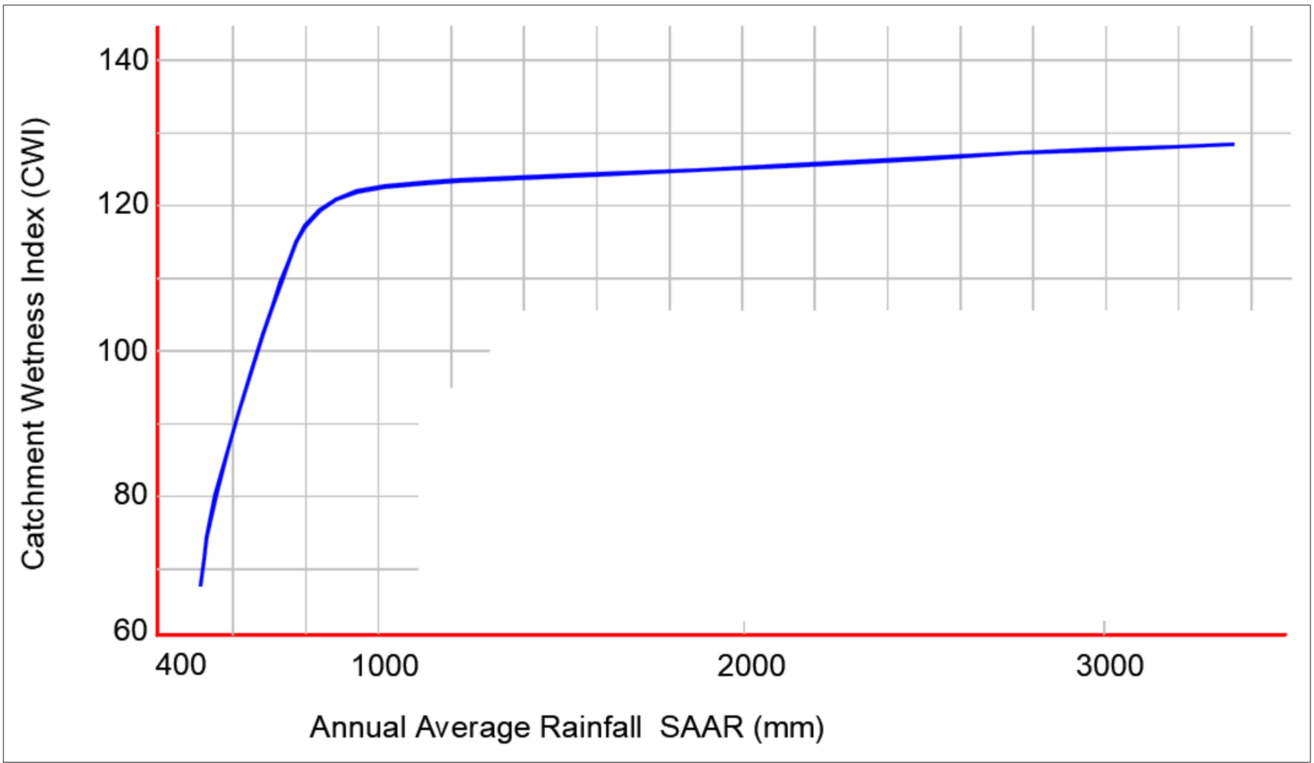


Figure 22 - Plot of Catchment wetness Index, CWI against mean annual rainfall, SAAR

[8] The Catchment Index (CIND) is derived from the following equation *CIND=102.4 SOIL + 0.28 (CWI-125)*

Applying the urbanisation to the Rural Q_{bar} values results in the Urban Q_{bar} flows which are described below in Table 6-8.

Flow Estimation Point	Q_{bar} Rural (m^3/s)	Q_{bar} Urban (m^3/s)
Scribblestown Stream	0.824	2.091
River Tolka Intervening Area at Ashtown	1.232	2.373
River Tolka Intervening Area at Cardiffsbridge	0.657	1.369

Table 6-8: Q_{bar} Urbanisation

The return period flows ‘Qt’ are estimated using the index flood method and are calculated by multiplying the Q_{bar} flow by the appropriate growth factor ‘X_t’ using the national growth curve for Ireland as described below in Table 6-9.

Flood Return Period (Years)	2	5	10	20	50	100	1000
Growth Curve Factor (QT/QBAR)	0.95	1.20	1.37	1.54	1.77	1.96	2.59

Table 6-9: Growth Factors applied to Irish Catchments for Qbar Discharge Prediction

Table 6-10 below describes the estimated peak flood flow at each flow estimation point for the 1 in 100 year and 1 in 1000 year return periods.

Flood Return Period (Years)	2	5	10	20	50	100	100
Scribblestown Stream	1.99	2.51	2.86	3.22	3.70	4.10	5.41
River Tolka Intervening Area at Ashtown	2.25	2.85	3.25	3.65	4.20	4.65	6.15
River Tolka Intervening Area at Cardiffsbridge	1.30	1.64	1.88	2.11	2.42	2.68	3.54

Table 6-10: Estimated Peak Flows for different return periods

6.3.1.3. Climate Change

The future impact of climate change on the fluvial flows has also been accounted for in accordance with the OPW ‘Flood Risk Management Climate Change Sectoral Adaptation Plan -September 2019’. This assessment includes two climate change scenarios namely the Mid-Range Future Scenario (MRFS) which was selected to represent a ‘typical or near to the general average for the future climate projections’, and a High-End Future Scenario (HEFS) which represents a ‘more extreme future based on the upper end of the range of projections of future climatic conditions’. The MRFS recommends a 20% increase to peak fluvial flood flows while the HEFS recommends a 30% increase, the results of which are illustrated below in Table 6-11.

Flow	1 in 100	1 in 100	1 in 100	1 in 1000	1 in 1000	1 in 1000

Estimation Point	year flow (m^3/s)	year MRFS Flow (m^3/s)	year HEFS Flow (m^3/s)	year Flow (m^3/s)	year MRFS Flow (m^3/s)	year HEFS Flow (m^3/s)
River Tolka Upstream Catchment Flow	64.25	77.10	100.23	90.73	108.87	117.95
Scribblestown Stream	4.10	4.92	5.33	5.41	6.50	7.04
River Tolka Intervening Area at Ashtown	4.65	5.58	6.05	6.15	7.37	7.99
River Tolka Intervening Area at Cardiffsbridge	2.68	3.22	3.49	3.54	4.25	4.61

Table 6-11: Climate Change Peak Flows

6.3.2. Hydraulic Model Build

The model type utilised is a linked 1D-2D model where the 1D model defines the main river channel flow and the 2D model defines the flood plain. The two domains are linked together at the point where the flow spills from the channel bank onto the flood plain. This allows the overland flow paths within the flood plain to be accurately mapped, which is particularly useful in urbanised areas.

6.3.2.1. River Channel & Flood Plain Roughness Co-Efficients

The Mannings ‘n’ coefficient represents the hydraulic resistance to flow of the river channel or floodplain. The Mannings ‘n’ coefficients are estimated from an inspection of the river channel and associated floodplains. Guidance is available on appropriate Manning’s ‘n’ value (from Chow 1959, French 1986), however the Manning ‘n’ coefficients are usually subsequently refined upon the development of the model and calibrated where appropriate with any historical flooding data in the area, but only if available. Table 6-12 below lists the recommended manning roughness values for various vegetation types.

Type of Channel and Description	Minimum	Normal	Maximum
A. *Natural Streams*			
1. **Main Channels**			
a. Clean, straight, full, no rifts or deep pools	0.025	0.030	0.033
b. Same as above, but more stones and weeds	0.030	0.035	0.040
c. Clean, winding, some pools and shoals	0.033	0.040	0.045
d. Same as above, but some weeds and stones	0.035	0.045	0.050
e. Same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
f. Same as "d" but more stones	0.045	0.050	0.060
g. Sluggish reaches, weedy. deep pools	0.050	0.070	0.080
h. Very weedy reaches, deep pools, or floodways with heavy stands of timber and brush	0.070	0.100	0.150
2. **Flood Plains**			
a. Pasture no brush			
1. Short grass	0.025	0.030	0.035
2. High grass	0.030	0.035	0.050
b. Cultivated areas			
1. No crop	0.020	0.030	0.040
2. Mature row crops	0.025	0.035	0.045
3. Mature field crops	0.030	0.040	0.050
c. Brush			
1. Scattered brush, heavy weeds	0.035	0.050	0.070
2. Light brush and trees, in winter	0.035	0.050	0.060
3. Light brush and trees, in summer	0.040	0.060	0.080
4. Medium to dense brush, in winter	0.045	0.070	0.110
5. Medium to dense brush, in summer	0.070	0.100	0.160
d. Trees			
1. Cleared land with tree stumps, no sprouts	0.030	0.040	0.050
2. Same as above, but heavy sprouts	0.050	0.060	0.080
3. Heavy stand of timber, few down trees, little undergrowth, flow below branches	0.080	0.100	0.120
4. Same as above, but with flow into branches	0.100	0.120	0.160
5. Dense willows, summer, straight	0.110	0.150	0.200
B. *Lined or Built-Up Channels*			
1. **Concrete**			
a. Trowel finish	0.011	0.013	0.015
b. Float Finish	0.013	0.015	0.016
c. Finished, with gravel bottom	0.015	0.017	0.020
d. Unfinished	0.014	0.017	0.020
e. Gunite, good section	0.016	0.019	0.023
f. Gunite, wavy section	0.018	0.022	0.025
g. On good excavated rock	0.017	0.020	
h. On irregular excavated rock	0.022	0.027	
2. **Concrete bottom float finished with sides of:**			
a. Dressed stone in mortar	0.015	0.017	0.020
b. Random stone in mortar	0.017	0.020	0.024
c. Cement rubble masonry, plastered	0.016	0.020	0.024
d. Cement rubble masonry	0.020	0.025	0.030
e. Dry rubble on riprap	0.020	0.030	0.035
3. **Gravel bottom with sides of:**			
a. Formed concrete	0.017	0.020	0.025
b. Random stone in mortar	0.020	0.023	0.026
c. Dry rubble or riprap	0.023	0.033	0.036

Table 6-12: Manning's Roughness Values

The roughness values applied to the hydraulic model are summarised below in Table 6-13. The 2d domain flood plain roughness values are based on aerial photos of the land cover.

Location	Roughness Value	Description
River Channel	0.04	Generally straight channel with areas that are winding with some pools
River Bank	0.06	Light brush in summer
Flood Plain – General	0.035	Long Grasses
Flood Plain – Dense Trees/Brush	0.10	Dense brush in summer
Roads	0.013	Asphalt
Buildings	0.30	Impact of Buildings on overland flow

Table 6-13: Applied Model Roughness Values

6.3.2.2. Boundary Conditions

Boundary Conditions are required at the downstream extent of both the 1d and 2d domains of the hydraulic model. A normal depth boundary has been applied to the 1d model based on the downstream bed slope in the River Tolka with a value of 0.00263797 (1/379). A normal depth boundary has also been applied to the 2d domain based on the ground slope of with a value of 0.0091 (1/110).

6.3.3. Model Verification

The Tolka Flooding Study was completed in 2003. As part of this study flood maps were produced as discussed in Section 4.3.3 above. The study includes the 1 in 100 year current scenario flood mapping which has been used to verify the extent of flooding produced as part of this assessment on the River Tolka the Scribblestown Stream. The upstream and downstream extents of the model were compared to the Tolka Flooding Study mapping.

The upstream section of the modelled 1 in 100 year flood extent compares reasonably well with the Tolka Flooding Study, however there are locations where the extent of flooding is slightly less as shown in Figure 23 below.

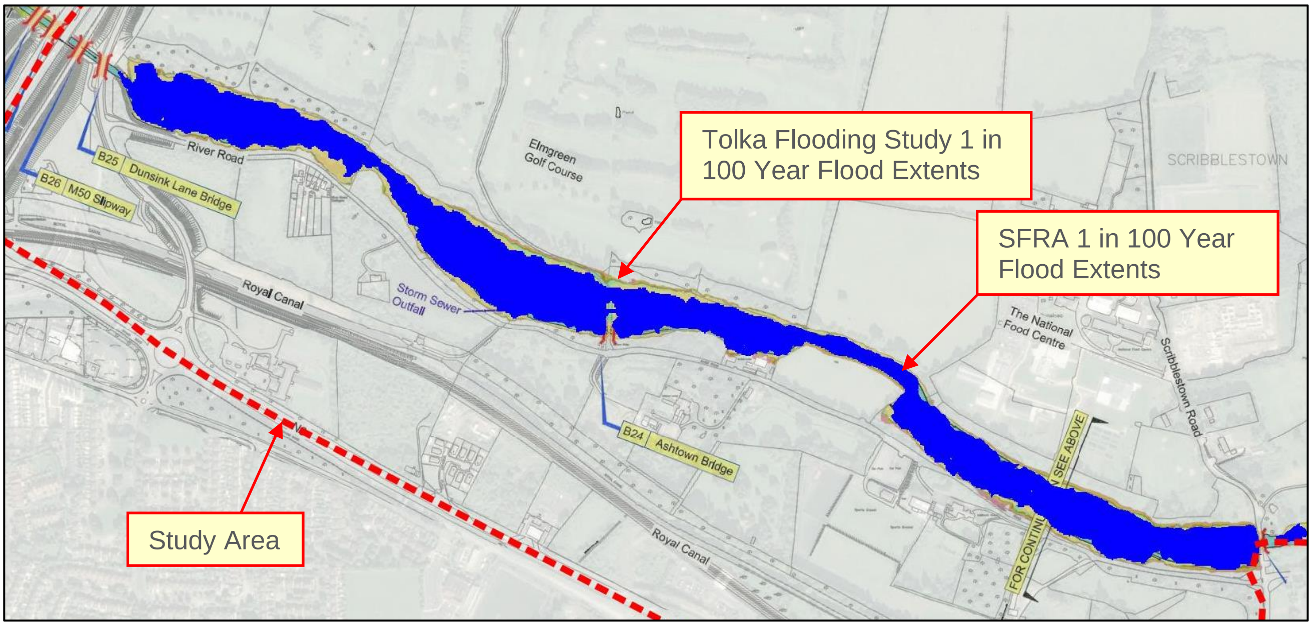


Figure 23 – 1 in 100 year Fluvial Flood Extent Comparison at Upstream Extent

The downstream section of the modelled 1 in 100 year flood extent compares very well with the Tolka Flooding Study. There are some isolated areas where the extents differ but overall, the model shows a good fit with the Tolka Flooding Study mapping shown in Figure 24 below.

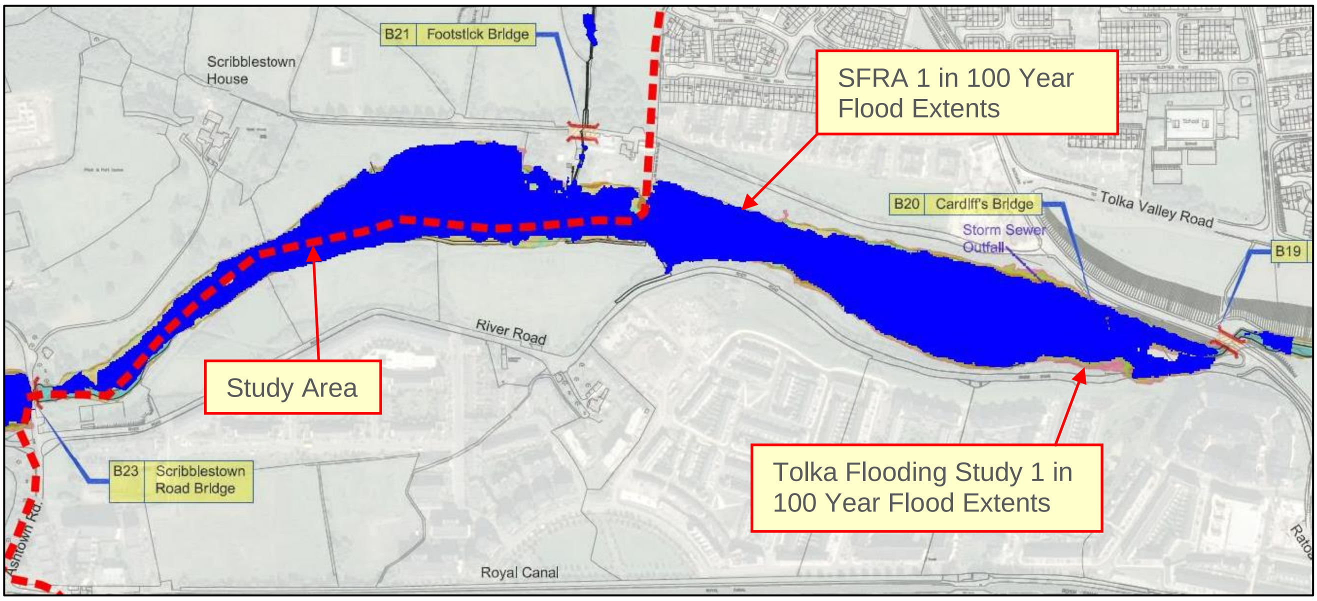


Figure 24 - 1 in 100 year Fluvial Flood Extent Comparison at Downstream Extent

Overall, there is a relatively good fit between the Tolka Flooding Study flood extents and the modelled flood extents on the River Tolka. There are some areas, particularly in the upstream section of the River Tolka model where the extent of flooding is less than that shown on the Tolka Flooding Study mapping. This difference in extent could be due to several reasons. This may be due to the type of hydraulic model that was utilised during the Tolka Flooding Study, which is likely to have been a 1D model only as it was modelled in 2002-2003. A 1D model is likely to over-estimate the extent of flooding and hence the water levels as it does not fully account for the volume of storage provided in the flood plain how the flood waters are conveyed overland.

The Scribblestown Stream model shows some isolated areas of out of bank flooding that is not shown on the Tolka Flooding Study mapping. This may be due to the extent of the watercourse cross sections and where the top of bank levels were taken in the Tolka Flooding Study.

The model is deemed to provide acceptable results to determine the fluvial flood risk to the study area.

6.3.4. Model Sensitivity

Model sensitivity was carried out to assess the sensitivity of the simulation to changes in base parameters. The 1 in 100 year present day flood event was used to carry out the sensitivity testing. Variation in the manning roughness value was tested in this study.

The downstream boundary may also have an impact on the extent of flooding, however the hydraulic model extends approximately 1km beyond the study area boundary and therefore any variation is likely to have a negligible impact on the extent of flooding at this location.

6.3.4.1. Manning Roughness

The Manning's roughness value plays an important part in how easily the water flows in the watercourse. It is important to test how the model reacts to variations in the roughness parameter to ensure it still produces robust and reasonable results even with variations in the Manning's value. Therefore a 20% increase was applied to all channel cross sections within the hydraulic model.

Increasing the roughness value by 20% causes an increase of approximately 0.05m - 0.18m along the watercourses with a maximum increase in flood level of 0.290m at cross section S-07. This increase was localised to a single location on the left bank. There is also an increase of 0.275m at cross section S-04, which is immediately upstream of the bridge at Rathoath Road. There is little or no discernible impact on the extent of flooding throughout the modelled reaches.

Figure 25 below shows the area with the greatest increase in flood extent due to a 20% increase in channel roughness. Overall, variation in the river channel roughness has an insignificant impact on the extent of flooding.

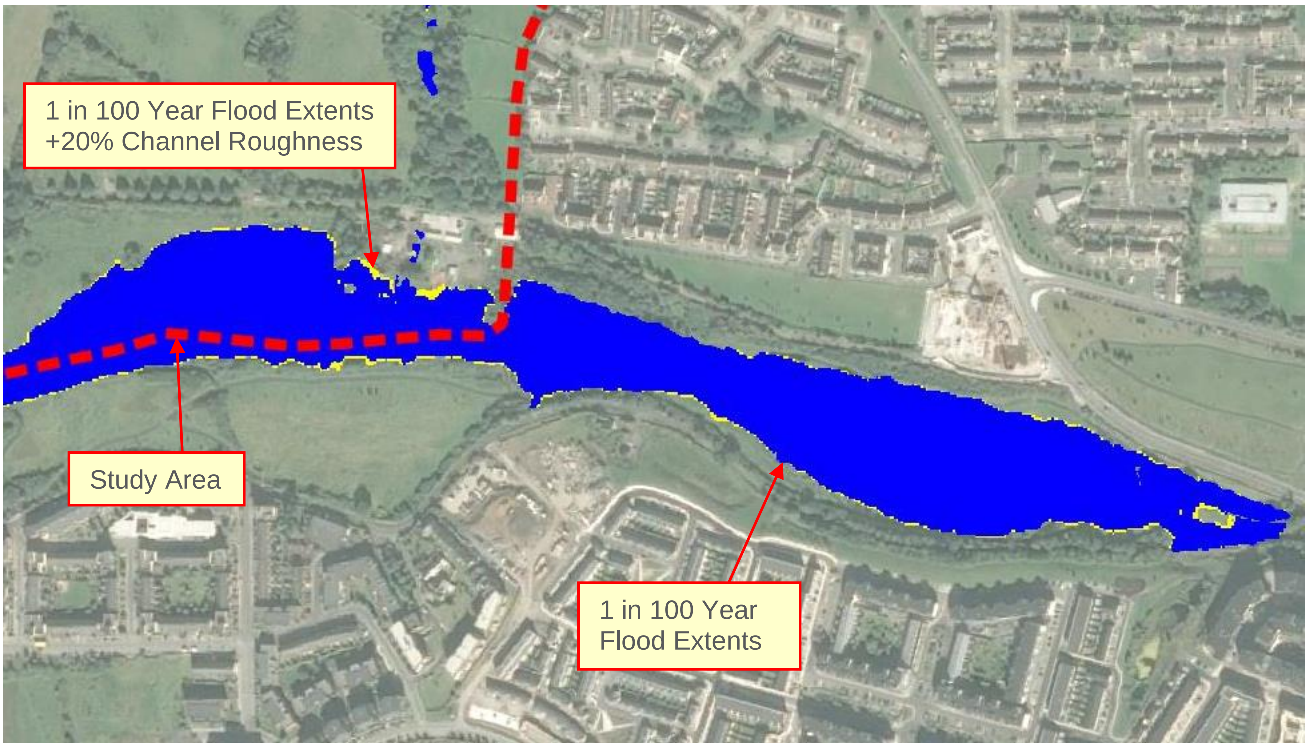


Figure 25 – 1% AEP Fluvial Flood Extents due to 20% increase in channel roughness

6.3.5. Assumptions and Limitations of Modelling

A hydraulic model has been developed to translate the many complex processes which occur within a catchment during a flood event. As with any hydraulic model assumptions were necessary to produce a reasonable, robust and cost-effective result. The following are the main assumptions used in the development of this model:

- The terrain model (OSI LiDAR data, topographic survey data and river survey data) accurately represents the surface elevation within the catchment and no significant changes to ground levels have occurred since the data was collected.
- The roughness variable does not vary with time.
- The opening of all structures is assumed to be free of any blockage or obstructions.

The main limitations of the modelling are:

- Model verification based on Tolka Flooding Study mapping and is likely a 1D model only, which potentially over-estimates the extent of flooding.

6.3.6. Discussion of Results

6.3.6.1. Current Day Scenario Results

The results of the hydraulic modelling show that the primary fluvial flood risk to the study area is from the River Tolka located in the southern section of the study area as illustrated below in Figure 26. Flood depths in this area are in the range of between 0.012m to 2.106m during the 1 in 100 year flood event and between 0.011m to 2.874m during a 1 in 1000 year flood event. There is limited out of bank flooding in the Scribblestown Stream during a 1 in 100 year or 1 in 1000 year current day fluvial flood event.

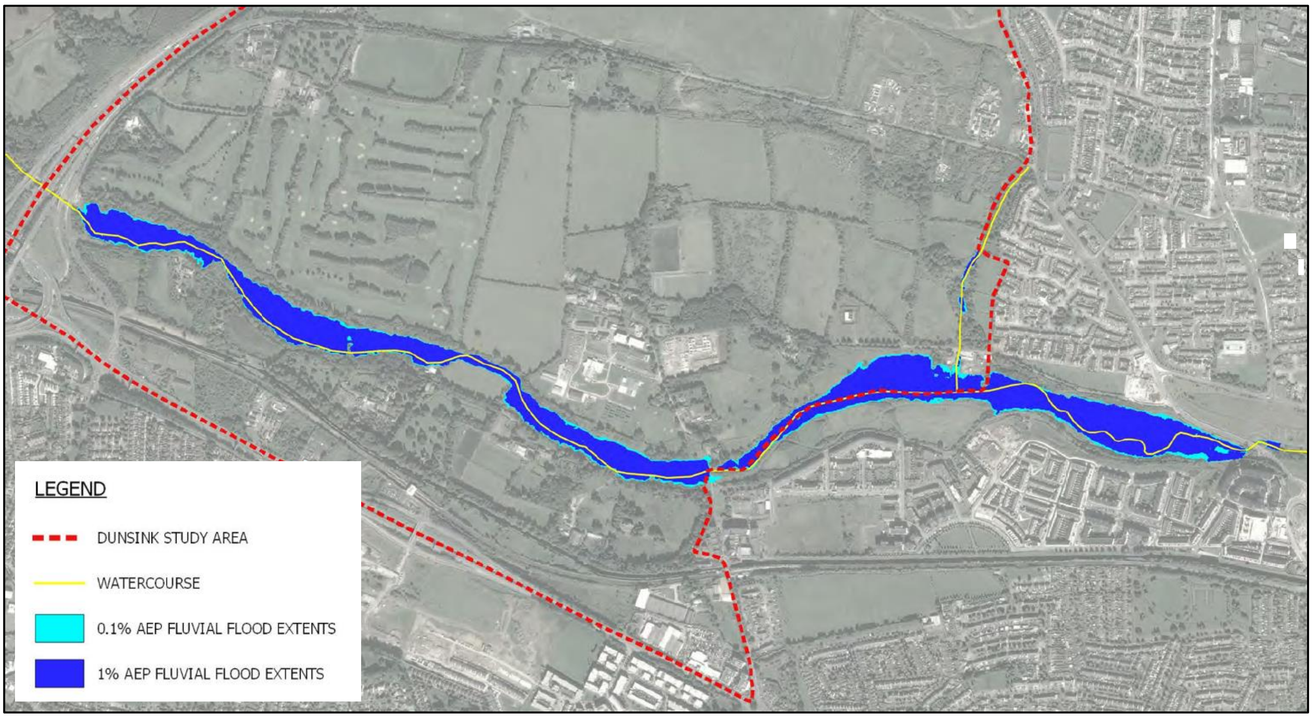


Figure 26 - Current Day Fluvial Flood Extents

6.3.6.2. Climate Change Scenario Results

As discussed above in Section 6.3.1.3 the impacts of climate change have also been assessed by applying a 20% increase and 30% increase to the flows, which represent the MRFS and HEFS respectively.

During the MRFS flood depths in this area are in the range of between 0.018m to 2.57m during the 1 in 100 year flood event and between 0.011m to 3.20m during a 1 in 1000 year flood event. Water levels throughout the watercourses increased by an average of 0.279m during the 1 in 100 year flood event and by an average of 0.290 during a 1 in 1000 year flood event from the current day scenario. As illustrated below in Figure 27 this results in a small increase in flood extents.

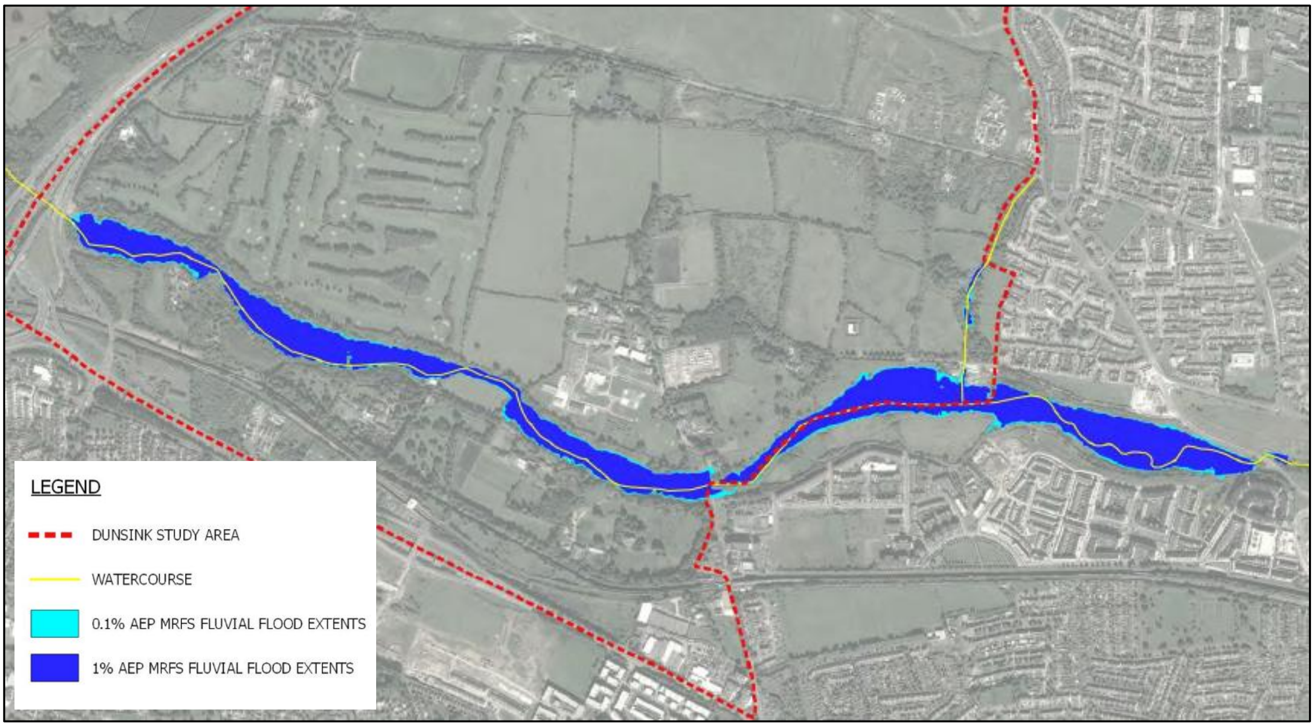


Figure 27 - MRFS Fluvial Flood Extents

During the HEFS flood depths in this area are in the range of between 0.010m to 3.267m during the 1 in 100 year flood event and between 0.010m to 3.762m during a 1 in 1000 year flood event. Water levels throughout the watercourses increased by an average of 0.668m during the 1 in 100 year flood event and by an average of 0.449 during a 1 in 1000 year flood event from the current day scenario. As illustrated below in Figure 28 this results in a small increase in flood extents.

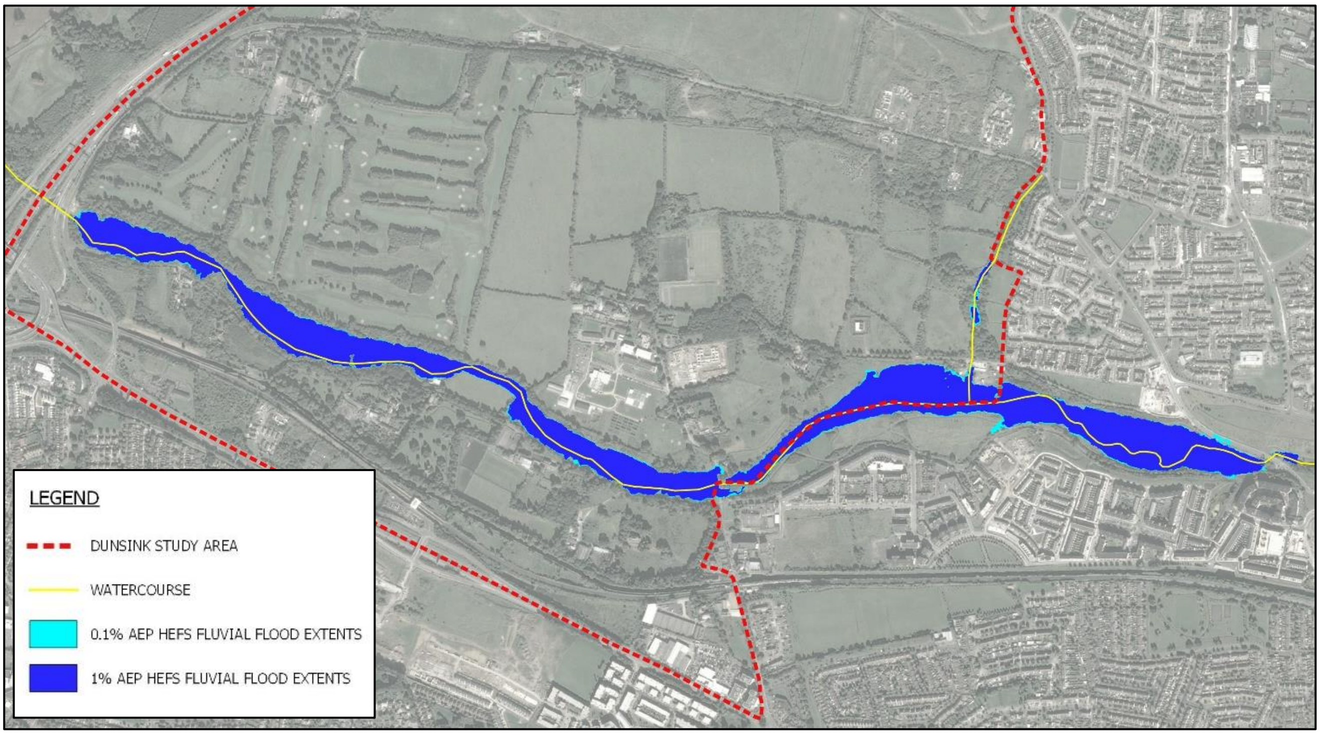


Figure 28 - HEFS Fluvial Flood Extents

A copy of the fluvial flood maps is included in Appendix E.

6.3.6.3. Blockage Scenarios Results

The potential effects of a blockage were assessed at five locations along the two watercourses, which are illustrated below in Figure 29. A 50% blockage was applied to each structure individually during a 1 in 100 year current scenario flood event. Two of the bridges on the River Tolka have been excluded from the blockage analysis (S-14 and S-03). The bridge at S-14 is a single span bridge with five flood relief box culverts. These structures are unlikely to become significantly blocked. The bridge at S-03 is also a single span bridge that is located 965m downstream of the site and unlikely to become significantly blocked or have any impact on flood levels at the study area.

Figure 29 - Blockage Locations

Blockage Scenario B1

At cross section structure S-31 there is a two arch bridge on the River Tolka. A blockage scenario was tested by reducing the bridge opening by 50%. Running the model with the blockage applied to this bridge resulted in a 0.297m increase in water levels directly upstream of the structure. There is no significant increase in the extent of flooding as a result of the blockage, therefore blockage of this bridge does not pose a significantly increased flood risk to the study area.

Blockage Scenario B2

At cross section structure S-22 there is a two arch bridge on the River Tolka. A blockage scenario was tested by reducing the bridge opening by 50%. Running the model with the blockage applied to this bridge resulted in a 0.303m increase in water levels directly upstream of the structure. There is no significant increase in the extent of flooding as a result of the blockage, therefore blockage of this bridge does not pose a significantly increased flood risk to the study area.

Blockage Scenario B3

At cross section structure S-06 there is a three arch bridge on the River Tolka. A blockage scenario was tested by reducing the bridge opening by 50%. Running the model with the blockage applied to this bridge resulted in a 0.052m increase in water levels directly upstream of the structure. There is no significant increase in the extent of flooding as a result of the blockage, therefore blockage of this bridge does not pose a significantly increased flood risk to the study area.

Blockage Scenario B4

At cross section structure S-54 there is a box culvert on the Scribblestown Stream. A blockage scenario was tested by reducing the culvert opening by 50%. Running the model with the blockage applied to this culvert resulted in a 0.403m increase in water levels directly upstream of the structure. There is no significant increase in the extent of flooding as a result of the blockage, therefore blockage of this culvert does not pose a significantly increased flood risk to the study area.

Blockage Scenario B5

At cross section structure S-52 there is a box culvert on the Scribblestown Stream. A blockage scenario was tested by reducing the culvert opening by 50%. Running the model with the blockage applied to this culvert resulted in a 0.303m increase in water levels directly upstream of the structure. There is no increase in the extent of flooding as a result of the blockage as the increase in water level is contained within the channel, therefore blockage of this culvert does not pose an increased flood risk to the study area.

6.4. Pluvial Flood Risk

6.4.1. Rainfall Data

The following sections present an analysis and assessment of the estimated 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) pluvial flood event within the catchment boundary of the study area. Rainfall data is required for the 2d hydraulic model to be capable of deriving pluvial flood extents.

As part of this study rainfall data was obtained from the Met Eireann Depth-Duration-Frequency (DDF) rainfall tables and from the OPW Flood Studies Update (FSU) Rainfall DDF module for this area of Dublin. Three storm durations including 3, 6 and 9 hours were selected to determine the critical duration of the study area catchment for the 1 in 100 year event. This analysis determined the 3 hour rainfall event as being the critical duration for the catchment.

The 1 in 100 year and 1 in 1000 year rainfall depths for a 3 hour duration are summarised in Table 6-14 below.

Return Period	3 Hour Rainfall Depths (mm)
1 in 100 year event	52.7
1 in 1000 year event	92.8

Table 6-14: Rainfall Depths

The rural loss model methodology described in the OPW 'National Pluvial Screening Project Report – November 2010' was implemented into the model. The site is covered by Soil Type 2 while has an infiltration rate of 6.75 mm/hour. With a 3 hour storm duration applied to the pluvial model the total losses applied to the rainfall event is 20.25mm, see Table 6-15 below.

Return Period	Rainfall Depths (mm)
1 in 100 year 3 hour event	32.5
1 in 1000 year 3 hour event	72.6

Table 6-15: Rainfall depths with rural losses applied

To obtain a time series of the rainfall data a hyetograph was developed using the FSSR unit in Flood Modeller. This unit calculates a hyetograph based on a series of catchment descriptors for a given rainfall depth using the FSR method, which is built into the FSSR unit in Flood Modeller. A depth of 5mm depression storage was applied to the resulting hyetograph to account for the depression storage within the catchment. Due to the rural nature of the study area catchment a winter rainfall profile was applied to the catchment. The 1 in 100 year and 1 in 1000 year hyetographs applied to the 2d surface water model in Flood Modeller are illustrated below in Figure 30.

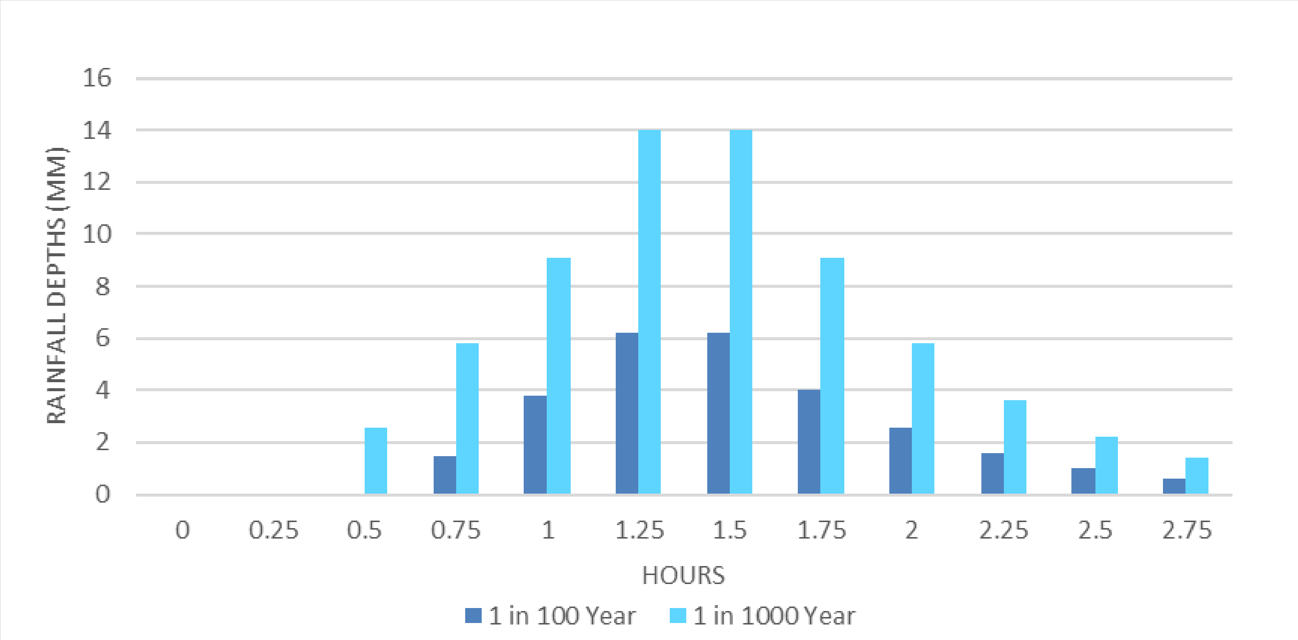


Figure 30 – Rainfall Hyetographs

6.4.2. Building the 2D Surface Water Model

A 2D Surface Water Runoff Model was developed to provide a more accurate determination of pluvial flood risk to the study area by assessing surface water runoff characteristics over a significant precipitation event, determine areas where surface water ponding and flooding may occur and to determine the depth and volume of any pluvial flooding within the study area.

The 2D hydraulic surface water model developed is based on an appropriate computer software package that utilises a detailed Digital Terrain Model (DTM) of the site area and surrounding lands and specific extreme rainfall data discussed above in Section 6.4.1 while the surface water contributing area is shown above in Figure 20.

For this study, the Flood Modeller 2D computer model was employed. Roughness values are used to allow the model to determine the nature of the flood flows across the surface of the ground as surface water will flow more slowly over vegetated areas in comparison to hard-standing areas. The roughness values applied to the hydraulic model are summarised below in Table 6-16 below.

Location	Roughness Value	Description
Flood Plain – General	0.035	Long Grasses
Brush	0.07	Dense brush in winter
Brush	0.1	Dense brush in summer
Buildings	0.30	Impact of Buildings on overland flow

Table 6-16: Applied 2D Model Roughness Values

The model was developed based on a resolution cell size of 4m x 4m.

6.4.3. Climate Change

The impact of future climate change on the pluvial flows have also been accounted for within in the 2d surface water model. Requirements for climate change allowances are as per OPW 'Flood Risk Management Climate Change Sectoral Adaptation Plan'. As with the fluvial flood risk assessment the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS) were tested. The MRFS scenario recommends a 20% increase to extreme rainfall depths while the HEFS recommends a 30% increase. The results of which are illustrated below in Table 6-17.

Return Period	Rainfall Depths (mm) - Current day	Rainfall Depths (mm) - MRFS	Rainfall Depths (mm) - HEFS
1 in 100 year rainfall event with 3 hour duration	52.7	63.24	68.51
1 in 1000 year rainfall event with 3 hour duration	92.8	111.36	120.64

Table 6-17: Rainfall depths for climate change scenarios

The rural loss model methodology was then applied to the MRFS and HEFS rainfall depths for the 1 in 100 year and 1 in 1000 year events, see Table 6-18 below.

Return Period	Rainfall Depths (mm) - Current day	Rainfall Depths (mm) - MRFS	Rainfall Depths (mm) - HEFS
1 in 100 year rainfall event with 3 hour duration	32.5	43.0	48.3
1 in 1000 year rainfall event with 3 hour duration	72.6	91.1	100.4

Table 6-18: Rainfall depths for climate change scenarios with rural losses applied

These peak rainfall depths were then used to derive Hyetographs following the same methodology described above in Section 6.4.1.

6.4.4. Model Verification

A search for historic pluvial flood information was performed to validate the model results. However, limited historic data was available in the area in relation to reported pluvial or surface water flooding. There are no suitable rainfall gauges located within the study area and the past pluvial flood events tool on the floodinfo.ie website does not show any past flood event extents.

6.4.5. Assumptions and Limitations of Modelling

The following are the main assumptions used in the development of this model.

- The terrain model (LiDAR data, topographic survey data and river survey data) accurately represents the surface elevation within the catchment and no significant changes to ground levels have occurred since the data was collected.
- The roughness does not vary with time.
- The impact of hydraulic structures in the watercourse area assumed not to have any impact on pluvial flooding.

The main limitations of the modelling are:

- There is limited flood history in the area to calibrate and verify the model results
- There are no rainfall gauges within the catchment to determine the accuracy of the hydrological inflows.

6.4.6. Discussion of Results

6.4.6.1. Results processing

To produce clear and meaningful maps the results of the pluvial model were processed. Flood depths smaller than 0.05m were removed from the final maps to show the major flow pathways within the study area.

6.4.6.2. Current Day Scenario Results

The results of the pluvial modelling show that a portion of the study area is at risk from surface water flooding during both the 1 in 100 year and 1 in 1000 year event. The surface water flow paths are from the higher topography in the central and northern lands of the study area towards the southern and eastern boundaries where the River Tolka and Scribblestown Stream are located as illustrated below in Figure 31.

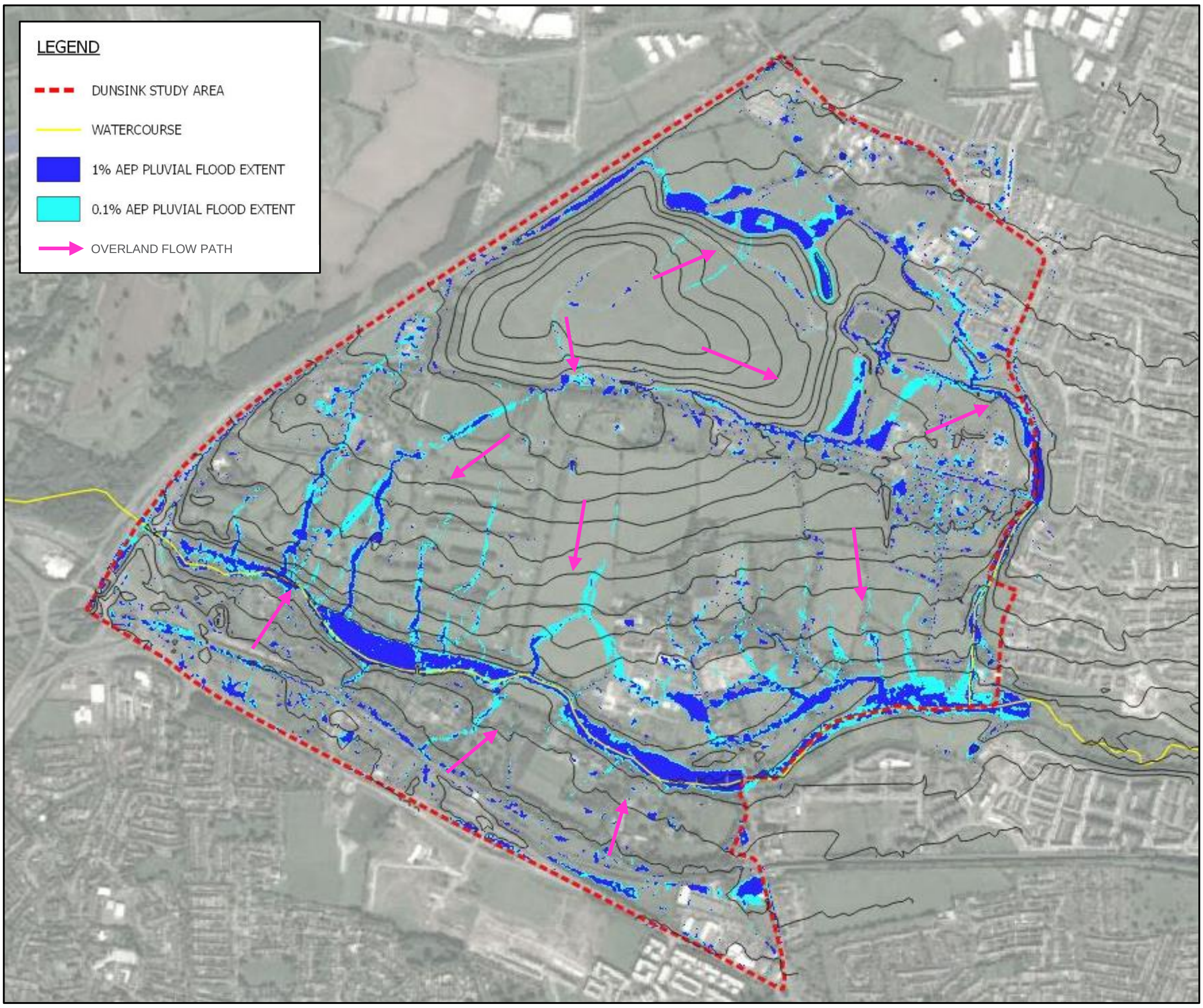


Figure 31 - Pluvial flood extents during 1 in 100 year event and 1 in 1000 year event current day

The most significant pluvial flooding is in the southern area where the River Tolka is located. This surface water is likely to be captured by the River Tolka and conveyed downstream, therefore the extent of pluvial flooding shown in this location is likely to be over-stated. Similarly, there is flooding identified along the eastern boundary where the Scribblestown Stream is located. Surface water would be captured by this channel and conveyed downstream, therefore the extent of flooding shown in this located is also likely to be over-stated.

6.4.6.3. Climate Change

As discussed above in Section 6.4.3 the impacts of climate change have also been assessed by applying a 20% increase and 30% increase to the peak rainfall depths, which represent the MRFS and HEFS respectively.

As illustrated below in Figure 32 there is a small increase in pluvial flood extents, however no significant differences are noted when compared to the current day 1 in 100 year and 1 in 1000 year events.

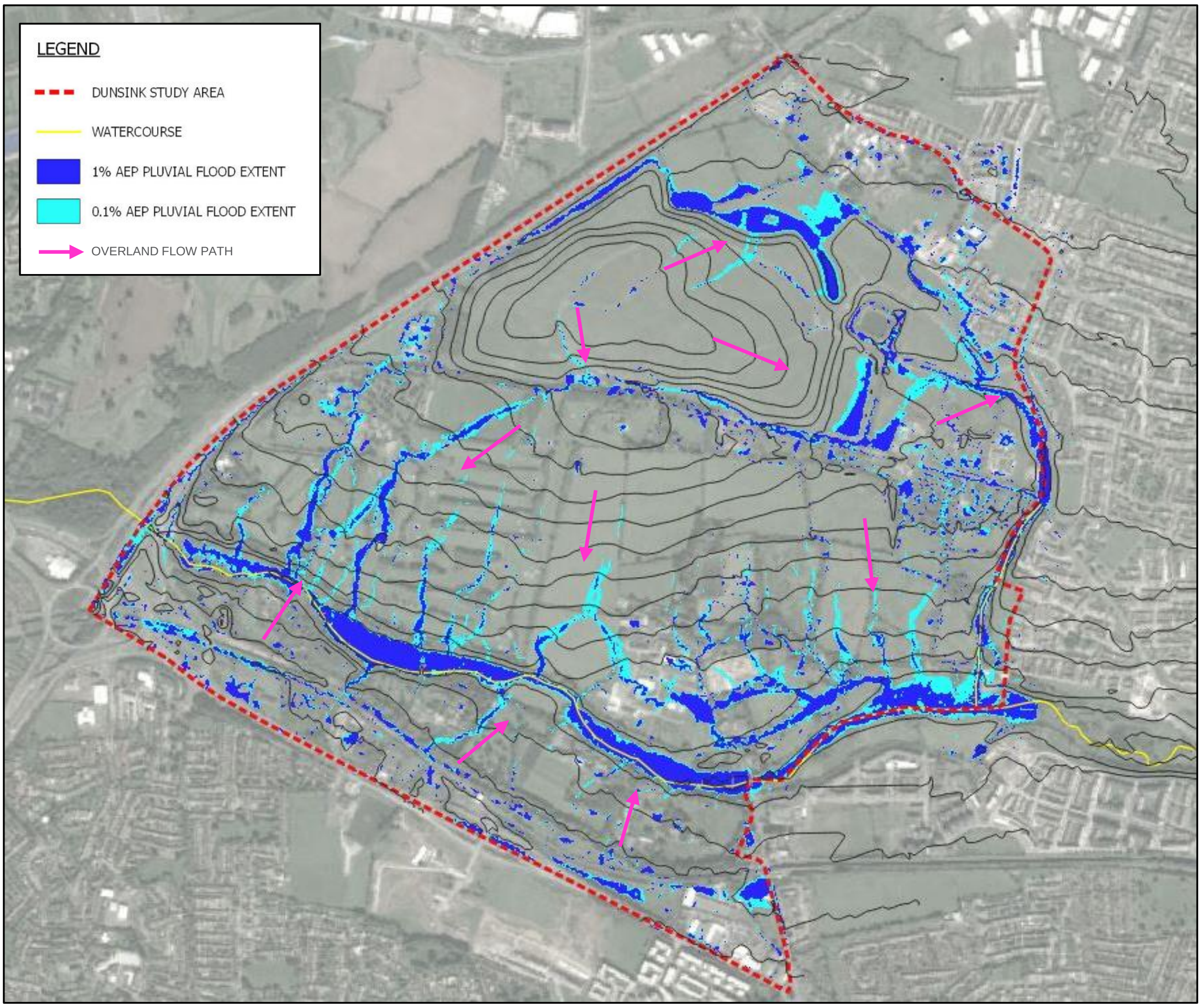


Figure 32 - Pluvial flood extents during 1 in 100 year event and 1 in 1000 year event MRFS

During the 1 in 100 year and 1 in 1000 year HEFS, there is a small increase in the extent of pluvial flood extents from the current scenario results as illustrated below in Figure 33.

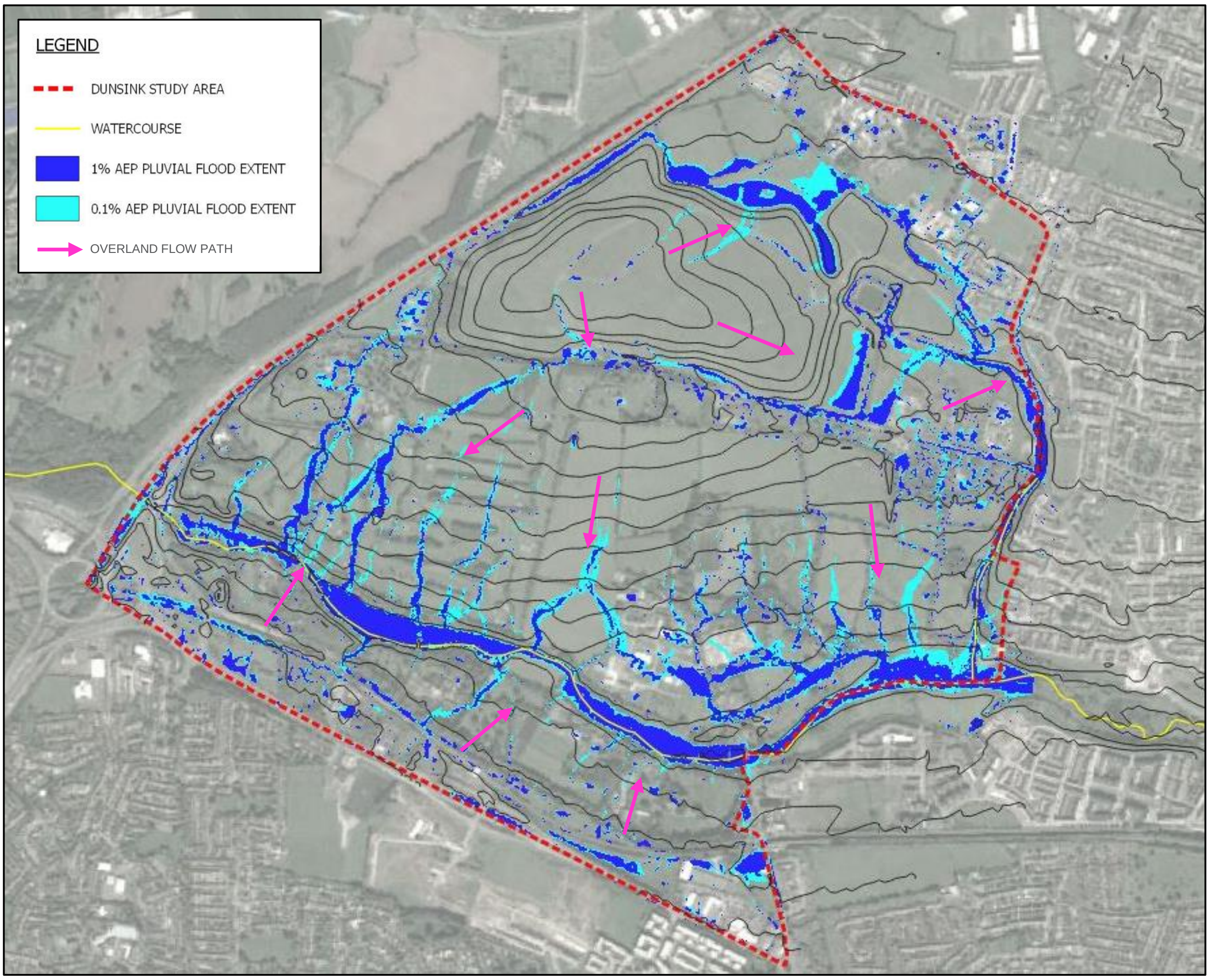


Figure 33 - Pluvial flood extents during 1 in 100 year event and 1 in 1000 year event HEFS

Overall, the effects of climate change cause the surface water flow paths to become more defined and result in a slight increase to flood extents throughout the study area in comparison to current day flood extents. Pluvial flood extent and depth maps for each return period and including allowances for climate change are included in Appendix F.

7. Conclusions and Recommendations

7.1. Conclusions

In consideration of the findings of this flood risk assessment and analysis the following conclusions and are made in respect to the Dunsink Study Area.

7.1.1. Fluvial Flood Risk

The southern section of the study area is at risk of fluvial flooding from the River Tolka during a 1% AEP and 0.1% AEP event for the current scenario, MRFS and HEFS. The Scribblestown Stream does not pose a significant flood risk to the study area for the current scenario, MRFS and HEFS. The predicted flood depth ranges from the River Tolka are illustrated below in Table 7-1.

Return Period	Flood Depths (m)
1 in 100 year– Present day	0.012 – 2.106
1 in 100 year– MRFS	0.018 – 2.57
1 in 100 year– HEFS	0.010 – 3.267
1 in 1000 year– Present day	0.011 – 2.874
1 in 1000 year– MRFS	0.011 – 3.200
1 in 1000 year– HEFS	0.010 – 3.762

Table 7-1 - Flood Depths from River Tolka

No other significant fluvial flood mechanisms exist which may result in flooding to the study area.

7.1.2. Pluvial Flood Risk

A portion of the study area is also at risk from surface water runoff from an extreme rainfall event. During both the 1 in 100 year and the 1 in 1000 year extreme rainfall event surface water runoff is routed through the study area. The effects of climate change on the pluvial flood risk result in an increase in the extents and depths during both the MRFS and the HEFS.

7.2. Development Land Use Zoning Compatibility

The Fingal County Council Development Plan 2017 – 2023 zoning for the plan area is shown in Figure 6 above (Section 2.5) and the majority is zoned as 'OS – Open Space', followed by lesser areas zoned as 'HA – High Amenity', 'HT – High Technology', 'CI – Community Infrastructure', 'RS – Residential' and also 'GB – Green Belt'.

The fluvial flood risk analysis above shows a potential 1 in 100 year and 1 in 1000 year flood extent within the study area from the River Tolka in the southern area. As described above in Section 3.5 the 1 in 100 year fluvial event equates to a Flood Zone A where only water compatible development is permitted without a Justification Test. Highly vulnerable development and less vulnerable development is deemed not to be suitable within Flood Zone A. The 1 in 1000 year event equates to a Flood Zone B where both water compatible development and Less vulnerable development is permitted. Highly vulnerable development requires a Justification Test to assess the suitability of the proposed development. Where any proposed development is located within Flood Zone A or Flood Zone B a Justification Test will be required, except for water compatible development.

A portion of the study area is at risk from pluvial flooding during both the 1 in 100 and 1 in 1000 year extreme rainfall events. There are no restrictions to land use regarding pluvial flood risk from the OPW guideline. However, it is stated within the OPW guidelines that the core objective of the guidelines is to avoid inappropriate development in areas at risk of flooding and avoid new developments which could increase flood risk elsewhere, including that which may arise from surface water run-off. Therefore, any proposed development within the plan area should be flood resilient and not increase flood risk to surrounding properties or lands.

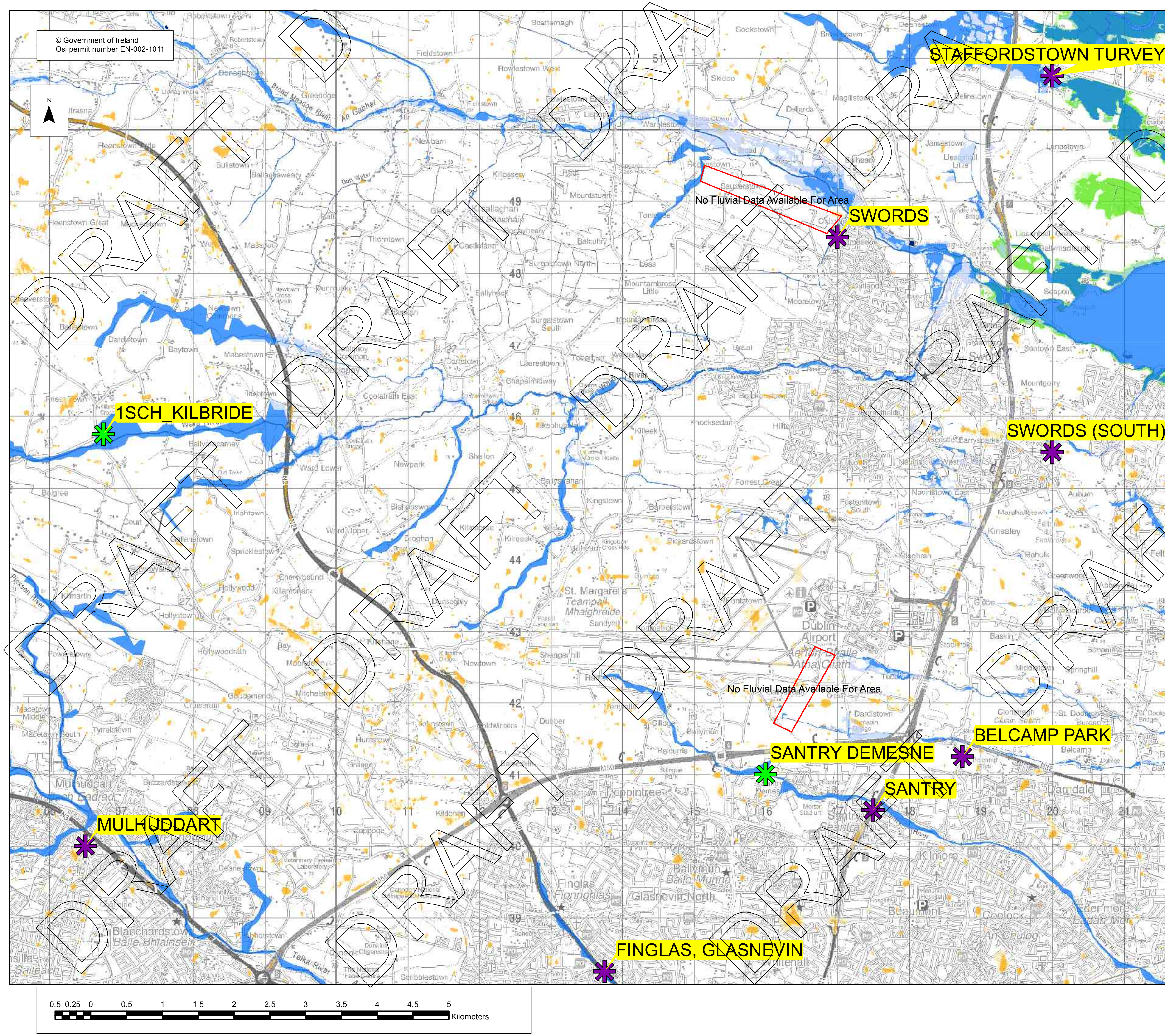
7.3. Recommendations

The following recommendations are made in respect to any proposed development within the Dunsink study area.

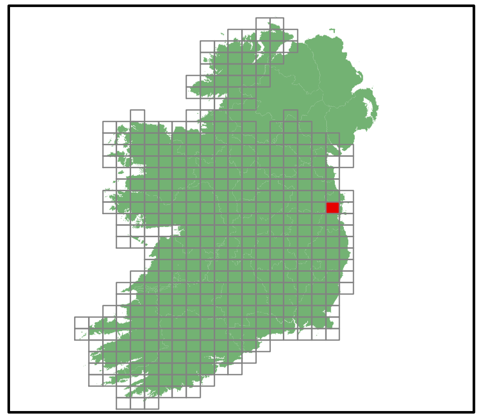
1. Development proposed within the plan area should be subject to a site-specific flood risk assessment in accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009'. Proposals within areas of flood risk shall apply the Justification Test to ensure development is appropriate and does not cause an increased flood risk elsewhere.
2. Existing watercourses shall be maintained and protected as open channels as these provide a drainage conveyance function. Any proposals to alter the route or dimensions of these shall be subject to detailed hydraulic modelling as part of a site specific flood risk assessment.
3. A riparian corridor of 10m minimum offset from each side of the channel banks on the Scribblestown Stream shall be provided.
4. A riparian corridor of 30m minimum offset from each side of the channel banks on the River Tolka shall be provided.
5. Proposed development within the study area should take site drainage into consideration to ensure no excess runoff is generated which could result in an increased flooding risk to surrounding lands.

Appendices

Appendix A. PRFA Mapping



Location Plan :



Legend:

Flood Extents

- Fluvial - Indicative 1% AEP (100-yr) Event
- Fluvial - Extreme Event
- Coastal - Indicative 0.5% AEP (200-yr) Event
- Coastal - Extreme Event
- Pluvial - Indicative 1% AEP (100-yr) Event
- Pluvial - Extreme Event
- Groundwater Flood Extents
- Lakes / Turloughs

PFRA Outcomes

- Probable Area for Further Assesment
- Possible Area for Further Assesment

Important User Note:

The flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location. Information on the purpose, development and limitations of these maps is available in the relevant reports (see www.cfram.ie). Users should seek professional advice if they intend to rely on the maps in any way.

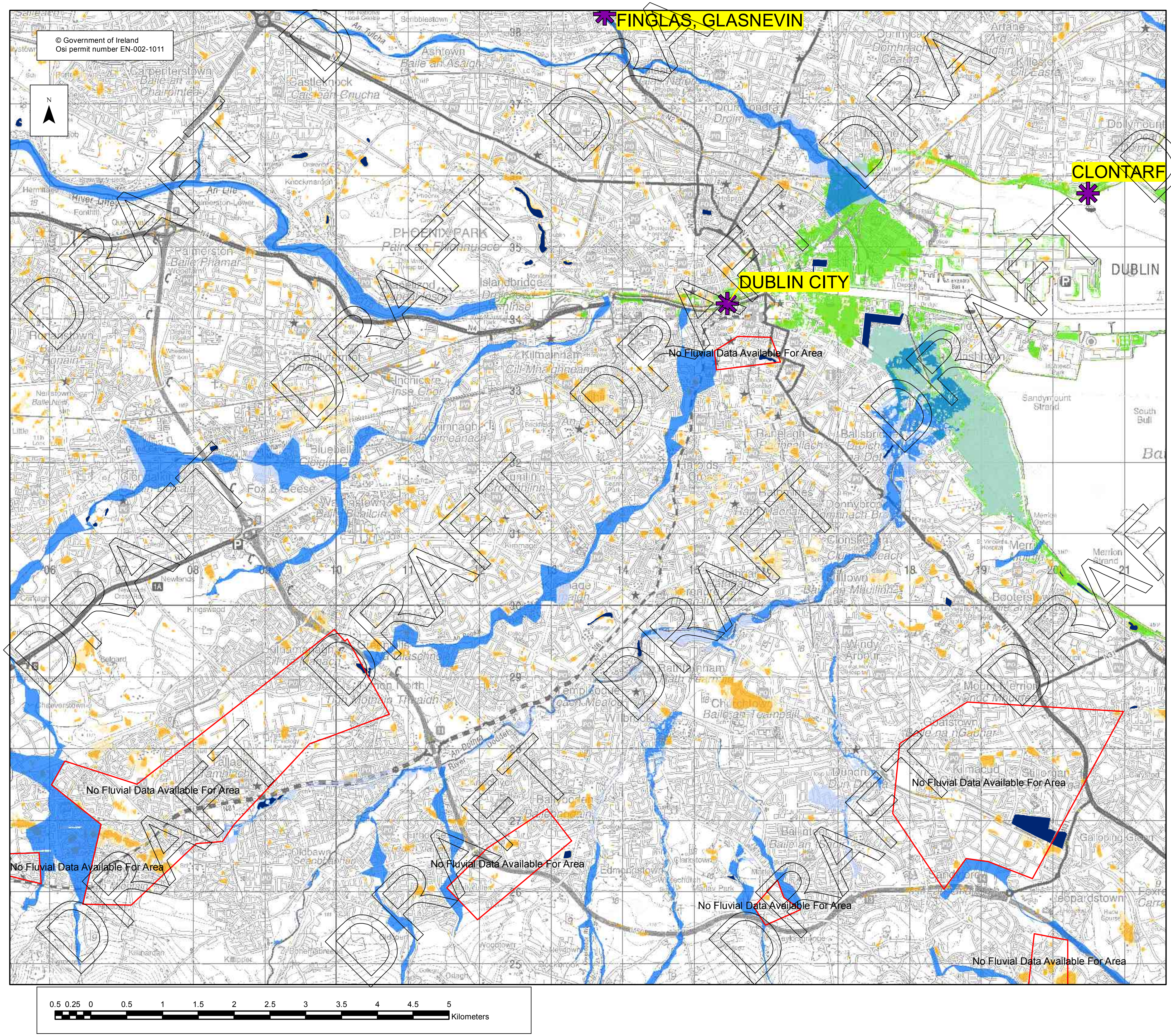
If you believe that the maps are inaccurate in some way please forward full details by contacting the OPW (refer to PFRA Information leaflets or 'Have Your Say' on www.cfram.ie).

Office of Public Works
Jonathon Swift Street
Trim
Co Meath
Ireland

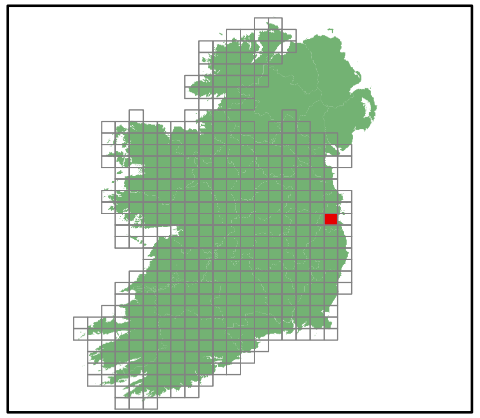
Project :
PRELIMINARY FLOOD RISK ASSESSMENT (PFRA)

Map :
PFRA Indicative extents and outcomes
- Draft for Consultation

Figure By : PJW	Date : July2011
Checked By : MA	Date : July 2011
Figure No. : 2019 / MAP / 256 / A	Revision 0
Drawing Scale : 1:50,000	Plot Scale : 1:1 @ A3



Location Plan :



Legend:

Flood Extents

- Fluvial - Indicative 1% AEP (100-yr) Event
- Fluvial - Extreme Event
- Coastal - Indicative 0.5% AEP (200-yr) Event
- Coastal - Extreme Event
- Pluvial - Indicative 1% AEP (100-yr) Event
- Pluvial - Extreme Event
- Groundwater Flood Extents
- Lakes / Turloughs

PFRA Outcomes

- Probable Area for Further Assesment
- Possible Area for Further Assesment

Important User Note:

The flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location. Information on the purpose, development and limitations of these maps is available in the relevant reports (see www.cfram.ie). Users should seek professional advice if they intend to rely on the maps in any way.

If you believe that the maps are inaccurate in some way please forward full details by contacting the OPW (refer to PFRA Information leaflets or 'Have Your Say' on www.cfram.ie).

Office of Public Works
Jonathon Swift Street
Trim
Co Meath
Ireland

OPW

Project :
PRELIMINARY FLOOD RISK ASSESMENT (PFRA)

Map :
PFRA Indicative extents and outcomes
- Draft for Consultation

Figure By : PJW	Date : July2011
Checked By : MA	Date : July 2011
Figure No. : 2019 / MAP / 238 / A	Revision 0
Drawing Scale : 1:50,000	Plot Scale : 1:1 @ A3

Appendix B. Past Flood Events

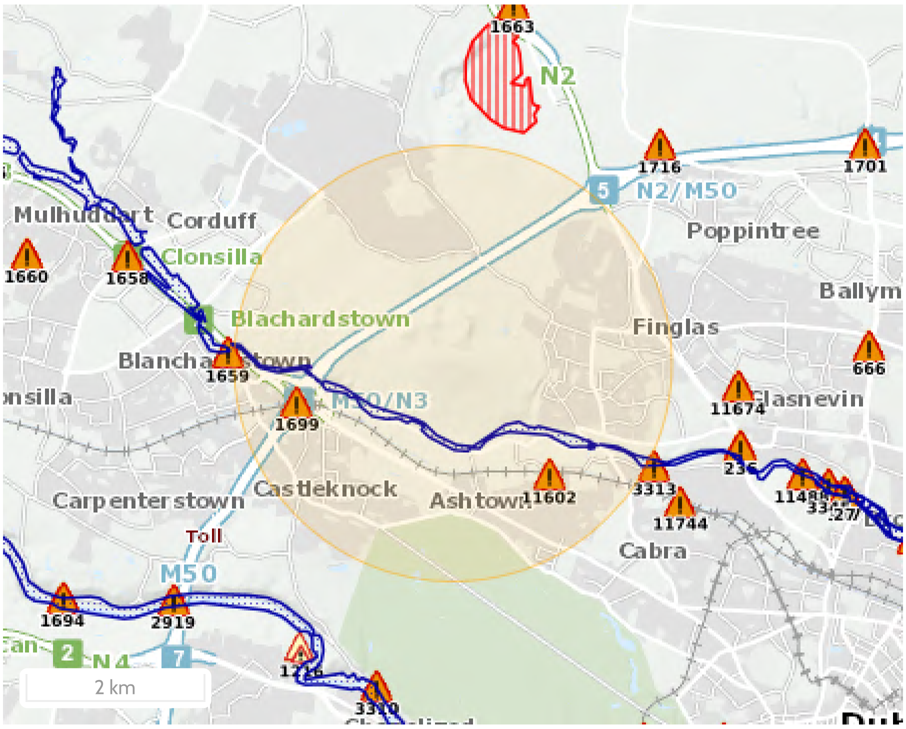
Past Flood Event Local Area Summary Report

OPW Oifig na nOibreacha Poiblí Office of Public Works

Report Produced: **20/9/2021 15:01**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

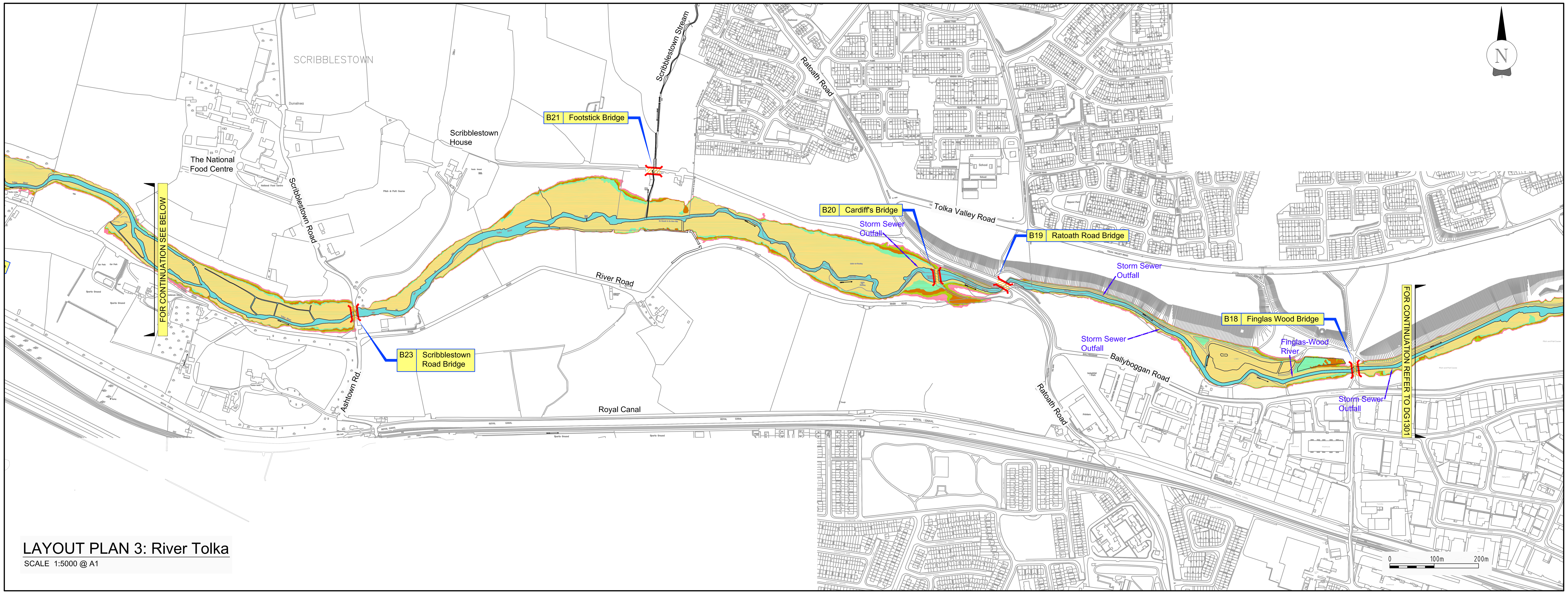
- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

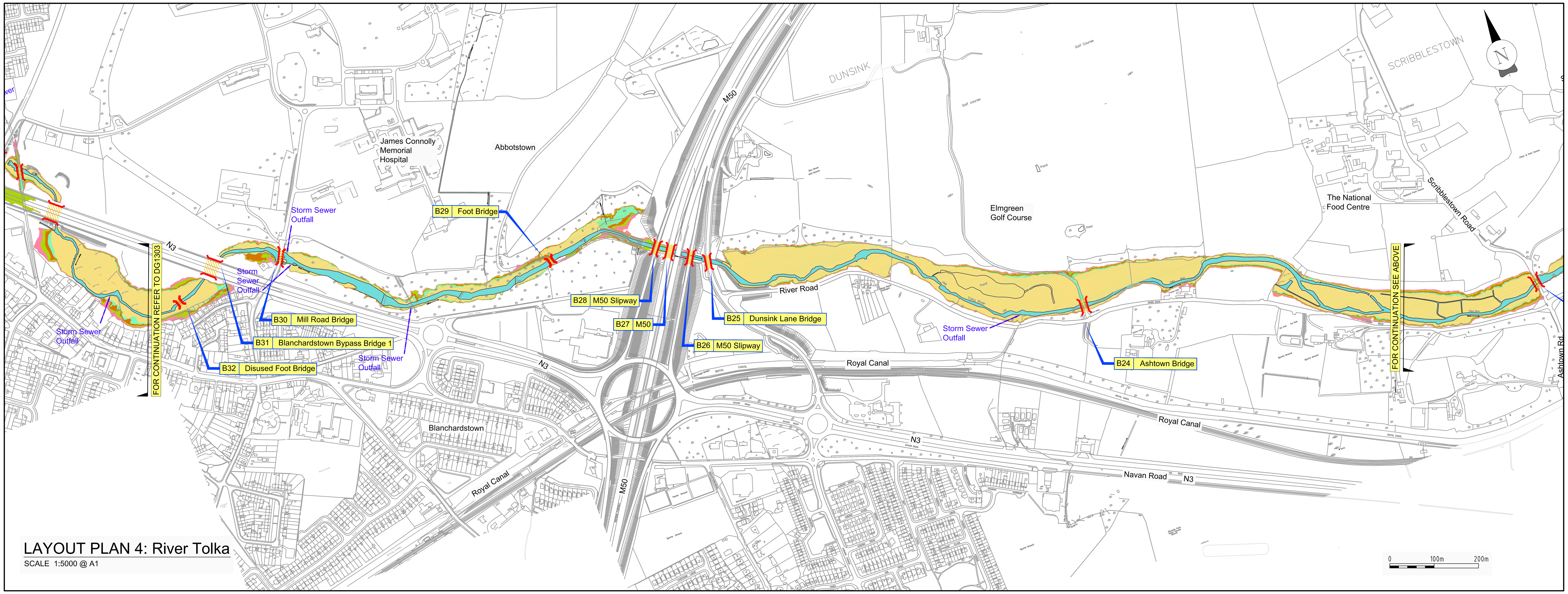
3 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Tolka November 2002 (ID-5)	13/11/2002	Area
	Additional Information: Reports (143) Press Archive (13)		
2.	M50 at the N3 Interchange Nov 2002 (ID-1699)	13/11/2002	Exact Point
	Additional Information: Reports (1) Press Archive (0)		
3.	Flooding at Glendhu Park, Cabra, Dublin 7 on 24th Oct 2011 (ID-11602)	24/10/2011	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		

Appendix C. River Tolka Flooding Study Map



LAYOUT PLAN 3: River Tolka
SCALE 1:5000 @ A1



LAYOUT PLAN 4: River Tolka
SCALE 1:5000 @ A1

Notes/Legend

GENERAL NOTES

1. This drawing is the property of M.C. O'SULLIVAN. It is a confidential document and must not be copied, used, or its contents divulged without prior written consent.
2. All levels are referred to Ordnance Survey Datum, Malin Head.
3. DO NOT SCALE, use figured dimensions only, if in doubt ask.

PLAN KEYS

FLUVIAL FLOOD EXTENTS

TOLKA RIVER

10 YEAR

25 YEAR

50 YEAR

100 YEAR

200 YEAR

BRIDGE

Storm Sewer Outfall — *STORM WATER ENTRY POINT*

No.	Date	By	Amendments
F01	23/12/03	SB GG	FINAL ISSUE
D01	29/07/03	SB GG	Issue for Draft

Client

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

Dublin City Council,
Design Division (Water),
68-70 Marrowbone Lane,
Dublin 8.

Michael Phillips,
City Engineer

RPS MCOS
Block 2,
West Pier Business Campus,
Old Dun Laoghaire Road,
Dun Laoghaire,
Co.Dublin

Dublin Drainage
A Strategic Study for Greater Dublin

Issued from: DUBLIN

Project

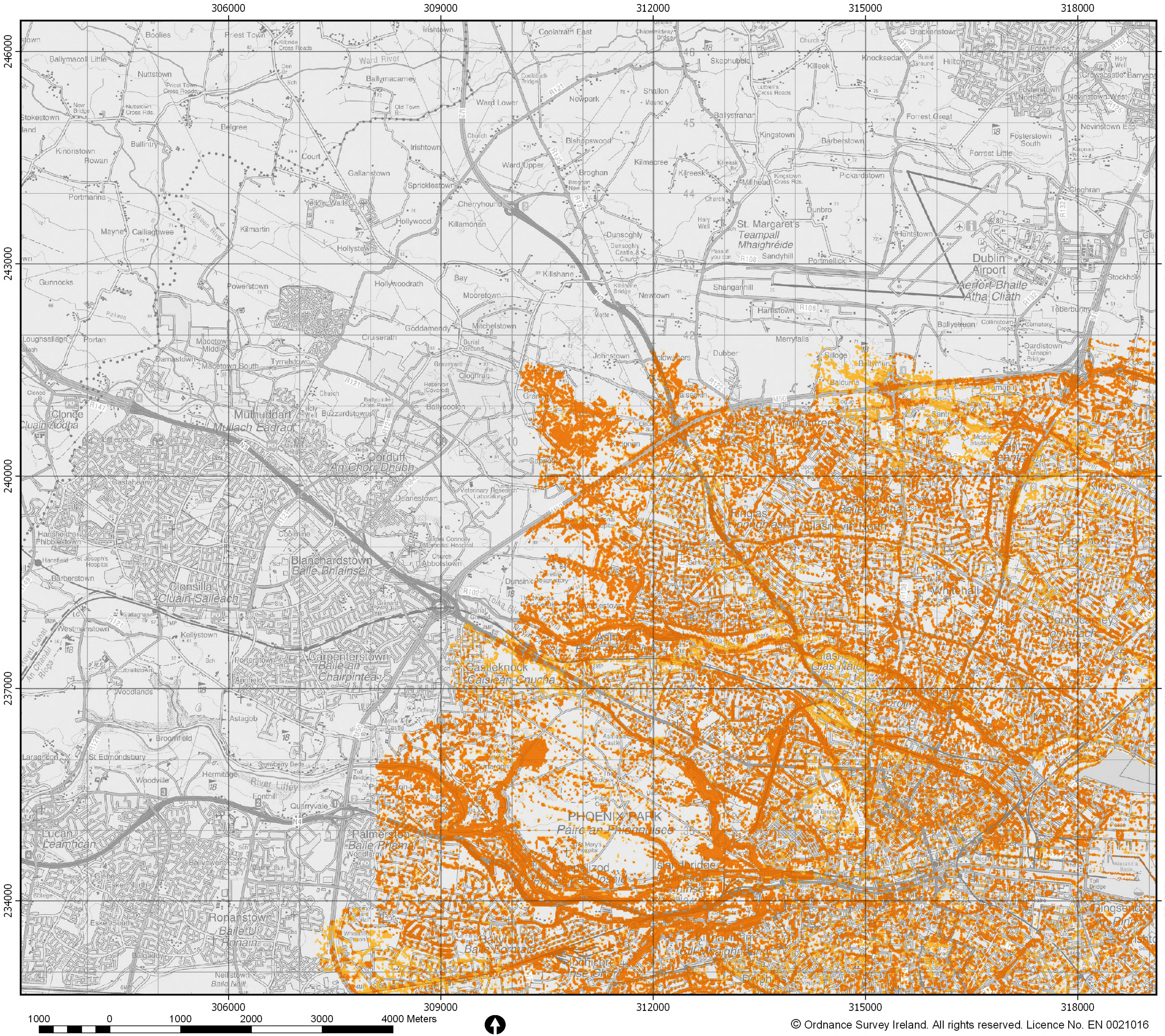
RIVER TOLKA FLOODING STUDY

Title

Existing Conditions
Flood Risk Maps
(Plan 3 & 4 of 10)

Drawn: B. Murray	File No: 074515001DG1302F01	
Chkd: S. Baigent	Job No: 074515001	
Appr: G. Gillespie	Drg. No: DG1302	Rev: F01
Scale: 1 : 5,000		
Date: July 2003		

Appendix D. Dublin Pluvial Flood Study Map



Location Plan:

LEGEND

- 10% AEP Pluvial
- 1% AEP Pluvial
- 0.5% AEP Pluvial

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

Comhairle Cathrach Bhaile Átha Cliath
Dublin City Council

The Office Of Public Works Jonathan Swift Street Trim Co. Meath	Dublin City Council Civic Offices Wood Quay Dublin 8

Project:
DUBLIN PLUVIAL STUDY (FloodResilienCity)

Map: **DUBLIN CITY - PLUVIAL FLOOD EXTENT MAP**

Map Type:	EXTENT - 180min Rainfall		
Source:	PLUVIAL		
Map Area:	URBAN		
Scenario:	CURRENT		
Drawn by:	IH	Date:	Aug - 2016
Checked by:	MC	Date:	Aug - 2016
Approved by:	JM	Date:	Aug - 2016

Map No.:
E09DCC_EXPCD_F0_01

Revision: F0

Map Scale: 1:50,000 Plot Scale: 1:1 @ A3

Appendix E. Fluvial Flood Maps

DO NOT SCALE

A3

0 50 100150200250 m

100

LEGEND

DUNSINK STUDY AREA

WATERCOURSE

0.1% AEP FLUVIAL FLOOD EXTENTS

1% AEP FLUVIAL FLOOD EXTENTS

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP) &
1 IN 1000 YEAR (0.1% AEP)
FLUVIAL FLOOD EXTENTS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-100	A

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

LEGEND

- DUNSINK STUDY AREA
- WATERCOURSE

1% AEP FLUVIAL FLOOD DEPTHS

- 0 - 0.2500
- 0.2500 - 0.5000
- 0.5000 - 0.7500
- 0.7500 - 1.0000
- 1.0000 - 1.2500
- 1.2500 - 1.5000
- > 1.5000

A3

0 50 100150200250 m

DO NOT SCALE

File: IE2316-200 A

Date: 11/10/2021

Plotted by: NOM

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP)
FLUVIAL FLOOD DEPTHS

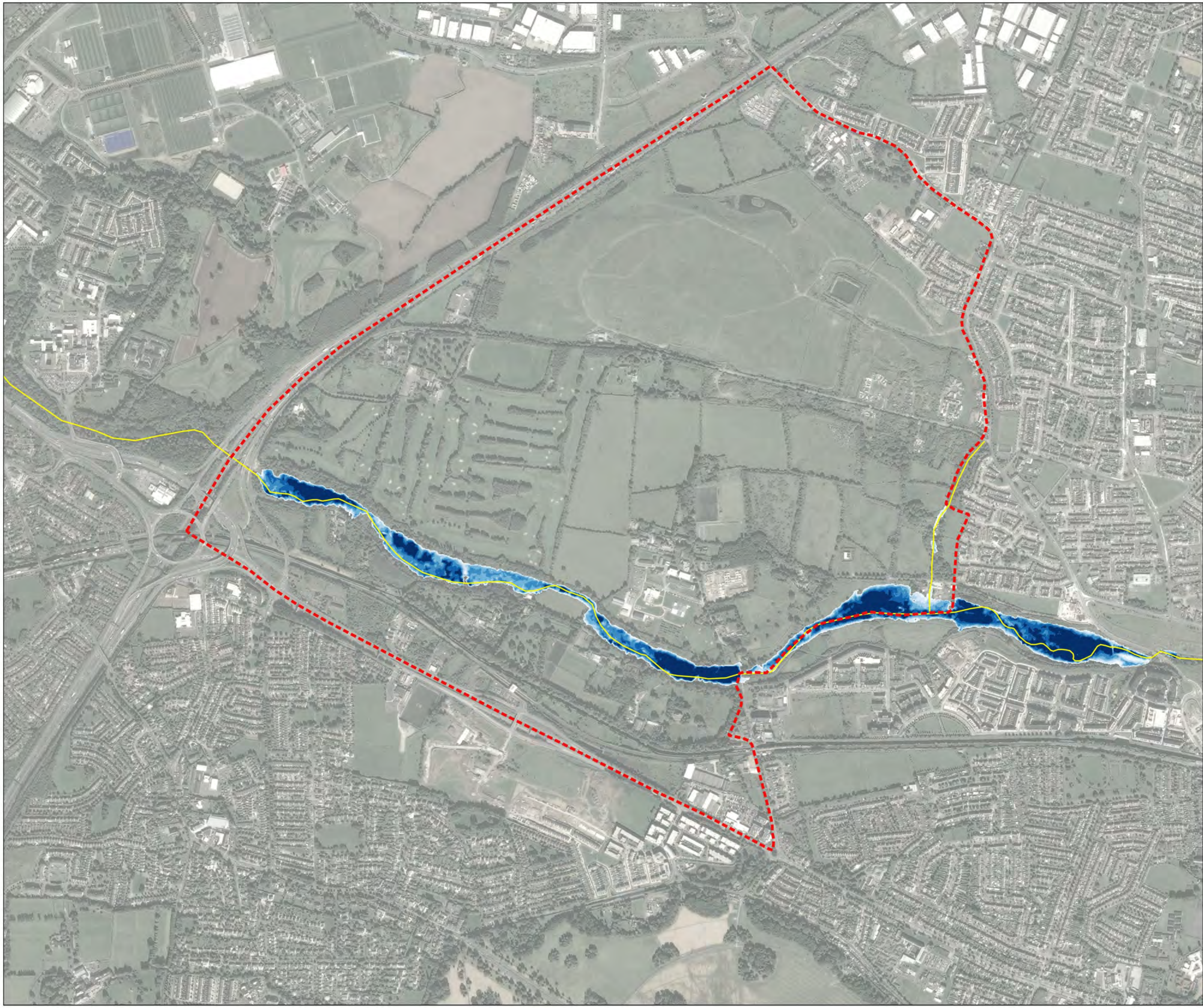
Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-101	A

DO NOT SCALE

A3

0 50 100150200250 m



LEGEND

DUNSINK STUDY AREA

WATERCOURSE

0.1% AEP FLUVIAL FLOOD DEPTHS

- 0 - 0.2500
- 0.2500 - 0.5000
- 0.5000 - 0.7500
- 0.7500 - 1.0000
- 1.0000 - 1.2500
- 1.2500 - 1.5000
- > 1.5000

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 1000 YEAR (0.1% AEP)
FLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-102	A

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

DO NOT SCALE

A3

0 50 100 150 200 250 m

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

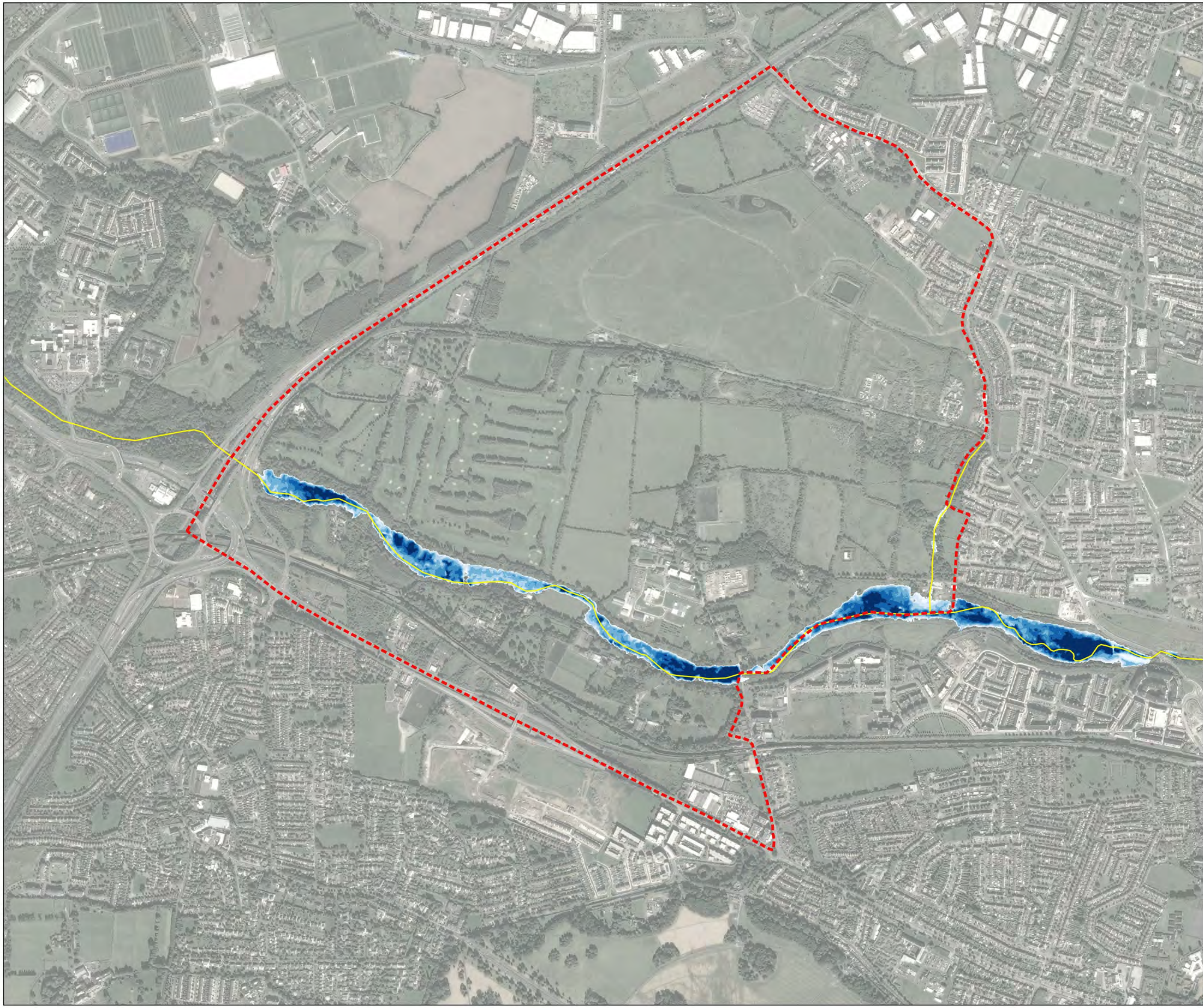
Client
FINGAL COUNTY COUNCIL

Project
DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title
1 IN 100 YEAR (1% AEP) &
1 IN 1000 YEAR (0.1% AEP)
MID-RANGE FUTURE SCENARIO
FLUVIAL FLOOD EXTENTS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-103	A



LEGEND

DUNSINK STUDY AREA

WATERCOURSE

1% AEP MRFS FLUVIAL FLOOD DEPTHS

- 0 - 0.2500
- 0.2500 - 0.5000
- 0.5000 - 0.7500
- 0.7500 - 1.0000
- 1.0000 - 1.2500
- 1.2500 - 1.5000
- > 1.5000

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP)
MID-RANGE FUTURE SCENARIO
FLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-104	A

A3

0 50 100150200250 m

DO NOT SCALE

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

LEGEND

DUNSINK STUDY AREA

WATERCOURSE

0.1% AEP MRFS FLUVIAL FLOOD DEPTHS

- 0 - 0.2500
- 0.2500 - 0.5000
- 0.5000 - 0.7500
- 0.7500 - 1.0000
- 1.0000 - 1.2500
- 1.2500 - 1.5000
- > 1.5000

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 1000 YEAR (0.1% AEP)
MID-RANGE FUTURE SCENARIO
FLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-105	A

A3

0 50 100150200250 m 100

DO NOT SCALE

File: IE2316 200 A
Date: 11/10/2021
Plotted by: NOM

LEGEND

- DUNSINK STUDY AREA
- WATERCOURSE
- 0.1% AEP HEFS FLUVIAL FLOOD EXTENTS
- 1% AEP HEFS FLUVIAL FLOOD EXTENTS

0 50 100 150 200 250 m

A3

DO NOT SCALE

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client
FINGAL COUNTY COUNCIL

Project
DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title
1 IN 100 YEAR (1% AEP) &
1 IN 1000 YEAR (0.1% AEP)
HIGH-END FUTURE SCENARIO
FLUVIAL FLOOD EXTENTS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-106	A

A3

0 50 100150200250 m

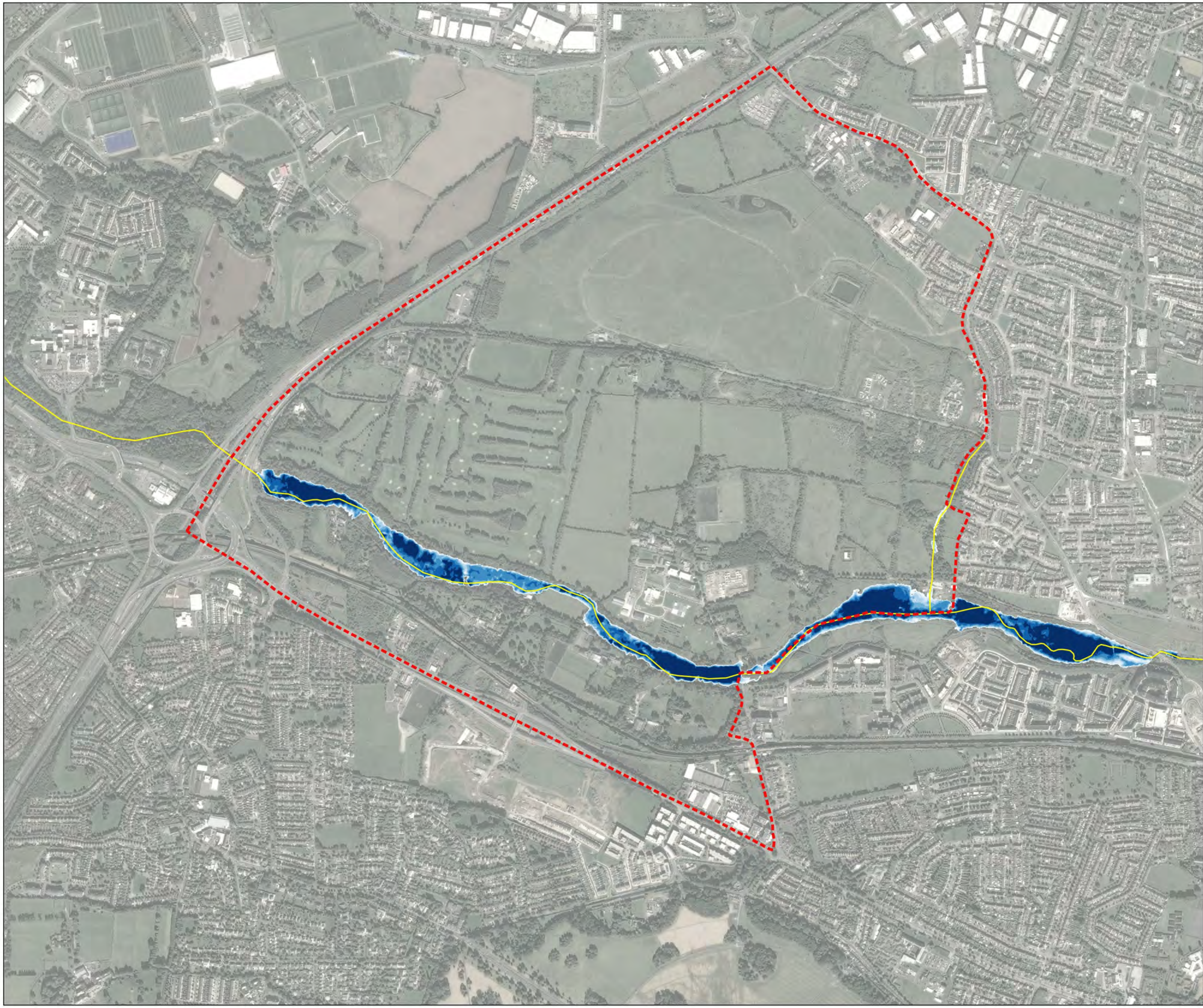
100

DO NOT SCALE

File: IE2316 200 A

Date: 11/10/2021

Plotted by: NOM



LEGEND

- DUNSINK STUDY AREA
- WATERCOURSE

1% AEP HEFS FLUVIAL FLOOD DEPTHS

- 0 - 0.2500
- 0.2500 - 0.5000
- 0.5000 - 0.7500
- 0.7500 - 1.0000
- 1.0000 - 1.2500
- 1.2500 - 1.5000
- > 1.5000

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

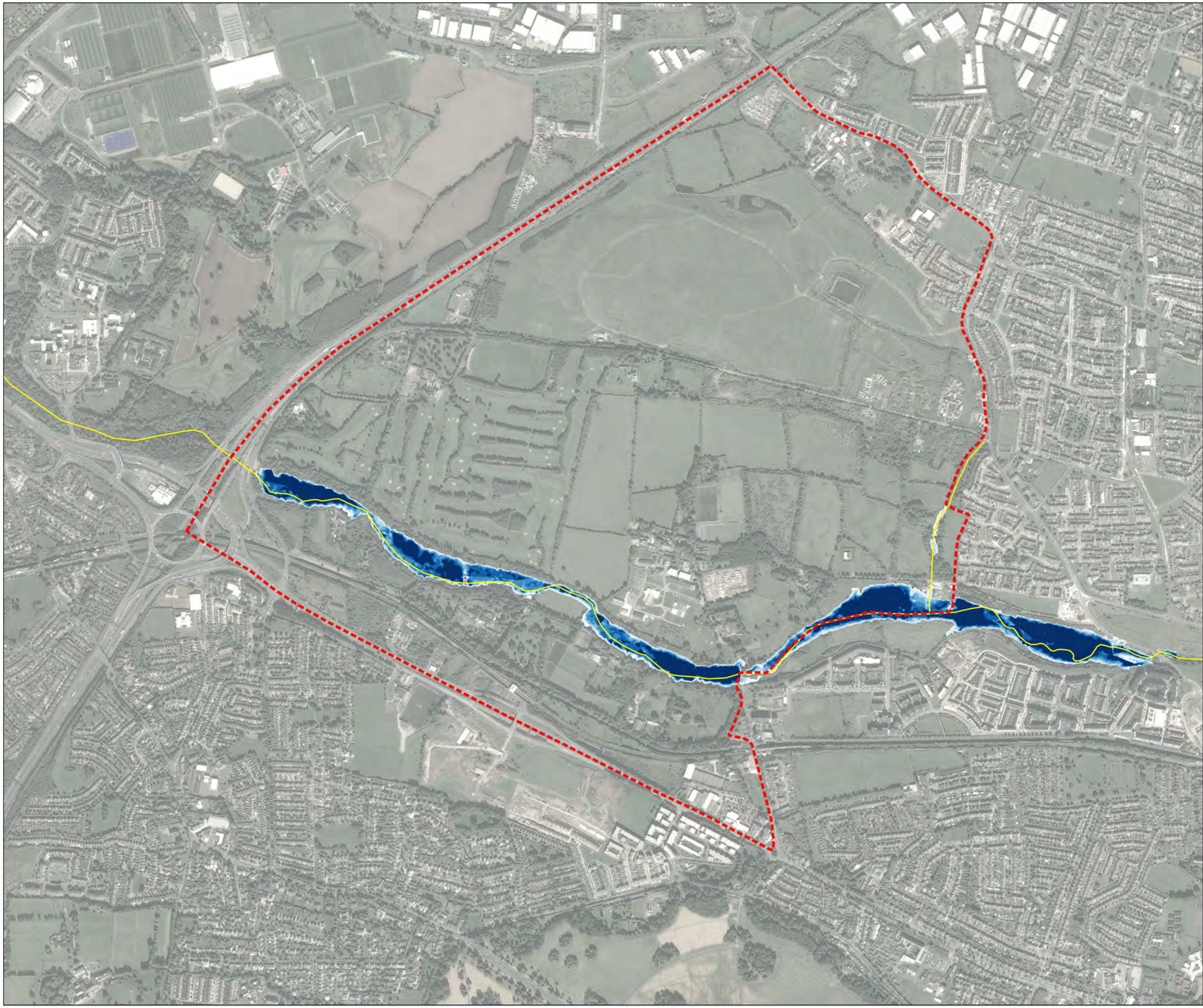
DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP)
HIGH-END FUTURE SCENARIO
FLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-107	A



LEGEND

DUNSINK STUDY AREA

WATERCOURSE

0.1% AEP HEFS FLUVIAL FLOOD DEPTHS

- 0 - 0.2500
- 0.2500 - 0.5000
- 0.5000 - 0.7500
- 0.7500 - 1.0000
- 1.0000 - 1.2500
- 1.2500 - 1.5000
- > 1.5000

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	14/10/21	NOM	PMS

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 1000 YEAR (0.1% AEP)
HIGH-END FUTURE SCENARIO
FLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 14/10/2021	Date 14/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-108	A

A3

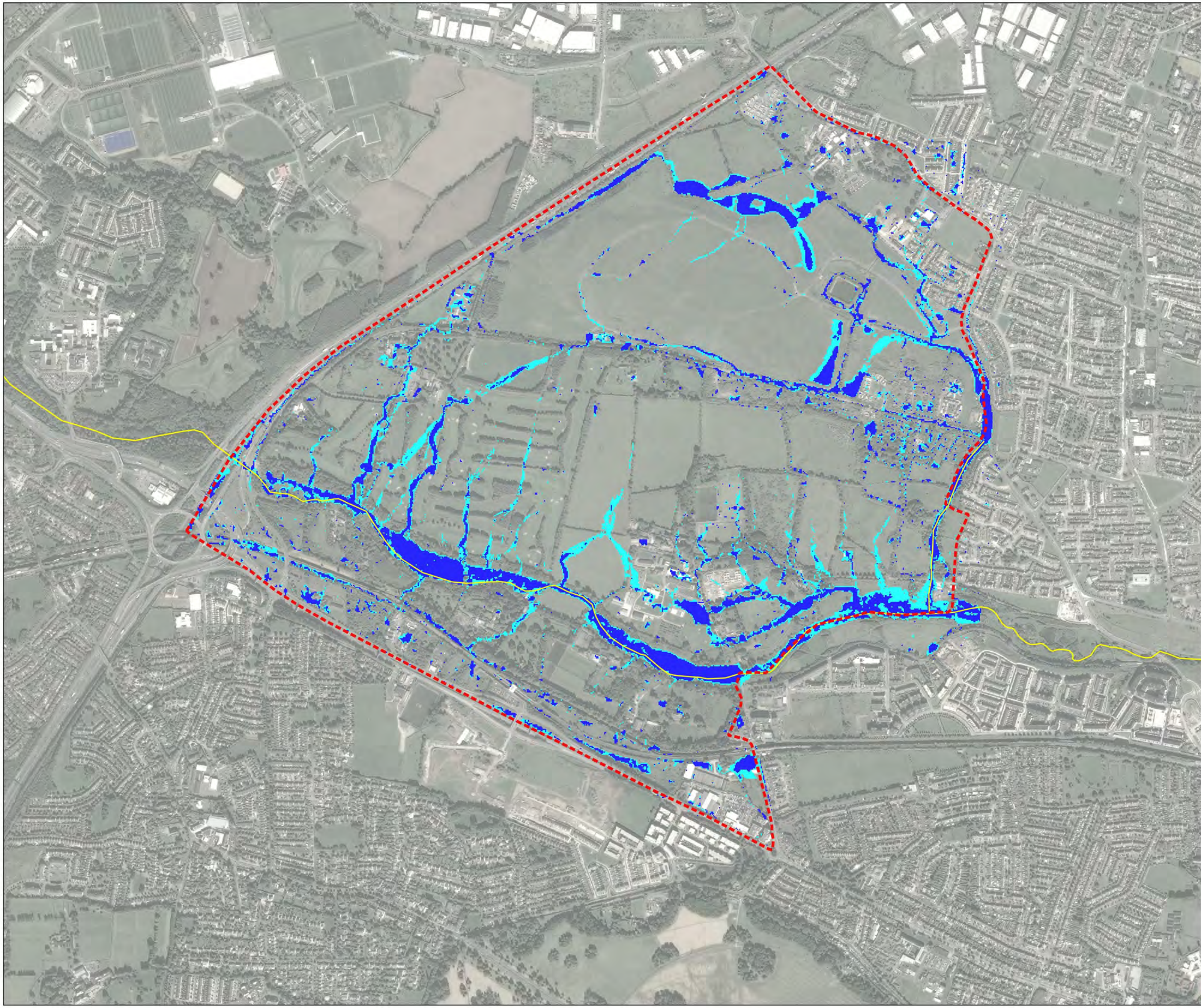
0 50 100150200250 m

100

DO NOT SCALE

File: IE2316 200 A
Date: 11/10/2021
Plotted by: NOM

Appendix F. Pluvial Flood Maps



LEGEND

DUNSINK STUDY AREA

WATERCOURSE

1% AEP PLUVIAL FLOOD EXTENT

0.1% AEP PLUVIAL FLOOD EXTENT

A3

0 50 100150200250 m

DO NOT SCALE

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP) &
1 IN 1000 YEAR (0.1% AEP)
PLUVIAL FLOOD EXTENTS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500.01744	NOM	MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-200	A

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

LEGEND

DUNSINK STUDY AREA

WATERCOURSE

1% AEP PLUVIAL FLOOD DEPTHS

0 - 0.2500

0.2500 - 0.5000

0.5000 - 0.7500

0.7500 - 1.0000

> 1.0000

DO NOT SCALE

A3

0 50 100150200250 m

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP)
PLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-201	A

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

DO NOT SCALE

A3

0 50 100150200250 m

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 1000 YEAR (0.1% AEP)
PLUVIAL FLOOD DEPTHS

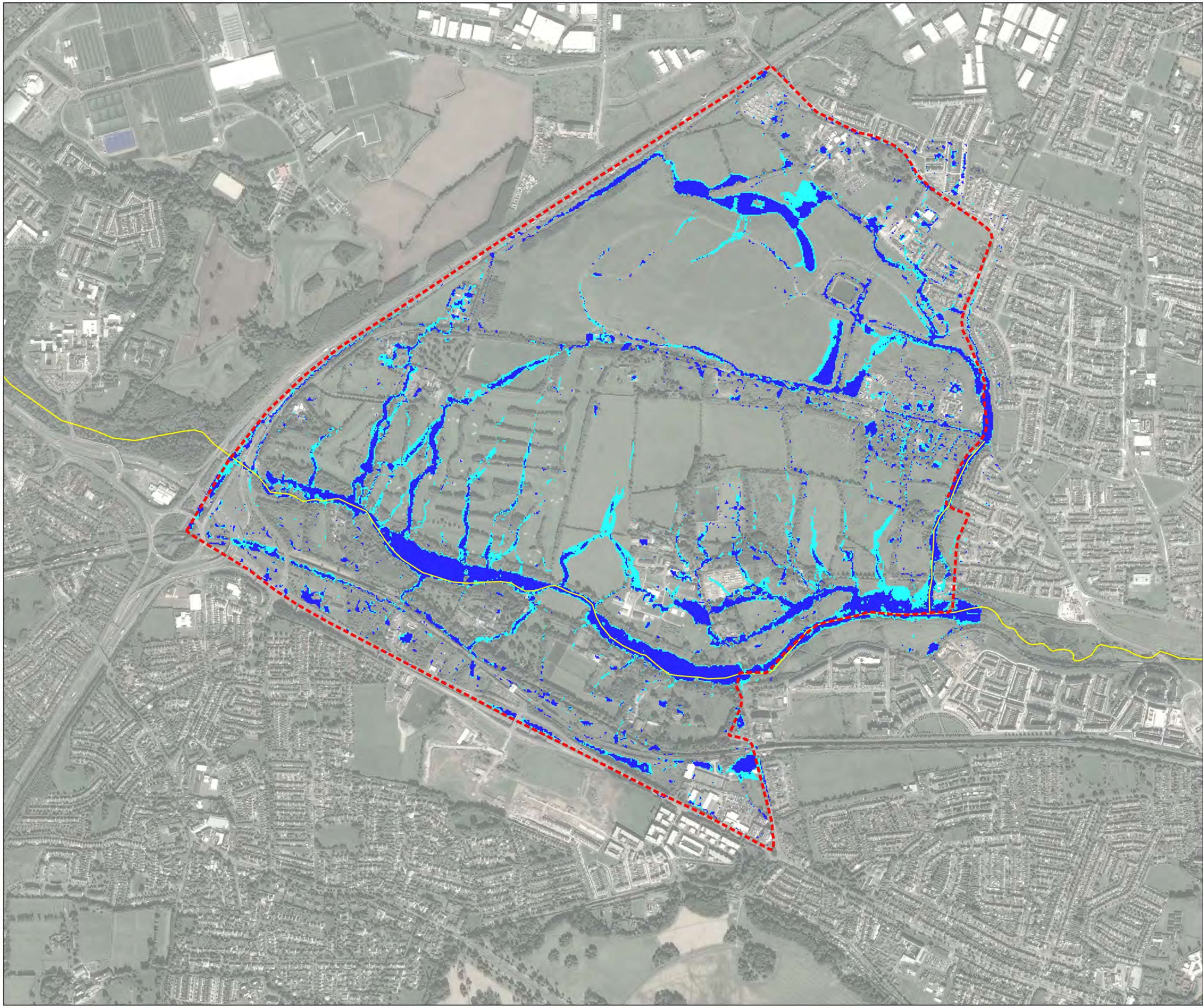
Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status: DRAFT

Drawing Number: IE2316-202

Rev: A

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM



LEGEND

DUNSINK STUDY AREA

WATERCOURSE

1% AEP MRFS PLUVIAL FLOOD EXTENT

0.1% AEP MRFS PLUVIAL FLOOD EXTENT

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP) &
1 IN 1000 YEAR (0.1% AEP)
MID-RANGE FUTURE SCENARIO
PLUVIAL FLOOD EXTENTS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500.01744	NOM	MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-203	A

A3 0 50 100150200250 m 100

DO NOT SCALE

File: IE2316 200 A
Date: 11/10/2021
Plotted by: NOM

DO NOT SCALE

A3

0 50 100150200250 m

LEGEND

DUNSINK STUDY AREA

WATERCOURSE

1% AEP MRFS PLUVIAL FLOOD DEPTHS

- 0 - 0.2500
- 0.2500 - 0.5000
- 0.5000 - 0.7500
- 0.7500 - 1.0000
- > 1.0000

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP) MRFS
PLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500		MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-204	A

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

A3

0 50 100150200250 m

DO NOT SCALE

File: IE2316 200 A
Date: 11/10/2021
Plotted by: NOM

LEGEND

DUNSINK STUDY AREA

WATERCOURSE

0.1% AEP MRFS PLUVIAL FLOOD DEPTHS

- 0 - 0.2500
- 0.2500 - 0.5000
- 0.5000 - 0.7500
- 0.7500 - 1.0000
- > 1.0000

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

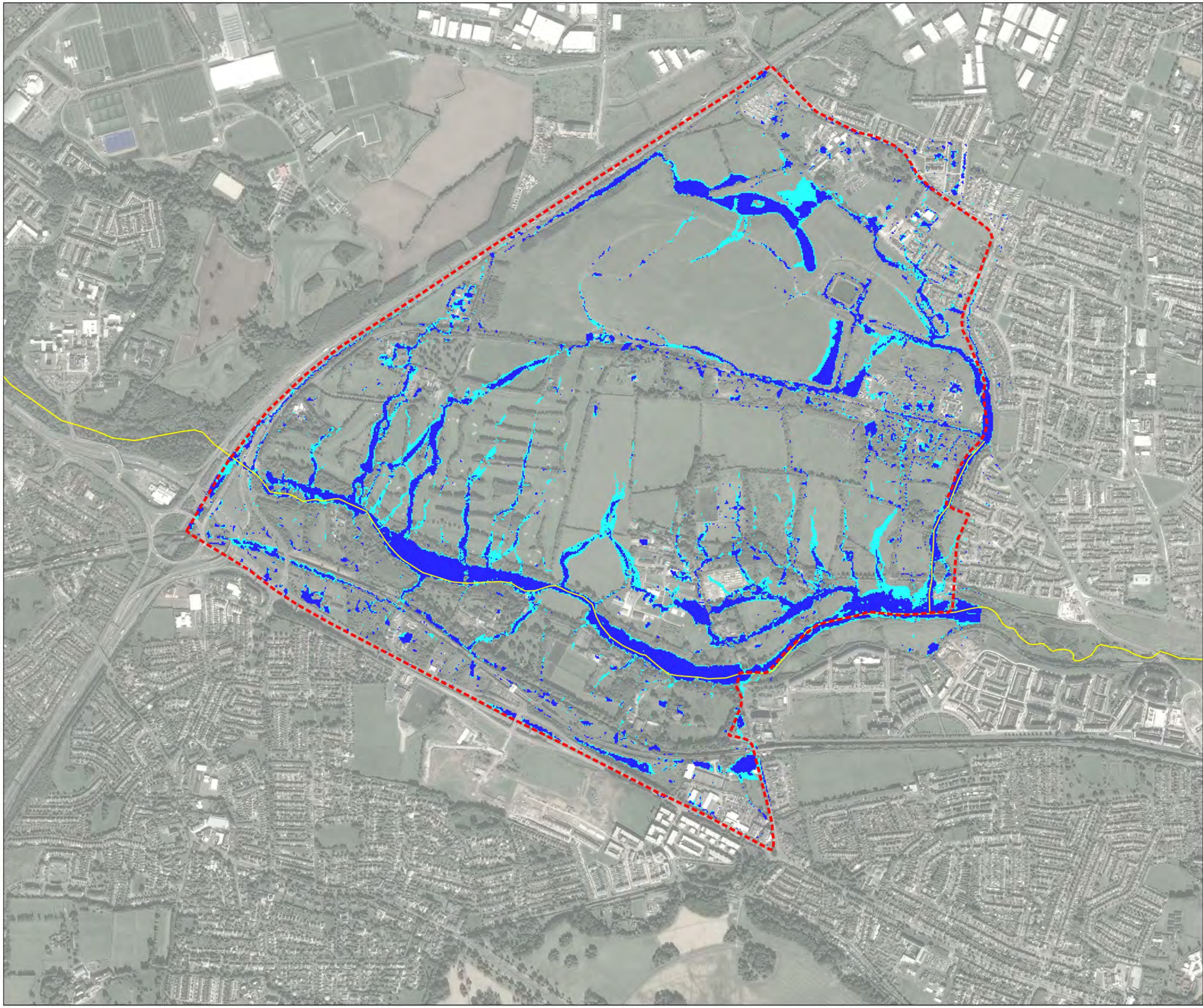
DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 1000 YEAR (0.1% AEP) MRFS
PLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-205	A



LEGEND

- DUNSINK STUDY AREA
- WATERCOURSE
- 1% AEP HEFS PLUVIAL FLOOD EXTENT
- 0.1% AEP HEFS PLUVIAL FLOOD EXTENT

DO NOT SCALE

A3

0 50 100150200250 m

File: IE2316 200 A
Date: 11/10/2021
Plotted by: NOM

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP) &
1 IN 1000 YEAR (0.1% AEP)
HIGH-END FUTURE SCENARIO
PLUVIAL FLOOD EXTENTS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500.01744	NOM	MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-206	A

DO NOT SCALE

A3

0 50 100150200250 m

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 100 YEAR (1% AEP) HEFS
PLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500		MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-207	A

File: IE2316-200 A
Date: 11/10/2021
Plotted by: NOM

LEGEND

DUNSINK STUDY AREA

WATERCOURSE

0.1% AEP HEFS PLUVIAL FLOOD DEPTHS

0 - 0.2500

0.2500 - 0.5000

0.5000 - 0.7500

0.7500 - 1.0000

> 1.0000

DO NOT SCALE

A3

0 50 100150200250 m

File: IE2316-200 A

Date: 11/10/2021

Plotted by: NOM

Purpose

Rev	Description	By	Date	Chk'd	Auth
A	DRAFT	NOM	11/10/21	NOM	PMS

ATKINS

Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000 Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport, Business Park, Cork
Tel (+353) 021 429 0300 Fax (+353) 021 429 0360

1st Floor Technology House, Parkmore Technology Park, Galway
Tel (+353) 091 786 050 Fax (+353) 091 779 830

Client

FINGAL COUNTY COUNCIL

Project

DUNSINK AREA FEASIBILITY STUDY
STRATEGIC FLOOD RISK ASSESSMENT

Title

1 IN 1000 YEAR (0.1% AEP) HEFS
PLUVIAL FLOOD DEPTHS

Original Scale	Design/Drawn	Checked	Authorised
1:12,500	NOM	MOF	PMS
	Date 11/10/2021	Date 11/10/2021	Date 11/10/2021

Status	Drawing Number	Rev
DRAFT	IE2316-208	A

SNC·LAVALIN

ATKINS
Member of the SNC-Lavalin Group

Sustainable Drainage Strategy

Lands at Dunsink, Co. Dublin

Fingal County Council

13 January 2022

Notice

This document and its contents have been prepared and are intended solely as information for Fingal County Council and use in relation to Sustainable Drainage Strategy for Lands at Dunsink, Co Dublin.

WS Atkins Ireland Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

This document has 24 pages including the cover.

Document history

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 0.0	Draft	A. Corrigan	G. Hanratty	D. Larkin	G. Hanratty	13.01.22
Rev 1.0	Review	A. Corrigan	G. Hanratty	A. Corrigan	G. Hanratty	07.02.22
Rev 2.0	Dunsink Landfill update.	A. Corrigan	G. Hanratty	A. Corrigan	G. Hanratty	09.02.22
Rev 3.0	Final	A. Corrigan	G. Hanratty	A. Corrigan	G. Hanratty	22.02.22

Client signoff

Client	Fingal County Council
Project	Sustainable Drainage Strategy
Job number	5203335
Client signature / date	

Contents

Tables

Figures

1. Introduction

Atkins was commissioned by Fingal County Council (FCC) to carry out a Sustainable Drainage Strategy (SDS) report as part of an overall Surface Water Management Plan (SWMP) for the Lands at Dunsink, Co. Dublin.

1.1. Sustainable Drainage Strategy

The purpose of this Sustainable Drainage Strategy (SDS) report is to set out the criteria to ensure the appropriate measures are taken to achieve the requirements set out under the Water Framework Directive (WFD). The WFD promotes the use of Sustainable Drainage Systems (or SuDS) for managing surface water runoff and to minimise the downstream negative impacts of both water quality and quantity.

The use of SuDS allows for the reduction of surface water volume quantities from the study area to manage downstream flood risk and also reduce the risk of runoff causing pollution.

SuDS can also have a positive impact on both biodiversity and amenity.

Future Development within the Plan area will be required to provide SuDS solutions and attenuate runoff within the site and existing network of drainage ditches, without adversely affecting the risk of downstream water quality and quantity downstream. The site layout and outline SuDS elements in this document need to be further considered as part of any further development of the site.

2. Baseline Characteristics

2.1. Plan Area Description

The plan area is located to the south of the M50 motorway, immediately east of the M50/N3 junction, south-west of the M50/N2 junction and north of the Royal Canal as shown in Figure 1 below. The eastern and south-eastern boundary of the study area adjoins the administrative area of Dublin City Council.

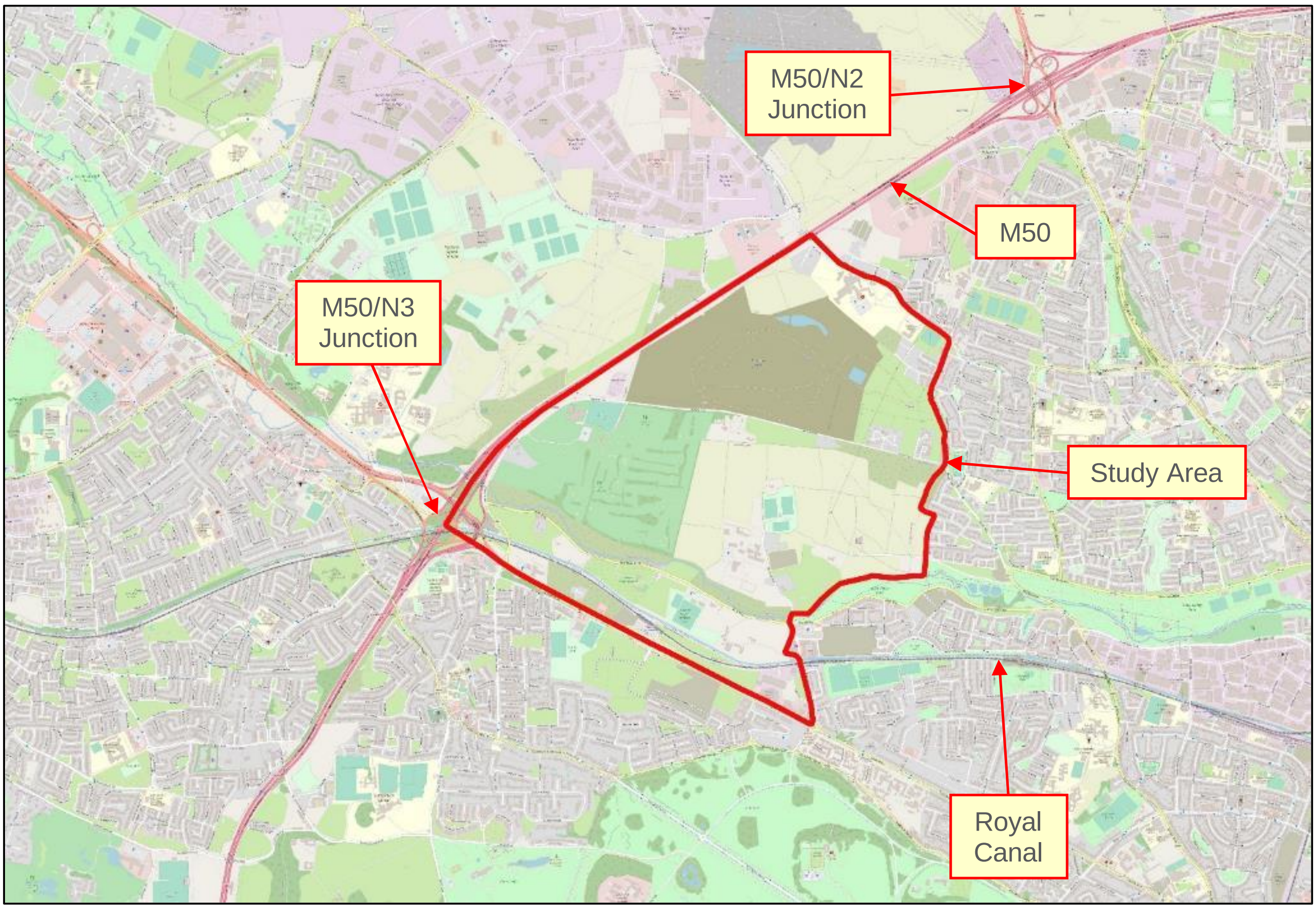


Figure 1 - Location of Dunsink Study Area

2.2. Existing Land Usage

The total study area is approximately 436 hectares located at the south-western fringe of Co. Fingal and approximately 7Kms from Dublin City centre. The study area contains the former Dunsink landfill which has been closed since the late 1990's. Gas is being collected at Dunsink landfill and is being used to generate electricity which is fed into the national grid.

The River Tolka and Tolka Valley are located within the study area close to the southern boundary. The Royal Canal also traverses these lands along its southern boundary.

There is an existing train station (Navan Parkway) located along the southern boundary of the study area.

Figure 2 – Existing Land Usage

2.3. Topography

The lands slope from the northern boundary towards the southern and eastern boundaries. Existing ground elevations within the study area range from approximately 98.54m OD (Malin) in the northern area to 26.05m OD (Malin) in the eastern area.

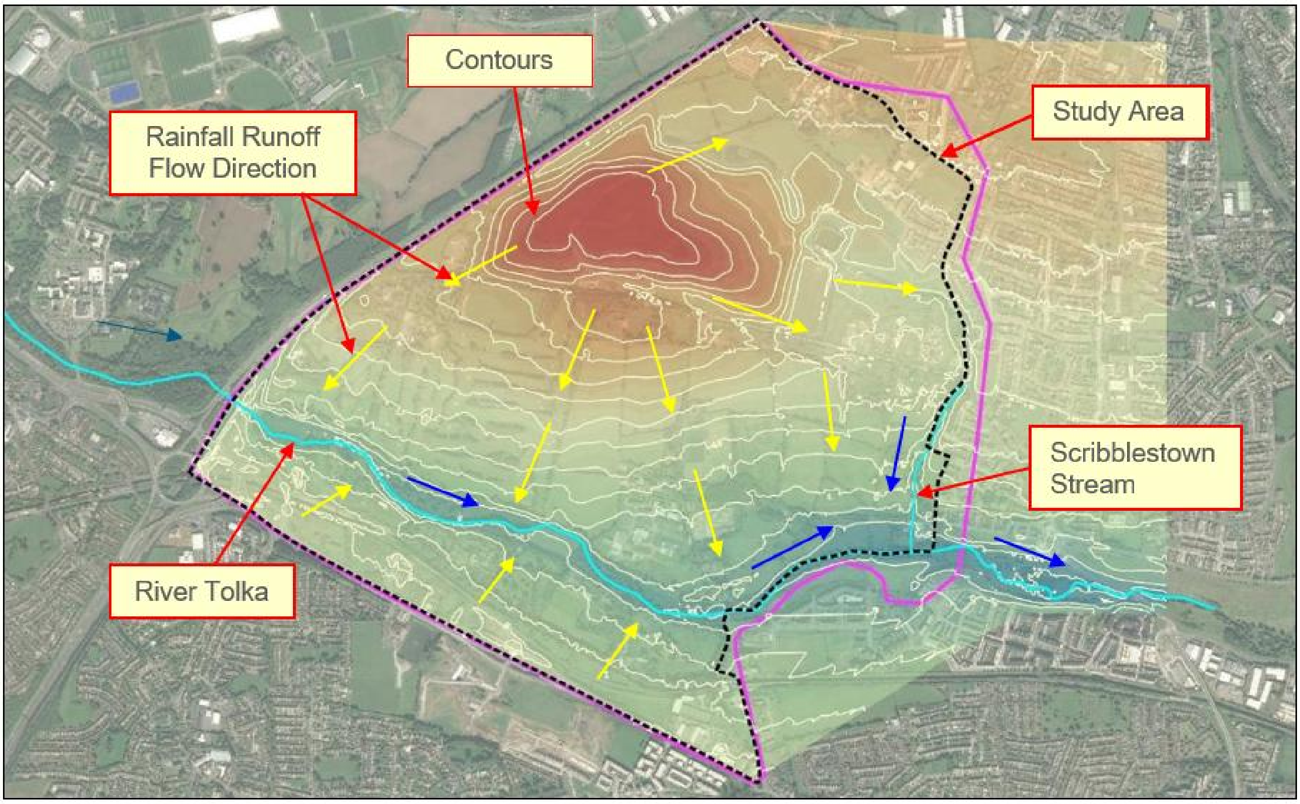


Figure 3 – Existing Topography

2.4. Geology

Geological mapping indicates that the plan area is underlain by a bedrock of calcareous shale and limestone conglomerate throughout. The land adjacent to M50 (East) is classified as Tober Colleen formation which ranges from 50m to 250m in thickness. The land further to west of study area is classified as Lucan formation which may range from 300m to 800m thick. Figure 4 – Bedrock Formations captures the different bedrock formations in the study area.

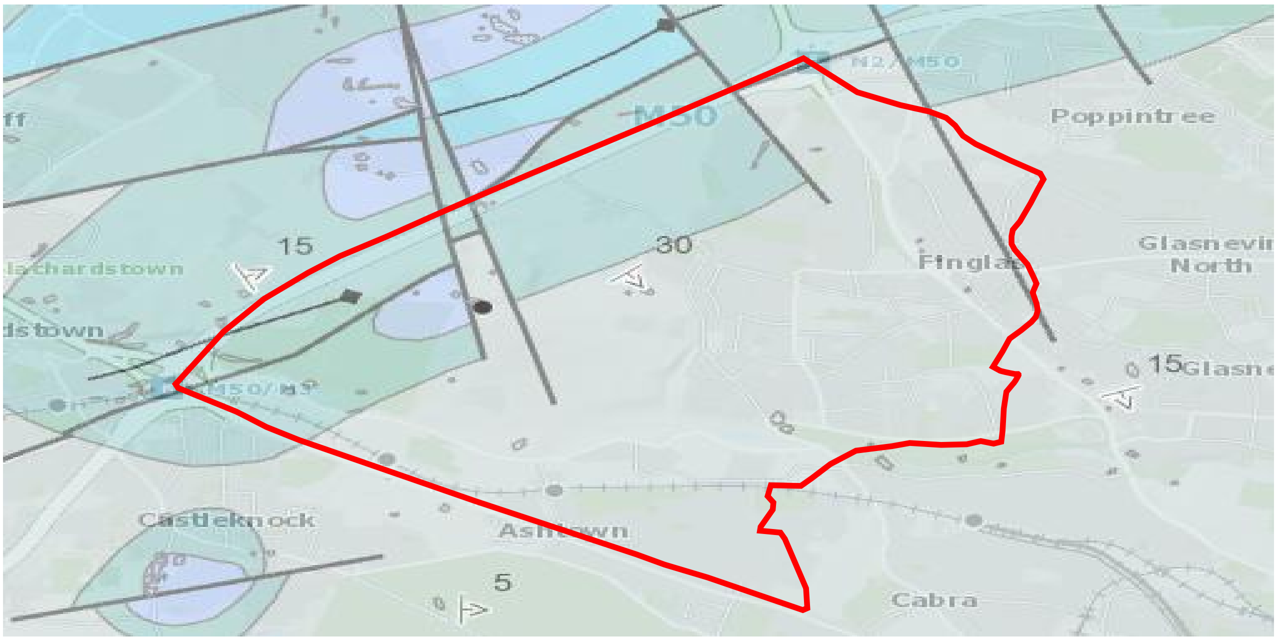


Figure 4 – Bedrock Formations

The Area is filled with superficial deposits over the bedrock and with till derived from limestones except the area surrounding the landfill which is exposed bedrock. Refer to Figure 5 – Superficial Deposits below which depicts the superficial formations in the plan area.

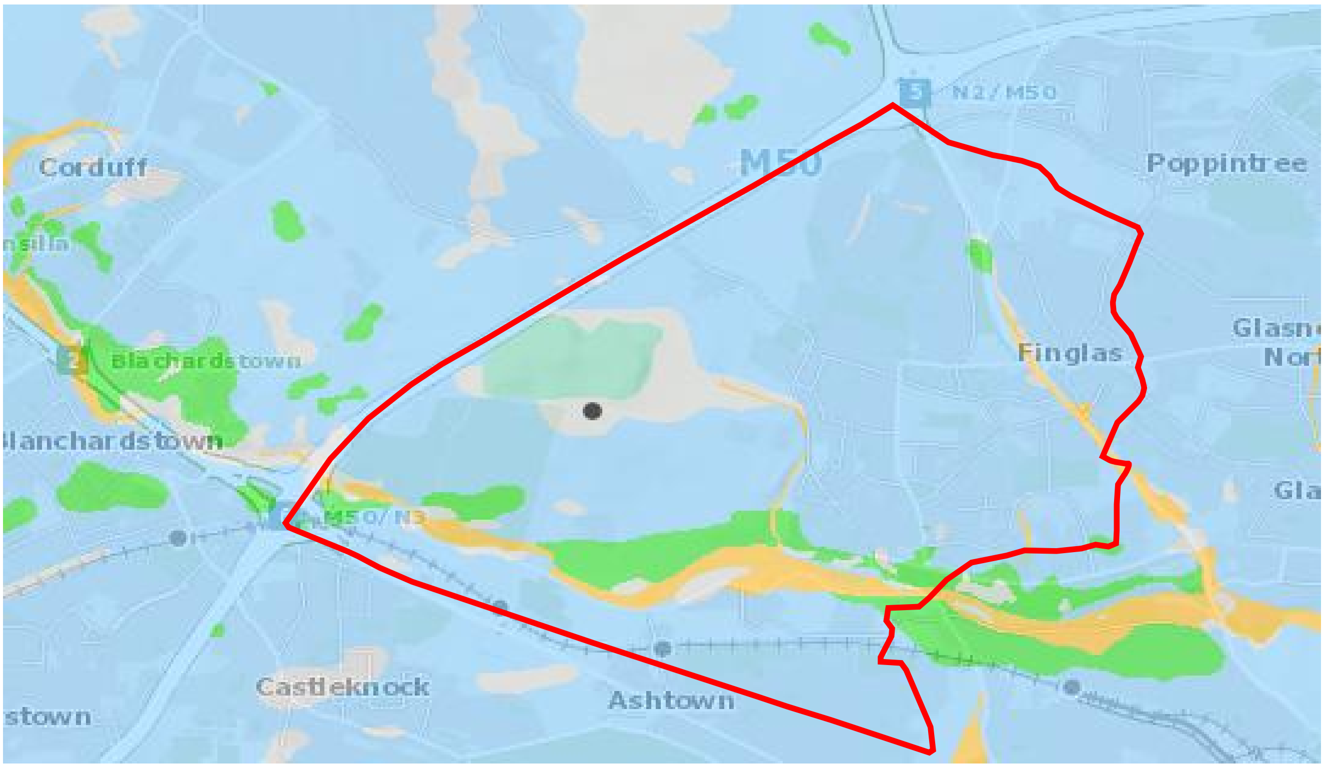


Figure 5 – Superficial Deposits

2.5. Water Environment

2.5.1. Existing Drainage features

The most immediate hydrological features in the vicinity of the study area are the River Tolka and the Royal Canal, which are located near the southern boundary of the site. There is also a small tributary of the River Tolka called the Scribblestown Stream, located along the eastern boundary of the study area as shown in Figure 6 – Existing Drainage Features below.

Several settlement / attenuation ponds are located to the Northern Boundary of the existing Dunsink Landfill.

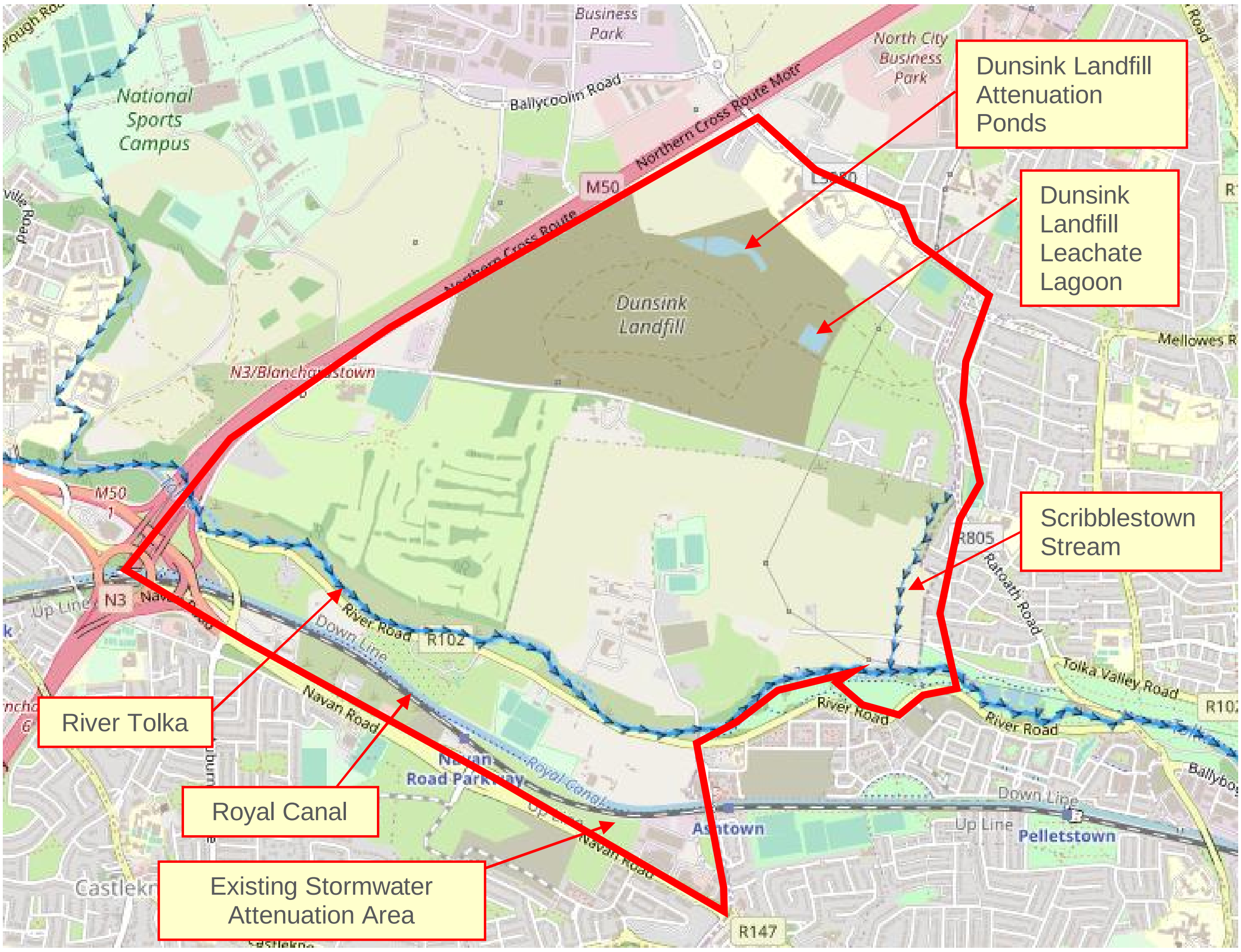


Figure 6 – Existing Drainage Features

A review of the existing public drainage GIS mapping for existing storm sewers shows no proof of existing public storm drainage networks inside the majority of the study area. Some public sewers are indicated in catchments A to the North East and catchment F to the south. Refer to Appendix A for catchment areas.

2.5.2. Dunsink Landfill Surface Water

Surface Water at the existing Dunsink Landfill is managed through a series of Attenuation ponds. The attenuation ponds are located to the North of the existing landfill. Surface water from upstream enters the landfill site via a culvert under the M50 (Node SW21 – SW18). The culvert then continues to Node SW19 prior to discharging the attenuation ponds. The surface water downstream of the attenuation pond flows via a series of pipes and open ditches prior to discharging to the Scribblestown stream downstream of Node SW22.

Under licence with the EPA (ref; W0127-01) Fingal County Council continues to undertake to monitor of the surface water quality in consultation with the EPA. Refer to Figure 7 – Dunsink Landfill Existing Drainage Features below for Node locations.

Surface Water Monitoring Locations at Dunsink Landfill

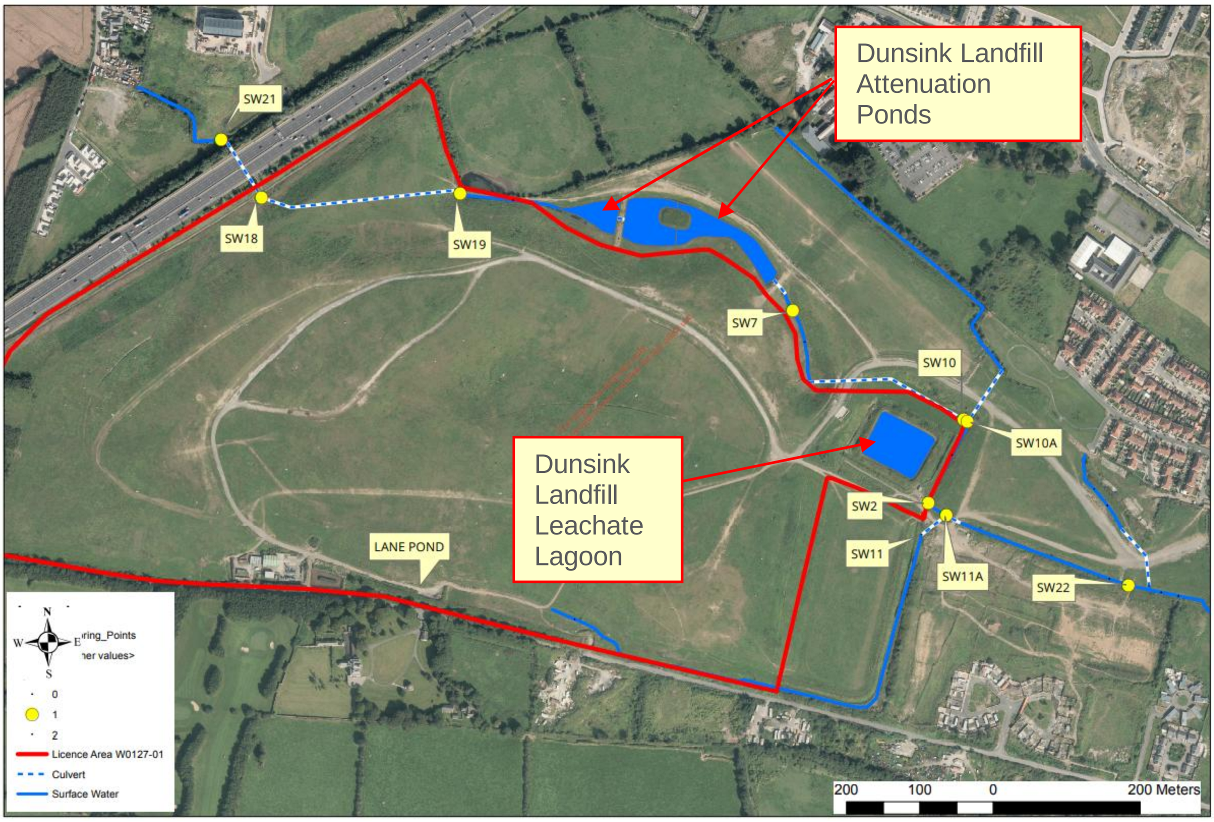


Figure 7 – Dunsink Landfill Existing Drainage Features

2.5.3. Dunsink Landfill Leachate Collection

Leachate from the existing Dunsink Landfill is managed through a Leachate collection system and continuously monitored for dissolved methane. Monitoring is carried out at 2No. locations, a Leachate sump located near Node SW11A and at the Leachate Lagoon. Leachate on-site is pumped via the leachate sump to the leachate lagoon. It is then pumped into the Irish Water Public Foul Sewer via return to the Leachate sump.

Fingal County Council manually opens and closes the valves to allow for dissolved methane measurements prior to discharge to the Foul Sewer network. The Leachate enters the Finglas Sewer which enters the gravity sewer system prior to treatment at the Ringsend Waste Water Treatment Plant. Refer to Figure 7 – Dunsink Landfill Existing Drainage Features above for Sump and Lagoons locations.

2.6. Proposed Development

The Fingal County Council Development Plan 2017 – 2023 zoning map for the Dunsink area is shown below in Figure 8. The area of study is largely zoned within current Fingal Development Plan as Open Space and High Amenity, but also includes some pockets of land zoned for Residential and Community Infrastructure uses.

Dunsink area is also identified in the Metropolitan Area Strategic Plan within the Regional Spatial and Economic Strategy (RSES) as *"…a major green field land bank with long term potential to develop a new district centre"*

- OS – Open Space. Objective: Preserve and provide for open space and recreational amenities.
- HA – High Amenity. Objective: Protect and enhance high amenity areas.
- CI – Community Infrastructure. Objective: Provide for and protect civic, religious, community, education, health care and social infrastructure.
- RS – Residential. Objective: Provide for residential development and protect and improve residential amenity.

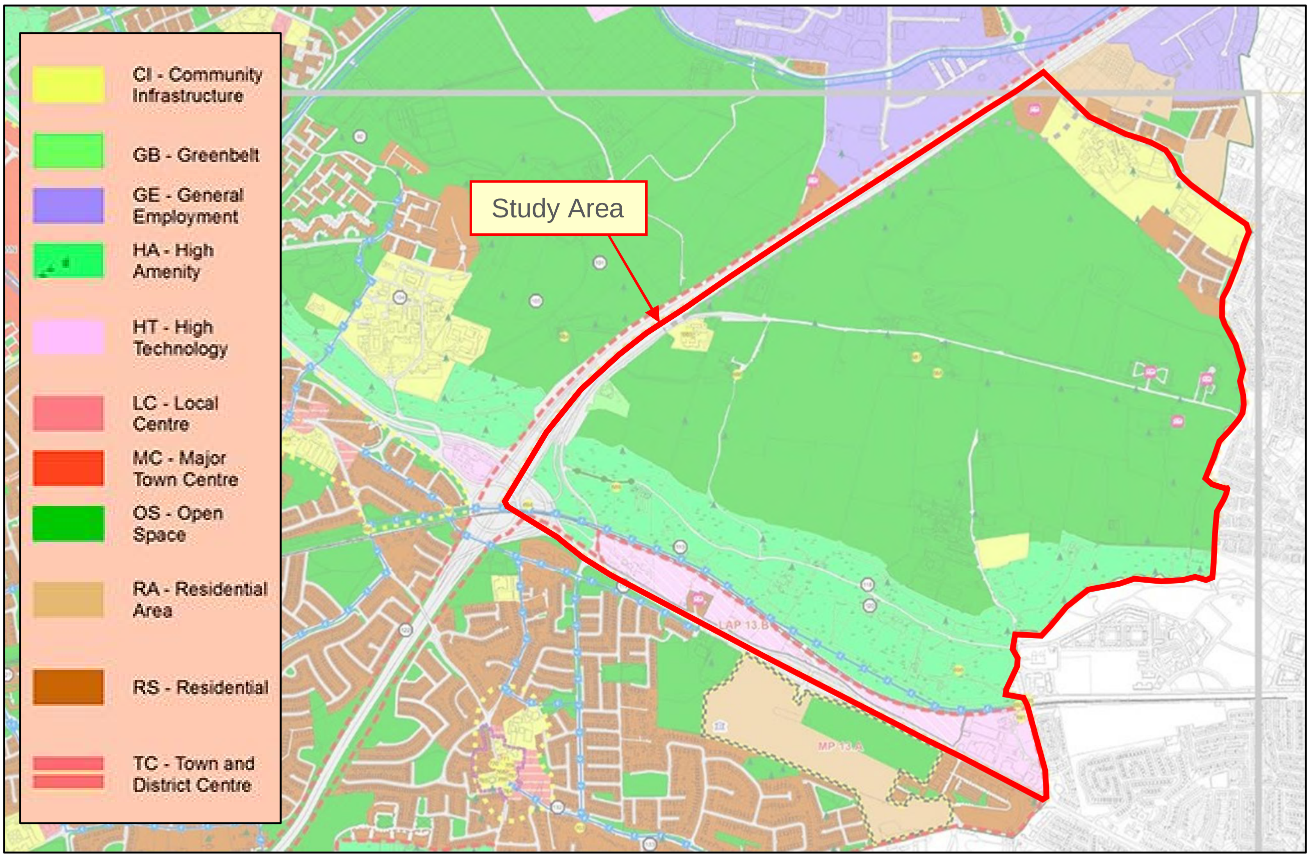


Figure 8 – Fingal County Council Land Zoning Map

3. Sustainable Drainage Strategy

This Sustainable Drainage Strategy (SDS) outlines the approach for the management of surface water runoff from the study area to ensure no increase of flood risk downstream. The SDS also outlines requirements to provide SuDS components to improve water quality, amenity and biodiversity benefits.

The SDS follows guidance provided in the CIRIA SuDS Manual and as outlined below:

- Identify existing flow routes
- Identify modified flow routes
- Identify suitable mechanism of discharge for Plan Area drainage
- Allocate management train and approach number of sub-catchments to provide the collection, treatment, storage and conveyance of stormwater runoff from the proposed area.
- Identify suitable SuDS components which are in keeping with the proposed character of the existing area and other objectives for the Area.

3.1. Flow Route Analysis

Figure 9 – Flow Route Analysis identifies the natural hydrology of the existing area based on the topography and surround hydrological features. This Analysis should be reviewed as part of the Flood Risk Assessment for the Site.

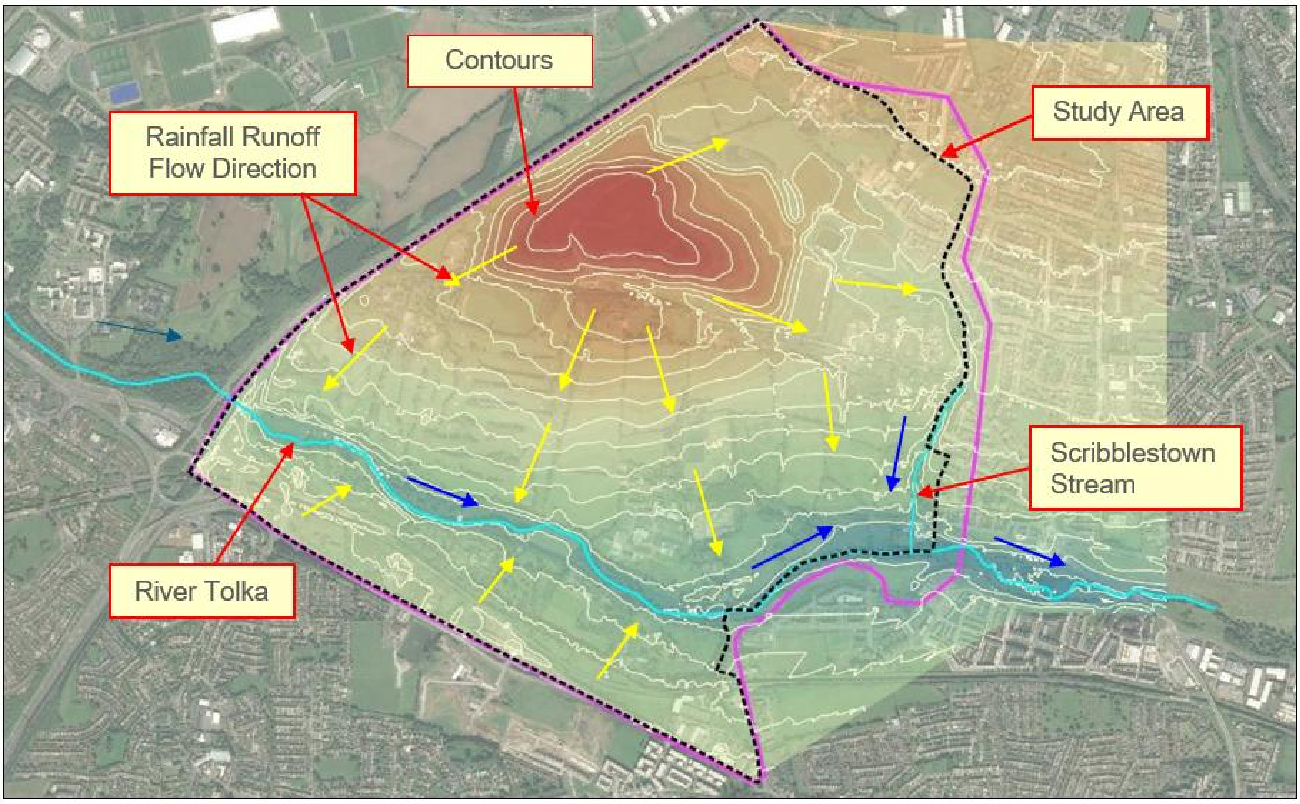


Figure 9 – Flow Route Analysis

3.2. Modified Flow Route Analysis

At the time of carrying out this report, no proposed layouts had been indicated for the site and therefore no modified flow route analysis was carried out.

3.3. Sub-catchments

Based on the existing site topography as indicated in Figure 9 – Flow Route Analysis above, the site should be managed through sub-catchments using SuDS components. While determining the Sub Catchments, a review of the Land Segregation areas within the Area Based Transport Assessment (ABTA) by Transport Insights was also to ensure synergies had been considered. Refer to Figure 10 – Sub Catchments below and Appendix A

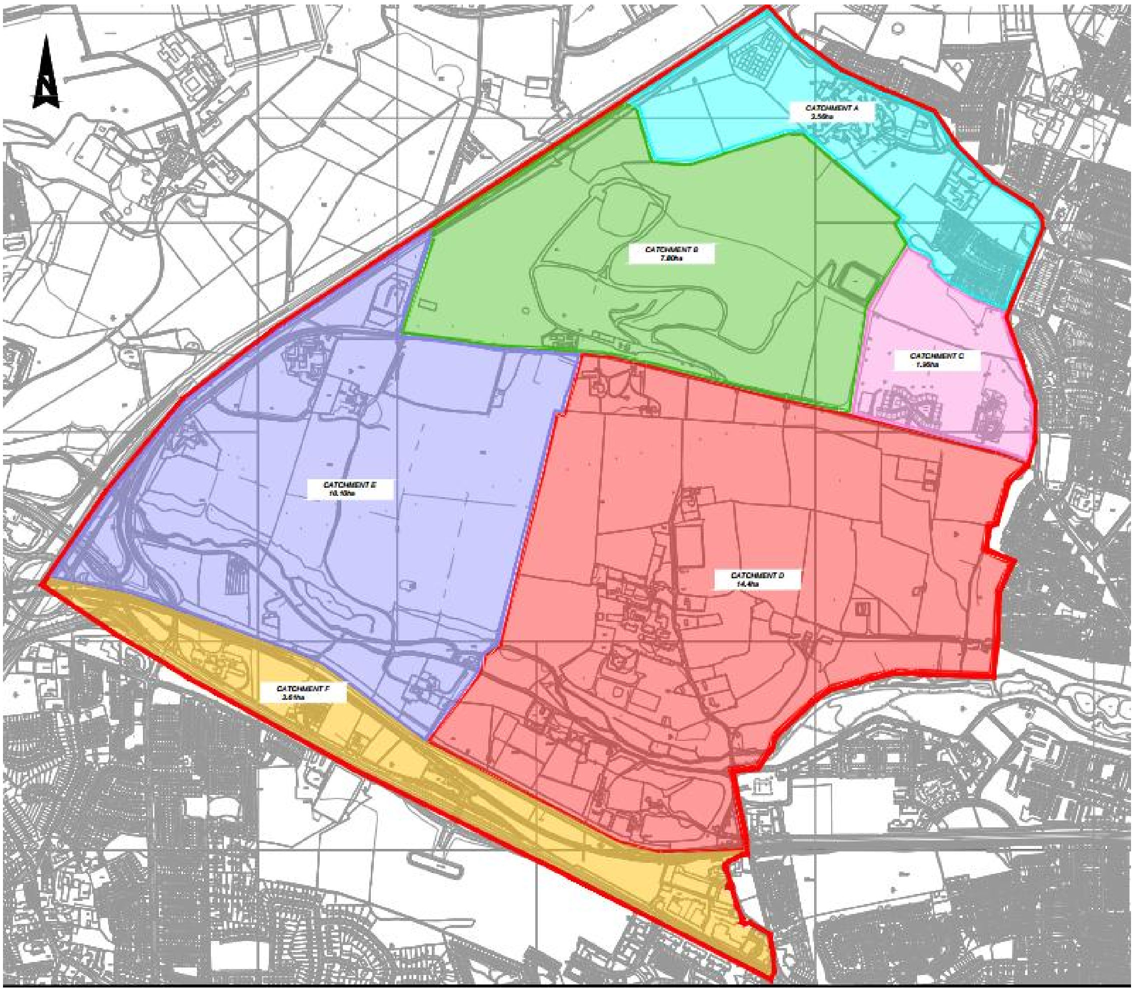


Figure 10 – Sub Catchments

3.4. Drainage Hierarchy

Surface Water runoff from the Site Area should follow the principles set out below in the drainage hierarchy:

1. Rainwater reuse – Where opportunities arise from rainfall, rainwater harvesting within the proposed development should be maximised in suitable settings.
2. Infiltration – To reduced overall surface water discharge quantity from the proposed development, site-specific testing should be carried out to determine where Infiltration is suitable.
3. Existing Watercourse – The majority of the site area is bound by the Tolka River to the South and the Scribblestown Stream to the South East. The use of SuDS and flow controls is required prior to discharge into these existing hydrological features to ensure there is no impact on existing water quality and quantity.
4. Combined Sewer. – No proposed surface water from this site should discharge into an existing combined sewer.

3.5. Water Quantity

Storm Water attenuation is required to be proposed as part of any proposed development within the study area to ensure the risk of downstream flooding.

3.5.1. Climate Change

Proposed development within the study area should account for climate change as part of the storm drainage design.

The current requirement set out in the Fingal County Council Development Plan 2017-2023 is for a 20% uplift in extreme rainfall depth. Future updates to FCC requirements are to be taken into account prior to any planning submissions

3.5.2. Runoff Rates

The existing greenfield runoff rates from the existing site are required to be maintained based on the requirements set out in the GDSDS and as required by FCC to restrict post-development runoff.

The method used for the runoff rate calculation below is the IH124 which specifically addresses the runoff from small catchments (Institute of Hydrology, 1994)

The maximum allowable discharge rates calculated in Table 3-1 to Table 3-6 below are broken down into specific catchment areas and based on the following characteristics.

- Soil WRAP Class 3 (taken following a review of historical Site Investigation works carried out near the Scribblestown Stream by IGSL in 2005)
- SAAR value 802mm (taken from opw.hydronet.com)

Table 3-1 Catchment A – 3.56ha

Return period	Attenuation Rate (l/s) green field	Attenuation Rate (l/s) Qbar
100% AEP (1 in 1 year)	10.19	11.99
3.33% AEP (1 in 30 year)	25.54	11.99
1% AEP (1 in 100 year)	31.3	11.99

Table 3-2 Catchment B – 7.80ha

Return period	Attenuation Rate (l/s) green field	Attenuation Rate (l/s) Qbar
100% AEP (1 in 1 year)	22.33	26.27
3.33% AEP (1 in 30 year)	55.96	26.27
1% AEP (1 in 100 year)	68.57	26.27

Table 3-3 Catchment C – 1.96ha

Return period	Attenuation Rate (l/s) green field	Attenuation Rate (l/s) Qbar
100% AEP (1 in 1 year)	5.61	6.6
3.33% AEP (1 in 30 year)	14.06	6.6
1% AEP (1 in 100 year)	17.23	6.6

Table 3-4 Catchment D – 14.4ha

Return period	Attenuation Rate (l/s) green field	Attenuation Rate (l/s) Qbar
100% AEP (1 in 1 year)	41.23	48.5
3.33% AEP (1 in 30 year)	103.31	48.5
1% AEP (1 in 100 year)	126.6	48.5

Table 3-5 Catchment E – 10.1ha

Return period	Attenuation Rate (l/s) green field	Attenuation Rate (l/s) Qbar
100% AEP (1 in 1 year)	28.92	34.02
3.33% AEP (1 in 30 year)	72.46	34.02
1% AEP (1 in 100 year)	88.79	34.02

Table 3-6 Catchment F – 3.61ha

Return period	Attenuation Rate (l/s) green field	Attenuation Rate (l/s) Qbar
100% AEP (1 in 1 year)	10.34	12.16
3.33% AEP (1 in 30 year)	25.90	12.16
1% AEP (1 in 100 year)	31.74	12.16

3.5.3. Storage Volumes

Controlled runoff from the site is to be attenuated throughout the plan area and within the sub-catchments. SuDS components selected should be used as part of the overall attenuation strategy to provide storage locally within each catchment.

Attenuation storage is to be sized in accordance with the GDSDS for the 1% AEP (including requirements for climate change). Storage requirements indicated below are based on Qbar runoff rates provided in section 3.5.2 Runoff Rates.

Table 3-7 Indicative Attenuation Storage Volumes

Catchment	Area (ha)	Return period	Indicative Attenuation Volume (m^3)
A	3.56	1% AEP (1 in 100 year)	1220
B	7.80	1% AEP (1 in 100 year)	2639
C	1.96	1% AEP (1 in 100 year)	661
D	14.4	1% AEP (1 in 100 year)	4873
E	10.1	1% AEP (1 in 100 year)	3418
F	3.61	1% AEP (1 in 100 year)	1218

Final surface water discharge from development within the site is likely to outfall to the Tolka River to the South, the Scribblestown Stream to the South East and the existing public storm drainage network to the North / North East of the area. The existing attenuation ponds constructed as part of the Dunsink Landfill are unlikely to be suitable for surface water discharge from the wider site area.

The Scribblestown Stream should be retained as part of any proposed development in the area and incorporated into the surface water and landscape design. The criteria set out in the GDSDS and requirements by Fingal County Council for Riparian Corridors to the stream should be adhered to.

3.6. Water Quality

Proposals for the Plan Area are likely to provide for residential development and associated open space requirements which can be considered to be low risk in terms of water quality. Water runoff from roads and car park areas are required to have a 2-stage treatment process prior to discharge to the existing watercourses.

3.7. Amenity

The amenity value of SuDS should be considered as part of any future development within the site area. The following should be considered as part of the design:

- All proposed SuD features can improve the amenity value of a proposed development provided they are designed as part of the overall coordinated design by project Architects, Landscape Designer and Drainage Engineers.
- Open Space areas can be multifunctional and provide both amenity value and a surface water management requirement.
- The design of all SuDS features as part of amenity areas should be carried out in accordance with Fingal County Council requirements and in accordance with Health and Safety criteria in the CIRIA SuDS guidance manual chapter 36.

3.8. Biodiversity

Biodiversity value of SuDS should be considered as part of any future development within the site area. The following should be considered as part of the design:

- Provide habitat and connectivity for wildlife throughout the development.
- Water throughout the proposed development is to be kept at or near the surface level a designed as part SuDS treatment train in coordination with the Landscape Designer
- Ensure improved water quality by providing SuDS with the development as set out in the CIRIA SuDS guidance manual chapter 26
- Demonstrate ecological design and creation of habitats through the use of correct SuDS design in coordination with the Landscape Designer to meet Objective NH02, GI03 and GI25 of the current FCC Development Plan 2017-2023.

3.9. SuDS Components

Table 3-8 SuDS Components below summarises a comprehensive review of suitable SuDS for the overall site area. It is noted that as areas of the site are existing landfill, flood zones and developed areas, further review of the final development proposal would be required to be carried out to determine the final suitability of proposed SuDS Components

Table 3-8 SuDS Components

SuDS Component	Description	Suitability	Rationale
Green Roof	A planted soil layer constructed on the roof of a building to create an area for vegetation.	Possible depending on building types	Potential to provide green roof to suitable structures to promote biodiversity and reducing runoff. The use of green roofs meets Objective SW06 and GI33 of the current FCC Development Plan 2017-2023.
Infiltration systems	Systems used to collect and store storm water runoff allowing for infiltration to ground.	Possible depending on site specific testing to determine suitability and ground water levels	Discharge via infiltration systems to be determined within site specific testing and further investigations. Where suitable infiltration system allow for recharge of ground water and reduce risk of downstream flooding.
Filter strips	Water runoff from impermeable areas flow across grassed strips allowing for treatment and filtration.	Yes	Use of filter strips to be incorporated into suitable areas of a proposed development in coordination with landscape design.
Filter drains	Temporary storage area below ground allowing for attenuation, conveyance and infiltration.	Yes	Use of filter drains to provide temporary storage at source and allow for infiltration were suitable.
Swales	Shallow vegetated channel allowing for temporary attenuation, conveyance at surface levels. Also allows for treatment and infiltration	Yes	Swales to be incorporated into suitable areas of a proposed development in coordination with landscape design. The use of swales meets Objectives GI03, GI11, GI21, GI25 and NH02 in the current FCC Development Plan 2017-2023.
Bioretention systems / rain planters	Shallow vegetated area allowing for temporary attenuation, surface levels. Also allows for treatment and infiltration.	Yes	Use of bioretention systems / rain planters to be incorporated into development were suitable in coordination with landscape design.
Tree pits	Water runoff can discharge into tree pits allowing for attenuation storage, infiltration and treatment.	Yes	Use of tree pits to be considered throughout proposed development within Urban areas

Permeable / Porous Paving	Water runoff soaks through structural paving allowing for treatment, temporary attenuation and infiltration	Possible is lightly trafficked areas such as driveways or car parks areas	Permeable / Porous paving to be provided were suitable within a proposed development. Areas to be determined suitable based on traffic loading and usage. Taken in charge requirements to also be considered. The use of permeable / porous paving meets Objective SW04 in the current FCC Development Plan 2017-2023.
Rainwater Harvesting	Collection of runoff and stored for reuse.	Possible, re use of water to be further considered depending on development type	To be considered as part of the proposed development in relation reduced surface water runoff and decreases requirements on the potable water supply.
Attenuation modular storage units	Underground temporary storage to control discharge and allowing for infiltration	Possible	The FCC Development Plan 2017-2023 Objective DMS74 states that “underground tank and storage systems will not be accepted under public open space as part of the SuDS solution” As underground modular storage units are not always considered as SuDS, they should be used as a final resort and a requirement on the developer to demonstrate the extents of other Green Infrastructure.
Detention basins	Generally shallow vegetated basins at surface level allowing for temporary storage to control discharge and allowing for infiltration	Yes	Detention basins can be used to provide attenuation, improve water quality / biodiversity and reduce peak discharge rates. Basins can be used as part of Open space requirements within the development were suitable in coordination with landscape design. Detention basins can meet Objectives GI03, GI11, GI21, GI25 and NH02 in the current FCC Development Plan 2017-2023.
Ponds / Wetlands	Generally shallow vegetated areas with permanent water levels to provide surface water treatment and temporary attenuation storage volume.	Possible	Ponds / Wetlands can be used to provide attenuation, improve water quality / biodiversity and reduce peak discharge rates. Ponds / Wetlands can be incorporated as part of an overall landscape design. Ponds / Wetlands can meet Objectives SW01, NH02, GI21, GI25, GI31 and GI32 in the current FCC Development Plan 2017-2023.

4. Conclusions and Recommendations

4.1. Conclusions

This SDS outlines the approach and criteria that should be carried out when developing an area within the overall site area. The report considers design requirements for managing surface water quantity, improving surface water quality, increasing amenity and biodiversity values of the site.

A flood flow route should be considered as part of any future development within the site and ensure that vulnerable development areas are considered in accordance with the requirements set out in the Flood Risk Assessment.

This report has provided guidance based on the maximum allowable discharge rates from each catchment and maximum attenuation requirements. It is likely that as proposals are developed these rates and volumes may change depending on the extent of SuDS components incorporated into the design.

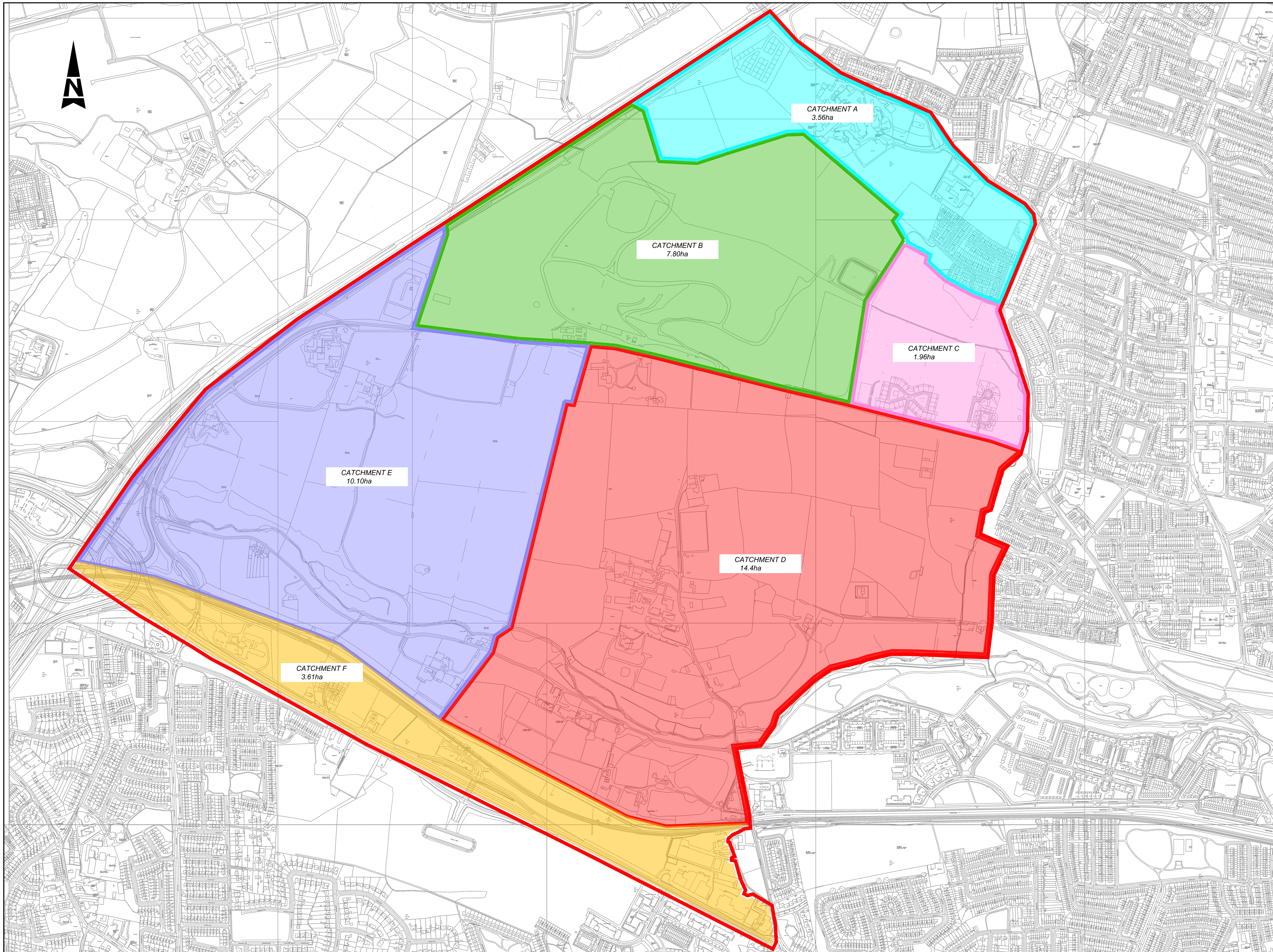
4.2. Recommendations

The following recommendations are made for the development of SuDS and SDS for the overall Plan Area.

- Any future proposed development in the site area is to consider the existing site flow routes as indicated in Figure 9 – Flow Route Analysis of this report.
- Site-specific testing including suitability for infiltration to ground and existing groundwater levels should be carried out as part of any proposed development.
- The Lands within the EPA licence ref; W0127-01 (Figure 7) should be considered for Open Space Zoning.
- The impact from the Dunsink landfill is to be considered as part of any SuDS design particularly where high groundwater table is encountered.
- The existing stormwater attenuation area in catchment F is allocated for lands to the south of the study area, no stormwater runoff from catchment F is to be attenuated within it.
- No SuDS features should be located within existing Flood Zones as identified in the Flood Risk Assessment.
- SuDS are to be included as part of any future development in the site area and will provide a treatment train through the sub-catchment as indicated in Figure 10 – Sub Catchments of this report. Additional catchments sub be provided within each sub catchments to ensure surface water treatment is carried out at the source.
- Any proposed development within catchment F to the Southern Boundary of the site is to fully consider an impact on the existing canal and railway line. Full engagement should be carried out with Inland Waterways and Irish Rail.
- Any proposed development surround catchment B should take into consideration any potential negative impact from the existing landfill including leachate and / or gas collection system.
- Riparian corridors are to be provided along any existing rivers or streams within the site area. The Riparian corridor should be in accordance with the requirements set out in the GDSDS and Fingal County Council Development Plan. Existing Flood plains should also be considered to ensure no reduction in Biodiversity within the site.
- Final discharge rates are to be agreed with Fingal County Council. It should be considered that large open space areas which are not positively drained should not form part of the maximum allowable discharge rate for any proposed development.
- Final outfall locations from a proposed development is to be agreed with Fingal County Council as part of the initial consultation process.
- An Outline Construction Management Plan (OCMP) should be considered as part of the proposed drainage design.
- Construction of all SuDS components should take account of guidance provided in the CIRIA manual C768 'Guidance on construction of SuDS'

Appendices

Appendix A. Sub Catchments



DO NOT SCALE

A1

0 10 100

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. NO DIMENSIONS SHALL BE SCALED FROM THE DRAWINGS
3. ALL LEVELS ARE IN METRES AND ARE TO MALIN HEAD DATUM
4. ALL COORDINATES ARE IN METRES AND ARE TO IRISH TRANSVERSE MERCATOR
5. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SPECIFICATION

LEGEND:

SITE SURVEY LINE

OS SHEET REFERENCES
3130-02, 3130-07, 3130-12, 3130-17, 3130-22, 3196-02, 3196-07, 3196-03, 3196-04, 3196-05, 3196-08, 3196-09, 3196-10, 3130-15, 3130-20, 3130-25, 3131-01, 3131-06, 3131-11, 3131-16, 3131-21, 3197-01, 3197-06, 3130-A, 3130-B, 3130-C, 3130-D

LEGEND:

- CATCHMENT A
- CATCHMENT B
- CATCHMENT C
- CATCHMENT D
- CATCHMENT E
- CATCHMENT F

NOTE:

1. THE SURFACE WATER DRAINAGE NETWORK IS TO BE DESIGNED AND CONSTRUCTED IN COMPLIANCE WITH THE 'REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS VERSION 6.0'
2. NO SURFACE WATER/RAINWATER TO DISCHARGE INTO THE FOUL SEWER SYSTEM UNDER ANY CIRCUMSTANCES.
3. ALL RWP, GULLY AND CHANNEL DRAIN CONNECTIONS TO THE MAIN SURFACE WATER DRAINAGE SYSTEM ARE TO BE ACHIEVED VIA DIRECT CONNECTION TO THE MANHOLE AT LEVELS SOFFITS OR VIA SADDLE CONNECTION TO THE STORM SEWER PIPE.
4. ALL GULLIES TO HAVE SEPARATE CONNECTIONS TO THE STORM DRAINAGE NETWORK.

Risk Level	
	Atkins Base Line - Low Risk
	Atkins Sensitive - Medium Risk
	Atkins Private - High Risk
	Client Critical - Already Marked

Rev	Description	By	Date	Chk'd	Rev'd	Auth
-	FOR INFORMATION	PS	14.01.22	AC	AC	GH

ATKINS
Member of the SNC-Lavalin Group

Atkins House, 150-155 Airside Business Park, Swords, Co. Dublin
Tel (+353) 01 810 8000
Fax (+353) 01 810 8001

Unit 2B, 2200 Cork Airport Business Park, Cork
Tel (+353) 021 429 0300
Fax (+353) 021 429 0360

1st Floor Technology House Parkmore Technology Park, Galway
Tel (+353) 091 786 050
Fax (+353) 091 779 830

Client: FINGAL COUNTY COUNCIL

Project: LANDS AT DUNSINK DUBLIN 15

Purpose: INFORMATION

Title: LANDS AT DUNSINK STUDY AREA MAP DRAINAGE CATCHMENT AREAS

Original Scale	Drawn	Checked	Reviewed	Authorised
NTS at A1 NTS at A3	PS	AC	AC	GH
	Date 14.01.22	Date 14.01.22	Date 14.01.22	Date 14.01.22

Status	Drawing Number	Rev
I	5203335-ATK-XX-XX-M2-CE-000001	-

File: 5203335-ATK-XX-XX-M2-CE-000001.dwg Plotted by: patrick.sheridon
Date: Jan 27, 2022 - 3:24pm

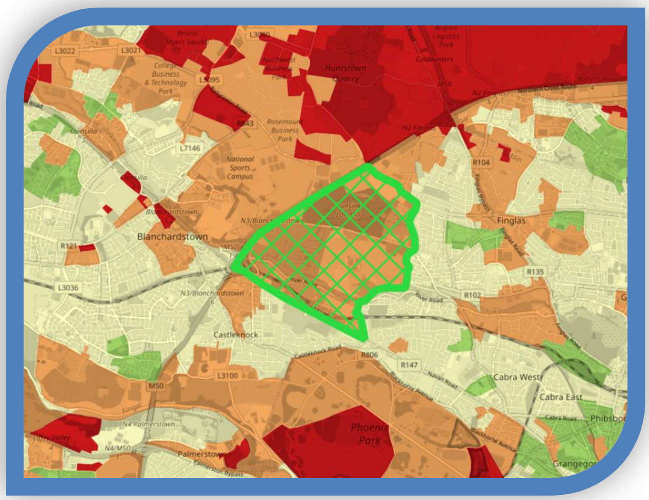
C:\Users\patrick.sheridan\appdata\local\temp\AcPublish_9452\5203335-ATK-XX-XX-M2-CE-000001.dwg

Garry Hanratty
WS Atkins Ireland Limited
Atkins House
150 Airside Business Park
Swords
Co. Dublin
K67 K5W4

Tel: +353 1 810 8000

Dunsink Transport Appraisal Report

For Fingal County Council



Final Report

February 2022

TRANSPORT INSIGHTS

MDB MacCabe Durney Barnes
Planning Environment Economics

Table of Contents

Appendices

1. Introduction

1.1 Overview

Fingal County Council (FCC) has commissioned Transport Insights, in partnership with MacCabe Durney Barnes, to undertake a Transport Appraisal for lands at Dunsink, hereafter referred to as the Dunsink Study Area (DSA).

The National Planning Framework (NPF) and the Regional Spatial and Economic Strategy (RSES) for the East & Midlands Region require an evidence-based approach to planning, and therefore FCC has commissioned a Transport Appraisal for the DSA to inform the development feasibility of these land parcels.

The main goal of the Appraisal is to identify potential transport challenges and identify the required interventions for the DSA to pave the way for development to be planned, phased and undertaken in line with the objectives of the NPF, RSES, Fingal Development Plan (FDP) 2017-2023 and other local planning policies. As such, the findings of this appraisal will inform FCC in relation to the nature, scale, location and timing of delivery of future development within the DSA, and identify the transport infrastructure and service requirements to support the realisation of such development.

This Appraisal represents a key input to the overarching Dunsink Feasibility Study and shall inform FCC's potential rezoning of the DSA within the ongoing update of the FDP. The Appraisal approach was formulated in such a way that it conforms to the process by which the first two stages of an ABTA would be undertaken. As an input to the Appraisal, a Baseline Assessment was undertaken, and a Baseline Assessment Report subsequently produced. This Report assessed baseline conditions within the DSA and its environs, including existing and committed transport infrastructure and services, existing traffic characteristics and travel patterns within and in the vicinity of the lands. A subsequent workshop was also undertaken with FCC in order to confirm and identify development opportunities, constraints, developable areas etc. The findings of this workshop informed further work on the Appraisal, namely drafting of a development vision and transport objectives, preparation of proposed DSA development scenarios and completion of outline travel demand analysis. This Report provides an overview and summary of the Transport Appraisal and its findings.

1.2 Background

The goal of the Transport Appraisal was to undertake an assessment for the DSA in the context of its local context in addition to the wider Greater Dublin Area (GDA) level. It aimed to ensure appropriate and meaningful integration of land use objectives and transport planning is advanced in line with national, regional and local policies. The study approach aimed to ensure that the overarching transport planning policy objectives such as higher public transport and active modes share, reduced private car dependency etc. are realised within the context of the DSA lands' development.

The DSA lands are identified in the current FDP via Objective BLANCHARDSTOWN 13, as follows:

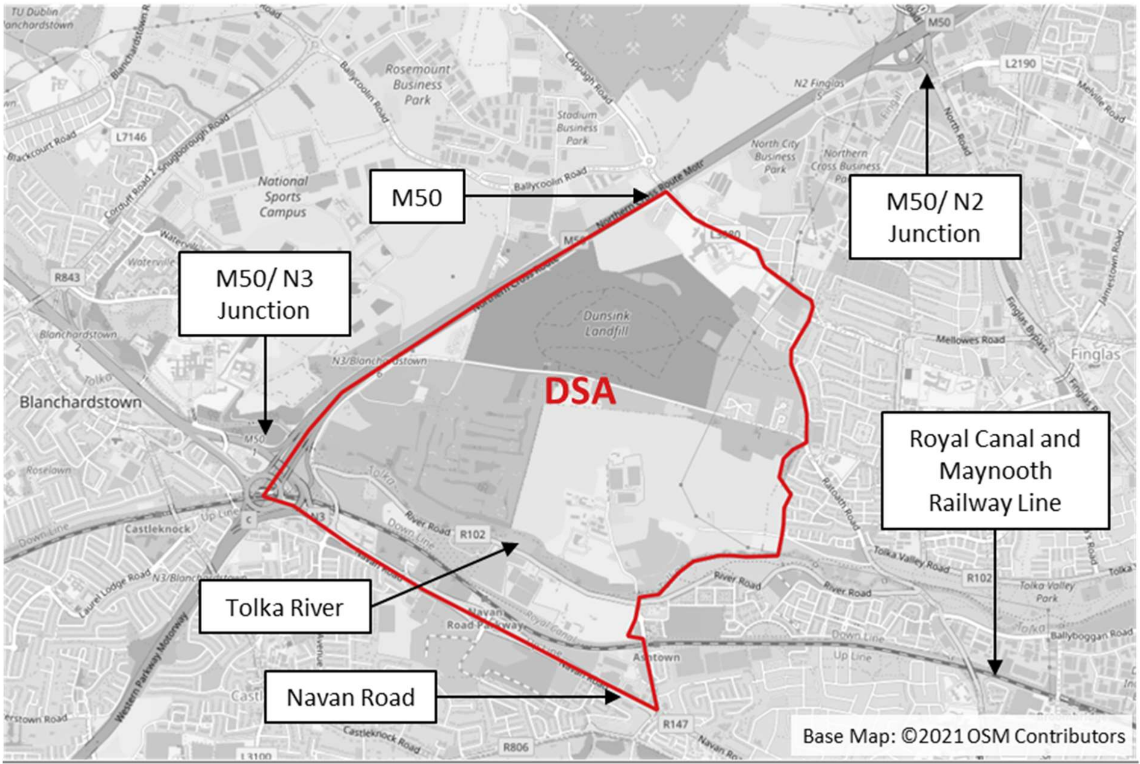
> *"Carry out a feasibility study of lands at Dunsink to include a full investigation of requirements in terms of infrastructure, water, access, drainage within three years of the adoption of this Development Plan and any remedial measures associated with the former landfill area to inform the future designation of these lands for development. This will be carried out in consultation with necessary statutory agencies and appropriate stakeholders to facilitate the orderly and appropriate release of lands at Dunsink."*

The FDP also includes in its Development Strategy for Blanchardstown an objective to *'Promote lands at Dunsink as a longer-term strategic area suitable for mixed use development'*.

Objectives within the FDP recognise the strategic location of the land bank and its related development potential.

The ca. 434.9 ha. DSA lands, illustrated in the following Figure 1.1, are located inside the M50 motorway, southeast of the M50/ N3 junction, west of the M50/ N2 junction and north of the Royal Canal. The south-western boundary of the DSA is defined by Navan Road, and the south-eastern boundary is defined by the Tolka River set in parkland, which forms part of the larger Tolka Valley Park. The eastern and south-eastern boundary of the DSA lands adjoin the Dublin City Council administrative area, including the built-up area of Ashtown/ Pelletstown within which medium-high density public transport orientated development is being delivered.

Figure 1.1 DSA Lands – Location Plan



At a strategic level, the DSA lands are located ca. 7 kilometres (straight line distance) from Dublin City Centre (measured from the centre of the lands to O'Connell Bridge).

The DSA lands benefit from being served by existing built and natural assets, in particular relating to public transport, amenity and recreation as follows:

- Navan Road Parkway and Ashtown are existing train stations located within/ adjacent to the DSA lands. These stations are located on the Maynooth Rail Line providing commuter rail services to Dublin City and also serving Hansfield, Dunboyne and Pace (via a spur). This route is part of Irish Rail's planned DART+ West Project (part of the overall DART+ Programme), which seeks to significantly increase rail capacity on the Maynooth Rail Line by providing a more frequent and more reliable electrified rail service.
- The Tolka River and Tolka Valley Park which traverse the DSA close to its southern boundary.
- The Royal Canal which traverses the DSA along its southern boundary, in addition to Route N02 of the National Transport Authority's current GDA Cycle Network Plan, the alignment of which runs parallel to the Canal.

In recognition of the DSA's potential, Dunsink is identified in the Metropolitan Area Strategic Plan (MASP) included in the RSES as *…a major greenfield land bank with long term potential to develop a new district centre' (Table 5.1 p. 104).* Furthermore, the RSES MASP specifically references the Study

Area, stating that *"the proposed DART Underground and LUAS extensions to Finglas and Lucan subject to appraisal and delivery post 2027, will unlock long-term capacity including strategic landbanks such as Dunsink".*

The DSA is largely zoned within the current FDP as Open Space and High Amenity and also includes some pockets of land zoned for Residential and Community Infrastructure.

The development of the DSA is anticipated as a medium-high density, mixed-use transit orientated development (TOD) in conjunction with recreational, commercial, and educational facilities and complementary transport links. It will be integrated within the existing urban fabric and will benefit from and support other infrastructure in the area. This includes public transport and multi-modal interchanges on existing or planned infrastructure within the DSA and its environs, and active modes' infrastructure (walking and cycling), thereby enabling enhanced sustainable travel accessibility. The proposed DART+ Project is noted to be of direct relevance to the Dunsink lands, given the alignment of the existing Maynooth Rail Line within the southern part of the DSA lands.

The Transport Appraisal strategy for DSA aims to capitalise on the opportunities, possibilities and strengths offered by these land parcels in order to prioritise sustainable mobility goals and objectives. In particular, the Appraisal will help identify the optimum level of development that can be sustained in the DSA taking account of existing and planned transport infrastructure and services within the area.

1.3 Dunsink Transport Appraisal – Aims, Overall Approach and Work to Date

Transport Appraisal Aims

The purpose of an ABTA, the first two stages of which this Appraisal conforms, is to address the need to incorporate national and regional transport policies and objectives into local level land use planning in accordance with Transport Infrastructure Ireland (TII) and National Transport Authority (NTA) guidance documents. This Appraisal therefore seeks to maximise opportunities for the integration of land use and transport planning, with an emphasis on sustainable mobility. In accordance with TII and the NTA guidance, the key aims of an ABTA are to:

- maximise the opportunities for the integration of land use and transport planning by including the ABTA process as integral to the preparation of the feasibility study;
- assess the existing traffic, transport and movement conditions within the DSA and in its wider context;
- plan for the efficient movement of people, goods and services within, to and from the DSA;
- identify the extent to which estimated transport demand associated with the emerging local development objectives can be supported and managed on the basis of existing transport assets;

- identify the transport interventions required within the DSA lands and in the wider context, to effectively accommodate the anticipated increase in demand; and
- inform site-specific Transport Assessments for new planning applications.

ABTA Approach

The overall approach to an ABTA is described in TII[1] and NTA[2] guidance documents, and includes following main tasks:

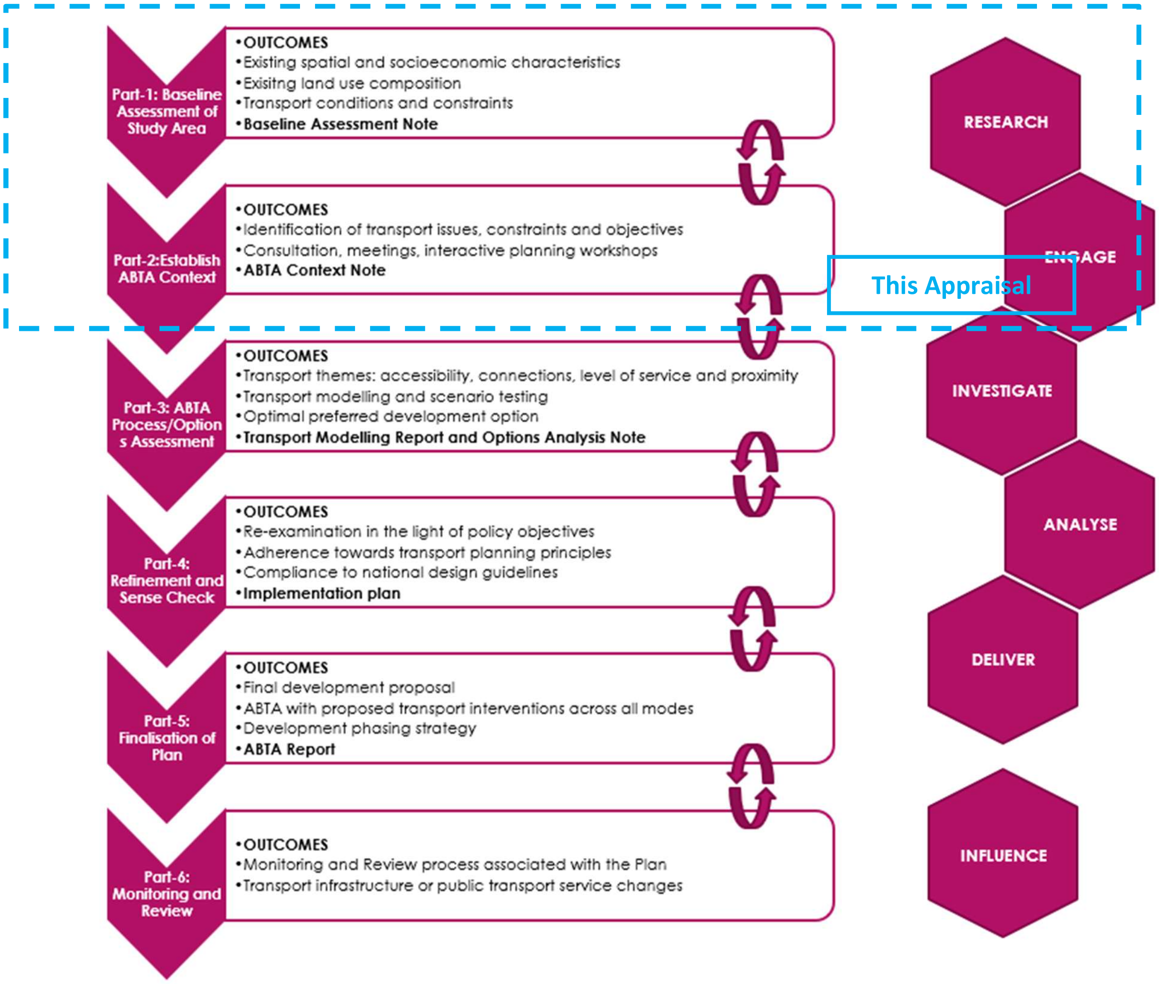
- review of the existing policy and transport baseline conditions;
- establish development objectives, planning principles, transport issues and constraints;
- development and testing of proposed development options;
- optimisation of land use to align with sustainable transport provision;
- finalisation of the study and its proposals through consultation with FCC and key stakeholders such as the NTA, TII and Dublin City Council; and
- development of an implementation plan.

The intended effect of an ABTA is to ensure that the assessment of transport demand and its associated impact plays a central role in informing the development proposals. The overall approach to completion of an ABTA, and how it relates to other planning and environmental processes, is illustrated in Figure 1.3 (overleaf). Note that this Appraisal conforms to the first two stages of an ABTA only.

1 TII Publications: ABTA Guidance Notes, PE-PDV-02046, April 2018

2 NTA ABTA Advice Note, December 2018

Figure 1.3 ABTA Process – Key Components



1.4 Report Structure

The remainder of this Report is structured as follows:

- Section 2 provides a summary of the planning and policy context within which the Appraisal is being developed;
- Section 3 summarised presents DSA lands' characteristics;
- Section 4 illustrates the DSA immediate catchment and wider area characteristics;
- Section 5 provides a high-level overview of transport infrastructure, services and accessibility;
- Section 6 summarises existing travel patterns with the study area and its surrounds;
- Section 7 provides an overview and summary of the constraints workshop undertaken with FCC;
- Section 8 provides an overview of the development vision and transport objectives developed to date;
- Section 9 details the proposed DSA development scenarios;
- Section 10 gives an overview preliminary outline travel demand analysis; and

- Section 11 provides a summary to the Report.

2. Planning and Policy Context and Best Practice Guidance Review

2.1 Introduction

As part of the Appraisal, the planning and policy context for the project is required to be established. As such, a comprehensive review of was undertaken of the relevant planning and policy context, covering national, regional and local contexts (see Sections 2.2, 2.3 and 2.4 respectively of the Baseline Assessment Report included as Appendix 1). A review of national guidance published by the NTA and TII in relation to the production ABTAs was also undertaken. A summary of these reviews is provided below.

National Policy

The following documents were assessed as part of the review of national policy. It is important to note that national policy documents relating to many different areas were assessed including those relevant to transport but also cycling, street design, permeability, retail, development plans etc.

- Housing Supply Target Methodology for Development Planning Guidelines (2020);
- Climate Action Plan (2019);
- Transport-Orientated Development: Assessing the Opportunity for Ireland (2019);
- Project Ireland 2040, National Planning Framework (2018);
- National Development Plan 2018-2027 (2018);
- Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities Department (2018);
- Strategic Investment Framework for Land Transport (2015);
- Design Manual for Urban Roads and Streets (2013);
- Permeability Best Practice Guide (2013);
- Achieving Effective Workplace Travel Plans, Guidance for Local Authorities (2013);
- Local Area Plans – Guidelines for Planning Authorities (2013) and Manual for Local Area Plans (2012);
- Spatial Planning and National Roads Guidelines for Planning Authorities (2012);
- Retail Planning Guidelines (2012);
- National Cycle Manual (2011);
- National Cycle Policy Framework 2009-2020 (2009);
- Smarter Travel – A Sustainable Transport Future 2009-2020 (2009);
- Sustainable Residential Development in Urban Areas (2009); and
- Development Plans – Guidelines for Planning Authorities (2007).

Regional Policy

- Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region 2019-2031 (2019);
- Transport Strategy for the Greater Dublin Area 2016-2035 (2016);
- Greater Dublin Area Cycle Network Plan (2013);
- Planning and Development of Large Scale, Rail Focused Residential Areas in Dublin (2013); and
- Retail Strategy for the Greater Dublin Area 2008-2016 (2008).

Local Policy

- Fingal Development Plan 2017-2023 (2017);
- Dublin City Development Plan 2016-2022 (2016);
- Blanchardstown Urban Structure Plan (2007); and
- Blanchardstown Town Centre Development Framework/ Masterplan (2007).

2.2 National, Regional and Local Policy Review Findings

The primary findings of the policy review are outlined below:

- The DSA lands are largely undeveloped but identified in the current FDP via Objective BLANCHARDSTOWN 13 and in its Development Strategy for Blanchardstown as an objective to *'Promote lands at Dunsink as a longer-term strategic area suitable for mixed use development'*.
- DSA is identified in the RSES MASP as *'a major greenfield land bank with long term potential to develop a new district centre'*. Furthermore, it specifically references the DSA in stating that *"the proposed DART Underground and LUAS extensions to Finglas and Lucan subject to appraisal and delivery post 2027, will unlock long-term capacity including strategic landbanks such as Dunsink".*
- The current FDP also seeks to provide new Regional Parks at the following locations: *"Baleally Lane, Mooretown/Oldtown (Swords), Baldoyle, and Dunsink subject to Appropriate Assessment screening"*.
- Chapter 4 of RSES sets out the settlement strategy with the DSA lands falling within Dublin City and Suburbs where the Strategy seeks to *"support the consolidation and re-intensification of infill/brownfield sites to provide high density and people intensive uses within the existing built up area and ensure that the development of future development areas is coordinated with the delivery of key water and public transport infrastructure".*
- The current TSGDA envisages that the Maynooth Rail Line, which serves the DSA lands via both the Navan Road Parkway Station and Ashtown Station, will be enhanced as part of the DART+ Programme in the form of the DART+ West Project. In doing so, capacity on the Maynooth Rail Line is due to increase from ca. 4,500 to 13,750 passengers per hour per direction (pphpd). Furthermore, an extension to the Luas Green Line from Broombridge to Finglas is proposed,

however the DSA lands are noted to be outside the immediate (walking) catchment of its alignment.

- The DSA lands could directly benefit from the proposal to implement a radial CBC between the City Centre, Finglas, and Corduff via Ballycoolin; in addition to an orbital CBC from Kilbarrack to Blanchardstown via Ballycoolin. Opportunities also exist for transfer to services operating along the proposed Luas Finglas project via planned new bus services emerging from the New Dublin Area Bus Network which run on roads adjoining the DSA lands.
- Local Objectives such as 129, 134, 135 and 136 contained within the current FDP are located within and are directly relevant to the DSA lands:
    - Local Objective 129 *"Provide for a pedestrian/cyclist link between the Tolka River and the Royal Canal"*.
    - Local Objective 134: *"Provide for the development of a linear park along the Tolka River Valley"*.
    - Local Objective 135: *"Provide a footbridge over the N3 at an appropriate location between the Auburn Avenue junction with the N3 and the Phoenix Park interchange"*.
    - Local Objective 136: *"Facilitate pedestrian access from Coolmine Rugby Club grounds over the Canal adjacent to the Phoenix Park [Navan Parkway] Railway Station"*.
- The current FDP also emphasizes provision of new Regional Park at Dunsink subject to Appropriate Assessment screening.

3. DSA Lands' Characteristics

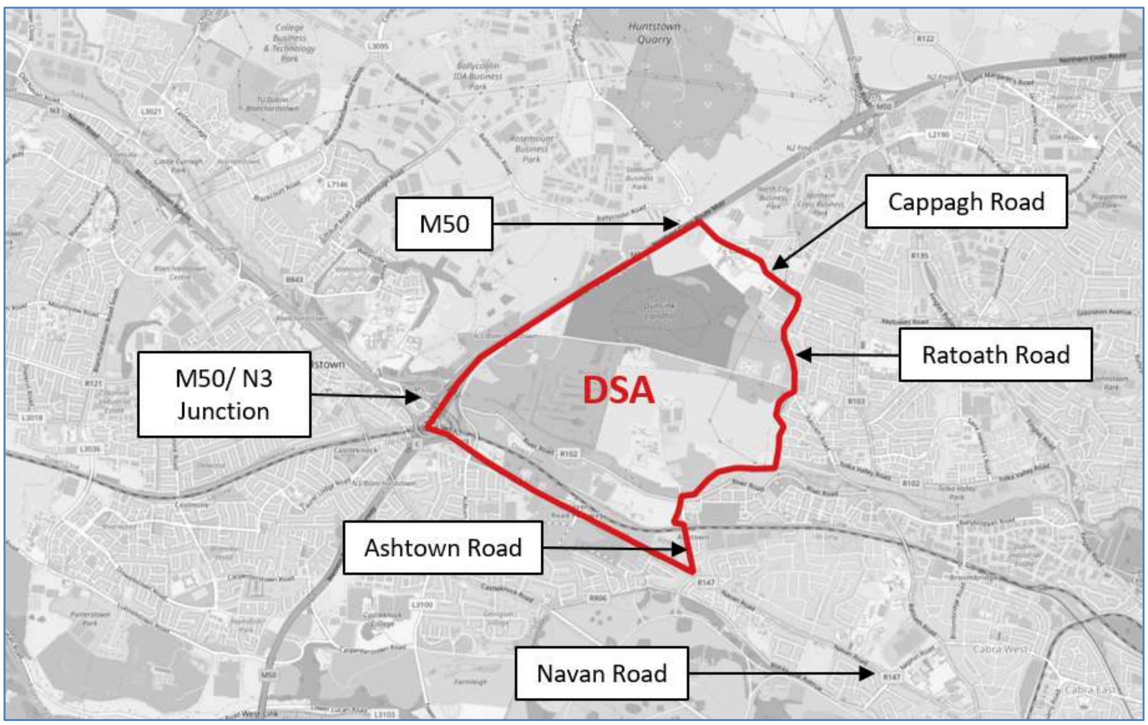
3.1 Introduction

As part of the Baseline Assessment, the general DSA lands characteristics were set out, with focus on its locational attributes, topographical features, land uses, and population and employment patterns. In reviewing their characteristics, key landmarks within the DSA lands have also been identified and presented. These characteristics are summarised below and outlined in detail within Section 3 of the Baseline Assessment Report included as Appendix 1.

3.2 Study Area Extent and Location

The DSA comprises ca. 434.9 hectares of lands located at the southwestern fringe of County Fingal, as shown in Figure 3.1 below. At a strategic level, the DSA lands are located ca. 7 kilometres (straight line distance) from Dublin City Centre (measured from the centre of the lands to O'Connell Bridge).

Figure 3.1 DSA Lands Strategic Location



As can be seen in the preceding figure, the DSA is bounded by the M50 in the northwest, Cappagh Road in the northeast, and the R147 Navan Road to the south. The eastern DSA boundary is formed, from north to south, by Ratoath Road, existing residential development at Scriblestown/ Cardiffsbridge, Tolka River, the R102 River Road, and Ashtown Road.

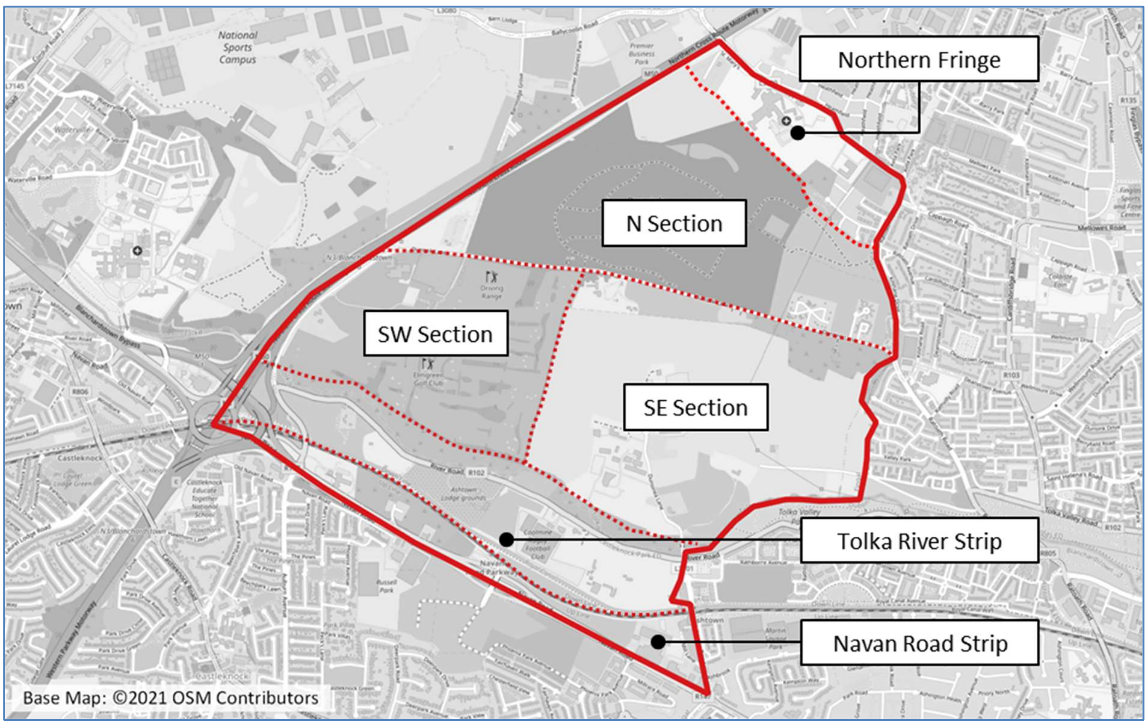
It is noted that a minor strip of the DSA lands located south of the Maynooth Rail Line and the Royal Canal may currently only be accessed from the south from the R147 Navan Road. The remainder of the lands (located north of the Royal Canal) may only be accessed from the northeast, east, and southeast, with the M50 and the Maynooth Line/ Royal Canal currently forming significant permeability barriers (notwithstanding the existing pedestrian underpass under the M50 at the N3/ M50/ R147 Navan Road Interchange in the DSA's south-western corner).

3.3 Current Land Uses within Study Area

DSA Lands Sub-Division and Landmarks

At the highest level, the DSA may be subdivided into six distinct parts with respect to the current land use, as shown in the following Figure 3.2.

Figure 3.2 DSA Subdivision



As can be seen from the preceding Figure 3.2, the DSA lands have been subdivided as follows based on the existing land uses:

- The **Northern Fringe**: bounded by Cappagh Road in the northwest, and the Northern Section (described below). Existing development is present along Cappagh Road, including, from west to east, a Travellers' Halting Site, the National Orthopaedic Hospital, New Cross College, and low-density residential development on Dunsoghly Drive.
- The **Northern Section**: bounded by the Northern Fringe to the north, Ratoath Road in the East and Dunsink Lane in the south. The majority of these lands is taken up by the former Dunsink Landfill, which is now in its aftercare phase, with these lands remaining undeveloped pending its conclusion. Existing development is present in the lands' south-eastern corner (including St. Joseph's Halting Site and residential units at St. Mary's Park). In addition, the lands' south-western

corner is occupied by Abbotstown AGI (gas-related installation), with the Dunsink Horse Club site also located nearby.

- The **South-Eastern Section**: bounded by Dunsink Lane in the north, the Elmgreen Golf Club's course to the west, Tolka River to the south and southeast, and the existing residential development at Scriblestown/ Cardiffsbridge to the east. The majority of these lands is undeveloped, with existing development including the Dunsink Observatory in the north-western corner, Phoenix Football Club's pitches in the centre, and industrial/ research-related facilities in the southern part (including the Teagasc Ashtown Food Research Centre).
- The **South-Western Section**: bounded by Dunsink Lane in the north, the M50 in the west, and Tolka River in the south, with the eastern boundary of these lands formed by the eastern boundary of the Elmgreen Golf Club's course. The majority of these lands is taken up by the golf course, with the north-western corner occupied by the Elm Green Nursing Home.
- The **Tolka River Strip**: bounded by Tolka River in the north, the M50 in the west, the Royal Canal and the Maynooth Rail Line in the south, and Ashtown Road in the east. These lands form a narrow strip (ca. 200 metres between the Tolka River and the Royal Canal), with existing development including (from west to east) several residential properties, the Coolmine Rugby Club and Ger Conroy Fitness Castleknock, and the Ashtown Dog Pound – all accessed from the north via River Road.
- The **Navan Road Strip**: bounded by the Royal Canal and the Maynooth Rail Line in the north, the M50 in the west, the R147 Navan Road in the south, and Ashtown Road in the west. These lands form a narrow strip (ca. 150 metres between the Royal Canal and the R147 Navan Road), with existing development including (from west to east) the Travelodge Dublin Phoenix Park Hotel, several residential properties on Morgan Place, a filling station, the Navan Road Parkway Railway Station, and several commercial/ retail properties, all accessed either from the south via the R147 Navan Road or from the east via Ashtown Road. The south-eastern corner of these lands is taken up by the Revenue Commissioners (Fingal District) building.

The key landmarks within the DSA lands are presented for reference within Figure 3.3, with the legend for the numbered items included in the subsequent Table 3.1 (both overleaf).

Figure 3.3 Identified Key DSA Landmarks

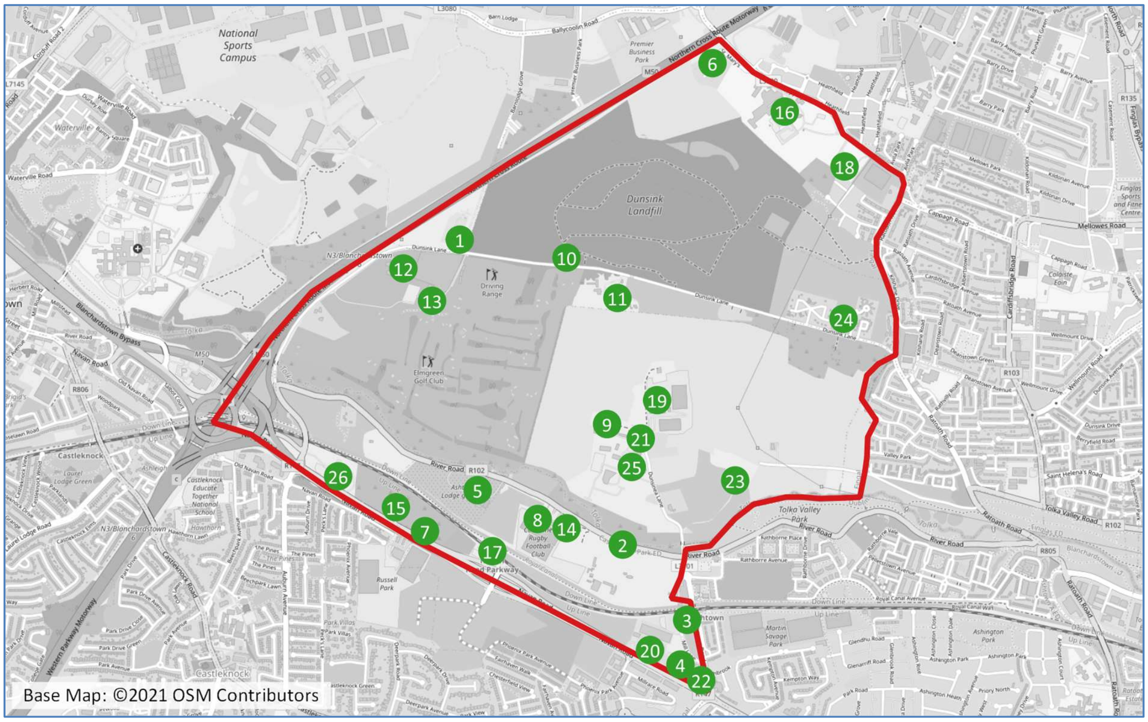


Table 3.1 Landmarks within DSA

ID	Name	ID	Name
1	Abbotstown AGI Natural Gas Station	14	Ger Conroy Fitness Castleknock
2	Ashtown Dog Pound	15	Morgan Place Residential Area
3	Ashtown Equestrian Centre	16	National Orthopaedic Hospital Cappagh
4	Ashtown Gate	17	Navan Road Parkway Railway Station
5	Ashtown House	18	New Cross College
6	Cappagh Rd Travellers' Halting Site	19	Phoenix Football Club
7	Circle K Brady's	20	Phoenix Industrial Estate
8	Coolmine Rugby Club	21	Rathbourne Motors
9	David Quigley Car Sales	22	Revenue Commissioners
10	Dunsink Horse Club	23	Scribblestown Airsoft
11	Dunsink Observatory	24	St. Joseph's Travellers' Halting Site
12	Elm Green Nursing Home	25	Teagasc Ashtown Food Research Centre
13	Elmgreen Golf Club	26	Travelodge Dublin Phoenix Park Hotel

Land Use

Using GeoDirectory the predominant land uses within the DSA land have been determined. The DSA has 356 no. premises marked as Residential that are mainly concentrated towards the northeast of the lands and comprise the Dunsoghly housing estate along with travellers' accommodations. There are 66 no. premises marked as Commercial, most notably within the Ashtown Industrial area, Ashtown

Food Research Centre, Coolmine Rugby club, Travelodge Dublin Phoenix Park, Elmgreen Golf Club and National Orthopaedic Hospital. The DSA also has 4 no. premises marked as Both (i.e. Residential and Commercial) along the R102 Ratoath Road – Ashtown House, Ashbrook Lodge and River Road Cottages.

3.4 Population and Employment

Development within the DSA lands is at present limited. As a result, its resident population is low, with its demographic and socioeconomic structure likely to change significantly should large-scale development of the area be pursued. A baseline review of the DSA lands' population and employment characteristics was undertaken using available Central Statistics Office (CSO) Census 2016 datasets namely the Small Area Population Statistics (SAPS) dataset and the Workplace Zones dataset (for employment).

Population and employment levels within the DSA lands were found to be roughly equal, with a total of 1,547 residents and 1,570 daytime workers recorded by the Census. A relatively densely populated area in the north-eastern corner of the DSA lands was identified which covers the Dunsoghly Avenue area. The southern part of the DSA lands also includes isolated residential dwellings along the R102 River Road, in addition to a pocket of detached houses at Morgan Place. The population within the remainder of the lands is understood to mainly comprise the residents of the 2 no. traveller accommodation sites, in addition to the residents of the Elm Green Nursing home and patients of the National Orthopaedic Hospital on the Census night.

Approximately 30% of DSA employees have been recorded in the south-eastern tip of the DSA lands (Ashtown Gate) which includes the Revenue Commissioners offices and other commercial operations such as garages. Furthermore, it is understood that the majority of employees within the northern part of the DSA lands are mostly employees of the National Orthopaedic Hospital and the adjacent New Cross College – both located along the northern boundary, adjacent to Cappagh Road. The remaining DSA lands' employees are understood to be distributed across its central and southern parts.

3.5 Topography and Physical Characteristics

Key topographical and physical characteristics within each of the defined DSA parts illustrated in Figure 3.2 can be summarised as follows:

- The **Northern Fringe** lies to the extreme north of the overall study area. This section of the DSA is primarily flat in its topography. This area is bounded by trees and hedgerows along the northern boundary with the Cappagh Hospital. The levels of this section are between ca. 50-70 metres Above Ordnance Datum (AOD). It generally has urban, or edge of urban characteristics.
- The **Northern Section** comprises of the lands formally used as the landfill. The former landfill has been capped and now comprises of grasslands. The topography of section is formed by its

previous use of as a landfill, and thus the level increases from the east at ca. 50 metres AOD to a height of ca. 90 metres AOD in the western section. The sides of the historic landfill are noted to be relatively steep. There are also two lagoons to the north of the old landfill and two halting sites on relatively flat ground on the eastern portion. The current landscape character is informed by its legacy as a former landfill.

- The **South-Eastern Section** is formed of undulating landscape, divided several pastural and agricultural fields. The boundary of these fields comprises of trees and dense hedgerows. The lands slope downwards from north to south from a level of ca. 80 metres AOD to ca. 40 metres AOD towards the Tolka River.
- The **South-Western Section** is formed from lands in use by Elmgreen Golf Course. The landscape here is laid out in typical rolling, parkland expected with a golf course. The external perimeter of the golf course is bounded by mature trees and dense hedgerows. The elevation of the golf club lies between ca. 40 metres AOD and ca. 70 metres AOD, rising in the northern direction.
- The **Tolka River Strip** runs along the valley of the river. This section of the DSA is quite narrow, and steep, following the natural contours and the flow of the river. The landscape is riparian in nature with the river valley gently sloping to the north and a steeper incline to the south up to the railway and canal. The elevation of the landscape here is ca. 30 metres AOD along its entire length.
- The **Navan Road Strip** comprises a narrow strip to the extreme south of the DSA. This part of the lands is quite challenging as it is constrained by the surrounding physical infrastructure. From the southernmost part of the DSA is bounded by the main N3 /Navan Road. Parallel to this road, is the Maynooth Rail Line including the train station at Navan Road Parkway. Immediately adjacent to the railway is the Royal Canal, which meanders through the southern portion of the DSA. The topography of this area is flat and similarly has an elevation of ca. 30 metres AOD. It has an urban and infrastructure characterisation.

The combined landscape characteristics of the South-Western Section, South-Eastern Section and the Tolka River Strip, have been classified as a *"highly sensitive landscape"* in the current FDP owing to their elevation and rolling semi-rural landscape form. Dunsink Observatory is on an elevated part of the DSA with a view over the surrounding landscape. The Observatory is identified on the National Inventory of Architectural Heritage (NIAH) and is a protected structure. The NIAH notes its parkland setting.

4. DSA Immediate Catchment and Wider Area Characteristics

4.1 Introduction

The Baseline Assessment set out the context within which the DSA lands are located, describing key demographic, employment and facilities within its immediate surrounds and wider area. This section of this Report provides a summary of the findings of the Baseline Assessment Report with further details set out in Section 4.2 and 4.3 of Appendix 1).

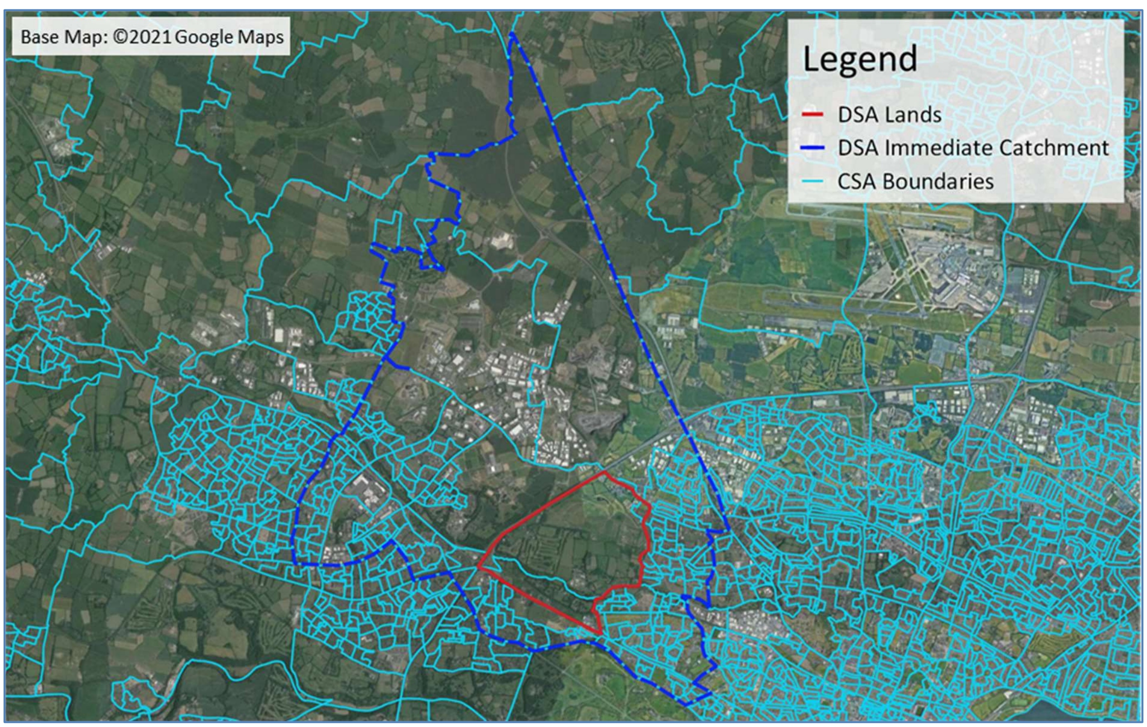
4.2 Catchment Area Definition and Rationale

The immediate surrounding and catchment of the DSA has been arrived at on the basis of CSO defined Electoral Divisions (ED) and Census Small Area (CSA) boundaries. The defined boundary is directly related to the population, employment and other socioeconomic characteristics from Census 2016 and other datasets such as Place of Work, School or College Anonymised Records (POWSCAR).

The boundaries of the DSA lands and DSA Immediate Catchment are illustrated in Figure 4.1 (below).

Key employment centres, recreational and social facilities such as schools, hospitals and medical centres have been identified within the defined immediate catchment area boundary.

Figure 4.1 DSA and Immediate Catchment Boundaries



4.3 DSA Immediate Catchment – GeoDirectory Data Analysis

GeoDirectory data for the DSA Immediate Catchment (excluding the DSA lands and areas within Dublin City County Council's jurisdiction), suggest ca. 12,200 no. Residential premises which are mostly concentrated in predominantly low-density settlements within Castleknock and Blanchardstown to the south and west of the DSA lands.

There are ca. 2,215 no. Commercial entities within the DSA Immediate Catchment, offering ample employment opportunities. These are mainly concentrated in Blanchardstown Town Centre in the southwest and industrial estates to the northwest of the DSA lands including Coolmine Industrial Estate, Rosemount and Northwest Business Parks and North Park Industrial Estate.

An additional ca. 345 no. premises in the DSA Immediate Catchment are marked as Both (i.e. Residential and Commercial).

4.4 DSA Immediate Catchment – Population and Employment Patterns

Figure 4.2 (below) presents population distribution patterns (as ascertained from CSO Census 2016 Small Area data) within the DSA Immediate Catchment. As can be seen from this figure, most residential development was found to be located to the south and west of the DSA lands.

Figure 4.2 DSA Immediate Catchment – Population Distribution Patterns

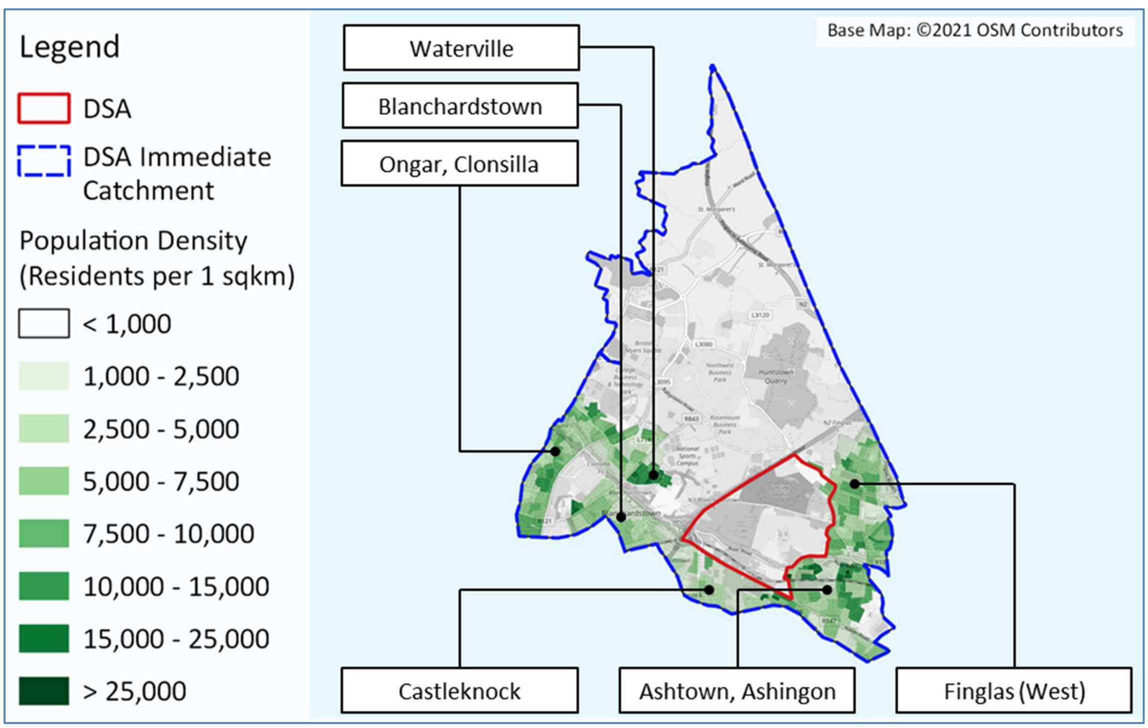
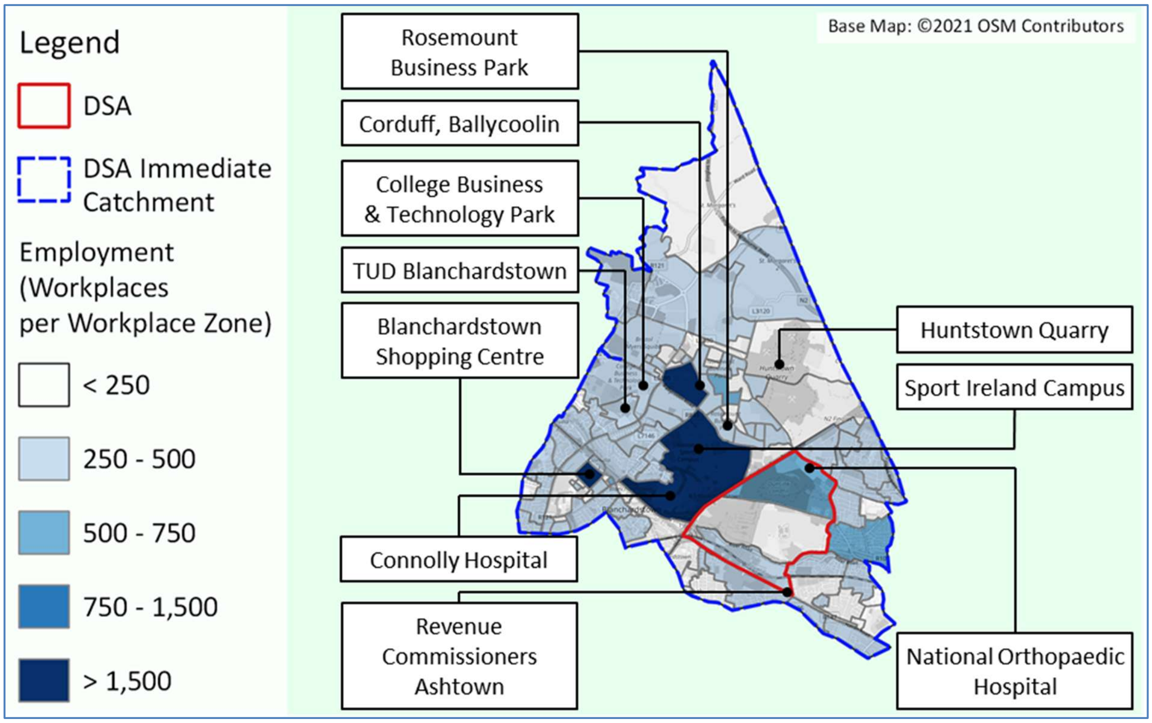


Figure 4.3 (overleaf) presents employment distribution patterns (as ascertained from CSO Census 2016 Workplace Zones data) within the DSA Immediate Catchment. As can be seen from this figure, it reinforces the findings of the GeoDirectory data analysis, whereby most commercial development was found to be located in Blanchardstown Town Centre and industrial estates to the northwest of the DSA lands. The Sport Ireland Campus, located adjacent to the DSA lands but across the M50, also features as a notable employment centre.

Figure 4.3 DSA Immediate Catchment – Employment Distribution Patterns



4.5 DSA Immediate Catchment – Key Facilities

Education

There are 31 no. primary schools and 11 no. secondary schools within the DSA Immediate Catchment. The majority of these educational institutions are located in the west, southwest, south and southeast of the catchment. Only 1 no. of these schools, namely New Ross College secondary school is located within the DSA lands.

In relation to higher education institutions, the Technological University (TU) Dublin Blanchardstown Campus is noted to be located within the DSA Immediate Catchment, to the northwest of the DSA lands.

Hospitals and Medical Centres

There are 7 no. medical centres and 2 no. hospitals located within the DSA and its surrounds. Notably, Connolly Hospital Blanchardstown, the main healthcare facility is located to the west of the DSA lands and to the northwest of the M50/N3 junction. 1 no. healthcare facility, namely the National Orthopaedic Hospital Cappagh, is located within the DSA lands adjacent to the northern boundary.

4.6 DSA Immediate Catchment – Major Landmarks and Employment Zones

Sport Ireland Campus

The Sport Ireland Campus is located at Snugborough Road, Blanchardstown, Dublin 15, occupying lands on the opposite side of the M50 relative to the Dunsink Study Area. The Campus covers an area of ca. 200 ha. and includes high profile facilities including the National Indoor Arena and the National Aquatic Centre. The Campus also provides amenities for the local community.

It is noted within Section 4.2 of the Baseline Assessment Report that there is an emerging new Masterplan for the Campus which envisages that the Campus will accommodate a new village centre, sports facilities, office and athletes' accommodation. Given the proximity of the Campus to the DSA, consideration of potential new linkages between the two and their benefits is deemed an essential component of an overall strategy for Dunsink.

Key Employment Zones

Other major employment zones include the Dublin Enterprise Zone (DEZ) which covers the primarily industrial lands at Rosemount, Ballycoolin, and Damastown and comprising approximately twenty business parks and the TU Dublin Blanchardstown (TUDB) Campus. The Zone is noted to employ ca. 20,000 people, while further development of this area, mostly zoned as High Technology (HT), has been addressed within the current FDP. Blanchardstown Town Centre also falls within the DSA's immediate catchment

4.7 DSA Wider Area Catchment

A spatial analysis was undertaken for the wider area (up to 20 kilometres from the DSA) to identify key residential areas and their populations, and key employment areas and the associated number of workplaces within increasing distance bands from the DSA lands, with the outputs of this analysis presented within Section 4.3 of the Baseline Assessment Report at Appendix 1.

Residential Settlements

The DSA's local environs (within a 2.5-kilometre distance band) have a relatively low population, as the areas to the north and south of the lands are non-residential. Nevertheless, residential areas to the east (Finglas, West Cabra) and southwest/ west (Castleknock, Blanchardstown) currently house a population of ca. 100,000. The most densely populated areas of Dublin City Centre are located between 5 and 7.5 kilometres from the DSA, and the majority of urban Dublin is within the 12.5 kilometres distance band.

Employment Centres

The nearest prominent employment area within DSA's vicinity covers the lands to the northwest, including the Dublin Enterprise Zone. These lands, located between 2.5 and 5 kilometres from the DSA and include ca. 20,000 workplaces, with the DEZ understood to include development lands to enable doubling this figure.

Dublin Airport, which is home to ca. 10,000 daytime workers, is located within 7.5 kilometres from the DSA as are major employment areas within Dublin City. Other prominent employment areas such as Leopardstown, Tallaght, and Leixlip are ca. 10 kilometres away from the DSA.

5. Transport Infrastructure, Services and Accessibility

5.1 Introduction

An in-depth review of the DSA lands in the context of transport infrastructure and services, both existing and planned was undertaken. This review also took account of the accessibility of public transport infrastructure from the DSA lands, with the accessibility of the study area by walking, cycling and driving also assessed. This section of the Report provides a summary of the key findings of this review.

5.2 Existing Public Transport Infrastructure and Services

Heavy Rail Services

The assessment found that the subject lands and are currently served by 2 no. rail stations, namely Navan Road Parkway and Ashtown Stations, on the Maynooth Rail Line which passes through the DSA lands, adjacent to its southern boundary. Commuter rail services from these stations connect the DSA to major train stations in Dublin City from where transfers can be made to the wider light (Luas) and heavy (DART, Commuter and InterCity) rail network. Commuter rail services operating from these stations also connect the DSA to Maynooth to the west and other intermediate stations. Peak hour commuter train frequencies from these stations are detailed in Section 5.2 of the Baseline Assessment Report at Appendix 1.

The Dublin to Sligo InterCity Rail Line runs through the DSA, co-utilising infrastructure with commuter rail services from Maynooth to Dublin City Centre. This railway line is double tracked between Connolly Station and Maynooth Station, after which it is single tracked to Sligo. This route serves intermediary stations including Maynooth Kilcock, Enfield, Mullingar, Edgeworthstown, Longford, Carrick-on-Shannon and Boyle.

Light Rail Services

At present, there is no light rail infrastructure in the immediate vicinity of the DSA, however Broombridge Station, which is served by both commuter trains and Luas Green Line services, is located ca. 2.3 kilometres to the east of the subject lands, and can be reached directly from both Navan Road Parkway and Ashtown Stations via commuter rail services. At Broombridge, passengers can transfer from commuter rail to Luas Green Line services, thereby providing a light rail link to Dublin City Centre via Cabra, Phibsborough, Grangegorman (TU Dublin City Campus), Broadstone, and onwards to South Dublin as far as Sandyford and Brides Glen. Transfers from commuter rail to Luas Red Line services can also be availed of at Connolly Station.

Bus Infrastructure and Services

The bus routes currently serving the DSA lands run along the roads demarcating its northern, eastern, and southern boundaries, i.e. Cappagh Road (40d, 17A, 220) , Ratoath Road (220/ 220A), and River Road (120), and the R147 Navan Road (38, 38A, 38B, 39, 39A, 39X and 70) respectively. Bus priority measures in form of bus lanes are also provided on the R147 Navan Road.

The Navan Road corridor which adjoins the DSA lands' southern boundary is a key regional artery between Dublin City and the northwest suburbs, and accommodates a number of bus services, as set out above. These services offer a cumulative headway of under 3 minutes in the AM peak. Further details relating to existing bus infrastructure, services and frequencies are provided in Figure 5.2 and Tables 5.2 (local services) and 5.3 (regional services) of the Baseline Assessment Report at Appendix 1.

In addition to the local bus services, the DSA is served by a wide range of regional and long-distance bus services which operate along the R147 Navan Road corridor. These services are operated by both public (Bus Eireann) and private companies.

Public Transport Accessibility Analysis

An accessibility analysis of existing local bus stops and existing train stations was undertaken by means of an isochrone analysis to ascertain the extent to which they accommodate residents of or visitors to (including employees) the DSA lands. The outputs of these analyses presented are presented in the following Figure 5.3 and Figure 5.4 respectively of the Baseline Assessment Report at Appendix 1.

The southern and northern parts of the DSA lands were found to be accessible via a convenient walk from existing bus stop infrastructure along the R147 Navan Road and Cappagh Road corridors respectively, the remainder of the DSA lands are outside the bus walking catchment. The southern part and south-eastern corner of the DSA lands are directly served by rail services. The remainder of the DSA lands are not however directly served by rail, with the absence of pedestrian links over the Royal Canal and the absence of pedestrian infrastructure on River Road representing identified barriers to improved public transport accessibility. This is discussed in detail in the Section 5.2 of the Baseline Assessment Report at Appendix 1.

5.3 Proposed Public Transport Infrastructure and Services

DART+ Programme / DART+ West Project

The part of the overarching DART+ Programme involving the infrastructure and service upgrades on the Maynooth Rail Line has been referred to as the DART+ West Project (and in some instances as Dart+ Maynooth Line Project). As per the DART+ Maynooth Line Preliminary Options Selection Report, key infrastructural works will include such items as electrification and re-signalling of the Maynooth and M3 Parkway line from City Centre to Maynooth (ca. 40 kilometres), closure of level crossings along the railway corridor (including at Ashtown Road at the southeast of the DSA), construction of a new DART depot facility near Maynooth and the development of an interchange station with MetroLink at Glasnevin.

It is understood that when all works are completed, peak frequency along the Maynooth Rail Line will have increased from seven to fifteen trains per hour, resulting in capacity increasing from ca. 4,500 to 13,750 passengers per hour per direction (pphpd).

BusConnects

BusConnects[3] is a multi-faceted programme that aims to improve bus services within the GDA through an improved network (New Dublin Area Bus Network), enhanced infrastructure (Core Bus Corridors), new ticketing/ fare systems and improved/ new bus stop facilities.

Core Bus Corridors (CBCs)

The CBC project represents one key element of the overall BusConnects programme, and will deliver improved infrastructure on sixteen radial bus priority corridors (in addition to the provision of segregated cycle lanes in both directions along each corridor). The bus infrastructure improvements proposed along the CBCs include measures such as provision of bus lanes, bus gates, and filtered permeability systems to improve bus speeds, reliability, and punctuality.

The DSA lands are noted to be located at the proposed CBC5 Blanchardstown to the City Centre, running along the R147 Navan Road. With regard to the R147 Navan Road section which adjoins the DSA's southern boundary, the following bus infrastructure improvements are proposed as part of the CBC project:

- continuous bus lanes to be provided in both directions on the roundabout over the M50;
- additional bus stops to be provided at Auburn Avenue (by the DSA's south-western corner);
- bus lanes to be directed along the slip roads to provide access to the bus stops serving the Navan Road Parkway railway station; and
- the R147 Navan Road/ Ashtown Road Roundabout to be converted into a signal-controlled roundabout.

New Dublin Area Bus Network

The revised network, which represents a key element of the overall BusConnects programme, is to be implemented on phased stages from 2021, with improved service provision expected to be delivered throughout the overall Dublin area, including Northwest Dublin within the DSA's general vicinity.

3 https://busconnects.ie/

Characteristics of the network redesign include enhanced *"spine"* corridors to/ from the City Centre that are comprised of multiple services operating along the same core corridor, additional provision of other radial routes (that do not route through the main spine corridors), enhanced orbital services that connect areas outside of the City Centre, and other local services that cater for the needs of specific areas, in addition to express and peak only services that allow for enhanced commuting journey options for those living in areas that are located further from the City Centre.

Revised bus services operating along the R147 Navan Road corridor (the B Spine) which adjoins the DSA lands' southern boundary will offer a cumulative headway of under 3 minutes throughout the day. For further detail on proposed bus services in the vicinity of the DSA and their frequencies, refer to Figure 5.8 and Table 5.4 of the Baseline Assessment Report at Appendix 1.

Luas Finglas – Green Line Extension

It is currently proposed under the Luas Finglas Project that the existing Luas Green Line be extended from its current terminus at Broombridge to the new terminus at Charlestown ca. 4 kilometres to the north. The proposed extension will include four new stops and initially operate at a running frequency of 7.5 minutes, delivering capacity of in excess of 3,250 pphpd.

Luas Finglas is noted to have been named in the Eastern and Midland Region RSES as a scheme essential for development of the landbank at Dunsink. Nevertheless, the nearest proposed Luas Finglas at Broombridge (existing) and St. Helena's (proposed) are noted to be located 1.7 kilometres and 1.3 kilometres (straight line distance) from the eastern boundary of the Dunsink landbank, with other parts of the landbank being more remote. While the landbank is deemed to be located at the periphery/ outside of Luas Finglas' walking catchment, there would appear to be opportunities to transfer to Luas Finglas services, depending on bus provision.

Additional Luas Infrastructure

It is noted that as part of the NTA's Draft Transport Strategy for the Greater Dublin Area 2022-2042 published in late-2021, a number of Luas lines have been included for delivery post-2042, including a City Centre to Blanchardstown Luas Line and a Luas Green Line Extension to Tyrrelstown, with the indicative alignment of the latter scheme appearing to pass directly through the DSA lands.

Measure LRT6 contained within the Draft Strategy states that the NTA will undertake detailed appraisal, planning and design work a number of Luas lines during the lifetime of the Strategy, including the abovementioned Luas lines, with a view to their delivery in the period after 2042.

MetroLink

The proposed MetroLink project will create a high-frequency and high-capacity link between Swords and Ranelagh via Dublin Airport and Dublin City. A heavy rail and light rail (metro) interchange is proposed as part of the DART+ West Project with the planned MetroLink scheme at Glasnevin, which will create a further transport interchange on the upgraded Maynooth Rail Line.

5.4 Current and Proposed Active Modes' Infrastructure

Current Active Modes' Infrastructure

Cycling

The DSA lands have segregated (off-road) cycling infrastructure towards the south and south east parts. The first cycle track is part of the Tolka Valley Park, and its alignment runs immediately inside the DSA boundary for ca. 900 metres before terminating at Dunsinea Lane. The other cycle track runs along the Royal Canal from Ashtown Train Station in the east to M50/ N3 Junction 6 in the west for a length of ca. 2.2 kilometres and forms park of the overall Royal Canal cycle route between Dublin City Centre and Castleknock.

These cycle tracks offer good connectivity from the south to the eastern parts of the DSA however do not in themselves offer connectivity to the rest of the lands. The DSA lands currently lack comprehensive cycling infrastructure and there appears to be good scope for integrated cycling infrastructure providing sustainable access to public transport facilities (bus and rail) which are also concentrated towards the south and southeast of the lands.

The DSA Immediate Catchment contains a range of a cycling infrastructure types, varying from bus lanes to segregated cycle tracks.

Walking

The existing walking infrastructure within the DSA lands is very limited and does not provide direct connectivity within the different parts of the lands. Within the DSA Immediate Catchment, footpaths are generally provided along roads within the urban area in accordance with best practice, however significant permeability barriers exist as evidenced by accessibility analysis contained within Figure 5.16 and Figure 5.17 of the Baseline Assessment Report at Appendix 1.

Ireland's official Famine Heritage Trail is a 165 kilometres long cross-country pilgrim walk which passes through country lanes, villages, towns and Dublin City, mostly along the banks of the Royal Canal. Ashtown Lock within the DSA lands falls on the trail and offers good potential to integrate development of these lands with heritage walking routes.

Proposed Active Modes' Infrastructure

A number of cycling schemes are proposed within the GDA Cycle Network Plan (2013). These schemes have recently been endorsed and approved funding for implementation. Relevant schemes in close vicinity to DSA lands include:

- Royal Canal Cycle Route – entire Fingal route and Dublin City route upgrade;
- Ashtown Road to Phoenix Park;
- Ratoath Road from Navan Road to Tolka Valley Road;
- Glasnevin and Finglas via Ashtown to the Royal Canal Greenway;
- Snugborough Road N3 overbridge;
- Damastown to Clonsilla Cycle Route incl. N3 bridge;
- Clonee to Blanchardstown Shopping Centre; and
- Snugborough Road – National Aquatic Centre to Ongar.

It is noted that as part of the NTA's Draft Transport Strategy for the Greater Dublin Area 2022-2042, an updated GDA Cycle Network Plan was published in late-2021, also in draft format. This Draft Plan also includes an additional cycling scheme, the proposed alignment of which runs from Finglas Road in the east to Snugborough Road in the west, through the DSA via Dunsink Lane, crossing the M50 Motorway (via a new overbridge) and through the Sport Ireland Campus.

5.5 Current and Proposed Road Infrastructure

Current Road Infrastructure

Key roads within the DSA lands' and their vicinity have been subject to review. Key roads within the DSA lands include Dunsink Lane, R102 River Road, R102 New River Road, Dunsinea Lane, Scribblestown Lane, Dunsoghtly Residential Area and Mill Lane. Key roads external to the DSA lands' boundary include M50, R147 Navan Road, R805 Ashtown Road, R102 Ratoath Road and Cappagh Road.

An overview of each of the above-listed internal and external roads is provided within Section 5.4 of the Baseline Assessment Report at Appendix 1.

Road Safety

Data from the Road Safety Authority (RSA) collision database was used to assess the historic safety performance characteristics of the existing road network within DSA lands' vicinity. The available data showed very few collisions have been recorded within the DSA lands and that no pattern in collisions is apparent on the external road network.

Proposed Road Schemes

As noted in Section 2.4 of the Baseline Assessment Report at Appendix 1, Objective MT41 of the current FDP seeks to implement road improvement schemes within the Plan period (to 2023), and 2 no. such road schemes fall within DSA lands:

- Cappagh Road – North Road Link (to the north of the DSA); and
- Cappagh Road – River Road Link (passing through the DSA, parallel to the M50).

5.6 Study Area Accessibility – GIS Analysis

The DSA lands' accessibility by walking, cycling and general traffic have been assessed by means of isochrone analysis using GIS software. For further information on these analyses including graphical outputs, refer to Section 5.5 of Appendix 1 for walking and cycling accessibility analyses and Section 5.4 of Appendix 1 for general traffic accessibility analysis.

Walking Accessibility Analysis

The DSA lands' accessibility by walking, cycling and driving has been assessed by means of an isochrone analysis using GIS software.

It is apparent from the analysis presented in Figure 5.16 of the Baseline Assessment Report at Appendix 1 that the M50 represents a major permeability barrier in the area, with the Sport Ireland Campus and its environs close to or in excess of 60 minutes' walk from the assumed DSA Centre Point. Furthermore, permeability across the area along the east-west axis is affected by the severance of Dunsink Lane, which results in only highly circuitous alternative routes being available. Further permeability barriers to include the Royal Canal and the Maynooth Rail Line.

Cycling Accessibility Analysis

The severance of Dunsink Lane and its implications discussed above also applies to cycling, with a lack of direct east-west and north-south links across the DSA as evidenced within Figure 5.17 of the Baseline Assessment Report at Appendix 1.

The area accessible within a 60 minutes' cycle, extends from the DSA lands to Clontarf and Sandymount in the east, Donnybrook and Terenure in the south, Leixlip and Dunboyne in the west, and Dublin Airport in the north. All of Dublin City Centre and Dublin's North and South Docklands are also within its cycling catchment. As with walking, the severance impact of the M50 in relation to permeability between the DSA lands and areas to the northwest of the M50 are noted.

General Traffic Accessibility Analysis

As evidenced within Figure 5.12 of the Baseline Assessment Report at Appendix 1, the area accessible within a 45 minutes' drive extends from the DSA lands to Howth in the east, Wicklow and Kildare in the south, Kinnegad in the west, and Kells and Dunleer in the north. The effect of the DSA's proximity to the M50 is clearly visible in the figure, with the lands located along strategic roads accessible within a relatively short drive time. Conversely, the south Dublin City and Dún Laoghaire are noted to be relatively poorly accessible by car due to the lack of direct high-capacity road connections between these areas and the DSA. The impact of the M50 in terms of severance is also noted, with drive times from the DSA lands considerably longer to areas located directly to its northwest.

6. Existing Travel Patterns Analysis

6.1 Introduction

As part of the Baseline Assessment an analysis of CSO Census 2016 travel patterns analysis was undertaken. Due to the largely undeveloped nature of the DSA lands at present, the focus of the analysis is both on the DSA and the larger DSA Immediate Catchment. The analysis has utilised a series of Census 2016 datasets, including workplace zonal data and Place of Work, School or College Anonymised Records (POWSCAR). Analysis has included commuting destinations (for those resident in the DSA Immediate Catchment), commuting origins (for those working, learning, or studying in the DSA Immediate Catchment), and commuting mode shares both those residing in and those working, learning, or studying in the DSA Immediate Catchment. This section of the Report summarises the findings of this analysis with further details given within Section 6 of the Baseline Assessment Report at Appendix 1.

6.2 Resident Commuter Destination Patterns

Census 2016 commuting data for residents of the DSA Immediate Catchment (incl. the DSA lands) was investigated to assess residents commuting destinations using POWSCAR data as the basis for the analysis.

The northwest part of the catchment area represents an important destination of residents, with this area corresponding to major employment areas in Corduff and Damastown. Blanchardstown Town Centre and Ashington also represent important employment centres for residents of the analysed area. Outside the DSA Immediate Catchment, notable commuting destinations include the City Centre, Sandyford/ Leopardstown and Maynooth/ Leixlip areas. Further information, including GIS outputs, is provided within Section 6.2 of the Baseline Assessment Report at Appendix 1.

6.3 Resident Commuting Mode Share

In analysing the commuting mode share of residents within the DSA Immediate Catchment (incl. the DSA lands), travel by the following modes has been considered – active modes (walking and cycling), public transport and private car. The findings of analysis can be summarised as follows:

- **Active modes**: Low levels of active modes' use among residents of both the DSA (< 20%) and the DSA Immediate Catchment (typically <20%, with a few areas 20-40% and four small areas with higher mode shares).
- **Public transport**: Low public transport mode share among residents of most of the DSA (10-20%), increasing to 20-30% in the southwest part, which corresponds to bus and rail service provision. Within the DSA Immediate Catchment, the resident mode share is typically in the 10-30% range, with small pockets having a 30-40% and >40% public transport mode shares.

- **Private car**: The resident car mode share typically varies between 40% and 80% throughout both the DSA and the DSA Immediate Catchment. Within the DSA, the private car mode share is lowest (40-60%) in the southern part, corresponding to bus and rail service provision. Within the DSA Immediate Catchment, a few small pockets of 20-40% resident mode share are also evident, notably in the southwest part.

Further information, including GIS outputs, is provided within Section 6.3 of the Baseline Assessment Report at Appendix 1.

6.4 Employee and Student Commuter Origin Patterns

Census 2016 commuting data for those commuting to the DSA Immediate Catchment (incl. the DSA lands) for work or education purposes was investigated to assess their origins, using POWSCAR data as the basis for the analysis.

A significant concentration of those working and learning within the DSA Immediate Catchment are resident within it, with significant further concentrations of trip origins located to the northwest, including the wider Dublin 15 area, Navan and Trim. Other notable concentrations include along the M1 and N/ M7 corridors. Further information, including GIS outputs, is provided within Section 6.4 of the Baseline Assessment Report at Appendix 1.

6.5 Employee and Student Commuting Mode Share

In analysing the commuting mode share of those working, learning, or studying within the DSA Immediate Catchment (incl. the DSA lands), travel by the following modes has been considered – active modes (walking and cycling), public transport and private car. The findings of analysis can be summarised as follows:

- **Active modes**: Active modes' use among commuters to the DSA varying from 20-30% in the northern part to <10% in the south. Within the DSA Immediate Catchment, the mode share varies substantially, with the lowest levels recorded in the north and west, and the highest areas located to the east of the DSA and in the southwest part of the DSA Immediate Catchment, with >60% recorded in one area.
- **Public transport**: Within both the DSA and DSA Immediate Catchment, workers' public transport mode share is typically low (<20%), with a few small parts of the DSA Immediate Catchment recording a public transport mode share of 30-40%.
- **Private car**: The private car mode share among workers of the DSA is in the 60-80% range, whereas within the DSA Immediate Catchment, it varies substantially from south (typically 40-60%) to north (>80%).

Further information, including GIS outputs, is provided within Section 6.5 of the Baseline Assessment Report at Appendix 1.

7. FCC Constraints Workshop

7.1 Introduction

A workshop was undertaken on April 14 2021 which involved representatives from various departments within FCC, Transport Insights and MacCabe Durney Barnes. The aim of this workshop was to brief FCC on the emerging findings of the Appraisal and seek input from FCC in relation to:

- identification of key physical constraints as set out with the Baseline Assessment Report;
- classify the significance of such constraints in relation to the future development of the lands; and
- determine implications for identified constraints in relation to the determination of the net developable area within the study lands.

The workshop was supported by a PowerPoint presentation, which set out work to date in undertaking the Appraisal, namely Part 1 (Baseline Assessment) and initial activities on Part 2 (Establish Appraisal Context), which was delivered by Transport Insights and MacCabe Durney Barnes. FCC attendees were requested to provide feedback and comments throughout the workshop in relation to identified constraints and opportunities. The following Sections 7.2 and 7.3 give an overview of the key transport and physical and environmental constraints which were identified and discussed and other items which were noted during the workshop. Section 7.4 outlines the key outcomes of the workshop as they relate to, *inter alia*, transportation, the environment, protected structures and zoning.

7.2 Identified Key Transport Constraints and Opportunities

Constraints

Limited accessibility by public transport through much of the DSA lands, i.e. rail and bus, was identified as a particular constraint. The scale of the DSA lands and lack of direct connections over the Royal Canal and Tolka River result in poor accessibility to the two train stations on the Maynooth Rail Line. While the R147 Navan Road accommodates high-frequency bus services, access to these services from much of the DSA lands is limited. It was also noted during the workshop that bus services operating along Cappagh Road in the north operate at much lower frequency.

Road access to the lands was also discussed as a constraint. Specifically, general traffic connectivity was noted to be constrained by the lack of direct connections to the M50 motorway and to R147 Navan Road, with much of the DSA lands severed by the Maynooth Rail Line, Royal Canal and Tolka River. The existing road network to the north and east of the lands including Cappagh Road and Ratoath Road were noted to present a constraint in accommodating significant additional traffic volumes that may be associated with development of the lands.

Key built and natural barriers within the DSA and its immediate environs such as Royal Canal, Tolka River, Maynooth Rail Line and M50 currently limit the potential of active travel modes i.e. walking and cycling. The current routes are isolated and restricted to Tolka Valley Park section of the DSA lands.

Opportunities

The R147 Navan Road forms part of the BusConnects Core Bus Corridor 5, Blanchardstown to Dublin City Centre route, with the B Spine (B1, B2, B3 and B4) along with other bus routes offering excellent access to high-capacity bus services and connectivity to Dublin City, Blanchardstown and other areas. This represents a key opportunity for the lands to make use of proposed high-frequency bus services in order to accomplish sustainable travel patterns to and from the subject lands.

The Luas Green Line extension to Charlestown was also identified as an opportunity associated with the lands as it will provide enhanced public transport accessibility within its direct catchment, and opportunities to serve wider area via appropriate public transport connections/ interchanges.

Proximity of lands to R147 Navan Road and M50 motorway also represents a key opportunity as these roads provide connectivity between the DSA and the strategic road network. The existing R102, Cappagh Road and Dunsink Lane were also noted as to provide local connectivity within the lands and to their immediate surrounds.

Existing GDA Cycle Network and Local Objectives within the current FDP also represent key opportunities relating to active travel. Route No. 2 and Tolka Greenway on the south side of the lands, Route No. 5 on the northern edge of the lands, Route No. 4B on the eastern edge and Route No. 4A along Navan Road present good cycling potential and opportunities for integration with any development scheme within the DSA lands.

Other key transport opportunities are the significant local residential settlements in the vicinity of the subject lands, employment opportunities, and related strong active modes' potential.

7.3 Identified Physical and Environmental Constraints and Opportunities

Constraints

Dunsink Observatory is located within the lands on an elevated part of the DSA with a view over the surrounding landscape. The Observatory is identified on the National Inventory of Architectural Heritage (NIAH) and is a protected structure. During the workshop the sensitivity of the observatory to development in its vicinity and light pollution was also noted. A number of other protected structures along the Tolka Valley and in peripheral parts of the DSA were also noted.

Dunsink Former Landfill is in its aftercare phase and is governed by a Closure, Restoration and Aftercare Management Plan (CRAMP) as part of the waste licence issued by the EPA (Ref: W0127-01). There is an extensive system of gas and leachate monitoring and management on and around the site. The contaminated nature of the land and the slope of the landfill appear to represent significant challenges to any form of development on, or immediately, adjacent to the facility.

The southern part of the study area, excluding the Navan Road Strip, is characterized in the current FDP as a *"highly sensitive landscape"*. The topography and the rising nature of land from the Tolka Valley up to the Dunsink Observatory and former landfill is also noted. This does not prohibit development, but the nature and scale will have regard to the landscape and parkland setting in the South-Eastern and South-Western Sections.

The Tolka Valley riparian corridor was noted to represent a constraint as it is prone to flooding, however it was noted that the flood zone is relatively narrow. The opportunity for the valley to be ultimately utilized as an amenity asset in any urban development was also noted.

Constraints associated with ecology and biodiversity were also discussed. The principal ecological designation is the Proposed Natural Heritage Area covering the Royal Canal. There are no other sensitive ecological designations, however the riparian ecology associated with Tolka River, wildlife corridors and trees would all have to be taken into account in the detailed planning of the development of the area.

During the workshop, the M50 motorway was noted as a constraint in relation to noise, air and other pollutants associated with the motorway which could impact upon the development potential along the western edge of the DSA.

Constraints associated with existing urban development along the northern fringe of the lands in the form of the National Orthopaedic Hospital, New Cross College and Dunshoghly housing estate were discussed. It was noted that these are well established urban uses that are likely to be consolidated rather than redeveloped. There are also one-off houses, sports clubs and other facilities located within the lands which may present a challenge to comprehensive development, particularly in the short-term.

Opportunities

It was noted that the proximity of the lands to existing built-up areas makes them accessible to engineering services that would be required to facilitate their development, namely water and drainage infrastructure. Furthermore, the DSA location immediately adjacent to existing built-up areas would facilitate a consolidation of urban development.

It was also noted that natural assets and amenities including the Tolka River and the Royal Canal would benefit development and act as amenities. The Dunsink former landfill and a potential park at the Tolka Valley were also discussed.

In terms of topography, it was noted that large portions of the land are relatively flat, thereby supporting their development and for provision of active travel infrastructure and convenient usage. The size of the DSA lands was also noted to present an opportunity for creation of a standalone sustainable community.

Again, the proximity of the DSA lands to existing and underused suburban rail stations, the N3 transport corridor and the M50 motorway were discussed as key physical opportunities. There is a particular opportunity to develop a transport-oriented development along the southern boundary of the lands due to the existing and proposed transport infrastructure at this location.

7.4 Key Workshop Outcomes

Transport

A preference was expressed for the DSA to be planned and developed with an emphasis on low carbon and sustainable transport, as active travel and public transport modes have significant potential for use given proximity to Dublin City and Dublin City Centre. However, it was noted that upfront provision of public transport, specifically bus services, in the vicinity of and within the DSA would be required to achieve a development which is low carbon and sustainable transport focused.

The rural character is currently attractive and any proposals seek to incorporate certain key features into the future development of the lands.

DART+ West project is examining provision of an underpass of Ashtown Road adjacent to Ashtown Station as part of their programme of closing level-crossings in order to facilitate the expansion of DART services to the wider Dublin area.

Dunsink Lane is currently closed, however FCC's preference is for it to be reopened to prevent illegal dumping in the area.

Drainage

The River Tolka is the primary watercourse in the area and associated flooding risks are noted. It is envisaged that SuDS (Sustainable Urban Drainage Systems) can be utilised and form part of a linear park incorporating the riparian corridor of the River Tolka.

Zoning

The Navan Road Strip is currently zoned for High Technology uses.

Protected and Historical Buildings

It is noted that there are many historical (but not necessarily protected) buildings within lands. Development within the DSA lands has the potential to impact on the operation of Dunsink Observatory due to light pollution.

Parks, Ecology, Environment

In its existing form, the DSA represents a green lung/ breathing space in contrast to the built-up areas around it. Development of the lands would open up the opportunity to develop a linear park incorporating the riparian corridor of the Tolka which would be kept free from development.

It was noted that it may be desirable to propose cycling routes along existing roads within the DSA, particularly River Road, instead of existing roads being widened/ upgraded to accommodate cars which would have negative impacts on existing hedgerows.

It was also noted that there were previously plans for a park in the DSA however, these plans were postponed around the time of the economic crisis of the late 2000s.

Other

Non-residential development could be used to screen noise from busy road network i.e. M50, R147 Navan Road.

As noted above, one of the aims of this workshop was to determine implications for the identified constraints in relation to the determination of the net developable area within the study lands. After the FCC workshop, the developable and non-developable areas were identified. This is discussed further in Sections 8 and 9 which follow.

8. Development Vision and Transport Objectives

8.1 Introduction

This section outlines the vision for Dunsink and considers the transport objectives for the area. These have been drafted following consultation with different departments within FCC.

8.2 Vision

The development vision for the Dunsink is as follows:

"Development of a low-carbon mixed-use transit-orientated urban quarter which prioritises active travel and public transport modes both within and outside, is well connected to the wider City via high quality public transport and active travel infrastructure and seeks to protect and enhance the environmental and historic character of the area."

8.3 Transport Objectives

Informed by the vision set out in the preceding Section 8.2, a set of transport objectives have been prepared to inform the study and to assist in selecting a preferred option from a transport perspective. Key performance indicators (KPIs) have also been to devised in order to provide aa basis against the effectiveness of potential options in meeting each objective can be assessed.

Transport Objective 1: Maximise travel by public transport by achieving effective land use and transport integration.

KPIs:

- Public transport mode share;
- Reduction in car mode share;
- Quantum of population within 10-minute (active modes) of a public transport facility; and
- Total employment within 10 minutes of a public transport facility.

Transport Objective 2: Maximise opportunities for active modes trips.

KPIs:

- Public transport mode share;
- Reduction in car mode share;
- Quantum of population within 10-minute (active modes) of a public transport facility; and
- Total employment within 10 minutes of a public transport facility.

Transport Objective 3: Achieve low car travel demand to, from and within the development.

KPIs:

- Reduction in car mode share;
- Reduced car vehicles kms; and
- Journey times and junction capacities.

9. Proposed DSA Scenarios

9.1 Introduction

Three planning and development scenarios have been developed to inform the study and facilitate further stages in the planning process. The scenarios are established for the period up to 2042 as this reflects the timeframe for the Draft Transport Strategy for the Greater Dublin Area 2022-2042, which was under preparation by the NTA at the time of developing these scenarios. The timeframe is divided into Phase 1 up to 2035 and Phase 2 up to 2042. All scenarios have been developed to respect higher level policies in the NPF and Eastern and Midlands RSES.

This section outlines the definitions used in relation to land areas, classifies the various parcels of land within the study area, and considers the broad parameters of the scenarios.

9.2 Definitions and Land Parcel Classification

Definitions

Establishing the quantum of development of the different scenarios requires a consideration of the appropriate density. In order to calculate density and the volume of development which can be accommodated within the study area, it is necessary to define the development area. The definitions below have due regard to the Appendix A: Measuring Residential Density of the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (DEHLG, 2009).

The following definitions are used:

- Dunsink Study Area (DSA) – the overall area of Dunsink as outlined in red in Figure 3.1 and which formed the basis of the Appraisal.
- Strategic Corridors & Open Space – consists of the railway, arterial routes, canal, proposed regional park and Tolka Valley.
- Existing Built-up Area – relates to existing schools, hospitals, residential estates.
- Gross Developable Area – the developable area excluding strategic corridors and existing built-up area.
- Net Developable Area – this excludes the area for new major and local distributor roads and other new public open space serving the new development.

A net density is the most commonly used approach in allocating housing land within Local Area Plans and is appropriate for development on infill sites where the boundaries of the site are clearly defined and where only residential uses are proposed. It is also appropriate where phased development is taking place in a major development area (perhaps spanning different plan periods) and individual housing areas have been identified. The abovementioned Guidelines use net densities.

Classification of Study Area

The study area has been analysed and categorised having regard to the above definitions. This allows for calculation of the net developable area which is used as the basis for establishing development volumes. Figure 9.1 and the subsequent Table 9.1 establishes figures for the DSA, the Gross Developable Area and the Net Developable Area. Details of each parcel are provided in Appendix 2 of this Report.

Figure 9.1 Study Area Parcels

Table 9.1 Study Area Breakdown

Classification	Area (ha)
Gross Study Area	434.9
Gross Developable Area	334.4
Net Developable Area	215.9

9.3 Development Scenarios

Outline of Scenarios

Three distinct scenarios have been developed for the DSA, having regard to the policy context outlined in previous sections. The three scenarios are as follows:

- Scenario 1 – Suburban Extension;
- Scenario 2- 10 Minute Urban Quarter; and

- Scenario 3 – High Density Urban District.

Assumptions

Certain assumptions have been made to establish development volumes, as follows:

- Persons per dwelling based on 2016 Census for Fingal was 3.03. Regional Demographics and Housing Structural Demand at County Level (ESRI, 2010) assume a reduced household size from 2.81 to 2.43 by 2040, a 14% decline by 2040 or 15% decline by 2042.
- Retail and employment plot ratios varied to reflect different scenarios.
- Full Time Equivalent (FTE) based on Employment Density Guide (2010, Housing & Community Agency). Blended rates brought to GEA basis.
- Net to gross of 1.15 and vacancy of 20%.
- 12% of population is of school going age.

Land use mix and density assumptions are applied to the scenarios, and these are detailed in the Table 9.2 below.

Table 9.2 Development Scenario Assumptions

Description	Land Use Mix			Residential Density			Employment Density			
	Resid. Land Use	Retail / Commty' Land Use	Employ' Land Use	Net Dwelling per Ha.	Persons per Dwelling 2035	Persons per Dwelling 2042	Retail & Commty' Plot Ratio	Retail & Commty' Employ' Density (sqm per FTE)	Com m' Plot Ratio	Comm' Employ Density (sqm per FTE)
Scenario 1 - Suburban Extension	90%	5%	5%	35	2.7	2.6	0.2	40	0.3	40
Scenario 2 - 10-minute Urban Quarter	85%	7%	8%	50	2.7	2.6	0.2	30	0.4	25
Scenario 3 - High Density Urban District	80%	5%	15%	65	2.7	2.6	0.3	20	0.6	15

It is noted that the advancement of development within all three scenarios outlined within this section will require investment in transport infrastructure and services to differing degrees. It is specifically noted that upfront enhancements to bus services in the vicinity of and within the DSA lands will be required in all scenarios.

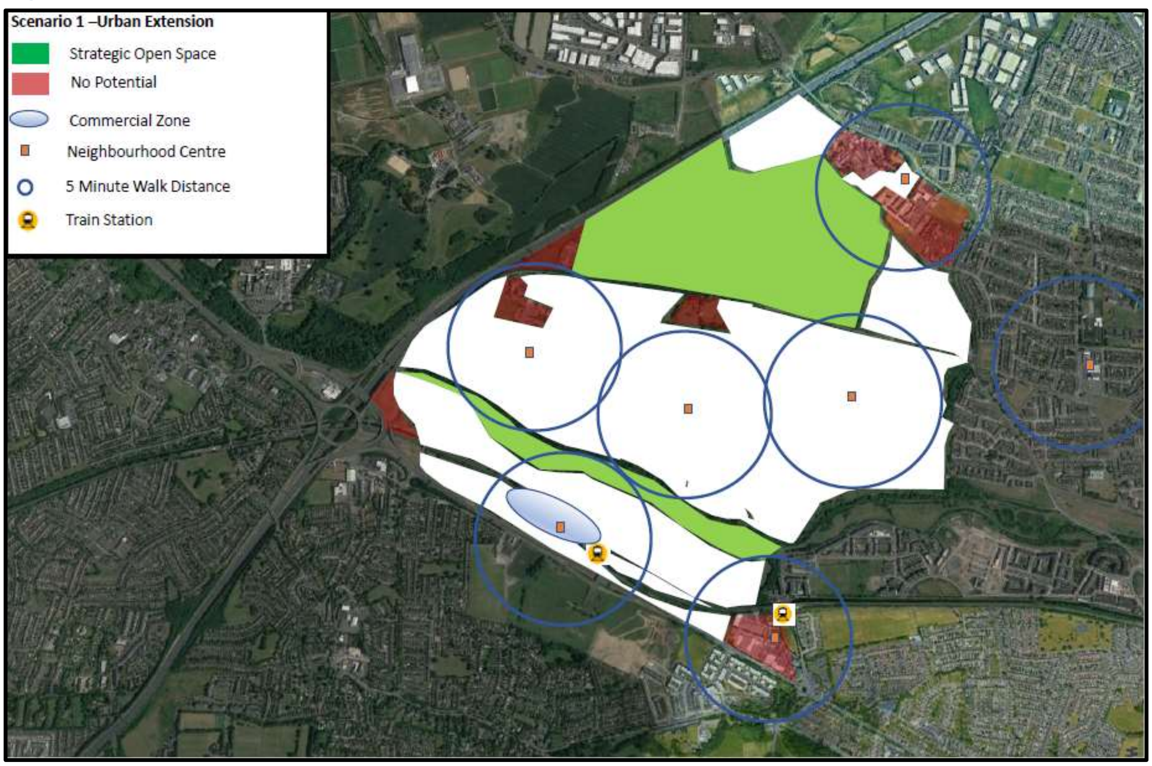
Scenario 1 – Suburban Extension

This scenario involves the extension of the existing suburban built up area. It would require a series of neighbourhood centres within a five-minute walk distance of residential communities and has commercial development around the train station. It primarily utilizes existing infrastructure, however local infrastructure to enable the lands to be accessed and address key permeability barriers will also be necessary. The following Table 9.3 outlines the key information in this scenario. Spatially, the scenario is illustrated in the subsequent Figure 9.2.

Table 9.3 Scenario 1 – Urban Extension Key Information

	Scenario 1 – Urban Extension		
	Phase 1 to 2035	Phase 2 - 2036 to 2042	Phase 1 & 2 to 2042
Residential Net Developable Area (ha.)	97	97	194
Non-residential Net Developable Area (ha.)	11	11	22
No. of Residential Units	3,401	3,401	6,802
Quantum of Retail / Community Floor Space (sqm)	4,319	12,956	7,274
Quantum of Commercial Non-Retail Floor Space (sqm)	12,956	12,956	25,911
Residents	9,274	8,759	18,033
Education Places (Primary & Secondary)	1,113	1,051	2,164
Retail / Community Employment	108	324	432
Commercial Non-Retail Employment	324	324	648

Figure 9.2 Suburban Extension



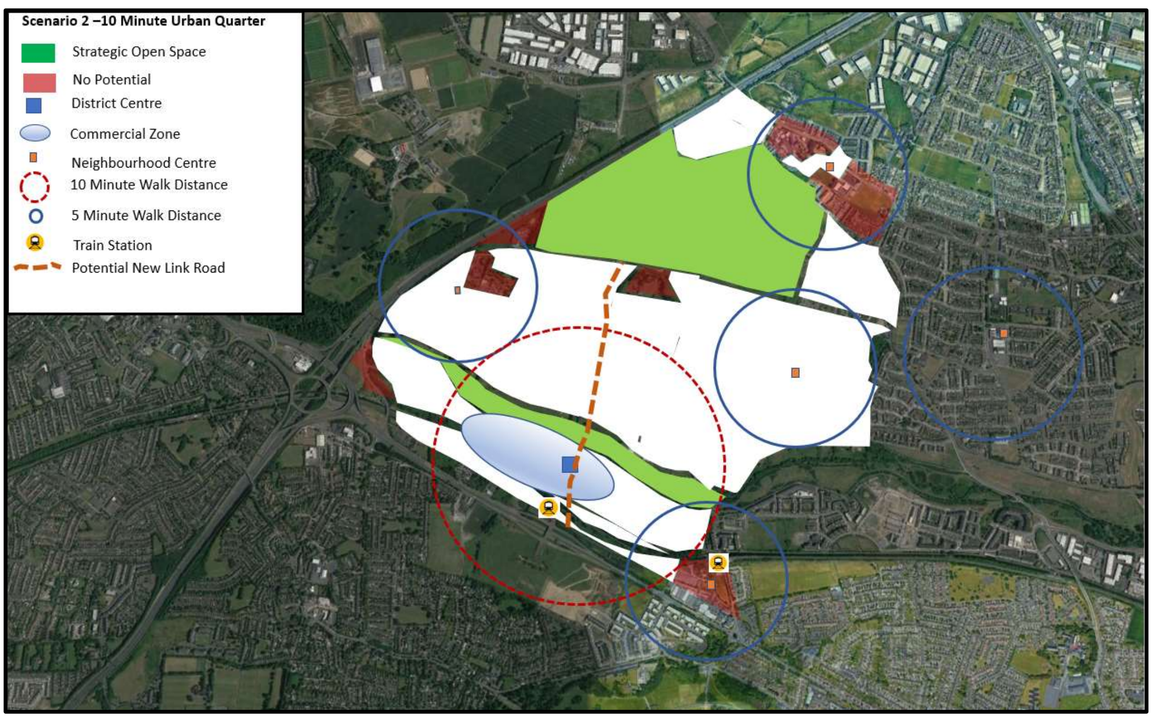
Scenario 2 – 10 Minute Urban Quarter

The 10 minute settlement concept seeks to have all community facilities and services accessible within a 10 minute walk or cycle from homes or are accessible by public transport services connecting people to larger scaled settlements. It involves the provision of a district centre close the railway station, which would serve the new quarter, which would include commercial and other employment uses. Community and local services would be provided through a number of neighbourhood centres. A new spine road from the N3 (Navan Road) provides relevant access to overall area. In terms of public transport requirements, this scenario utilises existing and enhanced train services, however it will also require the significant enhancement of bus services in the vicinity of and within the DSA. The key parameters and spatial elements are detailed in Table 9.4 and Figure 9.3 below.

Table 9.4 Scenario 2 – 10 Minute Quarter Key Information

	Scenario 2 – 10 Minute Quarter		
	Phase 1 to 2035	Phase 2 - 2036 to 2042	Phase 1 & 2 to 2042
Residential Net Developable Area (ha.)	92	92	184
Non-residential Net Developable Area (ha.)	16	16	32
No. of Residential Units	4,588	4,588	9,177
Quantum of Retail / Community Floor Space (sqm)	6,046	18,138	24,184
Quantum of Commercial Non-Retail Floor Space (sqm)	27,639	27,639	55,278
Residents	11,818	11,818	23,635
Education Places (Primary & Secondary)	1,418	1,418	2,836
Retail / Community Employment	202	605	806
Commercial Non-Retail Employment	1,106	1,106	2,211

Figure 9.3 10 Minute Urban Quarter



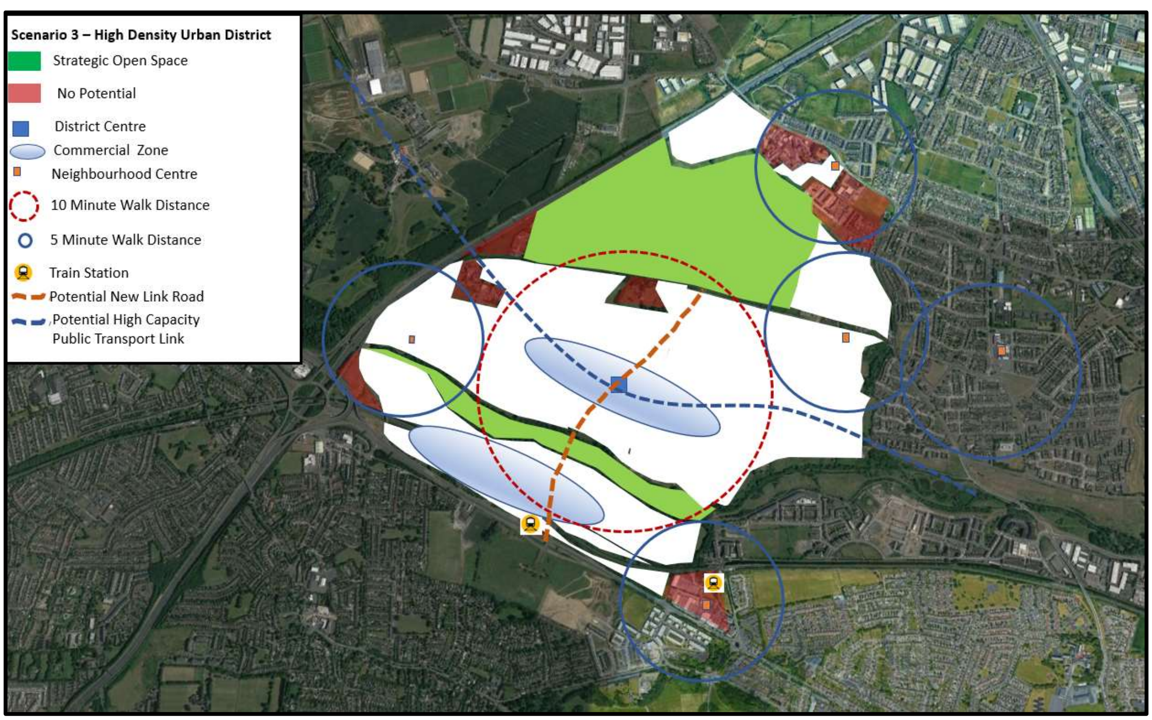
Scenario 3 – High Density Urban District

The third scenario proposes a high-density urban quarter with mx of residential, commercial and retail uses. A centrally located district centre would be accommodated and new infrastructure includes a north-south link road and an east-west high-capacity public transport link which would intersect the lands. In terms of public transport requirements, this scenario is dependent on the provision of the east-west high-capacity public transport link in order to accommodate the high-density urban form envisaged. This scenario also requires the enhancement of bus services in the vicinity of and within the DSA. Key information is provided in the Table 9.5 (below) and the subsequent Figure 9.4.

Table 9.5 Scenario 3 High Density Urban Quarter Key Information

	Scenario 3 - High Density Urban District		
	Phase 1 to 2035	Phase 2 - 2036 to 2042	Phase 1 & 2 to 2042
Residential Net Developable Area (ha.)	86	86	173
Non-residential Net Developable Area (ha.)	22	22	43
No. of Residential Units	5,614	5,614	11,228
Quantum of Retail / Community Floor Space (sqm)	6,478	19,434	25,911
Quantum of Commercial Non-Retail Floor Space (sqm)	77,734	77,734	155,468
Residents	15,310	15,310	30,619
Education Places (Primary & Secondary)	1,837	1,837	3,674
Retail / Community Employment	324	972	1,296
Commercial Non-Retail Employment	5,182	5,182	10,365

Figure 9.4 High Density Urban Quarter



The selection of a preferred scenario will be carried out as part of the planning process and be subject to the relevant environmental assessments.

10. Preliminary Outline Travel Demand Analysis

10.1 Introduction

In undertaking the Appraisal, it is pertinent to understand the potential travel demand associated with development of the DSA lands. In that regard, preliminary travel demand estimates have been generated for the 3 no. development scenarios outlined in Section 9, as follows:

- Scenario 1 – Urban Extension;
- Scenario 2 – 10-minute Quarter; and
- Scenario 3 – High Density Urban District.

10.2 Travel Demand

The travel demand associated with these development scenarios outlined above were based on certain assumptions associated with the development scenarios such as the number of residents each scenario may accommodate (including existing residents), the number of trips generated by these residents, the employment figures for each possible scenario and the number of primary and secondary education institutions.

The following table is a summary of the results of the preliminary travel demand estimate for the full development.

Table 10.1 Preliminary Travel Demand Analysis Outputs

	Scenario 1 – Urban Extension	Scenario 2 – 10 Minute Quarter	Scenario 3 – High Density Urban District
Total Residents (existing* + proposed)	19,583	25,185	32,169
2 NHTS 2017 Daily Trip Rate for Dublin City (Fingal)	1.56	1.56	1.56
Total Trip Production (Dublin City Rate)	**30,550**	**39,289**	**50,184**
Total Employment (existing + proposed)	1,080	3,017	11,660
Education Places (primary & secondary) (no.)	2,164	2,836	3,674
Total Trip Attraction (Employment and Education)	**3,244**	**5,853**	**15,334**
Total Trip Production and Attraction (existing + proposed)	**33,794**	**45,142**	**65,518**

**existing population of 1,550*

As can be seen from the table above, preliminary analysis shows that daily total trips from the DSA could range from ca. 31,000 to ca. 50,000, depending on the development scenario. Analysis also shows that depending on the scenario, the DSA would attract between ca. 3,000 and ca. 15,000 trips from outside the DSA.

10.3 Preliminary Trip Production Mode Share Estimate 2035

In order to ascertain the numbers of trips that might be undertaken by each mode i.e. car, public transport, walking and cycling, the projected 2035 modal split within the Transport Strategy for the Greater Dublin Area 2016-2035 was applied total trips expected to be generated within the DSA lands. The result of this exercise is outlined in the following Table 10.1.

Table 10.2 Preliminary Travel Demand Analysis Outputs [Trip Production]

	Scenario 1 – Urban Extension	Scenario 2 – 10 Minute Quarter	Scenario 3 – High Density Urban District
Travel Modes	Person Trips by Mode (based on 2035 modal split, GDA Transport Strategy		
Car (51%)	15,580	20,037	25,594
Public Transport (23%)	7,026	9,036	11,542
Walking (18%)	5,499	7,072	9,033
Cycling (8%)	2,444	3,134	4,015
Total	**30,550**	**39,289**	**50,184**

Access to public transport services, particularly via active travel modes such as walking and cycling will play a key role sustainable movement to, from and within the DSA and the sustainability of the overall development. High quality active travel infrastructure, improved permeability within, to and from the DSA lands and integration with existing and planned public transport are of fundamental importance to DSA lands' sustainability and should be integrated within the design of any proposed development from the outset. As per Section 9.3, it is also noted that for all three development scenarios, in order to facilitate access to public transport, upfront provision of public transport services, specifically bus services would be required in the vicinity of and within the DSA in order to achieve sustainability.

11. Summary

11.1 Introduction

Fingal County Council (FCC) has commissioned Transport Insights, in partnership with MacCabe Durney Barnes, to undertake a Transport Appraisal for lands at Dunsink, hereafter referred to as the Dunsink Study Area (DSA).

This Appraisal was formulated in such a way that it conformed to the first two stages of an Area Based Transport Assessment. As part of the Appraisal, a Baseline Assessment was undertaken, and a Baseline Assessment Report subsequently produced. This Report assessed baseline conditions within the DSA and its environs, including existing and committed transport infrastructure and services, existing traffic characteristics and travel patterns within and in the vicinity of the lands. A subsequent workshop was also undertaken with FCC in order to confirm and identify development opportunities, constraints, developable areas etc. The findings of this workshop informed further work on the Appraisal, namely drafting of a development vision and transport objectives, preparation of proposed DSA development scenarios and completion of outline travel demand analysis. This Report provides an overview and summary of the Transport Appraisal and its findings.

11.2 Planning and Policy Context and Best Practice Guidance Review

A comprehensive review of the relevant planning and policy context was undertaken, covering national, regional and local contexts (see Sections 2.2, 2.3 and 2.4 respectively of the Baseline Assessment Report included as Appendix 1). A review of national guidance published by the NTA and TII in relation to the production ABTAs was also undertaken.

11.3 DSA Lands' Characteristics

The DSA comprises ca. 434.9 hectares of lands located at the southwestern fringe of County Fingal. At a strategic level, the DSA lands are located ca. 7 kilometres (straight line distance) from Dublin City Centre (measured from the centre of the lands to O'Connell Bridge).

As part of the Baseline Assessment, the general DSA lands characteristics were set out, with focus on its locational attributes, topographical features, land uses, and population and employment patterns. In reviewing their characteristics, key landmarks within the DSA lands have also been identified and presented.

11.4 DSA Immediate Catchment and Wider Area Characteristics

The context within which the DSA lands are located were set out in the Baseline Assessment, describing key demographic, employment and facilities within its immediate surrounds and the wider area.

11.5 Transport Infrastructure, Services and Accessibility

An in-depth review of the DSA lands in the context of transport infrastructure and services, both existing and planned was undertaken. This review also took account of the accessibility of public transport infrastructure from the DSA lands, with the accessibility of the study area by walking, cycling and driving also assessed.

11.6 Existing Travel Patterns Analysis

An analysis of CSO Census 2016 travel patterns analysis was undertaken. Due to the largely undeveloped nature of the DSA lands at present, the focus of the analysis is both on the DSA and its surrounds (larger DSA Immediate Catchment). Analysis has included commuting destinations (for those resident in the DSA Immediate Catchment), commuting origins (for those working, learning, or studying in the DSA Immediate Catchment), and commuting mode shares both those residing in and those working, learning, or studying in the DSA Immediate Catchment.

11.7 FCC Constraints Workshop

A workshop was undertaken on April 14 2021 which involved representatives from FCC, Transport Insights and MacCabe Durney Barney Barnes. The aim of this workshop was to brief FCC on the findings of the Baseline Assessment and seek input from FCC in relation to identification of key physical constraints, classify the significance of such constraints and determine implications for identified constraints in relation to the determination of the net developable area within the study lands.

As part of this workshop, FCC attendees were requested to provide feedback and comments in relation to the Baseline Assessment. Key transport and physical and environmental constraints which were identified and discussed, in addition to other items which were noted during the workshop. Key outcomes of the workshop as they relate to, inter alia, transportation, the environment, protected structures and zoning have been documented.

11.8 Development Vision and Transport Objectives

A vision for Dunsink has been developed. This is underpinned by transport objectives for the area which are themselves supported by measurable key performance indicators (KPI). The vision, objectives and KPIs have been drafted following consultation with different departments within FCC. The current vision for the lands is as follows:

> *"Development of a low-carbon mixed-use transit-orientated urban quarter which prioritises active travel and public transport modes both within and outside, is well connected to the wider City via high quality public transport and active travel infrastructure and seeks to protect and enhance the environmental and historic character of the area."*

11.9 Proposed DSA Scenarios

Three planning and development scenarios have been developed to considered to inform the study and facilitate further stages in the planning process. These scenarios are:

- Scenario 1 – Suburban Extension;
- Scenario 2- 10 Minute Urban Quarter; and
- Scenario 3 – High Density Urban District.

The scenarios are established for the period up to 2042 in line with the horizon year of for the Draft Transport Strategy for the Greater Dublin Area 2022-2042, which was under preparation by the NTA at the time of developing these scenarios. The timeframe is divided into Phase 1 up to 2035 and Phase 2 up to 2042. All scenarios have been developed to respect higher level policies in the NPF and Eastern and Midlands RSES.

11.10 Preliminary Outline Travel Demand Analysis

An outline travel demand analysis was undertaken in order to identify the potential travel demand associated with development of the DSA lands. These preliminary travel demand estimates relate to the 3 no. development scenarios, and indicate that daily total trips to and from the DSA could range from ca. 34,000 to ca. 66,000, depending on the development scenario.

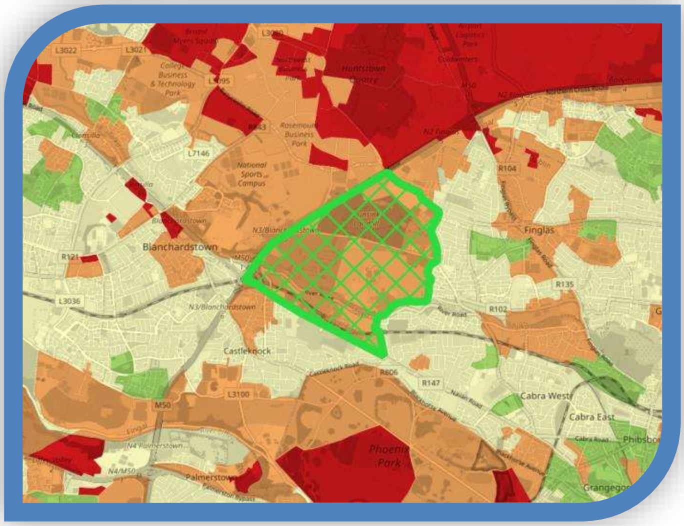
It is also noted that in order to facilitate access to public transport, upfront provision of public transport services, specifically bus services would be required in the vicinity of and within the DSA in order to achieve sustainability.

Appendix 1 Baseline Assessment Report

Transport Insights Limited, Suite 30, 21 Baggot Street Lower, Dublin 2, D02 X658, Ireland
Email: info@transportinsights.com | Telephone: + 353 1 685 2279

Dunsink Area Based Transport Assessment: Baseline Assessment Report

For Fingal County Council



TRANSPORT INSIGHTS

MDB MacCabe Durney Barnes
Planning Environment Economics

Document Control

Contract Name	MacCDB FCC Dunsink ABTA
Contract Number	C607 2020
Document Type	Baseline Assessment Report
Document Status	Draft
Primary Author (s)	Seán Byron, Jurek Gozdek, Niall Togher
Other Author (s) and Reviewer	Jerry Barnes and Dinesh Bhardwaj
Approver	Ciaran McKeon

Document Review

Item No.	Item Description	Reviewers Initials	Review Date
1	Draft Report v1.0	DNB/ CMcK	11/03/2021
2	Draft Report v1.5	DNB/ CMcK	13/03/2021
3	Draft Report v1.9	DNB/ CMcK	19/03/2021
4	Draft Report v1.10	CMcK/ JB	21/03/2021
5			
6			
7			
8			

Distribution

Item No.	Item Description	Approvers Initials	Date
1	Draft Report v1.10	CMcK	22/03/2021
2			
3			
4			
5			
6			
7			
8			

Table of Contents

Appendices

1. Introduction

1.1 Overview

Fingal County Council (FCC) has commissioned Transport Insights, in partnership with MacCabe Durney Barnes, to undertake an Area Based Transport Assessment (ABTA) for lands at Dunsink, hereafter referred to as the Dunsink Study Area (DSA).

The National Planning Framework (NPF) and the Regional Spatial and Economic Strategy (RSES) for East & Midlands Region require an evidence-based approach to planning, and therefore FCC has commissioned an ABTA for the DSA to inform the development feasibility of these land parcels.

The main goal of the ABTA is to identify potential transport challenges and identify the required interventions for the DSA to pave the way for development to be planned, phased and undertaken in line with the objectives of the NPF, RSES, Fingal Development Plan (FDP) 2017-2023 and other local planning policies. As such, the ABTA findings will inform FCC in relation to the nature, scale, location and timing of delivery of future development within the DSA, and identify the transport infrastructure and service requirements to support the realisation of such development.

The ABTA represents a key input to the overarching Dunsink Feasibility Study and shall inform FCC's potential rezoning of the DSA within the ongoing update of the FDP.

1.2 Background

The goal of the ABTA is to undertake a thorough transport assessment for the DSA in the context of its local context in addition to the wider Greater Dublin Area (GDA) level. It will seek to ensure appropriate and meaningful integration of land use objectives and transport planning is advanced in line with national, regional and local policies. The study approach will ensure that the overarching transport planning policy objectives such as higher public transport and active modes share, reduced private car dependency etc. are realised.

The DSA lands are identified in the current FDP via Objective BLANCHARDSTOWN 13, as follows:

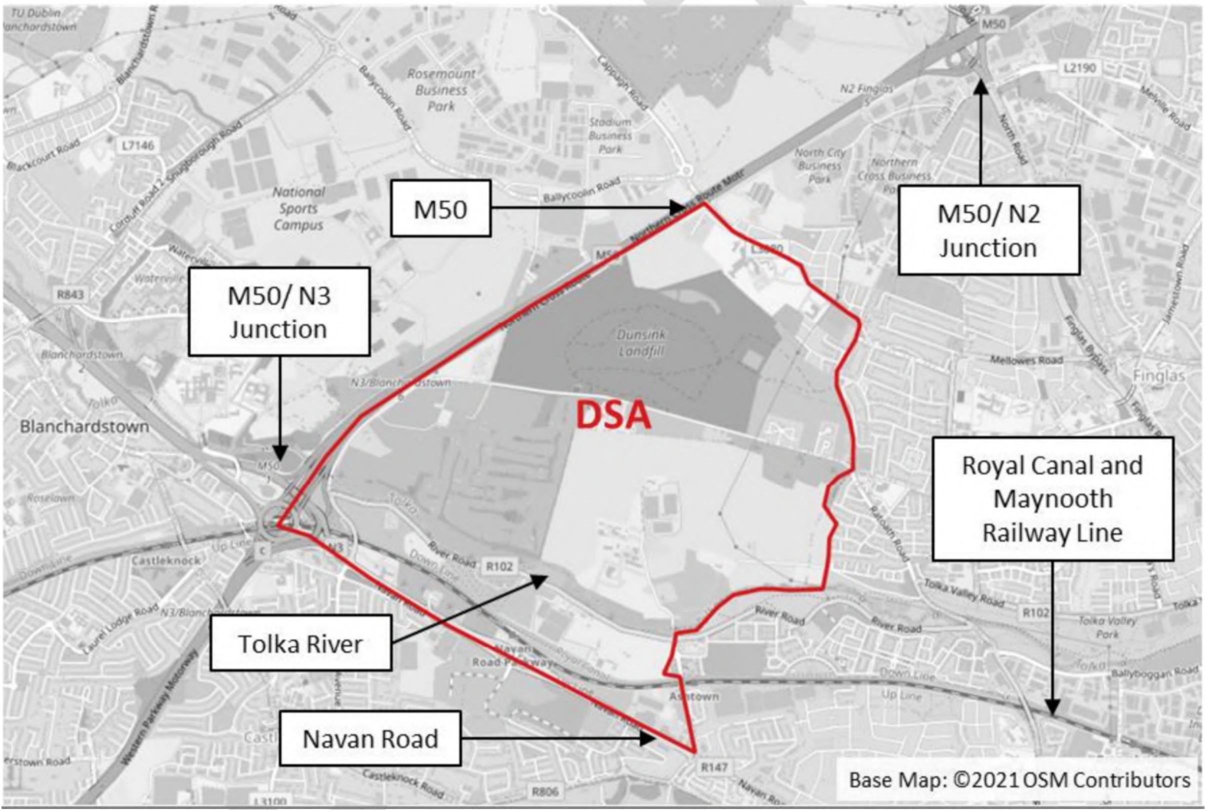
> *"Carry out a feasibility study of lands at Dunsink to include a full investigation of requirements in terms of infrastructure, water, access, drainage within three years of the adoption of this Development Plan and any remedial measures associated with the former landfill area to inform the future designation of these lands for development. This will be carried out in consultation with necessary statutory agencies and appropriate stakeholders to facilitate the orderly and appropriate release of lands at Dunsink."*

The FDP also includes in its Development Strategy for Blanchardstown an objective to *'Promote lands at Dunsink as a longer-term strategic area suitable for mixed use development'*.

These objectives recognise the strategic location of the land bank and its related development potential.

The ca. 435.9 ha. DSA lands, illustrated in the following Figure 1.1, is located inside the M50 motorway, southeast of the M50/ N3 junction, west of the M50/ N2 junction and north of the Royal Canal. The south-western boundary of the DSA is defined by Navan Road, and the south-eastern boundary is defined by the Tolka River set in parkland, which forms part of the larger Tolka Valley Park. The eastern and south-eastern boundary of the DSA adjoin the Dublin City Council administrative area, including the built-up area of Ashtown/ Pelletstown within which medium-high density public transport orientated development is being delivered.

Figure 1.1 DSA Lands – Location Plan



At a strategic level, the DSA lands are located ca. 7 kilometres (straight line distance) from Dublin City Centre (measured from the centre of the lands to O'Connell Bridge).

The lands in DSA have the benefit of being served by existing built and natural assets, in particular relating to public transport, amenity and recreation as follows:

- Navan Road Parkway and Ashtown are existing train stations located within/ adjacent to the DSA lands. These stations are located on the Maynooth Rail Line providing commuter rail services to Dublin City and also serving Hansfield, Dunboyne and Pace (via a spur). This route is part of Irish Rail's planned DART+ West Project (part of the overall DART+ Programme), which seeks to significantly increase rail capacity on the Maynooth Rail Line by providing a more frequent and more reliable electrified rail service.

- The Tolka River and Tolka Valley Park which traverse the DSA close to its southern boundary.
- The Royal Canal which traverses the DSA along its southern boundary, in addition to Route N02 of the National Transport Authority's GDA Cycle Network Plan, the alignment of which runs parallel to the Canal.

In recognition of the DSA's potential, Dunsink is identified in the Metropolitan Area Strategic Plan (MASP) included in the RSES as *…a major greenfield land bank with long term potential to develop a new district centre' (Table 5.1 p. 104). Furthermore, the RSES MASP specifically references the Study Area, stating that "the proposed DART Underground and LUAS extensions to Finglas and Lucan subject to appraisal and delivery post 2027, will unlock long-term capacity including strategic landbanks such as Dunsink".*

The DSA is largely zoned within the current FDP as Open Space and High Amenity and also includes some pockets of land zoned for Residential and Community Infrastructure. The following local objectives contained within the FDP are located within/relevant to the DSA:

- Local Objective 129 *'Provide for a pedestrian/cyclist link between the Tolka River and the Royal Canal'.*
- Local Objective 134: *'Provide for the development of a linear park along the Tolka River Valley'.*
- Local Objective 135: *'Provide a footbridge over the N3 at an appropriate location between the Auburn Avenue junction with the N3 and the Phoenix Park interchange'.*
- Local Objective 136: *'Facilitate pedestrian access from Coolmine Rugby Club grounds over the Canal adjacent to the Phoenix Park [Navan Parkway] Railway Station'.*
- *Provide new Regional Parks at the following locations: Baleally Lane, Mooretown/Oldtown (Swords), Baldoyle, and Dunsink subject to Appropriate Assessment screening*

The development of the DSA is anticipated as a medium-high density, mixed-use transit orientated development (TOD) in conjunction with recreational, commercial, and educational facilities and complementary transport links. It will be integrated within the existing urban fabric and will benefit from and support other infrastructure in the area. This includes public transport and multi-modal interchanges on existing or planned infrastructure within the DSA and its environs, and active modes' infrastructure (walking and cycling), thereby enabling enhanced sustainable travel accessibility. The proposed DART+ Project is noted to be of direct relevance to the Dunsink lands, given the alignment of the existing Maynooth Rail Line within the southern part of the DSA lands.

The ABTA Strategy for DSA aims to capitalise on the opportunities, possibilities and strengths offered by these land parcels in order to prioritise sustainable mobility goals and objectives. In particular, the

ABTA will help identify the optimum level of development that can be sustained in the DSA taking account of existing and planned transport infrastructure and services within the area.

1.3 ABTA Process – Aims and Overall Approach

ABTA Aims

The purpose of the ABTA is to address the need to incorporate national and regional transport policies and objectives into local level land use planning in accordance with Transport Infrastructure Ireland (TII) and National Transport Authority (NTA) guidance documents. ABTA therefore seeks to maximise opportunities for the integration of land use and transport planning, with an emphasis on sustainable mobility. In accordance with TII and the NTA guidance, the key aims of an ABTA are to:

- maximise the opportunities for the integration of land use and transport planning by including the ABTA process as integral to the preparation of the feasibility study;
- assess the existing traffic, transport and movement conditions within the DSA and in its wider context;
- plan for the efficient movement of people, goods and services within, to and from the DSA;
- identify the extent to which estimated transport demand associated with the emerging local development objectives can be supported and managed on the basis of existing transport assets;
- identify the transport interventions required within the DSA lands and in the wider context, to effectively accommodate the anticipated increase in demand; and
- inform site-specific Transport Assessments for new planning applications.

Overall ABTA Approach

The overall approach to an ABTA is described in TII[1] and NTA[2] guidance documents, and includes following main tasks:

- review of the existing policy and transport baseline conditions;
- establish development objectives, planning principles, transport issues and constraints;
- development and testing of proposed development options;
- optimisation of land use to align with sustainable transport provision;
- finalisation of the study and its proposals through consultation with FCC and key stakeholders such as the NTA, TII and Dublin City Council; and
- development of an implementation plan.

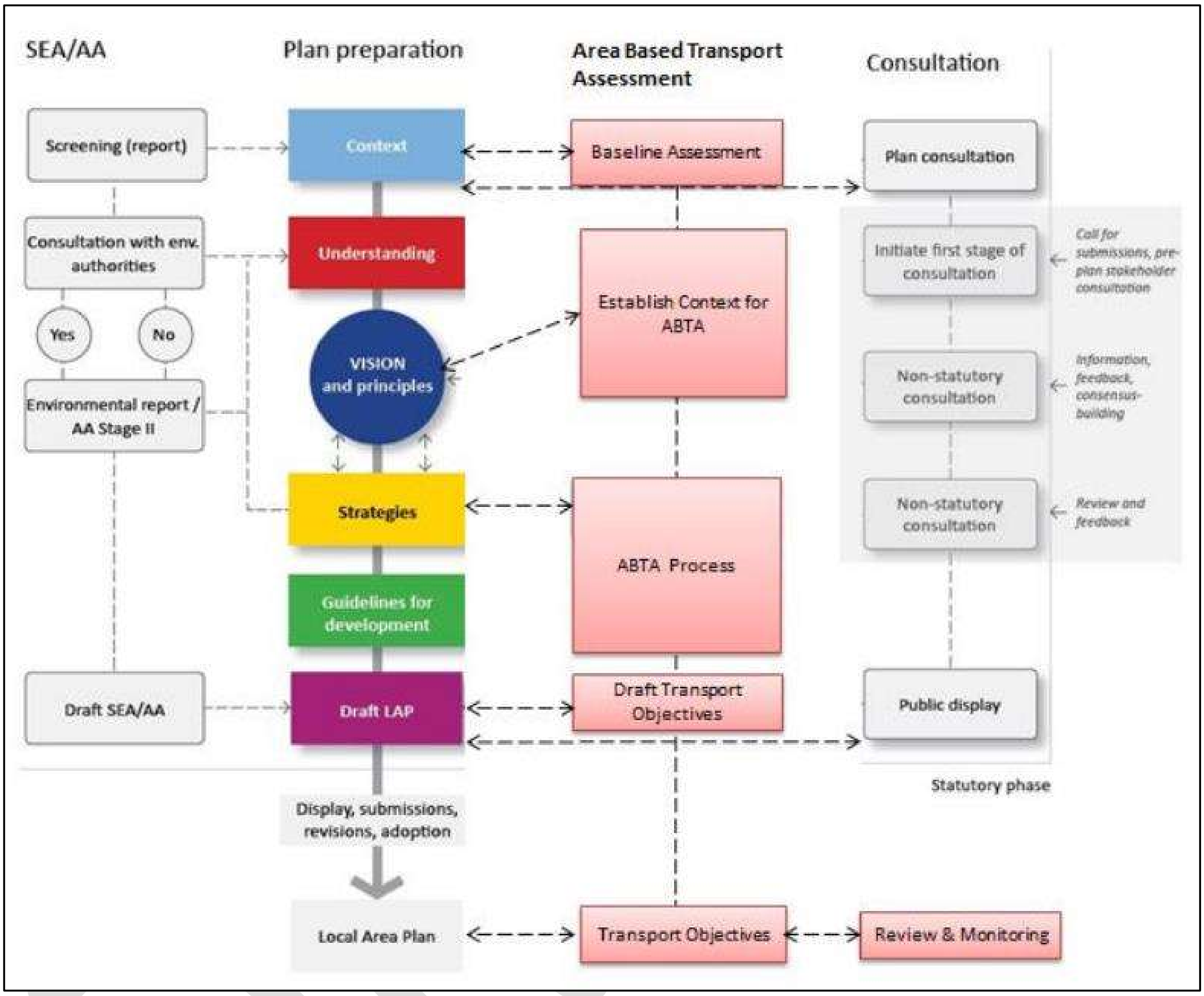
---

1 TII Publications: ABTA Guidance Notes, PE-PDV-02046, April 2018

2 NTA ABTA Advice Note, December 2018

Key components of the ABTA process, and its interrelationships with other planning processes are illustrated in the following Figure 1.2.

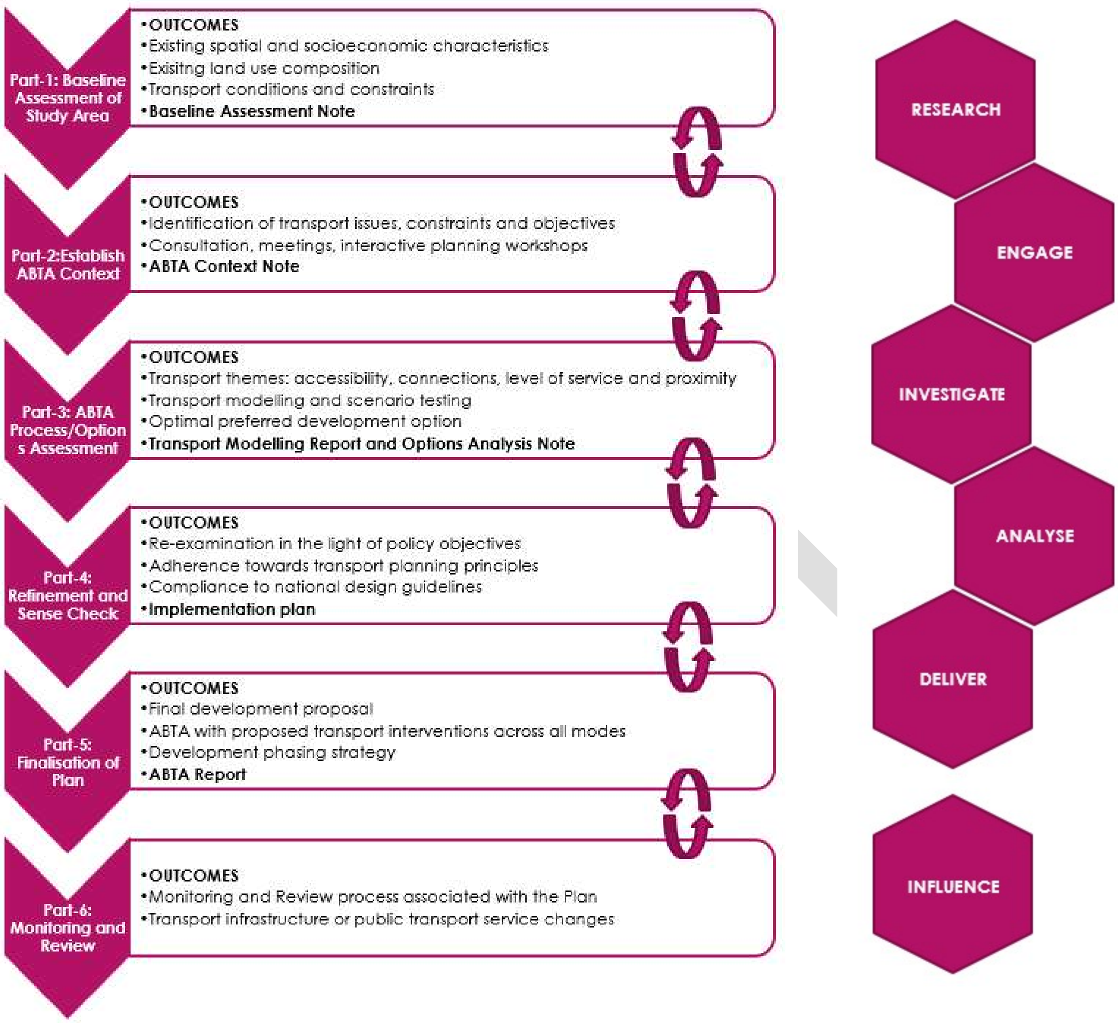
Figure 1.2 Overall ABTA Process and Key Interrelationships



Source: Area Based Transport Assessment Advice Note, NTA Dec 2018

The intended effect of ABTA is to ensure that the assessment of transport demand and its associated impact plays a central role in informing the development proposals. The overall approach to completion of an ABTA, and how it relates to other planning and environmental processes is illustrated in Figure 1.3 (overleaf).

Figure 1.3 ABTA Process – Key Components



This stage of the ABTA relates to Part (Section) 1, i.e. the baseline assessment of the DSA, a summary of which is provided below.

Section 1 – Baseline Assessment of Study Area and the Surrounding Area

A baseline assessment of the DSA and the surrounding areas is the first step towards identifying and understanding both opportunities and constraints in relation to development of the DSA lands. It involves a robust policy review comprising all relevant statutory national, regional and local documents such as strategies, frameworks, plans, policy papers, past studies and guidance documents. Next steps within the baseline assessment stage comprise a review of the DSA characteristics, establishing existing travel patterns and setting out the existing and proposed transport infrastructure/ services.

The outcomes of Section 1 are expected to establish the existing spatial characteristics, land use and density configuration, existing travel patterns and an understanding of the transport infrastructure provision.

1.4 Baseline Assessment Report Structure

The remainder of this Report is structured as follows:

- Section 2 sets out the planning and policy context within which the ABTA is being developed, and an overview of relevant best practice guidance;
- Section 3 presents DSA lands' characteristics;
- Section 4 details the DSA Immediate Catchment and wider area characteristics;
- Section 5 provides an overview of transport Infrastructure, services and accessibility;
- Section 6 presents existing travel patterns with the study area and its surrounds; and
- Section 7 provides a summary to the Report.

2. Planning and Policy Context and Best Practice Guidance Review

2.1 Introduction

This section of the Report sets out the DSA's relevant planning and policy context, covering national, regional and local contexts (Sections 2.2, 2.3 and 2.4 respectively). Relevant documents at each level are set out in reverse chronological order, and as such do not necessarily reflect their relevance or importance to the ABTA process.

2.2 National Level

Housing Supply Target Methodology for Development Planning Guidelines (2020)

These Guidelines were issued in December 2020 and seek to provide further guidance on the translation of NPF population targets into the core strategies of development plans. They set out the additional households required for each local authority up to 2031. The Guidelines indicate that an additional 20,608 units should be provided in Fingal between 2020 and 2031.

Climate Action Plan (2019)

The Climate Action Plan was published by the Government of Ireland in 2019 and seeks to evaluate the sectoral changes required in Ireland in order to reduce carbon emissions and achieve 2030 European Union (EU) emissions targets and achieve net zero emissions by 2050. The Plan recognises that the areas of transport, land use planning and the built environment are major contributors of carbon emissions in Ireland.

It outlines policies and actions being implemented to help reduce and lower carbon outputs. It outlines these objectives based around the themes relating to transport and the built environment. It recommends that planners *"introduce stricter requirements for new buildings"* and *"make growth less transport intensive through better planning, remote and home-working and modal shift to public transport"*. This document provides an important framework and a range of actions for all aspects of government policy to align with an overall aim to reduce carbon outputs in a coordinated manner.

In its approach to decarbonisation, the EU has split greenhouse gases into two categories. These are as follows:

- Emissions Trading System (ETS): Emissions from electricity generation, aviation, and large industry; and
- Non-ETS: Emissions from agriculture, transport and the built environment and small industry.

ETS are dealt with at EU level while Non-ETS are dealt with at national level. For ETS, the EU has targeted at least a 20% reduction of overall greenhouse gas emissions across the EU by 2020 and 43% by 2030, both relative to 2005 levels. Ireland's non-ETS targets are to achieve a 20% reduction in non-

ETS sector emissions by 2020 and 30% by 2030 (relative to 2005 levels), with annual binding emissions limits set for each individual year to 2030. It should be noted that Irish agriculture represents 33% of total national emissions and almost half (46%) of non-ETS nationally. These figures are 10% and 17% when compared with the EU27 and UK. The Plan also recognises that agricultural activity presents challenges that are difficult to address through technological solutions in comparison to other sectors such as transportation.

Chapter 10 of the Plan deals with transportation, which represented 20% of greenhouse gas emissions in 2017, with the Plan which also stating that carbon intensity in the transportation sector per head of population is 40% higher than the EU average. It recognises that while there are technical barriers to reducing emissions such as high upfront costs of electric vehicles (EVs), electric vehicular usage in the movement of freight and the difficulty in substituting biofuel for fossil fuel, there are specific challenges to Ireland which include dispersed settlement patterns and low population density leading to a higher proportion of trips being undertaken by private cars, poor public transport provision and less opportunity for undertaking trips via active travel modes. The Plan states that *"analysis of the most cost-effective policy options available to Ireland shows a very substantial number in the transport sector"* and that *"on this basis, the most efficient roadmap for Ireland would include a 45-50% reduction in transport emissions by 2030, with substantial acceleration in the second half of the decade."*

The Plan includes some key policies to make growth less transport intensive which include:

- the successful execution of the NPF designed to promote compact, connected and sustainable living;
- expansion of walking, cycling and public transport to promote modal shift;
- better use of market mechanisms to support modal shift;
- the successful roll-out of the National Broadband Plan, which can promote remote working and wider activities which reduce unnecessary journeys;
- enhancing priority for public transport; and
- giving Local Authorities more discretion in designating low emission zones.

Relevant actions to deliver the modal split targets that are required in order to contribute towards achieving Irelands emissions targets include:

72 *"Develop the EV charging network necessary to support the growth of EVs to at least 800,000 by 2030 and set a target for the supply of infrastructure to stay sufficiently ahead of demand."*

73 *"Develop and implement planning rules and guidelines across residential and non-residential parking locations for EV charging infrastructure."*

81 *"Develop a regulatory framework on low emission zones and parking pricing policies, and provide local authorities with the power to restrict access to certain parts of a city or a town to zero-*

emission vehicles only. Examine the role of demand management measures in Irish cities, including low emission zones and parking pricing policies."

88 *"Increase public bus network capacity and usage (implementation of BusConnects services network)."*

89 *"Establish a "Park and Ride Development Office" within NTA and develop overall Park and Ride Implementation Plan, including the provision of multimodal facilities (e.g. EV charging/bicycle parking)."*

90 *"Add additional capacity to Luas network."*

91 *"Undertake an expansion of cycling infrastructure through the establishment of a "Cycling Project Office" within the National Transport Authority and develop an implementation plan."*

93 *"Extend the Dublin area railway electrification for the Maynooth Line (to Maynooth), Kildare Line (to Celbridge), and Northern Line (to Drogheda)."*

95 *"Develop and implement cycle network plans for all major cities."*

96 *"Review and bring forward a revised implementation plan for the outstanding policies and actions in the 2009-2020 policy Smarter Travel, A Sustainable Transport Future, in time for Budget 2020."*

97 *"Commence full implementation of the National Cycle Policy Framework."*

Transport-Orientated Development: Assessing the Opportunity for Ireland (2019)

Transport-Orientated Development: Assessing the Opportunity for Ireland was published by the National Economic and Social Council (NESC) in June of 2019. The aim of this document is to present and explore the concept of transport orientated development and provide advice on how this can be applied to Ireland. The document recognises that urban development in Ireland continues to be orientated around the car leading to negative consequences for the environment and liveability. The document presents transport-orientated development (TOD) as an alternative approach that:

> *"…seeks to maximise the provision of housing, employment, public services and leisure space in close proximity to frequent, high-quality transport services. It is a form of development that is friendlier to public transport users, cyclists and pedestrians, and seeks to convert car trips to public and active transport trips. This in turn improves mobility and environmental conditions, and delivers more efficient and sustainable urban development."*

The document outlines the key elements of a transport-orientated approach to development which are:

- integrated land-use transport planning and investment;
- compact, mixed-use, mixed-income development and communities;
- moderate to higher housing density (related to proximity to transport nodes);

- short distances to transport nodes; and
- high-quality and frequency of transport services.

The document gives an overview of three different types of TOD:

Single node TOD:

> *"This type consists of a single neighbourhood based around heavy rail stations. Its location can be urban or suburban. The development takes place in a circular pattern centred on a train station. The radius varies from 0.5km in the US (to allow for pedestrian access) to 2-3km in the Netherlands (where bicycle access is more common)."*

Multi-node TOD:

> *"This type is similar to the single-node TOD but it reaches further than a single location to create a regional network of nodes around heavy rail stations. The nodes can be circular or semi-circular. The location of TOD nodes follows a typical beads-in-a-string pattern. This type of TOD aims at realigning entire urban regions around rail transport and away from the car."*

Corridor TOD:

> *"This type is encountered in urban areas, and is based around light rail or Bus Rapid Transit (BRT) stops (which are more frequent than heavy-rail stops). The development pattern is linear or ribbon-like along the transit line(s) because the nodes (e.g. around tram stops) are near each other. TOD corridors are applicable to existing urban areas or planned urban extensions (Urban Europe, 2016: 2)"*

The primary benefits of adopting the above approaches to transport-orientated development are listed with in the document:

- the improvement of mobility and environmental conditions,
- more efficient and sustainable urban development; and
- improved viability of transport companies.

The document states that a secondary key benefit of a TOD strategy is the potential to increase supplies of affordable housing but that this is not automatically the case and that explicit measures to achieve affordability in a TOD development as with housing may be needed.

Obstacles to the success of a TOD approach to development are also included within the document, and include:

- **Locational liability**: Transit systems have rarely been set up to maximise development potential. Lines follow existing rights of way through unattractive industrial areas or terminate in suburban areas not slated for or conducive to high-intensity development.

- **Property market cycle**: Cyclical factors may delay station-area development, inhibiting the transit agency's ability to attract ridership. Market conditions along specific corridors also affect station-area development and accordingly should inform governmental policy in promoting TOD.
- **Non-supportive government policies:** Policies such as exclusionary zoning, lot-size restrictions, and suburban-like building codes are restrictive. Government strictures may disallow optimal mixes of uses, suppress densities, and impose inappropriate setback, height or parking standards.
- **Institutional barriers**: Cross-jurisdictional cooperation is often necessary but difficult to achieve. Also, in attempting joint developments, transit agencies are usually unaccustomed to assessing or taking the types of risks inherent in real-estate development.
- **Fixation on car-oriented design**: In a survey of 19 rail systems in North America, Porter found that most prioritised park-and ride lots over passenger-generating land uses near stations.

In order to negate the above obstacles, any planned development within the DSA lands needs to take cognisance of said obstacles from the earliest stages of planning if a successful TOD is to be realised.

Project Ireland 2040, National Planning Framework (2018)

Project Ireland 2040 is the Government's long-term overarching strategy guiding investments in public infrastructure in Ireland to the year in 2040. The Strategy is comprised of two components; the National Planning Framework (NPF), which outlines the government's strategic plan for shaping the future growth and development of Ireland to 2040, and the National Development Plan (NDP), which seeks to provide enabling investment to implement the Strategy. The NPF was published by the Government of Ireland in 2018 and prioritises ten National Strategic Outcomes.

The NPF identifies the need for the growth of Dublin to be accommodated within and close to the City and the need for the better management of overspill into surrounding counties. The Framework also identifies that infrastructural bottlenecks need to be addressed in order to increasing the quality of life of citizens and increasing housing supply in the right locations. Compact growth is also a cornerstone of the Framework and sets a target for 40% of future housing development nationally to be delivered within and close to the existing footprint of built-up areas (National Policy Objective 3a) and making better use of underutilised land. At least 50% of all new homes are targeted to be delivered within and in the suburbs of Dublin, Cork, Limerick, Galway and Waterford. Compact growth will require a focus on 4 areas:

- the 'liveability' or quality of life of urban places;
- making the continuous regeneration and development of existing built-up areas as attractive and as viable as greenfield development, with active land management;
- tackling legacies of concentrations of disadvantage; and
- linking compact growth with climate action.

The NPF states that the Dublin City and the Metropolitan Area's key challenges relate to housing affordability, transport, urban amenities and liveability and that in order to address these challenges, it needs to offer among other things, increased transport mobility while also becoming a more environmentally sustainable city. The Framework identifies *"key future growth enablers for Dublin"* and the growth enablers of direct relevance to this ABTA are the following:

- identifying a number of ambitions large-scale regeneration areas for the provision of new housing and employment and measures required to facilitate them as integrated, sustainable development projects;
- progressing the sustainable development of new greenfield areas for housing especially those on public transport corridors, such as Adamstown, Cherrywood, Clonburris and Clongriffin;
- delivering the key rail projects set out in the Transport Strategy for the Greater Dublin Area including MetroLink, the DART expansion and Luas Green Line link to MetroLink;
- the development of an improved bus-based system, with better orbital connectivity and integration with other transport networks;
- measures to enhance and better link the existing network of green spaces, including the Phoenix Park and other parks, Dublin Bay and the canals, subject to carrying out a routing study and any necessary environmental assessments;
- 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 the canal, river and coastal corridors; and
- improving access to Dublin Airport, to include improved public transport access, connections from the road network from the west and north and in the longer term, consideration of heavy rail access to facilitate direct services from the national rail network in the context of potential future electrification.

Notwithstanding the location of the DSA lands with respect to the Maynooth Rail Line, they are in general currently underserved by public transport with poor connections to existing and proposed transport infrastructure. Nonetheless, there is significant opportunity to achieve the objectives set out above which are in line with the key growth enablers set out for Dublin.

The Implementation Roadmap for the NPF (July 2018) indicated how the settlement strategy and associated population targets would be implemented through the regional and spatial economic strategies and development plans. Population targets were established for each county for both 2026 and 2031 where Dublin was not disaggregated into its constituent administrative areas. These targets are illustrated in Table 2.1 (overleaf).

Table 2.1 Dublin Population Target to 2031

County	2016	2026	2031
Dublin	1,347,500	1,489,000-1,517,500	1,549,500-1,590,000

National Development Plan 2018 – 2027

The National Development Plan 2018-2027 (NDP), published in February 2018, is the overarching plan with a 10-year time horizon that shall guide national, regional and local planning up to the year 2027. This document sets out the strategy and investments necessary in order to promote sustainable growth in Ireland over the lifetime of the Plan. Key National Strategic Outcomes of relevance to the ABTA include:

- **National Strategic Outcome 1**: Actions supporting the achievement of compact growth outcomes include the allocation of €2 billion to support the co-development of the NPF's growth enablers, the setting up of the National Regeneration and Development Agency working with local authorities to release strategical located land banks suitable for redevelopment and designation for future public and private housing provision.
- **National Strategic Outcome 4**: Sustainable mobility sets out the need for an environmentally sustainable public transport system which will enable growth and change, meet the significant increase in travel demand and urban congestion and contribute to enabling a low-carbon economy and facilitate a shift away from polluting and carbon intensive propulsion systems, which would otherwise increase in use as travel demand increases due to employment and population growth. Relevant public transport investments contained within the NDP include:
    - MetroLink;
    - Dublin BusConnects; and
    - Dart Expansion Programme.

Mobility interventions may emerge from the ABTA process shall be consistent with these priorities, aiming to integrate with and make full use of the above public transport investments in order to reduce car-reliance and support a shift towards sustainable mobility.

Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities Department (2018)

The Design Standards were published by the Department of Housing, Planning and Local Government in March 2018 and provides guidance on different aspects of new residential developments, including locational suitability, and car and cycle parking provision. Section 2.4 of the Standards state:

"Identification of the types of location in cities and towns that may be suitable for apartment development, will be subject to local determination by the planning authority, having regard to the following broad description of proximity and accessibility considerations…"

It identifies three broad location types, as follows:

"1) Central and/or Accessible Urban Locations"

"2) Intermediate Urban Locations."

"3) Peripheral and/ or Less Accessible Urban Locations."

Locational criteria are provided for each of the above locations, determined via distance/ time from public transport in the case of rail and light rail, and distance/ time/ frequency in the case of bus.

Area Based Transport Assessment (ABTA) Guidance Notes (2018)

The NTA is currently in the process of drafting and making available an ABTA Manual. Until then, guidance on carrying out an Area Based Transport Assessment are currently provided in two following documents:

- Area Based Transport Assessment Guidance Notes, PE-PDV-02046 – TII (2018); and
- Area Based Transport Assessment Advice Note – NTA (2018).

Both documents provide an overview of the role of an ABTA and its planning and policy context. The guidance states that the primary objective of an ABTA is:

"to make sure that movement and accessibility of all forms, across all modes of transport, is considered as a key component in the development of areas at a local level."

The intended effect of ABTA is to integrate land use and transport planning at the centre of the preparation of a plan i.e. Local Area Plan (LAP) or Masterplan, and to ensure that the assessment of transport demand and its associated impact plays a central role in informing the overall scale of development, as well as the mix of land uses, development location, density, phasing and design/ delivery of supporting transport infrastructure/ services across all modes of transport.

Both documents specify the steps involved in undertaking an ABTA and their intended outcomes, and these are outlined in the following Table 2.2.

Table 2.2 Six Sections of an ABTA and Intended Outcomes

Part No.	Task	Outcome
1	Baseline Assessment of Plan Area and Surrounding Area	A clear understanding of the existing spatial characteristics, land uses, transport conditions and constraints relating to the Plan area.

Part No.	Task	Outcome
2	Establish Context for the ABTA	Identification of transport issues and transport objectives relating to the Plan area. Other matters which are deemed to have a bearing on transport options are identified and presented.
3	ABTA Process / Options Assessment	Bring forward a preferred development option, based on high level objectives, with guiding development principles and associated transport objectives.
4	Refinement and Sense Check the Proposals	A finalised land use and transport scenario has been tested, to ensure it satisfies the overall objectives and guiding plan principles with appropriate transport implementation measures.
5	Finalisation of the Plan	The finalised Plan with associated ABTA
6	Monitoring and Review	A monitoring/review process associated with the Plan should be developed.

Strategic Investment Framework for Land Transport (2015)

The Strategic Investment Framework for Land Transport was published in 2015 by the Department of Transport, Tourism and Sport (DTTAS). The aim of the Framework is to estimate the appropriate level of investment in the Irish land transport system and to develop investment priorities for the system. The Framework recognises that current settlement patterns are not conducive to the provision of an effective public transport system and are leading to an increased reliance on the car as a means transport. Effective demand management, mainly in the form of fiscal measures are proposed which would be used in part to fund transport alternatives.

The Framework states that its overarching priority is the restoration of capital funds for transport at an average level of 1.1% to 1.5% of Gross Domestic Product (GDP) per annum at a minimum and its priorities within the available investment budget for land transport are to:

- achieve steady state maintenance;
- address urban congestion; and
- maximise the contribution of land transport networks to national development.

The Framework also outlines its key principles for land transport investment proposals such as that the overall outcome of transport investment should be to maintain and improve citizen's quality of life and be consistent with environmental, climate and biodiversity objectives and to address urban congestion and increase the efficiency of efficiency and sustainability of urban transport.

Road Safety Authority Road Safety Strategy 2013 – 2020

The Road Safety Authority Road Safety Strategy 2013 – 2020 was published with a view to building on previous success in reducing the number of fatal road collisions in Ireland. The primary target of the Strategy is stated as:

> *"A reduction of road collision fatalities on Irish roads to 25 per million population or less by 2020 is required to close the gap between Ireland and the safest countries. This means reducing deaths from 162 in 2012 to 124 or fewer by 2020. A provisional target for the reduction of serious injuries by 30% from 472 (2011) or fewer to 330 by 2020 or 61 per million population has also been set."*

In order to achieve the stated target, the Strategy incorporates a comprehensive action plan for the lifetime of the Strategy which includes:

- education measures;
- engineering measures;
- enforcement measures; and
- evaluation data and research measures.

Design Manual for Urban Roads and Streets (2013)

The *Design Manual for Urban Roads and Streets* (*DMURS*) was jointly published by the Department of Transport, Tourism and Sport and Department of Environment, Community and Local Government in 2013, and updated in 2019. The principles, approaches and standards set out in DMURS apply to the design of all urban roads and streets (streets and roads with a speed limit of 60 km/ h or less).

The aim of the document, while also providing specific design guidance, is to shift the design of urban streets so that they are more concerned with multi-modal movement and streets as places rather than with the movement of traffic. The Manual recognises that walking is the most sustainable form of transportation and should be considered first in the design of an urban environment, followed by cyclists and public transport and finally the private vehicle. Four core design principles are presented with the document which are:

1. To support the creation of integrated street networks which promote higher levels of permeability and legibility for all users, and in particular more sustainable forms of transport.
2. The promotion of multi-functional, place-based streets that balance the needs of all users within a self-regulating environment.
3. The quality of the street is measured by the quality of the pedestrian environment.
4. Greater communication and co-operation between design professionals through the promotion of a plan-led, multidisciplinary approach to design.

DMURS provides extensive technical and 'holistic' guidance, including real-world examples, as a means for incorporating the design principles set out above into the design of an urban scheme. Should any development take place at the subject lands, due to the lands currently undeveloped nature, there is an opportunity to create a scheme which puts the principles set out in DMURS into practice and create an urban environment which truly prioritises pedestrians, cyclists and sustainable transport over the private vehicle.

Permeability Best Practice Guide (2013)

The Permeability Best Practice Guide was produced by the NTA in collaboration with South Dublin County Council and AECOM in order to provide guidance on how best to facilitate the demand for walking and cycling in existing built-up areas by retaining and providing linkages within the urban environment for people to access shops, work, schools, services and, importantly public transport services, with a view to increasing public transport patronage. The Guide recognises that severance is *"built-in"* to the environment by walls, cul-de-sacs and other means and that this needs to be addressed in order to increase people's access to workplaces and services.

The Guide gives an overview of the concept of permeability and its benefits, the permeability issues and challenges created by development betters to date and best practice principles for maintaining and providing permeability. A guide to implementing permeability schemes is also included in the document including scheme design, consultation guidance and evaluation and monitoring methods and techniques. In the implementation of any scheme at the DSA lands, permeability and unfettered access to workplaces, schools, services, and public transport by active travel modes must inform the design from the earliest stages.

Achieving Effective Workplace Travel Plans, Guidance for Local Authorities (2013)

This guidance document was published by the NTA in 2013 as a means of assisting local authorities in integrating the principles and practices of Workplace Travel Plans into both their development plan and development management processes. The document begins by outlining that Workplace Travel Plans are effective instruments within the planning process to promote and support sustainable travel at a site-specific level. The document gives guidance in relation to development thresholds determining when a Workplace Travel Plan should be required as part of a development and what content should be included in such a Plan, i.e. an Action Plan containing measures to promote sustainable travel and decrease private car use. The document also incorporates guidance on setting targets and identifying indicators for a Workplace Travel Plan.

The document states Workplace Travel Plans should incorporate measures and targets which will have a positive impact on modal split and that the success of any Workplace Travel Plan will be its ability to set and deliver ambitious targets.

Local Area Plans – Guidelines for Planning Authorities (2013) and Manual for Local Area Plans (2012)

The Local Area Plans Guidelines for Planning Authorities provide a valuable instrument for creating a specific vision for a smaller, geographic area having its own unique set of circumstances that require specific interventions. It avoids the need for large-scale alternations to adopted County Development Plans. The Guidelines state that the Planning and Development Act 2000-2012 introduced, inter alia:

> *"The concept of local area plans within the framework of higher-level plans (such as Regional Planning Guidelines and City and County Development Plans) local area plans provide more detailed planning policies for areas where significant development and change is anticipated, without having to prepare very detailed local planning policies and objectives for many specific areas within city and county development plans."*

The accompanying manual sets out the proper process to developing a local area plan (LAP). The process has two distinct elements of which the primary focus is concerned with the preparation of quality, evidence-based, draft LAP. The second element addresses the statutory process from the draft LAP through to the adoption.

LAPs are intended to provide more detailed planning policies for areas that are expected to experience significant development and change, through proper public participation and democratic oversight. This is achieved by setting out the LAP context; setting a vision and establishing principles for development; generating strategies; preparing detailed guidance. When preparing a draft LAP the manual provides a preliminary timeline from conception in a draft form through to adoption by the local authority.

Given the scale and extent of the lands at Dunsink, it may be prudent in due course to pursue the creation of a LAP (or planning scheme), that follows these guiding principles to achieve an optimal outcome for the lands.

Spatial Planning and National Roads Guidelines for Planning Authorities (2012)

Section 2.6 on Exceptional Circumstances considers the possibility for Planning Authorities to identify stretches of national roads where a 'less restrictive' approach may be applied as part of the forward planning process, i.e. through either varying or reviewing a Development Plan. It states that in considering whether a development would be exceptional, Planning Authorities should take account of:

- *"the relevance and appropriateness of proposed development in supporting the aims and objectives of the National Spatial Strategy and Regional Planning Guidelines;*

- *the requirements of other planning guidelines issued under section 28 of the Act including the Retail Planning Guidelines (2005), which include a general presumption against large retail centres being located adjacent or close to existing, new or planned national roads, including motorways;*
- *the nature of proposed development and the volume of traffic to be generated by it,*
- *any implications for the safety, capacity and efficient operation of national roads;*
- *any plans for future upgrades of national roads and other transport infrastructure/services;*
- *the suitability of the location compared to alternative locations;*
- *the pattern of existing development in the area;*
- *satisfactory details of the proposed demand management measures;*
- *acceptable funding and delivery proposals for any road improvements required, and*
- *the precedent that could be created for cumulative development in the area and the potential implications for the national road network."*

It also sets out criteria for development along lightly trafficked sections of national secondary roads.

Section 2.7 on 'Development at National Road Interchanges and Junction' sets out the policy in relation to development objectives/ zoning of location at or close to junctions where such development could generate significant additional traffic with potential impact on the national road network. It considers that development which is considered by a Planning Authority can demonstrate that it will not comprise the capacity or efficiency of the national road or junction, then a number of criteria will have to be met, including:

- *"demonstration of the need for additional connectivity by reference to policy considerations such as the National Spatial Strategy, Regional Planning Guidelines and in the Greater Dublin Area, the National Transport Authority's transport strategy;*
- *consistency between the relevant development plan and the relevant plans and strategies mentioned above;*
- *early identification, through the plan-making process, of appropriate strategic land uses, which will benefit from high quality access, such as nationally or regionally important employment clusters or intermodal transfer facilities (but excluding retail and residential development);*
- *demonstration that all other options for servicing the development needs and, in particular, the regional and local roads network and the use of public transport solutions, have been examined and exploited to the fullest extent practicable;*
- *demonstration that the additional traffic loading can be satisfactorily accommodated at the junction concerned and on the national road network;*
- *ensuring that the proposed development will not give rise to an undesirable precedent for further traffic generating development at or in the vicinity of the proposed development;*

- *demonstration that design complies with NRA Design Manual for Roads and Bridges (DMRB) standards;*
- *satisfactory details of the proposed demand management measures; and*
- *acceptable funding and delivery proposals for any required improvements."*

Retail Planning Guidelines (2012)

The current Retail Planning Guidelines place substantial greater emphasis on competition and serving consumers. As such, five key policy objectives must guide planning authorities in addressing retail development issues in their development planning and development management functions, namely:

- ensuring that retail development is plan-led;
- promoting city/town centre vitality through a sequential approach to development;
- securing competitiveness in the retail sector by actively enabling good quality development proposals to come forward in suitable locations;
- facilitating a shift towards increased access to retailing by public transport, cycling and walking in accordance with the Smarter Travel strategy; and
- delivering quality urban design outcomes.

Section 3.3.3 of the Guidelines emphasises, inter alia, that County Development Plans must outline the level and form of retailing that is appropriate to the various components in the settlement hierarchy of the core strategy, provide a broad assessment of retail floorspace and set out guidance on the location and scale of retail development to support the settlement hierarchy.

District Centres are defined as those which provide *"….a range of retail and non-retail service functions (e.g. banks, post office, local offices, restaurants, public houses, community and cultural facilities) for the community at a level consistent with the function of that centre in the core strategy. They can be purpose built as in new or expanding suburbs or traditional district centres in large cities or town."* They should not serve as a retail destination in their own right and should serve new or expanding suburbs. They can serve populations in excess of 10,000 persons. Their provision should be based on significant growth in population[3]. Local Centre or Neighbourhood Centre *"…comprise a small group of shops, typically comprising newsagent, small supermarket/general grocery store, sub-post office and other small shops of a local nature serving a small, localised catchment population."*

3 A guideline size of approximately 10,000 sq m net and up to 20,000 sq m net is set for the metropolitan area of the GDA was given in the 2005 Guidelines.

National Cycle Manual (2011)

The National Cycle Manual (NCM) was published by the NTA in 2011 and acts as a reference manual for transport planners and engineers in better planning and designing for cyclists and incorporating cycling into within transport networks. The goal of NCM is to *"'raise the bar' and to aim to provide two-abreast safe cycling in a stress free and safe environment*". The Manual gives guidance on cycling networks, link types, junctions and detailed design of cycling infrastructure in Ireland.

National Cycle Policy Framework 2009 – 2020

As part of the Irish Government's *2009-2020 Smarter Travel – A Sustainable Transport Future,* the *National Cycle Policy Framework 2009 – 2020* (NCPF) was published with a view to creating a strong cycling culture in Ireland through the implementation of policy that would create environments in Irish cities, towns and villages that would be amenable to cyclists with the overarching goal of having 10% of all trips undertaken by bicycle by the year 2020 while also arresting the decline of cycling in Ireland since the 1980's.

The NCPF outlines 19 objectives in order to achieve the abovementioned goal of a 10% bicycle mode share for all trips, which include such objectives as ensuring all urban road infrastructure with the exception of motorway are designed or retrofitted with the cyclist in mind, providing cycle friendly routes to school, providing public bikes in cities and ensuring proper integration between public transport and cycling. These objectives remain relevant in 2021 and should be given consideration and, where possible, inform any proposed development design of the DSA lands from the earliest stage.

Smarter Travel – A Sustainable Transport Future 2009-2020

The Department of Transport, Tourism and Sport's sustainable transport policy was published in 2009 and set out ambitious targets to reduce car use at a national level by 2020, targeting a reduction in the car commuting mode share from 65% to 45%, and a corresponding increase in sustainable transport mode shares from 35% to 55%. The latter figure included a 10% cycling mode share target.

Recognising the greater potential to achieve a shift away from car within urban areas where travel distances are shorter and realistic alternatives either exist or can be provided, the policy document places substantial emphasis on the role of public transport and cycling within cities. In this regard, it includes:

> *"Actions to reduce distance travelled by private car and encourage smarter travel, including focusing population and employment growth predominantly in larger urban areas and the use of pricing mechanisms or fiscal measures to encourage behavioural change…."*

The policy document contains a range of actions aimed at achieving these targets, including initiatives to encourage smarter travel and delivering alternative ways of travelling. New developments within the largest urban areas such as Dublin shall play a key role in achieving the 55% sustainable transport mode share target (even if this target is achieved at a date well beyond 2020, as it was initially aimed). Given that the lands at Dunsink are currently underdeveloped yet are in relative proximity to existing and proposed transport infrastructure, there is significant opportunity to create an environment which fosters a shift towards sustainable transport modes and reduces car use.

Sustainable Residential Development in Urban Areas (2009)

The Sustainable Residential Development in Urban Areas 2009 sets out high level strategic design led principles for achieving good quality, sustainable residential design. This document is designed specifically for urban residential requirements and how best to maximise and utilise sites for development. There are several factors that influence sustainable residential development and how best to approach differing sites. Given the ever-increasing urban population in Ireland, it is critical to provide development of sustainable, integrated neighbourhoods within our cities, towns and villages.

Location

The location of a site has a major Impact of the type and scale of development being permissible. Where sites are being repurposed such as infill developments, brownfield developments, regeneration schemes, there is scope for increased development as the surrounding lands have already been developed. "*Where such* significant *sites exist and, in particular, are close to existing or future public transport corridors, the opportunity for their re-development to higher densities, subject to the safeguards expressed above or in accordance with local area plans, should be promoted."*

Density

The Guidelines state: *"The increase of population within city or town centers with their range of employment, recreation, educational, commercial and retail uses can help to curtail travel demand; therefore, these locations have the greatest potential for the creation of sustainable patterns of development."*

Increasing density promotes the long-term sustainability of an area and ensures that there is a sufficient population base to sustain many services. The lands at Dunsink lie within the M50 motorway that encircles Dublin City, and is one of the few remaining large land banks that offers an opportunity to create a new urban quarter with an advantage of having rail and motorway networks already in place.

Public Transport

Access to public transport is a fundamental requirement regarding any policy in relation to sustainable development, especially when located within an urban setting. Given the difficulties providing public transport options in low-density developments, it is imperative to maximize all public transport options available, both existing and planned. In this respect, it is noted that:

> *"To maximise the return on this investment, it is important that land use planning underpins the efficiency of public transport services by sustainable settlement patterns – including higher densities on lands within existing or planned transport corridors."*

This objective can be easily applied to the DSA lands, given that the Maynooth Rail Line runs through the southern part of the lands, including the Navan Road Parkway station. This would help alleviate private car dependency in this area and offer future residents' connections to local and national rail, and a direct connection to Dublin City Centre. It is recommended that walking distances from public transport nodes should be used in defining such corridors, and that "*increased densities should be promoted within 500 metres walking distance of a bus stop, or within 1km of a light rail stop or a rail station."*

Development Plans – Guidelines for Planning Authorities (2007)

The Guidelines set out the objectives and aspirations as to how a development plan should be framed and lays out the goals to be achieved, and *"set out in detail, how, within the legislative framework for planning, Ireland can develop a more dynamic, objective and inclusive planning system to structure future development that meets wider economic, social, environmental and heritage objectives."*

The Guidelines set the criteria of the objectives and ensure that they adequately address the key concerns by ensuring that:

- development plans should be strategic;
- development plans should be a catalyst for positive change and progress;
- development plans should anticipate future needs on an objective basis;
- development plan's role in protecting the environment and heritage is recognised; and
- development plans act as a framework within which sustainable development can be achieved:

Specifically, in any rezoning proposals, the development plan will be required to consider:

- need (population & core strategy);
- policy context (NPF and RSES);
- capacity of water, drainage and roads infrastructure (subject study in part);
- supporting infrastructure and facilities (to be determined);
- physical suitability (refer to area characterisation);

- sequential approach (Dunsink lies adjacent to the existing built-up area); and
- environmental and heritage policy, including conservation of habitats and other sensitive areas (The Royal Canal is a Proposed Natural Heritage Area).

Given that the lands in Dunsink are currently undeveloped, there is now an opportunity to apply the above factors, thus ensuring that the DSA lands are developed and utilised efficiently, in a coordinated plan-led manner. In doing so, it will achieve the best possible outcome for the lands.

2.3 Regional Level

Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region 2019-2031

RSES Overview

The RSES is a strategic plan and investment framework, addressing economic and spatial development of the Midland, Eastern, and Dublin subregions or Strategic Planning Areas in an integrated manner. It *"identifies regional assets, opportunities, and pressures and provides appropriate policy responses in the form of Regional Policy Objectives".* It acts as an intermediate level of planning between local level and national level and allows for joint up spatial planning and economic policy across local authorities within a region.

Chapter 4 sets out the settlement strategy, with the DSA lands falling within Dublin City and Suburbs where the Strategy seeks to "*support the consolidation and re-intensification of infill/brownfield sites to provide high density and people intensive uses within the existing built up area and ensure that the development of future development areas is coordinated with the delivery of key water and public transport infrastructure."* Table 4.3 indicates the socio-economic functions include international diverse business core, high-density retail and service hub, and quality arts, culture and leisure offer. The transport profile includes self-sufficient (high internal trip rate) transport hub with high-quality public transport and links to other centres. The policy response is continued population and employment growth with a focus on improving housing supply and amenity provision to create sustainable communities and improve public transport and sustainable travel options.

Chapter 8 of the RSES deals with connectivity which incorporates both transport connectivity and digital network connectivity, and *"the RSES provides the basis for the integration of land use and transport planning in the Region, informing the preparation of plans, programmes and projects at all levels".* It includes the following guiding principles as a means to achieve this of which relevant principles include:

- *"For urban-generated development, the development of lands within or contiguous with existing urban areas should be prioritised over development in less accessible locations. Residential* *development should be carried out sequentially, whereby lands which are, or will be, most accessible by walking, cycling and public transport – including infill and brownfield sites – are prioritised."*

- *"Within the Dublin Metropolitan Area, except in limited planned circumstances, trip intensive developments or significant levels of development should not occur in locations not well served by existing or proposed high capacity public transport."*
- *"The strategic transport function of national roads and associated junctions should be maintained and protected."*
- *"In locations where the highest intensity of development occurs, an approach that caps car parking on an area-wide basis should be applied."*
- *"The management of space in town and village centres should deliver a high level of priority and permeability for walking, cycling and public transport modes to create accessible, attractive, vibrant and safe, places to work, live, shop and engage in community life. Accessibility by car does need to be provided for, but in a manner, which complements the alternative available modes. Local traffic management and the location / management of destination car parking should be carefully provided."*
- *"Planning at the local level should prioritise walking, cycling and public transport by maximising the number of people living within walking and cycling distance of their neighbourhood or district centres, public transport services, and other services at the local level such as schools."*
- *"Support the '10 minute' settlement concept, whereby a range of community facilities and services are accessible in short walking and cycling timeframes from homes or accessible by high quality public transport to these services in larger settlements."*
- *"New development areas, including peripheral areas, should be permeable for walking and cycling and the retrospective implementation of walking and cycling facilities should be undertaken in existing neighbourhoods, in order to a give competitive advantage to these modes. Where possible, developments shall provide for filtered permeability."*
- *"Proposals for right of way extinguishments should only be considered where these do not result in more circuitous trips for local residents accessing public transport, or local destinations."*
- *"Cycle parking should be appropriately designed into the urban realm and new developments at an early stage to ensure that adequate cycle parking facilities are provided."*
- *"Support investment in infrastructure and behavioural change interventions to encourage and support a shift to sustainable modes of transport and support the use of design solutions and innovative approaches to reduce car dependency. Development will have regard to the Design Manual for Urban Roads and Streets, where appropriate."*

Relevant Regional Policy Objectives (under ‘Integration of Transport and Land Use Planning’ and ‘Mobility Management and Travel Plans’ headings) are as follows:

- ***“RPO 8.1****: The integration of transport and land use planning in the Region shall be consistent with the guiding principles expressed in the transport strategy of the RSES.*
- ***RPO 8.2****: The capacity and safety of the Region’s strategic land transport networks will be managed and enhanced, including through the management of travel demand in order to ensure their optimal use.*
- ***RPO 8.3****: That future development is planned and designed in a manner which maximises the efficiency and protects the strategic capacity of the metropolitan area transport network, both existing and planned and to protect and maintain regional accessibility.*
- ***RPO 8.4****: Land use plans within the GDA shall demonstrate a consistency with the NTA’s Transport Strategy for the Greater Dublin Area and plans with or outside of the GDA shall be consistent with the guiding principles expressed in the RSES.*
- ***RPO 8.7****: To promote the use of mobility management and travel plans to bring about behaviour change and more sustainable transport use.”*

Metropolitan Area Strategic Plan (MASP)

Chapter 5 of the RSES also includes a MASP for Dublin, which provides a 12 – 20 year strategic planning and investment framework for the Dublin metropolitan area. The MASP states its guiding principles as:

- compact sustainable growth;
- integrated transport and land use;
- increased employment density in the right places;
- alignment of growth with enabling infrastructure;
- identify future development areas; and
- metropolitan scale amenities and coordination of land management.

The MASP notes that the NPF identifies a target population of 1.4 million people in Dublin City and Suburbs for 2031, an increase of some 220,000 people, and a target of 1.65m in the MASP, an increase of some 250,000 people. MASP seeks to achieve compact development targets of at least 50% of all new homes within or contiguous to the existing built-up area in Dublin and 30% in other settlements. Furthermore, the MASP identifies strategic residential, employment and regeneration development opportunities on the corridors along with the requisite infrastructure investment needed to ensure a steady supply of sites in tandem with the delivery of key public transport projects. Table 5.1 of the MASP seeks to establish the population capacity of each corridor, including the North Western Corridor, with reference in the short-term to 2026; in the medium-term (in the lifetime of the RSES) to

2031; and in the long-term horizon of the NPF to 2040. It does not, however, refer specifically to the capacity of the Dunsink landbank.

The MASP identifies the lands at Dunsink as being inside the M50 ring and states:

> *"The proposed DART Underground and LUAS extensions to Finglas and Lucan subject to appraisal and delivery post 2027, will unlock long-term capacity including strategic landbanks such as Dunsink."*

Dunsink is identified by Table 5.1 as a major greenfield land with long-term potential to develop a new district centre and that whether the lands are employment or mixed-use shall be *"subject to feasibility"*. In relation to phasing and enabling infrastructure, the *"LUAS extension to Finglas"* is identified as well as *"access, site conditions and feasibility"*.

In terms of integration of land use and transport, the MASP states that to the extent practicable development within the metropolitan area should be carried out sequentially whereby lands which are or will be most accessible by walking and cycling and public transport development – including infill and brownfield sites – are prioritised. Related regional policy objectives include:

- ***"RPO 5.2**: Support the delivery of key sustainable transport projects including Metrolink, DART and LUAS expansion programmes, BusConnects and the Greater Dublin Metropolitan Cycle Network and ensure that future development maximises the efficiency and protects the strategic capacity of the metropolitan area transport network, existing and planned.*
- ***RPO 5.3**: Future development in the Dublin Metropolitan Area shall be planned and designed in a manner that facilitates sustainable travel patterns, with a particular focus on increasing the share of active modes (walking and cycling) and public transport use and creating a safe attractive street environment for pedestrians and cyclists."*

Transport Strategy for the Greater Dublin Area 2016-2035

Current Strategy

The current Transport Strategy for the Greater Dublin Area (TSGDA) provides the overarching policy framework with respect to all modes of transport within the four counties that comprise the GDA, namely counties Dublin, Meath, Kildare and Wicklow. The Strategy has identified transport investment priorities in the region to 2035, and has supported the progression and ongoing delivery of projects such as the Luas Cross City, the re-opening of the Phoenix Park Tunnel Rail Line, roll out of a network of cycle tracks and greenways, Metrolink, the DART+ Programme, and BusConnects.

The Strategy recognises proliferation of car-dependent lifestyles as its driving challenge, noting that significant levels of growth within metropolitan Dublin have occurred in edge-of-the-city locations and beyond, which *"are not effectively served by public transport and are of a layout and density unsuited to its* *provision, or for walking and cycling"*, resulting in overreliance on the private car. Blanchardstown is noted to be among the *"peripheral suburban locations"*, which have experienced the highest population growth. At the same time, the *"large swathe of employment development between the M2 and N3 at Ballycoolin/ Damastown to north of Blanchardstown"* i.e. to the north of the subject lands are acknowledged.

For the purposes of the Strategy's development, the GDA was divided into eight strategic corridors, including six radial corridors and two central corridors. The subject lands environs are located within the catchment of Corridor B: Navan – Dunboyne – Blanchardstown – to Dublin City Centre, with the N/M2, N/M3, and the Maynooth Rail Line identified as the major transport links within this corridor. According to the data supporting the Strategy, trip patterns within this corridor are heavily car based, with the car mode share in all trip purposes within the corridor being 74% and the equivalent public transport mode share at just 8%. The Strategy also notes that rail plays a *"limited role in meeting the demand for radially-based trips within this corridor"*, with only the southern part of Blanchardstown in addition to Dunboyne and its hinterland being served by rail.

Conversely, large areas of Blanchardstown are noted to lack high-capacity public transport links, with the anticipated significant growth in population and demand in Blanchardstown and the broader corridor area deemed *"difficult to service by public transport, without a substantial increase in the extent and capacity of public transport services."*

Notably, the DSA lands are served by the Maynooth Rail Line which will be enhanced in terms of both infrastructure and services as part of the DART+ Programme in the form of the DART+ West project. Further afield, a Luas extension to the north of Finglas and to Lucan in West Dublin are proposed, however, the lands are noted to outside the catchment of both corridors. The subject lands could benefit from the development of the Core Bus Network proposed in the Strategy. In particular, the Strategy includes proposals for a radial Core Bus Corridor (CBC) between the City Centre, Finglas, and Corduff via Ballycoolin, in addition to an orbital CBC from Kilbarrack to Blanchardstown via Ballycoolin. However, neither of these two proposed CBCs have been included in the ongoing CBC Project which forms an integral part of the overall BusConnects programme, which aims to implement the Strategy's provisions in relation to the bus infrastructure and services enhancements.

In terms of road transport, notable the M50 motorway runs adjacent to the site. The Strategy notes that the M50 is a critical part of the national road network and is a primary artery for the movement of goods from Dublin Port and Dublin Airport to the rest of Ireland. The Strategy also notes that the M50 is under pressure and demand management and the provision of alternatively transport modes is needed in order to ensure that its strategic function as a means of accommodating "*non-local trips of high economic value*" as opposed to commuter traffic is maintained.

As required by legislation determining its frequency of update, the NTA has recently embarked upon a review and update of the existing Strategy, as detailed further below.

TSGDA Update – Issues Paper

In support of a recent public consultation in relation to the TSGDA's update, the NTA has published an Issues Paper which sets out the need for a review of the current Strategy, stating that the review *"will assess the implementation of the current plan, and look to produce an updated strategy which will set out the framework for investment in transport infrastructure and services, taking us to 2042."* The Issues Paper sets out the rationale underpinning the review and update of the TSGDA:

- It is a legislative requirement - *"The NTA is required by legislation to review the strategy every six years"*.
- Citing a "*rapidly changing world compared to even four years ago*", the Issues Paper has recognised the need to update the TSGDA with respect to future needs of society, and poses the following questions:
  - *"How should we evaluate future transport needs?"*
  - *"What are the key components to a forward-looking transport strategy?"*

The Strategy update process is graphically illustrated within the Issues Paper, with the recent consultation noted to inform development of the new Strategy's objectives, and identification of its transport requirements.

TSGDA Update – Supporting Studies

Although not set out within the Issues Paper, it is stated on the pertinent NTA webpage4 that a number of studies will be undertaken to inform the TSGDA update process. These studies are as follows:

- assessment of metro to Terenure-Rathfarnham-Knocklyon;
- assessment of metro to UCD-Sandyford; and
- assessment of a rail line to Navan.

Greater Dublin Area Cycle Network Plan (2013)

The GDA Cycle Network Plan proposes to expand the urban cycle network to over 1,485 kilometres in length, and in addition will provide over 1,300 kilometres of new connections between towns in the rural areas throughout the region. Proposed schemes of note within and in the vicinity of the subject lands include the Tolka Greenway and Royal Canal Greenway (N02) which will link to a network of primary, secondary and feeder routes which will serve the surrounding areas such as Blanchardstown,

[4] https://www.nationaltransport.ie/nta-publishes-issues-paper-ahead-of-revising-greater-dublin-area-transport-strategy/

Castleknock and Finglas. While cycle network proposals in the vicinity of the DSA lands are somewhat limited (due in large part to the currently undeveloped nature of the lands), the Tolka and Royal Canal greenway routes in particular represent a significant opportunity for linking up with the city-wide cycle network and encouraging sustainable transport as a means of reaching not only Dublin City Centre but also employment settlements elsewhere within the City, and existing rail stations located along the Royal Canal Greenway.

Planning and Development of Large Scale, Rail Focused Residential Areas in Dublin (2013)

The purpose of this study was to assess the future delivery of rail-based large and medium scale residential development areas in Dublin, given the very poor economic and funding conditions prevailing in Ireland after the financial crash and the lack of new residential development delivery of any scale. The approach allowed for initial development at a lower density; leveraging the use of existing infrastructure; providing for investment in necessary early infrastructure while seeking to minimise early infrastructure costs; and promoting the enhancement of the environs of each phase.

Retail Strategy for the Greater Dublin Area 2008-2016

The Retail Strategy for the Greater Dublin Area (RSGDA) considers the strategic retail hierarchy for the GDA and provides guidance on formats and sizes of centres within the hierarchy. Although dated, its provisions have not been reviewed or replaced in a regional context. Figure 2.1 (overleaf) sets out the retail hierarchy as detailed in the Strategy. The centres close to the DSA lands are highlighted.

Figure 2.1 Retail Hierarchy for the Greater Dublin Area (Areas Close to DSA Lands Highlighted)

LEVEL 1	METROPOLITAN CENTRE
	Dublin City Centre
LEVEL 2	MAJOR TOWN CENTRES & COUNTY TOWN CENTRES
	Fingal: Swords, Blanchardstown
	South Dublin: Tallaght, Liffey Valley
	Dun Laoghaire: Dun Laoghaire, Dundrum
	Wicklow: Bray, Wicklow
	Meath: Navan
	Kildare: Naas / Newbridge, Leixlip (including Collinstown*)
LEVEL 3	TOWN AND/OR DISTRICT CENTRES & SUB-COUNTY TOWN CENTRES (Not definitive list, see text below)
	Dublin City: Finglas, Northside Shopping Centre, Ballyfermot, Rathmines, Crumlin Shopping Centre, Donaghmede Shopping Centre, Omni, Ballymun, Point Village and Poolbeg
	Fingal: Malahide, Balbriggan, Skerries, Charlestown.
	South Dublin: Adamstown, Crumlin (Ashleaf), Clonburris/Balgaddy, Clondalkin, Fortunestown, Kilnamanagh, Lucan, Rathfarnham
	Dun Laoghaire Rathdown: Stillorgan, Blackrock, Cornelscourt, Nutgrove, Cherrywood.
	Wicklow: Greystones, Arklow, Blessington, Baltinglass
	Meath: Dunboyne**, Ashbourne, Dunshaughlin, Kells, Trim, Laytown/Bettystown, Enfield.
	Kildare: Celbridge, Kilcock, and Maynooth, Kilcullen, Athy, Kildare, Monasterevin, Clane.
LEVEL 4	NEIGHBOURHOOD CENTRES, LOCAL CENTRES-SMALL TOWNS AND VILLAGES
LEVEL 5	CORNER SHOPS/SMALL VILLAGES

2.4 Local Level

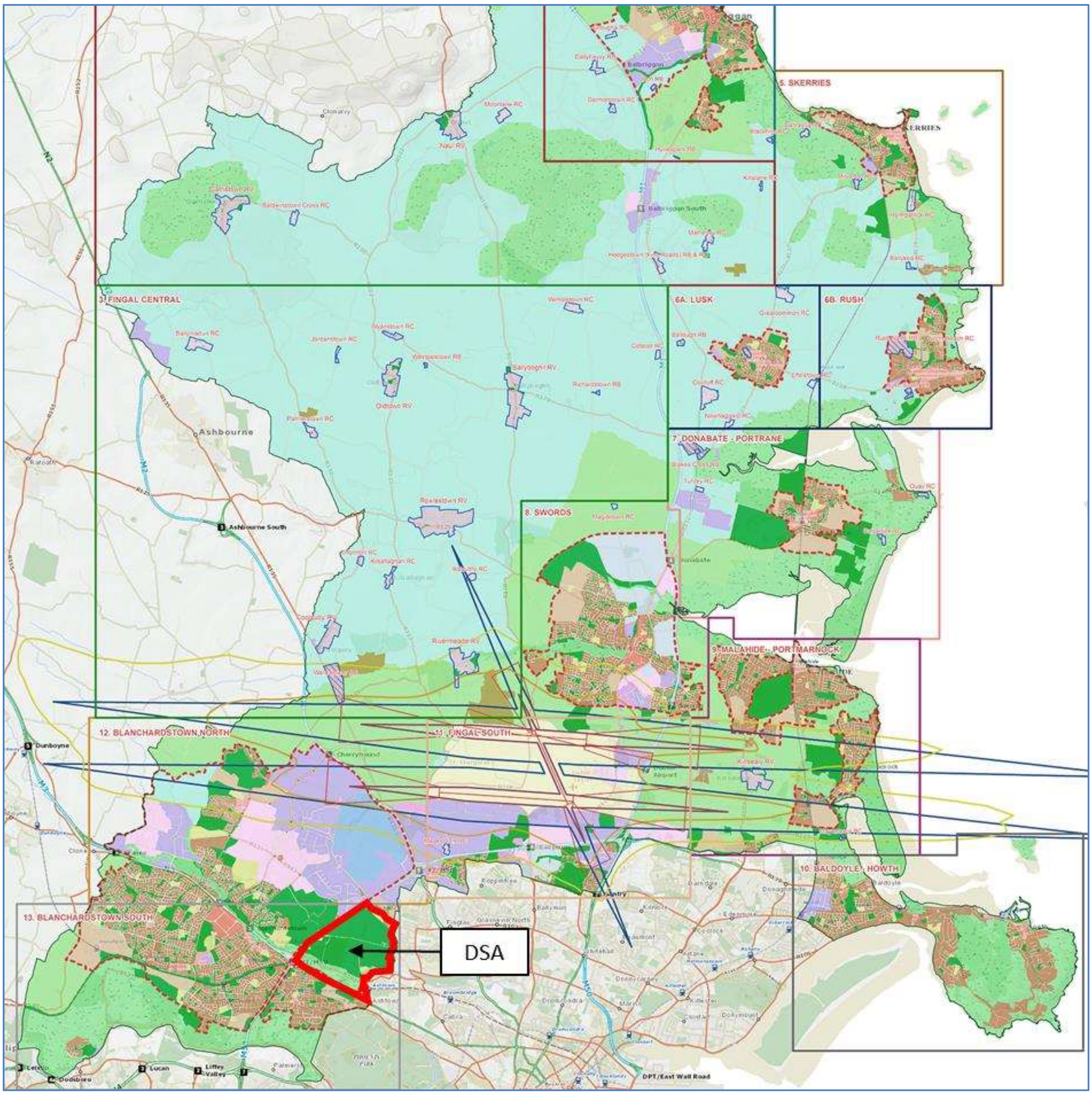
Fingal Development Plan (FDP) 2017-2023

The lands area situated with the Fingal County Council administrative area, and the current FDP *"sets out the Council's proposed policies and objectives for the development of the County"* and focuses on several themes such as infrastructure, transport and mobility.

County Settlement Strategy

Chapter 1 sets out the Vision for the County, detailing the Plan's emphasis on sustainable development, climate action, social inclusion, high quality design and resilience. Chapter 2 sets out the settlement and core strategy objectives. The following Figure 2.2 illustrates spatially the settlement strategy for the County, and outlines the DSA lands with this context.

Figure 2.2 County Strategy Map



Variation No.2 reflects the NPF and RSES housing and population allocation. This is summarised in Figure 2.3 (overleaf).

Figure 2.3 Population Targets to 2031

Fingal County Council	CENSUS 2016	2026 Range Low	High	2031 Range Low	High
Dublin NPF Road Map	1,347,500	1,489,000	1,517,500	1,549,500	1,590,000
RSES Fingal Allocation	296,000	327,000	333,000	340,000	349,000
Source: NPF/RSES and CSO Census					

The varied Plan indicates that there is capacity for an additional 43,104 units.

Section 2.8 of the Plan recognises the strategic location and development potential of the DSA lands, and states that the area provides an opportunity to *"significantly consolidate the Dublin Gateway in a sustainable manner underpinned by high quality public transport given the sites benefits from close proximity to the existing heavy rail network and Ashtown and the proposed extension to the Luas to Finglas."*

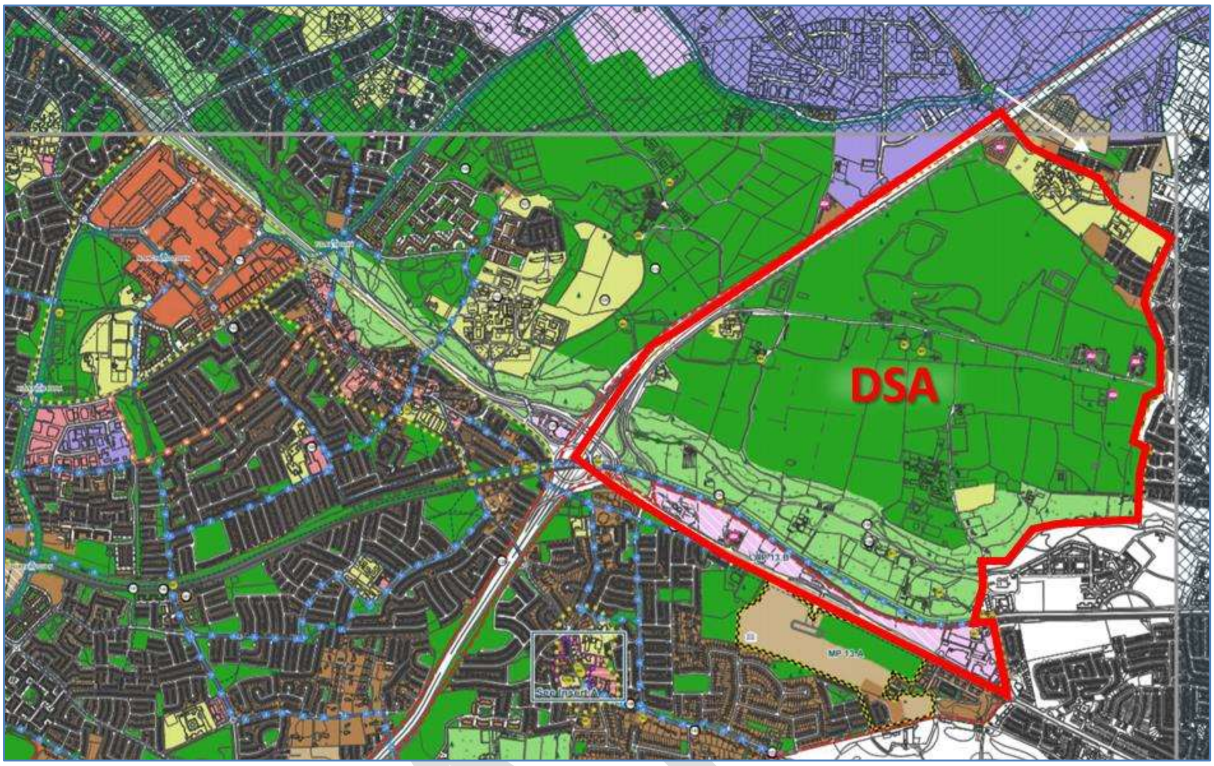
The Plan also gives cognisance to the proximity of the land and envisages that it could facilitate 4,000 to 5,000 residential units in a mixed-use district. Objective BLANCHARDSTOWN 13 states that it is an objective of the Council to:

> *"Carry out a feasibility study of lands at Dunsink to include a full investigation of requirements in terms of infrastructure, water, access, drainage within three years of the adoption of this Development Plan and any remedial measures associated with the former landfill area to inform the future designation of these lands for development. This will be carried out in consultation with necessary statutory agencies and appropriate stakeholders to facilitate the orderly and appropriate release of lands at Dunsink."*

Relevant Local Objectives

An extract of the objectives map is provided in Figure 2.4 (overleaf), with boundary of the DSA lands illustrated for clarity.

Figure 2.4 Extract from FDP 2017-2023 Objective Map (Sheet No.13)



Zoning Objectives: the following land use zoning objectives apply, with the objective's relevance to the DSA lands indicated in parenthesis:

- **CI – Community Infrastructure**: *"Provide for and protect civic, religious, community, education, health care and social infrastructure"* (National Orthopaedics Hospital, Elm Green Nursing Home).
- **HA – High Amenity**: *"Protect and enhance high amenity areas"* (Tolka Valley).
- **OS – Open Space**: *"Preserve and provide for open space and recreational amenities"* (majority of the lands).
- **HT – High Technology**: *"Provide for office, research and development and high technology/high technology manufacturing type employment in a high quality built and landscaped environment"* (adjacent to railway station on Navan Road).
- **RS – Residential**: *"Provide for residential development and protect and improve residential amenity"* (Dunshoghly estate and two traveller accommodation estates).

Specific Objectives

- **129** Provide for a pedestrian/cyclist link between the Tolka River and the Royal Canal.
- **135** Provide a footbridge over the N3 at an appropriate location between the Auburn Avenue junction with the N3 and the Phoenix Park interchange.
- **136** Facilitate pedestrian access from Coolmine Rugby Club grounds over the Canal adjacent to the Phoenix Park Railway Station.

There are 10 protected structures and one recorded monument within the area.

Navan Road Parkway Local Area Plan (LAP 13.B)

The LAP, which has yet to be prepared will cover, inter alia, the following:

- regional drainage infrastructure and SUDS measures;
- visual integration with Dunsink;
- provide for a detailed phasing of construction of development in the LAP in tandem with the delivery of transport and drainage infrastructure; and
- other local objectives (135 and 136 above).

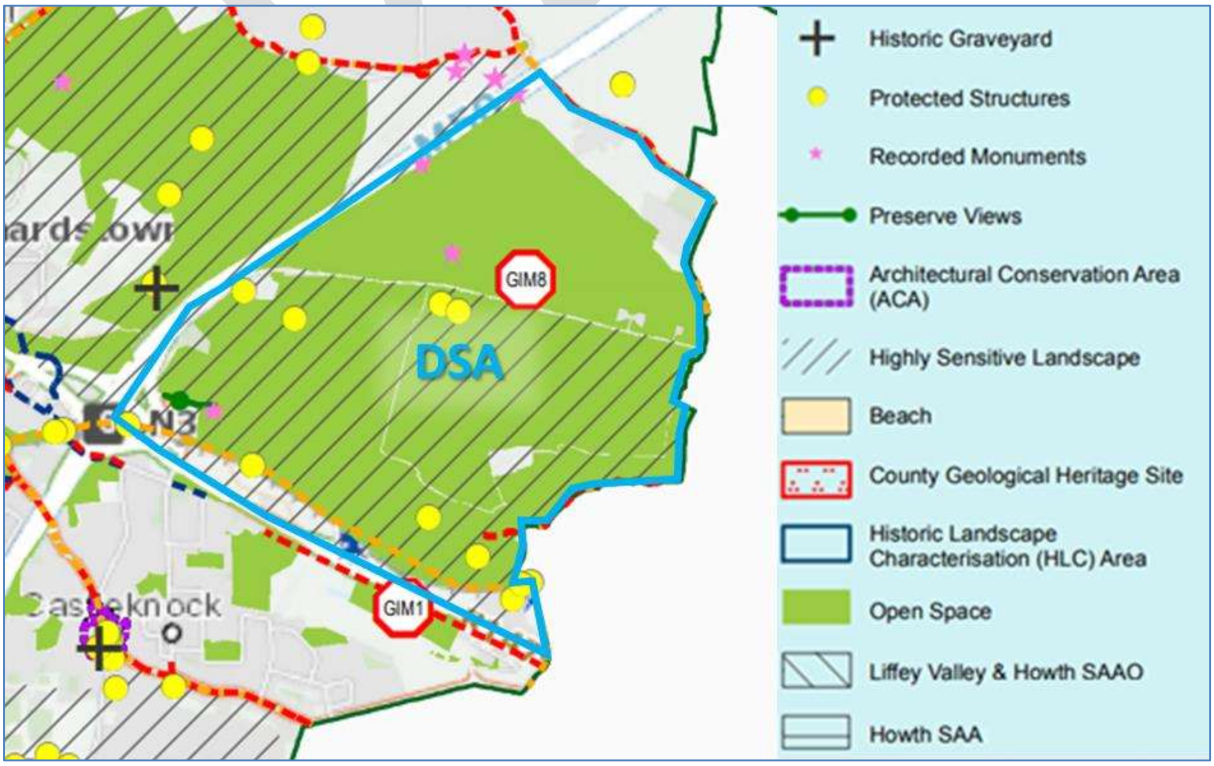
Green Infrastructure, Landscape and Cultural Heritage

Sheet No. 14 of the current FDP details the proposed green infrastructure, landscape sensitivities, protected structures and record monuments for the area (see Figure 2.5 below). The following specific objectives apply:

- GM1 – Provide active regional hub at Phoenix Park racecourse.
- GM8 – Provide new regional park at Dunsink.

That part of the DSA that lies between the old landfill at Dunsink and the Tolka is identified as a *"highly sensitive landscape"*.

Figure 2.5 Green Infrastructure, Landscape, Protect Structures & Recorded Monuments



There are 10 protected structures in the DSA, as detailed in the following Table 2.3.

Table 2.3 Protected Structures in the DSA

RPS Number	Address	Description
0685	Mound Elm Green Nursing Home, Dunsink Lane, Dunsink, Dublin 15	Archaeological site of large irregular shaped mound (3m high) within grounds of Elm Green Nursing Home
0686	Elm Green Dunsink Lane, Dunsink, Dublin 15	Five-bay two-storey over basement 19th century house, now clubhouse of Elmgreen Golf course
0687	Observatory House Dunsink Observatory, Dunsink Lane, Dunsink, Dublin 15	Late 18th century house & outbuildings
0688	South Dome Dunsink Observatory, Dunsink Lane, Dunsink, Dublin 15	Mid 19th century rotunda with copper dome, housing telescope
0690	Ashton House Ashtown Road, Ashtown, Dublin 15	Early 19th century house, outbuildings, gate lodge & gates. The house is in Victorian Italianate
0941	Ashbrook River Road, Ashtown, Dublin 15	Late 18th century house and walled garden (excludes altered and extended outbuildings containing commercial business)
0942	Castleknock House Castleknock Lodge, Castleknock, Dublin 15	Early 19th century detached five-bay two-storey house
0943	Knockmaroon Estate Lodge Carpenterstown Road, Castleknock, Dublin 15	Early 20th century detached Tudor-Revival estate lodge
0944b	Royal Canal 10th Lock Ashtown Road, Ashtown, Dublin 15	10th Lock of late 18th century Royal Canal structure, formed by cut stone walls and timber gates
0944c	Royal Canal 11th Lock Castleknock, Dublin 15	11th Lock of late 18th century Royal Canal structure, formed by cut stone walls and timber gates

There are two recorded monuments:

- **DU014-043** – Burial ground on the southern side of River Road.
- **DU014-033001** – Souterrain at Dunsink Landfill.

There is an identified preserved view in the south-western part of the DSA.

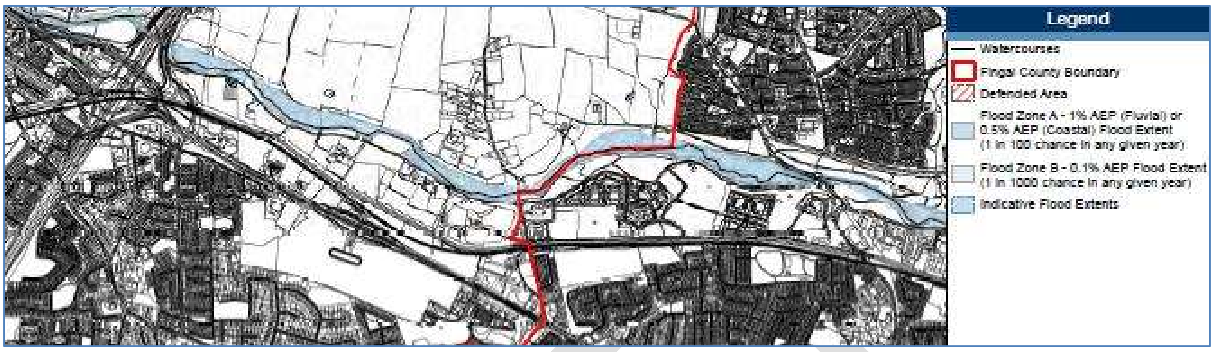
Waste Management Objectives

- *"**Objective WM16:** Ensure the full restoration of the Balleally landfill site and the development of both it and the former Dunsink landfill into amenities for recreation and nature conservation. Undertake this process in co-operation with all relevant stakeholders and in compliance with all legislative and regulatory requirements."*

Flood Risk

The Strategic Flood Risk (SFRA) for the current FDP identified that there was a Flood Zone A along the Tolka. This is illustrated in the following Figure 2.6. The OPW is currently reviewing the flood mapping as it currently does not identify Flood Zones A and B.

Figure 2.6 SFRA Flood Map



Transport Objectives

Chapter 7 of the current FDP outlines the Council's policy in relation to transportation, stating that its policy in relation to transportation is to:

- promote and facilitate movement to, from, and within the County of Fingal, by integrating land use with a high-quality, sustainable transport system that prioritises walking, cycling and public transport;
- provide an appropriate level of safe road infrastructure and traffic management, in particular to support commercial and industrial activity and new development; and
- work with all relevant stakeholders to seek a reduction in greenhouse gas emissions from transport.

Key relevant transportation objectives contained within the current FDP are as follows:

- **Objective MT01**: *"Support National and Regional transport policies as they apply to Fingal. In particular, the Council supports the Government's commitment to the proposed new Metro North and DART expansion included in Building on Recovery: Infrastructure and Capital Investment 2016-2021. The Council also supports the implementation of sustainable transport solutions."*
- **Objective MT02**: *"Support the recommendations of the National Transport Authority's Transport Strategy for the Greater Dublin Area 2016-2035 to facilitate the future sustainable growth of Fingal."*
- **Objective MT03**: *"Implement Smarter Travel – A Sustainable Travel Future policy and work to achieve the Key Goals set out in this policy."*

- **Objective MT04**: *"At locations where higher density development is being provided, encourage the development of car-free neighbourhoods, where non-motorised transport is allowed and motorised vehicles have access only for deliveries but must park outside the neighbourhood, creating a much better quality public realm with green infrastructure, public health, economic and community benefits."*
- **Objective MT05**: *"Integrate land use with transportation by allowing higher density development along higher capacity public transport corridors."*
- **Objective MT13**: *"Promote walking and cycling as efficient, healthy, and environmentally-friendly modes of transport by securing the development of a network of direct, comfortable, convenient and safe cycle routes and footpaths, particularly in urban areas."*
- **Objective MT15**: *"Investigate and avail of the opportunities provided by new Metro North and any other public transport infrastructure to provide new cycle and pedestrian links including crossings of the M50 which currently represents a major barrier to active transport modes."*
- **Objective MT16**: *"Promote the provision of adequate, secure and dry bicycle parking facilities and a bike rental scheme at appropriate locations, including stations and other public transport interchanges."*
- **Objective MT19**: *"Design roads and promote the design of roads, including cycle infrastructure, in line with the Principles of Sustainable Safety in a manner consistent with the National Cycle Manual and the Design Manual for Urban Roads and Streets."*
- **Objective MT22**: *"Improve pedestrian and cycle connectivity to stations and other public transport interchanges."*
- **Objective MT27**: *"Support TII in progressing the design of a Light Rail Corridor that addresses the needs of Fingal, in particular the Blanchardstown area, with a view to securing permission from An Bord Pleanála."*
- **Objective MT28**: *"Facilitate, encourage and promote high quality interchange facilities at public transport nodes throughout the County."*
- **Objective MT30**: *"Support Iarnród Éireann and the NTA in implementing the DART Expansion Programme, including the extension of the DART line to Balbriggan, the design and planning for the expansion of DART services to Maynooth, and the redesign of the DART Underground."*
- **Objective MT31**: *"Promote the provision of platform shelters and the covering of platforms at railway stations where there is currently no cover for commuters, in order to encourage more commuters to use the train to travel to work."*

Road Objectives

Objective MT41 of the current FDP identifies 2 no. road schemes which relate to the DSA lands and their environs:

- Cappagh Road – North Road Link (to the north of the DSA); and
- Cappagh Road – River Road Link (passing through the DSA, parallel to the M50).

Fingal County Development Plan 2023-2029

The review of the current FDP has commenced with the first stage of the statutory process. The Issues Paper has been published, inviting observations until 12 May 2021. The following key themes have been identified:

- Theme 1: People and Places;
- Theme 2: Climate Action;
- Theme 3: Connectivity and Movement;
- Theme 4: Employment, Economy and Dublin Airport;
- Theme 5: Cultural Heritage;
- Theme 6: Green Infrastructure & Natural Heritage; and
- Theme 7: Infrastructure and Utilities.

Dublin City Development Plan 2016-2022

The Dublin City Development Plan 2016-2022 is the statutory plan presently adopted and it solely applies to the administrative area of Dublin City Council. Dublin City Council have established their own policies regarding the development of brownfield sites, and how these sites are to be actively managed in future. The following objectives of relevance to the DSA lands have been identified:

- **Objective SCO3:** *"To develop an active land management strategy for the city, which shall include mapping of brownfield and other lands, such as vacant, under-utilised or large undeveloped sites."*
- **Objective SC29:** *"To discourage dereliction and to promote the appropriate sustainable re-development of vacant and brownfield lands, and to prioritise the re-development of sites."*

While the DSA lands are entirely within the Fingal County Council administrative area, they also adjoin the Dublin City Council administrative area. As such, it is necessary to liaise and coordinate any future development plans for the lands with Dublin City Council, to ensure that planning policies for the site are coherent, and align and that they are not contradictory and disjointed in nature.

Blanchardstown Urban Structure Plan (2007)

The Urban Structure Plan published in 2007 was prepared to discuss the future vision and the expansion of the Blanchardstown area. The Plan discusses development themes, infrastructural improvements and development opportunity areas, and makes specific reference to the opportunities for the development of DSA lands.

The Plan states that *"these lands have a strategic location in close proximity to existing development areas, the planned upgraded Maynooth rail corridor and planned QBC networks. Part of the lands are a major recreation/leisure resource – Elmgreen golfcourse, Dunsink Observatory, the Tolka Valley, the Royal Canal and several distinctive properties listed for preservation. The lands are the subject of a planning special study, which will inform a Development Plan Variation, to bring forward the Dunsink area lands for sustainable mixed use community development."*

The specific mention of *"mixed use community"* suggests potential for the DSA lands to accommodate such a future development type, and it was envisaged that a LAP would be developed specifically to outline future proposals and potential opportunities within the lands.

Blanchardstown Town Centre Development Framework/ Masterplan (2007)

Blanchardstown Town Centre Development Framework/ Masterplan is a non-statutory document published by Fingal County Council in 2007, and it was produced as an accompaniment to the prevailing Development Plan. The stated purpose of the Framework/ Masterplan was to:

- *"to recommend criteria to assess the delivery of an effective balance in the mix of uses in Fingal's urban streets"*; and
- to ensure that *"proposed commercial developments in Blanchardstown Town Centre incorporate an appropriate mix of development, which will be included as an issue within the Master Plan"* as required by Objectives UO4 and UO5 (p33) of the prevailing Development Plan.

The document identifies a number of development opportunity areas, including the DSA lands, about which it states:

> *"These lands have a strategic location in close proximity to existing development areas, the planned upgraded Maynooth rail corridor and planned QBC networks. Part of the lands are a major recreation/leisure resource – Elmgreen golfcourse, Dunsink Observatory, the Tolka Valley, the Royal Canal and several distinctive properties listed for preservation. The lands are the subject of a planning special study, which will inform a Development Plan Variation, to bring forward the Dunsink area lands for sustainable mixed use community development."*

Landfill Aftercare Licenses/ Documents

- **NO. W0127-01 -** This EPA waste licence covers the aftercare of the Dunsink Landfill. The dump was operated up until the 1990 as a land fill with continued receipt of recyclable waste until 2003. The landfill has been capped and infrastructure provided to manage air and ground discharges. A Closure, Restoration and Aftercare Management Plan (CRAMP) was agreed between the EPA and Fingal County Council in 2005.

3. DSA Lands' Characteristics

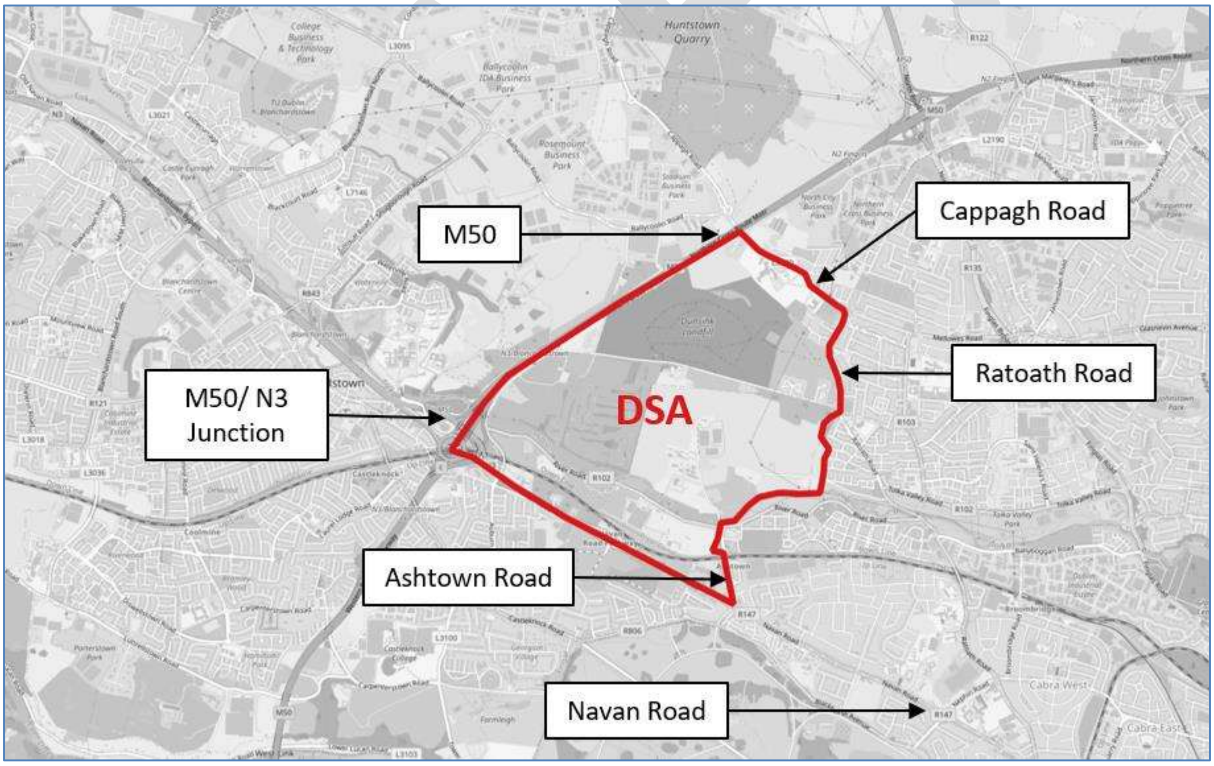
3.1 Introduction

This section of the Report sets out the general DSA lands characteristics, with focus on its locational attributes, topographical features, land uses, and population and employment patterns. In reviewing the lands' characteristics, key landmarks within the DSA lands have also been identified and presented. The wider context of the DSA lands' environs is presented in Section 4, whereas the DSA lands' mobility-related characteristics are covered in Sections 5 and 6.

3.2 Study Area Extent and Location

The DSA covered by this ABTA, also referred to as the Dunsink Study Area (DSA), includes ca. 435.9 hectares of lands located at the southwestern fringe of County Fingal, as shown in Figure 3.1 below. At a strategic level, the DSA lands are located approx. 7 kilometres (straight line distance) from Dublin City Centre (measured from the centre of the lands to O'Connell Bridge).

Figure 3.1 DSA Lands Strategic Location



As can be seen in the preceding figure, the DSA is bounded by the M50 in the northwest, Cappagh Road in the northeast, and the R147 Navan Road to the south. The eastern DSA boundary is formed, from north to south, by Ratoath Road, existing residential development at Scriblestown/ Cardiffsbridge, Tolka River, the R102 River Road, and Ashtown Road.

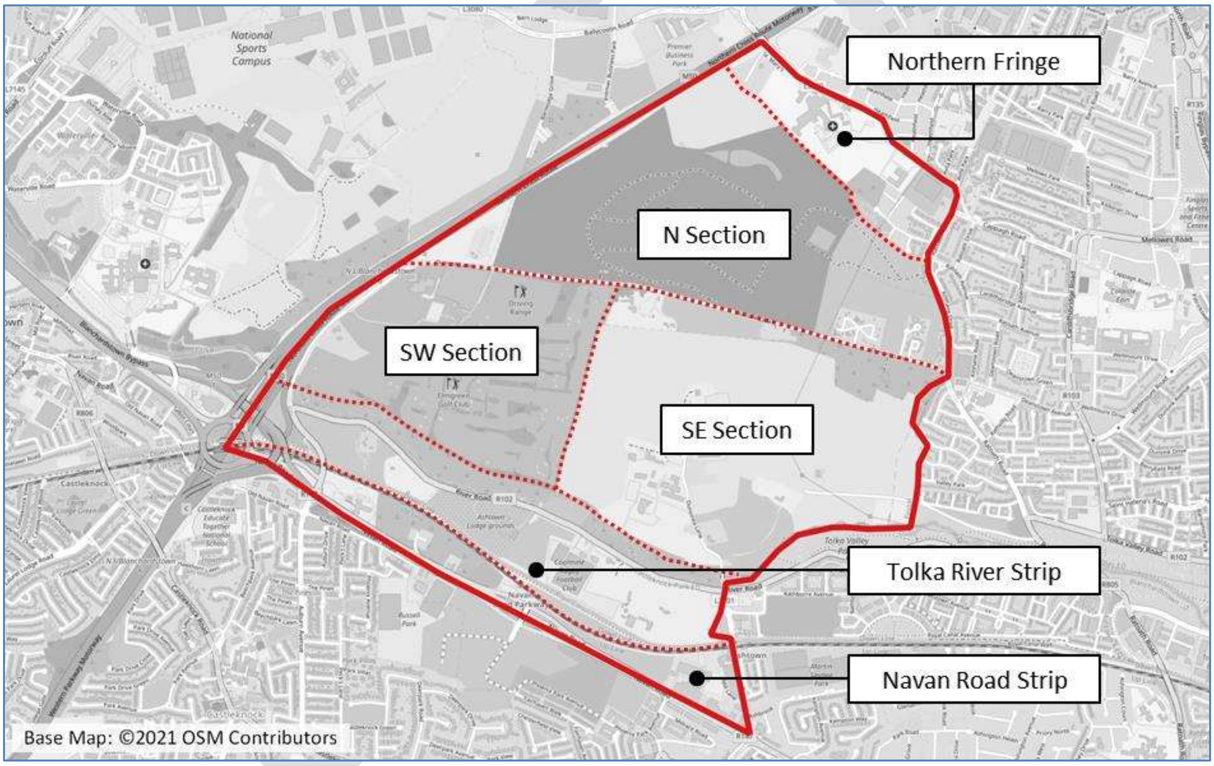
It is noted that a minor strip of the DSA lands located south of the Maynooth Rail Line and the Royal Canal may currently only be accessed from the south from the R147 Navan Road. The remainder of the lands (located north of the Royal Canal) may only be accessed from the northeast, east, and southeast, with the M50 and the Maynooth Line/ Royal Canal currently forming significant permeability barriers (notwithstanding the existing pedestrian underpass under the M50 at the N3/ M50/ R147 Navan Road Interchange in the DSA's south-western corner). Transport infrastructure, services and mobility related characteristics of the DSA lands and their surrounds have been addressed in detail in Sections 5 and 6 of this Report.

3.3 Current Land Uses within Study Area

DSA Lands Sub-Division and Component Land Uses

At the highest level, the DSA may be subdivided into six distinct parts with respect to the current land use, as shown in the following Figure 3.2.

Figure 3.2 DSA Subdivision



As can be seen from the preceding Figure 3.2, the DSA lands have been subdivided as follows based on the existing land uses:

- The **Northern Fringe** of the DSA lands is bounded by Cappagh Road in the northwest, and the Northern Section (described below). Existing development is present along Cappagh Road, including, from west to east, a Travellers' Halting Site, the National Orthopaedic Hospital, New Cross College, and low-density residential development on Dunsoghly Drive.
- The **Northern Section** of the DSA lands is bounded by the Northern Fringe to the north, Ratoath Road in the East and Dunsink Lane in the south. The majority of these lands is taken up by the

former Dunsink Landfill, which is now in its aftercare phase. As such, these lands remain undeveloped, pending conclusion of the aftercare process. Existing development is present in the lands' south-eastern corner (including St. Joseph's Halting Site and residential units at St. Mary's Park). In addition, the lands' southwestern corner is occupied by Abbotstown AGI (gas-related installation), with the Dunsink Horse Club site also located nearby.

- The **South-Eastern Section** of the DSA lands is bounded by Dunsink Lane in the north, the Elmgreen Golf Club's course to the west, Tolka River to the south and southeast, and the existing residential development at Scriblestown/ Cardiffsbridge to the east. The majority of these lands is undeveloped, with existing development including the Dunsink Observatory in the north-western corner, Phoenix Football Club's pitches in the centre, and industrial/ research-related facilities in the southern part (including the Teagasc Ashtown Food Research Centre).
- The **South-Western Section** of the DSA lands is bounded by Dunsink Lane in the north, the M50 in the west, and Tolka River in the south, with the eastern boundary of these lands formed by the eastern boundary of the Elmgreen Golf Club's course. The majority of these lands is taken up by the golf course, with the north-western corner occupied by the Elm Green Nursing Home.
- The **Tolka River Strip** within the DSA lands is bounded by Tolka River in the north, the M50 in the west, the Royal Canal and the Maynooth Rail Line in the south, and Ashtown Road in the east. These lands form a narrow strip (ca. 200 metres between the Tolka River and the Royal Canal), with existing development including (from west to east) several residential properties, the Coolmine Rugby Club and Ger Conroy Fitness Castleknock, and the Ashtown Dog Pound – all accessed from the north via River Road.
- The **Navan Road Strip** within the DSA lands is bounded by the Royal Canal and the Maynooth Rail Line in the north, the M50 in the west, the R147 Navan Road in the south, and Ashtown Road in the west. These lands form a narrow strip (ca. 150 metres between the Royal Canal and the R147 Navan Road), with existing development including (from west to east) the Travelodge Dublin Phoenix Park Hotel, several residential properties on Morgan Place, a filling station, the Navan Road Parkway railway station, and several commercial/ retail properties, all accessed either from the south via the R147 Navan Road or from the east via Ashtown Road. The south-eastern corner of these lands is taken up by the Revenue Commissioners (Fingal District) building.

As detailed above, the DSA lands in their entirety are largely undeveloped, with the exception of their northern, eastern, and southern fringes. The Elmgreen Golf Club's course is noted to take up a significant proportion of the DSA lands' western part, with isolated pockets of development noted in the lands' interior. The key landmarks within the DSA lands are presented for reference within Figure 3.3, with the legend for the numbered items included in the subsequent Table 3.1 (both overleaf).

Figure 3.3 Identified Key DSA Landmarks

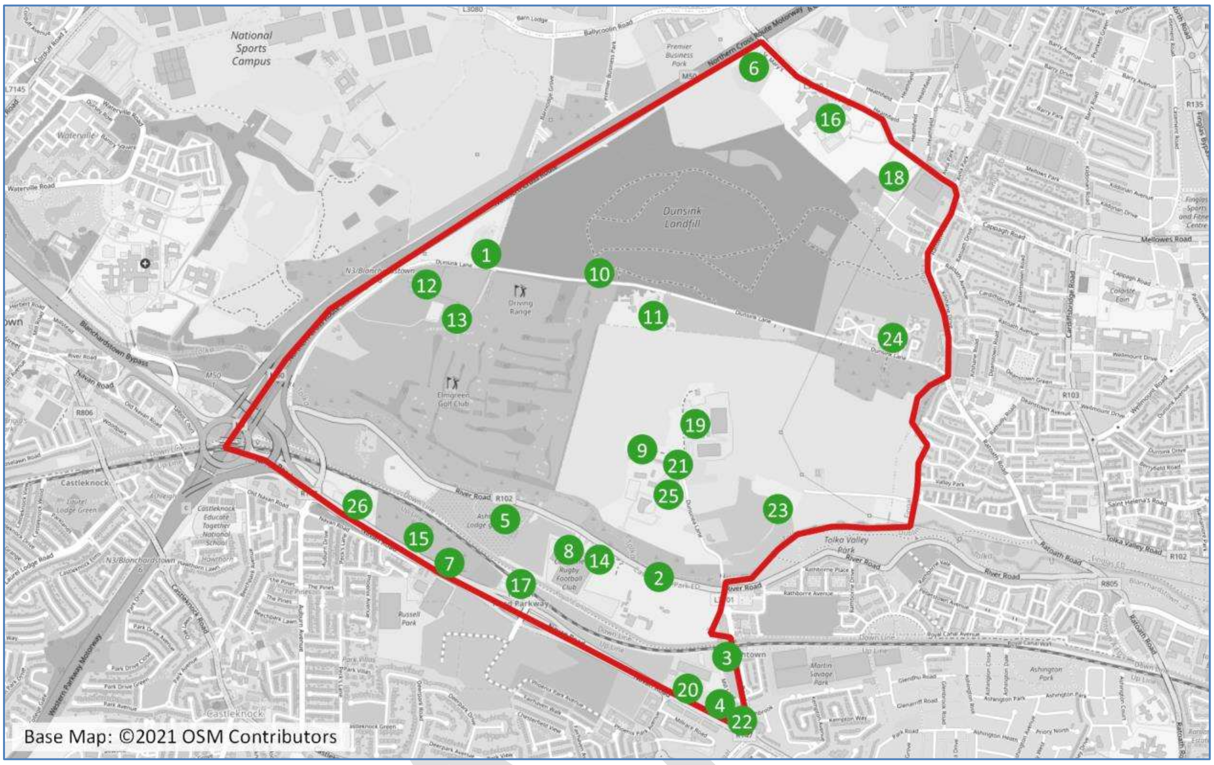


Table 3.1 Landmarks within DSA

ID	Name	ID	Name
1	Abbotstown AGI Natural Gas Station	**14**	Ger Conroy Fitness Castleknock
2	Ashtown Dog Pound	**15**	Morgan Place Residential Area
3	Ashtown Equestrian Centre	**16**	National Orthopaedic Hospital Cappagh
4	Ashtown Gate	**17**	Navan Road Parkway Railway Station
5	Ashtown House	**18**	New Cross College
6	Cappagh Rd Travellers' Halting Site	**19**	Phoenix Football Club
7	Circle K Brady's	**20**	Phoenix Industrial Estate
8	Coolmine Rugby Club	**21**	Rathbourne Motors
9	David Quigley Car Sales	**22**	Revenue Commissioners
10	Dunsink Horse Club	**23**	Scribblestown Airsoft
11	Dunsink Observatory	**24**	St. Joseph's Travellers' Halting Site
12	Elm Green Nursing Home	**25**	Teagasc Ashtown Food Research Centre
13	Elmgreen Golf Club	**26**	Travelodge Dublin Phoenix Park Hotel

DSA Lands – GeoDirectory Data Analysis

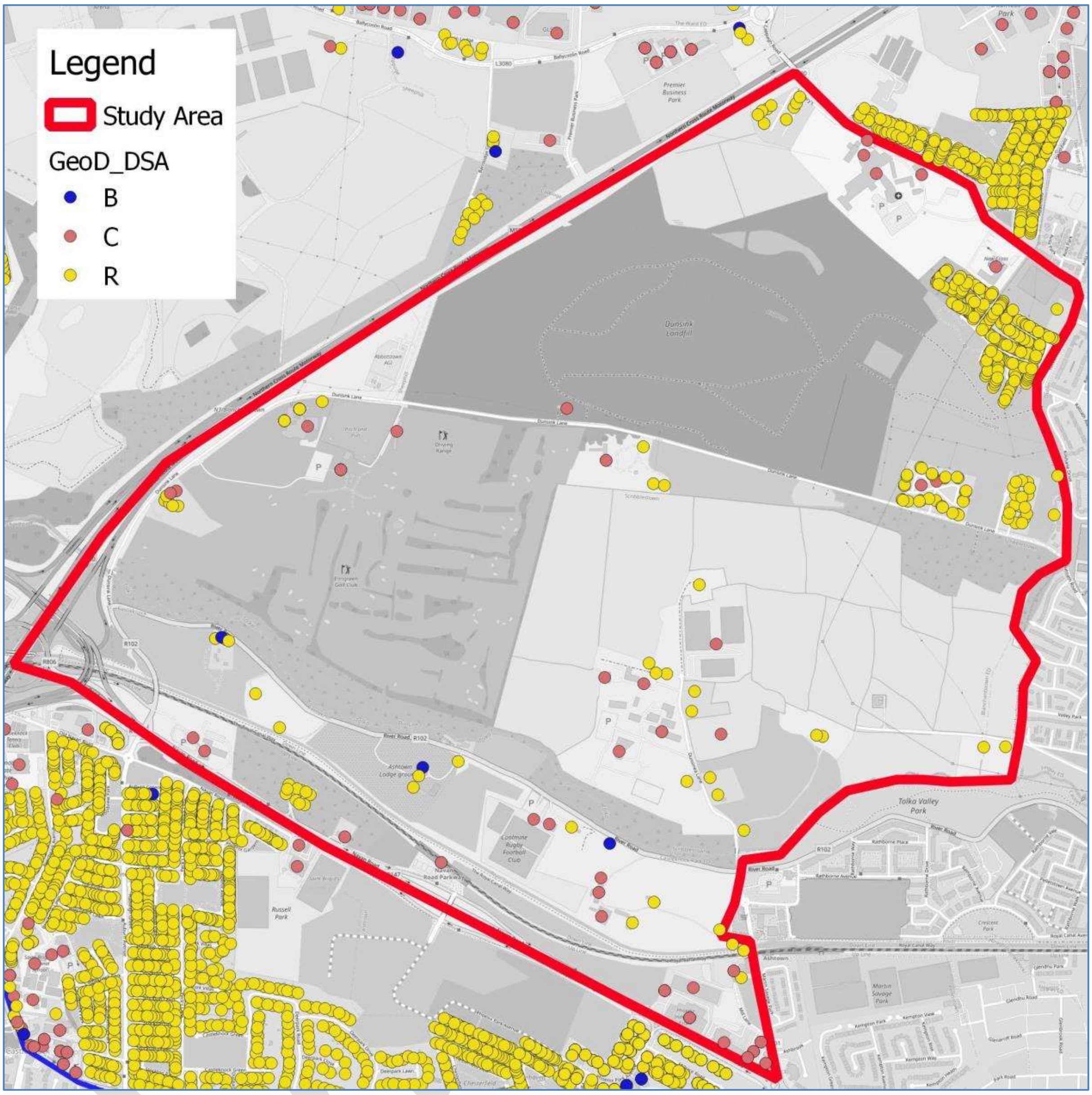
GeoDirectory data provides information on the use of building uses, and is therefore a very convenient and effective way to determine the predominant land uses within the DSA lands. The building uses are divided into four main uses, namely:

- Residential (R);
- Commercial (C);
- Both (B); and
- Unknown (U).

The residential areas include all premises where people reside on a long-term basis, and hence marked as Residential, whereas Commercial represents uses other than residential. Some premises are marked as 'Both', being mixed-use buildings, and 'Unknown' where no use is clearly established.

The DSA has 356 no. premises marked as Residential that are mainly concentrated towards the northeast of the lands and comprise the Dunsoghly housing estate along with travellers' accommodations. There are 66 no. premises marked as Commercial, most notably within the Ashtown Industrial area, Ashtown Food Research Centre, Coolmine Rugby club, Travelodge Dublin Phoenix Park, Elmgreen Golf Club and National Orthopaedic Hospital. The DSA also has 4 no. premises marked as Both along the R102 Ratoath Road – Ashtown House, Ashbrook Lodge and River Road Cottages. These are presented in Figure 3.4 (overleaf).

Figure 3.4 GeoDirectory Data Points within DSA

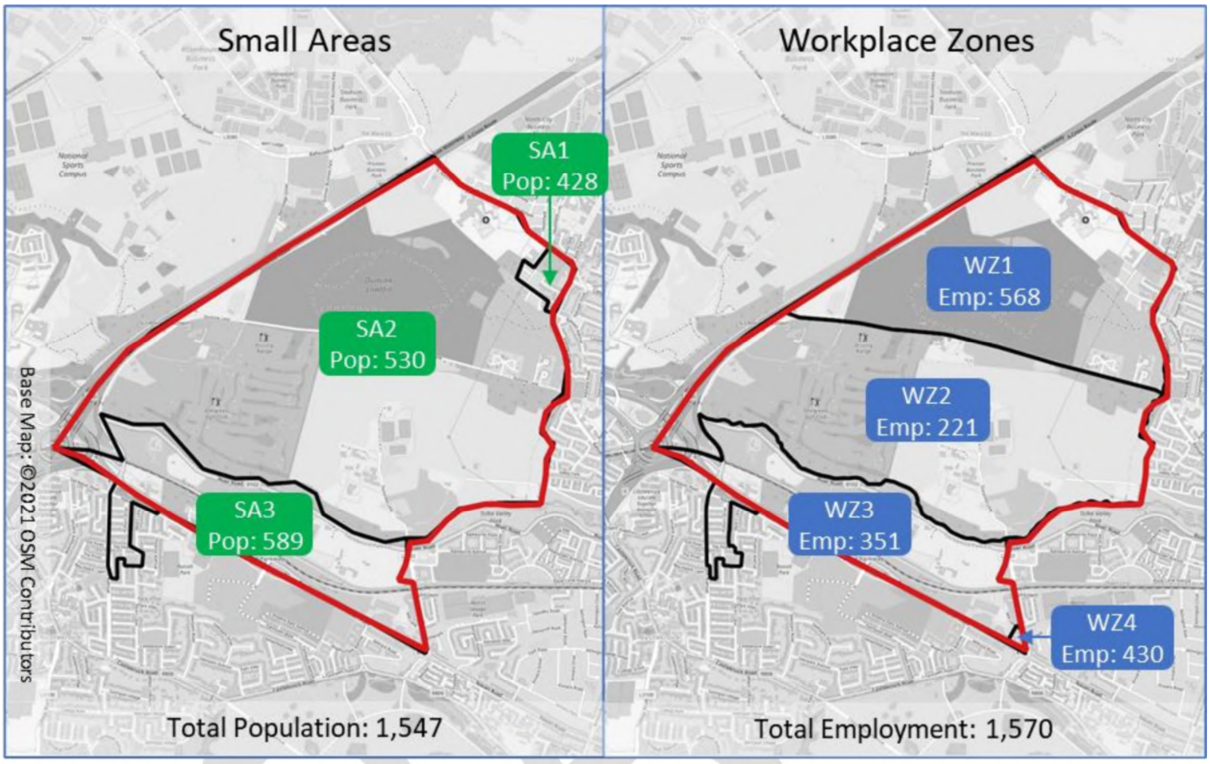


3.4 Study Area Population and Employment Characteristics

As noted in the preceding sub-section, development within the DSA lands is at present limited. As a result, its resident population is low, with its demographic and socioeconomic structure likely to change significantly should large-scale development of the area be pursued. Nevertheless, a baseline review of the DSA lands' population and employment characteristics has been undertaken, based on the available Central Statistics Office (CSO) Census 2016 datasets, namely the Small Area Population Statistics (SAPS) dataset and the Workplace Zones dataset (for employment).

As shown in Figure 3.5 (overleaf), the DSA includes three Census Small Areas (CSAs) as per boundaries defined in the Census 2016 along with four workplace zones. It is noted that in either case, the statistical subdivisions do not fully align with the DSA lands' extent, with Small Area No. 3 (SA3) and Workplace Zone No. 3 (WZ3) both partially located outside of the DSA boundary – this may result in the population and employment figures for the associated parts of the DSA lands being somewhat overestimated. Key demographic and employment characteristics identified by analysis of the relevant Census records are presented in the following Figure 3.5.

Figure 3.5 Population and Employment within DSA



As shown in the preceding figure, population and employment levels within the DSA lands are roughly equal, with a total of 1,547 residents and 1,570 daytime workers recorded by the Census. A relatively densely populated area in the north-eastern corner of the DSA lands (i.e. the SA1) can be seen, which covers the pocket of terraced housing in the Dunsoghly Avenue area. The southern part of the DSA lands (i.e. SA3) includes isolated residential dwellings along the R102 River Road, in addition to a pocket of 10 no. detached houses at Morgan Place – however, it is understood that the majority of the population within the SA3 may reside outside of the DSA lands, in the terraced housing area along Auburn Avenue (as caveated above). The population within SA2 is understood to mainly comprise the residents of the 2 no. traveller accommodation sites, in addition to the residents of the Elm Green Nursing home and the patients of the National Orthopaedic Hospital on the Census night.

Approximately 30% of DSA employees have been recorded in the south-eastern tip of the DSA lands (WZ4), which includes the Revenue Commissioners offices. Furthermore, it is understood that the majority of employees within the northern part of the DSA lands (WZ1) are mostly employees of the National Orthopaedic Hospital and the adjacent New Cross college – both located along the northern site boundary, adjacent to Cappagh Road. The remaining DSA lands employees are understood to be distributed across its central and southern parts.

3.5 Topography and Physical Characteristics

Key topographical and physical characteristics within each of the defined DSA parts illustrated in Figure 3.2 can be summarised as follows:

- The **Northern Fringe** lies to the extreme north of the overall study area. This section of the DSA is primarily flat in its topography. This area is bounded by trees and hedgerows along the northern boundary with the Cappagh Hospital. The levels of this section are between ca. 50 – 70 metres Above Ordnance Datum (AOD). It generally has urban, or edge of urban characteristics.
- The **Northern Section** comprises of the lands formally used as the landfill. The former landfill has been capped and now comprises of grasslands. The topography of section is formed by its previous use of as a landfill, and thus the level increases from the east at ca. 50 metres AOD to a height of ca. 90 metres AOD in the western section. The sides of the historic landfill are noted to be relatively steep. There are also two lagoons to the north of the old landfill and two halting sites on relatively flat ground on the eastern portion. The current landscape character is informed by its legacy as a former landfill.
- The **South-Eastern Section** is formed of undulating landscape, divided several pastural and agricultural fields. The boundary of these fields comprises of trees and dense hedgerows. The lands slope downwards from north to south from a level of ca. 80 metres AOD to ca. 40 metres AOD towards the Tolka River.
- The **South-Western Section** is formed from lands in use by Elmgreen Golf Course. The landscape here is laid out in typical rolling, parkland expected with a golf course. The external perimeter of the golf course is bound by mature trees and dense hedgerows. The elevation of the golf club lies between ca. 40 metres AOD and ca. 70 metres AOD, rising in the northern direction.
- The **Tolka River Strip** runs along the valley of the river. This section of the DSA is quite narrow, and steep, following the natural contours and the flow of the river. The landscape is riparian in nature with the river valley gently sloping to the north and a steeper incline to the south up to the railway and canal. The elevation of the landscape here is ca. 30 metres AOD along its entire length.
- The **Navan Road Strip** comprises a narrow strip to the extreme south of the DSA. This part of the lands is quite challenging as it is constrained by the surrounding physical infrastructure. From the southernmost part of the DSA is bound by the main N3 /Navan Road. Parallel to this road, is the Maynooth Rail Line including the train station at Navan Road Parkway. Immediately adjacent to the railway is the Royal Canal, which meanders through the southern portion of the DSA. The topography of this area is flat and similarly has an elevation of ca. 30 metres AOD. It has an urban and infrastructure characterisation.

The combined landscape characteristics of the South-Western Section, South-Eastern Section and the Tolka River Strip, have been classified as a *"highly sensitive landscape"* in the current FDP owing to their elevation and rolling semi-rural landscape form. Dunsink Observatory is on an elevated part of the DSA with a view over the surrounding landscape. The Observatory is identified on the National Inventory of Architectural Heritage (NIAH) and is a protected structure. The NIAH notes its parkland setting.

4. DSA Immediate Catchment and Wider Area Characteristics

4.1 Introduction

This section of the Report sets out the context within which the DSA lands are located, describing key demographic, employment and facilities within its immediate surrounds (Section 4.2) and wider area (Section 4.3).

For the purposes of this Report, the analysis has been undertaken within DSA's immediate surroundings with a more detailed approach including identification of local landmarks and amenities. It is followed by the analysis at wider GDA level with a buffer of up to 20 kilometres. It is noted that spatial proximity by itself may not paint the full picture of DSA's relationships with other lands in vicinity, with the available or missing infrastructure and transport links making some areas more accessible and better connected with the DSA than others. This has been examined within Section 5 of this Report.

4.2 DSA Immediate Catchment Area

Overview

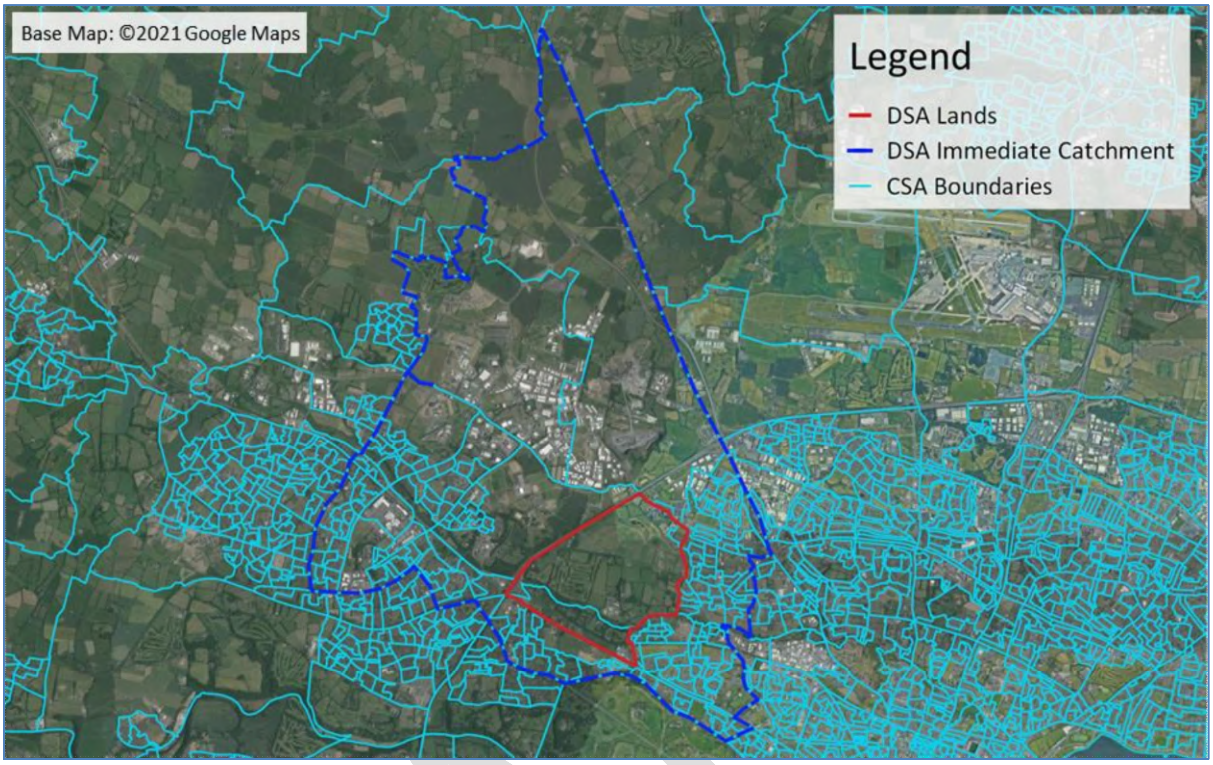
This sub-section of the Report presents an overview of the DSA's local environs. As the DSA forms a relatively undeveloped pocket within the urbanised area of Dublin, considering its location with respect its surrounds has been deemed essential to establish opportunities for its future development and inform the selection of the most appropriate future land use mix.

Catchment Area Definition and Rationale

The immediate surrounding and catchment of the DSA has been arrived at on the basis of adjacent CSO defined Electoral Divisions (ED) and Census Small Area (CSA) boundaries. The defined boundary is directly related to the population, employment and other socioeconomic characteristics from Census 2016 and other datasets such as POWSCAR. The DSA lands are part of a larger ED and therefore CSAs have been used to define the surrounding area boundary where the ED was either too large or overlapping with the DSA. The boundaries of the DSA lands and DSA Immediate Catchment are illustrated in Figure 4.1 (overleaf).

Key employment centres, recreational and social facilities such as schools, hospitals and medical centres have been identified within the defined immediate catchment area boundary, detailed within this sub-section of the Report.

Figure 4.1 DSA and Immediate Catchment Boundaries

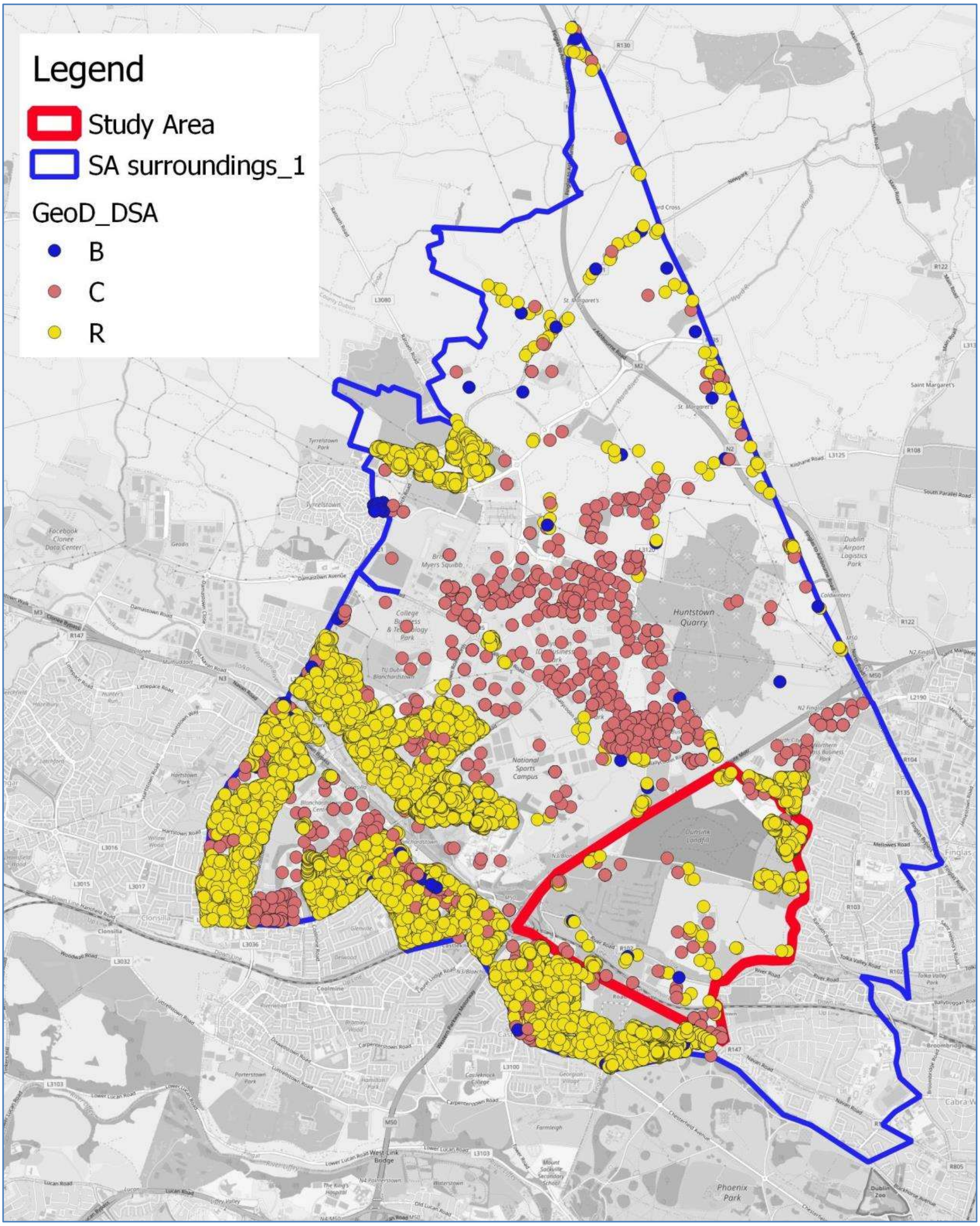


DSA Immediate Catchment – GeoDirectory Data Analysis

GeoDirectory data for the DSA Immediate Catchment (excluding the DSA lands and areas within Dublin City County Council's jurisdiction), suggest ca. 12,200 no. Residential premises which are mostly concentrated in predominantly low density settlements within Castleknock and Blanchardstown to the south and west of the DSA lands.

There are ca. 2,215 no. Commercial entities within the DSA Immediate Catchment, offer ample employment opportunities. These are mainly concentrated in Blanchardstown Town Centre in the southwest and industrial estates to the northwest of the DSA lands including Coolmine Industrial Estate, Rosemount and Northwest Business Parks and North Park Industrial Estate. An additional ca. 345 no. premises in the DSA Immediate Catchment are marked as Both and are scattered throughout this area as illustrated in Figure 4.2 (overleaf).

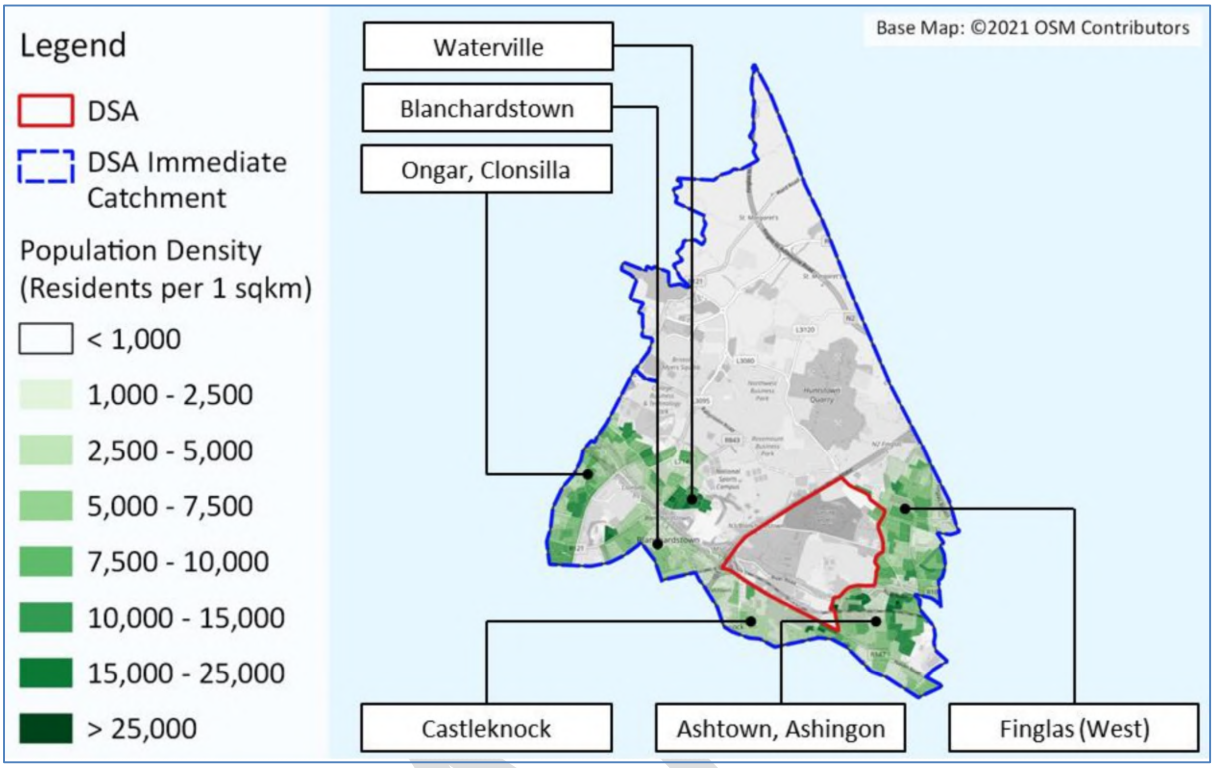
Figure 4.2 GeoDirectory Data Points within DSA Immediate Catchment



DSA Immediate Catchment – Population Patterns

Figure 4.3 (overleaf) presents population distribution patterns (as ascertained from CSO Census 2016 Small Area data) within the DSA Immediate Catchment, reinforcing the findings of the GeoDirectory data analysis, whereby the majority of residential development was found to be located to the south and west of the DSA lands.

Figure 4.3 DSA Immediate Catchment – Population Distribution Patterns

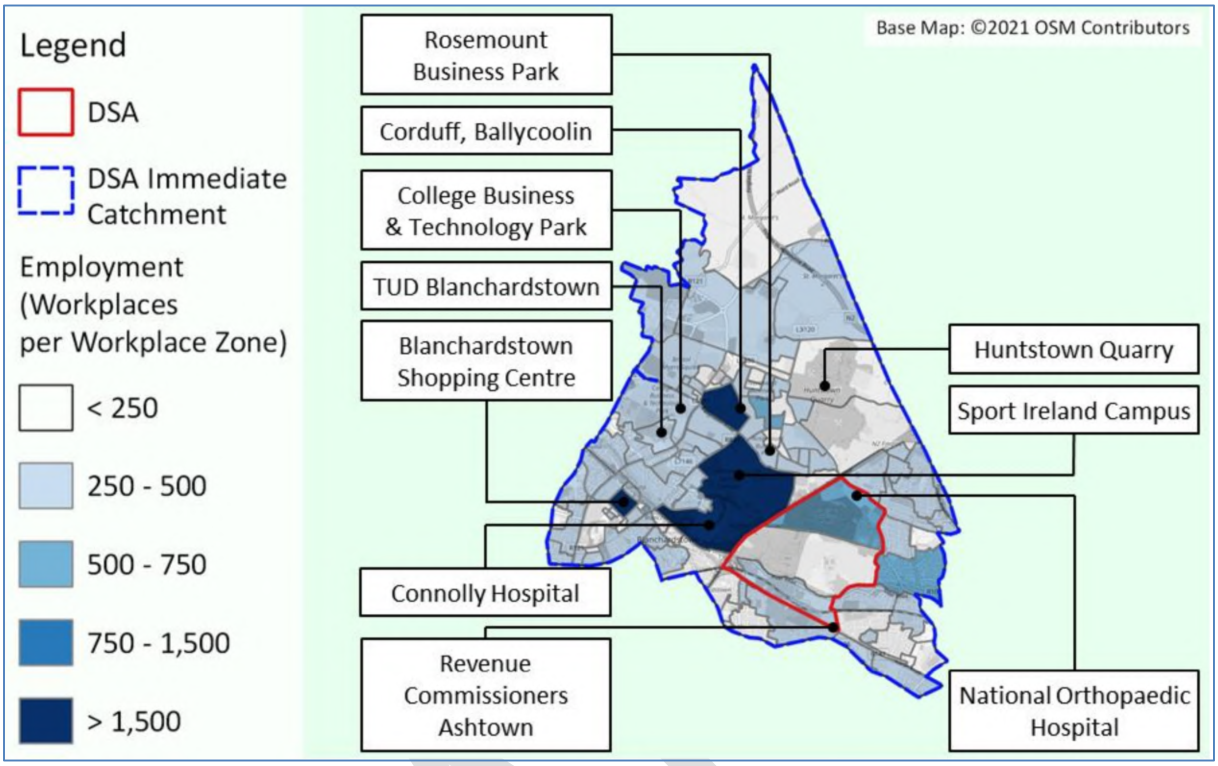


DSA Immediate Catchment – Employment Patterns

Figure 4.4 (overleaf) presents employment distribution patterns (as ascertained from CSO Census 2016 Workplace Zones data) within the DSA Immediate Catchment, reinforcing the findings of the GeoDirectory data analysis, whereby the majority of commercial development was found to be located in Blanchardstown Town Centre and industrial estates to the northwest of the DSA lands. The Sport Ireland Campus, located adjacent to the DSA lands but across the M50, also features as a notable employment centre.

Note – whereas residential distribution patterns are presented as population density (due to the more granular data available at a Small Area level, employment distribution is presented in numerical (actual no. of workplaces) due to the less granular data available at a Workplace Zone level.

Figure 4.4 DSA Immediate Catchment – Employment Distribution Patterns



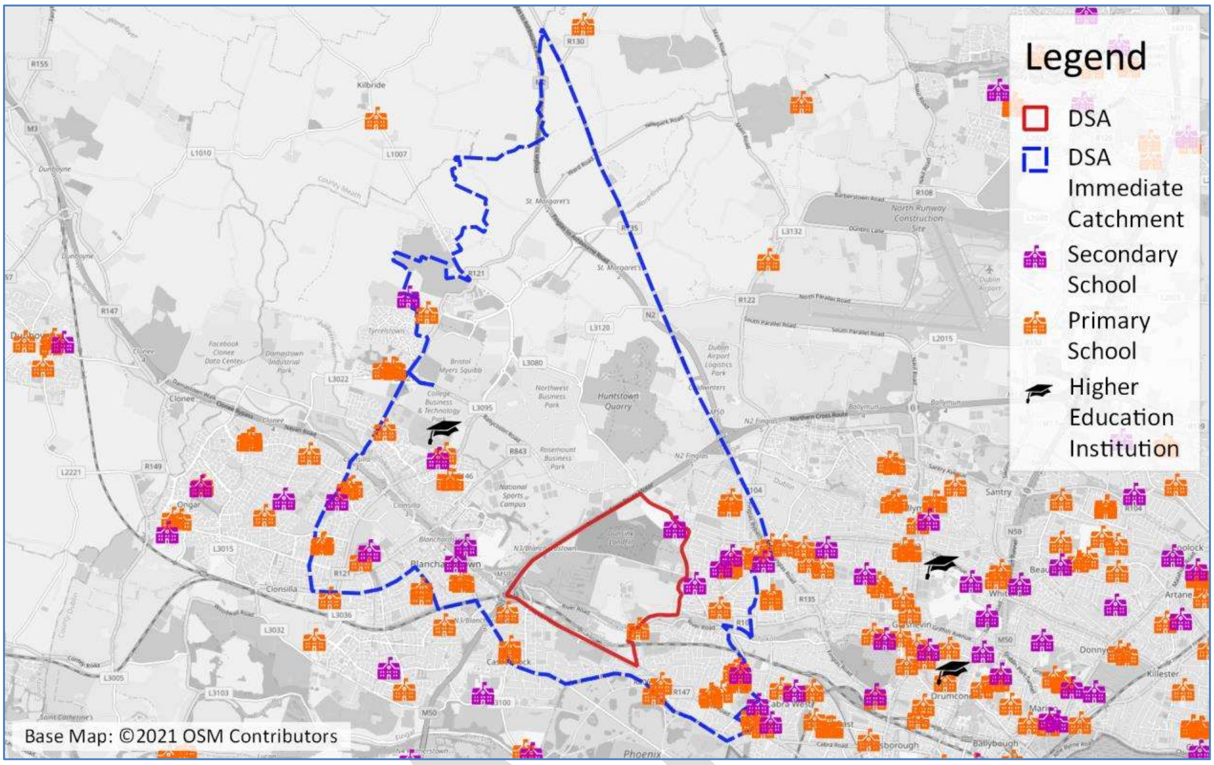
DSA Immediate Catchment – Key Facilities

Education

Figure 4.5 (overleaf) illustrates key schools and higher education institutes (HEIs) within the DSA Immediate Catchment. As can be seen from this figure, there are 31 no. primary schools and 11 no. secondary schools within the DSA Immediate Catchment. The majority of these educational institutions are located in the west, southwest, south and southeast of the catchment where populations are at their highest, with the more rural and industrial areas within the immediate catchment having fewer educational institutions. Only 1 no. of these schools, namely New Ross College secondary school is located within the DSA lands.

In relation to higher education institutions, the Technological University (TU) Dublin Blanchardstown Campus is noted to be located within the DSA Immediate Catchment, to the northwest of the DSA lands.

Figure 4.5 Schools and HEIs within DSA Immediate Catchment

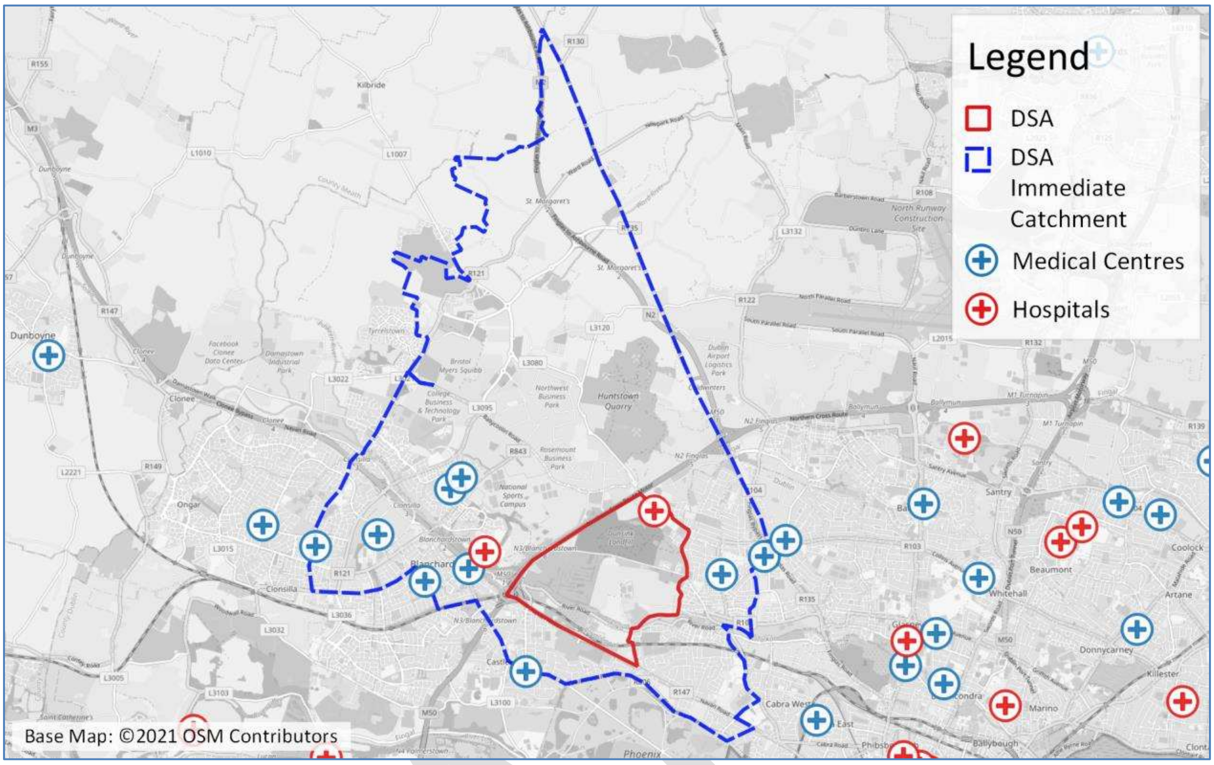


Hospitals and Medical Centres

Figure 4.6 (overleaf) illustrates hospitals and medical centres in the DSA Immediate Catchment. As can be seen from this figure, there are 7 no. medical centres and 2 no. hospitals located within the DSA and its surrounds. The majority of these facilities are located within more densely populated areas within the DSA immediate catchment, particularly in the Blanchardstown area.

Notably, Connolly Hospital Blanchardstown, the main healthcare facility is located to the west of the DSA lands and to the northwest of the M50/N3 junction. 1 no. healthcare facility, namely the National Orthopaedic Hospital Cappagh, is located within the DSA lands adjacent to the northern boundary.

Figure 4.6 Hospitals and Medical Centres within DSA Immediate Catchment



DSA Immediate Catchment – Major Landmarks and Employment Zones

Sport Ireland Campus

The Sport Ireland Campus is located at Snugborough Road, Blanchardstown, Dublin 15, occupying lands on the opposite side of the M50 relative to the Dunsink Study Area. At a strategic level, the Campus is located ca. 13 kilometres to the northwest of Dublin City Centre, with the overall site extending from the M50 to the southeast, to Snugborough Road (R843) to the northwest, and from Connolly Hospital to the southwest to Ballycoolin Road to the northeast.

The Campus covers an area of ca. 200 ha. and includes high profile indoor and outdoor facilities which host local, national and international events, also accommodating team and individual training. The existing sporting facilities include, among others, the National Indoor Arena and the National Aquatic Centre, the latter of which attracts ca. 1.2 million visitors per year (most recently in 2019). The Campus also provides amenities for the local community, including facility rentals, kids camps, sports academies, birthday parties, team-building events, corporate conferences etc. The importance of the Campus is recognised within the National Sports Policy 2018-2027, which has deemed its continued development as integral to the future development of sport in Ireland.

Within the lifetime of the emerging new Masterplan for the Campus, it is envisaged that the Campus will accommodate a new village centre, sports facilities (including stadia, a velodrome, and an ice rink), office and athletes' accommodation. The envisaged development of the Campus will further increase its profile as a venue for professional sporting activities, a place of employment, and an active leisure amenity. Given the spatial proximity of the Campus to the DSA, consideration of potential new linkages between the two and their benefits is deemed an essential component of the Dunsink ABTA, particularly in light of severance created by the M50 motorway which adjoins the DSA lands' north-western boundary.

Dublin Enterprise Zone (DEZ)

The Dublin Enterprise Zone (DEZ) covers the primarily industrial lands at Rosemount, Ballycoolin, and Damastown, comprising approximately twenty business parks, in addition to the TU Dublin Blanchardstown (TUDB) Campus. The Zone is noted to employ ca. 20,000 people, while further development of this area, mostly zoned as High Technology (HT), has been addressed within the current FDP.

Blanchardstown Town Centre

Blanchardstown is recognised within the current FDP as *"the largest settlement centre in Fingal"*, which is *"strategically located at the intersection of the N3 and M50 national roads"*. Furthermore, it is noted in the current FDP to be designated *"as a Level 2 Major Town Centre in the Retail Strategy for the Greater Dublin Area"* and to represent *"one of the largest and most important retail centres in the State."*

4.3 DSA Wider Area Catchment

Overview

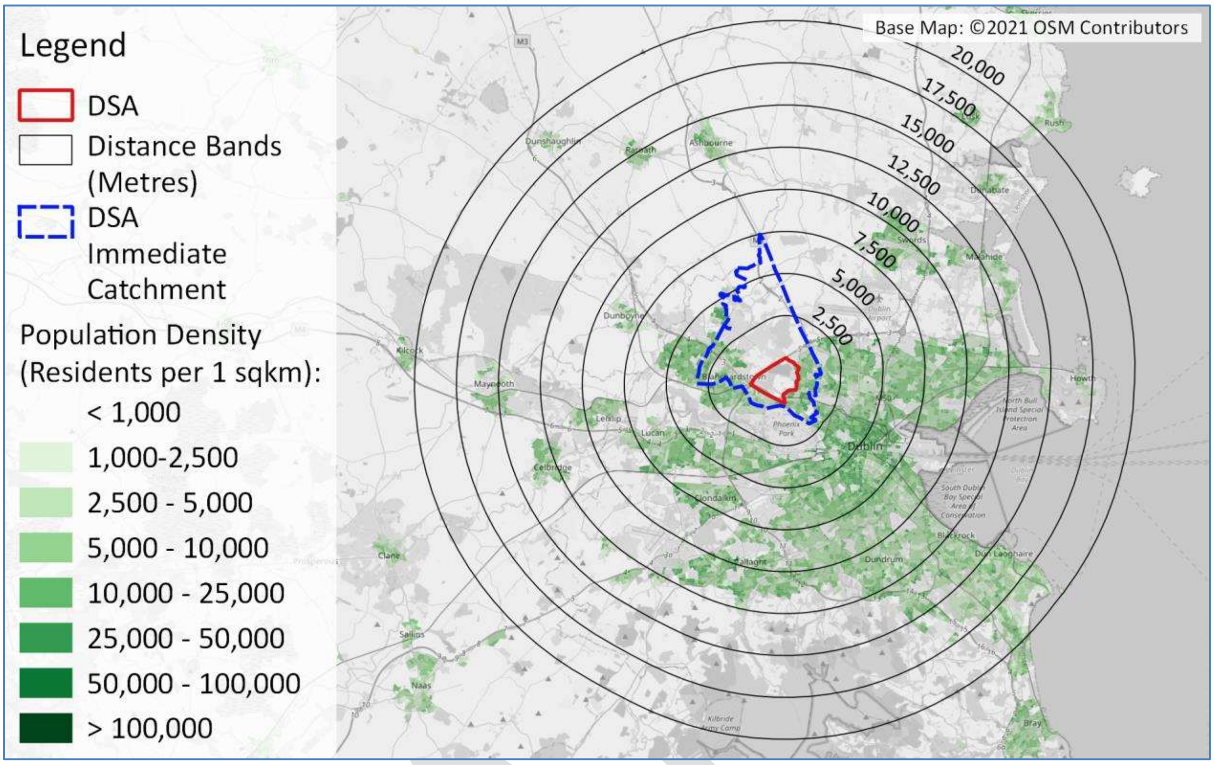
Due to the DSA's large size and the associated large-scale development potential, which may both attract and generate a significant travel demand dependent on target land uses, its catchment has been deemed to extend over the entire GDA and beyond.

A spatial analysis has been undertaken for the wider area (up to 20 kilometres from the DSA) to identify key residential areas and their populations, and key employment areas and the associated number of workplaces within increasing distance bands from the DSA lands, with the outputs of this analysis presented hereunder.

Residential Settlements

Figure 4.7 (overleaf) presents the DSA in the context of a population density map, developed based on the CSO Census 2016 outputs at the Small Area level. For ease of reference, distance bands have also been overlaid onto the map at 2.5-kilometre intervals.

Figure 4.7 DSA Wider Catchment Population Density



As illustrated in the preceding Figure 4.7, DSA's local environs (within the 2.5-kilometre distance) band have a relatively low population, which is primarily due to the fact that the areas to the north and south of the lands are non-residential, including the Sport Ireland Campus and industrial lands to the north and Phoenix Park to the south. Nevertheless, the residential areas to the east (Finglas, West Cabra) and southwest/ west (Castleknock, Blanchardstown) currently house a population of ca. 100,000. A significantly larger population resides in the somewhat wider distance bands, with the most densely populated areas of Dublin City Centre located within the 5-kilometre and 7.5-kilometre bands, together with other prominent residential districts. As can be seen in the figure, the majority of urban Dublin is within the 12.5-kilometre distance band extending to Dublin Mountains in the south, Ashbourne in the north, and Celbridge in the west, with only parts of Dún Laoghaire-Rathdown located further afield.

The following Table 4.1 sets out the current population recorded on the Census night within each distance band from the DSA, with the key residential areas within each band also listed.

Table 4.1 DSA Wider Catchment Population and Residential Areas

Distance Band	Population		Residential Areas
	Single Band	Cumulative	
2.5 km	100,000	100,000	Castleknock, Blanchardstown, Finglas, West Cabra

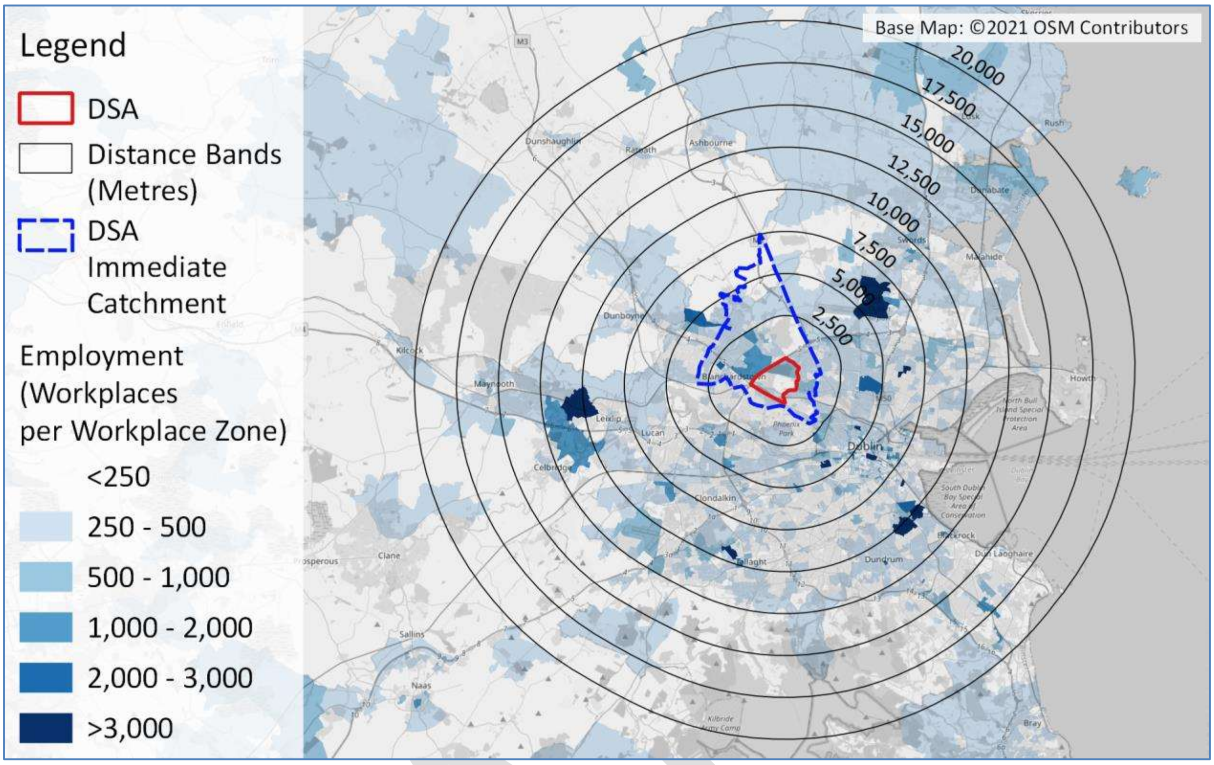
Distance Band	Population		Residential Areas
	Single Band	Cumulative	
5.0 km	250,000	350,000	Chapelizod, Ballyfermot, Clonsilla, Tyrrelstown, Ballymun, Phibsborough, Kilmainham
7.5 km	300,000	650,000	Clondalkin, Lucan, Ongar, Beaumont, Marino, The Docklands, Portobello, Crumlin
10.0 km	250,000	900,000	Tallaght, Leixlip, Adamstown, Dunboyne, South Swords, Coolock, Clontarf, Ballsbridge, Templeogue
12.5 km	220,000	1,120,000	North Swords, Clongriffin, Dundrum
15.0 km	130,000	1,250,000	Rathcoole, Newcastle, Celbridge, East Maynooth East, Ashbourne, Malahide, Blackrock, Leopardstown
17.5 km	90,000	1,340,000	Maynooth West, Ratoath, Donabate, Howth, Dún Laoghaire, Deansgrange, Stepaside
20.0 km	50,000	1,390,000	Dunshaughlin, Lusk, Dalkey, Ballybrack, Glencullen

Employment Centres

Figure 4.8 (overleaf) presents the DSA in the context of the employment map, developed based on the CSO Census 2016 Workplace Zones dataset. Distance bands have also been overlaid onto the map at 2.5-kilometre intervals. As illustrated in this figure, the nearest prominent employment area within DSA's vicinity covers the lands to the northwest, including the Dublin Enterprise Zone (DEZ; stretching across Rosemount, Corduff, and Damastown), the Connolly Hospital, TU Dublin Blanchardstown Campus, and the Sport Ireland Campus. These lands, located within the 2.5- and 5-kilometre distance bands from the DSA, currently include ca. 20,000 workplaces, with the DEZ alone understood to include development lands to enable doubling this figure. However, the lands to the northwest of the DSA are noted to currently be severed from it by the M50, which forms a permeability barrier and results in circuitous routes only being available via Cappagh Road or the N3.

Further afield, Dublin Airport, which is home to ca. 10,000 daytime workers, is located within 7.5 kilometres from the DSA, with the City Centre including the Northern and Southern Docklands, Dublin 2, and Parnell/ O'Connell Streets' Area located in the same distance band. Other prominent employment areas such as Leopardstown, Tallaght, and Leixlip are ca. 10 kilometres away from the DSA.

Figure 4.8 Study Area in the Context of Greater Dublin Employment Distribution



The following Table 4.2 sets out the current number of daytime workers within each distance band from the DSA, which is deemed to accurately reflect the employment patterns, with the key employment areas within each band also listed.

Table 4.2 DSA Wider Catchment Employment and Employment Areas

Distance Band	Workplaces		Employment Areas/ Clusters
	Single Band	Cumulative	
2.5 km	44,000	44,000	Blanchardstown Shopping Centre, Connolly Hospital, Sport Ireland Campus, Rosemount Business Park, Ballycoolin Business Park, North City Business Park, Northern Cross Business Park, Charlestown, Dublin Industrial Estate, Ordnance Survey Ireland
5.0 km	116,000	160,000	St. Joseph's Hospital, TU Dublin Blanchardstown Campus, College Business & Technology Park, Damastown, Northwest Business Park, Dublin Airport Logistics Park, Ikea, DCU Glasnevin Campus, Mater Hospital, An Garda Síochána HQ, TU Dublin City Campus (Grangegorman), Diageo, St. James's Hospital, Heuston Station Environs, CIÉ Inchicore Works, Cherry Orchard Hospital, Cherry Orchard Industrial Estate, Cloverhill Prison, Liffey Valley Shopping Centre

Distance Band	Workplaces		Employment Areas/ Clusters
	Single Band	Cumulative	
7.5 km	270,000	430,000	Clonee (IBM, Geodis), Dublin Airport, Clonshaugh Business and Technology Park, Beaumont Hospital, The Docklands, Dublin City Centre, Crumlin Hospital, Walkinstown, Park West
10.0 km	100,000	530,000	Swords Pavilions Shopping Centre, Airside Retail/ Business Park, Dublin Port, Ballsbridge, RTÉ, The Square Shopping Centre, TU Dublin Tallaght Campus, Tallaght University Hospital, The Grange (Pfizer, Microsoft)
12.5 km	80,000	610,000	Swords Town Centre, Swords Business Park, Baldiyle Industrial Estate, Kilbarrack Industrial Estate, Elmpark Green Campus, UCD Belfield Campus, Dundrum, Citywest Business Campus, Liffey Business Park, Leixlip (Intel)
15.0 km	60,000	670,000	Sandyford, Leopardstown
17.5 km	30,000	700,000	National Forensic Mental Health Hospital Donabate, Dún Laoghaire Town Centre, Maynooth University
20.0 km	40,000	740,000	Tayto Park

5. Transport Infrastructure, Services and Accessibility

5.1 Introduction

This section of the Report describes the environment of the DSA lands in the context of private and public transport infrastructure and services within their vicinity. Both existing and planned facilities are described. Due to the COVID-19 Level-5 travel restrictions in place in early-2021, an assessment of the site's receiving environment was undertaken by means of a desktop study in March of 2021.

5.2 Current Public Transport Infrastructure and Services

Commuter and InterCity Rail Services

Commuter Rail

The subject lands and are currently served by 2 no. rail stations, namely Navan Road Parkway and Ashtown Stations, on the Maynooth Rail Line which passes through the DSA lands, adjacent to its southern boundary. Commuter rail services from these stations connect the DSA to major train stations in Dublin City such as Connolly, Docklands, Tara and Pearse, from where transfers can be made to the wider light (Luas) and heavy (DART, Commuter and InterCity) rail network. Commuter rail services operating from these stations also connect the DSA to Maynooth to the west and other intermediate stations.

Weekday AM (08:00-09:00hrs) and PM (17:00-18:00hrs) peak hour train frequencies from these stations are detailed in the following Table 5.1.

Table 5.1 Commuter Services: Weekday Service AM & PM Peak Hour Frequencies

Direction	Service	Weekday Frequency	
		AM Peak Hour	PM Peak Hour
Eastbound	Commuter	7 – 17 minutes	5 – 13 minutes
Westbound	Commuter	7 – 15 minutes	9 – 22 minutes

Heavy InterCity Rail

The Dublin to Sligo InterCity Rail Line runs through the DSA, co-utilising infrastructure with commuter rail services from Maynooth to Dublin City Centre. This railway line is double tracked between Connolly Station and Maynooth Station, after which it is single tracked to Sligo.

InterCity services connect Dublin Connolly and Sligo, with intermediary stations including Maynooth Kilcock, Enfield, Mullingar, Edgeworthstown, Longford, Carrick-on-Shannon and Boyle.

Bus Infrastructure and Services

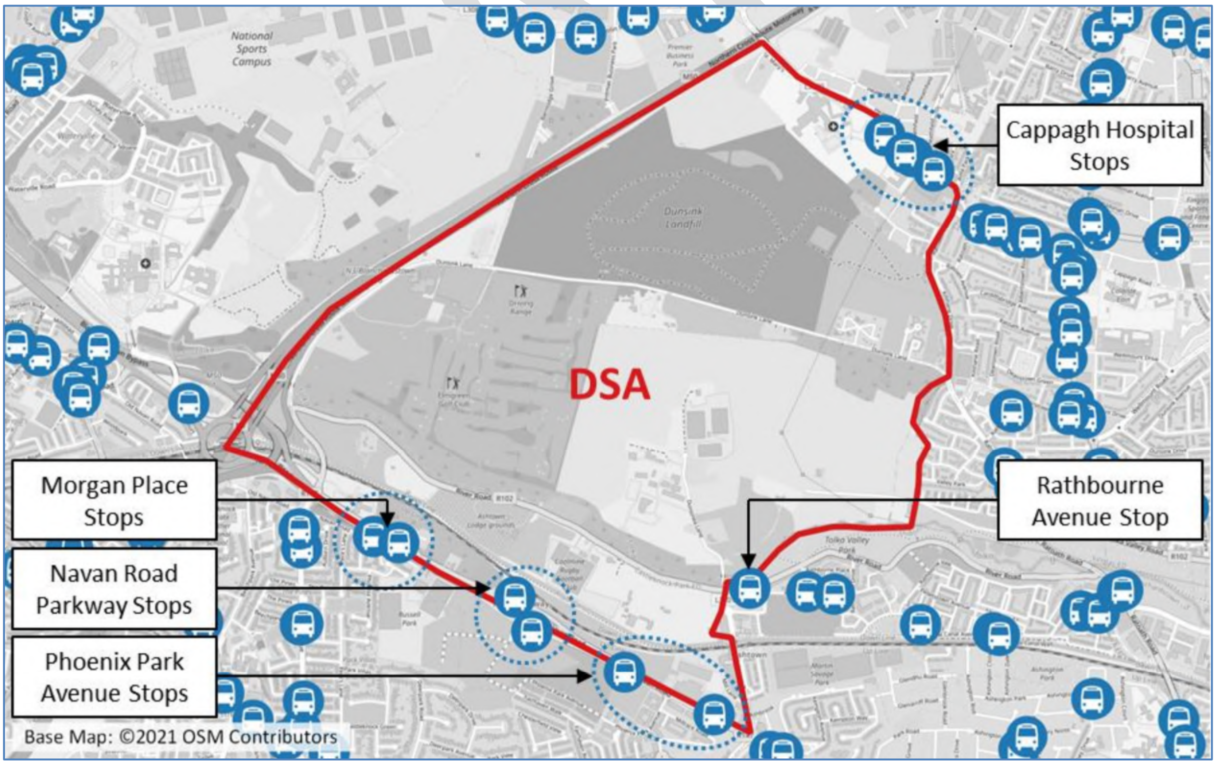
Current Bus Infrastructure

The bus routes currently serving the DSA lands run along the roads demarcating its northern, eastern, and southern boundaries, i.e. Cappagh Road, Ratoath Road, and River Road, and the R147 Navan Road respectively. Bus priority measures in form of bus lanes are also provided on the R147 Navan Road, as follows:

- a ca. 1,150 metres long eastbound bus lane between the off-ramp allowing access to the Navan Road Parkway Station (from the west) and the R147 Navan Road/ Ashtown Road Roundabout; and
- a ca. 700 metres long westbound bus lane between the off-ramp allowing access to the Navan Road Parkway Station (from the east) and the exit from the Circle K filling station.

The bus stops located along the DSA boundaries are grouped at five locations, including the National Orthopaedic Hospital on Cappagh Road, Rathbourne Avenue, Phoenix Park Avenue, Navan Road Parkway station, and Morgan Place. The location of the pertinent stops is presented in Figure 5.1, which follows.

Figure 5.1 Current Bus Stops Serving DSA



Current Intracity Bus Services

The current bus route network within DSA's environs is presented in Figure 5.2, with details of the service provision provided in the subsequent Table 5.2 (both overleaf).

Figure 5.2 Existing Bus Routes in DSA Lands' Vicinity

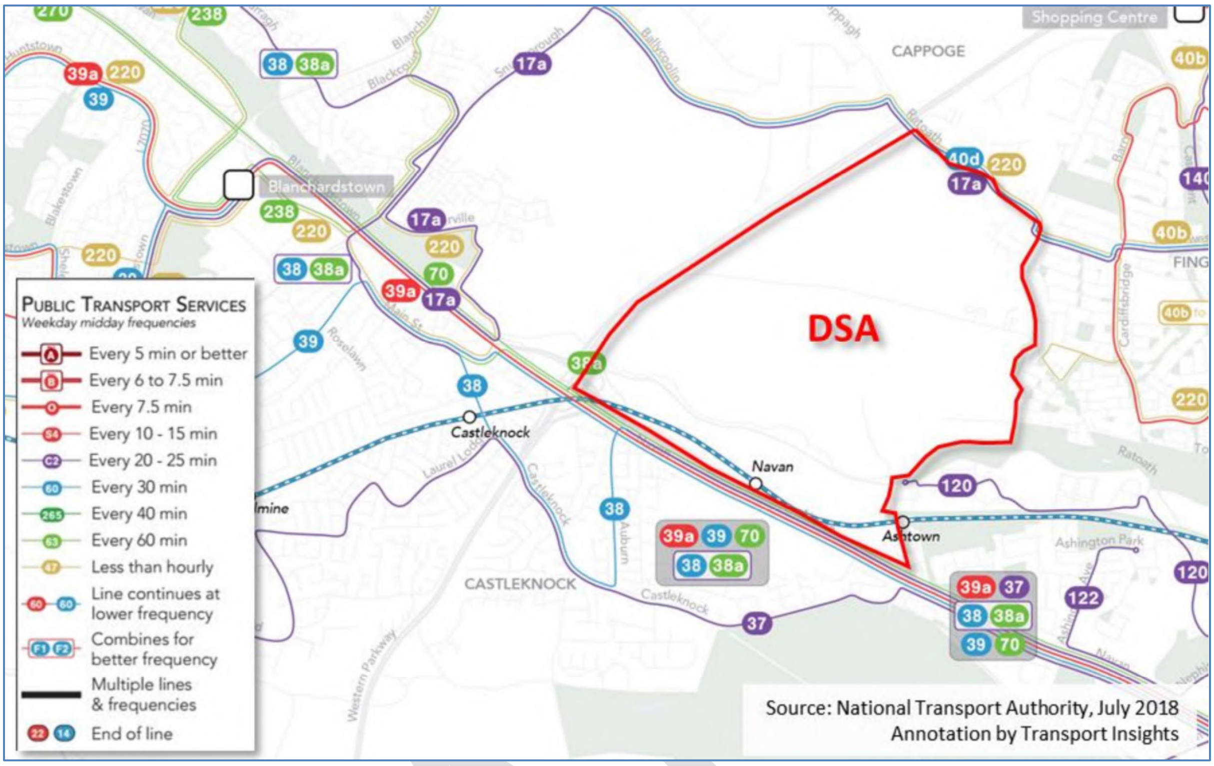


Table 5.2 Existing Local Bus Services

Service No.	Origin/ Destination	Peak Headways	Off-Peak Headways
17a	Howth Junction – Blanchardstown (via Santry, Finglas)	20 minutes	30 minutes
38	Burlington Rd – Damastown	20 minutes	30 minutes
38a	Burlington Rd – Damastown	20 minutes	30 minutes
38b	Burlington Rd – Damastown	6 no. AM peak services	
39	Burlington Rd – Ongar	30 minutes	30 minutes
39a	UCD Belfield – Ongar	10 minutes	10 minutes
39x	Burlington Rd – Ongar	1 no. eastbound AM peak service; 1 no. westbound PM peak service	
40d	Parnell St – Tyrrelstown	15 minutes	30 minutes
70	Burlington Rd - Dunboyne	30 minutes	60 minutes

Service No.	Origin/ Destination	Peak Headways	Off-Peak Headways
120	Merrion Road, RDS – River Rd	15 minutes	30 minutes
220/ 220a	DCU – Lady's Well Rd (via Ballycoolin, Blanchardstown)	No services during AM peak	60 minutes

As can be seen from the preceding Figure 5.2 and Table 5.2, the Navan Road corridor which adjoins the DSA lands' southern boundary, accommodates a number of bus services, namely the 38, 38A, 38B, 39, 39A, 39X and 70. These services offer a cumulative headway of under 3 minutes in the AM peak.

Current Regional Bus Services

In addition to the local bus services set out above, the DSA is served by a wide range of regional and long-distance bus services which operate along R147 Navan Road corridor. These services are operated by both public (Bus Eireann) and private companies. Regional bus services operated by Bus Eireann are presented in the following Table 5.3.

Table 5.3 Existing Regional Bus Eireann Services

Service No.	Origin/ Destination	Peak Headways	Off-Peak Headways
109	Dublin (Busáras) – Kells (1 no. extended service to/from Cavan)	20 minutes	30 minutes
109B	Dublin (Busáras) – Trim	120 minutes	
111	Dublin (Busáras) – Trim	60 minutes	

Light Rail

Current Infrastructure and Services

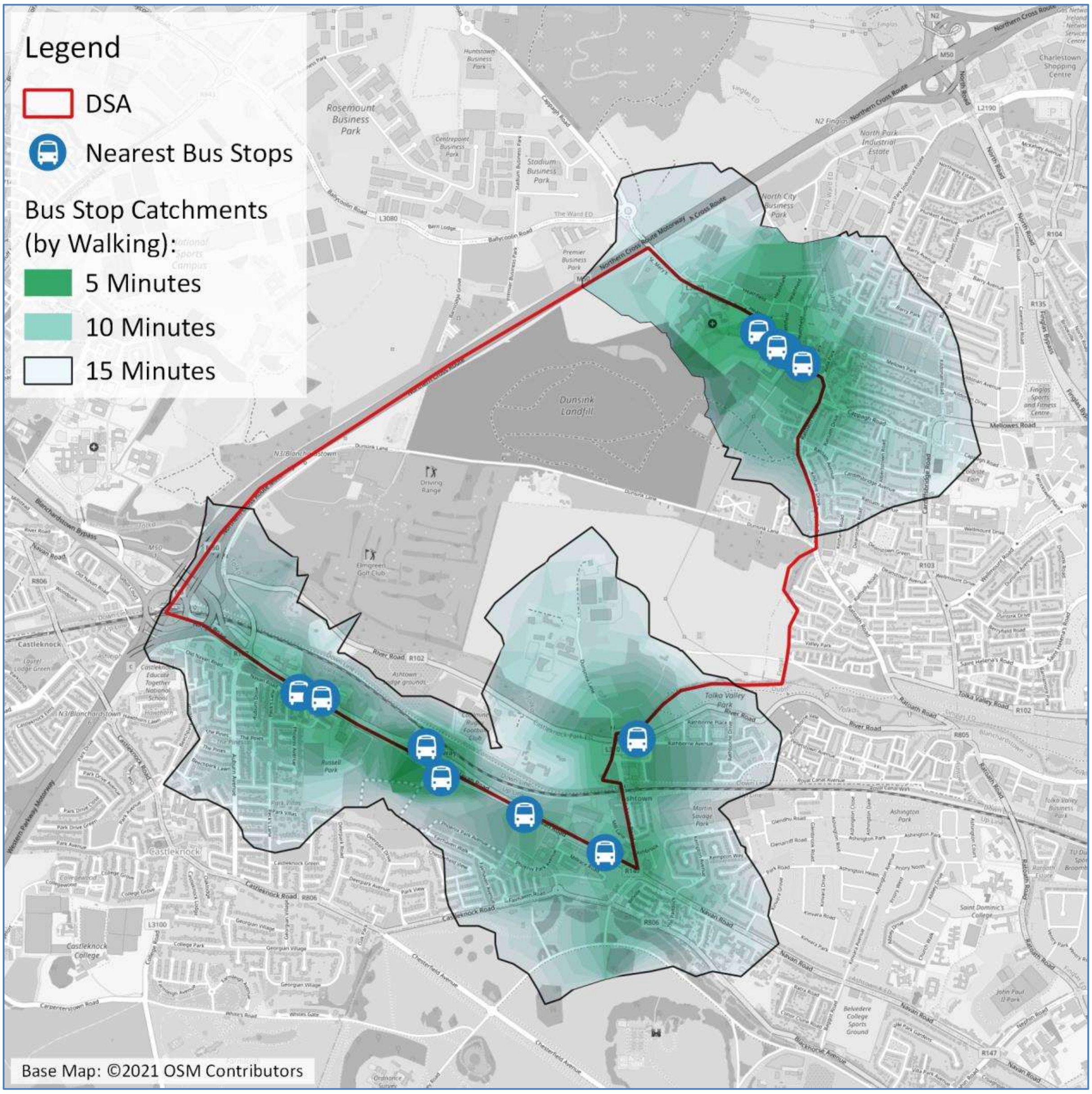
There is no light rail infrastructure in the immediate vicinity of the DSA, however Broombridge Station, which is served by both commuter trains and Luas Green Line services, is located ca. 2.3 kilometres to the east of the subject lands, and can be reached directly from both Navan Road Parkway and Ashtown Stations via commuter rail services. At Broombridge, passengers can transfer from commuter rail to Luas Green Line services, thereby providing a light rail link to Dublin City Centre via Cabra, Phibsborough, Grangegorman (TU Dublin City Campus), Broadstone, and onwards to South Dublin as far as Sandyford and Brides Glen. Transfers from commuter rail to Luas Red Line services, which operate between The Point/ Connolly in Dublin City Centre and Saggart/ Tallaght in West Dublin, can also be availed of at Connolly Station.

Public Transport Accessibility Analysis

Bus Stop Catchment Analysis

The accessibility of existing local bus stops has been analysed by means of an isochrone analysis (using geographic information systems (GIS) software) to ascertain the extent to which they accommodate residents of or visitors to (including employees) the DSA lands. The generated isochrone map is presented in the following Figure 5.3.

Figure 5.3 Bus Stop Walking Time Isochrones

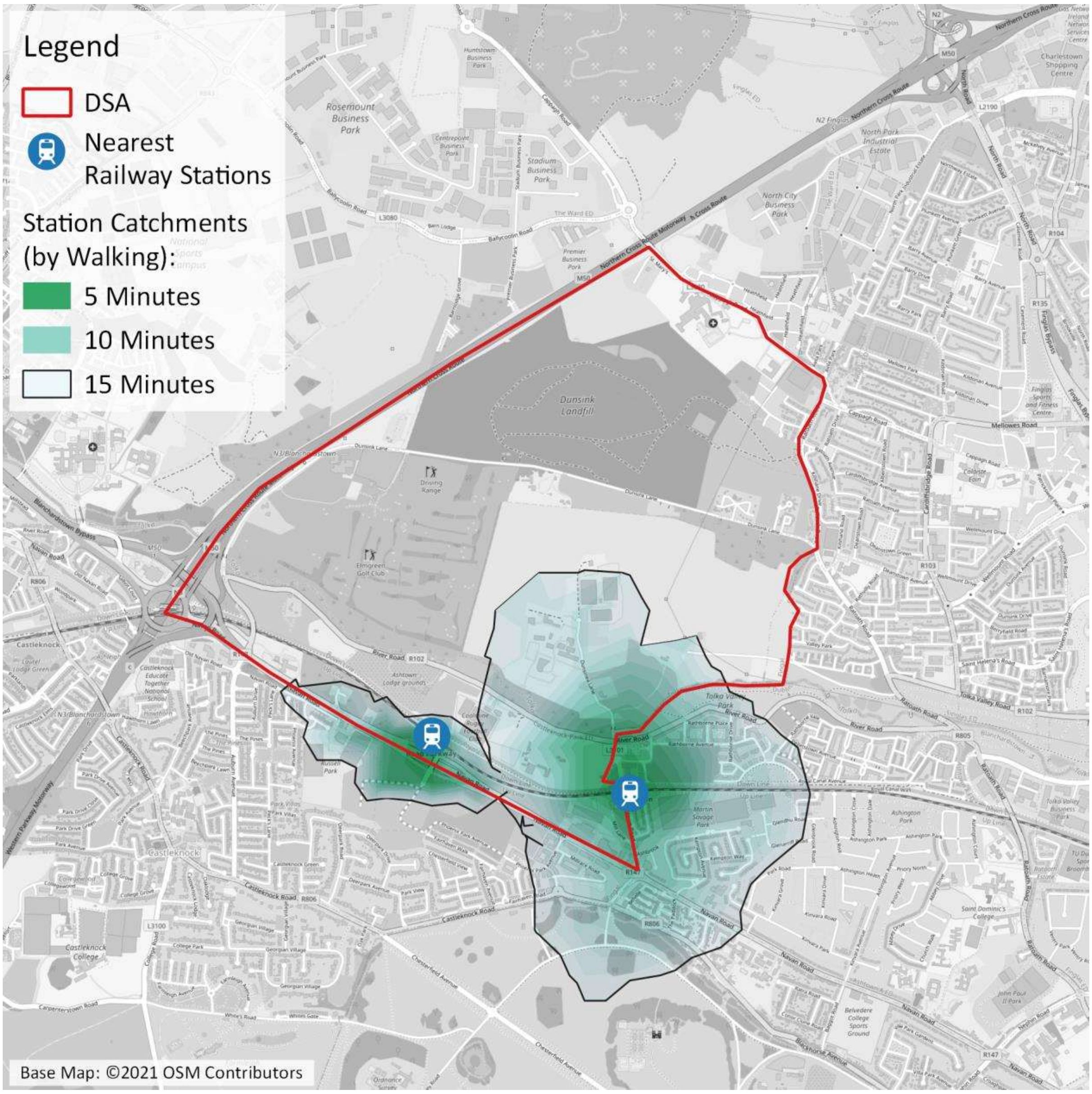


As can be seen from the preceding Figure 5.3, while the southern and northern parts of the DSA lands are accessible within a convenient walk from existing bus stop infrastructure along the R147 Navan Road and Cappagh Road corridors respectively, the remainder of the DSA lands are outside the bus walking catchment.

Train Station Catchment Analysis

The accessibility of existing local train stations has been analysed by means of a GIS isochrone analysis to ascertain the extent to which they currently accommodate residents of or visitors to (including employees) the DSA lands. The generated isochrone map is presented in the following Figure 5.4.

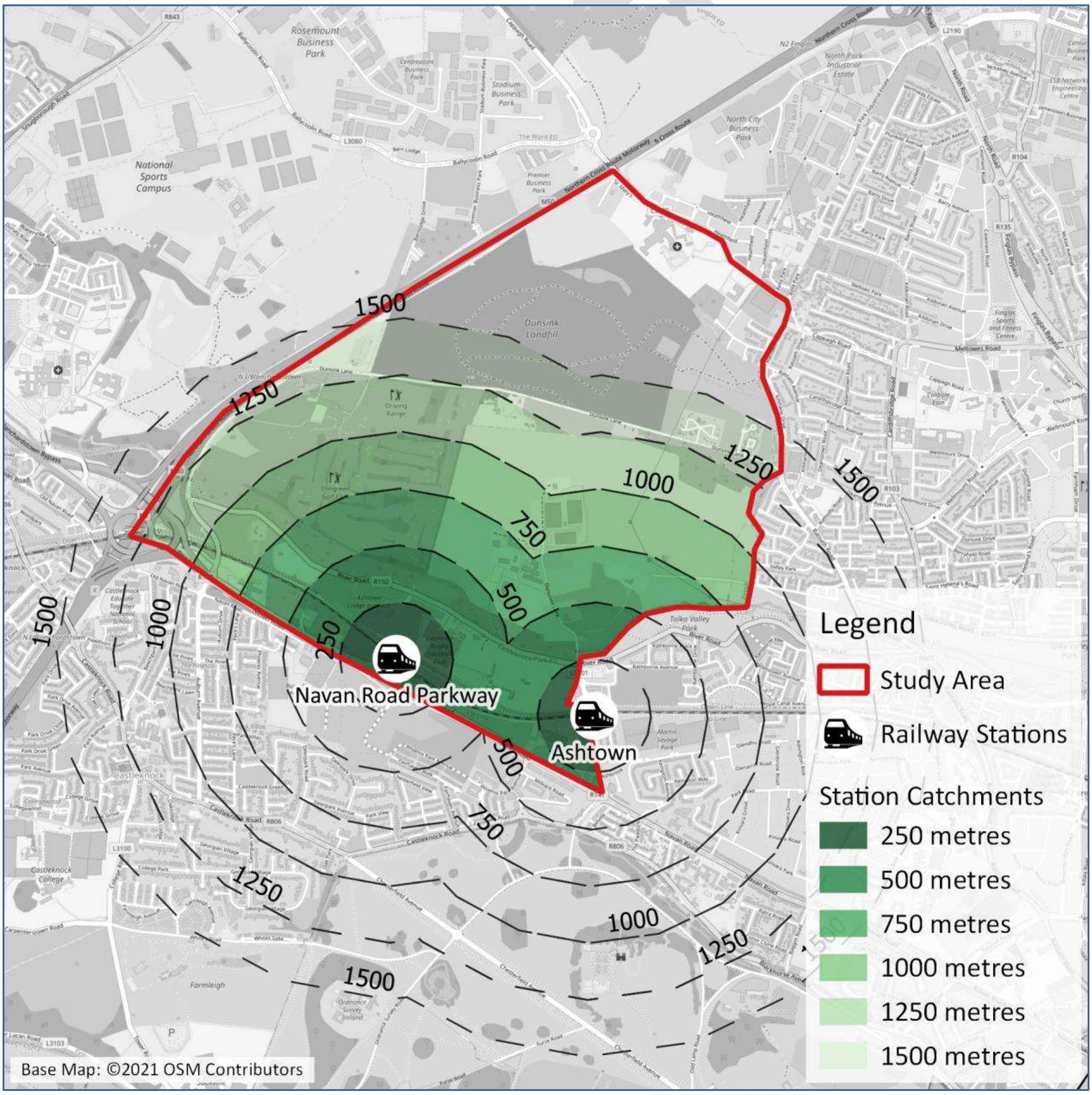
Figure 5.4 Rail Stations Walking Time Isochrones



As can be seen from Figure 5.4, the southern part and south-eastern corner of the DSA lands are directly served by rail services (due to their location within a 15 minutes' walk from Navan Road Parkway and Ashtown Rail Stations). The remainder of the DSA lands are not however directly served by rail, with the absence of pedestrian links over the = Royal Canal representing an identified barrier to improved public transport accessibility within a greater proportion of the southern part of the DSA lands.

To illustrate the extent to which the Royal Canal represents an accessibility barrier to/ from rail and the DSA lands, an analysis of the catchment areas of the Navan Road Parkway and Ashtown Stations at 250-metre increments up to 1,500 metres has been completed. The findings of this analysis is illustrated in the following Figure 5.5, demonstrating a significant divergence between distance and walk travel time catchments, particularly from the Navan Road Parkway Station. This analysis also illustrates that even if direct pedestrian connections were provided from existing rail stations over the Royal Canal into the remainder of the DSA lands, the central and northern parts of the lands are in excess of 1,000 metres and 1,500 metres respectively from rail (and therefore would not be directly served by it).

Figure 5.5 Study Area Train Station Catchments



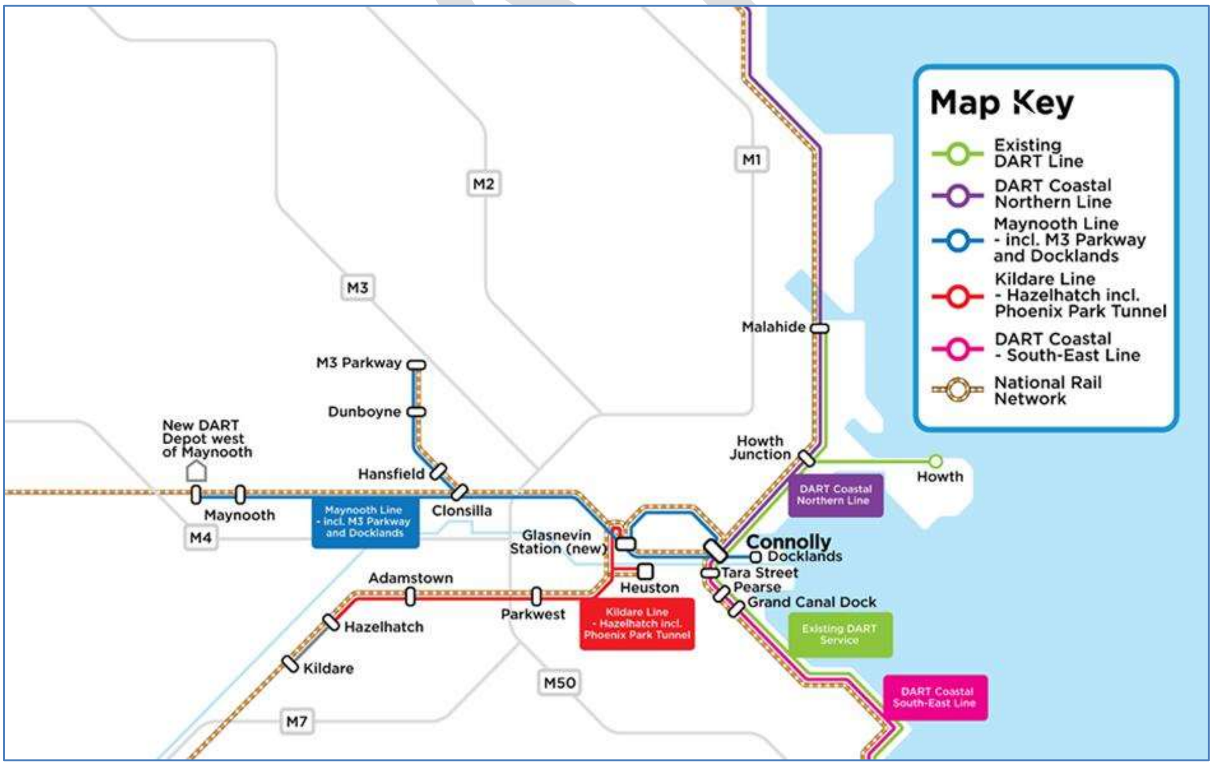
5.3 Proposed Public Transport Schemes

DART+ Programme / DART+ West Project

As per the Preliminary Options Selection Report for the DART+ West Project, the DART+ Programme's primary objective, supported by a series of sub-objectives, is *"to support urban compact growth and contribute to reducing transport congestion and emissions in the Dublin region by enhancing the heavy rail network between Dublin City Centre and the areas of Drogheda, Maynooth, Dunboyne, Celbridge, and Greystones, providing a sustainable, safe, efficient, integrated, and accessible public transport service along these corridors."*

The DART+ Programme is a package of investment projects to be completed by Irish Rail with an overarching objective to enable substantial expansion and improvements to existing DART services. It will see an expansion of the DART network to a number of other corridors, with the overall network length rising to ca. 150 kilometres, which is to be achieved by infrastructure upgrades, track electrification, and new train fleet acquisition. A schematic drawing of the current and future proposed DART network layout is presented in the following Figure 5.6.

Figure 5.6 Existing and Proposed Future DART Network Layout



As can be seen from the preceding Figure 5.6, the DART+ Programme will involve introduction/ extension of DART services on the following new corridors:

- Northern Coastal Line: Dublin Connolly to Drogheda;
- Maynooth Line: Dublin Connolly/ Docklands to M3 Parkway/ Maynooth; and

- Kildare Line: Dublin Heuston/ Glasnevin to Hazelhatch (incl. Phoenix Park Tunnel services).

In addition to the above, modernisation of the existing rail infrastructure and service improvements along the DART Southern Coastal Line from Dublin Connolly to Greystones (without further spatial expansion southwards) is also planned.

The part of the overarching DART+ Programme involving the infrastructure and service upgrades on the Maynooth Rail Line has been referred to as the DART+ West Project (and in some instances as Dart+ Maynooth Line Project). As per the DART+ Maynooth Line Preliminary Options Selection Report, the following key infrastructural works will be included in the project:

- electrification and re-signalling of the Maynooth and M3 Parkway line from City Centre to Maynooth (ca. 40 kilometres);
- capacity enhancements at Dublin Connolly station and in Dublin's Docklands, relocation of the Docklands station to a new location at Spencer's Dock;
- closure of level crossings along the railway corridor;
- construction of a new DART depot facility west of Maynooth station for the maintenance and stabling of trains; and
- development of an interchange station with MetroLink at Glasnevin.

Construction works on the proposed project are due to commence in 2022, with all works scheduled to be completed by 2025, at which point peak frequency along the Maynooth Rail Line will have increased from seven to fifteen trains per hour, resulting in capacity increasing from ca. 4,500 to 13,750 passengers per hour per direction (pphpd). The proposed project therefore has the potential to transform travel patterns along the entire corridor of the Maynooth Rail Line, and afford opportunities for sustainable future, i.e. public transport-oriented, development within its catchment.

BusConnects

BusConnects[5] is a multi-faceted programme that aims to improve bus services within the GDA through an improved network (New Dublin Area Bus Network), enhanced infrastructure (Core Bus Corridors), new ticketing/ fare systems and improved/ new bus stop facilities.

Core Bus Corridors (CBCs)

The CBC project represents one key element of the overall BusConnects programme, and will deliver improved infrastructure on sixteen radial bus priority corridors (in addition to the provision of segregated cycle lanes in both directions along each corridor). The latest round of public consultation

5 https://busconnects.ie/

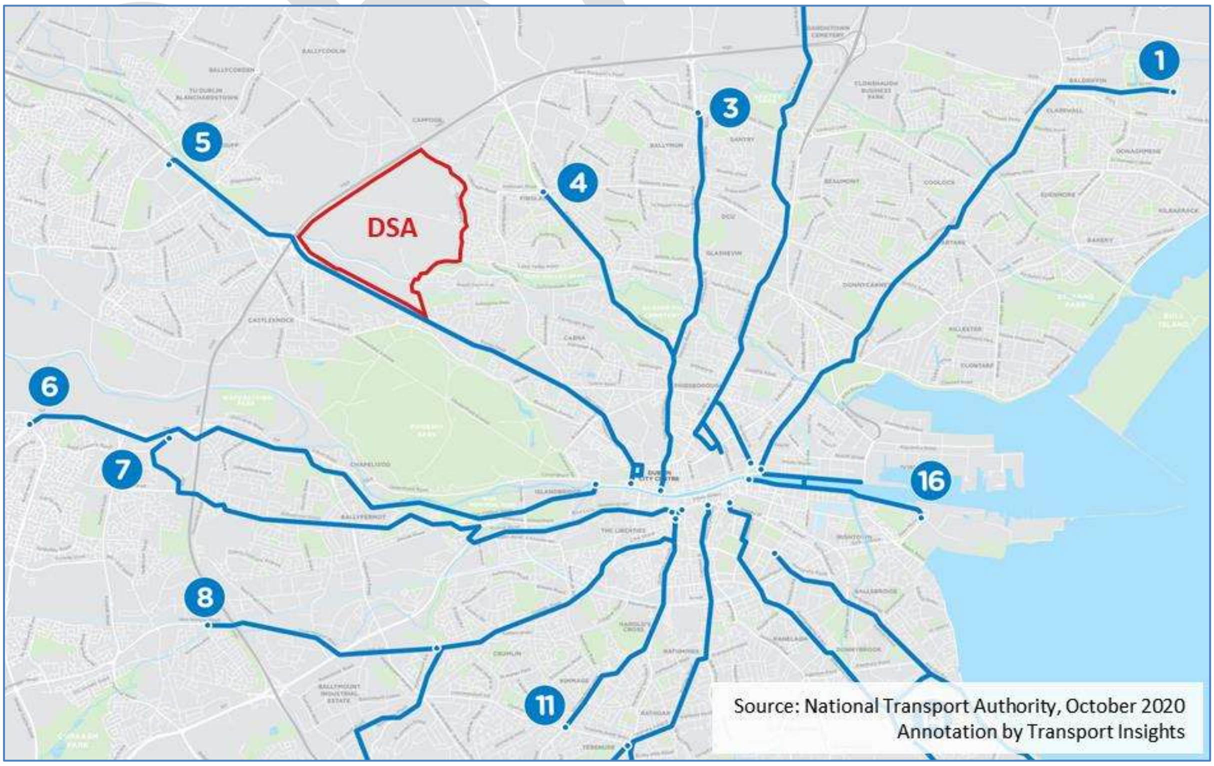
concluded in December 2020, and a statutory planning application is scheduled to be lodged with An Bord Pleanála in 2021, with construction commencing in 2022.

These corridors, either carry or are intended to carry a large number of high-frequency bus services and therefore represent the backbone of Dublin's urban bus system, hence they have been referred to as CBCs. The bus infrastructure improvements proposed along the CBCs include measures such as provision of bus lanes, bus gates, and filtered permeability systems to improve bus speeds, reliability, and punctuality.

The CBC network arising from the BusConnects programme is illustrated within the following Figure 5.7, with the location of the DSA lands marked for reference. The DSA lands are noted to be located at the proposed CBC5 Blanchardstown to the City Centre, running along the R147 Navan Road. With regard to the R147 Navan Road section which adjoins the DSA's southern boundary, the following bus infrastructure improvements are proposed as part of the CBC project:

- continuous bus lanes to be provided in both directions on the roundabout over the M50;
- additional bus stops to be provided at Auburn Avenue (by the DSA's southwestern corner);
- bus lanes to be directed along the slip roads to provide access to the bus stops serving the Navan Road Parkway railway station; and
- the R147 Navan Road/ Ashtown Road Roundabout to be converted into a signal-controlled roundabout.

Figure 5.7 Proposed BusConnects CBCs



New Dublin Area Bus Network

Following a comprehensive review and series of public consultations, the NTA published a New Dublin Area Bus Network in September 2020. The revised network, which represents a key element of the overall BusConnects programme, is to be implemented on phased stages from 2021, with improved service provision expected to be delivered throughout the overall Dublin area, including Northwest Dublin within the DSA's general vicinity.

Characteristics of the network redesign include enhanced *"spine"* corridors to/ from the City Centre that are comprised of multiple services operating along the same core corridor, additional provision of other radial routes (that do not route through the main spine corridors), enhanced orbital services that connect areas outside of the City Centre, and other local services that cater for the needs of specific areas, in addition to express and peak only services that allow for enhanced commuting journey options for those living in areas that are located further from the City Centre.

Future BusConnects bus route network within the DSA's environs is presented in Figure 5.8, with details of the service provision shown in Table 5.4 (both overleaf).

In order to take full advantage of the opportunities of the opportunities presented by the BusConnects program, the NTA should be engaged with at the earliest stage. Furthermore, owing to the subject lands' location in proximity to heavy rail modes, it is noted that the integrated ticketing structures proposed to be implemented as part of BusConnects represents a significant opportunity for the encouragement of interchange between transport modes and sustainable movement for residents and visitors within any development within the lands.

As can be seen from Figure 5.8 and Table 5.4, revised bus services operating along the R147 Navan Road corridor (the B Spine) which adjoins the DSA lands' southern boundary will offer a cumulative headway of under 3 minutes throughout the day.

Figure 5.8 Proposed BusConnects Bus Routes

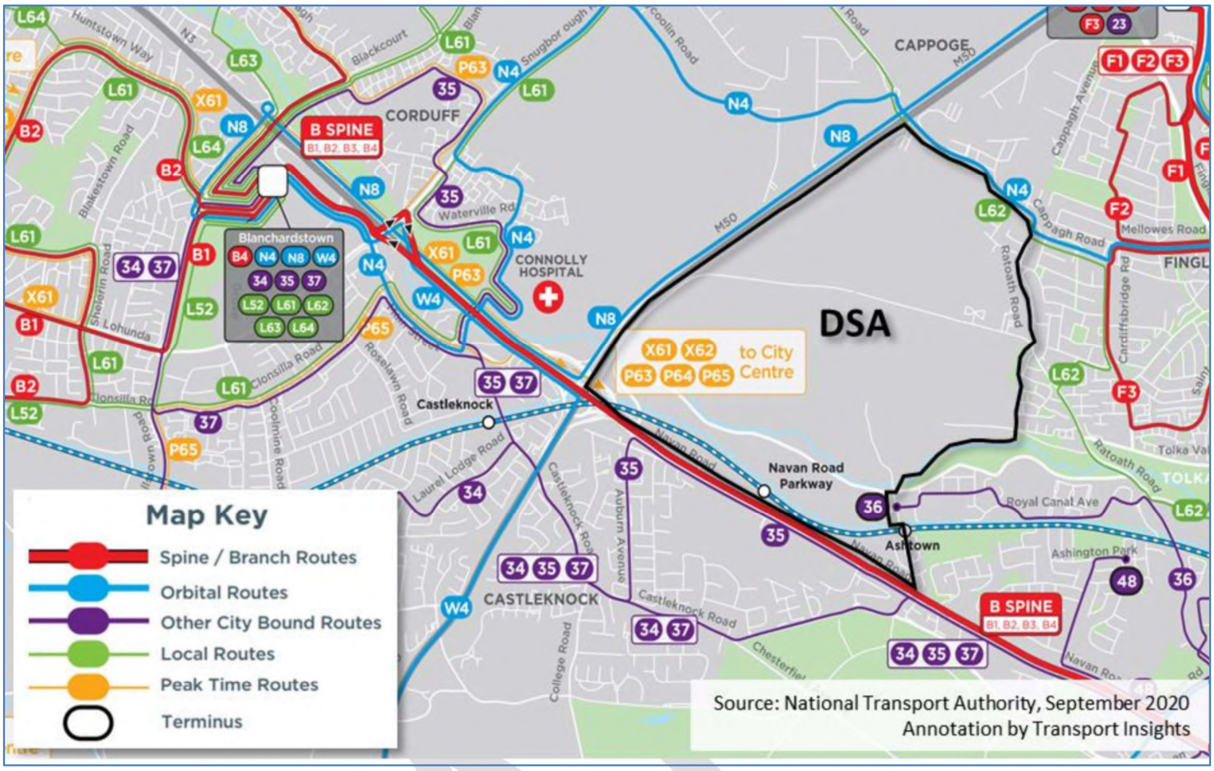


Table 5.4 Proposed Local Bus Services under BusConnects network redesign programme

Service No.	Origin/ Destination	Peak Headways	Off-Peak Headways
B-Spine, including:	Blanchardstown Shopping Centre – City Centre – UCD Belfield	3 minutes	
– B1	Ongar – City Centre – UCD Belfield	15 minutes	
– B2	Ongar North – Clonsilla – City Centre – UCD Belfield	15 minutes	
– B3	Tyrellstown – City Centre – Dún Laoghaire	15 minutes	
– B4	Blanchardstown Shopping Centre – City Centre – Sallynoggin	15 minutes	
N4	Blanchardstown Shopping Centre – Finglas – DCU – Docklands	10 minutes	
N8	Blanchardstown Shopping Centre – Dublin Airport – Clongriffin (no stops on the M50 along the Study Area boundary)	30 minutes	
35	Blanchardstown Shopping Centre – Corduff – Castleknock – Burlington Rd	15 minutes	20 minutes

Service No.	Origin/ Destination	Peak Headways	Off-Peak Headways
36	Rathborne – City Centre – Ballsbridge	15 minutes	15 minutes
L62	Blanchardstown – Tyrrelstown – Broombridge	15 minutes	30 minutes
L63	Damastown – Blanchardstown	15 minutes	15 minutes
P63	Damastown – Corduff – City Centre	6 no. two-way AM peak services; and 9 no. two-way PM peak services	
P64	Dunboyne – City Centre	1 no. eastbound AM peak service; and 1 no. westbound PM peak service	
P65	Diswellstown Rd – Clonsilla Rd – City Centre	1 no. eastbound AM peak service; and 1 no. westbound PM peak service	
X61	Hartstown – Huntstown – City Centre	4 no. eastbound AM peak services; and 4 no. westbound PM peak services	
X62	Ongar – Littlepace Distributor – City Centre	4 no. eastbound AM peak services; and 4 no. westbound PM peak services	

Luas Finglas – Green Line Extension

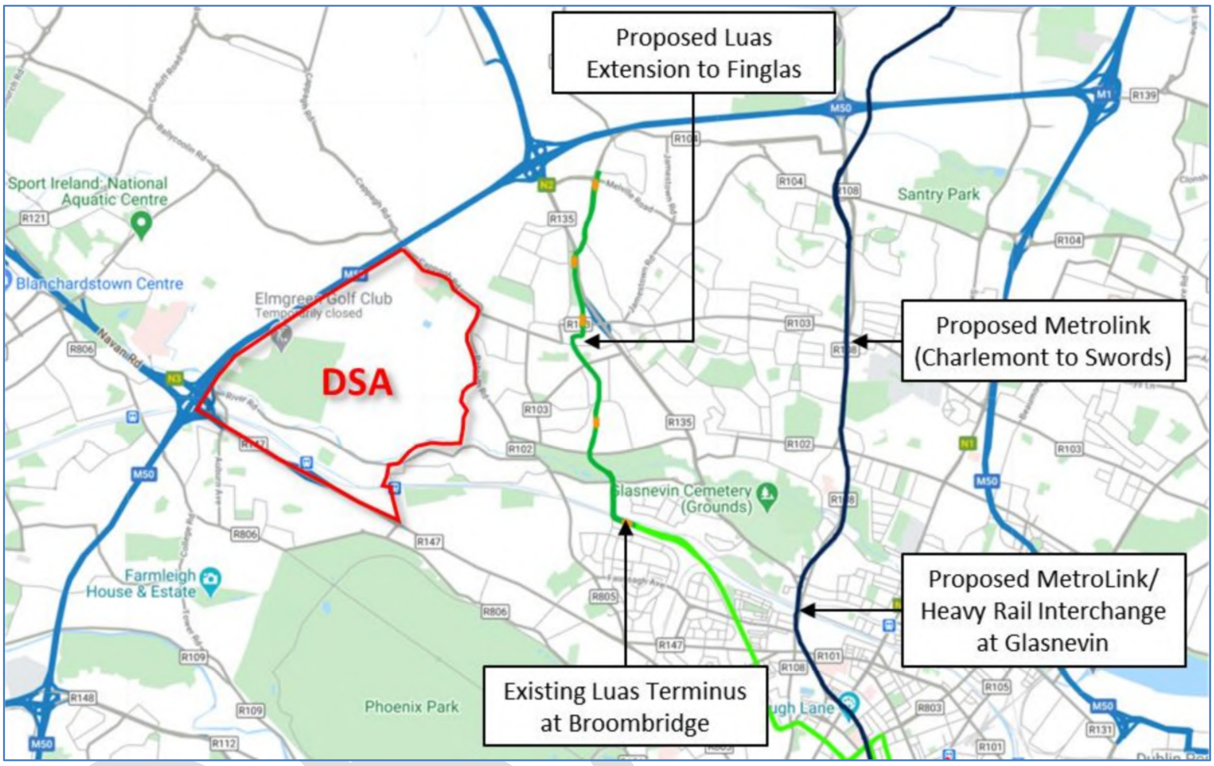
It is currently proposed under the Luas Finglas Project that the existing Luas Green Line be extended from its current terminus at Broombridge to the new terminus at Charlestown ca. 4 kilometres to the north, with the indicative route presented in Figure 5.9 (overleaf). The proposed extension will include four new stops and initially operate at a running frequency of 7.5 minutes, delivering capacity of in excess of 3,250 pphpd.

Luas Finglas is noted to have been named in the Eastern and Midland Region RSES as a scheme essential for development of the landbank at Dunsink. Nevertheless, the nearest proposed Luas Finglas at Broombridge (existing) and St. Helena's (proposed) are noted to be located 1.7 kilometres and 1.3 kilometres (straight line distance) from the eastern boundary of the Dunsink landbank, with other parts of the landbank being more remote. Therefore, the landbank is deemed to be located at the periphery/ outside of Luas Finglas' walking catchment.

While, as noted above, the DSA lands are outside of the Luas Finglas' direct catchment, it could play a role in serving transport demand that may be generated within the DSA, particularly at its northernmost boundary subject to the provision of bus links and transfer facilities to Charlestown Luas Stop. In this context, the planned bus routes N4 and L62 (via the New Dublin Area Bus Network) will offer transfer opportunities at Finglas Village Stop and Broombridge Stop respectively.

The proposed MetroLink project will create a high-frequency and high-capacity link between Swords and Ranelagh via Dublin Airport and Dublin City, with its alignment illustrated in Figure 5.9. A heavy rail and light rail (metro) interchange is proposed as part of the DART+ West Project with the planned MetroLink scheme at Glasnevin, which will create a further transport interchange on the upgraded Maynooth Rail Line.

Figure 5.9 Luas Finglas and MetroLink (Emerging Preferred) Routes



5.4 Current and Proposed Road Infrastructure

Current Road Infrastructure

Key roads within the DSA lands' and their vicinity have been subject to review. As noted in Section 5.1, information has been ascertained by means of a desktop study in the absence of a site assessment (due to COVID-19 travel restrictions).

Key Internal Roads

Key roads within the DSA lands include Dunsink Lane, R102 River Road, R102 New River Road, Dunsinea Lane, Scribblestown Lane, Dunsoghtly Residential Area and Mill Lane.

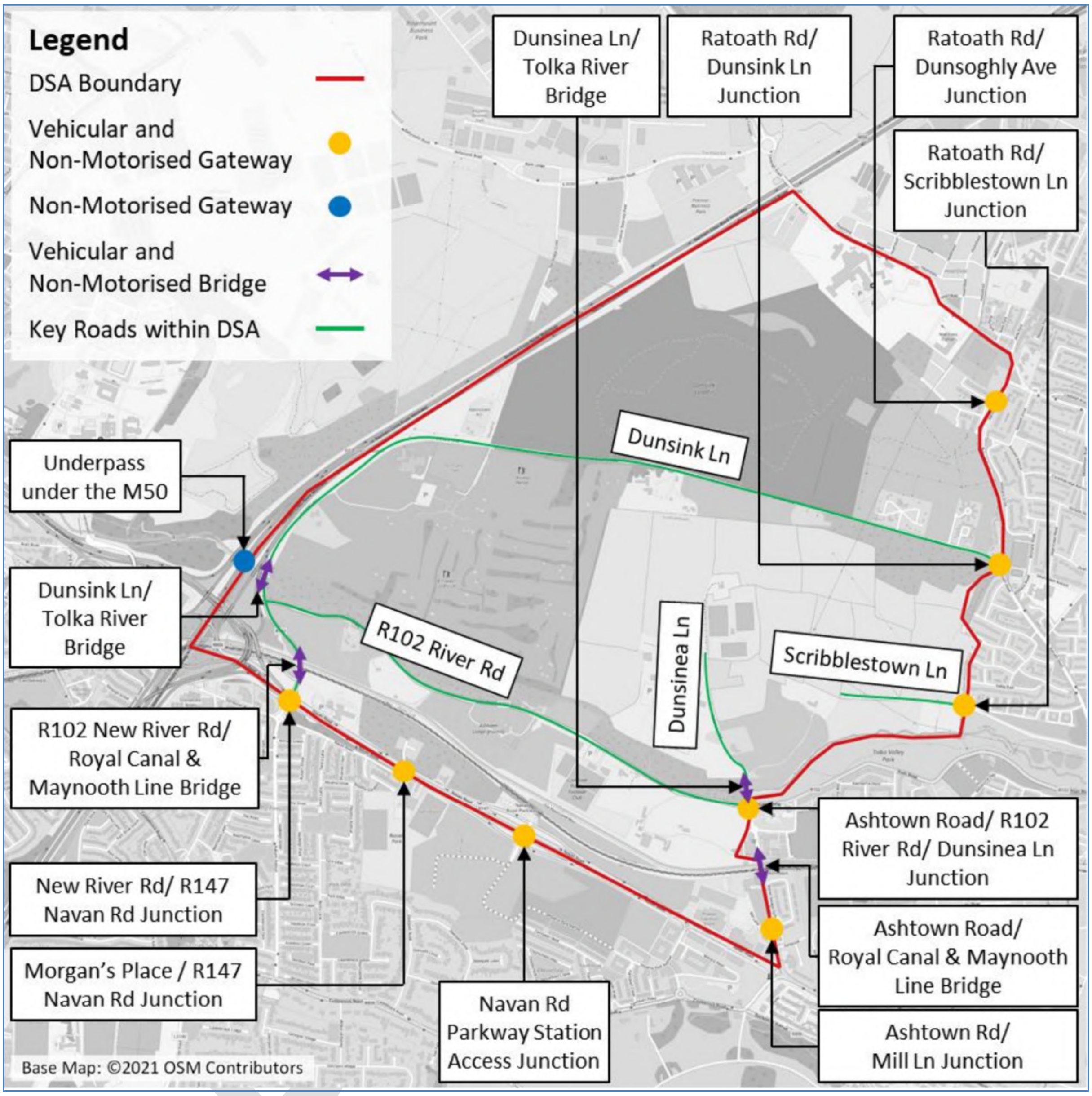
Key External Roads

Key roads external to the DSA lands' boundary include M50, R147 Navan Road, R805 Ashtown Road, R102 Ratoath Road and Cappagh Road.

An overview of each of the above-listed internal and external roads is provided within Appendix A.

The following Figure 5.10 illustrates the location of key junctions and gateways to the DSA lands, and within the lands' vicinity.

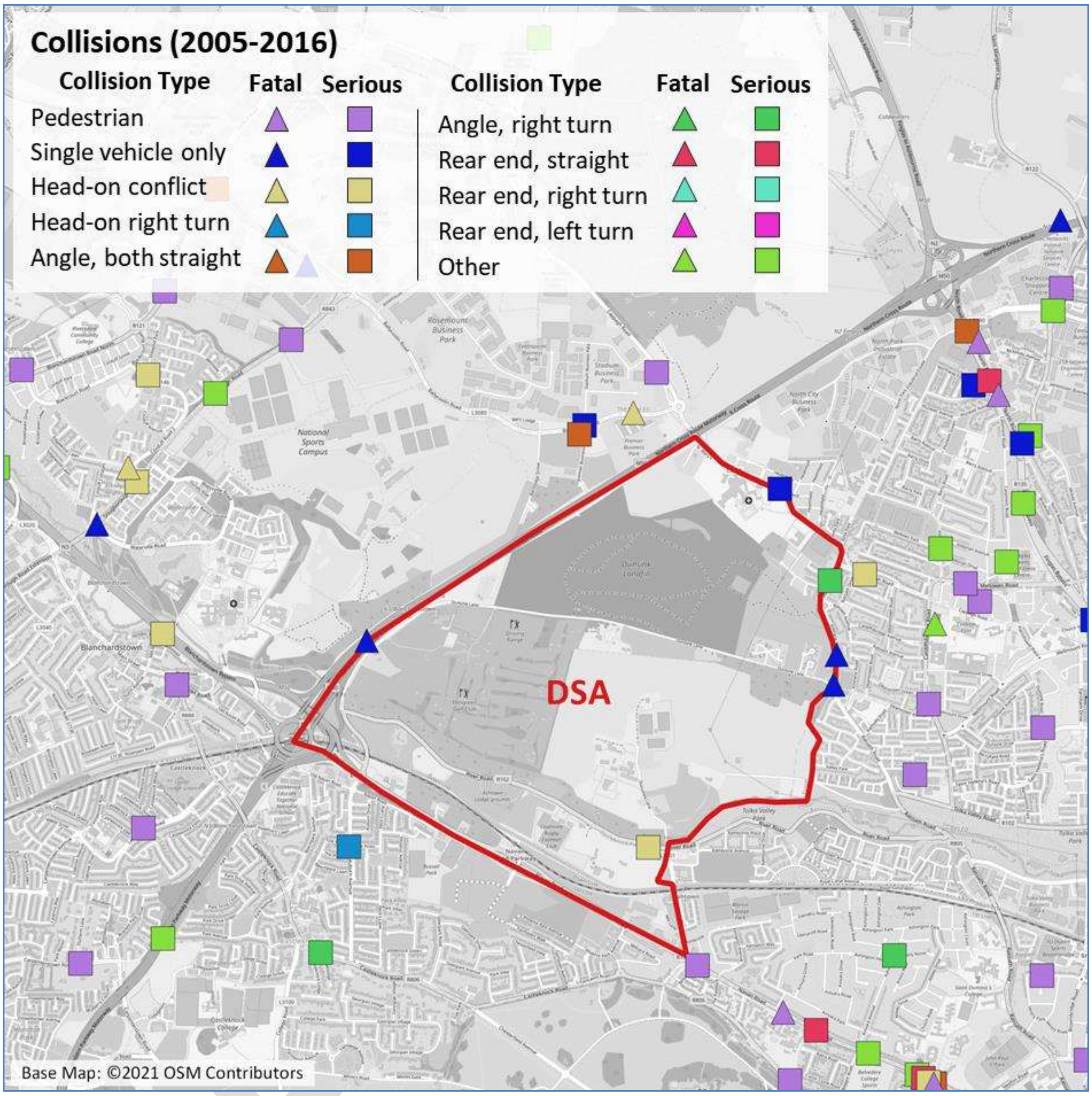
Figure 5.10 Key Roads within and Public Access Points to DSA



Road Safety

Data from the Road Safety Authority (RSA) collision database was used to assess the historic safety performance characteristics of the road network within DSA lands' vicinity. The database contains information on all reported collisions by severity of injury incurred (i.e. fatal, serious or minor) and by year the collision occurred. Figure 5.11 (overleaf) illustrates the location of all collisions in the vicinity of the site for the twelve-year period from 2005 to 2016 inclusive. As can be seen from this figure, very few collisions have been recorded within the DSA lands over the analysed 12-year period, reflecting limited road infrastructure and development (= transport activity) within it. No pattern in collisions is apparent from the collision data on the external road network, which appears consistent with that experienced within an urban road network.

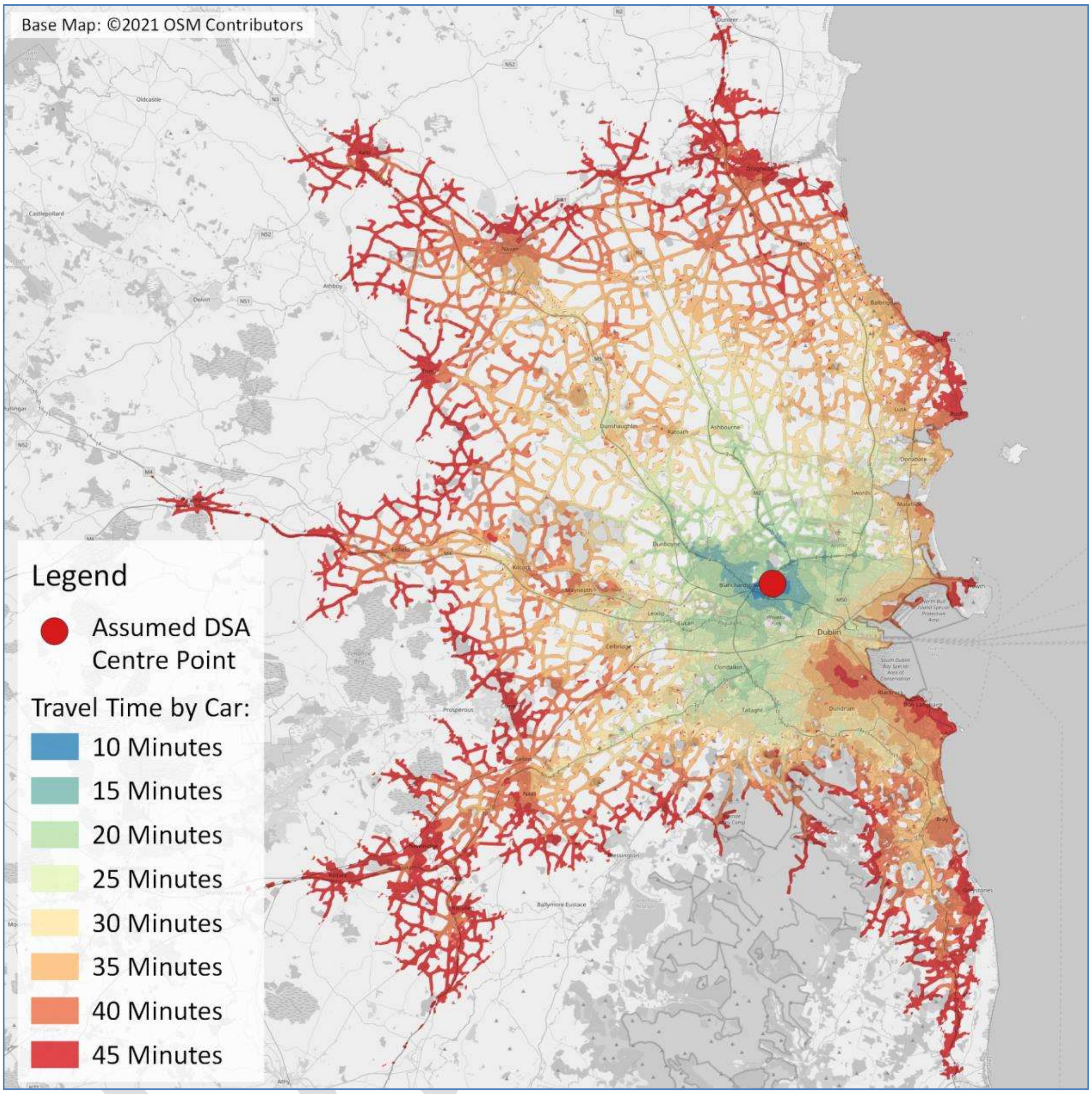
Figure 5.11 DSA Lands and Environs – Historical Collision Data



General Traffic Accessibility Analysis

The DSA lands' accessibility by car has been analysed by means of an isochrone analysis using GIS software. In doing so, catchments of the site have been generated for travel times up to 45 minutes, accounting for local speed limits on the road network (however without considering the impact of congestion). The generated isochrone map is presented in Figure 5.12 (overleaf).

Figure 5.12 Drive Time Isochrones



As can be seen from the preceding Figure 5.12, the area accessible within a 45 minutes' drive extends from the DSA lands to Howth in the east, Wicklow and Kildare in the south, Kinnegad in the west, and Kells and Dunleer in the north. The effect of the DSA's proximity to the M50 is clearly visible in the figure, with the lands located along strategic roads accessible within a relatively short drive time. Conversely, the south Dublin City and Dún Laoghaire are noted to be relatively poorly accessible by car due to the lack of direct high-capacity road connections between these areas and the DSA. The impact of the M50 in terms of severance is also noted, with drive times from the DSA lands considerably longer to areas located to its northwest.

Proposed Road Schemes

As noted in Section 2.4 of this Report, Objective MT41 of the current FDP seeks to implement road improvement schemes within the Plan period (to 2023), and 2 no. such road schemes fall within DSA lands:

- Cappagh Road – North Road Link (to the north of the DSA); and
- Cappagh Road – River Road Link (passing through the DSA, parallel to the M50).

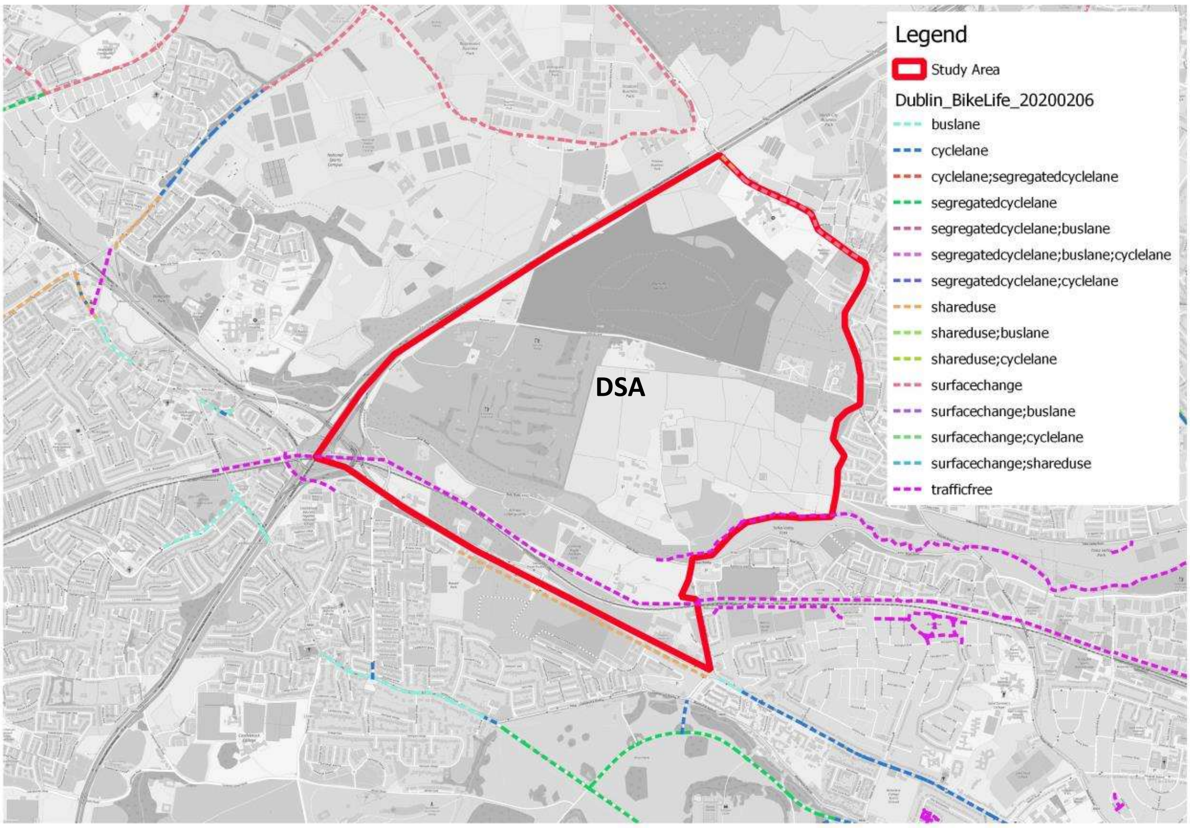
5.5 Current and Proposed Active Modes Infrastructure

Current Active Modes Infrastructure

Cycling

The DSA lands have segregated (off-road) cycling infrastructure towards the south and south east parts, as shown in Figure 5.13 below. The first cycle track is part of the Tolka Valley Park, and its alignment runs immediately inside the DSA boundary for ca. 900 metres before terminating at Dunsinea Lane. The other cycle track runs along the Royal Canal from Ashtown Train Station in the east to M50/ N3 Junction 6 in the west for a length of ca. 2.2 kilometres.

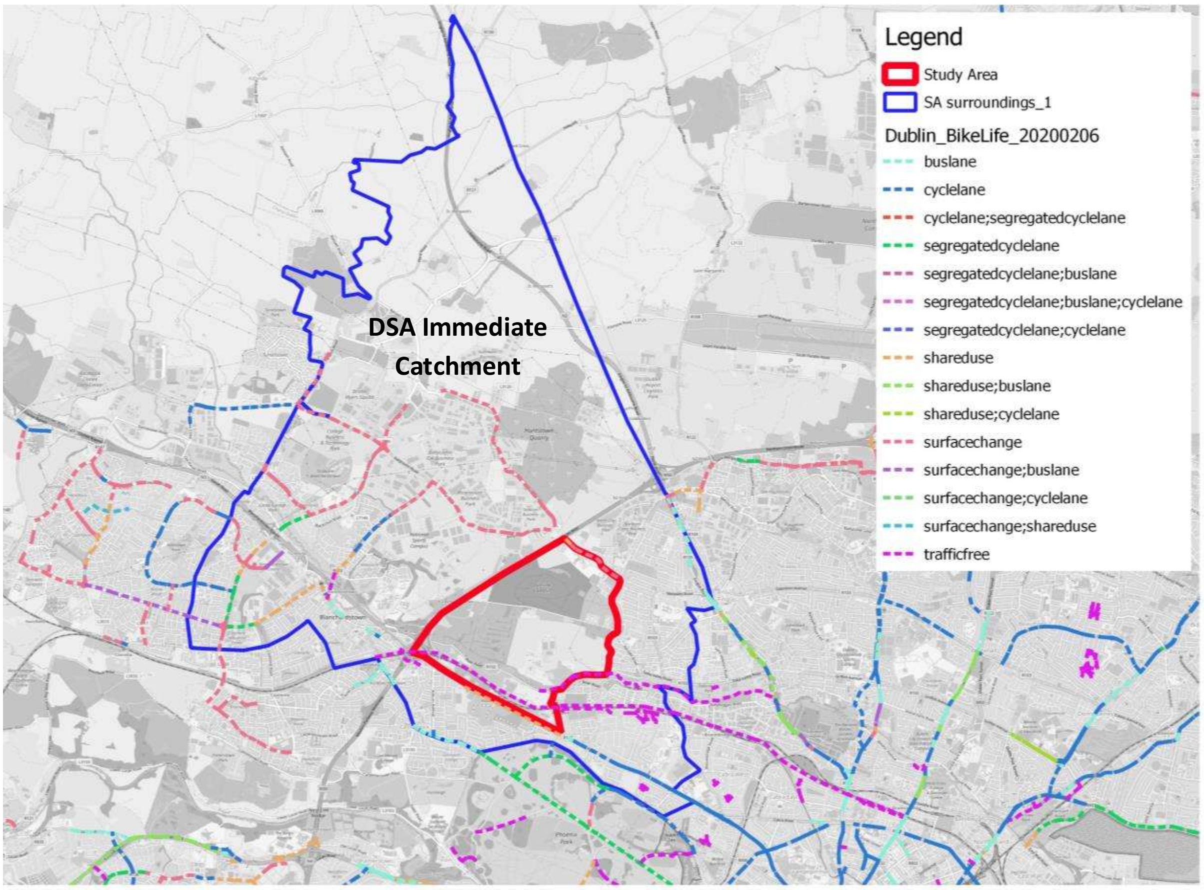
Figure 5.13 Existing Cycling Infrastructure within DSA Lands



These cycle tracks offer good connectivity from the south to the eastern parts of the DSA however do not in themselves offer connectivity to the rest of the lands. The DSA lands currently lack comprehensive cycling infrastructure and there appears to be good scope for integrated cycling infrastructure providing sustainable access to the public transport facilities (bus and rail) which are also concentrated towards the south and southeast of the lands.

The following Figure 5.14 illustrates existing cycling infrastructure within the DSA lands' vicinity.

Figure 5.14 Existing Cycling Infrastructure within DSA Immediate Catchment



As can be seen from the preceding figure, the DSA Immediate Catchment contains a range of a cycling infrastructure types, varying from bus lanes to segregated cycle tracks.

Walking

The existing walking infrastructure within the DSA lands is very limited and does not provide direct connectivity within the different parts of the lands. Within the DSA Immediate Catchment, footpaths are generally provided along roads within the urban in accordance with best practice, however significant permeability barriers exist as is evidenced by accessibility analysis contained within Figure 5.16 and Figure 5.17.

Famine Heritage Trail

Ireland's official Famine Heritage Trail is an adventurous 165 kilometres long cross-country pilgrim walk layered with history, art and culture. It weaves through country lanes, villages, towns and Dublin City, mostly along the banks of the Royal Canal. The route criss-crosses the Royal Canal and a part of the trail falls within the DSA lands close to its starting point in Dublin.

Ashtown Lock within the DSA lands falls on the trail and offers good potential to integrate the development on these lands with heritage walking routes. The following Figure 5.15 shows the part of the Famine Heritage Trail crossing through the DSA lands and their surrounds.

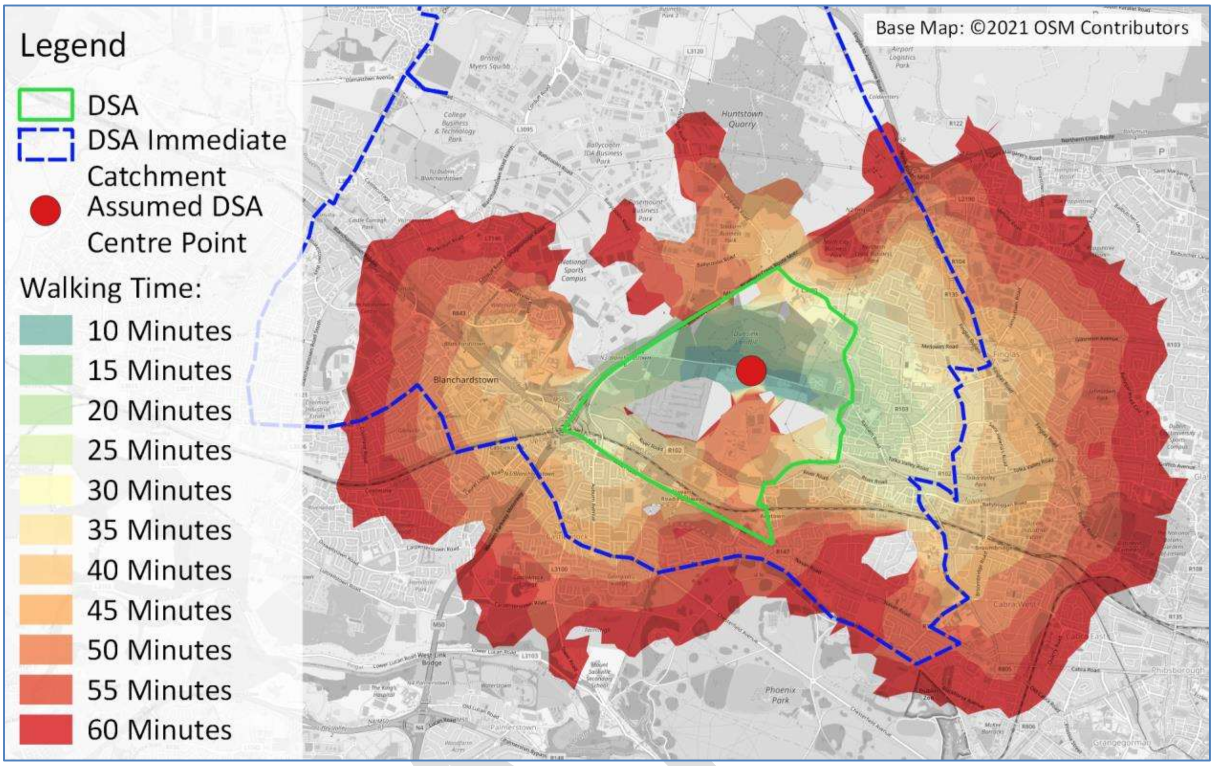
Figure 5.15 Section of Famine Heritage Trail Passing through DSA Lands

Study Area Accessibility by Active Travel Modes

Walking Accessibility Analysis

The DSA lands' accessibility by walking has been assessed by means of an isochrone analysis using GIS software. In doing so, walking catchments from the centre of the DSA lands have been generated for travel times up to 60 minutes at an adult's typical walking speed of 5 km/ h. The generated isochrone map is presented in Figure 5.16 (overleaf). The analysis is noted to have been undertaken under the assumption of permeability along the entire length of Dunsink Lane, which is understood to once have been a thoroughfare, but to currently be blocked. The results of the severance of this link across the DSA are discussed in the remainder of this subsection.

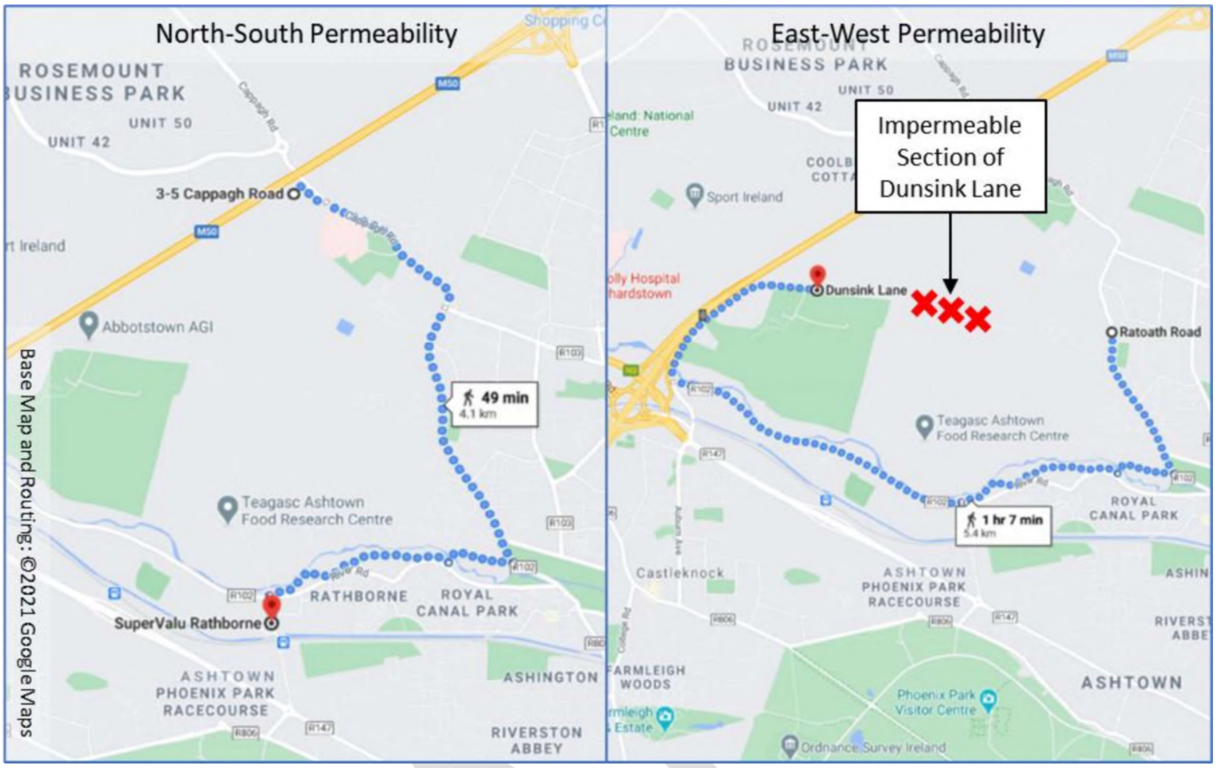
Figure 5.16 Walking Travel Time Isochrones



As can be seen from the preceding Figure 5.16, the area accessible within a 60 minutes' walk from the notional DSA centre point extends from the centre of the DSA lands to Glasnevin in the east, Cabra and Castleknock to the south, Blanchardstown and Coolmine to the west, and the N2/ M50 Interchange in the north. It is apparent from this graphic that the M50 represents a major permeability barrier in the area, with the Sport Ireland Campus and its environs close to or in excess of 60 minutes' walk from the assumed DSA Centre Point. Furthermore, permeability across the area along the east-west axis is affected by the severance of Dunsink Lane, which results in only highly circuitous alternative routes being available, as demonstrated in Figure 5.17 (overleaf).

As shown in the right-hand part of Figure 5.17, the current severance of Dunsink Lane link results in the shortest route between a point at Elmgreen Golf Club Entrance (in the west of the DSA) and the point on Ratoath Road (in the east of the DSA) measuring 5.4 kilometres, despite these points being located only ca. 1.8 kilometres apart along a straight line. In terms of north-south permeability, it is noted that as per the left-hand part of Figure 5.17, no road exists that would enable traversing the DSA lands directly. As a result, the shortest route between the two selected points, on Cappagh Road (in the north of the DSA) and at SuperValu Rathborne (in the south of the DSA) measures 4.1 kilometres, despite these points being located only ca. 2.2 kilometres apart along a straight line.

Figure 5.17 North-South and East-West Permeability Across the DSA

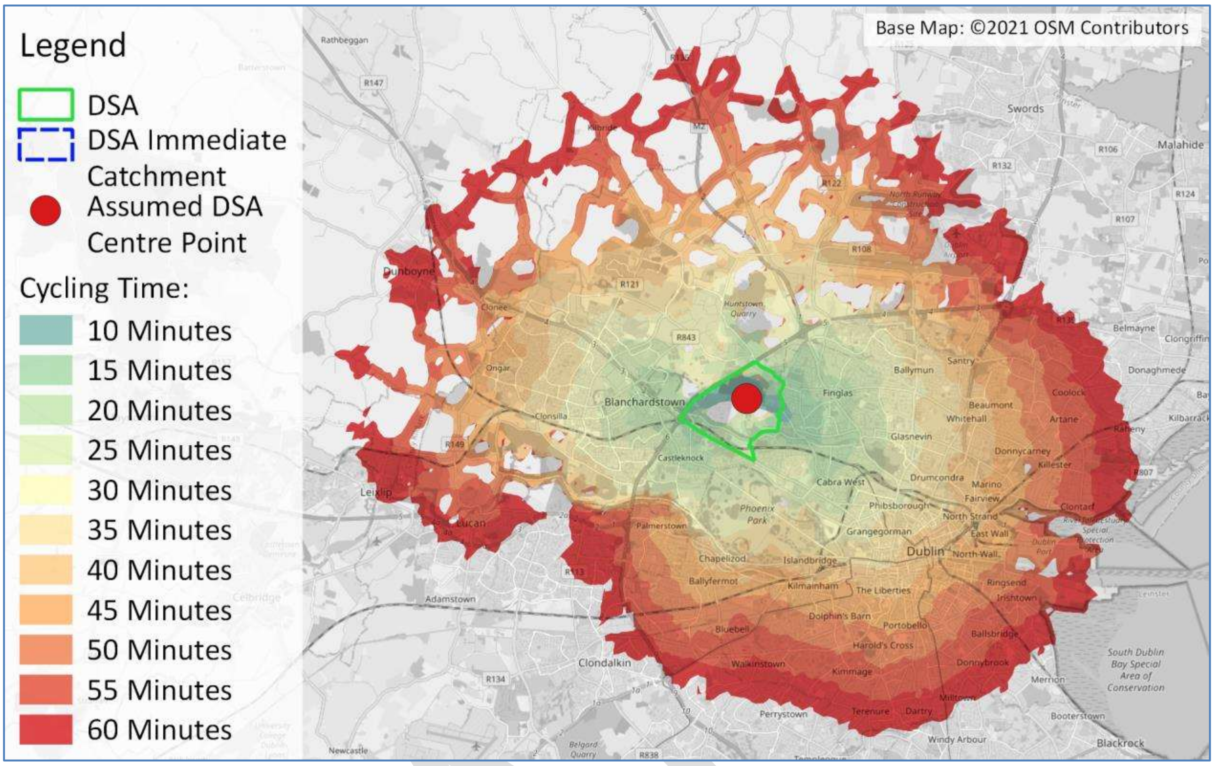


Cycling Accessibility Analysis

The DSA lands' accessibility by cycling has also been analysed by means of an isochrone analysis using GIS software. In doing so, cycling catchments of the site have been generated for travel times up to 60 minutes at a typical cycling speed of 14 km/ h. The generated isochrone map is presented in Figure 5.18 (overleaf). As per the walking analysis, this analysis is noted to have been undertaken under the assumption of permeability along the entire length of Dunsink Lane, which is understood to once have been a thoroughfare, but to currently be blocked. The implications of the severance of this link across the DSA discussed in the preceding subsection with respect to walking are noted to also apply to cycling, with a lack of direct east-west and north-south links across the DSA.

As can be seen from the preceding Figure 5.18, the area accessible within a 60 minutes' cycle, extends from the DSA lands to Clontarf and Sandymount in the east, Donnybrook and Terenure in the south, Leixlip and Dunboyne in the west, and Dublin Airport in the north. All of Dublin City Centre and Dublin's North and South Docklands are also within its cycling catchment. As with walking, the severance impact of the M50 in relation to permeability between the DSA lands and areas to the northwest of the M50 are noted.

Figure 5.18 Cycling Travel Time Isochrones

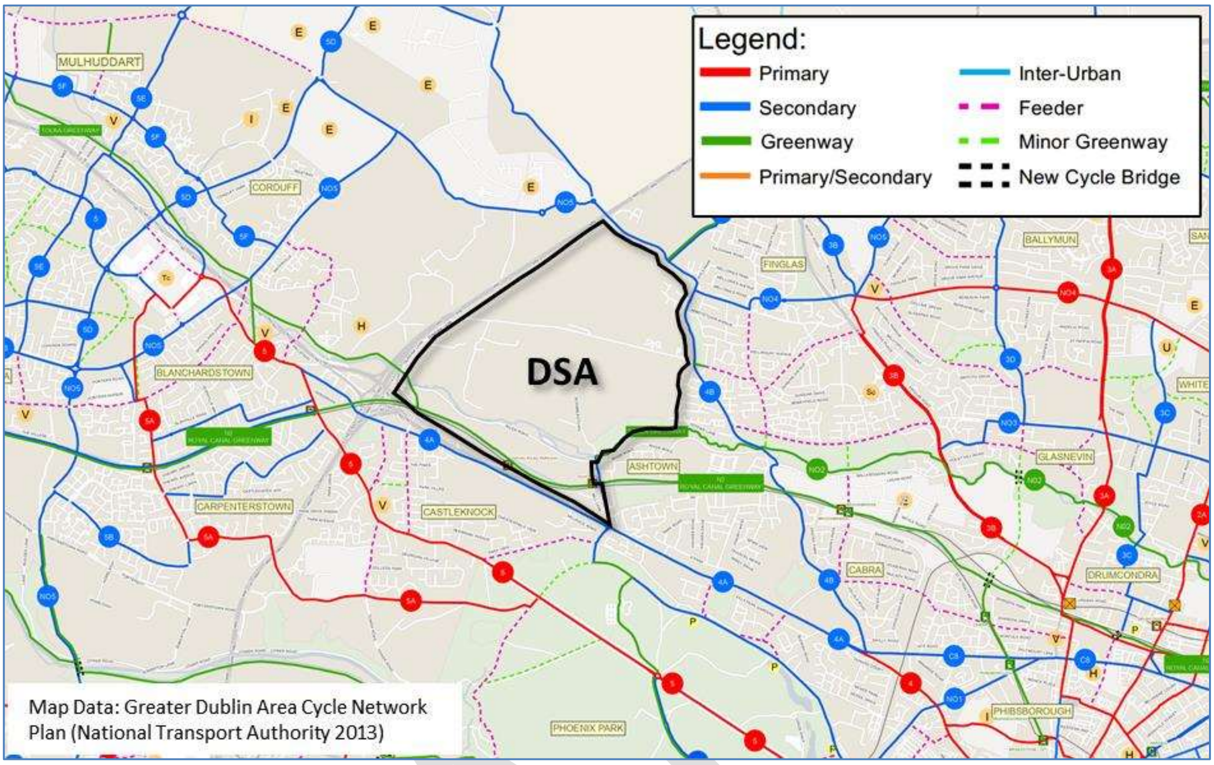


5.6 Proposed Active Modes Schemes

A number of cycling schemes are proposed within the GDA Cycle Network Plan (2013), with the completed network illustrated in Figure 5.19 (overleaf). These schemes have recently been endorsed and approved funding for implementation. Relevant schemes in close vicinity to DSA lands include:

- Royal Canal Cycle Route – entire Fingal route;
- Snugborough Road N3 overbridge;
- Damastown to Clonsilla Cycle Route incl. N3 bridge;
- Clonee to Blanchardstown Shopping Centre; and
- Snugborough Road – National Aquatic Centre to Ongar.

Figure 5.19 Proposed Cycle Network in DSA Lands' Vicinity



6. Existing Travel Patterns Analysis

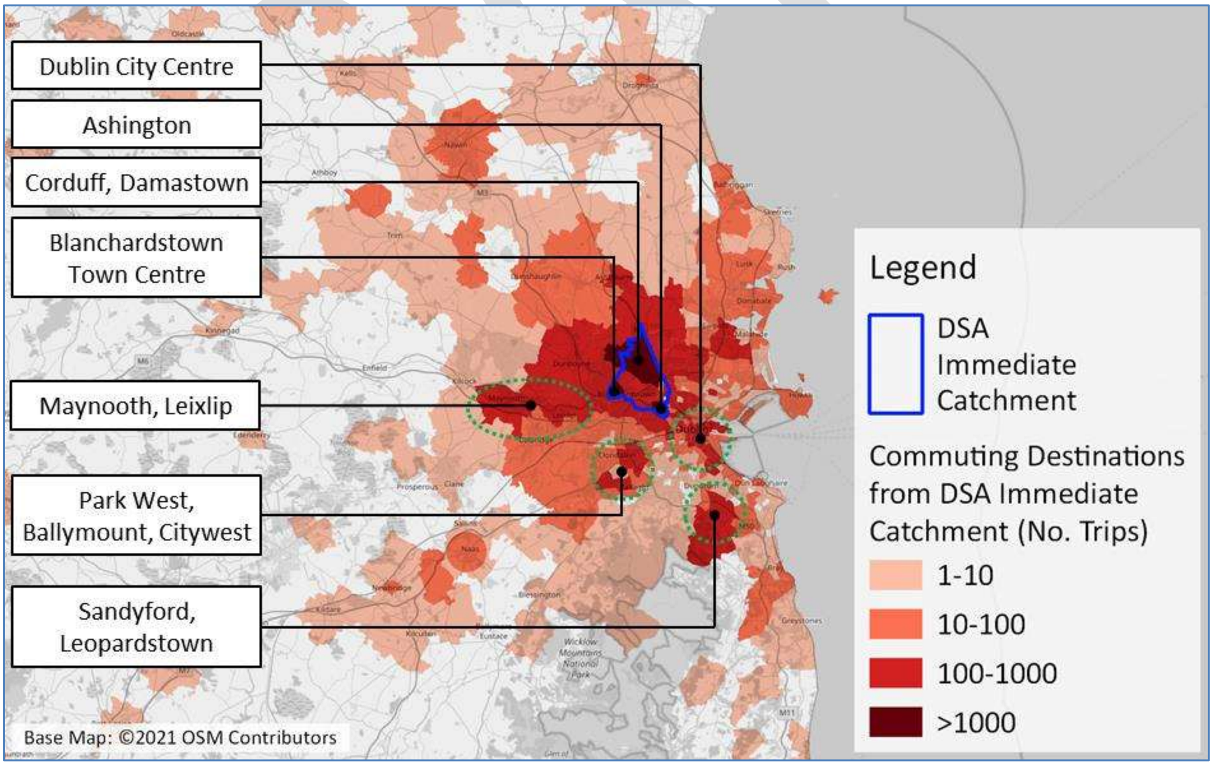
6.1 Introduction

This section of the Report presents analysis of CSO Census 2016 travel patterns analysis. Due to the largely undeveloped nature of the DSA lands at present, the focus of the analysis is both on the DSA and the larger DSA Immediate Catchment. The analysis has utilised a series of Census 2016 datasets, including workplace zonal data; and Place of Work, School or College Anonymised Records (POWSCAR). Analysis has included commuting destinations (for those resident in the DSA Immediate Catchment), commuting origins (for those working, learning, or studying in the DSA Immediate Catchment), and commuting mode shares both those residing in and those working, learning, or studying in the DSA Immediate Catchment.

6.2 DSA and Immediate Catchment – Resident Commuter Destination Patterns

The following Figure 6.1 presents the outputs of analysis of Census 2016 commuting data for residents of the DSA Immediate Catchment (incl. the DSA lands), illustrating their destinations. POWSCAR data has been utilised as the basis for this analysis, with data available and analysed at an Electoral Division level.

Figure 6.1 Resident Commuting Destinations



As can be seen from the preceding Figure 6.1, the northwest part of the catchment area represents an important destination of residents, with this area corresponding to major employment areas in Corduff and Damastown. Blanchardstown Town Centre and Ashington also represent important employment centres for residents of the analysed area. Outside the DSA Immediate catchment, notable commuting destinations include the City Centre, Sandyford/ Leopardstown and Maynooth/ Leixlip areas.

6.3 DSA and Immediate Catchment – Resident Commuting Mode Share

In analysing the commuting mode share of residents within the DSA Immediate Catchment (incl. the DSA lands), travel by the following modes has been considered – active modes (walking and cycling), public transport and private car. Data has been analysed at the most granular level possible, i.e. for Small Areas. The following Figures 6.2-6.4 presents the mode share of residents within the DSA and Immediate Catchment for each respective means of travel.

Figure 6.2 Resident Active Mode Share

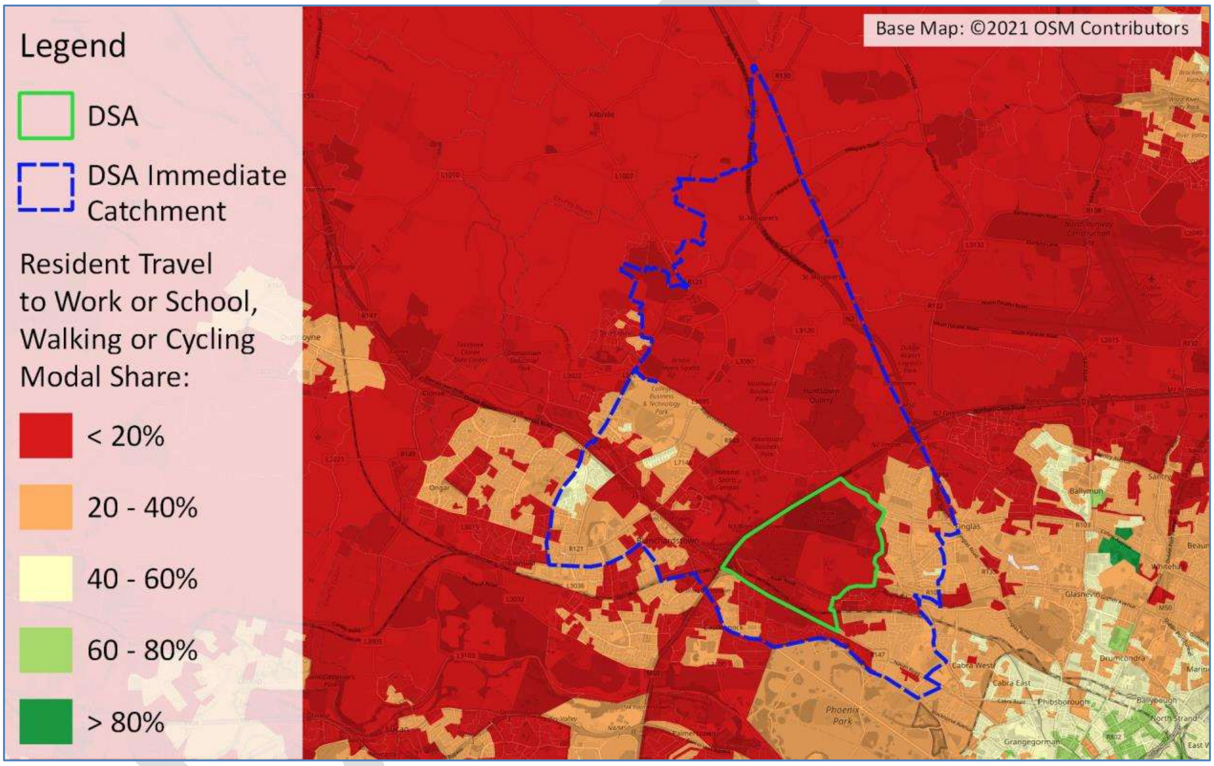


Figure 6.3 Resident Public Transport Mode Share

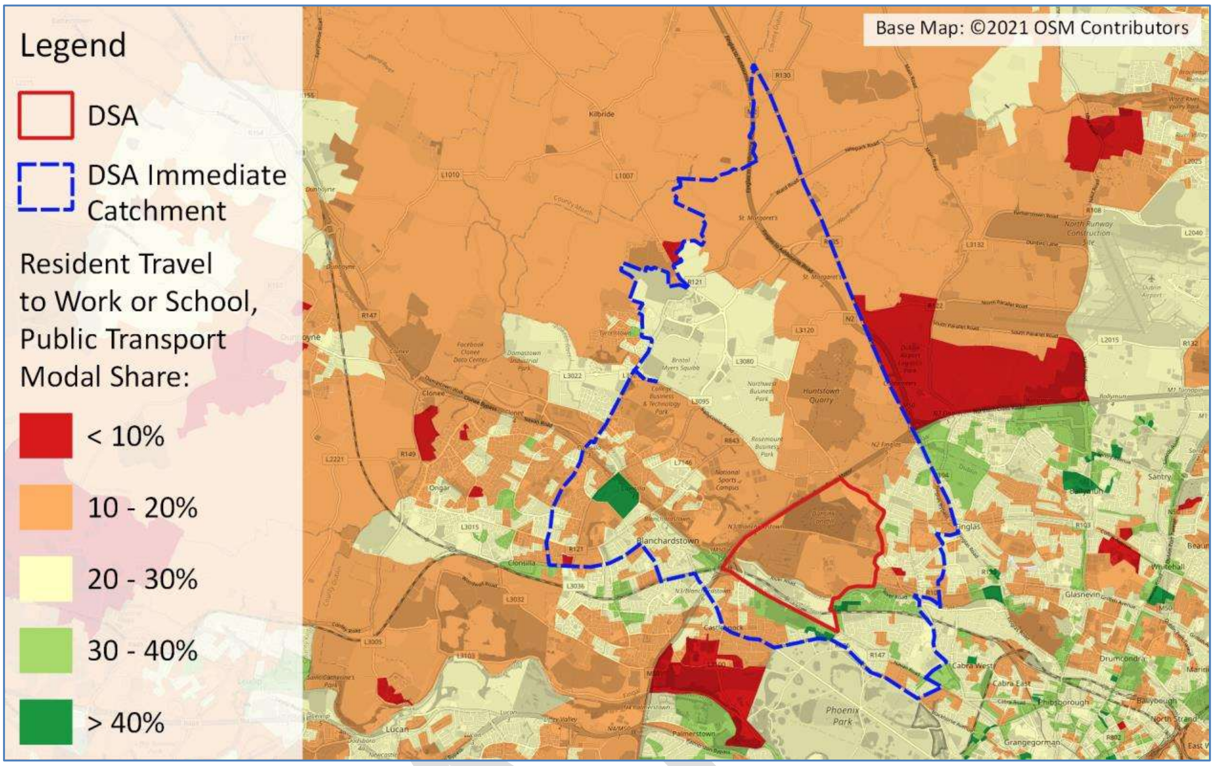
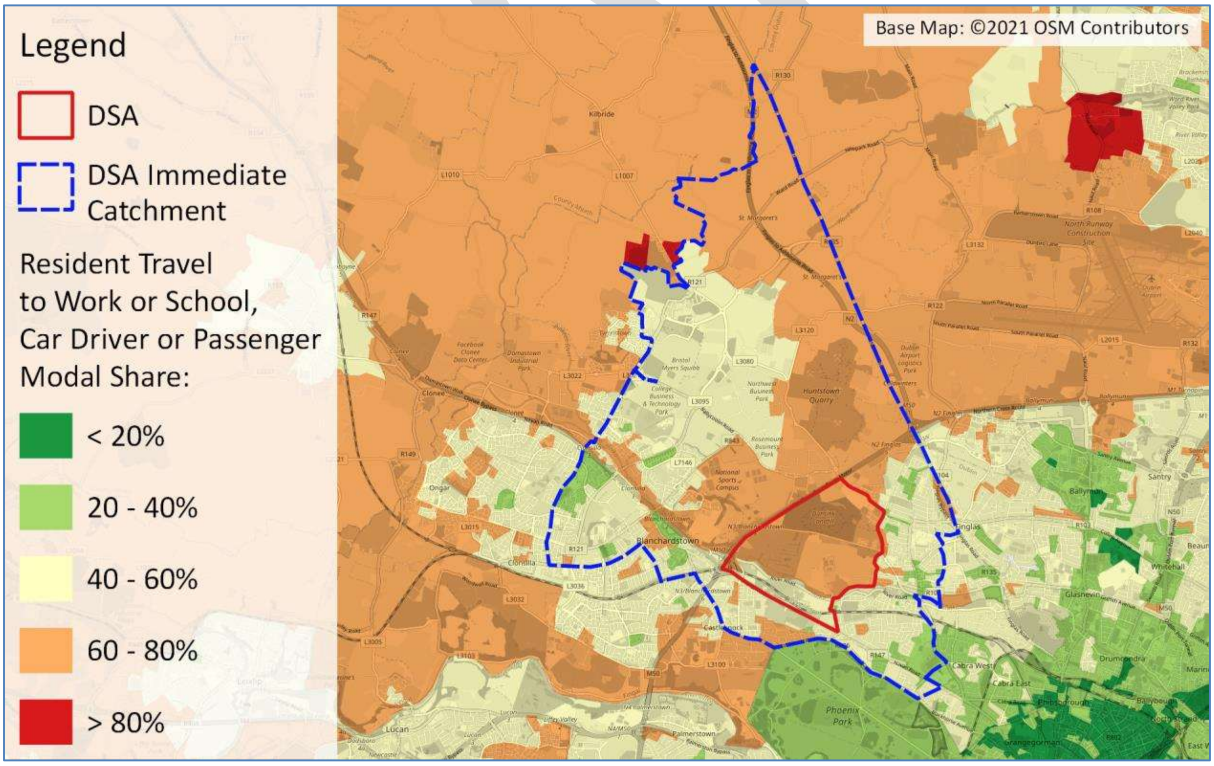


Figure 6.4 Resident Private Car Mode Share



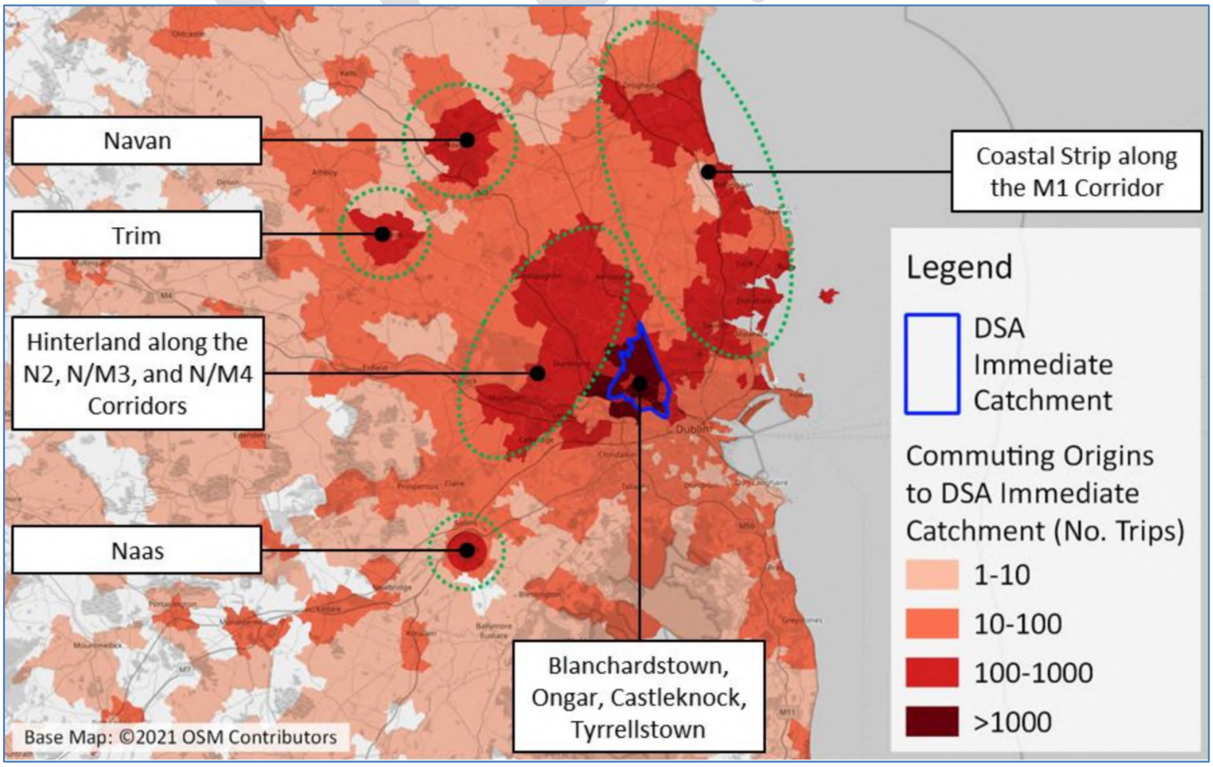
The findings of analysis contained within the preceding figures can be summarised as follows:

- **Active modes**: Low levels of active modes' use among residents of both the DSA (< 20%) and the DSA Immediate Catchment (typically <20%, with a few areas 20-40% and four small areas with higher mode shares).
- **Public transport**: Low public transport mode share among residents of most of the DSA (10-20%), increasing to 20-30% in the southwest part, which corresponds to bus and rail service provision. Within the DSA Immediate Catchment, the resident mode share is typically in the 10-30% range, with small pockets having a 30-40% and >40% public transport mode shares.
- **Private car**: The resident car mode share typically varies between 40% and 80% throughout both the DSA and the DSA Immediate Catchment. Within the DSA, the private car mode share is lowest (40-60%) in the southern part, corresponding to bus and rail service provision. Within the DSA Immediate Catchment, a few small pockets of 20-40% resident mode share are also evident, notably in the southwest part.

6.4 DSA and Immediate Catchment – Employee and Student Commuter Origin Patterns

The following Figure 6.5 presents the outputs of analysis of Census 2016 commuting data for those commuting to the DSA Immediate Catchment (incl. the DSA lands) for work or education purposes, illustrating their origins. POWSCAR data has been utilised as the basis for this analysis, with data available and analysed at an Electoral Division level.

Figure 6.5 Employee Commuting Destinations



As can be seen from the preceding Figure 6.5, a significant concentration of those working and learning within the DSA Immediate Catchment are resident within it, with significant further concentrations of trip origins located to the northwest, including the wider Dublin 15 area, Navan and Trim. Other notable concentrations include along the M1 and N/ M7 corridors.

6.5 DSA and Immediate Catchment – Employee and Student Commuting Mode Share

In analysing the commuting mode share of those working, learning, or studying within the DSA Immediate Catchment (incl. the DSA lands), travel by the following modes has been considered – active modes (walking and cycling), public transport and private car. Data has been analysed at the most granular level possible, i.e. for Workplace Zones. The following Figures 6.6-6.8 presents the mode share of those working, learning, or studying within the DSA and Immediate Catchment for each respective means of travel.

Figure 6.6 Employee Active Mode Share

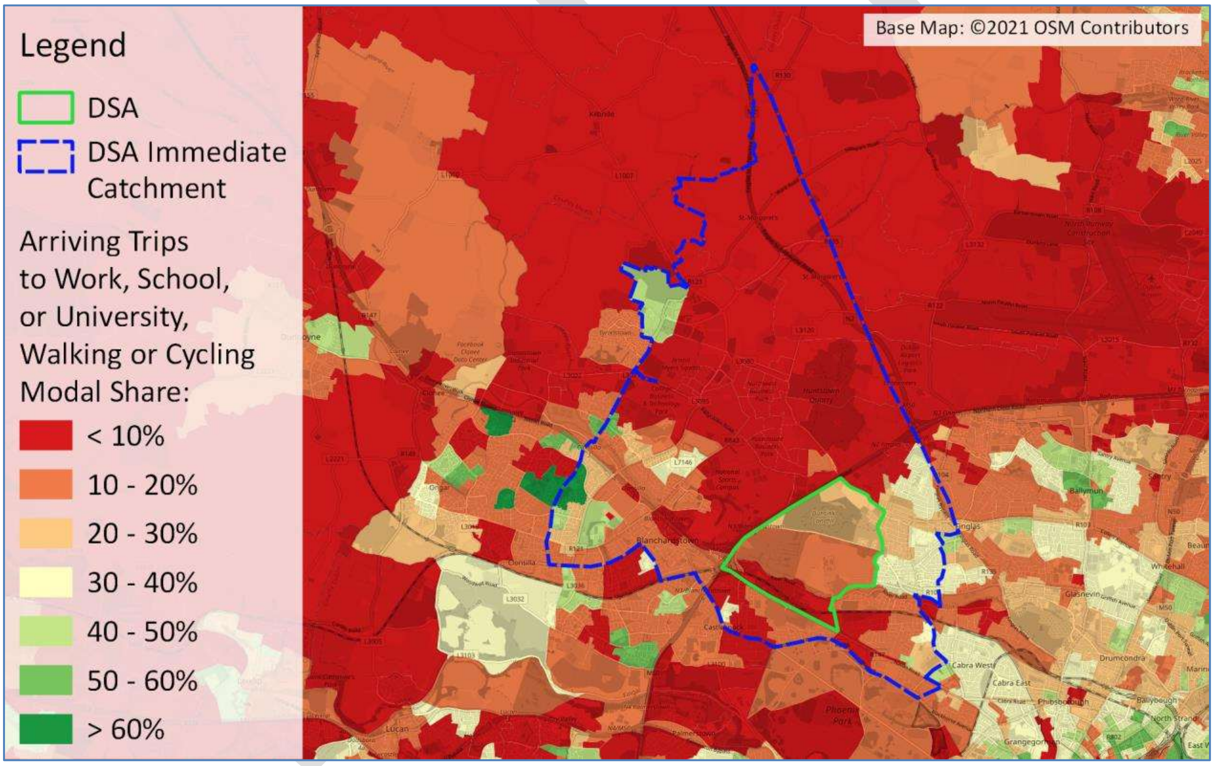


Figure 6.7 Employee Public Transport Mode Share

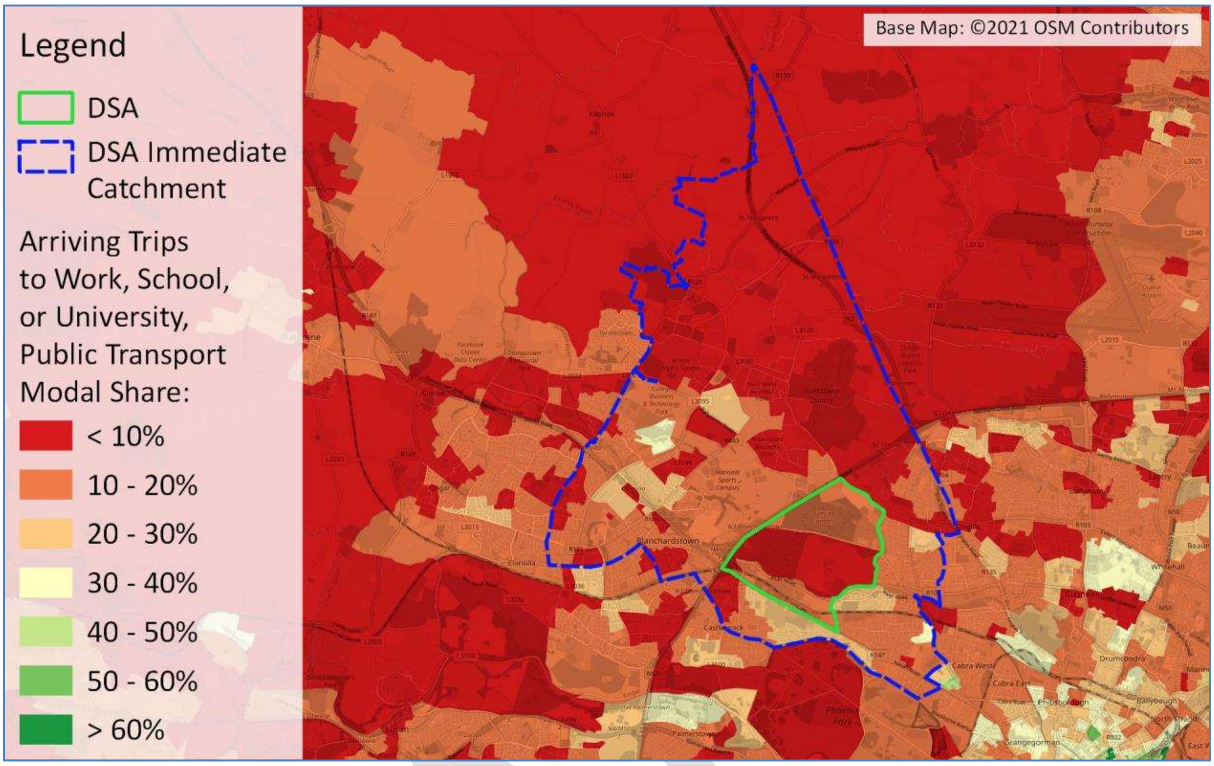
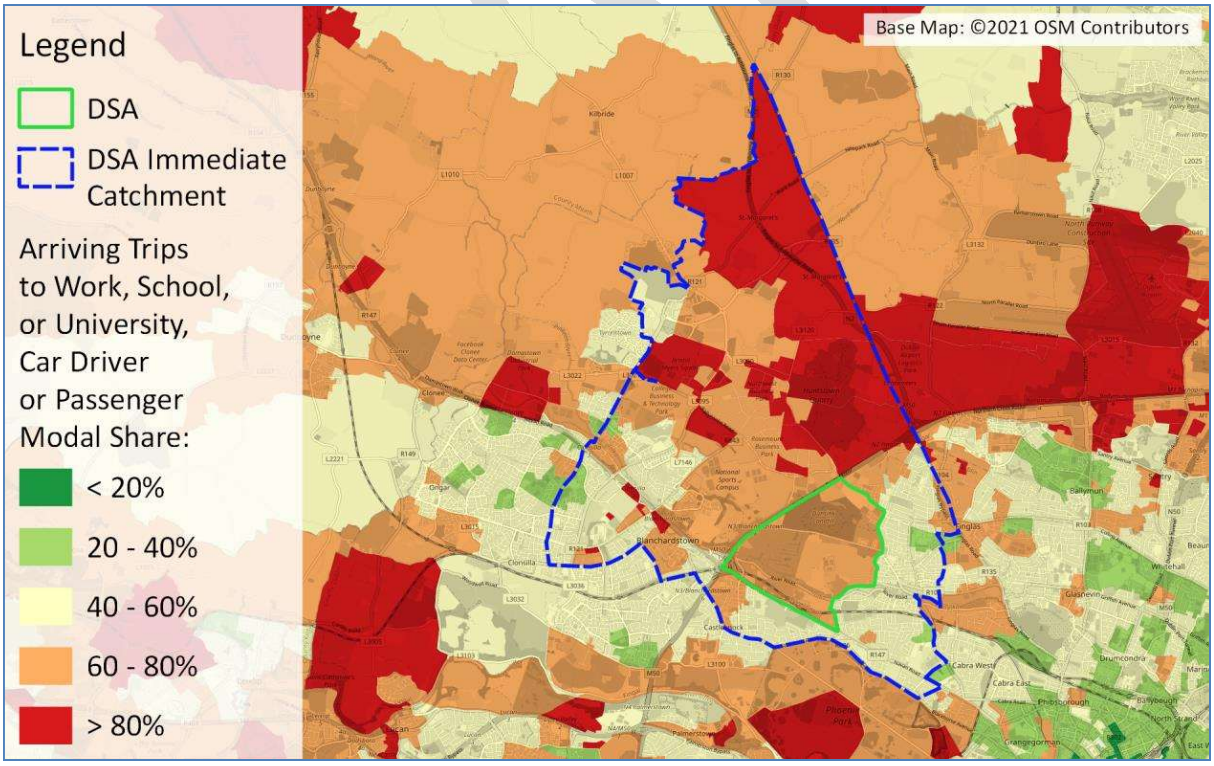


Figure 6.8 Employee Private Car Mode Share



The findings of analysis contained within the preceding figures can be summarised as follows:

- **Active modes**: Active modes' use among commuters to the DSA varying from 20-30% in the northern part to <10% in the south. Within the DSA Immediate Catchment, the mode share varies substantially, with the lowest levels recorded in the north and west, and the highest areas located to the east of the DSA and in the southwest part of the DSA Immediate Catchment, with >60% recorded in one area.

- **Public transport**: Within both the DSA and DSA Immediate Catchment, workers' public transport mode share is typically low (<20%), with a few small parts of the DSA Immediate Catchment recording a public transport mode share of 30-40%.
- **Private car**: The private car mode share among workers of the DSA is in the 60-80% range, whereas within the DSA Immediate Catchment, it varies substantially from south (typically 40-60%) to north (>80%).

7. Summary

7.1 Overview

This section of the Report summarises the 'Baseline Assessment of Study Area and the Surrounding Area', which has included an extensive and robust review of all relevant national, regional and local documents such as strategies, frameworks, plans, policy papers, past studies and standard guidance notes. The baseline transport conditions have also been analysed in detail to provide an understanding of opportunities and constraints in relation to the development of the DSA lands.

An extensive analysis of the DSA characteristics has been undertaken covering vital issues such as land and building uses, topographic and geographic features, major landmarks, physical transport infrastructure for public transport and active modes. The analysis of Census 2016 datasets (including POWSCAR) has enabled travel patterns and behaviours of direct relevance to the DSA to be determined, and has been particularly useful in identifying the potential for modal shift from private car to active and sustainable modes (walking, cycle and public transport).

7.2 Policy Review

- The DSA lands are largely undeveloped but identified in the current FDP via Objective BLANCHARDSTOWN 13 and in its Development Strategy for Blanchardstown as an objective to *'Promote lands at Dunsink as a longer-term strategic area suitable for mixed use development'*.
- DSA is identified in the RSES MASP as *'a major greenfield land bank with long term potential to develop a new district centre'*. Furthermore, it specifically references the DSA in stating that *"the proposed DART Underground and LUAS extensions to Finglas and Lucan subject to appraisal and delivery post 2027, will unlock long-term capacity including strategic landbanks such as Dunsink".*
- Local Objectives such as 129, 134, 135 and 136 contained within the FDP are located within and are directly relevant to the DSA. It also emphasizes provision of new Regional Park at Dunsink subject to Appropriate Assessment screening.
- Chapter 4 of RSES sets out the settlement strategy with the DSA lands falling within Dublin City and Suburbs where the Strategy seeks to *"support the consolidation and re-intensification of infill/brownfield sites to provide high density and people intensive uses within the existing built up area and ensure that the development of future development areas is coordinated with the delivery of key water and public transport infrastructure".*
- The current TSGDA envisages that the Maynooth Rail Line, which serves the DSA lands via both the Navan Road Parkway Station and Ashtown Station, will be enhanced under the DART+ Programme in the form of the DART+ West Project. In doing so, capacity on the Maynooth Rail Line is due to increase from ca. 4,500 to 13,750 pphpd. Furthermore, an extension to the Luas

Green Line from Broombridge to Finglas is proposed, however the DSA lands are noted to be outside the immediate (walking) catchment of its alignment.

- The DSA lands could directly benefit from the proposal to implement a radial CBC between the City Centre, Finglas, and Corduff via Ballycoolin; in addition to an orbital CBC from Kilbarrack to Blanchardstown via Ballycoolin. Opportunities also exist for transfer to services operating along the proposed Luas Finglas project via planned new bus services emerging from the New Dublin Area Bus Network which pass by the DSA lands.

7.3 DSA Lands

- The DSA lands have been subdivided into six distinct parts with respect to the current land use. The Northern Fringe with Travellers' Halting Site, the National Orthopaedic Hospital, New Cross College, and low-density residential development on Dunsoghly Drive. The Northern Section mainly comprises the former Dunsink Landfill, St. Joseph's Halting Site and Dunsink Horse Club. The South-Western Section mainly comprises Elmgreen Golf Course and the Elm Green Nursing Home. The South-Eastern Section is largely undeveloped, however also contains the Dunsink Observatory, Phoenix Football Club's pitches and Teagasc Ashtown Food Research Centre. The Tolka River Strip forms a narrow section of land with several residential properties, the Coolmine Rugby Club and Ger Conroy Fitness Castleknock, and the Ashtown Dog Pound. The Navan Road Strip forms a narrow section of land with the Travelodge Dublin Phoenix Park Hotel, Morgan Place, a filling station, the Navan Road Parkway railway station, and several commercial/ retail properties.
- The GeoDirectory data indicates that the DSA has 356 no. Residential entities that are mainly concentrated towards the northeast. There are 66 no. Commercial entities, most notably within the Ashtown Industrial area, Ashtown Food Research Centre, Coolmine Rugby club, Travelodge Dublin Phoenix Park, Elmgreen Golf Club and National Orthopaedic Hospital. It also has 4 no. premises marked as Both along the R102 Ratoath Road – Ashtown House, Ashbrook Lodge and River Road Cottages.
- As per Census 2016, the population and employment levels within the DSA lands are roughly equal, with a total of 1,547 residents and 1,570 daytime workers recorded. The low resident and worker populations of the lands reflect their largely undeveloped nature.

7.4 DSA Immediate Catchment

- The characteristics of the DSA Immediate Catchment has a bearing on the development potential of the DSA lands, with the boundary of this area arrived at on the basis of adjacent Electoral Divisions (ED) and Census Small Area (CSA) boundaries.

- The GeoDirectory data indicates that the DSA Immediate Catchment has 12,200 no. Residential entities in predominantly low density settlements within Castleknock and Blanchardstown. It also has 2,215 no. Commercial entities that are mainly concentrated in Blanchardstown Town Centre, Coolmine Industrial Estate, Rosemount and Northwest Business Parks and North Park Industrial Estate offering ample employment opportunities. At least 345 no. premises are marked as Both that are scattered throughout the DSA Immediate Catchment and implies prevalent mixed land use.
- The DSA's local environs (within the 2.5-kilometre distance band) have a relatively low population, including in particular the Sport Ireland Campus to the north and Phoenix Park to the south. At a strategic level, the DSA lands are located ca. 7 kilometres (straight line distance) from Dublin City Centre (measured from the centre of the lands to O'Connell Bridge). The majority of Dublin City is within a 12.5-kilometre distance.

7.5 DSA Connectivity

- The DSA lands are connected and served by road via the M50 motorway, national roads such as N3, N2 and regional roads including the R147 Navan Road and R102 Ratoath Road.
- The lands are also connected by a variety of bus routes served via several bus stops located on adjoining roads (R147 Navan Road and Cappagh Road). Services operating along the R147 Navan Road offer a cumulative high frequency, with headways of under 3 minutes in the AM peak.
- The Maynooth Rail Line accommodates both commuter and inter-city routes with two train stations (Navan Road Parkway and Ashtown) located along the southern and south-eastern boundaries – both are served by commuter rail services.
- Enhancements to bus and rail forming part of the overall BusConnects and DART+ Programmes will further enhance the DSA lands' public transport accessibility attributes.
- GDA Cycle Network Plan schemes such as Tolka Greenway and Royal Canal Greenway pass through the DSA lands and will link to a network of primary, secondary and feeder routes, and present a significant opportunity for connecting to the city-wide cycle network.

7.6 DSA and Immediate Catchment Travel Patterns

- The northwest part of the DSA Immediate Catchment (Corduff and Damastown) represents an important employment destination for residents of this area. Blanchardstown Town Centre and Ashington also represent important employment centres for residents of the analysed area. The City Centre, Sandyford/ Leopardstown and Maynooth/ Leixlip areas are also important employment destinations located further afield.
- An analysis of Census 2016 data has identified low levels of active modes' use among residents of both the DSA (< 20%) and the DSA Immediate Catchment (typically 0-20%, with a few areas 20-

40% and four small areas with higher mode shares). Low public transport mode share among residents of most of the DSA (10-20%) has also been identified, increasing to 20-30% in the southwest part, which corresponds to bus and rail service provision. Within the DSA Immediate Catchment, the resident public transport mode share is typically in the 10-30% range, with small pockets having a 30-40% and > 40% mode shares. The resident car mode share typically varies between 40% and 80% throughout both the DSA and the DSA Immediate Catchment. Within the DSA, the private car mode share is lowest (40-60%) in the southern part, corresponding to bus and rail service provision. Within the DSA Immediate Catchment, a few small pockets of 20-40% resident mode share are also evident, notably in the southwest part.

- A significant concentration of those working and learning within the DSA Immediate Catchment (incl. DSA lands) are resident within it, with significant further concentrations of trip origins located to the northwest, including the wider Dublin 15 area, Navan and Trim. Other notable concentrations include along the M1 and N/ M7 corridors.
- Active modes' use among commuters to the DSA varying from 20-30% in the northern part to <10% in the south. Within the DSA Immediate Catchment, the mode share varies substantially, with the lowest levels recorded in the north and west, and the highest areas located to the east of the DSA and in the southwest part of the DSA Immediate Catchment, with >60% recorded in one area. Within both the DSA and DSA Immediate Catchment, workers' public transport mode share is typically low (<20%), with a few small parts of the DSA Immediate Catchment recording a public transport mode share of 30-40%. The private car mode share among workers of the DSA is in the 60-80% range, whereas within the DSA Immediate Catchment, it varies substantially from south (typically 40-60%) to north (>80%).

7.7 Identified Physical Constraints

There are several physical constraints which will affect the nature scale and location of future development within the DSA. These physical characteristics and constraints are unlikely to alter during the planning and development timeframe. They can be summarized as follows:

- **Dunsink Former Landfill**: The facility is in its aftercare phase and is governed by a Closure, Restoration and Aftercare Management Plan (CRAMP) as part of the waste licence issued by the EPA (Ref: W0127-01). There is an extensive system of gas and leachate monitoring and management on and around the site. While the duration of the CRAMP will be confirmed upon review of the document when furnished by Fingal County Council, the contaminated nature of the land and the slope of the landfill appear to represent significant challenges to any form of development on, or immediately, adjacent to the facility.

- **Road, Rail and Canal Infrastructure**: The M50, R147 Navan Road, Maynooth Rail Line and Royal Canal all present opportunities to support development of the area, both through the provision of road and public transport infrastructure, in addition to the amenity value of the Canal. However, they also represent physical barriers which need to be overcome in relation to the integration of any development on the DSA lands with other parts of the urban area.
- **Sensitive Landscape**: The southern part of the study area, excluding the Navan Road Strip, is characterized in the current FDP as a *"highly sensitive landscape"*. The topography and the rising nature of land from the Tolka Valley up to the Dunsink Observatory and former landfill is also noted. This does not prohibit development, but the nature and scale will have regard to the landscape and parkland setting in the South-Eastern and South-Western Sections.
- **Tolka Valley**: This is a riparian corridor, which is prone to flooding. However, the flood zone is relatively narrow. The valley can ultimately be utilized as an amenity asset in any urban development.
- **M50 Corridor**: Noise, air and other pollutants associated with the M50 will impact upon the development potential along the western edge of the DSA.
- **Cultural Heritage:** There are a number of protected structures within the DSA, however these are limited in number and typically focused within Tokla Valley and in peripheral parts of the lands. The full extent of historical landscape setting around the Dunsink Observatory will need to be defined. There are two recorded monuments within the DSA, and the full extent of any archaeological heritage would have to be reviewed.
- **Existing Urban Development:** Urban development along the northern fringe in the form of the National Orthopaedic Hospital, New Cross College and Dunshoghly housing estate are well established urban uses that are likely to be consolidated rather than redeveloped.
- **Other Dispersed Development:** There are one-off houses, sports clubs and other facilities, which may present a challenge to comprehensive development, particularly in the short-term.
- **Ecology and biodiversity**: The principle ecological designation is the Proposed Natural Heritage Area covering the Royal Canal. There are no other sensitive ecological designations. However, riparian ecology, wildlife corridors and trees will all have to be taken into account in the detailed planning of the development of the area.

7.8 Identified Transport Constraints

There are several transport constraints which will affect the nature scale and location of future development within the study area. These can be summarised as follows:

- **Public Transport Accessibility**: The Maynooth Rail Line passes through the DSA lands, and will be upgraded as part of the DART+ West Project. The local area is served by 2 no. stations (Navan

Road Parkway and Ashtown) located along the southern and south-eastern boundaries. Due to the scale of the DSA lands and absence of connections over the Royal Canal, a significant proportion of the overall lands are outside the walking catchment of these stations. Furthermore, high frequency bus services operate along the R147 Navan Road, access to these services from much of the DSA is poor. Bus services operating along Cappagh Road to the north are noted to operate at lower headways.

- **Active Modes Accessibility**: GIS accessibility analysis for walking and cycling has identified that key built and natural barriers exist within the DSA and its immediate environs that currently limit the potential of both modes. The M50, which adjoins the DSA lands' north-western boundary, is noted to represent a particular sustainable transport permeability barrier in the local area.
- **Roads Access**: National roads policy would appear to limit opportunities to provide a new direct access from the M50 motorways to the DSA lands, notwithstanding the lands' bounding its alignment. The existing road network surrounding the DSA, particularly to the north and east has limited capacity to accommodate significant additional traffic volumes. With the exception of Dunsink Lane, the R147 Navan Road to the south is currently otherwise severed from the DSA lands by the Maynooth Rail Line and Royal Canal.

Appendix A Key Internal and External Roads

Key Internal Roads

Dunsink Lane

Dunsink Lane is a two-way local road which exists with the study area. Beginning in the southwest of the study area at the 3-arm Dunsink Lane/ River Road (R102)/ New River Road (R102) yield-controlled junction, the alignment of Dunsink Lane takes it northwards, approximately following the alignment of the M50 motorway on its eastern side before turning east and approximately bisecting the study area. This section of Dunsink Lane is in relatively good condition and provides access to Elm Green Nursing Home, Elmgreen Golf Club, an above-ground gas installation and Dunsink Observatory. To the immediate east of the vehicular access to the grounds of Dunsink Observatory, the road is blocked by means of a concrete barrier. A further concrete barrier blocks Dunsink Lane to the east meaning that this ca. 660 metres stetch of Dunsink Lane is inaccessible and appears overgrown.

The vehicular carriageway is ca. 7.7 metres wide between the 3-arm Dunsink Lane/ River Road (R102)/ New River Road (R102) yield-controlled junction and the vehicular access to Elmgreen Gold Club. Along this stetch of road there is a single vehicular lane in each direction which are divided by a continuous white centreline, which is nearly completely faded in some locations. Along this section of road there is a ca. 1.3-metre-wide footpath provided on the eastern side of the carriageway only. The section of Dunsink Lane between the access to Elmgreen Golf Club and the point at which the road appears blocked, and is narrower with a total carriageway width of ca. 4.5 metres. No pedestrian infrastructure is provided along this stretch of road. Public lighting is present in the vicinity of the 3-arm Dunsink Lane/ River Road (R102)/ New River Road (R102) yield-controlled junction only. The speed limit on this section of Dunsink Lane appears to be 60 km/h as inferred from speed limit signage on adjacent roads.

In terms of vertical alignment, Dunsink Lane gradually slopes upwards as it heads towards Dunsink Observatory from the direction of Navan Road. In terms of horizontal alignment, the section of Dunsink Lane which follows the alignment of the M50 on its eastern side incorporates a gradual bend before turning eastwards.

Figure A.1 Dunsink Lane

The eastern section of Dunsink Lane is a two-way local road which runs from the 3-arm Ratoath Road/ Dunsink Lane priority-controlled junction at its eastern end to the abovementioned concrete barrier at its western end. The primary purpose of this section of Dunsink Lane appears to be to accommodate access to the St. Mary's Avenue West Traveller Accommodation site. Street level mapping at this location is limited to the easternmost section of the road only. At this location, it is noted that Dunsink Lane is in relatively poor condition when compared to the western section of the road. No pedestrian infrastructure, public lighting or speed limit signage is present. The alignment of this section of Dunsink align appears relatively straight, while also sloping upwards from east to west.

R102 River Road

River Road (R102) is a two-way regional road which runs from the 3-arm Dunsink Lane/ River Road (R102)/ New River Road (R102) yield-controlled junction at its western end to the 3-arm Ratoath Road/ River Road stop-controlled junction at its eastern end. The road is characterised by its almost rural nature with much of the adjacent land being undeveloped and by its alignment which follows the Tolka River. At its eastern end, River Road provides access to the Rathborne residential area. Approximately mid-way along its length the River Road meets Dunsinea Lane and Ashtown Road at a 4-arm stop controlled junction, with River Road forming the major arms of the junction and having priority over the other arms. River Road also provides access to commercial facilities such Ashton Dog Pound, Dublin Grass Machinery, Ger Conroy Fitness Castleknock gym and Coolmine Rugby Club.

The vehicular carriageway is ca. 6.0 - 6.6 in width with a single vehicular lane in each direction which are for the most part divided by a continuous white centreline, prohibiting overtaking. Along much of its length, the carriageway edge is delineated on both sides of the carriageway by broken yellow lines. Various traffic calming measures are include along the length of River Road including speed ramps, warning signage and slow road markings and signage.

Pedestrian infrastructure on River Road is limited. There is ca. 1.2-metre-wide footpaths at the eastern end of River Road on the northern side of the vehicular carriageway along with pedestrian crossing infrastructure which facilitates pedestrian access to a walkway on the southern side of the road, allowing access to the River Drive residential street. Further east along the road, there is pedestrian infrastructure on the southern side of River Road at the location of the Rathbourne apartments. These footpaths measure ca. 1.8 metres wide and connect the Rathbourne residential area to pedestrian infrastructure on Ashtown Road. At the eastern end of River Road there is a ca 1.0-metre-wide footpath on the northern side of the vehicular carriageway for a length of ca. 100 metres.

Figure A.2 River Road (R102)

In terms of vertical alignment, River Road slopes upwards as it heads west from Ratoath Road. It then incorporates a series of crests and sags before sloping downwards again towards the 3-arm Dunsink Lane/ River Road junction. In terms of horizontal alignment, River Road follows the course of the Tolka River for much of its length and therefore incorporates a series of meandering bends for much of its length.

The posted speed limit on River Road is 50km/h are its eastern end between Ratoath Road and the vicinity of Coolmine Rugby Club. At this location the speed limit increases to 60 km/h for the remainder of its length. Public lighting is provided primary where there is pedestrian infrastructure. The road centreline also incorporates "cats-eyes" along some its length in order to aid driver visibility at night.

R102 New River Road

New River Road is a two-way regional road with a single lane in each direction which runs from the 3-arm Dunsink Lane/ River Road (R102)/ New River Road (R102) yield-controlled junction at its northern end to the New River Road / Navan Road (N7 / R147) junction at its southern end, crossing the Royal Canal and Maynooth Railway Line. The vehicular carriageway is ca. 7.2 metres wide. There are no road markings present on New River Road save for in the vicinity of the New River Road / Navan Road junction where a continuous white centreline separates the traffic lanes.

Figure A.3 New River Road (R102)

In terms of vertical alignment, New River Road slopes upwards as it crosses the Royal Canal and Maynooth Railway Line before sloping downwards as it approaches the 3-arm Dunsink Lane/ River Road (R102)/ New River Road (R102) yield-controlled junction. In terms of horizontal alignment, New River Road incorporates two large bends along its length.

There is a pedestrian footpath along the length of the western side New River Road which typically measures 1.6 metres wide. Public lighting is also provided along the length of the road. The speed limit on New River Road is assumed to be 60 km/h judging by signage on adjacent roads.

Dunsinea Lane

Dunsinea Lane is a two-way local cul-de-sac road which runs in an approximately north-south direction from the 4-arm Dunsinea Lane/ River Road (R102)/ Ashtown Road stop-controlled junction at its southern end, terminating at a gated access road at its northern end in the vicinity of Phoenix Football Club. Dunsinea Lane gives access to local businesses such as Scribblestown Airsoft, Teageasc Ashtown Food Research Centre, two car dealerships and an auto services business, Phoenix Football Club and a number of residential dwellings.

The vehicular carriageway of Dunsinea Lane is ca. 5.0 metres at its southern end, narrowing to ca. 4.5 metres at its northern end. There are no road markings present on the road and there is no pedestrian infrastructure or public lighting present save for a short section of footpath at the southern end of Dunsinea Lane and for ca. 150 metres at the eastern boundary of the Teagasc facility. It is unclear whether this infrastructure is within the bounds of the Teagasc facility. There is no posted speed limit on Dunsinea Lane. The speed limit appears to be 50 km/h as inferred by speed limit signage on the adjacent roads at its southern end.

In terms of vertical alignment, Dunsinea Lane appears to slope upwards from north to south. In terms of horizontal alignment, the road incorporates a series of meandering bends, particularly at its southern end.

Figure A.4 Dunsinea Lane

Scribblestown Lane

Scribblestown Lane is a two-way local cul-de-sac road which runs in an approximately east-west direction from the 3-arm priority-controlled Scribblestown Lane/ Ratoath Road at its eastern end. The vehicular carriageway of Scribblestown Lane is ca. 3.0 metres wide and there are no road markings present on the road. The primary function of Scribblestown Lane appears to be to provide access to a private horse stable approximately midway along its length.

There are no pedestrian facilities or public lighting present on Scribblestown Lane.

Figure A.5 Scribblestown Lane

Dunsoughly Residential Area

The Dunsoughly residential area is a housing estate within the study area. This area is comprised of two storey semi-detached and terraced houses in a dendritic network of two-way local residential roads, typically of suburban Dublin. Vehicular and pedestrian access to the Dunsoughly residential area is accommodated by a single priority-controlled access junction from Ratoath Road.

Vehicular carriageway widths within the area are typically 6.5 to 7.0 metres wide with pedestrian infrastructure typically measuring 1.6 to 1.8 metres wide. Public lighting is also provided throughout the area. There is no posted speed limit within the area.

It should be noted that currently available mapping indicates that the Dunsoughly residential area is currently being expanded to its northwest and south with the construction of new houses and an expanded road network.

Figure A.6 Dunsoughly Residential Area

Mill Lane

Mill Lane is a two-way local cul-de-sac road which runs in an approximately north-south direction from the 3-arm priority-controlled Mill Lane/ Ashtown Road junction at its southern end to the vicinity of Ashtown Stables at its northern end. The vehicular carriageway of Mill Lane is ca. 4.0 metres wide and there are no road markings present on the road. The primary function of Mill Lane appears to be to provide access to the abovementioned Ashtown Stables, car dealerships and an electrical supply store.

There are pedestrian facilities on Mill Lane in the vicinity of the Mill Lane/ Ashtown Road junction. There is also no public lighting present on Mill Lane.

Figure A.7 Mill Lane

Morgan Place

Morgan place is a small residential cul-de-sac accessed via a left in/ left out junction directly from the Navan Road (R147). Morgan's Place incoporates 10 no. bungalow houses which are understood to be Traveller Accomodation. The vehicular carriageway width is ca. 6.0 metres and ca. 1.2 – 1.6 metre wide pedestrian footpaths and public lighting are also provided.

Figure A.8 Morgan Place

Key External Roads

M50

Figure A.9 M50 Motorway

R147 Navan Road

Navan Road (R147) is a two-way regional road which runs in an approximately northwest to southeast direction, connecting the N3/M50 junction (M50 junction 6) at its north-western end to the R805 Ratoath Road junction (i.e. the southern end of Ratoath Road) at its south-eastern end. The N3/M50 junction is located in the southwestern corner of the Study Area, whereas the R805 Ratoath Road junction is located ca. 2.5 kilometres to the southeast of the Study Area, with the R147 Navan Road/ Ashtown Road Junction located at the very southeastern tip of the Study Area. The Navan Road is a busy commuting thoroughfare for people accessing Dublin City from areas in northwest Dublin such as Blanchardstown and Castleknock and from the national road network via the M50 and N/M3. Navan Road can currently be accessed from the study area by New River Road and Ashtown Road. There is also an above-grade junction ca. 730 metres to the west of the New River Road/ Navan Road signalised junction which facilitates access to the Navan Road Parkway station car park.

On Navan Road, between the New River Road (R102) / Navan Road signalised junction and the aforementioned above-grade junction, there are 3 no. traffic lanes in each direction. At the above-grade junction, the outermost traffic lanes on each side of the vehicular carriageway become mandatory bus lanes. To the east of the above-grade junction, the vehicular carriageway narrows becoming 2 no. lanes wide on each side. On the northern side of the carriageway (eastbound), 1 no. mandatory bus lane and 1 no. general traffic lane is provided. This arrangement continues as far as 4 arm Ratoath (R805)/ Old Cabra Road (R805)/ Cabra Road (R147)/ Navan Road (R147) signalised junction, save for locations where the bus lane is discontinued to allow for general vehicle access to junctions and where lane dualling is provided to accommodate turning movements. On the southern side of the vehicular carriageway (westbound), 2 no. general traffic lanes are provided for the most part with the outermost lane intermittently provided as a mandatory bus lane.

Figure A.10 Navan Road (R147)

R805 Ashtown Road

Ashtown Road is two-way local road which runs from 4-arm Dunsinea Lane/ River Road (R102)/ Ashtown Road stop-controlled junction at its northern end to the 4-arm Ashtown Road/ Navan Road (R147)/ Castleknock Road roundabout junction at its southern end at its southern end. The road notably features a barrier-controlled railway level crossing of the Maynooth railway line to the immediate south of the point at which it crosses the Royal Canal.

The vehicular carriageway of Ashtown Road measures ca. 5.1 – 6.5 metres in width, being at its narrowest to the immediate south of the railway level crossing and is for the most part divided by a broken white centreline. Between the 4-arm Dunsinea Lane/ River Road (R102)/ Ashtown Road stop-controlled junction and the railway level crossing, Ashtown Road is characterised by its urban streetscape with ground floor commercial units facing the vehicular carriageway with apartment units above. The eastern side of the vehicular carriageway also includes on-street parallel car parking. Pedestrian footpaths measuring ca. 1.8 metres wide are also provided on both sides of the vehicular carriageway at this location.

Pedestrian movements are accommodated on the eastern side of the canal bridge only via a pedestrian bridge. At the level-crossing, pedestrian areas are delineated from the vehicular carriageway only by means of a solid white line. Between the level crossing and the junction between Ashtown Road and Mill Lane, located ca 230 metres to the south, there is a ca 1.7 metres wide pedestrian footpath provided on the eastern side of the Ashtown Road vehicular carriageway only. At this location, the character of the streetscape is less urban and is bordered on both sides by mature trees. Between Mill Lane and 4-arm Ashtown Road/ Navan Road (R147)/ Castleknock Road roundabout junction, pedestrian ca 1.8 metres wide footpaths are provided on both sides on the vehicular carriageway. Along the length of Ashtown Road, public lighting is generally provided on the eastern side of the carriageway only.

Figure A.11 Ashtown Road

Source: ©2021 Google Maps/ StreetView

R102 Ratoath Road

Ratoath Road runs from the 4-arm Ratoath Road (R805)/ Cabra Road (R147)/ Old Cabra Road (R805)/ Navan Road (R147) signalised junction at its southern end to the Ratoath/ Cappagh Road 3-arm signalised junction at its northern end in ana approximately north-south direction. Ratoath Road bounds the study area on its north-western side for a distance of ca. 0.7km and can be used to access the study area at 3 no. locations, namely Scribblestown Lane, Dunsink Lane and Dunsoghly Avenue.

In the vicinity of the study area, Ratoath Road serves as a distributor road and serves to accommodate vehicular and pedestrian access to adjacent residential areas. The vehicular carriageway is typically 7.0 metres wide and incorporates a single traffic lane in each direction which are for the most part divided by a broken white centreline.

Between Scribblestown Road and Rathvilly Road pedestrian footpaths are provided on the eastern side of the vehicular carriageway only, measuring ca. 2.8 metres wide. Between Rathvilly Road and Kilshane Road, pedestrian footpaths are provided on both sides of the carriageway, typically measuring 1.9 metres in width on both sides. There is no pedestrian infrastructure present between Westwood Road and Ratoath Avenue, a distance of ca. 520 metres. It is noted that this section of road which bounds the study area for the entirety of its length. To the north of Ratoath Avenue, pedestrian footpaths are provided on both the eastern and western side of the vehicular carriageway, typically measuring 4.0 and 1.3 metres wide respectively.

In terms of vertical alignment, the vehicular carriageway appears to gently slope upwards between Scribblestown Lane and Cappagh Road. In the vicinity of Dunsink Lane, there also appears to be a series of shall crests and sags within the road alignment. In terms of horizontal alignment, the southern end of the road between Scribblestown Lane and Dunsink Lane is relatively straight. Between Dunsink Lane and Ratoath Avenue, the carriageway incorporates a series of meandering bends before becoming relatively straight again between Ratoath Avenue and Cappagh Road.

The speed limit on Ratoath Road is understood to be 50 km/h. Public lighting is provided along both sides of the vehicular carriageway, save for between Westwood Road and Ratoath Avenue where it primarily only provided on the eastern side of the carriageway. No existing cycling infrastructure was identified on Ratoath Road in the vicinity of the subject site.

Figure A.12 Ratoath Road

Cappagh Road

Cappagh Road is a two-way local road which runs from Finglas Village at its eastern end to Northwest Business Park at its western end and bounds the study area on its north-eastern side for a distance of ca. 1.1 kilometres between Ratoath Road and the point at which Cappagh Road bridges over the M50 motorway. The vehicular carriageway incorporates a single vehicular lane in each direction which in the vicinity of the subject site are separated by a continuous white centreline.

The vehicular carriageway typically measures 6.1 metres wide and in the vicinity of the subject lands there are pedestrian footpaths provided on both sides, save for a distance of ca. 100 metres at the northern boundary of the study area. These footpaths measure between ca. 1.0 - 2.0 metres on the southern side of Cappagh Road and 1.2 – 3.4 metres on the northern side. In the vicinity of the subject lands, a ca. 1.7 metres wide off-road cycle track is provided adjacent to the footpath on the northern side of the road for a distance of ca. 680 metres. Public lighting is primarily provided on the northern side of the vehicular carriageway.

In terms of vertical alignment, Cappagh Road appears to be relatively flat. In terms of horizontal alignment, between Finglas Village and Ratoath Road, Cappagh Road is also relatively straight. Between Ratoath Road and the point at which Cappagh Road crosses the M50 motorway, the vehicular carriageway incorporates a series of meandering bends.

The posted speed limit on Cappagh Road is 50 km/h. There are also slow road markings and warning signage present on approach to New Ross College.

Figure A.13 Cappagh Road

Source: ©2021 Google Maps/ StreetView

Appendix 2 Land Parcels

Parcel ID	AREAS	Area (ha.)
	Gross Developable Area (Green)	
1	Northern Fringe	12.04
2	Northern Fringe	2.20
3	Northern Section	8.58
4	Northern Section	17.80
5	Northern Section	64.45
6	South East Section	112.90
7	South West Section	61.61
8	Tolka Valley Strip	43.24
9	Navan Road Strip	11.54
	Gross Developable Area Total	**334.36**
5	Northern Section (Regional Park)	64.45
	Net Developable Area	**215.93**
	Existing Strategic Corridors & Open Space (Red)	
10	Tolka Valley Strip	16.00
11	Motorway, canal corridor, motorway junction	41.20
	Existing Built Up Area (Red)	
12	Northern Fringe	15.18
13	Northern Section - Gas Installation	4.40
14	South Western Section	3.30
15	Dunsink Observatory	3.40
16	Navan Road	17.04
	Overall Study Area	**434.88**