Comhairle Contae
Fhine Gall
Fingal County
Council

DUBLIN AIRPORT CENTRAL

DRAFT MASTERPLAN

FEBRUARY 2016

DUBLIN AIRPORT CENTRAL DRAFT MASTERPLAN

FEBRUARY 2016

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EXECUTIVE SUMMARY

Introduction

Fingal County Council, in consultation with the Dublin Airport Authority (DAA) and their consultancy team[1], has prepared the Dublin Airport Central Masterplan. The Masterplan is a framework for the future development of lands strategically located adjacent to Dublin Airport. The Masterplan lands comprise two parcels of land, referred to as Zone 1 and Zone 2. The Masterplan specifically focuses on the development of Phases 1 and 2 of Zone 1 for high quality, high value office accommodation supplemented with ancillary uses.

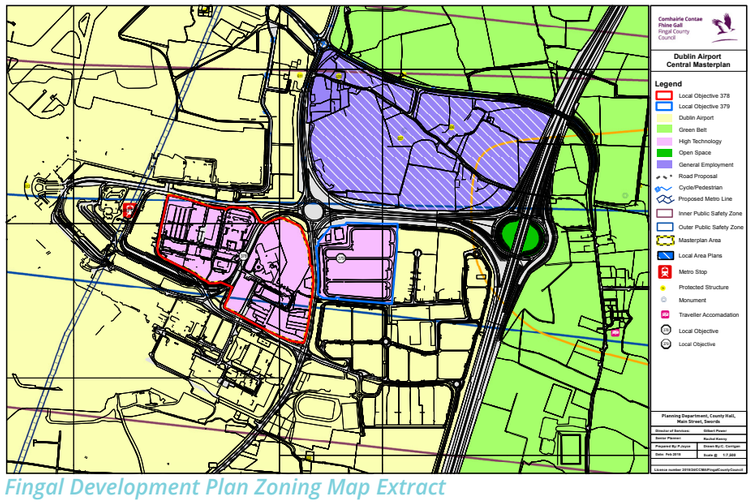
Zoning and Local Objective

In the *Fingal Development Plan 2011-2017*, the Masterplan lands are zoned as 'HT' High Technology and are subject to the map based Local Objective 378. The Zoning Objective for the HT zoning is to:

> *Provide for office, research and development and high technology/ high technology manufacturing type employment in a high quality built and landscaped environment*.

The map based Local Objective 378 specifically applies to these lands and seeks to:

> *Consider within the context of the Masterplan, the nature and scale of appropriate HT uses and enterprise centre related to aviation and airport business, research and development associated with airports or aviation and Air Transport Infrastructure, having regard to the site's strategic location within the Dublin Airport Authority Lands.*



Fingal Development Plan Zoning Map Extract

[1]The team retained by the DAA comprises the following consultants:
KCAP Architects & Planners | McGarry Ní Éanaigh Architects | Atelier Dreiseitl | ARUP | Bannon Property Consultants | Stephen Little & Associates | MauritsSchaafsma | Simon O'Donnell

Purpose of the Masterplan

The Masterplan will serve as a design framework for the future development of Phases 1 and 2 of Zone 1 of these strategically located lands. Economic analysis was undertaken to ensure that the framework would identify an appropriate nature and scale for such development. Comparative studies with other similarly sized airports internationally, indicated that Dublin Airport is underperforming.

The nature and scale of development envisaged for the Masterplan lands is not intended to compete with other local or regional employment or business locations, but with alternative international locations that would be considered by companies that look to airport locations and proximities as being key factors in their location selection process.

The delivery and implementation of the development framework for the lands will be achieved in a gradual manner, and will be linked to key infrastructural requirements and services supports; including road network, public transport and water services improvements. The provision of the office buildings will be in coherent clusters with car parking, ancillary uses and access to amenity opportunities.

Zone 1: Site Layout Plan

Key Guiding Principles

The Masterplan framework is formulated and structured on four key guiding principles. These include principles relating to urban design and quality space making; movement and circulation; economic conditions; and environmental and building sustainability.

In combination, the principles guiding the development framework ensure the creation of an extremely well connected, unique business destination that is of a high quality design, construction and finish, that will offer a range of high value office accommodation competing with other international locations and supplementing the employment and enterprise opportunities in Fingal.

Development Strategy

The development strategy for the Masterplan is based on marrying the requirements of the HT zoning and Local Objective 378, having regard to restrictions on use classes associated with being within the Inner Noise Zone, optimising the strategic, well-connected nature of the lands, and harnessing the unique economic conditions associated with being in proximity to an international airport.

The scale of office development and the type of potential tenants envisaged for the Masterplan lands shall be unique to this Dublin Airport location. The Masterplan area has been identified as being most suitable for corporate type headquarters i.e. offices with floor spaces in excess of 1,000 sqm. This scale of office accommodation is permitted in principle under the HT land use zoning.

Smaller offices with floor areas between 100 sqm and 1,000 sqm, while permitted in principle in the HT land use zoning, will be open for consideration within the Masterplan area as this scale of office is not as desirable at this location due to the proposed larger building/ office block formats having the greater potential to attract corporate entities.

Offices that are less than 100 sqm, while permitted in principle under the HT zoning will generally not be permitted given the strategic location of the airport, issues regarding traffic generation and mobility management, and to ensure that the office accommodation provided in the Masterplan lands does not compete with or impact negatively on other Fingal based HT zoning designations.

There are certain uses that are permitted in principle in the HT zoning that are not be considered appropriate to the Masterplan lands due to the considerations identified above. These use classes include high technology manufacturing, hospital, and light industry. This approach is considered to be consistent with the HT land use zoning and the move away from the DA land use zoning that applies to the functional area of Dublin Airport.

Phasing and Implementation

The Masterplan serves as a design framework for the future development of Phases 1 and 2 of Zone 1. It is, however, important to acknowledge that on the basis of the transportation assessment undertaken to inform the Masterplan, only Phase 1 and office floorspace up to a maximum of 41,677 sqm is provided for within the context of this Masterplan. Development of Phase 2 and additional floorspace above this level will be the subject of further traffic assessment to be undertaken in the preparation of the Dublin Airport Local Area Plan.

Table 7.1 Zone 1: Phases 1 and 2 and Quantum of Office Development

Phase	Office Floor Space in each Phase	Cumulative Totals
Phase 1	41,677 sqm	41,677 sqm
Phase 2	33,787sqm	75,464 sqm

The provision of office development will be planned to coincide with predicted demand levels as determined by the occupation of the completed building forms and by specific infrastructural requirements particularly those associated with the surrounding road network and water services infrastructure. This process will be managed and monitored through the development management process as planning applications for elements of the scheme are assessed, and in consultation with key stakeholders.

Screening for SEA and AA

Ensuring best planning and environmental practice, the Masterplan has been screened as part of the processes for Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA).

Consultants Brady Shipman Martin have undertaken the screening and scoping processes for the SEA, and Scott Cawley Ltd have undertaken the screening process for the AA. Fingal County Council has determined that while the Masterplan did not require a full AA to be undertaken, a full SEA was required. In this regard, an Environmental Report has been prepared with the Masterplan and is published in conjunction with Masterplan.

1.0 INTRODUCTION

1.1 Background to the Masterplan

Fingal County Council, in consultation with the Dublin Airport Authority (DAA) and their consultancy team[2], has prepared the Dublin Airport Central Masterplan. The Masterplan comprises a framework for the future development of lands located adjacent to Dublin Airport, covering an area of 21.7 hectares.

1.1.1 Fingal Development Plan 2011-2017: Land Use Zoning and Local Objective 378

The preparation of this Masterplan is determined by the current land use zoning and objectives contained within the current Fingal Development Plan 2011-2017. In the Development Plan, the Masterplan lands are zoned as 'HT' High Technology and are subject to the map based Local Objective 378. The Zoning Objective for the HT zoning is to:

> *Provide for office, research and development and high technology/ high technology manufacturing type employment in a high quality built and landscaped environment.*

The Objective is supported by the Vision for lands zoned as HT, which is to:

> *Facilitate opportunities for high technology, high technology and advanced manufacturing, major office and research and development based employment within high quality, highly accessible, campus style settings. The HT zoning is aimed at providing a location for high end, high quality, value added businesses and corporate headquarters. An emphasis on exemplar sustainable design and aesthetic quality will be promoted to enhance corporate image and identity.*

The map based Local Objective 378 specifically applies to these lands and seeks to:

> *Consider within the context of the Masterplan, the nature and scale of appropriate HT uses and enterprise centre related to aviation and airport business, research and development associated with airports or aviation and Air Transport Infrastructure, having regard to the site's strategic location within the Dublin Airport Authority Lands.*

Chapters 6 and 7 of the Masterplan outline in detail the nature and scale, respectively, of uses that are considered to be appropriate within the Masterplan lands.

1.1.2 Adjacent Lands and Local Objective 379

There are lands located to the east of the regional road R132, measuring approximately 8.77 hectares, which are subject to the map based Local Objective 379 that seeks to:

> *Undertake a Land Use and Transportation Study to determine the development capacity of the subject lands, and an appropriate phasing and quantum of development in advance of the operation of the Metro North line.*

While this area of land is zoned as HT, is adjacent to the Masterplan lands and is within the ownership of the DAA, it does not form part of this Masterplan development framework.

1.1.3 Dublin Airport Local Area Plan 2006-2015

The Masterplan lands are also included within the wider area subject to the Dublin Airport Local Area Plan 2006-2015. The Local Area Plan (LAP) was prepared in 2006, and prior to its expiration in 2012, the lifetime of the LAP was extended by three years up to June 2015. In the Dublin Airport LAP, the Masterplan lands are zoned as 'Core Aviation Development Zone'.

Through the adoption of the Development Plan in 2011, the HT zoning and map based Local Objective 378 applicable to the Masterplan lands supersedes the zoning designation of the LAP. Importantly however, the overriding objectives and principles in the LAP and Development Plan continue to pertain to the future development of the Masterplan lands. Specifically, that the functionality of the aviation business of the airport shall be given priority in any future development framework and that the nature and scale of potential commercial development shall be appropriate to its location and where it positioning within the hierarchy of employment centres in the County.

1.2 Time Horizon and Focus of the Masterplan

An exact length of time is not specified for life of the Masterplan. Instead a more pragmatic approach is envisaged, through which the delivery and implementation of the development framework for the lands will be achieved in a gradual manner. The development of the lands will be linked to key infrastructural requirements and services supports; including road network, public transport and water services improvements. The provision of the office buildings will be in clusters with car parking, ancillary uses and access to amenity opportunities.

The Masterplan lands that are subject to Local Objective 378 comprise two parcels of land, separated by existing roadways. These areas of land are referred to in the following Chapters of the Masterplan as Zone 1 (c. 9.5 hectares) and Zone 2 (c. 12.2 hectares). Due to the key infrastructural requirements and the quantum of development ultimately envisaged, the Masterplan focuses on the development framework of Zone 1 and, in particular, on Phases 1 and 2 comprising an area of c. 5.89 hectares.

1.3 Purpose and Layout of the Masterplan

The Masterplan will serve as a design framework for the future development of Phases 1 and 2 of Zone 1 of these strategically located lands. Future development shall be guided by Development Plan policy in relation to the requirements of the HT Zoning Objective, realising the Vision for HT zoned lands, and complying with the stipulations of Local Objective 378.

The layout of the Masterplan is organised into seven chapters: the initial chapters present the context for the subject lands in relation to the planning policy; existing land uses and environmental conditions; and unique economic factors pertaining to the lands. The subsequent chapters outline the vision and principles which guide the future development framework; present the detailed development strategy for the Masterplan lands with a focus on Phases 1 and 2 in Zone 1; and a description of the phasing and implementation of the development framework for Zone 1.

1.4 Screening for Strategic Environmental Assessment and Appropriate Assessment

Notwithstanding that the Masterplan is a non-statutory plan, to ensure best planning and environmental practice, the Masterplan has been screened as part of the processes for Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA).

Consultants Brady Shipman Martin have undertaken the screening and scoping processes for the SEA, and Scott Cawley Ltd have undertaken the screening process for the AA. Fingal County Council has determined that while the Masterplan did not require a full AA to be undertaken, a full SEA was required. In this regard, an Environmental Report has been prepared with the Masterplan and is published in conjunction with Masterplan.

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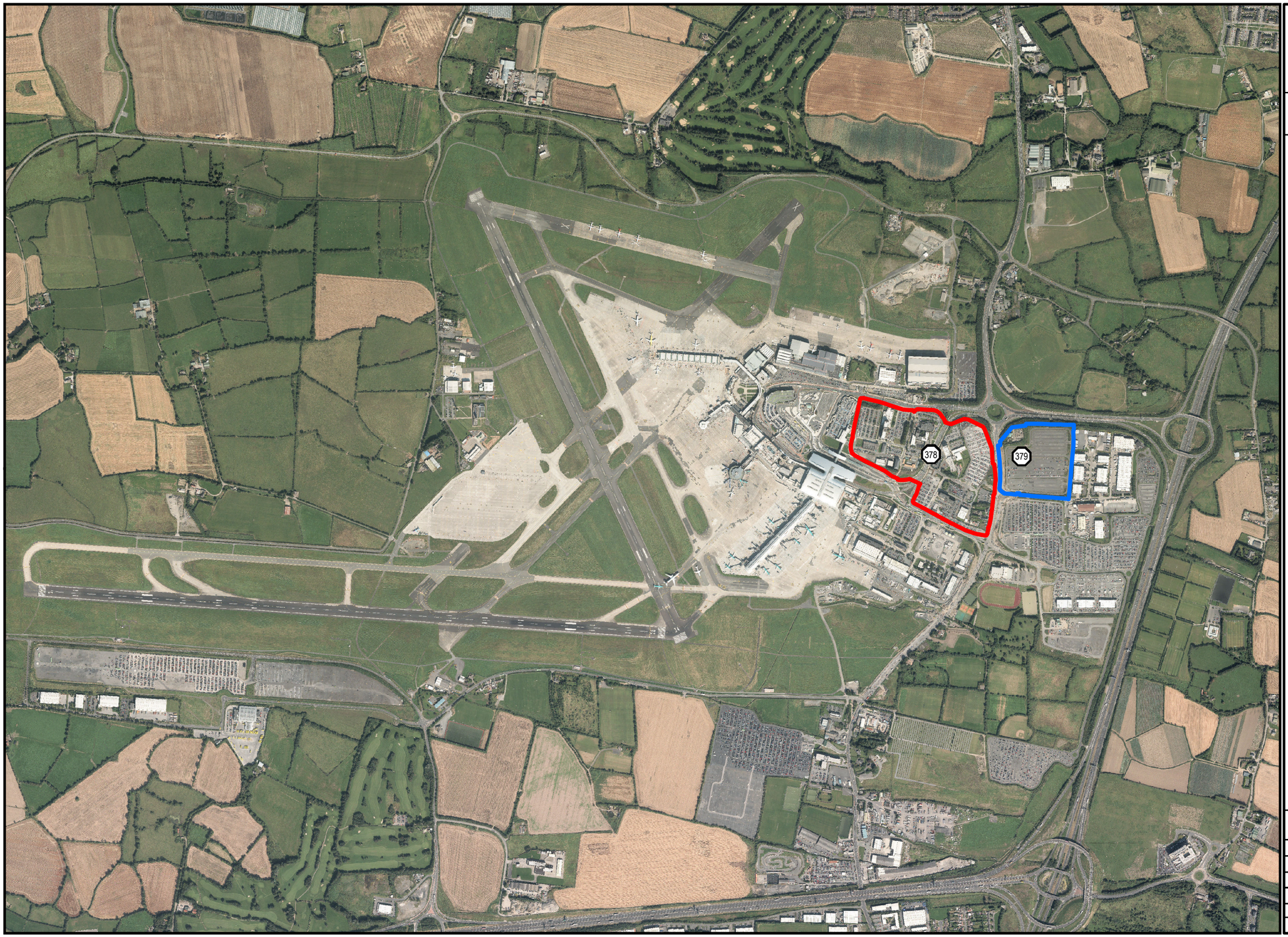

Comhairle Contae Fhine Gall
Fingal County Council

Dublin Airport Central Masterplan

Legend

- Local Objective 378
- Local Objective 379
- 378 Local Objective
- 379 Local Objective

Planning Department, County Hall, Main Street, Swords

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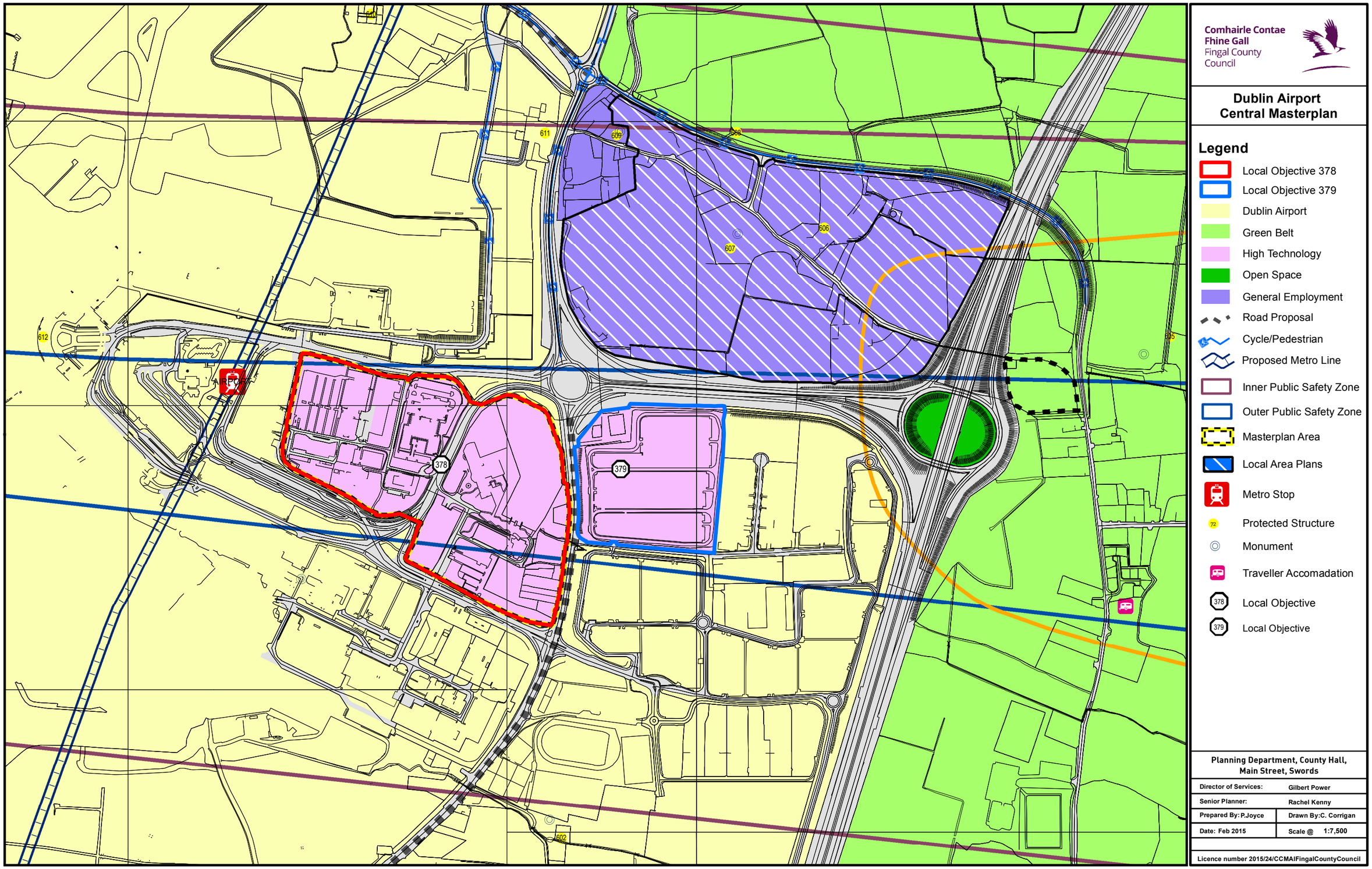
Date: Feb 2015	Scale @ 1:16,029

Licence number 2015/24/CCMA/FingalCountyCouncil

Aerial Photo with lands subject to Local Objectives 378 and 379



Fingal Development Plan Zoning Map Extract

2.0 PLANNING AND TRANSPORTATION POLICY CONTEXT

The statutory planning and transportation policy context for the Masterplan is determined at the national, regional and local policy levels. The key planning policy documents guiding the development framework contained in the Masterplan includes the National Spatial Strategy 2002-2020, the Regional Planning Guidelines for the Greater Dublin Area 2010-2022, and the Fingal Development Plan 2011-2017.

Importantly, due to the strategic location of the Masterplan lands adjacent to Dublin Airport, a key international gateway with a high level of landside intermodality, regard has also been given to the policy context established by key transportation documents. These documents include the National Aviation Policy 2015; Smarter Travel: A Sustainable Transport Future 2009; Investing in our Future, 2015, the Draft Transportation Strategy for the Greater Dublin Area 2016-2035, and the Fingal/ North Dublin Transport Study: Stage 2 Appraisal Report 2015.

2.1 National Planning and Transportation Policy Context

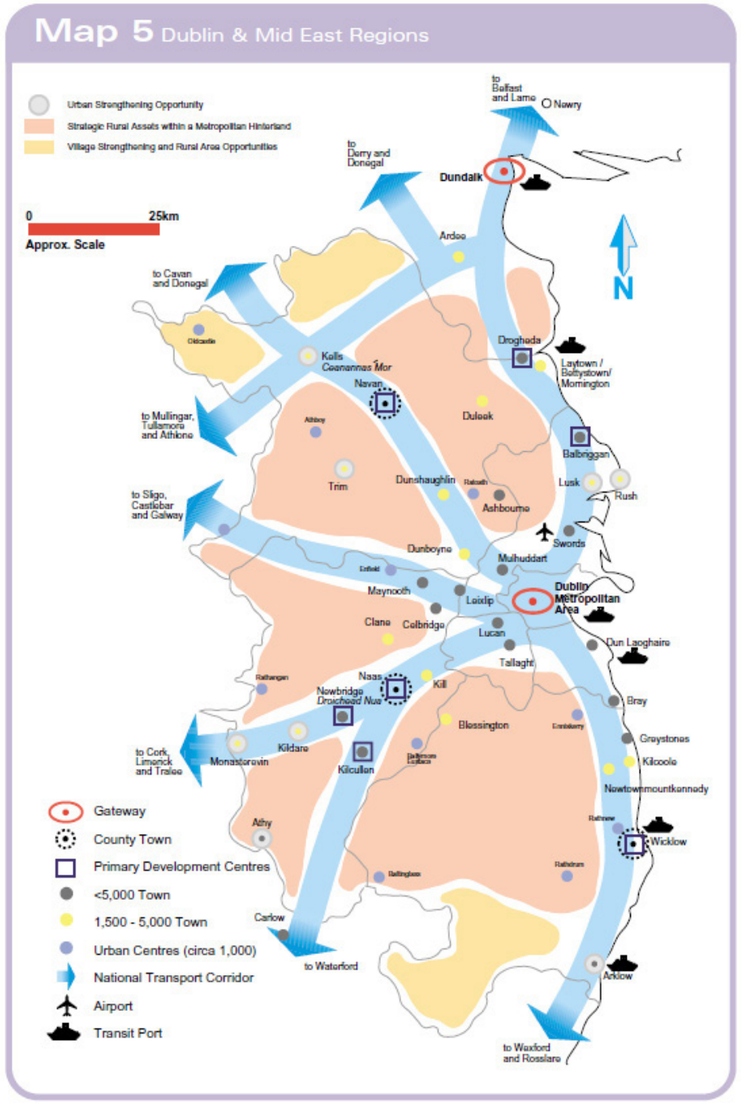
2.1.1 National Spatial Strategy 2002-2020

The National Spatial Strategy 2002-2020 (NSS) outlines the planned spatial development for the country until 2020. The strategy presents overarching aims at a national level, with more detailed development strategies for addressing conditions specific to each region. In relation to Dublin Airport located in the Greater Dublin Area (GDA), the focus of the NSS is primarily on it being an international gateway into the country, as a vital centre in the national transportation network and as an entity at which connections, both transport and economic, are created.

Strategically, the NSS proposes that the spatial structure for development across the country must be supported by a national transport framework. This framework will comprise of an improved network of roads and public transport services that will enhance access and connections throughout the country. The NSS intends for this framework to be internationally connected through vital centres such as airports, with Dublin Airport to the fore, and ports.

The NSS notes that Dublin Airport serves the city, region and country and offers the greatest number of international connections. For Ireland to have a globally competitive but regionally integrated economy, effective connections to the world are vital. The NSS guides that expanding the level of services available from Dublin Airport to an increasingly wider range of destinations is essential in the interests of underpinning Ireland's future international competitiveness. The national and regional benefits of expanded services from Dublin Airport can be enhanced through improved connections with public transport network, the national roads network and the regional airports. The NSS stated position is to ensure Ireland remains effectively linked to international markets and priorities in this regard include enhancing the role of Dublin, Cork and Shannon airports as international airports through efficient terminal facilities and effective land-side access by road and public transport.

At a regional focus, the NSS highlights that the continuing health of the Dublin area is critically dependent on creating an efficient and high quality system of public transport connections within the GDA to improve access to employment, education, services and amenities, and also to ensure good international access particularly through Dublin Airport and Dublin Port.



Map 5 Dublin and Mid East Regions, National Spatial Strategy

2.1.2 National Aviation Policy, 2015

The Department of Transportation, Tourism and Sport (DTTAS) published its National Aviation Policy in August 2015. The DTTAS Policy document has three key goals: to enhance Ireland's connectivity; to grow and support the aviation sector in Ireland; and to maximise the aviation sector's contribution to the country's economic growth and development.

Of the three State airports, the DTTAS highlights their critical role in supporting economic development by facilitating trade, tourism and inward investment. The Policy highlights that the country's airports have access to a well-developed network of regional and national development bodies with mandates to promote the development of the regions. The availability of land with investment/ development potential within and around the country's airports presents possibilities for the creation of new business activities to underpin the core airport business.

The Policy highlights that while access to global hubs is of key importance to inward investment, Dublin Airport's development as an interconnecting hub is itself also of great importance to the Irish aviation sector and the broader economy. The Policy concludes with commitments to support the development of Ireland's airports, including the development and promotion of Dublin Airport as a European Secondary Hub Airport.

2.1.3 Smarter Travel: A Sustainable Transport Future 2009-2020

In 2009, the Department of Transportation, Tourism and Sport (DTTAS) published Smarter Travel: A Sustainable Transport Future 2009-2020. Through the report, the Government seeks to establish a new approach to national transportation policy by identifying existing unsustainable patterns of travel, most particularly the reliance on the private car, and promoting more sustainable solutions. To address the existing patterns and achieve a greater level of sustainability, the report recommends changes in personal behaviour, in public policy in relation to settlement patterns and continued investment in public transport.

Of relevance to the development framework envisaged in the Masterplan, the report recommends a number of actions including those relating to focusing population growth in areas of employment and to encourage people to live in close proximity to places of employment; and actions aimed at ensuring that alternatives to the private car are more widely available, mainly through a radically improved public transport service and through investment in cycling and walking.

2.1.4 Investing in our Transport Future: A Strategic Framework for Investment in Land Transport, 2015

In April 2015, the Department of Transportation, Tourism and Sport (DTTAS) published Investing in Investing in our Transport Future: A Strategic Framework for Investment in Land Transport. This document seeks to determine the optimal strategy for the development and management of Ireland's land transport network over the coming decades.

In the accompanying Final Steering Group Report, key priorities for and principles to frame transport investment are set out. In relation to Dublin Airport, the Report highlights that the airport is fundamental to providing good international access both for passengers and freight (in 2011, 79% of all passengers into and out of Ireland and 85% of air freight went through Dublin Airport). The Report refers to a study on future aviation demand growth which suggests a doubling of aviation demand by 2050. The Report suggests that such significant demand growth will manifestly have implications for land transport provision to the country's airports and for the need for the balance to be struck between private car and public transport access to them. This, the Report notes, is particularly in the case of Dublin Airport, where increased demand levels over time should positively impact on the potential to deliver value for money investment in public transport options.

2.2 Regional Planning and Transportation Policy Context

2.2.1 Regional Planning Guidelines for the Greater Dublin Area 2010-2022

The Regional Planning Guidelines for the Greater Dublin Area 2010-2022 (RPG) expand on the proposed spatial structure contained in the NSS. As with the NSS, the RPG focus on Dublin Airport's role as a vital point in the region's transportation network, additionally however are more detailed policies recognising and supporting the airport as a driver of economic development in and for the region.

The RPG refers to the key nodes within the region's transportation network, including the international standing of Dublin Airport. The RPG state that despite significant investment in the region's transport system, there continue to be impediments such as road congestion and long travel times, and the need for greater integration of public transport services. The RPG raise that an efficiently functioning, well connected airport is a key competitiveness factor for Dublin, the wider region and the state, and that an area requiring ongoing attention is the airport's connections to the city and the region with public transport connections to the airport requiring significant development.

In relation to economic connections, the RPG state that identifying priority targets for investment in transport infrastructure at locations which can support economic and critical mass, and support structures and ease of access to do business is essential to the economic success of the region. Additionally, the RPG support and promote the role of the GDA as an attractive international destination for business, that the identified strategic economic growth centres continue to be focal points for regional population growth and employment. To this end, the 'critical mass' concept should be employed whereby development density levels are such to justify first class and strategic infrastructure provisions and to take full advantage of international transport hubs such as Dublin Airport and Dublin Port.

The stated policy in the RPG for Dublin Airport is ER7 which seeks to:

> *Promote and support the role of Dublin Airport as the primary gateway to Ireland and the GDA and as an important employment hub and business location in the region through land use planning which facilitates future airport capacity needs and by improved transport linkages to the city and region.*

2.2.2 Draft Transport Strategy for the Greater Dublin Area 2016-2035

In October 2015, the NTA published the Transport Strategy the Greater Dublin Area 2016-2035 in draft form. The draft Strategy seeks to establish the essential transportation policies and measures required to support the GDA in meeting its full potential.

The draft Strategy highlights the role of Dublin Airport as an international gateway, its critical national and regional importance, and how the management of transport to and from the airport must be considered to ensure its efficient operation. The Strategy identifies that 'Protecting and enhancing access to the ports and Dublin Airport is a strategic priority' as congestion currently presents the greatest risk to its functionality. It acknowledges that 'serving Dublin Airport with a high-capacity, reliable and frequent public transport service to Dublin City Centre and improved public transport network connectivity at a national level is, therefore, a priority for the transport strategy'.

The Fingal/ North Dublin Transportation Study (see Section 2.3.3 below) tasked with identifying the optimum longterm public transport solution to connect Dublin City Centre, Dublin Airport and Swords identified an Optimised Metro North as being the best solution. Subsequently, Metro North was included in the Government's Capital Investment Plan 2016-2021. It will run from St Stephen's Green via the Airport to Swords. The exact location of the Metro stop for the Airport is likely to be at the Ground Transportation Centre (GTC), just north of Terminal 2.

2.3 Local Planning and Transportation Policy Context

2.3.1 Fingal Development Plan 2011-2017

As outlined in Chapter 1, the planning context for the preparation of this Masterplan emanates from the current Fingal Development Plan 2011-2017. In the Development Plan, the Masterplan lands are zoned as 'HT' High Technology and are subject to the map based Local Objective 378, which commits the Council to:

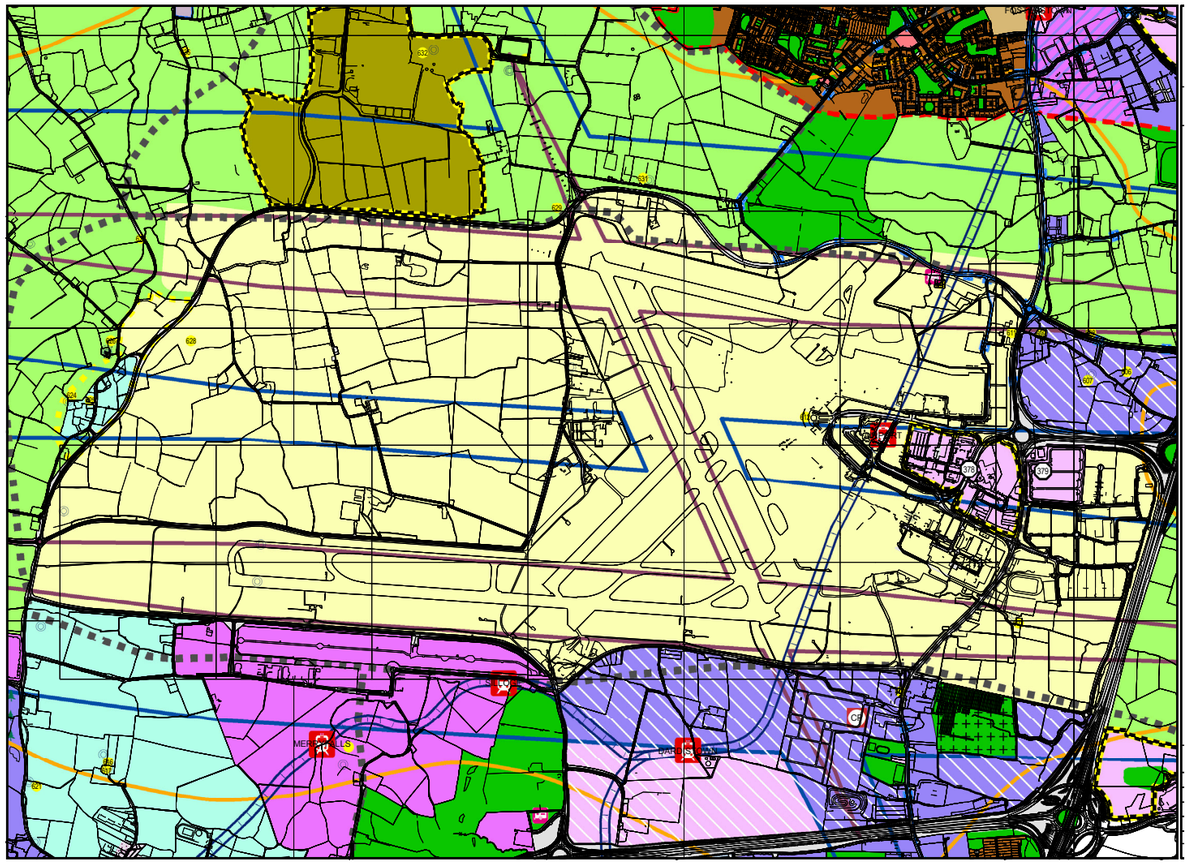
> *Consider within the context of the Masterplan, the nature and scale of appropriate HT uses and enterprise centre related to aviation and airport business, research and development associated with airports or aviation and Air Transport Infrastructure, having regard to the site's strategic location within the Dublin Airport Authority Lands.*

As the Masterplan is being prepared in the context of the current Development Plan, it is required to comply with the policies and objectives contained in the Plan. Of particular relevance for the Masterplan, are the stated policy requirements relating to the operation of Dublin Airport, the 'HT' High Technology land use zoning, Green Infrastructure, and Transportation policy for the County.

<u>Policy relating to Dublin Airport</u>

The Development Plan highlights both the international and national importance of Dublin Airport in the country's transportation network, but also its paramount significance as an economic entity in Fingal and the region, and its ability to drive economic development and generate direct and indirect forms of employment.

The Development Plan contains broad objectives relating to the development, operation, and management of Dublin Airport and its surrounding environs. The Plan contains objectives in the following areas: strategic operational issues, runway and terminal facilities; noise controls and abatement measures; safety standards and provisions; air and water quality standards and provisions; best practice measures for building design quality and accessibility; optimising surrounding land uses; controls and measures relating to residential development.



DA zoning from Development Plan showing Inner and Outer Noise and Public Safety Zones

The Development Plan contains a specific 'DA' Dublin Airport zoning objective covering an extensive area at and surrounding the airport. The Zoning Objective for the DA zoning is to:

> *Ensure the efficient and effective operation and development of the airport in accordance with the adopted Dublin Airport Local Area Plan.*

The Objective is accompanied by the Vision for lands zoned as DA, which is to:

> *Facilitate air transport infrastructure and airport related activity/uses only (i.e. those uses that need to be located at or near the airport). All development within the Airport Area (as designated by the Dublin Airport Local Area Plan) should be of a high standard reflecting the status of an international airport and its role as a gateway to the country and region. Minor extensions or alterations to existing properties located within the Airport Area which are not essential to the operational efficiency and amenity of the airport may be permitted, where it can be demonstrated that these works will not result in material intensification of land use.*
> *Air Transport Infrastructure includes: aircraft areas, air traffic control/ tower, ancillary health, safety and security uses, aprons, cargo handling, maintenance hangers, meteorology, retail – airside/duty free, runways, taxiways, terminals and piers.*

This DA zoning objective applies to the vast majority of lands surrounding the HT zoned Masterplan site. Fingal County Council is committed to facilitating future growth and development at the airport whilst safeguarding the surrounding environment and communities.

<u>Land Use Zoning Objective 'HT' High Technology</u>
There are four key employment and enterprise generating land use zonings designated in the Development Plan: 'GE' General Employment, 'HI' Heavy Industry, 'ME' Metro Economic Corridor and 'HT' High Technology. These zonings have varying Objectives and Visions depending on the type of enterprise and industry to be attracted and facilitated, the form of employment to be generated, localised advantages to be maximised upon, and potential opportunities to be harnessed.

Of these employment based land uses, the HT zoning is targeted towards the provision of high value, high quality office accommodation and manufacturing space located within easily accessible locations in quality designed environments.

Specifically, the HT Zoning Objective seeks to*:*

> *Provide for office, research and development and high technology/ high technology manufacturing type employment in a high quality built and landscaped environment*.

The Vision for the zoning further defines the planning principles which guide potential development in such zonings as to:

> *Facilitate opportunities for high technology, high technology and advanced manufacturing, major office and research and development based employment within high quality, highly accessible campus style settings. The HT zoning is aimed at providing a location for high end, high quality, value added businesses and corporate headquarters. An emphasis on exemplar sustainable design and aesthetic quality will be promoted to enhance corporate image and identity*.

Additionally, Objective EE30 seeks to:

> *Encourage the development of corporate offices and knowledge based enterprise in the County on HT zoned lands and work with Government agencies, and other sectors to achieve such development.*

As the HT zoning forms the basis for the development framework of the Masterplan, the strategic vision for HT zoned lands will be encapsulated within the Masterplan and be among its guiding principles, as will mechanisms through which the Masterplan can comply with and contribute to the achievement of the HT vision.

<u>Green Infrastructure Policy</u>
The Fingal Development Plan 2011-2017 presents the concept of 'Green Infrastructure' and proposals for developing a Green Infrastructure Strategy for the County through planning policy related to Local Area Plans and development proposals.

Green Infrastructure is an encompassing term for the interconnected networks of land and water that sustain environmental quality and enrich our quality of life. This infrastructure comprises nature conservation areas, parks, open space, rivers, floodplains, woodlands, farmland, and coastal zones which surround and weave through our urban areas. This vital infrastructure allows space for nature, biodiversity and natural systems, and provides numerous health and environmental benefits, and social and recreational opportunities for people.

The aim of the Development Plan in relation to Green Infrastructure is to*:*

> *Create an integrated and coherent green infrastructure for the County which will protect and enhance biodiversity, provide for accessible parks and open space, maintain and enhance landscape character including historic landscape character, protect and enhance architectural and archaeological heritage and provide for sustainable water management by requiring the retention of substantial networks of green space in urban, urban fringe and adjacent countryside areas to serve the needs of communities now and in the future including the need to adapt to climate change.*

The principles that form the basis of the Green Infrastructure concept serve as guiding principles for the development proposals contained in the Masterplan. Key elements of the development framework, as presented in Chapter 5, are a focus on the public realm and the creation of the 'Green Lung'. The Green Lung is an interlinked system of high quality landscaped open spaces running along a west-east orientation through the Masterplan lands. The design and delivery of the Green Lung seeks to accord with wider Development Plan policy relating to Green Infrastructure.

<u>Transportation Policy</u>
A fundamental component of the Masterplan framework, is complying with Development Plan transportation policy planned for the County. The Plan's Statement of Policy in this regard seeks to:

> *Promote and facilitate movement within, and to, the County of Fingal, by integrating land use with a high quality, sustainable transport system that prioritises public transport, cycling and walking. In facilitating such movement, the natural and cultural heritage of the County must be protected*.

The Development Plan policy on transportation, significantly determined by transportation policy at national level, emphasises improvements to the physical transportation infrastructure including rail and bus routes, increasing reliance on sustainable forms of transport including public transport, cycling and walking, and encouraging modal change from the dominant use of the private car to these alternative modes.

The Masterplan lands are strategically located adjacent to Dublin Airport which, as outlined in greater detail in Chapter 3, is a location that is extremely well connected and served by a range of existing modes of transport, including the public road network and most particularly public and private bus services. Evidently, the Masterplan lands are uniquely positioned to maximise on these existing transport services and infrastructure.

<u>Aviation Related Designations</u>
There are important aviation related designations for noise and public safety that are associated with the operation of the airport and apply to the Masterplan lands. These designations are the Inner and Outer Noise Zones and the Inner and Outer Public Safety Zones. These arise from European and national policy and legislation, and have been subsumed into local planning policy.

The designations are indicated on the Fingal Development Plan 2011-2017 zoning maps and the relevant policy is included within the written statement. The Masterplan lands are located within the Inner Airport Noise Zone, outside of the Inner Public Safety Zone and partially within the Outer Public Safety Zone (northwest corner of Zone 1 and southeast corner of Zone 2). (See DA Zoning from Development Plan showing the Inner and Outer Noise and Public Safety Zones.)

The creation of Noise Zones at Dublin Airport arises from compliance with national legislation and the EU Directive on Environmental Noise. The Development Plan policy for the Noise Zones is to restrict inappropriate development within the Outer Noise Zone and to actively resist noise-sensitive uses within the Inner Noise Zone. As required in the noise legislation, the four Dublin planning authorities have prepared The Dublin Agglomeration: Environmental Noise Action Plan 2013-2018, which includes analysis of Dublin Airport, identified as a major airport. The Action Plan reiterates the stated policy in the Development Plan for the two zones. The Action Plan specifies noise sensitive receptors to be residential developments, hospitals including nursing and convalescence homes, educational institutions, childcare/ crèche facilities, and places of worship.

While in relation to the Public Safety Zones, the Development Plan policy is guided by a report prepared by consultants Environmental Resources Management in 2005 for the Department of the Environment on the topic. While this report has not been formally adopted as Government policy to date, guidance is provided on the potential use and scale of development that may be considered appropriate within these Zones. Applicable to the Masterplan lands, is the guidance relating to the Outer Public Safety Zones. Within the Outer Public Safety Zones, residential, retail/ leisure and employment uses are permissible in principle subject to restrictions in terms of quantums (density per hectare).

2.3.2 Dublin Airport Local Area Plan 2006-2015

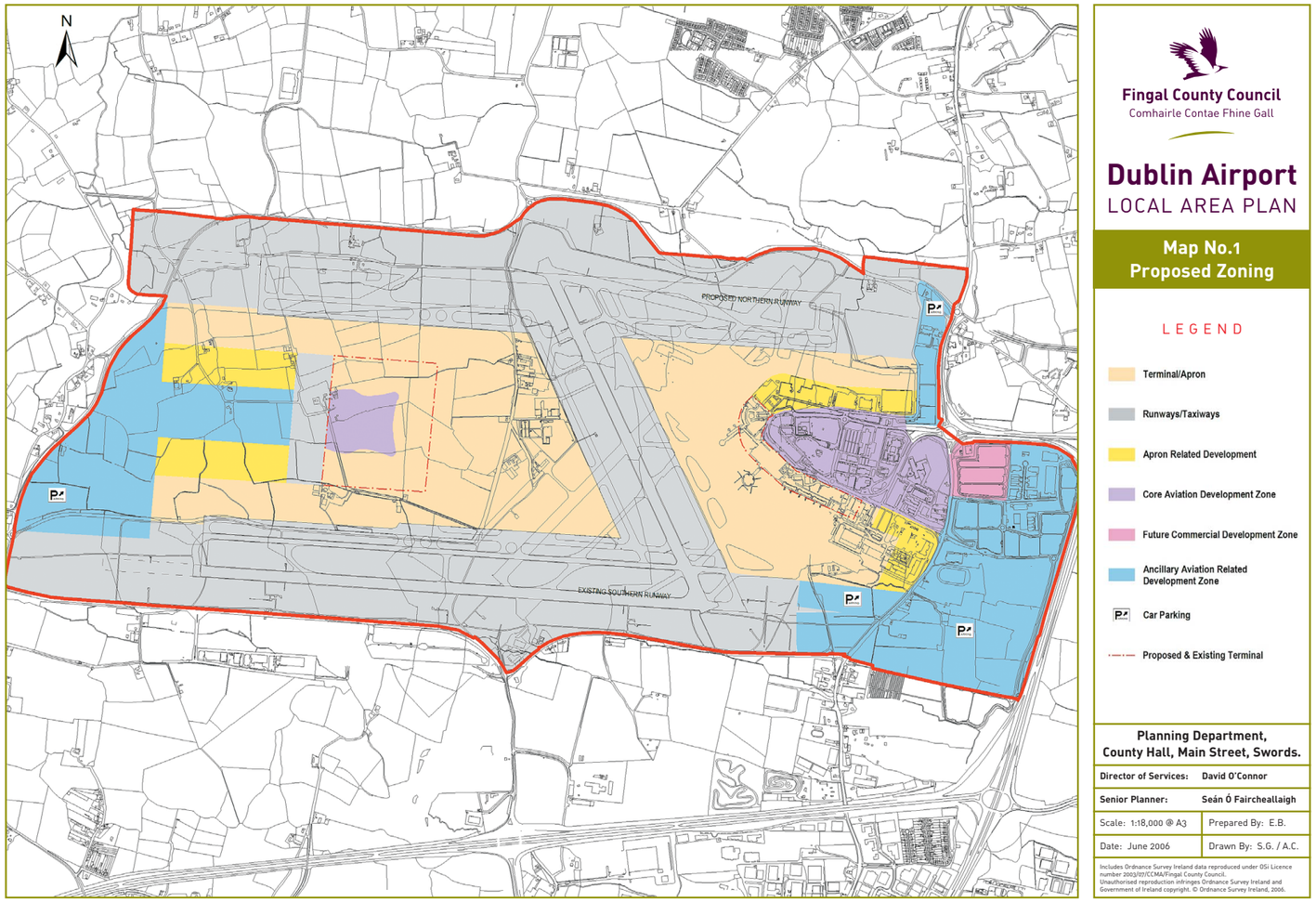
In 2006, Fingal County Council prepared the Dublin Airport Local Area Plan (LAP). In 2012, the lifetime of the LAP was extended by a further three

years up to June 2015. The LAP covered an extensive area of some 1,084 hectares including all functional and operational facilities at the airport, and lands extending eastwards beyond the regional road R132 and up to the M1 motorway.

The LAP is a detailed planning framework comprising information on the historical development of the airport; an overview of the-then existing conditions at the airport; and policies and objectives relating to airport infrastructure, aircraft operations, surface access, drainage and utilities, heritage, design criteria, commercial development and implementation.

In the LAP, the Masterplan lands were zoned as 'Core Aviation Development Zone' and subject to policies relating to commercial development at the airport. In the LAP, commercial development is largely restricted to airport related economic activities, and where permissible, non-aviation commercial development would be limited in quantum, specific in location and phased to coincide with the delivery of the Metro and other additional public transport facilities. Through the adoption of the Fingal Development Plan 2011-2017, these applicable policies have been superseded by the provisions of the 'HT' zoning and of Local Objective 378 which establish the Masterplan as the framework in which to determine the appropriate nature and quantum of development.

The LAP set the policy context for a number of infrastructural developments at Dublin Airport which have been undertaken such as the extension and improvements to Terminal 1; the development of Terminal 2, Pier D (also referred to as Pier 4) and the associated multi-storey car park; and the upgrade of the R132 to dual carriage way status.



Dublin Airport LAP zoning land use

As the 2006 LAP has expired, Fingal County Council intends to prepare a new LAP for the airport and all associated lands.

2.3.3 Fingal/ North Dublin Transportation Study: Stage 2 Appraisal Report 2015

In June 2015 the NTA published the Fingal/ North Dublin Transport Study: Stage 2 Appraisal Report. The Study is a key framework for the local planning and transportation policy context of the Masterplan lands. The purpose of the overall Study is to identify the optimum longterm public transport solution to connect Dublin City Centre, Dublin Airport and Swords.

The Stage 2 Appraisal Report further develops and assesses the potential options identified in the previous Stage 1: Appraisal Report from 2014. The Stage 2 Report found that the key transport infrastructure priority for Fingal/ North Dublin is the provision of new public transport capacity for the corridor from Dublin City Centre, through the north inner city and Ballymun to Dublin Airport and Swords. The selected public transport option is referred to as LR7 (Optimised Metro North) and is identified as representing the best medium and long term public transport solution for the Greater Dublin Area.

3.0 EXISTING LANDS AND ENVIRONMENTAL CONTEXT

This Chapter presents the physical, infrastructural and environmental context associated with the Masterplan lands. There are descriptions of Dublin Airport and its environs, which includes the lands comprising the Masterplan area. The current infrastructural context is outlined with regard to mobility, water services and utilities. Finally, the environmental and heritage context of the Masterplan lands are presented.

3.1 Existing Lands at Dublin Airport and Environs

The Masterplan lands are strategically located adjacent to Dublin Airport. The immediate proximity of the lands to the airport contributes to their unique character and setting, and any analysis and assessment of the lands is required to refer to this major transportation hub.

Dublin Airport, for the purposes of this section, refers to the complex of buildings forming the airport within which the operational functions of the airport occur. Principally, these are the terminal buildings, piers, hangars and car park buildings. References to the airport's environs are to the lands immediately adjacent to and surrounding Dublin Airport, and include the full extent of the Masterplan lands.

3.1.1 Character Zones

Dublin Airport and environs are categorised into a number of distinct 'Character Zones' based on the function of the zone and the nature and scale of the buildings located therein. The zones characterised are the Horseshoe Ring, the Ground Transportation Centre, the Inner Horseshoe Zone and Future Development Zone.

Character Zones

The Masterplan lands are centrally positioned within a larger area referred to as the Horseshoe, so-called due to its spatial composition. The Horseshoe Ring Zone is an outer perimeter essentially forming Dublin Airport and defining the airside[2]-landside[3] interface. The Horseshoe Ring comprises a range of buildings that have evolved over a number of decades, the majority of which are associated with the functional operations of the airport including the Old Central Terminal Building, Terminal 1 and Terminal 2, associated Pier structures, aircraft hangers, and apron[4] area.

The Inner Horseshoe Zone is formed by three parcels of land separated by the existing road system: to the west, adjacent to the bend in the Horseshoe Ring is the Ground Transportation Centre (GTC); centrally positioned is an area referred to as Zone 1; while to the east of Zone 1 are lands referred to as Zone 2.

In relation to the Character Zones, the Masterplan lands comprise Zone 1 (excluding the existing multi-storey car park associated with Terminal 2) and Zone 2 of the Inner Horseshoe Zone. The boundaries of the Masterplan lands are formed by the internal and external road network, most notable of which is the R132 which serves as a strong eastern boundary to the Masterplan lands.

3.1.2 Existing Land Uses at Dublin Airport and Environs

There is a notable mix and range of use classes at Dublin Airport and its environs. In addition to the dominant operational airport use, a number of associated and ancillary uses have become established. These include commercial car parking, offices, logistics, industrial, aviation related business operations, and hospitality and leisure related uses.

The GTC functions as the natural centre of gravity of the airport, operating as the key public transport focal point for bus trips associated with numerous public and private bus operators. In addition to set-down and pick-up areas and surface car parking, the GTC comprises a number of key buildings including the Terminal 1 multi-storey car park and the airport church, Our Lady Queen of Heaven.

Zone 1 contains a number of distinguishable buildings including the former Aer Lingus Head Office Building (HOB), the multi-storey car park associated with Terminal 2, the Maldron Hotel and the ALSAA swimming pool. The most notable building within Zone 2 is the Radisson Hotel. Across Zones 1 and 2, the existing buildings vary in scale and composition so that a coherent design rationale is not clearly identifiable. Between the two hotels and the terminal buildings is a mixture of non-descript, low-rise buildings of various uses including office, logistics and industrial. Lastly, the Future Development Zone includes lands to the east of regional road R132 that, at present, operate as a commercial car park.

This current range of use classes at the airport indicates the synergies that can exist between an airport, commercial operations and supportive ancillary uses.

[2] Airside is the area within an airport complex which requires Customs and Security clearance to access.
[3] Landside is the area(s) at an airport before passengers go through Security, Customs, and Immigration.
[4] Apron is the area of an airport where aircraft are parked, boarded, loaded, unloaded, and refuelled.

Uses

3.1.3 Public Realm and Landscaping

The existing public realm at Dublin Airport and its environs is characterised by its functional use, such as access, parking with in-between green spaces, resulting in an overall impression of hard surfaces. Positively, there are some notable developed and maintained stands of tree planting which do provide visual and environmental benefits.

Quality Green Structures

The topography of the Dublin Airport area is considered as generally flat to gently sloping. The ground level rises in a westerly direction from a lower point of 55m OD at the R132 to a peak of 67.5m OD at Terminal 1. The rise in ground level from the public road up to the operational complex of the airport, results in structures being visually prominent, and for buildings such as Terminal 2 having a particularly strong visual impact.

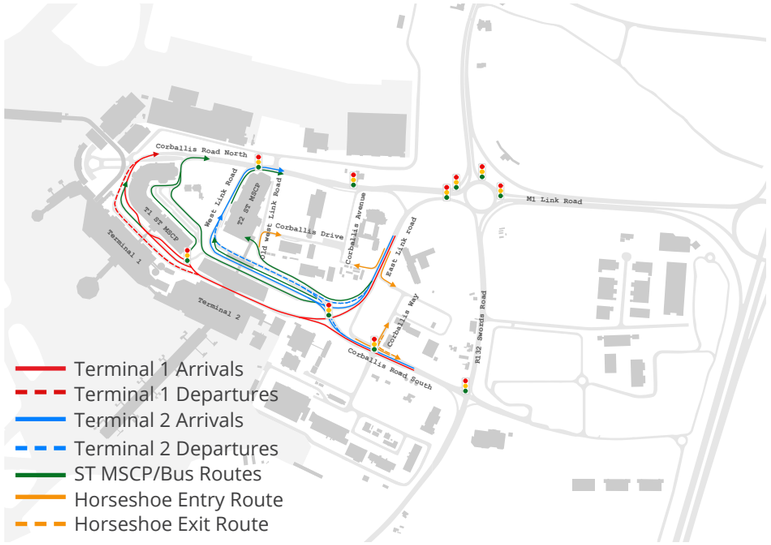
Topography

3.2 Existing Mobility and Access

3.2.1 Internal Road Network – Traffic Management

The existing airport internal road network consists primarily of a one-way system travelling in a clockwise direction. The one-way system splits at the main internal junction with Corballis Road South with the southern route serving Terminal 1 and its multi-storey car park, and the northern route serving Terminal 2 and its car park. The one-way system provides access to Zone 1 and Zone 2 of the Masterplan lands.

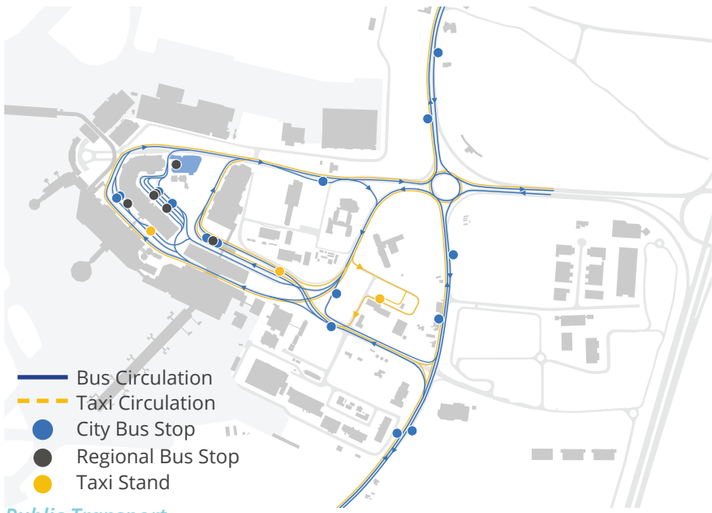
Corballis Road South is a two-way road and joins the internal road network at the signalised junction. This roadway provides access to Zone 1. On the East Link Road there are diverge lanes serving the Radisson Hotel/ Cloghran House and the Maldron Hotel/ former Aer Lingus HOB.



Local Road Network

3.2.2 Public Transport – Local Stops and Service Routes

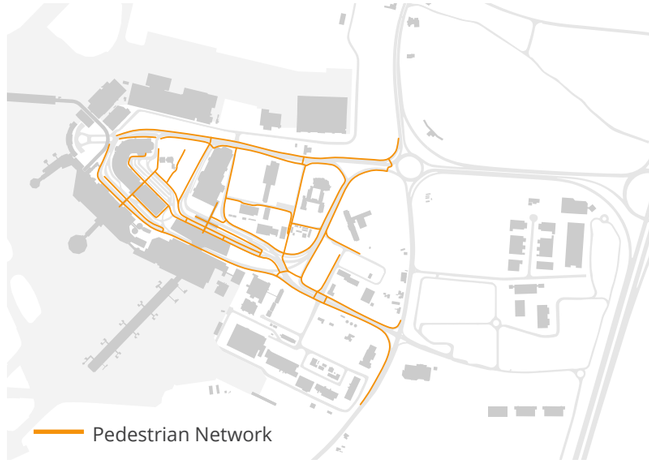
Dublin Airport is served by three main bus stop locations; outside Terminal 1, outside Terminal 2 and within the Ground Transportation Centre (GTC). The bus stops located outside Terminal 1 and 2 are used by Aircoach and Route 747 (Airlink), though all buses may set down here. Route 747 (Airlink) provides premium access to Dublin City centre including many of the major hotels located in the city via the Port Tunnel. Aircoach provides a range of bus services both locally within Dublin City centre and nationally to regional cities and towns. The GTC provides bus stops for the long-term car parks, for Bus Éireann services which are routed through the airport and other Dublin Bus services. In addition, a coach parking area is provided within the GTC serving other chartered coach services with an overflow also located in the DAA owned long term car park to the east of the R132.



Public Transport

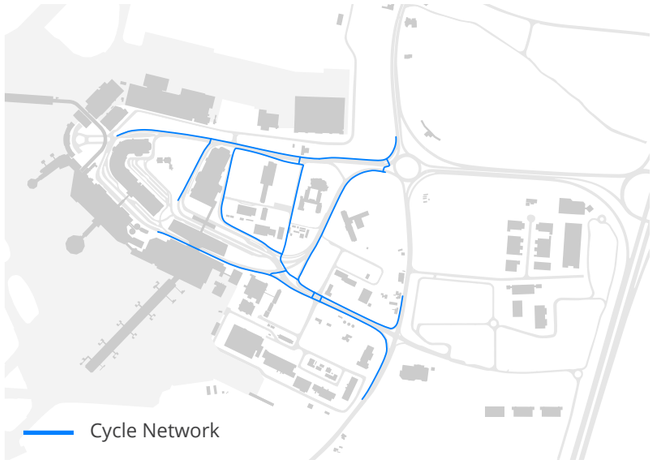
3.2.3 Pedestrian and Cycle Network

The existing provision of footpath facilities is generally good within Dublin Airport and its environs. The existing footpaths being of sufficient width and pavement surface quality. Covered walkways and dedicated footpaths have been provided to encourage walking within the airport grounds and provide connection between terminals, public transport nodes, car parking spaces and offices. Dedicated signalised pedestrian crossing locations are provided at all the major road crossing points. Other busy pedestrian-vehicle interaction points are designated as zebra crossings with provision of dropped kerbs along the primary pedestrian desired lines. The recent upgrade to the internal road system within the airport included a significant investment in cycle facilities particularly on the approach routes into the airport from the R132. The cycle facilities serve both the terminal buildings and also many of the employment centres located through the airport and environs. The R132 has recently been upgraded and the works have included improvements to the cycling environment along the road.



Pedestrian Network

A cycle network has been developed within the airport and its environs and that network also serves the Masterplan lands.

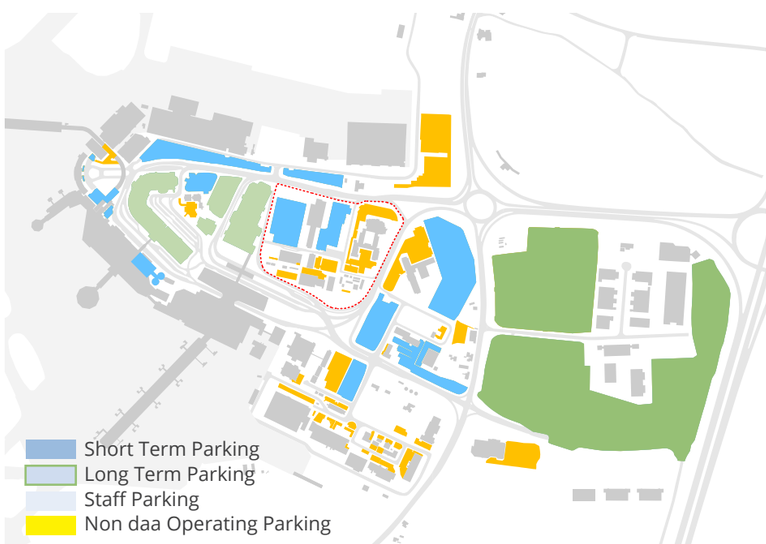


Cycle Network

3.2.4 Car Parking Provision

The available car parking spaces at Dublin Airport are classified into three types:

- Staff Car and Visitor Parks (DAA and non-DAA controlled)
- Short-Term Car Parks (DAA controlled)
- Long-Term Car Parks (DAA controlled and non-DAA controlled)



Parking Locations

<u>Staff and Visitor Car Parks</u>

Currently, there are approximately 5,360 car parking spaces available for staff working at the airport. These are for staff associated with the airlines, the terminal buildings, airline offices, catering building, airport hotels and other leisure facilities such as ALSAA swimming pool. These car parking spaces are located throughout the environs of the airport in Zone 1, Zone 2, adjacent to the Cargo Terminal, Hangar 6, Hangar 1-5, the Old Central Terminal and the Terminal 1 building. An employee shuttle bus is provided for staff travelling between a number of car parks and the main Terminal buildings.

<u>Short-Term Car Parks</u>

Short-term car parking spaces are generally provided within the multi-storey car parks (MSCP) located opposite Terminal 1 and Terminal 2. In addition, approximately 250 surface short-term parking spaces are available at the lands adjacent to the Coach Park and the airport church. In total, there are approximately 3,395 short-term spaces available to passengers. A higher parking charge is applicable to the short-term car park stock compared to the long-term parking stock to encourage greater turnover of parking spaces. The provision of short-term car parking spaces is at present limited by Condition 23 of the grant of permission for the Terminal 2 development which restricts the number of such spaces to 4,000 in total.

<u>Long-Term Car Parking Spaces</u>

There are currently 25,280 long-term car parking spaces serving Dublin Airport. Under Condition 23 of the grant of permission for the Terminal 2 development, the number of long term car parking spaces is restricted to 26,800. In total 19,040 of these spaces are controlled by the DAA and 6,240 spaces are provided by a private operator 'QuickPark'. The long-term car parks are remote from the terminal buildings and passengers making use of these car parks are transferred via shuttle buses (frequency varies in between 8-15 minutes) to and from the terminal buildings. The transfer times from these car parks vary depending on their location but all travel times are in the range of 5-10 minutes.

3.3 Existing Utilities Services

The key utility services include water services infrastructure comprising water supply, foul water discharge and surface water discharge; and the supply of power, gas and information communications technology (ICT). A number of these key utility services have been significantly upgraded in recent years as part of the Terminal 2 development at the airport.

The existing utilities supply and infrastructure serving Dublin Airport is sufficient to meet current and projected demands (including a potential future extension to Terminal 2) of a minimum of 36 million passengers per annum (Mpax). 32 million Mpax is the current permitted capacity for passenger throughput of Terminals 1 and 2.

3.3.1 Water Supply

The water distribution network comprises a twin 5-bar watermain which provides the following water supply requirements: potable; fire hydrants; sprinklers; and hot and chilled water system make-up. The current total water consumption is estimated as 1,733 m3/ day (equivalent of 19.1 Mpax), and the existing on-site water supply reservoir has a capacity of approximately 14,500 m3.

A new 300mm spur has been provided from Fingal County Council's mains on the R132 in order to safeguard supply for the airport operations.

3.3.2 Foul Water

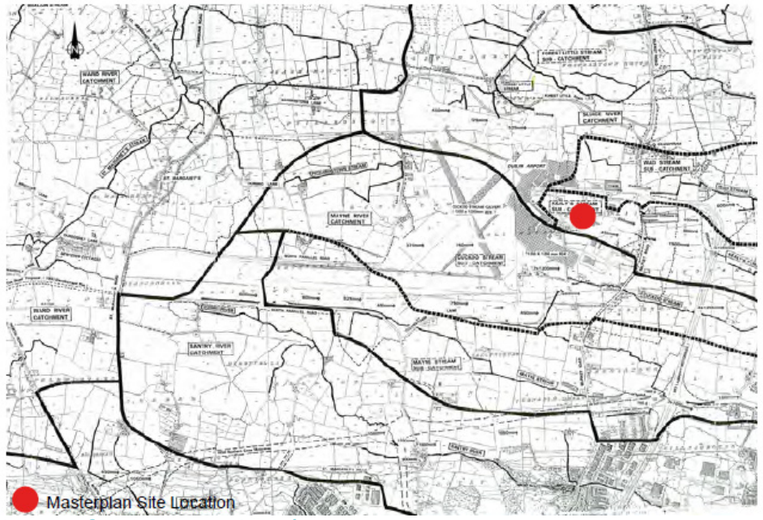
The existing foul sewer serving Dublin Airport and its environ is located in the R132. As part of the R132 upgrade that was completed in 2013, a twin rising main was constructed which is capable of carrying approximately 200,000 m² of development. However, the wider existing North Fringe sewer system that this rising main feeds into is at or nearing capacity and is required to be upgraded in the short to medium terms.

3.3.3 Surface Water

Several river catchments and subsequent sub-catchments serve to drain lands at Dublin Airport and its environs. These include:

- Wad stream and Kealy's stream sub-catchments, both tributaries of the Sluice River which discharge into the sea at Portmarnock; and
- Cuckoo stream and Mayne stream sub-catchments, both tributaries of the Mayne River which discharges into the estuary at Baldoyle.

The existing paved areas at the airport and environs, including runways, taxiways, roads, parking areas, roofs and so forth are drained by DAA privately owned and maintained gravity surface water drainage systems at Corballis Road South and north of Cloghran House. These drains outfall to an existing underground surface water attenuation facility with a 31,500m³ capacity that is located in the DAA owned long-term car park to the east of the R132. The attenuation tank is operating close to or at capacity.



Layout of Watercourses/ Catchments,

3.3.4 Power Supply – Electricity and Gas

With regard to electricity, the on-site power supply and distribution network was significantly upgraded as part of the development of Terminal 2 in 2011. A DAA owned and operated substation at Dardistown with dual supply 100kVA power lines to the airport has been completed. This enables the DAA to provide power to the airport directly. The DAA is a licenced energy provider to airport users under a "Section 37" permit issued by the Commission for Energy Regulation (CER).

The dual supply provides a high level of resilience to the airport (each supply alone can serve the demand should one supply fail). The Dardistown substation has two 40MvA transformers (one duty and other back up). The current load from the airport is approximately 13MvA. A dual 10kvA ring main serves the airport from the Dardistown substation via 20-plus on-site substations.

In addition to the Dardistown supply, portions of the airport are supplied from the public grid network via the Electricity Supply Board Networks (ESBN) owned substation at Collinstown which is located in the long-term car park east of the R132 and is also part of the DAA on-site power infrastructure.

With regard to gas, the on-site gas mains within in Dublin Airport were upgraded to a 315 mm 4-bar ring main installed as part of the development of Terminal 2 in 2011. This is fed from a new Above Ground Installation (AGI) adjacent to the Dardistown substation with local AGIs around the site. In addition, Bord Gais Networks (BGN) installed a new 19-bar distribution line and AGI on the Santry Road.

3.3.5 Information and Communications Technology (ICT)

The airport and its environs are served by a dual-path, divergent connectivity to Dublin's T50 broadband ring. This is a multi-duct system surrounding the City providing an uninterrupted physical link with two major transatlantic fibre termination points, with access to 27 international carriers, including direct fibre connectivity from Eircom, Colt, Digiweb, BT, Viatel and EU Networks.

The on-site communications ducting network was significantly upgraded as part of the development of Terminal 2. This network referred to as the Campus Area Network (CAN), and is a high capacity (band width) fibre optic system with nodes at which connections are made to individual buildings and/or users.

3.4 Existing Environment and Heritage Context

The environmental context of Dublin Airport and its environs have been assessed under the topics of flora, fauna, soils, geology, air quality, climate, noise, and water. While the heritage contexts of the lands are reviewed under the topics of archaeological, architectural and cultural heritage.

3.4.1 Biodiversity and Environment

Environmental Designations

There are no designated sites, Special Areas of Conservation (SAC) for flora and fauna, Special Protection Areas (SPA) for birds or Natural Heritage Areas (NHA) at the airport or in its environs. The sites closest to the subject lands include Feltrim Hill (pNHA) 2.5km to the east; Malahide Estuary (SAC, SPA, pNHA) 5km to the northeast; Sluice River marsh (pNHA) 5.5km to the east; and Baldoyle Bay (SAC, SPA, pNHA) 6km to the southeast.

Flora and Fauna: Habitats

Dublin Airport and its immediate environs are entirely artificial in character, comprising existing roads, car parks, buildings and landscape planting. There are a number of treelines, hedgerows and some small areas of amenity grassland. There are no unculverted surface watercourses on the subject area and the land drains in an easterly direction. There are two streams to the east of the area, the Wad stream and Kealy's stream, which receive surface run off.

The following habitats are identified in the airport and environs:

- Treelines: These border the main access roads and while they are landscape features they are considered to be of limited ecological value.
- Amenity Grassland: There are small areas of amenity grassland which border the main access roads. These areas are of no significant ecological value.
- Buildings and Artificial Surfaces: There are a number of buildings, roads and car parks. The majority of these are modern in construction and are of no ecological value.

Flora and Fauna: Species

The National Parks and Wildlife Service (NPWS) database was consulted with regard to the possible presence of rare or protected plant species at the subject lands. There are no records of rare or protected plant species close to or within the area and due to the modified nature of habitats none are likely to occur.

The airport and its environs are considered to be lacking suitable habitats for bats. The high levels of street and security lighting throughout the airport at night render most potential roosting sites, including trees with potential roosting crevices, unusable by bats. Birds were observed within the subject lands, however none of the species encountered within or close to the area were considered to be of high conservation concern.

Soils, Geology, Air Quality, Climate and Noise

The existing contexts for soils, geology, air quality, climate and noise have been investigated at the airport and its environs. It is determined that there are no significant concerns or potential constraints in relation to these environmental aspects as existing at the subject lands.

The soil and geological environment within the subject lands is developed and largely comprises made ground. Ambient air monitoring in recent years at locations proximate to the subject lands recorded results typical of urban and inter-urban areas and well within set standards, indicating air quality in the vicinity to be acceptable. The lands are located within the Inner Noise Zone identified and mapped in accordance with EU and national legislation on noise, however, the designation is not constraining the activities of the existing lands. Future climate change is considered to likely have an impact on the region's water resources and this must be taken into account in all aspects of sustainable planning.

Water

In relation to hydrology, i.e. surface water catchments, the airport and its environs are located within the Eastern River Basin District, and there are a number of waterbodies which drain the subject lands, including:

- Wad Stream – this is located outside of the north eastern section of the subject lands and drains the north apron. The stream is buried beneath the Airport Roundabout from where it flows eastwards. It forms part of the Sluice River catchment which flows into Baldoyle Estuary at Portmarnock Bridge.
- Kealy's Stream – this is located in the eastern section of the subject lands and drains the internal road network and car parks in the airport complex on landside, and the DAA controlled long-term car park on the R132. This stream also forms part of the Sluice River catchment which flows into Baldoyle Estuary at Portmarnock Bridge.
- Cuckoo Stream is located to the south of the subject lands. It forms part of the Mayne River catchment. It is the largest surface water system on the wider airport campus and collects runoff from the runway and from the central and southern aprons. This stream joins with the Mayne River beyond the southern boundary of the airport and discharges into the Baldoyle Estuary.

Water quality monitoring is undertaken of these watercourses for the purposes of the Water Framework Directive (WFD) by the DAA and supplied to the EPA. The primary mandate of the WFD is for all waters to achieve 'good' ecological status by 2015.

In records between April 2006 and September 2013, the Wad Stream has shown a trend of improvement since April 2009 and has a 'moderately polluted' status. The Cuckoo Stream and Kealys Stream have shown no sign of improvement and have a status of 'seriously polluted'. Development at the airport has impacted and will impact on both the quality and quantity of the surface water runoff into these catchments. Under the WFD classification, the status of the Sluice River is classified as 'good' with an overall objective to 'protect' whereas the Mayne River is classified as 'bad' with an overall objective to 'restore'. Both rivers are also classified as at risk of not achieving the WFD aim of 'good status' by 2015 as a result of diffuse pollution.

In relation to hydrogeology, i.e. groundwater conditions, two bedrock aquifers are identified beneath the subject lands; a locally important aquifer and a poor aquifer.

Due to the different bedrock conditions, groundwater vulnerability ranges from 'low' on lands to east of the airport and environs (the DAA controlled long-term car park on the R132) to 'moderate – high' in Zone 2 and 'high – extreme' in Zone 1 where there is shallow rock and thin subsoils. The groundwater WFD status for the subject lands is predominantly 'good' with an overall objective to 'protect'. Groundwater is also considered to be at risk of not achieving 'good status'.

3.4.2 Archaeology, Architectural and Cultural Heritage

Archaeological Heritage

While there are no recorded archaeological monuments within the Masterplan lands, there is a monument, an unclassified castle, recorded immediately to the east of the Terminal 2 building.

The excavations database maintained by the Department of Arts, Heritage and Gaeltacht (DAHG) contains three Irish Excavation Reports associated with the development of Terminal 2 at the airport. This indicates the extent of archaeological heritage in area.

- As part of development of Terminal 2 in 2006 – 2007, an area of nearly 8 hectares was monitored and the results were determined to be not of archaeological significance, as no remains of cultural or heritage value were recovered. Fragments of early 20th-century clay drainage pipes associated with the previous use of the area by the Royal Air Force (pre-1920) and one piece of oyster shell were recovered.

- As part of the development of Terminal 2 works in the vicinity of the former castle site were monitored in December 2007 and early 2008. The very bottom of a former late post-medieval boundary ditch was identified but was not considered to be of archaeological significance.

- Monitoring of groundworks on the south apron at Terminal 2 was undertaken between April to July 2008 with particular attention being paid to the former location of Collinstown House. No archaeology was identified.

Architectural and Cultural Heritage

There is one protected structure at Dublin Airport, which is the original 1937 Terminal Building in International Modernist Style. This building is listed on the Fingal County Council Record of Protected Structures (RPS Reference No. 612). It is also listed on the National Inventory of Architectural Heritage (NIAH Register No. 11349006) and is rated as being of national significance.

While not a protected structure, another building of note is the Church of our Lady Queen of Heaven which is listed on the NIAH (NIAH Register No. 11349001), and is rated as being of regional significance. The church is located within the GTC area. There are no protected structures within the Masterplan lands. (see Fingal Development Plan Zoning Map Extract).

4.0 ECONOMIC CONTEXT

4.1 Conditions associated with Airport Development

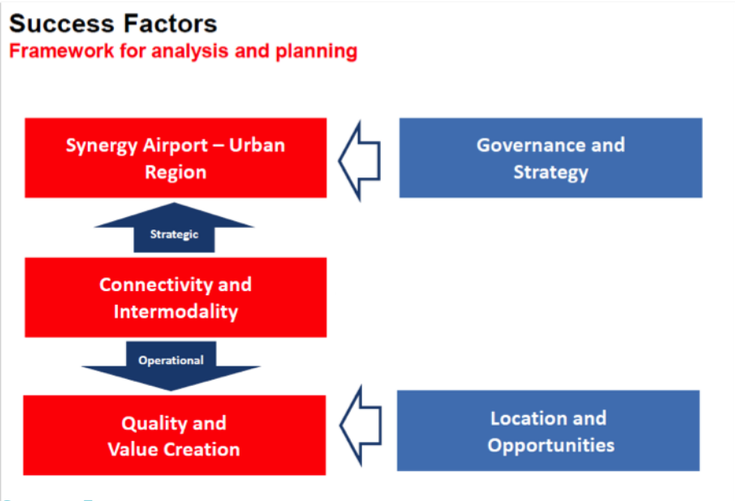
Dublin Airport is an airport of international standing and importance. At a national and regional level, the airport serves as an essential aviation and public transportation hub and a principal gateway into and out of the country and region. Furthermore, at the local level, Dublin Airport is one of the most significant economic entities driving economic development in Fingal, generating vital direct and indirect employment.

In planning for the future development of the Masterplan lands, there are unique conditions which are specific to the lands which are due to their immediate proximity to Dublin Airport. These conditions relate to creating and maintaining a synergy between the airport and its surrounding metropolitan area, and these conditions should be analysed and managed appropriately.

4.1.1 Airport Development: Success Factors for Dublin Airport

Internationally, Dublin Airport is relatively underdeveloped from an economic and business perspective. From best practice and success elsewhere at other airport locations, five factors have been identified which are necessary to create successful developments and projects close to and associated with an airport. These success factors include three core factors: economic synergy between an airport and metropolitan region; connectivity and intermodality; and quality and value creation; and a further two conditional factors including: governance and strategy; and location and opportunities. The achievement and management of these factors must be balanced to realise an optimum economic and planning framework for development at an airport.

Analysis of the existence and strength of these success factors for Dublin Airport indicates that there is an opportunity for economic development at and associated with the airport that can be harnessed for the wider economic and social benefit of Fingal. The potential economic development will complement the principal economic and employment bases of Swords and Blanchardstown in Fingal.



Success Factors

<u>Core Factor 1: Economic Synergy between the Airport and its Metropolitan Region</u>

The presence of existing economic clusters with an international orientation is an important factor for creating economic synergy. Dublin City and the GDA host some of the world's top multinational corporations and there is an established economic synergy between Dublin Airport and the wider metropolitan region in attracting and retaining these types of businesses. By harnessing the existing presence of such businesses, Dublin Airport shall prove an attractive location for international companies, for both corporate headquarters and supporting businesses and facilities. A tangible economic synergy between Dublin Airport, Fingal and the surrounding Dublin region will further improve the attractiveness of these places for international business locations.

<u>Core Factor 2: Connectivity and Intermodality (Mixed Transport Modes)</u>

Considerations relating to an airport and degrees of connectivity exist at an international level through to the local level. Connectivity is of most value to a metropolitan region that already has an international focus and economic potential. The success of an airport in this regard depends on its route network and that of the airlines that operate from and to it. For successful economic development at and near an airport, it is important that the global connectivity is matched with landside connectivity. Quality public transport provision and surface access is particularly relevant as it enhances accessibility for an airport development.

At present, with an average of 480 flights per day serving 175 global destinations directly, Dublin Airport is very well positioned to service the international connectivity demands of multinational businesses working across different time zones. The strength of the network at Dublin Airport is demonstrated by over 40 flights per day to North America and four flights per day to the United Arab Emirates. On the landside, Dublin Airport is serviced by close to 1,200 bus and coach movements per day serving all counties within Ireland. The mobility strategy employed by the daa at the airport seeks to provide improved public transport targeting both airport passengers, business workers and the business travel segments.

As referred to in Chapter 2, in December 2014 the National Transport Authority (NTA) published the *Fingal/ North Dublin Transport Study: Stage One Appraisal Report* with the aim of identifying the optimum longterm public transport solution to connect Dublin City Centre, Dublin Airport and Swords. Six options have been shortlisted for further investigation. These include two heavy rail (DART) options; one LUAS option, one Metro option (a revised version of the original Metro North project approved in 2010); one Bus Rapid Transit (BRT) option; and one Combination option (DART and LUAS). Notably for the Masterplan framework, each of the six shortlisted options shall by association also serve the Masterplan lands. For the majority of the options, this is through a BRT dedicated route around the lands, while for the heavy rail options there are proposals for an underground stop at the airport. These six options will be further examined in the subsequent stages of the Study for technical development, environmental assessment, modelling and cost benefit analysis before the final transport solution will be determined.

<u>Core Factor 3: Quality and Value Creation</u>

Future spatial planning which focuses on achieving quality of development at an airport is important for longterm value creation. Often, airports are planned pragmatically with an emphasis on their operational functions and it can be challenging to subsequently integrate economic development at an airport. It is only through the integration of such development at an airport that the best potential for economic value can be created.

An emphasis on quality and value creation is at the centre of the Masterplan framework. The delivery of Terminal 2 and improvements to the adjacent road network presents an international, dynamic image of Dublin Airport. These recent developments are in marked visual contrast to the many existing older buildings that are located in the adjacent Masterplan lands. The Masterplan seeks to progressively improve the character and image of the subject lands through a landscaping and public realm improvement strategy combined with the redevelopment and refurbishment of existing buildings and the provision of new office buildings.

<u>Conditional Factor 1: Governance and Strategy</u>

A conditional factor associated with the core factor of creating economic synergy, is the existence or creation of a suitable form of governance. An active strategy involving all stakeholders, from local to national interests must be promoted and adapted throughout the development. The Masterplan has been developed collaboratively with key stakeholders to ensure that the nature and scale of development envisaged for the subject lands will not result in a detached business enclave at Dublin Airport, but will be informed by and operate within local, regional and national policy contexts. The approval and agreement of all key enabling stakeholders is paramount to its success, and will continue through the implementation stages of the Masterplan.

<u>Conditional Factor 2: Location and Opportunities</u>

A conditional factor associated with the core factor of value creation, is the successful promotion and realisation that the optimum location for international development is at an airport. A good location within a broader network of cities (at an international context) and towns (in a regional and local context) can also be a driver and opportunity for development at an airport. The location of the Masterplan lands within the GDA is optimal with direct access to the national motorway infrastructure including the M1, M50 and Port Tunnel.

Supported and associated with a nationally integrated public transport network, the development envisaged in the Masterplan will create a new location for businesses that focuses on airport based development which complements the local bases in Fingal and the wider Dublin region.

4.2 Economic Opportunity associated with Airport Development

To comply with the requirements of Local Objective 378, in relation to determining the appropriate nature of HT and aviation related uses, and an appropriate scale of development in the Masterplan lands, analysis has been undertaken of economic growth and employment trends. Due to the requirement in Local Objective 378 for permissible HT uses to also be related to aviation and airport business, the focus of the analysis has identified and targeted towards corporate head quarter office based activities and services of international businesses which include professional, financial and insurance services; information and communication technologies; and administrative and support services.

Section 6.1 outlines in greater detail the specific use classes that are listed as being permitted in principle and those not permitted within the Masterplan lands.

4.2.1 Exports Profile

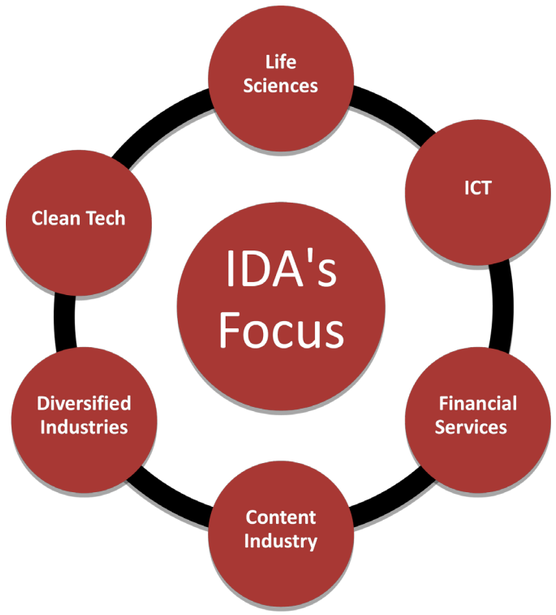
The main performer in the Irish economy over recent years has been the export sector. The published data divides exports into 'Goods' (referring to physical product leaving Ireland) and 'Services' (referring to exports relating to primarily office based activity such as Sales, IT Support, HR or Intellectual Property Management). A trend has been identified for internationally based companies to consolidate such functions into one location allowing them to build expertise or centres of excellence in a particular function in a single base as well as achieving cost reduction through consolidation.

Between 2006 and 2012, the services sector grew from being 21% of all exports from Ireland to 51%. In absolute terms, this represented growth from €17bn to €46bn. Computer and business services represent two thirds of the total service exports from Ireland with companies such as Google, Facebook, Amazon and LinkedIn basing significant operations in Ireland. Computer services exports grew by 16% in 2012 and business services exports grew by 4%. The engine for this growth is Foreign Direct Investment (FDI) by companies who consider Ireland to be a suitable base to support a European network. Ireland provides ready access to European markets and is considered by US companies, in particular, as a being a bridge into Europe.

4.2.2 Policy Approach for FDI Investment

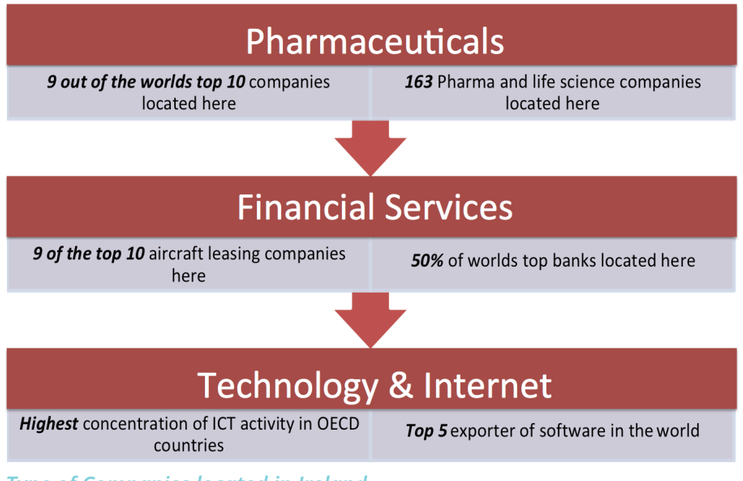
The source of the majority of FDI investment is through the Industrial Development Authority (IDA). The IDA's *Horizon 2020 Strategy*, published in March 2010, outlines the FDI goals for a four year period from 2010 to 2014 with a focus on securing investments in Global Services, High Technology Manufacturing and Research Development, and High Level Research and Development. The Strategy aims to achieve 640 new investments and create 62,000 gross jobs (IDA, 2010).

According to Forfás' *Action Plan for Jobs* (2013), 419 investments have been made within the first three years of the IDA's *Horizon 2020 Strategy*, which in turn has delivered an increase of 36,332 gross jobs since its inception. The strategy outlined in Horizon 2020 focuses on attracting new companies whilst supporting the existing stock of foreign owned companies. The IDA states its focus is on obtaining new investments from the following key sectors:



IDA Focus

The pace of FDI investment into Ireland performed well in 2013 with the creation of 13,367 gross jobs by the IDA's client companies. It is estimated that Ireland has increased its market share of the FDI pool in Europe to 3.78% and has entered into the top 10 countries in Europe for project numbers. There are currently in the region of 1,032 overseas companies operating in Ireland, including some of world's leading entities, which continue to direct investment into the Irish economy.



Type of Companies located in Ireland

4.2.3 Qualities that Attracts FDI Companies

In focusing on these high-value technical jobs, Ireland has a distinct advantage over its EU competitors. Ireland's industrial policies have been driven towards attracting and retaining FDI for decades. Along with reductions in rents, energy and living costs, in recent years there has been a 15% reduction in unit labour costs, which is in notable contrast to the 6.7% increase in unit labour costs predicted for the Euro area as a whole.

The availability in Ireland of a young, educated and English speaking labour force has proven extremely attractive to American companies. Consequently, the employment opportunities in world leading companies, such as Google and Facebook, have increased with greater numbers of young Europeans coming to Ireland, in particular to the Dublin region, to work.

Development of appropriately scaled economic and enterprise employment sources within the Masterplan lands, will benefit from being strategically located at the airport and with excellent connections across Fingal and to the wider Dublin region. Additionally, development of this type and at this location will be positively positioned to harness the unique demographic conditions which have become apparent in Fingal in recent years with expediential growth in the key working-age cohorts.

4.2.4 Recommendations from the Economic Analysis

For the Masterplan lands, through the specifications of the HT zoning and Local Objective 378, there is an opportunity to capitalise on the export led growth sectors. The ability to develop a cluster of similar type occupiers for the Masterplan lands focussed on international trade in services is a natural fit for the airport.

From the economic analysis undertaken, FDI inward investor targets should focus primarily on the American companies who require access to the European market which Ireland continues to offer on a cost effective basis. These companies are likely to grow rapidly and will require skilled workforce, a cost effective overhead and tax regime as well as the basics of English language, reliable legal system and political stability. As the global economy stabilises opportunity is created in being at the meeting point of international and national companies seeking to sell into increasing global demand.

Comparative studies with other similarly sized airports internationally, support the Masterplan economic analysis that Dublin Airport is underperforming in this regard. This underperformance would not appear to relate to any physical deterrents but heretofore the absence of a strong and coherent governance and planning structure to support such development and associated marketing of same.

The nature and scale of development envisaged for the Masterplan lands is not intended to compete with other local or regional employment or business locations, but to complement these and to compete with alternative international locations that would be considered by companies that look to airport locations and proximities as being key factors in their location selection process.

5.0 VISION AND PRINCIPLES

The Masterplan has been formulated and structured on the basis of a number of principles. These include principles relating to urban design and quality space making; movement and circulation; economic conditions; and environmental and building sustainability.

5.1 Urban Design and Space Making Principles

The development framework presented in the Masterplan includes core urban design principles. The design principles, identified as being of particular relevance to development at the airport, include connectivity, both pedestrian and vehicular; the timely delivery and arrangement of the built forms; and the provision of quality public realm features and structures.

5.1.1 Landside and Airside Connectivity

The interplay of connectivity and intermodality (mixed transport modes) is highlighted in Chapter 4 as being a Core Success Factor for airport-metropolitan developments. As such, efficient and effective connectivity between the landside and airside at Dublin Airport is a core design principle guiding the Masterplan framework.

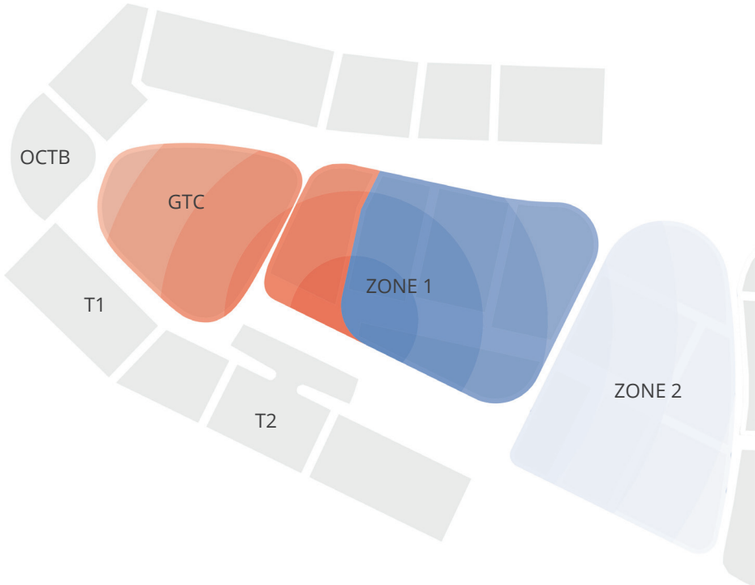
An important element of the Masterplan is the creation of a 'Green Lung' of connectivity, which is a spine of quality public open space running along a west-east orientation, protected from but connected to the main airport operations arteries.

Connectivity

A key component in achieving optimum landside and airside connectivity is the role of the Ground Transportation Centre (GTC). The GTC is an important public focal point for the airport itself and for the future development envisaged in the Masterplan. An important design consideration associated with pedestrian circulation and connectivity, is the provision of a direct link from the GTC to future development in Zone 1, formed to the south of the existing Terminal 2 Multi-storey Car Park (T2 MSCP) across the 'Transition Square'.

5.1.2 Delivery and Arrangement of Built Forms

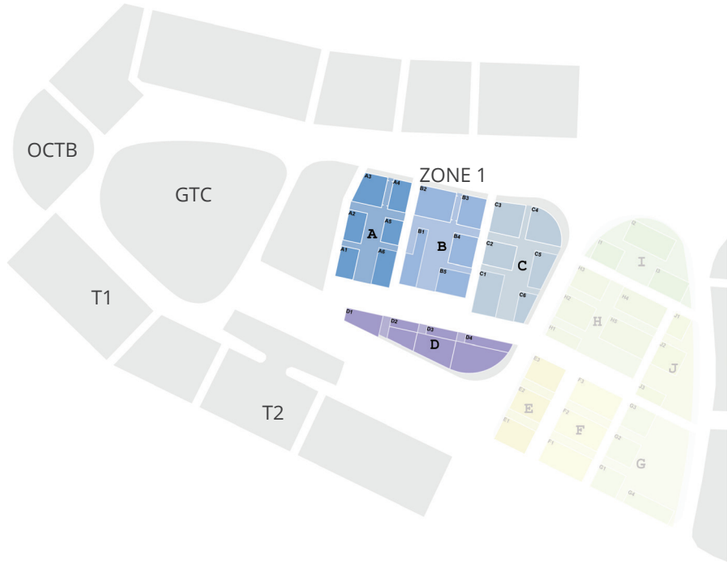
Ensuring that the future development of the Masterplan lands is delivered in a timely and appropriate manner is a strong guiding principle in devising the framework. The growth strategy proposed for the Masterplan commences with initial development being undertaken closest to the airport terminals and to the GTC. Subsequently, with a focus on further development within Zone 1, there shall be a range of higher density development proposed in the westernmost parts of the Zone.



Growth Strategy

The design framework for the development of the Masterplan lands consists of clusters of buildings organised along the length of the Green Lung. The arrangement of these clusters is flexible yet coherent, and their organisation will benefit from being in close proximity to, addressing and with ready access to the Green Lung. The range in sizes of buildings possible within each cluster provides a level of overall flexibility which is an important approach in the Masterplan.

The advantage of arranging the proposed development into clusters is the completion of those built forms in a timely and appropriate manner.

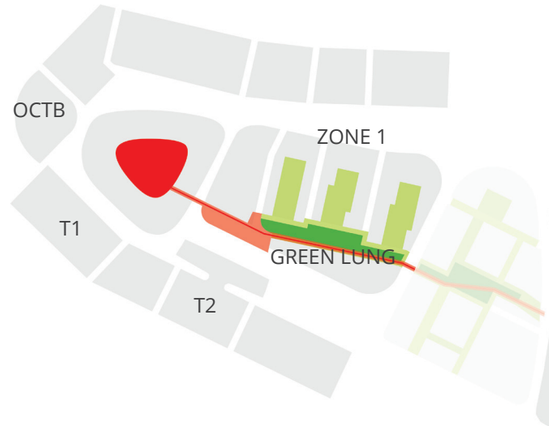


Clusters

5.1.3 Public Realm and the Green Lung

The public realm proposal is a continuous system of landscaped spaces of character varying according to their hierarchy. The highest order of space is the west-east orientated Green Lung to provide an open connectivity experience.

The formation of indoor (pavillions) and outdoor rooms or spaces within this Green Lung allows it to be used in all weather conditions. This Green Lung is connected by means of plazas and green streets of particular quality to the adjoining commercial building clusters. The main elements of the public realm system are the combinations of a central space, connected courtyards or plazas, and a hierarchy of green streets. This interconnected system of spaces is also the opportunity for sustainable stormwater management and biodiversity.

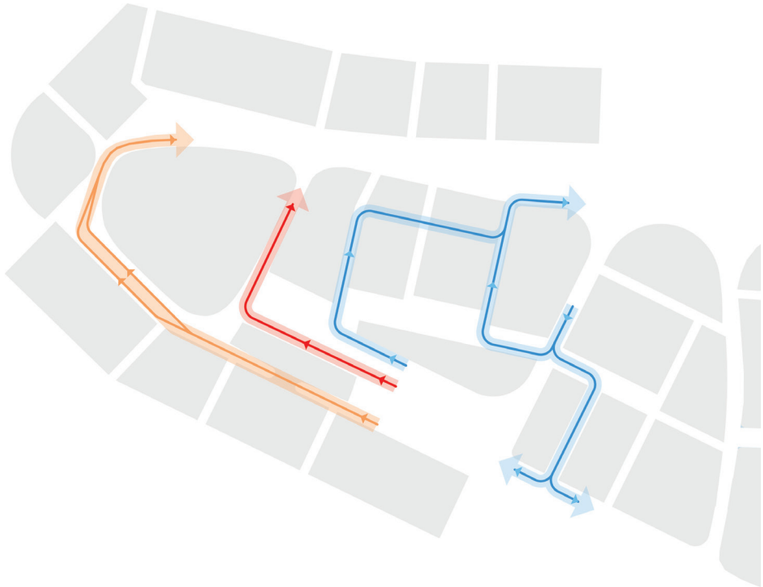


Public Realm

5.2 Movement and Circulation Principles

There are a number of fundamental principles determining the Masterplan framework in relation to movement and circulation within the lands. These include:

- A focus on high quality pedestrian connectivity both within the Masterplan lands and to the GTC and Terminal buildings;
- The provision of enhanced access by public transport to the Masterplan lands through the improvement of existing services and focusing the early phases of development close to the key public transport node , the GTC, serving the airport;
- A supply-side managed parking policy;
- Minimising at the earliest opportunity the interaction between Dublin Airport operations traffic and traffic generated by office development within the Masterplan lands;
- The location of the office- associated parking areas to the northern periphery of Zone 1, and focusing pedestrian traffic within the central Green Lung area; and
- The secondary circulation routes will provide access to limited on-street parking and will facilitate the necessary servicing of the buildings within the Masterplan lands.



Main Circulation

5.3 Economic Principles

The principles that form the basis of the economic rationale for the Masterplan have been presented in Chapter 4 and are summarised as follows:

- Creating a new and unique business destination;
- The creation of strong sense of place and association as being the desired business location for key market and employment sectors;
- Establish credibility in the market place in terms of deliverability, quality, and critical mass;
- Leveraging a large coherent site, with its pivotal location with strong land and air connectivity;
- Identifying and attracting potential tenant targets in competition with international destinations with a unique offering, and not competing with employment locations within Fingal; and
- A demand-led timely, appropriate and sustainable provision of development rather than a speculative build-out of office accommodation.

5.4 Sustainability Principles

The Masterplan includes a comprehensive and integrated sustainability strategy that is cognisant of national and European policy, of best practice in utilisation of finite resources, and of the future growing market demand for sustainable development. The sustainability principles at the core of the strategy are informed by policy and key objectives in the current Fingal Development Plan, which relate to energy efficiency and the functionality of built forms.

Relevant policy in the Development Plan guides that that all new developments contribute positively towards a reduced energy consumption and the associated carbon footprint. New development proposals will be required to demonstrate reduced energy consumption in their design and construction and should incorporate where possible alternative energy technologies such as bio-energy, solar energy, heat pumps, heat recovery and wind energy. New development within the Masterplan lands will be required to accord with Development Plan policy and, in particular, the requirements of Objectives EN02, EN03 and EN04, which are as follows:

Objective EN02

Improve the efficiency of existing building stock and require energy efficiency and conservation in the design and development of all new buildings in the County.

Objective EN03

Promote energy efficiency and conservation above the Building Regulations standards in the design and development of all new buildings and in residential schemes in particular and require designers to demonstrate that they have taken maximising energy efficiency and the use of renewable energy into account in their planning application.

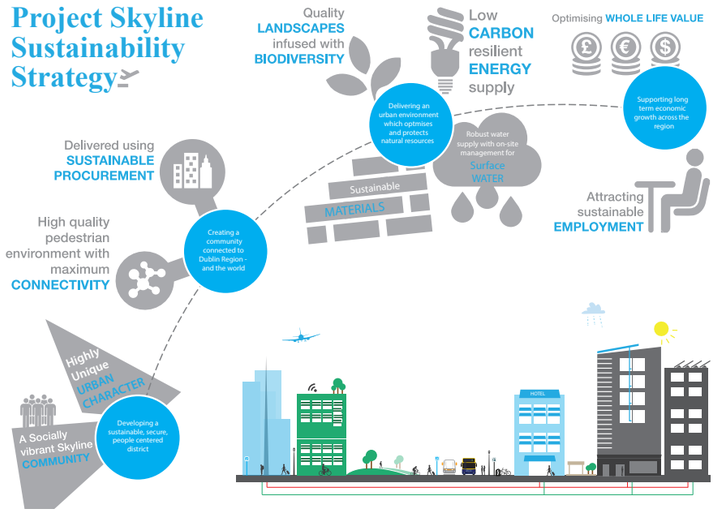
Objective EN04

Require details of the requirements for alternative renewable energy systems, for buildings greater than 1000sq m or residential schemes above 30 units, under SI 666 of 2006 European Communities (Energy Performance and Buildings) to be submitted at pre planning stage for consideration. These should take the form of an Energy Statement or Feasibility Study carried out by qualified and accredited experts.

The key principles that frame the sustainability strategy are:

- Developing a sustainable, secure, people-centred district;
- Creating an employment base that is easily accessible, well connected to and supports the economic growth of key urban centres within Fingal , and the wider Dublin region;
- Delivering an urban environment which optimises and protects natural resources and;
- Ensuring that new built forms are designed and constructed in an energy efficient manner.

An achievement of these overriding sustainability principles illustrates sustainability commitments, opportunities and solutions within the Masterplan.



Sustainability Strategy

6.0 DEVELOPMENT STRATEGY

6.1 Specific Use Classes and Objectives

The Masterplan lands are zoned as 'HT' High Technology and are subject to the map based Local Objective 378. In the current Development Plan, optimum use classes identified for HT zonings include office accommodation, enterprise centres, training centres, research and development space, and high technology manufacturing. These key use classes are supplemented with appropriate ancillary use classes such as restaurants, cafes and retail opportunities intended to serve the local work force.

An important consideration in determining the nature of the specific land uses permissible in the Masterplan lands is Local Objective 378. This objective acknowledges and seeks to harness the strategic location of the lands at Dublin Airport. The objective seeks to provide for HT use classes and enterprise centre uses related to aviation and airport business, research and development associated with airports or aviation, and airport transport infrastructure.

In determining the appropriate nature of uses in the Masterplan, the lands, in particular Zone 1 are considered to be suitable for business requiring and/ or preferring an airport location for the reasons outlined in the economic analysis in Chapter 4 rather than relating to reasons associated with the function and operation of an airport. Additionally, regard is given to other key considerations such as the strategic proximity of the Masterplan lands to the airport, and the international nature of the businesses and companies that the scheme seeks to attract. Regard is also had to the location of the lands within the Inner Noise Zone. There are certain uses that are permitted in principle in the HT zoning that are not considered appropriate to the Masterplan lands due to the considerations identified above. These use classes include high technology manufacturing, hospital, and light industry. This approach is considered to be consistent with the HT land use zoning and the move away from the DA land use zoning that applies to the functional area of Dublin Airport. In consultation with the DAA, NTA and NRA, aviation related activities (i.e. functionally related airport uses) such as air and transport infrastructure, logistics, car hire are not considered to be appropriate at this location and will continue to be classified as not permitted.

In relation to office development, the economic analysis in Chapter 4 highlights the attractiveness and opportunities associated with international airports in creating and fostering a strategic business destination. The scale of office development and the type of potential tenants envisaged for the Masterplan lands shall be unique to this Dublin Airport location. The Masterplan area has been identified as being most suitable for corporate type headquarters i.e. offices with floor spaces in excess of 1,000 sqm. This scale of office accommodation is permitted in principle under the HT land use zoning.

Smaller offices with floor areas between 100 sqm and 1,000 sqm, while permitted in principle in the HT land use zoning, will be open for consideration within the Masterplan area as this scale of office is not as desirable at this location due to the proposed larger building/ office block formats having the greater potential to attract corporate entities. However, this scale of office space maybe considered appropriate in the former Aer Lingus HOB and/ or in other permitted multi-tenancy buildings, subject to normal planning assessments.

USE CLASSES RELATED TO ZONING OBJECTIVE		
Permitted in Principle		
Enterprise Centre	High Technology Manufacturing	Hospital
Industry – Light	Office Ancillary to Permitted Use	Office ≤ 100sqm
Office > 100 sqm and < 1,000 sqm	Office ≥ 1,000 sqm	Open Space
Research and Development	Restaurant/Café[5]	Retail – Local < 150 sqm nfa[5]
Sustainable Energy Installation	Telecommunications Structures	Training Centre
Utility Installations		
Not Permitted		
Abattoir	Aerodrome/Airfield	Agri-Business
Agricultural Buildings	Agricultural Farm Supplies	Agricultural Machinery Sales and/or Maintenance
Agri-Tourism	Air Transport Infrastructure	Amusement Arcade
Bed and Breakfast	Betting Office	Boarding Kennels
Builders Provider/Yard	Burial Grounds	Car Hire Holding Area
Caravan Park – Holiday	Caravan Park – Residential	Cargo Yards
Carpark – Non-Ancillary	Casual Trading	Civic Waste Facility
Concrete/Asphalt	Dancehall/Nightclub	Extractive Industry /Quarrying
Fast Food Outlet /Take-Away	Farm Shop	Fuel Depot/Fuel Storage
Funeral Home/Mortuary	Garden Centre	General Aviation
Golf Course	Guest House	Health Practitioner[24]
Heavy Vehicle Park	Holiday Home /Apartments	Industry – High Impact
Logistics	Park and Ride Facilities	Place of Worship
Plant Storage	Public House	Residential
Residential Care Home /Retirement Home	Residential Institution	Retail – Comparison ≤ 500 sqm nfa
Retail – Comparison > 500 sqm nfa	Retail – Supermarket ≤ 2,500 sqm nfa	Retail – Superstore > 2,500 sqm nfa
Retail – Hypermarket > 5,000 sqm nfa	Retail – Factory Outlet Centre	Retail Warehouse*
Retail – Warehouse Club	Retirement Village	Road Transport Depot
Traveller Community Accommodation	Vehicle Sales Outlet – Small Vehicles	Vehicle Sales Outlet – Large Vehicles
Vehicle Servicing /Maintenance Garage	Veterinary Clinic	Warehousing
Waste Disposal and Recovery Facility (Excluding High Impact)	Waste Disposal and Recovery Facility (High Impact)	Wholesale

* Unless otherwise indicated on Development Plan maps by way of local objective. See Map 4 Balbriggan and Map 12 Blanchardstown North.

[5] To serve the local working population only.
[24] Unless located within a local centre.

Note: Uses which are neither 'Permitted in Principle' nor 'Not Permitted' will be assessed in terms of their contribution towards the achievement of the Zoning Objective and Vision and their compliance and consistency with the policies and objectives of the Development Plan.

HT Land Use Zoning Matrix, Fingal Development Plan 2011-2017

Offices that are less than 100 sqm, while permitted in principle under the HT zoning will generally not be permitted (for all new development other than the redevelopment of the existing HOB) in the Masterplan given the strategic location of the airport, issues regarding traffic generation and mobility management, and the requirement to protect and provide for Regional Planning Guidelines and Development Plan Core Strategy provisions for growth centres such as Swords. The proposed restrictions on the provision of smaller scaled offices are to ensure that the office accommodation provided in the Masterplan lands does not compete with or impact negatively on other Fingal based HT zoning designations.

In implementing the development strategy for the Masterplan lands, these key objectives shall apply:

Objective MP1
To safeguard the current and future operational, safety and access requirements of Dublin Airport while optimising the development potential of Zone 1 in the Masterplan lands.

Objective MP2
To promote economic growth and employment generation at the Masterplan lands with potential to capitalise on the airport location and integrate with sustainable transportation networks that exist or are planned for Dublin Airport.

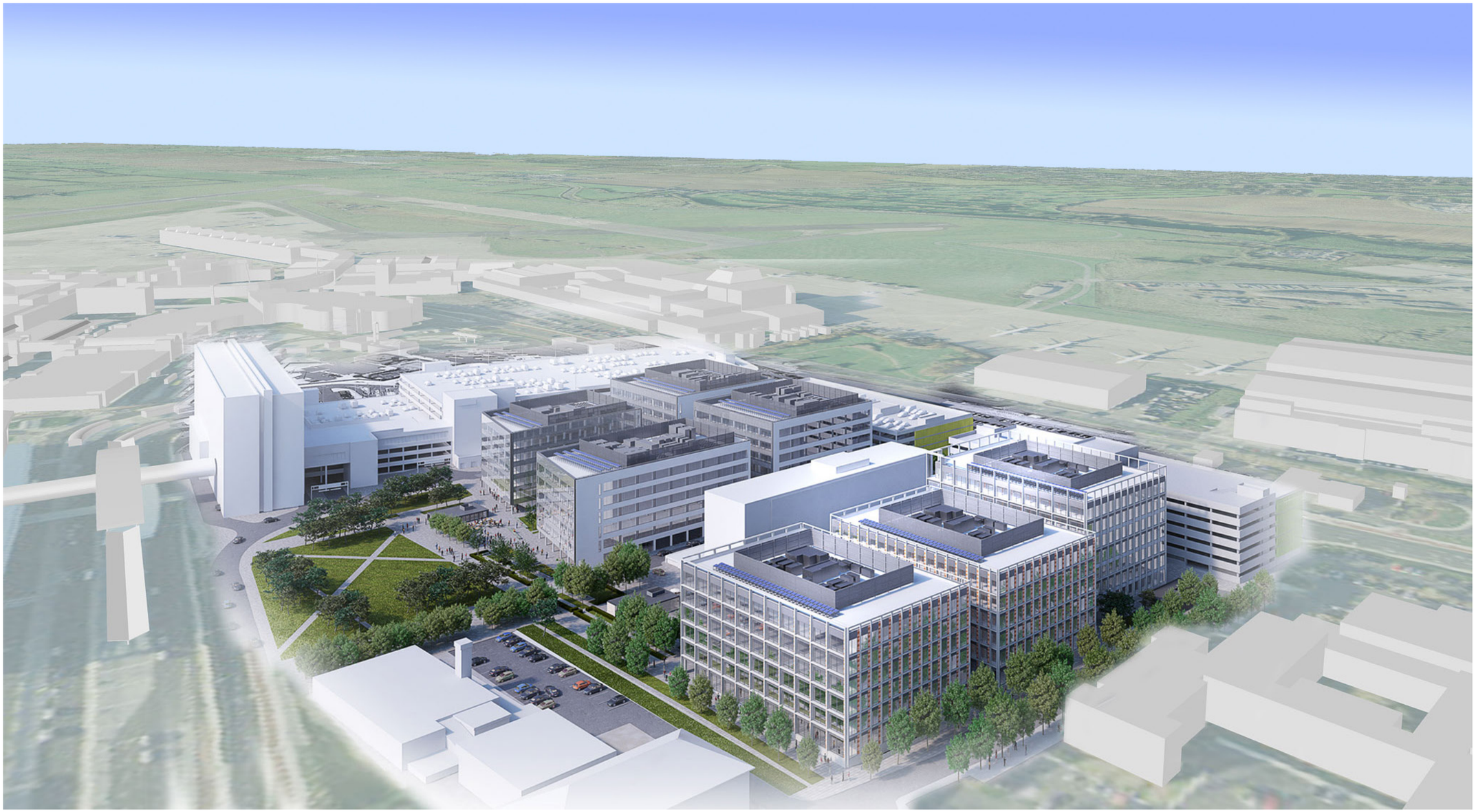
Objective MP3
To facilitate the wide range of uses acceptable in principle and open for consideration under the 'HT' Zoning that applies to the Masterplan lands, but primarily to promote the development of a high quality office accommodation that reflects the unique characteristics of this airport location.

Objective MP4
For the most part, the use classes associated with the 'HT' Zoning shall apply for new development within the Masterplan lands subject to the contents of Table 6.1. In assessing proposals for new development, regard shall be had to Table 6.1 which clarifies the nature and extent of appropriate use classes for the Masterplan lands, which are considered necessary to ensure consistency between the overall HT use classes and the specific requirements of Local Objective 378.

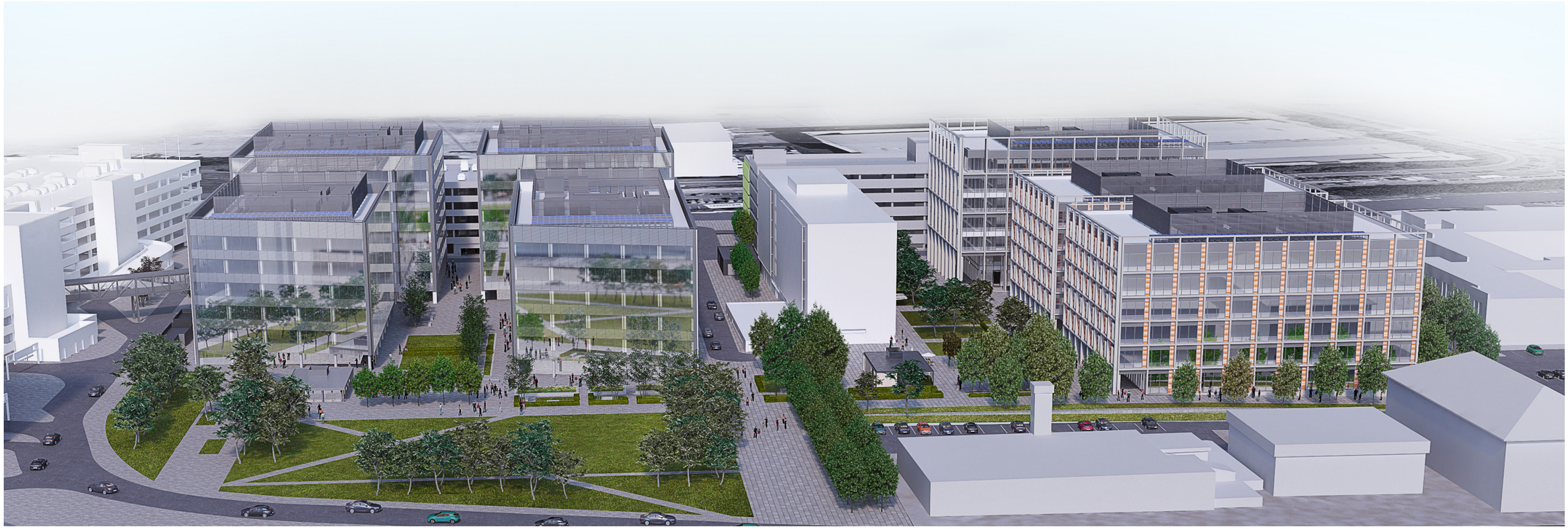
Table 6.1: Use Classes for the Masterplan Lands where different from the 'HT' Zoning Objective

Use Class	HT Zoning	Masterplan Lands
Hotel	Open for Consideration	Permitted in Principle
High Technology Manufacturing	Permitted in Principle	Not Permitted
Hospital	Permitted in Principle	Not Permitted
Industry – Light	Permitted in Principle	Not Permitted
Office ≤ 100sqm	Permitted in Principle	Not Permitted
Office > 100 sqm and < 1,000 sqm	Permitted in Principle	Open for Consideration

Dublin Airport Central Masterplan: Site Layout Plan

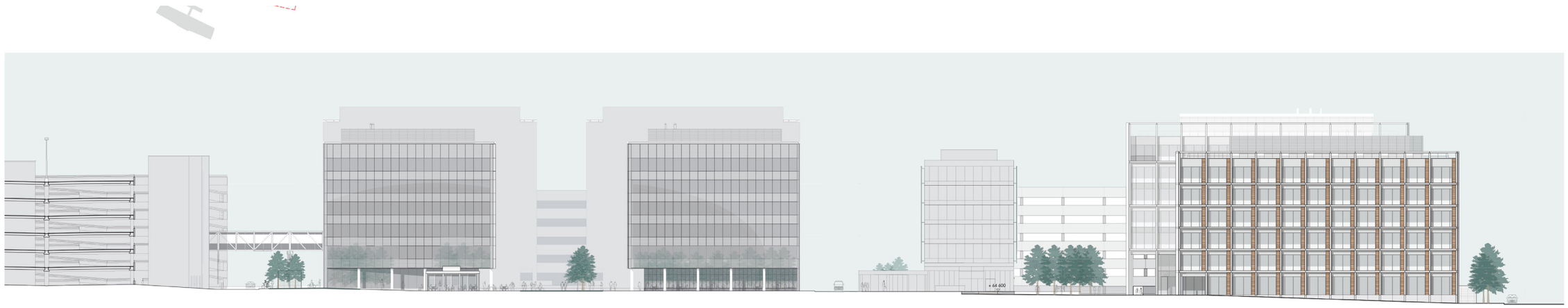


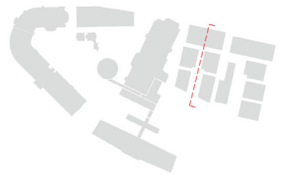
Aerial View from Southwest



Aerial View from Southeast

Zone 1 Masterplan





Zone 1 Cross Sections

Objective MP5
To limit multi-tenancy office development in new buildings through the imposition of a minimum floor area threshold of 1,000 sq m for single office units.

Objective MP6
Where the former Aer Lingus Head Office Building (HOB) is to be refurbished for alternative use, to allow for the full range of office sizes to be accommodated within the existing building. This would facilitate the establishment of incubator or start up enterprises, create a central hub and provide a potential catalyst for further development within Zone 1.

Objective MP7
To allow for the accommodation of local service (including cafes and restaurants) and local retail uses at appropriate locations to serve the needs of the local working population, to animate the public realm and active zones and to create a sense of community.

Objective MP8
To provide for ancillary car parking generally within the associated multi-storey car parks.

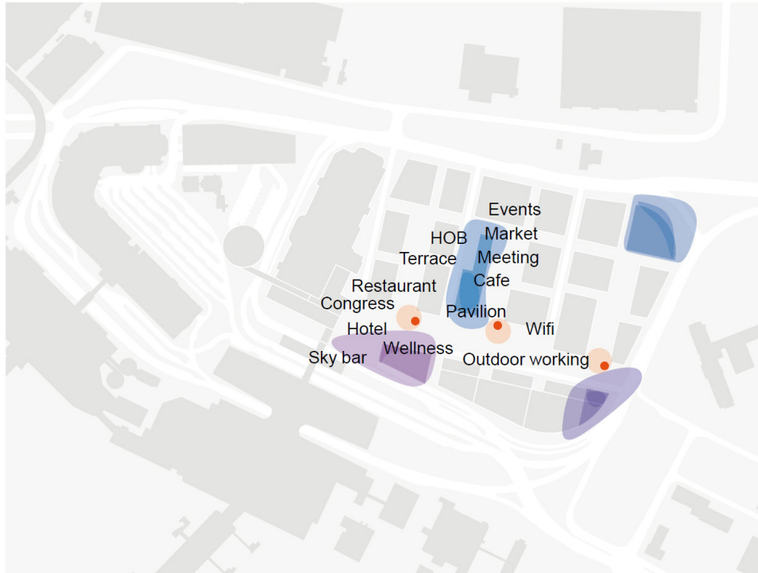
Objective MP9
To have regard to the location of Zone 1 within the Inner Noise Zone and require that buildings are designed to the appropriate standards to mitigate noise impact for occupants and users.

6.2 Key Uses and Buildings

The Masterplan framework allows the development of an environment that promotes organised and spontaneous contacts between its working population and also with the wider working, travelling and visiting population of Dublin Airport. The creation of a distinct identity that can foster a sense of collective community depends on the quality of the public realm and the supporting uses and services therein.

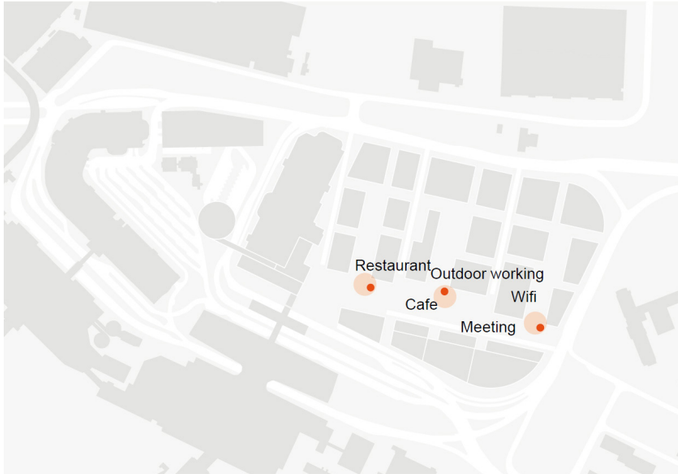
Key uses and buildings have been identified that partially or entirely, have a public function within the overall Masterplan framework. The key buildings in Zone 1 are the HOB and the building blocks in Clusters A and B. These buildings will establish the identity of the area and the development in Zone 1. They provide the public spaces and supporting services that are necessary for the cultivation of a sense of community.

An important aspect of developing the sense of community is to focus on the creative, diverse and flexible use of the physical as well as the virtual spaces to enrich the experience for people using the range of uses and services within the Masterplan lands.



Key Buildings and Uses

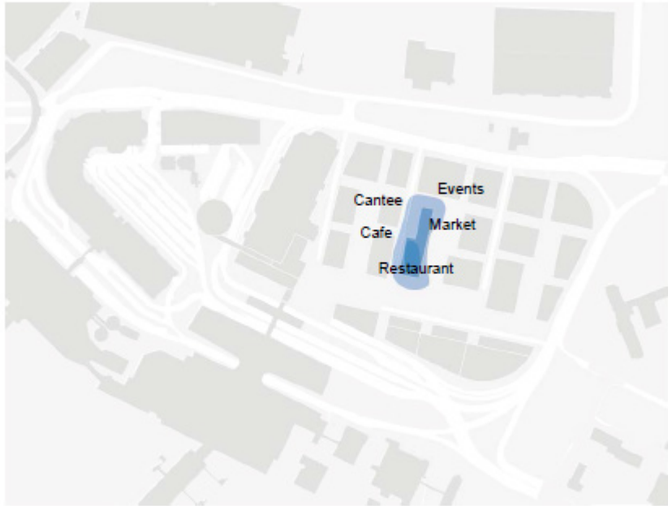
The key buildings shall be complemented with a variety of public meeting and working places, such as cafés and pavilions. In the Green Lung a series of pavilions are envisaged that can activate places within the landscaped areas with a diverse offer of cafés and restaurants. These can be extended into remote working spaces that invite people to use the park as an extension of the offices. In the initial Phase of development, these meeting places and cafés shall be positioned in and around the HOB building.



Pavillions in the Green Lung

6.2.1 Former Aer Lingus Head Office Building (HOB)

The former Aer Lingus Head Office Building (HOB) is an identifiable and noteworthy existing office structure in Zone 1 and has the potential to serve as a catalyst for further development. The building is an important landmark with a distinct historical use as the former Aer Lingus headquarters. As such, the HOB shall be retained and upgraded within the Masterplan framework. The Framework recommends the adaptation and internal renovation of the HOB into a dynamic multi-tenant office while safeguarding the architectural identity of the building. This type of format and use has the potential to serve as a catalyst for the wider scheme. Potentially, companies could have access to offices ranging from small studios and project rooms for short periods of time to small and mid-size units offering a high service level. The ground floor of the HOB with existing cafeteria and larger floor area presents itself as the logical place to offer local ancillary services for the first Phase of development.



Ground Floor Existing Office Building (HOB) – Key Uses and Amenities

6.2.2 Office Clusters

Phases 1 and 2 of Zone 1, which are the focus of the Masterplan, comprise two principal office clusters that have regard to the existing alignment of buildings and properties in the zone. This approach has two advantages: it allows for the integration of existing buildings such as the HOB into the overall framework and for the phasing of development to be delivered with the maximum flexibly.

Office Clusters A and B have a similar building typology and are organised around a plaza. These public spaces allow for each cluster to have its own identifiable address and benefit from southern orientation. To the south of Clusters A and B is the Green Lung which has a distinct layout.

Office Clusters

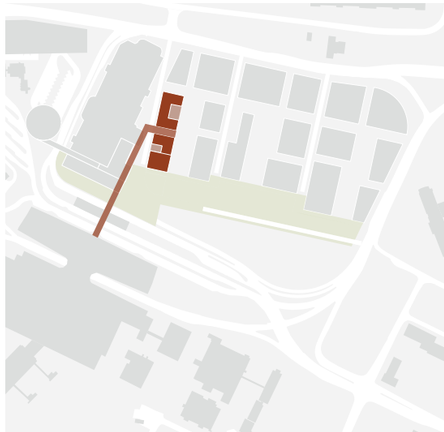
The office clusters have been designed to have a high degree of flexibility with regard to building typology. Clusters A and B typically comprise of up to 7 free standing buildings. Typically, the office buildings are intended for single or larger tenants that require larger floor plates and expression of their own identity. The buildings vary in typology, size and height. The building typologies are sufficiently flexible, so that combinations of buildings could be combined to create larger entities within the overall scheme. From six medium and small scale buildings the scheme can change scale up to two or three buildings that could internalise the plaza into a covered courtyard. Taller buildings are strategically placed in the most visible positions.

The exact nature of the building heights within each cluster is intended to be explored more specifically and in greater detail during the subsequent stages of the planning process. The Masterplan framework is intended to be an indicative and optimum proposal, and not to be precise on the scale and number of storeys of each building. Producing a flexible framework allows these choices to be made in an informed, considered and coherent manner. The recommended design approach for the treatment and articulation of buildings of varying heights is outlined in Section 6.2.4.

An important aspect of the Masterplan framework relates to the tenancy composition for the office accommodation. Phases 1 and 2 of Zone 1 offer a number of viable locations for multi-tenant type offices, depending on the character, size and building typology of the cluster.

A consideration in the final design of the buildings within the Cluster A is the potential to be linked to the Terminal 2 building through the existing T2 multi storey car park. The potential to link Cluster A to Terminal 2 is to offer the maximum opportunities for improved connectivity for users through the scheme and is not related to the operational or functional uses of Terminal 2.

In Cluster A, a multi-tenant office development cluster of some 30,000 sqm of is suggested in the form of four buildings around a central atrium.



Terminal Linked Multi Tenancy within Cluster A

6.2.3 Building Design Guidance

The current Development Plan highlights that Dublin Airport is a national gateway and should provide through exemplar design a visual coherence which will provide an attractive high quality environment which enriches visitor experiences. There are key objectives in the Development Plan that are particularly applicable to and relevant for new development within the Masterplan lands which have been brought into the Masterplan as follows:

Objective BDG1

Ensure that all development within the Dublin Airport Masterplan area will be of a high standard of design, to reflect the prestigious nature of an international gateway airport, and its location adjacent to Dublin City.

Objective BDG2

Encourage and promote the use of contemporary architecture for new developments except where such architecture is incongruous for a particular location.

Objective BDG3

Require an urban design statement with each planning application for development within the Dublin Airport Masterplan area, to ensure architectural coherence and quality in the Airport area; this shall demonstrate compliance with the approved Dublin Airport Masterplan

Objective BDG4

Submit a detailed design appraisal for developments in excess of 300 sq m of commercial/ office development. The design appraisal is required to:

- *Explain the design principles and design concept;*
- *Demonstrate how the twelve urban design criteria, as set out in the Fingal County Development Plan, have been taken into account when designing schemes in urban areas. Each of the twelve criteria is of equal importance and has to be considered in an integrated manner;*
- *Outline how the development meets the Development Plan Objectives, and the objectives of any Local Area Plan, Masterplan, Urban Centre Strategy, Framework Plan or other similar Plan affecting the site;*
- *Include photographs of the site and its surroundings;*
- *Include other illustrations such as photomontages, perspectives, sketches;*
- *Outline detailed proposals for open space and ensure the provision of open space is designed in from the beginning when designing a new scheme; and*
- *Outline how Green Infrastructure integrates into the scheme.*

The Development Plan guides that business parks and industrial estates in Fingal are intended to provide high quality physical environments for business and industry, reflecting the character of the County and increasing its competitiveness. The proposed development within Zone 1 shall be of the highest quality of design, construction and finish. In guiding and assessing planning applications for development within Phases 1 and 2 of Zone 1, the following shall apply:

Objective BDG5

Ensure that all proposed business and industrial development demonstrates regard to the Design Guidelines for Business Parks and Industrial Areas.

Objective BDG6

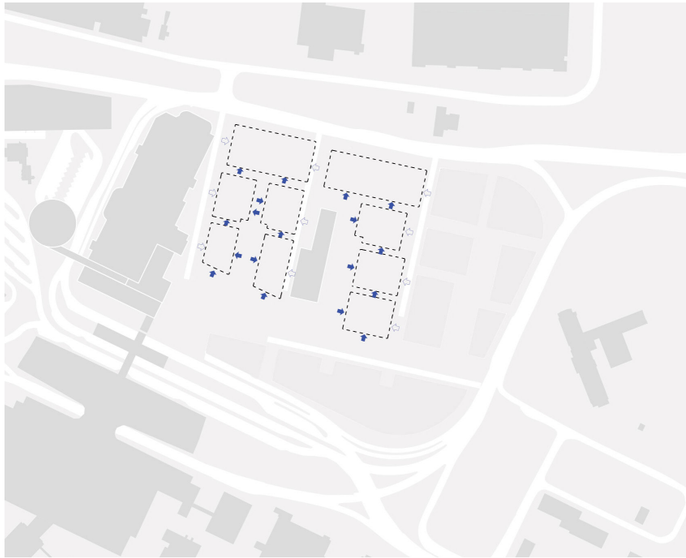
Require that new multi-storey car parks are designed to be of a high architectural standard, be visually unobtrusive, and that environmental considerations are taken into account in all new planning applications for such development.

Overview of Specific Design Guidance

Having regard to the very distinctive, high quality nature of the office development envisaged for Phases 1 and 2 of Zone 1, consideration has been given to the site and location specific conditions of the Masterplan lands. In addition to the detailed guidance provided in Appendix 4 of the current Fingal Development Plan (Design Guidelines for Business Parks and Industrial Areas), the following specific design guidelines have been developed and shall apply to all new built forms in the Masterplan area, i.e. the buildings, public realm locations and hard and soft landscaped areas.

Building Access and Entrance

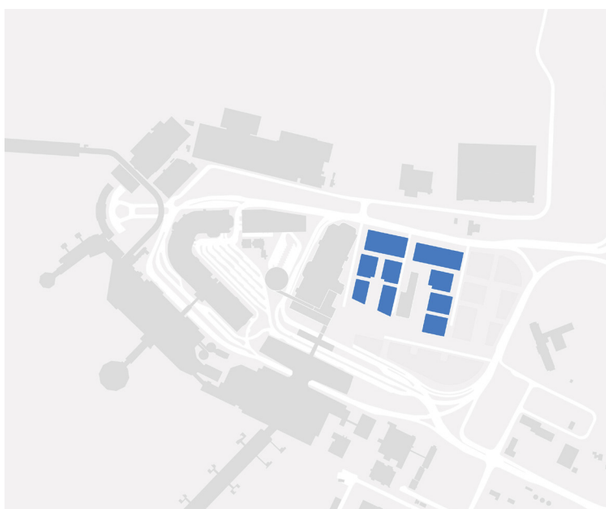
- Main entrance and delivery entrance should be located on the prescribed façade.
- Main entrance should be set back and double height.



Entrance Locations

Plots and Footprints

- Building should fill up to 100% of indicated building footprint at the ground floor level.
- Car parking will not be permitted on the plot once the development of the Zone is completed as parking shall be provided in shared multi storey car parks (MSCP).
- Any significant changes to the plots and buildings would require investigation to ensure overall coherence for the Zone.



Building Plots

Active Facades for Buildings

- An area or space that has a public dimension or character, such as an entrance, lobby, cafeteria, meeting room and so forth should be positioned in an "active zone".
- Active zones should be partially double height (with the exception of those of the MSCPs).

Active Facades Locations

Facade Principles and Building Composition Visual Coherence

Façade design within the Masterplan should positively contribute to create synergy between buildings thereby delivering visual coherence among the groupings of buildings. Such coherence requires an aesthetic balance that avoids, on one side, monotonous expression and, on the other side, an outright diversity of expression. A healthy aesthetic balance between these opposing sides of the design spectrum is key to achieving an architectural expression with meaningful visual interest among a series of buildings.

Therefore a building should be considered in respect to its visual coherence within its cluster or building groupings, and should not be designed in isolation.

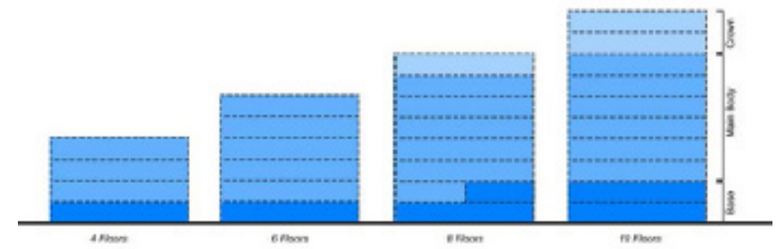
Facades and Sense of Scale

Although there can be many drivers for façade typologies, many modern facades present an aesthetic expression influenced by energy based and environmentally founded performance factors. The notable innovation in recent façade design has resulted in a wide variety of potential architectural expressions. Amid all such variations, the integration of both human and urban scale is a key design principle to ensure that people can relate to architectural forms. Therefore façade proportions have the ability to address human sensibility.

Human scale may be integrated by way of vertical façade elements within floor to floor zones. This is a common method employed typically by many multi-story buildings.

The ground level facades offer both a visual and functional interface with the ground plane urban realm. Therefore the use of a differing façade treatment on the ground floor to that of the upper floors can effectively allow pedestrians traversing the urban realm to relate to human scale directly i.e. by using the active zone. Such a ground plane experience will be further enhanced by selectively increasing such a façade treatment to both ground and first floor, but the exact appropriation should be considered in respect of the overall building height.

Using 4, 6, 8 and 10 storeys as an example, the formal composition of 'base level', 'main body' and 'crown' may be suggested diagrammatically. It should be noted that for a building over 5 storeys, the 'crown' (or top floors) with an alternative façade expression (massing or composition), has the potential to positively contribute to the visual expression, not only of the subject building, but also for its cluster.

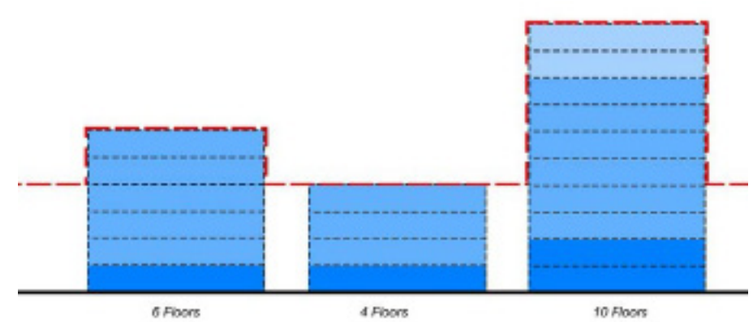


Façade Articulation

Building Composition

Building composition, comprising massing and articulation of form has the ability to introduce urban scale within a grouping of buildings. The heights of neighbouring buildings in relation to one another results in a collective composition that communicates visually at an urban scale.

The application of repeated building heights over a very large site area can result in monotonous expression at an urban scale. In order to avoid this, without precisely defining building heights, it is appropriate to note that building heights should have the potential to vary, subject to composition within the associated Cluster or grouping of buildings. Consideration may be given to allow signature buildings to exceed average heights, whilst maintaining overall development quantum. Potential compositions may be suggested diagrammatically.



Building Composition

Section and Height

The overall building heights vary between 4 and 10 levels with strategically positioned signature buildings of 12 levels that form an exception to this rule. The composition of the variation of height guarantees a pleasant human scale in the public space and a balanced distribution of density over the site. It also allows view lines and a maximum of sunlight to penetrate the site. Similar to the building typologies, the proposed heights in the Masterplan are indicative and shall evolve with the delivery of development within the Masterplan.

- Typical and ground floor height are approximately 4m.
- Maximum building height is dictated by aviation safety standards, and buildings may be limited to 40m in height.
- The design of buildings will have regard to the requirement to meet recommended daylight penetration standards and avoid undue over-shadowing.
- Liaison with Met Eireann in relation to the impact of building height on its weather radar is recommended.

6.3 Public Realm

In the Masterplan framework, the approach to the public realm is focused on developing public open spaces that are of a high quality, distinctive and legible. The framework includes three different categories of public open space: the Transition Square, the Green Lung, and the plazas within the development clusters.

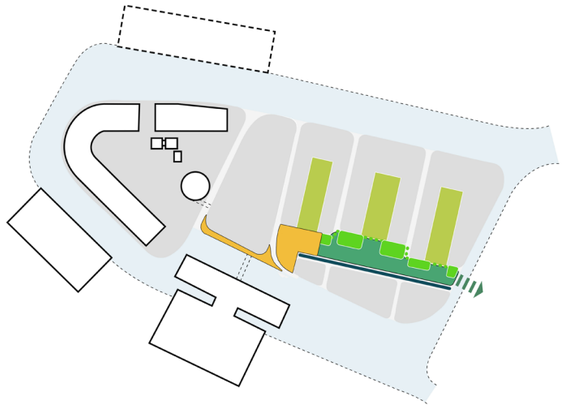
Coherent, atmospheric public open spaces which are also of a human-scale are created through considered design and the use of high quality vegetation, materials, and street furniture. Landscaped public realms are a key component in contributing to the amenity of the area, and to creating a feeling of wellbeing for employees, visitors and indeed passengers using the terminal buildings (see Appendix A for greater details).

Objective PR1

To ensure that the public realm as a whole, is legible, cohesive, of high quality, and operates as a connected network.

Objective PR2

To ensure that principles of Green Infrastructure inform the design of the public realm and that the provision of Transition Square and the Green Lung are advanced as critical elements of the Masterplan.



Landscape Zoning Character

6.3.1 Transition Square

The Transition Square is an important component of the development strategy and the public realm framework. The public Square is at a key location between the GTC to the west and new development in Zone 1 to the east will cross and join. The Square shall create a strong visual landmark for the iconic Terminal 2 and the new surrounding buildings, and as such it shall serve as a point of orientation and identity.

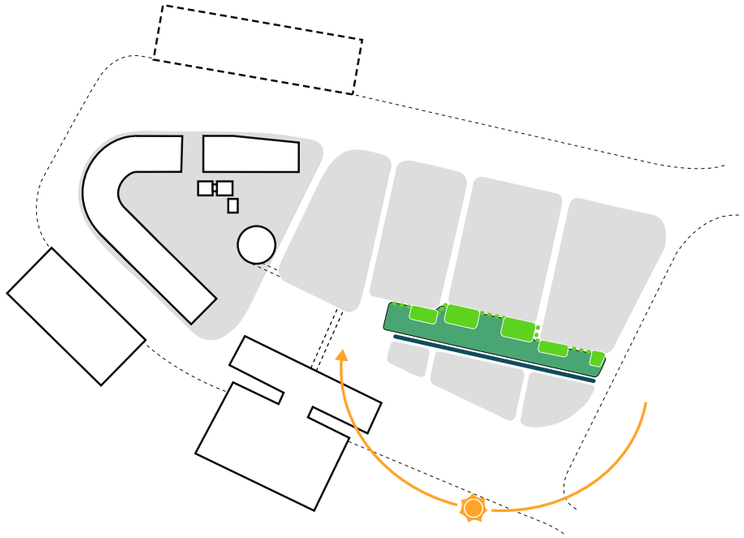
Zone 1: Landscape Plan showing Transition Square in detail

6.3.2 The Green Lung

The Green Lung is a central element of the public realm framework. This landscaped spine offers recreational opportunities where people can gather, slow down, stay, relax, exercise, or even work outdoors. This is achievable through a differentiation in the characters of the Green Lung; the northern (south facing) side has a sunnier aspect in comparison to the more shaded and protected southern side.

It is envisaged that the northern side can become a highly active space for people, comprising lush gardens, chess corners, intimate relaxation areas, and sporting facilities, such as basketball courts. The integration of pavilion structures and similar weather-protective features may provide opportunities for work spaces, especially with WiFi access, and the Green Lung could become an extension of the office spaces of the buildings.

The southern part of this linear park is designed more freely, including a mixture of lawn and ground cover areas that can be used for leisure opportunities. The road along this side of the Green Lung has more of a boulevard character.

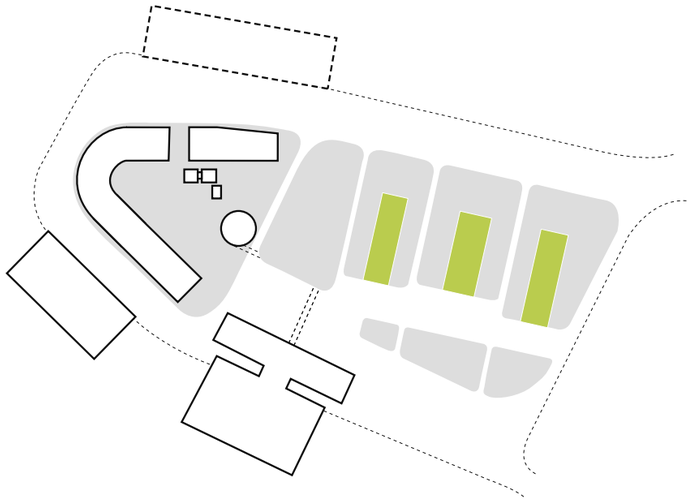


The Green Lung

6.3.3 Plazas

The approach to the design and layout of the plazas is to create a series of representative public entrances to the buildings. The plazas are intentionally and directly connected to the Green Lung for two reasons. Firstly, this very legible connection establishes the public nature of their character. The design of these places invites the public to enter and to use them multi-functionally, creatively, and proactively.

Secondly, the connection to the Green Lung contributes to the network of below-ground stormwater management. Connecting the stormwater system with the central area is the efficient way to create a successful system to effectively reduce the water footprint of the development and contribute to maintaining healthier urban soils. These recommended practices promote contemporary ideas of landscape performance, and establish sustainability at the core of the landscaped public realm framework.



Plazas

6.4 Mobility and Access

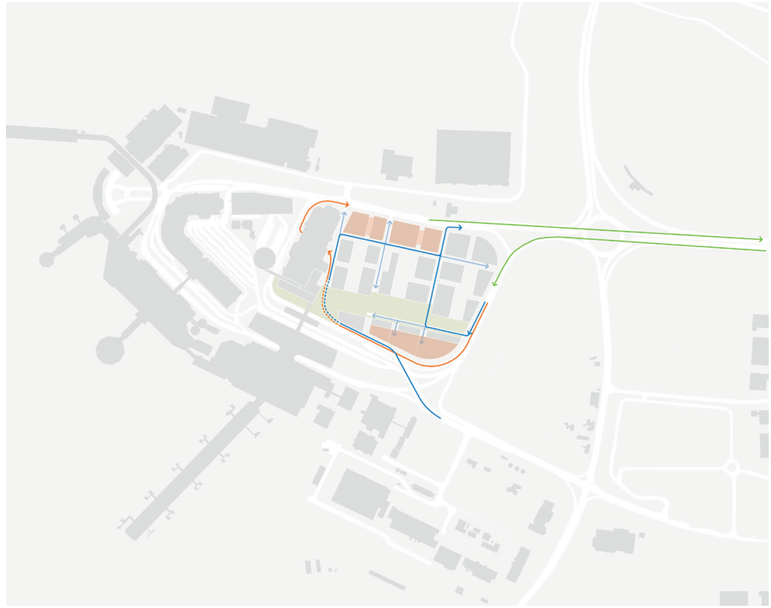
6.4.1 Mobility Strategy for Zone 1

The approach to mobility in the Masterplan framework is to ensure a sustainable strategy for access to and egress from the lands, while maintaining the surface capacity required and anticipated for airport operations.
With regard to access to Zone 1, the mobility strategy incorporates a number of key elements:

- The provision of the majority of car parking spaces to the northern part of Zone 1 to reduce the conflict with the primary pedestrian desire lines within the wider scheme.
- The retention of the existing access point from the Eastern Link Road to the south of the existing Maldron Hotel.
- The retention of the existing traffic signals and exit roadway from Zone 1 onto North Corballis Road.

The key benefits of the above mobility strategy include:

- Limited change to existing operations which will assist the phased delivery of Zone 1.
- Restricting access across the Green Lung to one primary location which is remote from the key pedestrian lines between the Masterplan lands and the Terminal Buildings/ GTC.
- The main access point to Zone 1 is adjacent to the Green Lung, which will provide the proposed development with a high quality address.



Access to Zone 1

6.4.2 Transportation Assessment

A transportation assessment was undertaken to inform the development proposals in the Masterplan lands. The transportation assessment included both an assessment of the potential wider impacts the proposals will have on the National and Regional Road networks and a more detailed assessment of the potential local impacts. The traffic modelling exercise was carried out by consultants for the DAA in conjunction with the NTA and the full suite of NTA traffic models has been used in the preparation of the Dublin Airport Local Area Model. The wider transportation assessment was prepared using SATURN and the local model using VISSIM. The transportation assessment included a number of different scenarios to be tested based on a combination of infrastructure provision and scale of development. The scenarios were defined at an early stage in the production of the Masterplan and informed the decision on the appropriate scale of development in the Masterplan area. For the purposes of the traffic assessment, Phase 1 of Zone 1 comprising some 41,677sqm of office floorspace was tested. Any additional floorspace, including Phase 2 of Zone 1, shall be subject of a further transportation assessment.

The results of the strategic modelling show that the Masterplan proposals will increase traffic on the M50 by approximately 3-4%, on the M1 by approximately 1-6%, and on the M1 Spur by approximately 14%. The results also show that the M50 has capacity issues even if the Masterplan proposals do not proceed.

The results of the scenario testing show that following the construction of the East-West Distributor Road (EWDR), the impact the Masterplan proposals have on the M50 and M1 will reduce.

The National Roads Authority (NRA) has prepared a Demand Management Study for the M50, identifying options to improve traffic flow on the motorway. The options include variable speed limits, fiscal measures, and incident management. This study has been completed, however no decision has yet been made on how best to manage the future traffic flows on the M50. In summary, the strategic traffic modelling shows that the Masterplan proposals would cause a limited increase in traffic flows, and that the East-West Distributor Road and demand management measures would mitigate the impact of increasing traffic.

<u>Transport Assessment – Local Area Modelling</u>
A local area model was developed to inform the Masterplan proposals and the key findings from this analysis are that the local road system will be capable of accommodating the first phase of development (up to 41,677 sqm of office development) without any significant upgrades to the local road network. The provision of an additional set of traffic signals on the R132 at the airport roundabout for traffic approaching from the R132 south would benefit traffic at the Airport roundabout during the evening peak period. This set of traffic signal improvements has been included in the preliminary designs of the Swords/ Airport to City Centre Swiftway BRT project.
The results of the model identified strategic capacity constraints in relation to broad phases of development. Traffic Impact Assessments (TIAs) will be required to support each phase of development. The TIAs will also need to quantify the additional capacity needed on the public transport system.

Planning applications for specific developments shall be fully compliant with the relevant transportation and mobility objectives as follows:

Objective MA1

Promote best practice mobility management and travel planning via sustainable transport modes.

Objective MA2

Require mobility management plans and transport impact assessments to be submitted with a planning application for proposed trip intensive developments.

Objective MA3

Require all developments to be supported by a viable mobility management plan that provides a reliable basis for the achievement of acceptable modal shares for both public and private transport within an appropriate timeframe.

Objective MA4

To restrict any floorspace development at a level above the quantum of 41,677 sq.m of Phase 1 of Zone 1 in advance of a further transportation assessment study, which meets the requirements of statutory stakeholders.

Objective MA5

To work with the NTA, other agencies and Dublin Airport to promote land-use planning measures which aim for transportation efficiency, economic returns on transport investment, minimisation of environmental impacts and a general shift towards the use of public transportation.

6.4.3 Parking Provision

The proposed level of parking provision within the Masterplan has been set to limit car-borne commuting and to encourage access by public transport thereby reducing the impact the development will have on the surrounding road network. The current Fingal Development Plan states that a maximum provision of 1 space per 25 sqm of office development is permissible, while the Draft Transport Strategy for the Greater Dublin Area 2011-2030 prepared by the NTA recommends a maximum provision for office developments at 1 space per 50 sqm.

It is proposed that Phase 1 of development (i.e. up to 41,677 sqm of office development) will have a parking rate of 1 space per 56 sqm. This is intended to assist in encouraging new tenants to the area and is consistent with the current level of public transport provision at Dublin Airport.

Table 6.3: Office Floor Space, Car Parking Standards and Car Parking Totals

	Phase by Phase			Cumulative Totals		
Phases	**Office GEFA sqm (gross external floor area)**	**No. of Spaces**	**Rate sqm per space**	**Office GEFA sqm (gross external floor area**	**No. of Spaces**	**Average Rate sqm per space**
Phase 1	41,677	742	56	41,677	742	56
Phase 2	33,787	581	58	75,464	1,323	57

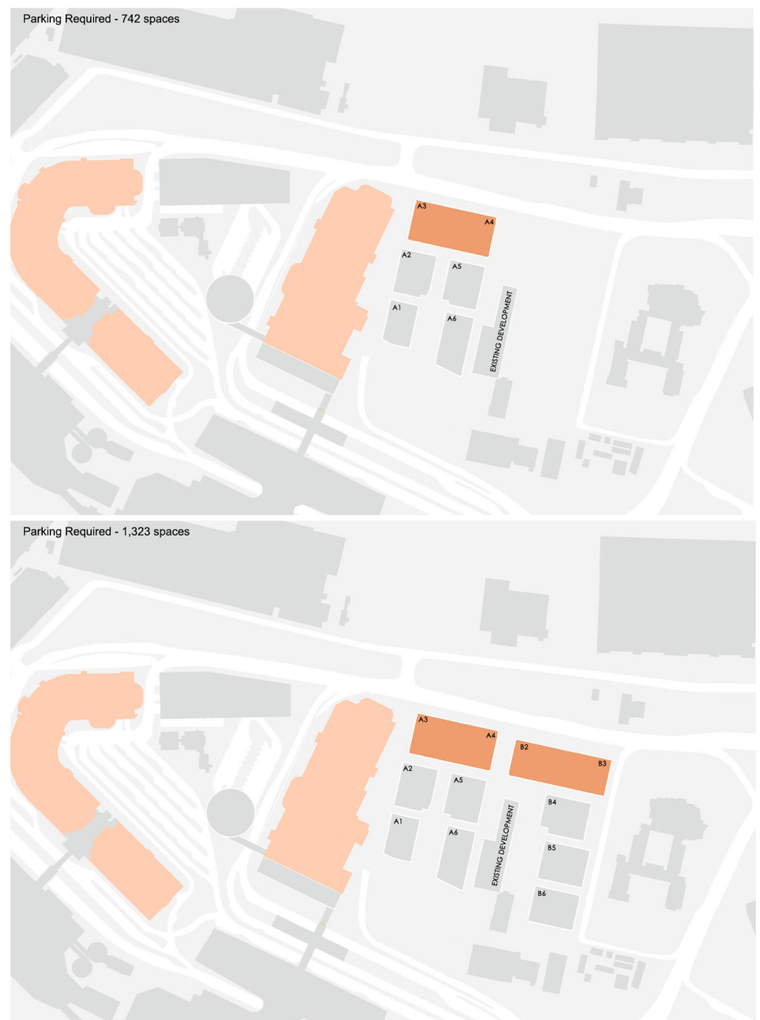
Subsequently for Phase 2, a parking rate of 1 space per 57 sqm is proposed for office development up to c. 75,000 sqm in total quantum, commensurate with enhanced public transport provision that is proposed to serve this area.

The applicability of these rates will be subject to ongoing review, monitoring and assessment prior to confirmation of appropriate parking standards.

If TIAs for specific planning applications within the Masterplan lands indicate negative impacts on the capacity of the surrounding road network, it will be necessary to tighten the parking standards for subsequent applications.

6.4.4 Phasing of Car Parking

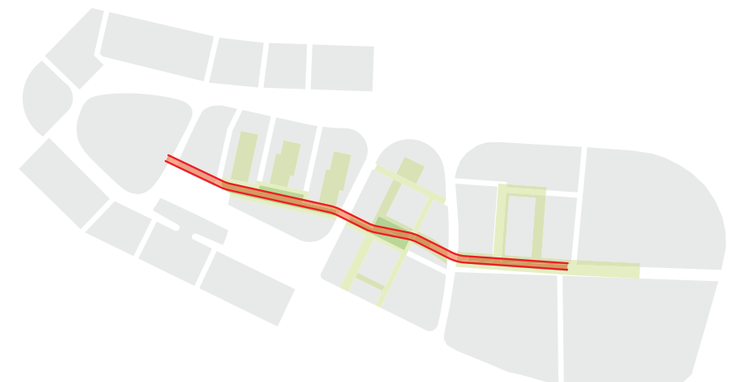
For Phases 1 and 2 of Zone 1 a combination of different car parking types has been proposed and the phasing of car parking has been considered on a building by building basis.



Phased Car Parking: Phases 1 and 2

6.4.5 Safeguarding a Transportation Corridor

In June 2015, the NTA published the Fingal/ North Dublin Transport Study: Stage 2 Appraisal Report which identified that an optimised Metro North was the best solution. Subsequently, Metro North was included in the Government's Capital Investment Plan 2016-2021. It will run from St Stephen's Green via the Airport to Swords. The exact location of the Metro stop for the Airport is likely to be at the Ground Transportation Centre, just north of Terminal 2. However, as it location has not been finalised, it is prudent to allow for the possibility that the stop will be near the R132 and to safeguard a transportation corridor within the Masterplan lands. The route identified may accommodate a light/ high-frequency type mode of transport with focus on limiting its impact and subject to a quality design proposal.



Safeguarded Future Transport

Objective MA5

To ensure that the transportation corridors for any future public transport proposals are safeguarded.

6.5 Utilities Provision

6.5.1 Utilities Strategy

The approach to utilities in the Masterplan framework is underpinned by a number of key aims. These include the retention and reuse of the existing utilities infrastructure, where and as much as possible, in the design and layout of the built environment. This approach will allow for the utilities infrastructure to be accessible for maintenance and expansion and to not be located under buildings.

The utilities strategy also seeks to ensure that the infrastructure provided for the Masterplan shall be designed to supply the entire development (to avoid demolition and up-sizing of networks in the future) and shall also be configured to allow for phasing of the delivery of the wider scheme.

The Masterplan framework includes a central Green Lung, a public open space spine, which is an ideal location for the utility corridor for the scheme that can be built out as the development progresses. This central spine can either be in the form of direct buried ducts and pipes or in the form of a utility tunnel. The utility tunnel is a far more costly solution but offers more flexibility in terms of accessibility, future proofing and expansion of the network.

Central Utility Spine

Objective UT1

Develop, protect, improve and extend existing utilities and services and to provide these services to facilitate the sustainable development of the Masterplan area proper planning and sustainable development.

6.5.2 Power and Infrastructure Requirements

There are two potential options for supply of electricity power for the Masterplan:

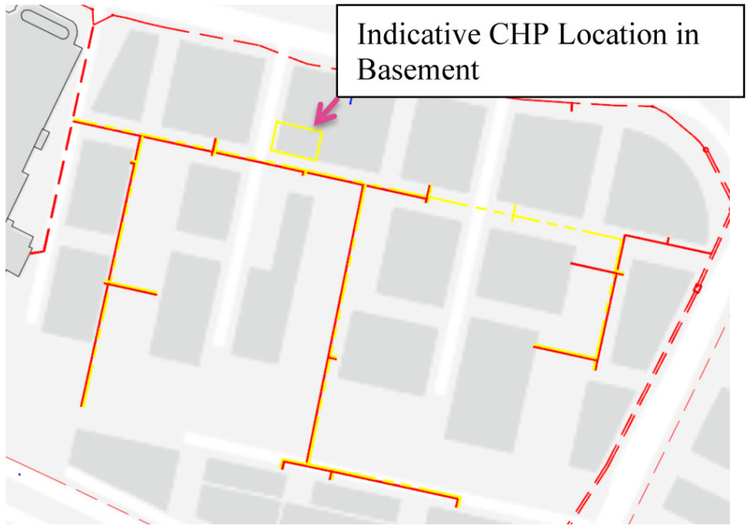
- Upgrade of the existing ESBN 38KV Collinstown Substation.
- Connection to the existing DAA owned Dardistown Substation.

6.5.3 Combined Heat Power (CHP)

Combined heat and power (CHP) involves the production of electricity on-site so that the heat by-product from the generation process can be recovered and used for steam production or process and space heating, rather than being wasted as is the case with centralised generation.
The overall efficiency of cogeneration can be as high as 90% compared with a typical efficiency of about 35% for traditional power stations and 55% for the latest generation of combined cycle gas turbine plants. CHP technology is well established in Ireland. There are currently some 70 installations in operation, and 20 of these generate 1 MW or more.

For energy users, the advantages include reduced electricity and fuel bills and greater security of energy supply. CHP use also benefits the environment by helping to preserve finite fossil fuel reserves and reducing the emission of energy-related pollutants.

Given the obvious advantages of CHP it would be prudent to make provision for CHP(s) as part of the Masterplan energy strategy. Package CHP unit(s) can be located in standalone buildings or in basement of other buildings. Sufficient space should be allocated to allow for build out of the CHP system as the development proceeds.



Indicative CHP Location

Objective UT2

To facilitate energy infrastructure provision, including the development of renewable energy sources at suitable locations, so as to provide for the further physical and economic development of the Masterplan lands. This may include CHP or an equivalent alternative sustainable approach.

6.5.4 Gas and Infrastructural Requirements

Gas distribution within the Masterplan lands would connect into the existing Bord Gais mains at suitable locations by way of a gas-skid and routed within designated service areas coordinated with the internal service roads and the Green Lung. Metering units for each user would be located at ground level adjacent to building entry points or otherwise as agreed with Bord Gais. The Zone 1 distribution network will connect to the existing 315mm 4 bar gas main that runs along the Terminal 2 forecourt roads. A gas-skid would be located as the southwest corner of the lands.

Gas Distribution Network

6.5.5 Information and Communications Technology (ICT)

The information and communications technology (ICT) infrastructure for the Masterplan framework needs to be able to support high-technology companies. The lands have excellent telecommunications infrastructure in place to provide high- bandwidth, secure connectivity for even the most demanding tenants. The Masterplan lands have dual-path, divergent connectivity to Dublin's T50 broadband ring: a multi-duct system surrounding the city providing an uninterrupted physical link with two major transatlantic fibre termination points, with access to 27 international carriers, plus direct fibre connectivity from Eircom, Colt, Digiweb, BT, Viatel and EU Networks. The Masterplan telecommunications infrastructure is mature and the intention will be to provide connectivity to every building. Tenants will be able to implement their own in- building ICT facilities and will be able to buy telecommunication services directly from Public Network Operators, or as a fully managed service.

The quality of ICT infrastructure and services available at the lands will ensure its suitability for all customers with high-bandwidth, internet-centric businesses: technology, financial services, media, healthcare, legal, and manufacturing. All tenants on the site will be able to have world-class communications that includes the following:

- Dedicated fibre network solutions.
- Wholesale telecom, cable, mobile and internet services.
- Managed ICT services.
- High-capacity connectivity worldwide, ensuring seamless end- to-end solutions.
- Direct connections to data centres readily available.

It is intended to provide Fibre-to-the-Premises (FTTP) access from the Public Network Operator POP to each building, and to provide telecommunications and other ICT services to tenants as a fully managed service offering, or else simply provide the FTTP access and the tenant can buy-in its services from another service provider. The ICT infrastructure provided will also support smart technology systems integral to the design of the site development, including building energy management systems, smart grid infrastructure, and smart water and waste management. Extensive deployment of fibre and optical network technology will provide the site with a strong backbone and future-proof it for the high- bandwidth demands of business services and communications that will increasingly include bandwidth-hungry video components. The trend towards increasing mobility will be met by higher-bandwidth wireless connectivity technologies that will support end-user mobile devices.

Objective UT3

To ensure that communications infrastructure follows best practice with regard to siting and design.

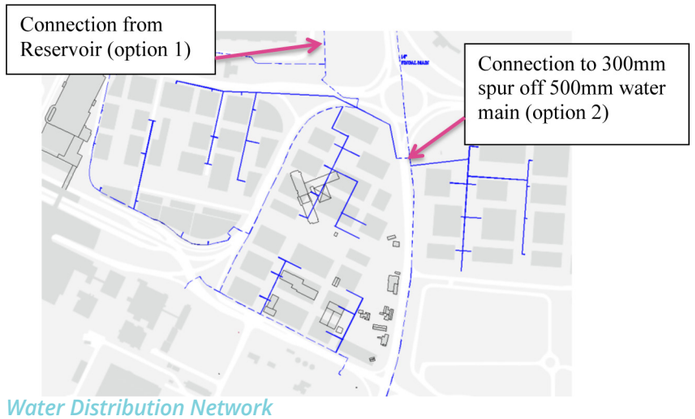
Objective UT4

To secure the expansion of high quality infrastructure within the Masterplan lands, in the interests of promoting economic growth and competitiveness.

6.5.6 Water Supply and Infrastructural Requirements

While there is sufficient capacity within the Dublin Airport Reservoir to serve development envisaged in the Masterplan, it is considered prudent to allow for two options for water supply.

- Option 1 - connect to existing daa reservoir.
- Option 2 - connect to the 300mm spur that was provided off the new 500mm watermain constructed as part of the R132 upgrade project.



Water Distribution Network

Objective UT5

To work with Irish Water in the development, protection, improvement and extension of the water supply system to facilitate the sustainable development of the Masterplan area in line with the approved Masterplan and the Fingal County Development Plan.

6.5.7 Foul Water

The existing foul sewer system draining the Masterplan lands is at capacity. A new gravity sewer, of approx. 800m in length, is required to connect the Masterplan lands with the public foul sewer system and pumping station on the R132 road.

The existing pumping station on the R132 road will require an upgrade in the form of the addition of a holding tank to cater for emergencies. The holding tank must be capable of storing 24hrs of foul sewage at 1 DWF from all the contributing area.

The pumping station on the R132 discharges to the North Fringe Sewer initially and ultimately to the Ringsend WWTP. The North Fringe Sewer only has capacity to cater for Phase 1 of the Masterplan lands.

Objective UT6

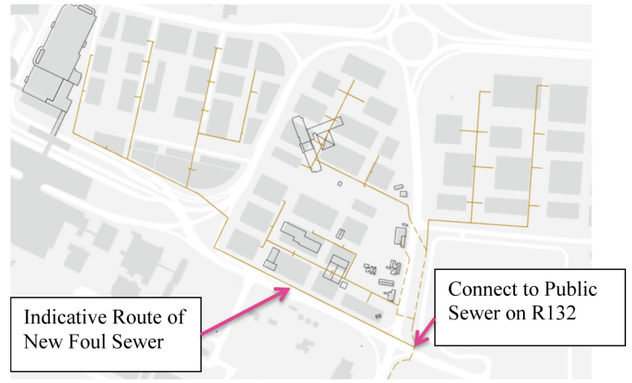
To provide a new foul sewer to connect the Masterplan lands to the public foul sewer system on the R132 road.

Objective UT7

To provide a holding tank of an agreed volume at the existing Pumping Station on the R132 road.

Objective UT8

To liaise and work with Irish Water to ensure that there is adequate capacity within the waste water collection and treatment system to cater for the proposed development.



Foul Water Collection Network

6.5.8 Surface Water

The Masterplan lands can be drained via a drainage network located in the Green Lung, which will connect to existing carrier drains on Corballis Road South and north of Cloghran House that outfall to the attenuation tank located in the daa owned longterm car park to the east of the R132.

Fingal County Council will encourage the achievement of a range of water services related objectives in the Fingal Development Plan, including Objectives WT01, WS01, WS02, WS03 and WS05; those objectives relating to the protection of ground water from surface water runoff, Objectives WQ01 and EE63; and those relating to climate change and preventing flood risk such as Objectives CC01 and SW06.
In particular, the implementation of SuDS measures will be actively required in the development of the Masterplan lands.

An extension of the existing attenuation tank located in longterm car park may be required for the development in Zone 1. The size of the attenuation tank extension will depend on run-off rates that shall be calculated as part of the planning process for the initial phases of development. These run-off rates shall be in accordance with previous agreements in relation to run-off rates for new and redeveloped sites within the Airport lands.

Drains shall connect to either the 1200mm surface drain that runs adjacent to Corballis Road South or the 750mm drainage pipe located north of Cloghran House that outfall to the attenuation tank located in the longterm car park.

Objective UT9

To require that development within the Masterplan lands incorporate SUDS (Sustainable Drainage Systems) in the surface water design in line with the GDSDS (Greater Dublin Strategic Drainage Study) Regional Drainage Policies, 2005, Volume 2 New Development and Volume 3 Environmental Management.

Objective UT10

To require the provision of additional SuDs devices to cater for the development of the Masterplan lands in line with previous agreements in relation to run-off rates for new and redeveloped sites.

Objective UT11

Ensure a Construction Management Plan (CMP) is produced as part of any planning application detailing how surface water run-off, especially in relation to release of silt and other pollutants, will be controlled during construction.

Surface Water Collection Network

6.5.9 Flooding

Any proposal in an area at risk of flooding that is considered acceptable in principle must demonstrate that appropriate mitigation measures can be put in place such that residual risks can be managed to acceptable levels. No flood risks have been identified in the Masterplan lands at present.

Objective FL1

To require that new development should not itself be subject to an inappropriate risk of flooding nor should it cause or exacerbate such a risk at other locations.

Objective FL2

To ensure that a flood risk assessment is carried out for any development proposal, where flood risk may be an issue in accordance with the "Planning System and Flood Risk Management – Guidelines for Planning Authorities" (DoECLG/OPW, 2009). This assessment shall be appropriate to the scale and nature of risk to the potential development.

6.6 Environment and Heritage

Although there are no designated sites i.e., Special Areas of Conservation (SAC) for flora and fauna, Special Protection Areas (SPA) for birds or Natural Heritage Areas (NHA) at the airport or in its environs and the environmental value of the area is low, the potential for impacts on environmental features must always be considered.

Objective EH1

Ensure that green infrastructure and landscape design proposals associated with proposals for development do not lead to the introduction or spread of invasive species.

Objective EH2

All proposed development will be subject to Appropriate Assessment Screening and/ or Natura Impact Statement, whichever is deemed relevant, to ensure no significant adverse effects on the integrity of any European sites either in isolation or in-combination with other plans and projects, having regard to their conservation objectives.

Additionally there are no recorded archaeological monuments within the Masterplan lands, there is a monument, an unclassified castle, recorded immediately to the east of the Terminal 2 building. While not a protected structure, another building of note is the Church of our Lady Queen of Heaven which is listed on the NIAH (NIAH Register No. 11349001), and is rated as being of regional significance. The church is located within the GTC area.

Objective EH3

To conserve, protect and enhance the architectural heritage and to ensure that new development makes a positive contribution to the historic character of the area.

Objective EH4

To require archaeological assessment where it is considered a development could have an effect on a recorded monument, zone of archaeological potential or as yet undefined element of archaeological heritage or their setting.

6.7 Air Quality, Water Quality, Noise and Climate

While it has been determined that there are no significant concerns or potential constraints in relation to the environmental context of the existing Masterplan lands, it is considered best practice to ensure the continued protection of these features.

Objective N1

To ensure that the Masterplan has regard to relevant measures and actions set out in the Dublin Environmental Noise Action Plan December 2013-November 2018.

Objective WQ1

To ensure adequate protection of waterbodies adjacent the Masterplan area with the objective of contributing to the improvement in the water quality of these waterbodies as identified in the Water Framework Directive.

Objective AQ1

To ensure no significant degradation in the air quality of the Masterplan or surrounding environment.

Objective C1

To seek to ensure the Masterplan lands contribute to the Dublin Airport's Sustainability Policies

7.0 PHASING AND IMPLEMENTATION

7.1 Phasing and Implementation

As is highlighted in Chapter 1, there is no specific time horizon for the lifetime of Masterplan and the focus for all initial development is on Phases 1 and 2 of Zone 1. The Masterplan serves as a design framework for the future development of Phases 1 and 2 of Zone 1. It is, however, important to acknowledge that on the basis of the transportation assessment undertaken to inform the Masterplan, only Phase 1 and office floorspace up to a maximum of 41,677 sqm is provided for within the context of this Masterplan. Development of Phase 2 and additional floorspace above this level will be the subject of further traffic assessment to be undertaken in the preparation of the Dublin Airport Local Area Plan.

The focus of development envisaged in the Masterplan is to be achieved through two phases of Zone 1. Clusters of buildings within each phase will be constructed and developed in coherent and distinct groupings across Zone 1, allowing for the provision of quality office and enterprise accommodation, ongoing improvements to public transport provision, implementation of mobility management plans, reviews of the capacity in the existing road network, and the delivery of usable amenity and opportunity for recreational experiences.

The provision of office development will be planned to coincide with predicted demand levels as determined by the occupation of the completed building forms and by specific infrastructural requirements particularly those associated with the surrounding road network and water services infrastructure. This process will be managed and monitored through the development management process as planning applications for elements of the scheme are assessed, and in consultation with key stakeholders.

7.1.1 Infrastructural Requirements

Based on the transportation assessment outlined in Section 6.4, the delivery of Phase 1 of Zone 1, yielding an office quantum of some 41,677 sq m is considered to be acceptable. The delivery of this quantum of office floorspace should allow for the economic provision of buildings, ancillary services and recreational opportunities, whilst also being reflective of current road network capacity and modal split assumptions.

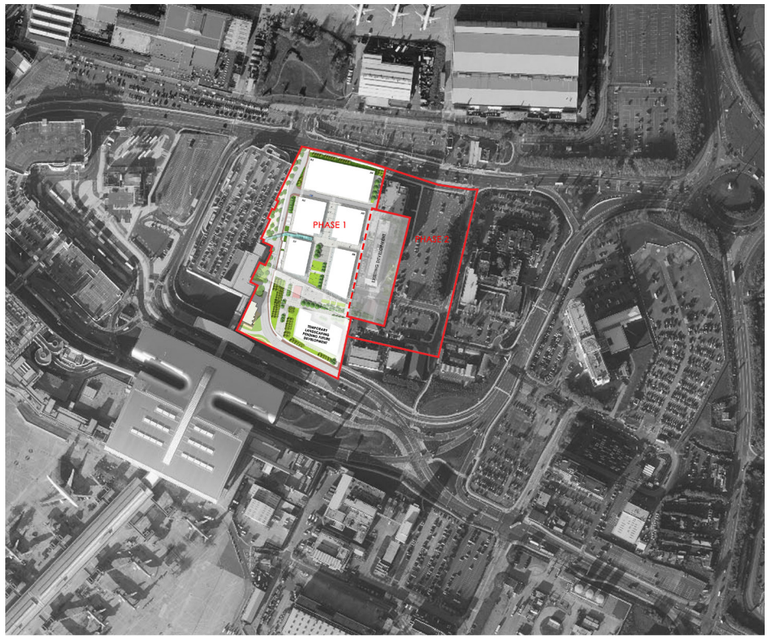
7.1.2 Development Scenario and Key Principles

The following Phasing images, overviews and key statistics represent a particular phased development scenario. For a Masterplan covering an area such as this and with an open time horizon, it is possible for circumstances in market demand, economic or infrastructural provision to change or modify. As such, pragmatically, this phasing scenario is a demonstration of potential, based on the interdisciplinary approach underpinning the Masterplan and the robustness of its underlying framework. The key strategic elements of the Masterplan include the Green Lung supporting west-east movement, the identification of a legible and characterful public realm, and sustainability. These key principles underpin the Masterplan, whilst allowing a degree of flexible and adaptable sequencing of the development.

The Quantum Overview table presents an overview of the quantums of floorspace (office, associated car parking and other ancillary uses) envisaged for the development of Phases 1 and 2 of Zone 1 in the Masterplan. The table details each of the phases, and refers to the planned development of buildings in Clusters A and B,. In relation to office development, the GFA column provides the office floor space for each of the phases. For ease of reference, Table 7.1 provides a summary of the phases and the quantum of office development envisaged.

Table 7.1 Zone 1: Phases 1 and 2 and Quantum of Office Development

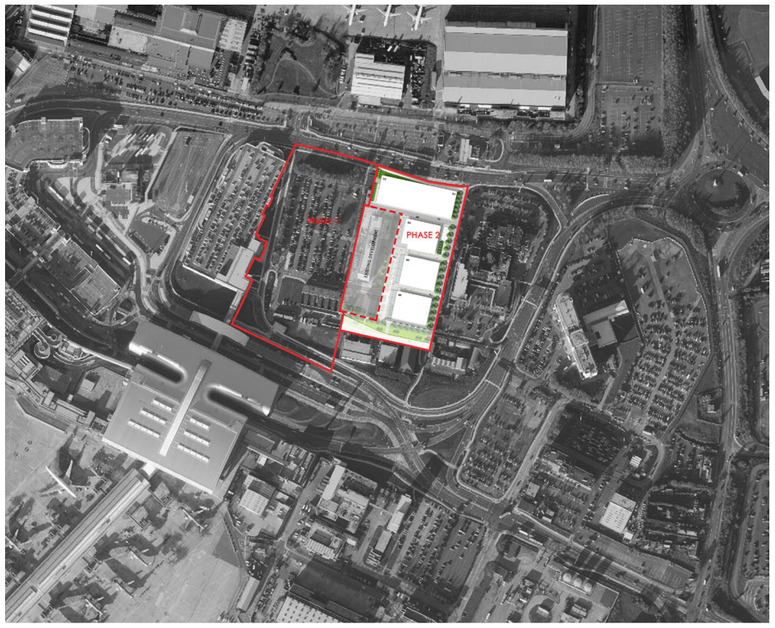
Phase	Office Floor Space in each Phase	Cumulative Totals
Phase 1	41,677 sqm	41,677 sqm
Phase 2	33,787sqm	75,464 sqm



Building and Urban realm phasing: - Indicatively shown and subject to design development and commercial recommendations
- For car parking requirements please refer to car parking phasing diagrams

Phase 1	
Total Site Area:	31,346 sqm
Total Built Parking:	17,340 sqm
Total Hotel:	0
Total Offices:	41,677 sqm
No. of Storeys:	6-7
Car Modal Split:	43%
Parking Standard:	1 space per 58 sqm
Parking Provision:	742

Figures shown are cumulative
Phasing is indicative and subject to design development and commercial appraisal



Building and Urban realm phasing: - Indicatively shown and subject to design development and commercial recommendations
- For car parking requirements please refer to car parking phasing diagrams

Phase 2	
Total Site Area:	60,536 sqm
Total Built Parking:	37,081 sqm
Total Hotel:	0
Total Offices:	75,464 sqm
No. of Storeys:	6-7
Car Modal Split:	42%
Parking Standard:	1 space per 60 sqm
Parking Provision:	1,323*

Figures shown are cumulative
Phasing is indicative and subject to design development and commercial appraisal
* Excludes existing surface carparking

Detailed Quantum per Building

Phase 1

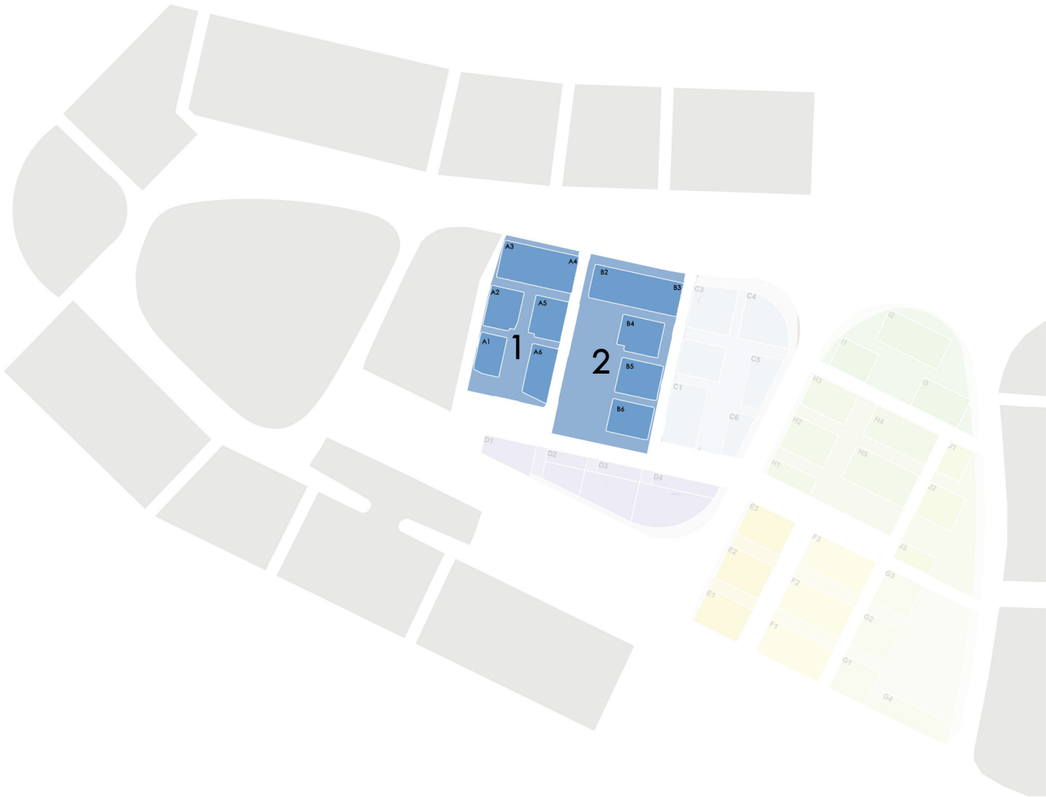
Code	Plot (sqm)	Footprint (sqm)*	GEFA (sqm)**	GEFA office (sqm)	GEFA parking (sqm)	GEFA hotel (sqm)	GFA (sqm)***	GFA office (sqm)	GFA parking (sqm)	GFA hotel (sqm)	Max levels	Remarks
A1	1,468	1,468	8,561	8,561	0	0	8,205	8,205	0	0	6	
A2	1,723	1,723	11,905	11,905	0	0	11,444	11,444	0	0	7	
A3 & A4	2,890	2,890	17,340	0	17,340	0	16,768	0	16,768	0	6	**Roof Parking**
A5	1,723	1,723	11,905	11,905	0	0	11,444	11,444	0	0	7	
A6	1,876	1,876	10,999	10,999	0	0	10,584	10,584	0	0	6	
Subtotal	**9,680**	**9,680**	**60,710**	**43,370**	**17,340**	**0**	**58,445**	**41,677**	**16,768**	**0**		

Phase 2

Code	Plot (sqm)	Footprint (sqm)*	GEFA (sqm)**	GEFA office (sqm)	GEFA parking (sqm)	GEFA hotel (sqm)	GFA (sqm)***	GFA office (sqm)	GFA parking (sqm)	GFA hotel (sqm)	Max levels	Remarks
B2 & B3	3,290	3,290	19,741	0	19,741	0	19,214	0	19,214	0	6	**Roof Parking**
B4	1,944	1,944	13,106	13,106	0	0	12,293	12,293	0	0	7	
B5	1,944	1,944	11,461	11,461	0	0	10,747	10,747	0	0	6	
B6	1,944	1,944	11,461	11,461	0	0	10,747	10,747	0	0	6	
Subtotal	**9,122**	**9,122**	**55,769**	**36,028**	**19,741**	**0**	**53,001**	**33,787**	**19,214**	**0**		

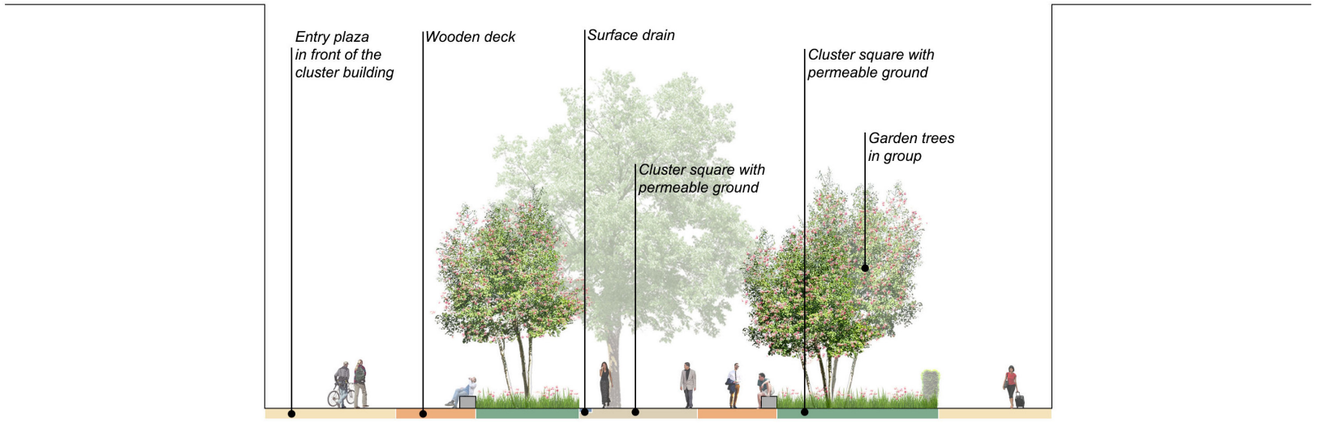
*40% building plot
** Gross External Floor Area
** GrossFloor Area (94%-96% GEFA)

Quantum Overview Table for Phases 1 and Phase 2 of Zone 1

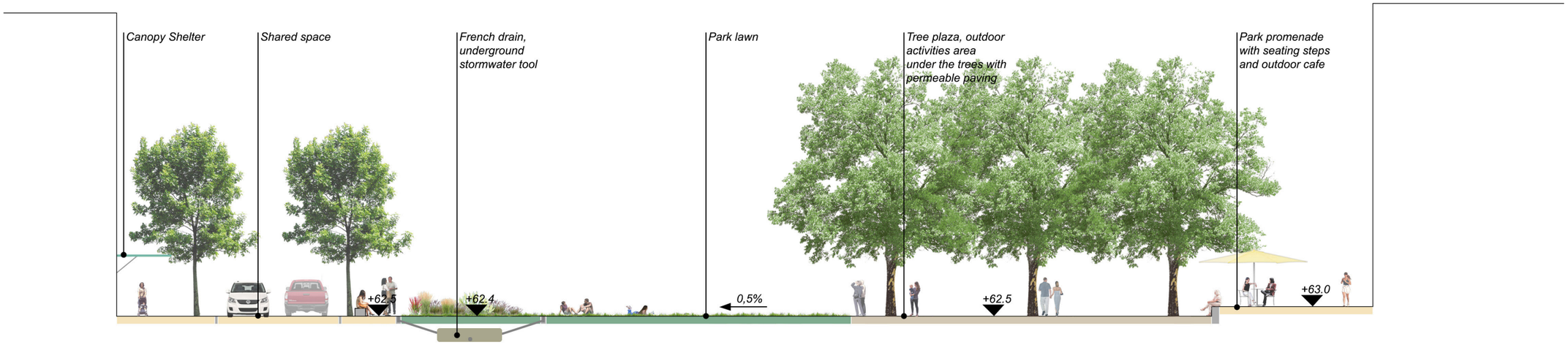


Office Clusters

APPENDIX A:
LANDSCAPED PUBLIC REALM



Section Through Cluster Plaza



Section Through Green Lung

Section at Edge of Transition Plaza

Vegetation, Planting and Character

The selection and use of planting species can help define the overall character of Zone 1 and make it a legible entity. As a general principle we suggest using a large number of trees, strategically located at essential locations. The approach to landscaping and vegetation selection is to maximise the contrast of tree clusters, tree rows and small flowering trees. Importantly, the trees species recommended for use in the public realm will not attract birds and have been used at other airport locations.

Five planting types are proposed to be used in the landscaped public realm in Zone 1. Firstly, there is a green buffer zone of vegetation around the boundary of the Zone, which will mitigate noise and filter the activity from the surrounding roads whilst also defining the horse-shoe shape of the lands. The vegetation is not formal, instead it is wilder including free-arranged trees, lush shrubs and ground-cover.

Secondly, is the planting for the streetscapes where the strict and formal tree rows are introduced for reinforcing the appearance and character of the streetscapes. The third category comprises the formal groupings of high trees that serve as a protective canopy for the heavy-activity areas where there is hard ground surfaces. For the fourth category, are the park areas, contained in the Green Lung, with lawns, grasses and small plants with cleansing functions at the edge. Lastly, are the groupings of small flowering trees in the plazas of the building clusters, which are introduced to stimulate interactions with the planting and landscaping in the public spaces that are more heavily used by people. The Green Lung and the plazas' green spaces provide a rhythmic sequence of tree-groups to open spaces. This design strategy creates a strong image for the public spaces and strengthens their distinct activities and functions.

Planting

Planting Guidance

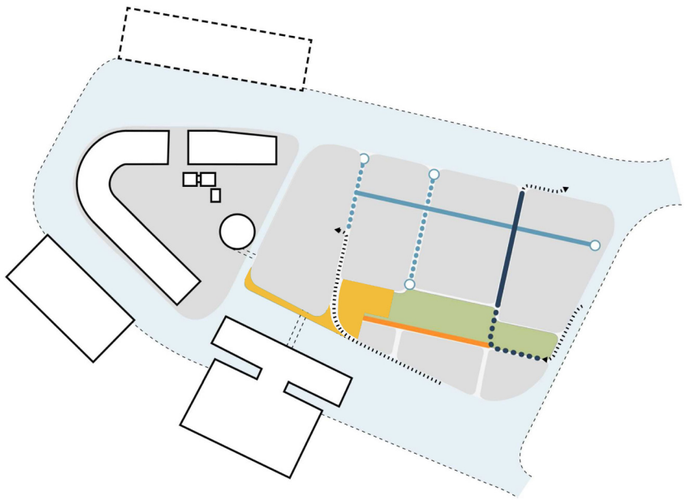
- Grid planting (indicated by green on the Landscaping: Zone 1 image) of trees and single large trees only in Transition Square and on the northern side of the Green Lung:
    - Large trees with big canopy (15-20m tall)
    - Crown height (between the ground to crown) 2.5m
- Formal tree rows (blue on the image) along the access streets and the park promenade:
    - medium trees pagoda shaped, 8-10m tall
- Ornamental garden trees (red on the diagram)
    - small trees of 6-8m tall, in groups only in the plazas of the building cluster, Transition Square and areas close to the northern side of the Green Lung
- Extensive grove of native trees as green frame/ buffer area around the boundaries of Zone 1, low maintenance.
- Tree setback to the buildings:
    - Large trees (15-20m tall): min. 5m
    - Medium trees pagoda shaped (8-10m tall): min. 3m
    - Small trees (6-8m tall): min. 3m
- Soil depth:
    - Large trees (15-20m tall): min. 2m
    - Medium trees pagoda shaped (8-10m tall): min 1.5m
    - Small trees (6-8m tall): min. 1.5m

Typical Species

- Typical planting proposals for the scheme may consist of:
    - Birch Trees
    - Beech Hedging
    - Ivy understorey (shrub layer) planting and
    - grass
- The Birch tree species (Paper Birch (Betula papyrifera), and Himalayan Birch (Betula utilis) is suggested as an appropriate species for an airport location primarily due to their slender branches which are light and therefore do not have the ability to support nests for birds and should not support landing large birds. These trees do not create a feeding ground as they are non-fruit bearing.
- A similar example of tree planting has been undertaken at Amsterdam's Schiphol Airport where over 25,000 Birch trees have been planted yearly.
- The Beech (Fagus sylvatica) hedge should be maintained in a manner to reduce its attractiveness to nesting and landing birds. Through the thinning of foliage and the toping of growth, the hedge should have a thin upper foliage that should not be suitable for the landing of large birds and with the removal of lower dense growth the hedge becomes less attractive to small birds for nesting.
- Grasses (a species mix Dwarf ryegrass, Chewings fescue). Ideal grass seed mix for an everyday grass area hard wearing. With the maintenance of the grass areas to a consistent length of between 40-70mm the grass areas provide no shelter and offer little cover for nesting birds.
- Hedge and tree planting shall be developed throughout the landscaped public realm and can provide seasonal change in terms of colour, form and texture.
- The trees, hedge and hedge planting should not be overpowering or require excessive pruning to retain their desired impact.
- All landscape proposals for the development will undergo specific assessment prior to planning application stage to determine precise detail in respect of species typology, quantum and location, to ensure the prevention of bird hazard

Streetscapes

An important component of a quality public realm is the design approach for the streetscapes. For the Masterplan, an underpinning principle is that the streets are for people and a key aim is to ensure safe and easy pedestrian flows and movements through the Zone.
Different shared space solutions and ways to make the streets more usable for people are envisaged. These include the use of trees with characteristics that strengthen the people-plant interaction and, consequently, the human scale experience; good way-finding design; high quality street furniture, promenade-like structures, and paving. It is important to improve visual aesthetic connections and create the identity of the horseshoe-shaped traffic flow zone by planting identical trees on streets, and using consistent material for paving and for street furniture.



Streetscape

Street Furniture

- Consistent, unified set of prefabricated pieces.
- Contemporary style with bright colour, unique, distinctive and timeless.
- Solid robust elements like metal, natural stone and colour concrete, low maintenance.

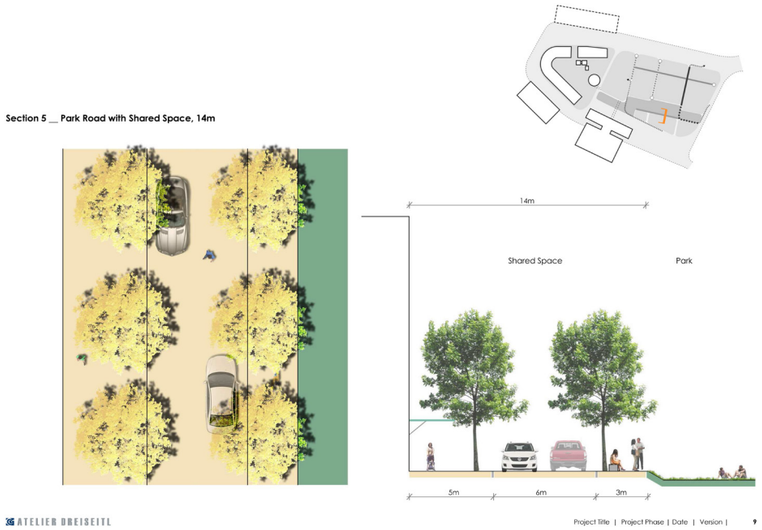
Movement Networks

Appropriately designed, there can be a reinforcing relationship between movement networks (pedestrian, cycle and vehicular) and the landscaped public realm. With regard to pedestrian and cycle movements, a coherent network of connections is envisaged. The strength of this system is that it intertwines green spaces with bicycle and pedestrian access, but also with a network of meeting places and seating within the green areas.

With regard to vehicular traffic, a clearly defined hierarchy of streets/ roads for vehicle circulation is proposed. There are five typologies of streetscapes in the hierarchy, including: a traffic calming typology for the dead-end streets (Section 1); the main east-west traffic connection (Section 2); the north-south main access connection that includes roadside parking (Section 3); the main access road along the southern side of the Green Lung serving as a main artery without roadside parking to the east (Section 4), and with a shared surface function to the west (Section 5).

The more heavily trafficked streets are intended to provide a green profile, and through appropriately selected landscaping, reassure pedestrian and bicycle users. The streets will have a homogenous and consistent design of trees, paving, street furniture material, unique bus-stop design, and way-finding signage. In the less trafficked streets there are more shared surfaces, whilst access and servicing of buildings is facilitated, in these streets there is a greater focus on people's experiences. Traffic calming is achieved by an offset vehicle circulation design, with alternating parking and through traffic. These streets are pedestrian and bicycle friendly allowing space for promenade trees, seating furniture, quality paving and urban equipment.

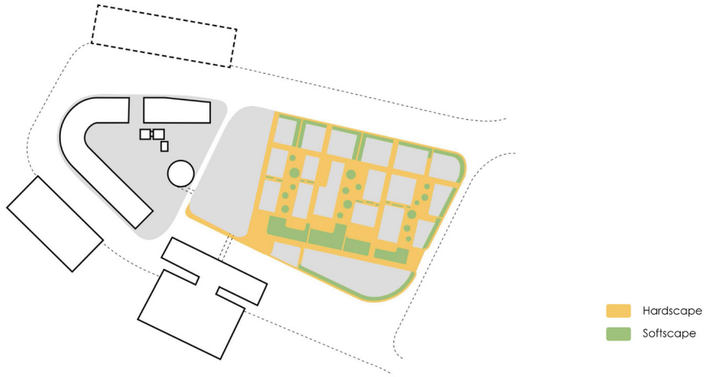
Section 1 – 4 images



Section 5 – 6 images

Soft and Hard Landscaping: Permeability

Different qualities and strengths of soft and hard landscaping (softscape and hardscape) are proposed for the public open spaces to allow for diversity in the ground surfaces of the spaces. There are five categories of surfaces for the public open spaces that are differentiated by strength. The Transition Square is fully hardscape (100%) to manage high levels of movement and demanding public uses; the Green Lung area is 75% green softscape where more leisure activities can take place; the main road on the southern side of the Green Lung is 70% hardscape, comprised of fixed hard pavement; the plazas between the clusters are 70% hardscape with small green areas for planters and small groups of trees providing an open urban feeling to these spaces; and, finally, the landscaped areas that frame the Zone are 70% green softscape, whilst still providing comfortable pavement space.



Soft-Hard Surface

Paving

In relation to the hardscaped spaces in the public realm, a range of hardscape designs are proposed dependent on the function of the space. Firstly, the Transition Square shall be constructed using a high quality pavement, which will be principally a white or ivory coloured surface with a wide-grid rectangular pattern that make the surface legible as a large smooth whole. The paving on the southern side of the Green Lung shall be of a surface that extends the character of the Transition Square through the shared-surface area. This shall be achieved primarily through the use of the same colour and material, however, a degree of diversification is envisaged through using the same stone material on a grid of smaller pieces and alternating it with lines of grey coloured stone.

The pavements (sidewalks) are designed to have a coherent collective character, but one that is neutral so as not to detract from the building frontages. A smooth surface of permeable paving, beige in colour and rectangular in form is proposed for the paving for the building entrance zones so as to differentiate them from the main plaza spaces and announce the proximity of the buildings. Lastly, the hardscape between the cluster buildings is designed to accommodate essential safe urban daily uses protected from weather-related events. A fine stabilized gravel surface is proposed (eco-friendly from organic and recycled material), or a monolithic permeable concrete surface in beige colour. This surface is rougher and less polished than the aforementioned public spaces and complements the softscape areas.

Paving

Surface Materials

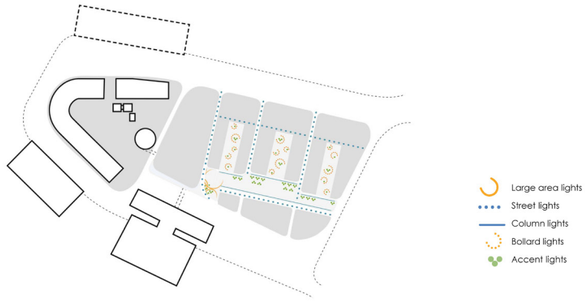
- Materials for pedestrian areas and shared spaces shall be selected from a warm and bright colour group, ranging from sandy beige, gold, cream and light brown coloured materials.
- Materials for the access streets shall be asphalt, grey in colour tone.
- Percentages of permeable paving shall be in the following ranges:
  - Plazas in the building clusters: 70% of permeable concrete;
  - In the Green Lung: 100% of stabilized gravel;
  - Along the access streets: permeable paved car park lanes and pavements;
  - Transition Square: 0% (as 100% shall be constructed by a high quality pavement, smooth surface).

Public Realm Surface Materials

Lighting and Atmosphere

The use of lighting and the creation of atmospheric lighting in the design of the public realm ensures that public open spaces are safe, accessible and readily available for use. This is a particularly important consideration for airport related uses and activities, many of which occur during darkness or night-time hours. In the Masterplan, the approach to lighting is to take advantage of dark conditions to highlight important components of the public realm, include design elements for night-time visitors, and to create certain ambiances, while complying with airport standards and requirements.
As such, the scheme focuses on the functional and atmospheric nature of lighting. For the functional lighting scheme, street lights and column fixtures in the form of modern and elegant poles and fixtures are proposed. In relation to atmospheric lighting, different proposals are envisaged for the different categories of open spaces.

Firstly, for Transition Square lighting features are proposed that create an atmospheric luminosity through the use of low intensity uplights at the trees. A general ambient luminosity for the Green Lung is provided from the plazas, the buildings, and activity areas on its northern side, and this atmosphere is reinforced with the use of low intensity uplights on the trees, lights in the seating areas, and through lighting along the paths or on specific features. The plazas of the building clusters will be mainly lit by indirect lights from the façades.



Lighting

Stormwater Management

A decentralised approach is proposed for managing stormwater where the rain falls in the first instance and secondly transporting it to a next layer of stormwater systems. These systems have to be selected carefully as there are specific requirements in an airport environment due to aircraft safety.

A balanced strategy is proposed that makes the most efficient use of the existing infrastructure and adds, where necessary and applicable, additional stormwater management tools. The development of building blocks within clusters and the Green Lung allows also for the easy integration of this highly innovative stormwater management system in phases. There following standards are proposed:

- Reduce hardscape and impermeable surfaces wherever possible through the use of green roofs/ permeable asphalt.
- Integrate re-use options (cisterns and other storage possibilities and replacement of tap-water consumption – toilet flushing/ irrigation/other uses).
- Focus on cleansing run-off from roads and hardscape surfaces through a top-soil layer of 30cm (either in green areas or in infiltration trenches).
- Any storage or transportation of greater volumes of stormwater should occur underground (gravel trench or pipe)
- Any standing water in bioswales or other softscape areas should be prevented.

Stormwater Integration

- Only the conveyance of stormwater shall happen on the surface while all retention and storage of stormwater shall be underground.
- Decentralise the management of stormwater (reduce impermeable surfaces / green roofs / storage cisterns / etc.).
- Focus on cleansing of run-off from roads and hardscape areas through filtration through top-soil layer.
- The design of any water features (and selection of any associated planting) shall have particular regard to the potential to attract birds and have implications for aviation safety.
- Detailed water needs study at design stage which shall be used to determine a potable water source mix for Zone 1. Potential sources to be assessed include: mains water, rainwater harvesting, grey water harvesting and groundwater abstraction. Targets for each source shall be included for each Phase of development.

Stormwater Management