

DART+ South West Project

Constraints Report

Iarnród Éireann

Contents

Chapter	Page
Figures	2
1. Introduction	4
1.1. Purpose of the Report	4
1.2. DART+ Programme Overview	4
1.3. DART+ South West Project Overview	5
1.4. Capacity increases associated with DART+ South West	6
1.5. Key infrastructural elements of DART+ South West Project	6
1.6. Geographic Context	6
1.7. Aims and Objectives of the Report	7
2. Constraints	8
2.1. Population and Human Health	8
2.2. Air and Climate	11
2.3. Noise and Vibration	13
2.4. Biodiversity	15
2.5. Water	19
2.6. Landscape and Visual	26
2.7. Cultural Heritage	29
2.8. Soils, Geology and Hydrogeology	31
2.9. Material Assets	34
Appendices	37
Appendix A. Planning Applications Monitor*	38
Appendix B. Heritage Memo	39
Appendix C. Constraints Mapping – Population Constraints	40
Appendix D. Constraints Mapping – My Plan Zones	41
Appendix E. Constraints Mapping – Round 3 Rail Noise Lden	42
Appendix F. Constraints Mapping – Biodiversity Constraints	43
Appendix G. Constraints Mapping – Landscape Constraints	44
Appendix H. Constraints Mapping – Cultural Heritage Constraints	45
Appendix I. Constraints Mapping – Soils and Geology Constraints	46
Appendix J. Constraints Mapping – Hydrology Constraints	47
Appendix K. Constraints Mapping - Key Utilities and Licensed Facilities	48

Tables

Table 2.1: Property Counts within Various Buffers of the DART+ South West Project Centreline	13
Table 2.2: WFD Surface Water Status and Risk	20

Figures

Figure 1.1: Schematic of Overall DART+ Programme	4
--	---

Figure 1.2: DART+ South West	5
Figure 1.3: The Location and constraints Study Area of DART+ South West	7
Figure 2.1: EPA Air Quality Index for Health	12
Figure 2.2: Present (a) & Future (mid-range) (b) Coastal Flood extents - River Liffey/Liffey Estuary	21
Figure 2.3: Present (a) & Future (mid-range) (b) Fluvial Flood extents - Liffey_190 [Liffey]	22
Figure 2.4: Present (a) & Future (mid-range) (b) Fluvial Flood extents - Liffey_170 [Griffeen]	22
Figure 2.5: Present (a) & Future (mid-range) (b) River Flood extents - Liffey_170 [Lucan]	23
Figure 2.6: Present (a) & Future (mid-range) (b) Fluvial Flood extents – Castletown (Dublin-Kildare)_010 [Shinkeen River]	23
Figure 2.7: Hazelhatch Flooding Further Study (2020) - 10% AEP (High Probability) Design Event and CFRAMS Comparison of Extents	24
Figure 2.8: Hazelhatch Flooding Further Study (2020) - 1% AEP (Medium Probability) Design Event and CFRAMS Comparison of Extents	24
Figure 2.9: Hazelhatch Flooding Further Study (2020) – 0.1% AEP (Low Probability) Design Event and CFRAMS Comparison of Extents	25
Figure 2.10: Geographic Extent of the DART+ Programme	35
Figure 2.11: Key Rail Infrastructure	36

1. Introduction

1.1. Purpose of the Report

This report provides a desktop review of the constraints in the study area for the DART+ South West Project to inform the identification of Emerging Preferred Options of the scheme development.

1.2. DART+ Programme Overview

The DART+ Programme is a transformative railway investment programme, that will modernise and improve the existing rail services in the Greater Dublin Area (GDA). It will provide a sustainable, electrified, reliable and more frequent rail service, improving capacity on rail corridors serving Dublin.

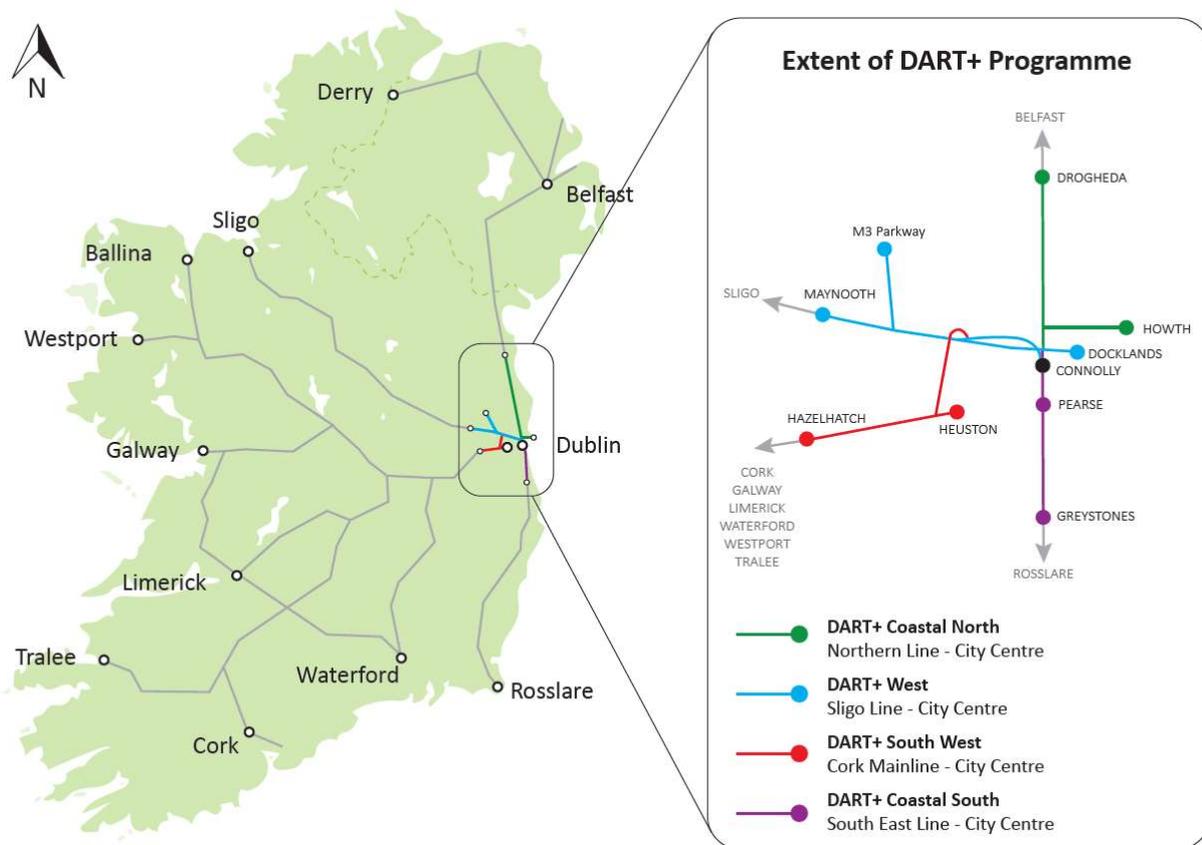


Figure 1.1: Schematic of Overall DART+ Programme

The current electrified DART network is 50km long, extending from Malahide / Howth to Bray / Greystones, and the DART+ Programme seeks to increase the network to 150km. The DART+ Programme is required to facilitate increased train capacity to meet current and future demands which will be achieved through a modernisation of the existing railway corridors. This modernisation includes the electrification, resignalling and certain interventions to remove constraints across the four main rail corridors within the Greater Dublin Area, as per below:

- **DART+ South West (this Project)** – circa 16km between Hazelhatch & Celbridge Station to Heuston Station and also circa 4km between Heuston Station to Glasnevin, via the Phoenix Park Tunnel Branch Line.
- DART+ West – circa 40km from Maynooth & M3 Parkway Stations to the City Centre.
- DART+ Coastal North – circa 50km from Drogheda to the City Centre.
- DART+ Coastal South – circa 30km from Greystones to the City Centre.
- DART+ Fleet – purchase of new electrified fleet to serve new and existing routes.

The DART+ Programme is a key element to the national public transportation network as it will provide a high-capacity transit system for the Greater Dublin Area and better connectivity to outer regional cities and towns. This will benefit all public transport users.

Delivery of the DART+ Programme will promote transport migration away from the private car and to public transport. This transition will be achieved through a more frequent and accessible electrified service, which will result in reduced road congestion, especially during peak commuter periods.

The DART+ Programme will provide enhanced, greener public transport to communities along the DART+ Programme routes delivering economic and societal benefits for current and future generations.

1.3. DART+ South West Project Overview

The DART+ South West Project will deliver the expansion of an improved electrified network, with increased passenger capacity and enhanced train service between Hazelhatch & Celbridge Station to Heuston Station (circa 16km) on the Cork Mainline, and Heuston Station to Glasnevin via Phoenix Park Tunnel Branch Line (circa 4km).

DART+ South West Project will complete four tracking between Park West & Cherry Orchard Station and Heuston Station and will also re-signal and electrify the route. The completion of the four tracking will remove a significant existing constraint on the line, which is currently limiting the number of train services that can operate on this route. DART+ South West will also deliver track improvements along the Phoenix Park Tunnel Branch, which will allow a greater number of trains to access the city centre.

Upon completion of electrification of the DART+ South West route, new DART trains will be used on this railway corridor, similar to those currently operating on the Malahide / Howth to Bray / Greystones Line.

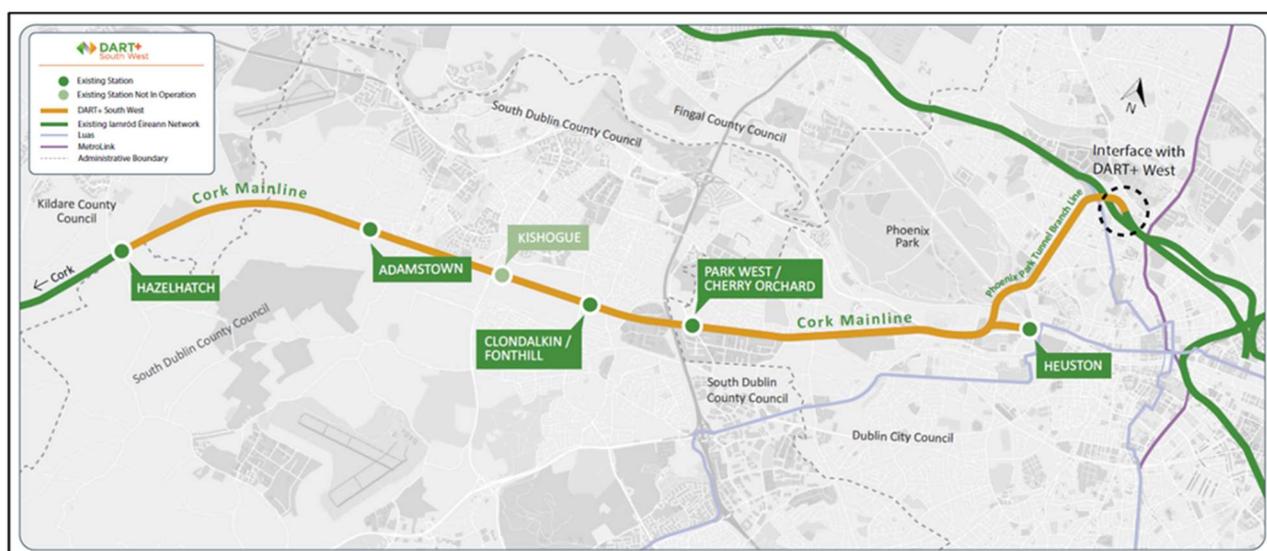


Figure 1.2: DART+ South West

1.4. Capacity increases associated with DART+ South West

The operating capacity of services in the Heuston area is currently constrained by railway infrastructure limitations and the ability of Heuston Station to accommodate terminating trains. Iarnród Éireann currently operates at a maximum capacity of 12 inbound trains in the AM peak hour and 12 outbound trains in the PM peak hour along the Cork Mainline. This provides a peak capacity of approximately 5,000 passengers per hour per direction during the AM and PM peak hours; operating inbound and outbound, respectively. DART+ South West aims to improve train service and increase train and passenger capacity on the route between Hazelhatch & Celbridge Station to Heuston Station and through the Phoenix Park Tunnel Branch Line to the City Centre, covering a distance of circa 20km.

DART+ South West will significantly increase train capacity from the current 12 trains per hour per direction to 23 trains per hour per direction (i.e. maintain the existing 12 services, with an additional 11 train services provided by DART+ South West). This will increase passenger capacity from the current peak capacity of approximately 5,000 passengers per hour per direction to approximately 20,000 passengers per hour per direction.

1.5. Key infrastructural elements of DART+ South West Project

The key elements of DART+ South West include:

- Completion of four-tracking from Park West & Cherry Orchard Station to Heuston Station, extending the works completed on the route in 2009.
- Electrification of the line from Hazelhatch & Celbridge Station to Heuston Station and also from Heuston Station to Glasnevin, via the Phoenix Park Tunnel Branch Line, where it will link with proposed DART+ West.
- Undertaking improvements/reconstructions of bridges to achieve vertical and horizontal clearances.
- Remove rail constraints along the Phoenix Park Tunnel Branch Line.
- Feasibility report and concept design for a potential new Heuston West Station.

1.6. Geographic Context

The DART+ South West Project is approximately 20 km in length. From Heuston Station in Dublin City, the railway network travels in a west/ south-westerly direction through Inchicore and Park West, entering South Dublin City via Clondalkin and Adamstown and finally to Hazelhatch in County Kildare. All are important regional towns also functioning as commuter towns to Dublin and other significant employment centres in the region. A spur line from Heuston north to Glasnevin junction, including Phoenix Park Tunnel, is also included in the DART+ expansion.

The study area is located predominantly within the administrative area of Dublin City County Council with the remaining sections of the line located within the administrative areas of South Dublin County Council and Kildare County Council.

The location of the DART+ South West within the wider context of major urban areas and employment centres in the region is illustrated in **Figure 1.3**.

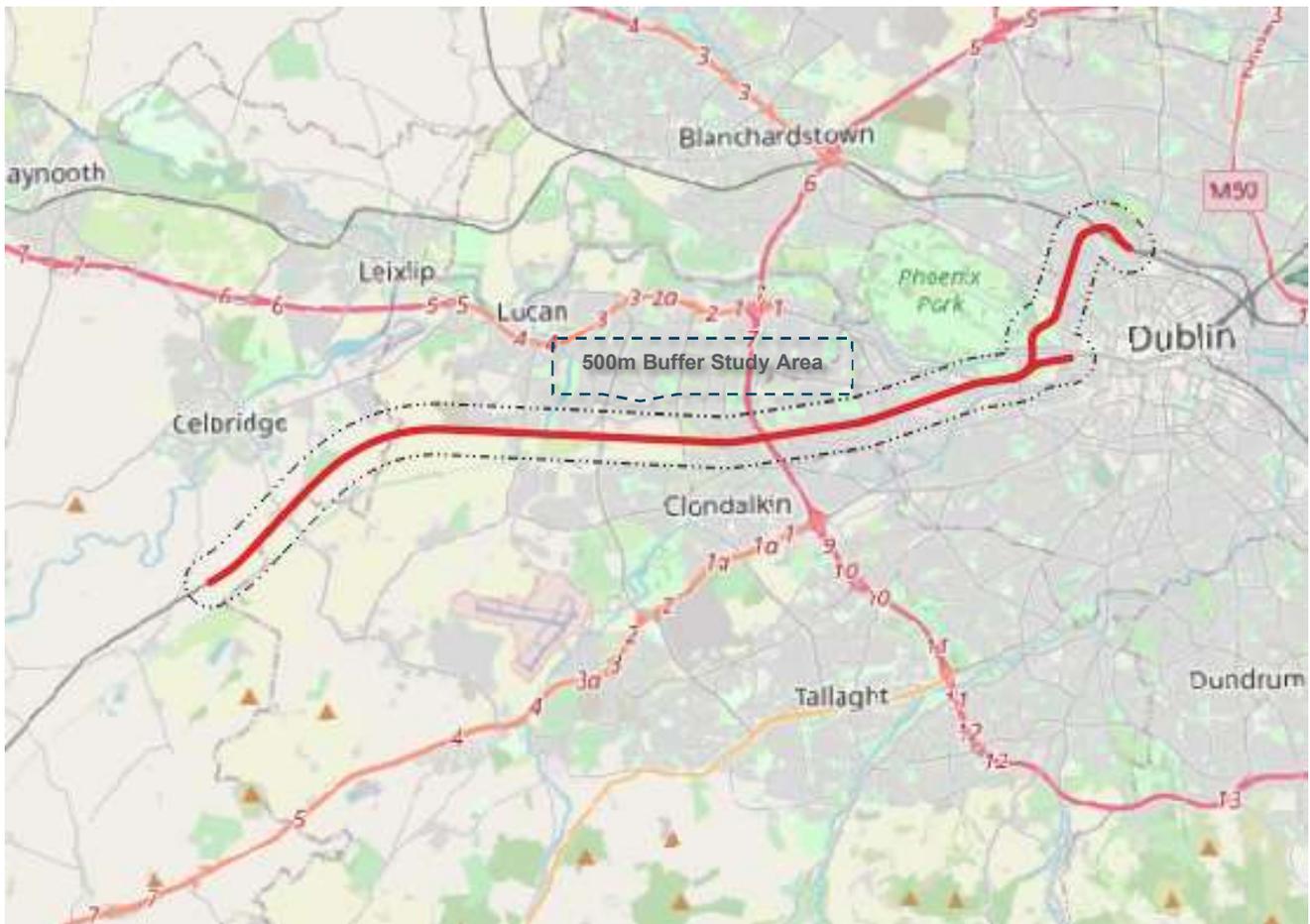


Figure 1.3: The Location and constraints Study Area of DART+ South West

1.7. Aims and Objectives of the Report

For the purpose of this constraints report a 500m buffer study area has been considered which includes 250m either side of the DART+ South West project centreline (see Figure 1.3). This reflects the fact that the existing corridor will be the main focus for all upgrade / expansion work. This constraints report has been compiled with reference Article 3 of the EIA Directive (2014/52/EU) in terms of the scope of topics considered at this feasibility stage. More detailed constraints investigations will follow as the scheme is progressed. The key environmental issues considered in this report are:

- Population and Human Health;
- Air Quality and Climate;
- Noise and Vibration;
- Biodiversity;
- Land and Agriculture;
- Geology and Soils;
- Water (Hydrology & Hydrogeology);
- Landscape and Visual;
- Archaeology, Architecture and Cultural Heritage; and
- Material Assets.

2. Constraints

2.1. Population and Human Health

The proposed development will serve several established communities along its length, increasing capacity in terms of frequency and passenger numbers albeit along an existing rail line. It will also potentially open up new land uses and support changes in housing and economy in its zone of influence. There is potential for permanent and temporary land take along the line due to the proximity of residential, commercial and recreational land uses which have developed up against the DART+ South West corridor. There is also potential for increased disturbance/ nuisance during construction and operation phases.

This section identifies the constraints aspects of the proposed project in relation to population and human health. A sensitive receptor in the context of population and human health relates to the following types of features:

- Residential areas;
- Hospitals, Fire Stations, Garda Stations and other emergency services;
- Schools (incl. childcare facilities, primary and secondary schools, third level education);
- Community facilities (e.g. community halls, youth centres, places of worship etc.);
- Recreational facilities (e.g. playgrounds, public parks, sports pitches etc.);
- Tourism (e.g. hotels, museums, landmarks, other attractions); and
- Retail / Local Centres / Businesses.

Key sources of information relating to these types of features have been identified with reference to: Central Statistics Office (CSO) data; Dublin City Development Plan 2016-2022¹; South Dublin County Development Plan 2016-2022²; Kildare County Development Plan (CDP) 2017-2023³; available mapping including aerial photography; and Ordnance Survey (OSi) mapping; and PRIME2.

The constraints information on population has been desk-based to date.

2.1.1. Key Constraints

Appendix C present the key population and human health constraints in the study area.

2.1.1.1. Residential

The DART+ South West passes through the administrative areas of three local authorities, notably Dublin City, South Dublin and Kildare and passes through the residential areas of Glasnevin, Cabra, Islandbridge, Inchicore, Park West, Clondalkin, Adamstown and Hazelhatch.

Using PRIME 2 data 5,399 residential properties have been identified within the study area and a further 112 are identified as both commercial and residential.

¹ <https://www.dublincity.ie/sites/default/files/content/Planning/DublinCityDevelopmentPlan/Written%20Statement%20Volume%201.pdf>

² [https://www.southdublindevplan.ie/sites/default/files/documents/CDP%202016-2022%20\(lower%20res\).pdf](https://www.southdublindevplan.ie/sites/default/files/documents/CDP%202016-2022%20(lower%20res).pdf)

³ <http://www.kildare.ie/countycouncil/Planning/developmentplans/KildareCountyDevelopmentPlan2017-2023/>

It also noted that a number of these residential properties within the study area include apartment blocks and thus the number of individual residential properties are greater than the residential property figure stated. Key residential areas in proximity to the scheme include:

- Houses along Claremont Lawns
- Houses along St. Attracta Road and Bannow Road
- Residents in Cabra
- Houses along Glenbeigh Road
- Residents and businesses in Kilmainham – particularly north of Inchicore Road
- Residents and businesses in Inchicore / Inchicore Village
- Residents along Landen Road, Kylemore Drive, Clover Hill Road, Cherry Orchard Avenue/ Crescent, Barnville Park
- Traveller Accommodation at Lynch's Park and Kishoge Road
- Residents in Adamstown
- Residents in Tullyhall, Handsted Drive, Adamstown Avenue (Adamstown)
- Residents at Hazelhatch Station
- Residents in Celbridge
- Individual (one-off) houses adjacent to the route

2.1.1.2. Planning Applications

A planning applications monitor has been established to track live planning applications within the study area.

An overview of all planning applications submitted within the last 5 years of September 2020 within 200m from the DART+ South West project centreline and 400m from Hazelhatch has been undertaken. A wider 1km distance from the centre line has been selected for Strategic Housing Developments (SHDs), Strategic Infrastructure Developments (SIDs) and local authority (Part 8) schemes. An Excel spreadsheet listing all applications and relevant details is included as **Appendix A** to this report (the Planning Application Monitor is a live document and is current to March 2021). Also enclosed is a corresponding set of maps to highlight the locations of these applications within the study area. It is noted that this is a live register and the enclosed information represents a point in time and will evolve as the project progresses.

The planning application search found over 350 applications in the study area, including 2 no. Strategic Infrastructure Developments. 2 no. Strategic Housing Developments within an extended 1km of the centre of the railway line. The vast majority of applications in the area are for minor works (e.g. housing extensions).

The planning application monitor will continue to be updated throughout the planning of the project.

2.1.1.3. Land Use Planning

Key developments of note within the study area include:

- Strategic Development Regeneration Area 11 (SDRA11) (O'Devaney Gardens)
- SDRA7 (Heuston Quarter)
- SDRA4 (Park West)
- Clonburris SDZ (May 2019) (road proposals and new communities/residential/businesses)
- Adamstown SDZ (road proposals and new communities/residential/businesses)
- Celbridge-Hazelhatch Link Road
- Key Development Areas (KDAs) in Celbridge LAP

2.1.1.4. Community Facilities, Amenities and Tourism Sites

The Cork Main line passes adjacent to and in proximity to a range of community facilities, amenities and tourism features as it makes its way from Glasnevin Junction toward Heuston and out to Hazelhatch. Key Sensitive Receptors are noted below. This is not intended to be an exhaustive list but reflects those in close proximity to the proposed works:

- Glasnevin Cemetery
- Royal Canal Way e.g. walkers
- St. Finbar's GAA Club
- McKee Barracks
- An Garda Síochána Headquarters
- Phoenix Park / Dublin Zoo
- Clancy Barracks
- St. John of God Special School
- IMMA and Kilmainham Gaol
- Irish National War Memorial Park
- Liffey Gaels GAA Club
- Corvin and Sarsfield Medical Centres (GP versus high tech Medical Centres e.g. x rays)
- Kishoge and Griffeen Community College
- Visiting Population e.g. Dublin Zoo, Museums.
- St. John the Evangelist National School
- Adamstown Community Centre
- Lucan Sarsfield's GAA (Adamstown Pitch)
- Celbridge Golf Club

2.1.1.5. Businesses

Key business areas which may be affected by the proposed DART+ South West project include those in the flowing locations. Note this is not intended to be an exhaustive list but rather to identify business areas in close proximity to the proposed scheme that may benefit / be impacted by the scheme, including businesses in:

- Cabra
- Kilmainham – particularly north of Inchicore Road
- Inchicore / Inchicore Village
- Kylemore and Parkwest/Cherry Orchard
- Cloverhill / Clondalkin Industrial Estate
- Adamstown
- Celbridge

2.1.1.6. Other Issues of Note for Population

Three Seveso sites were identified within the study area. One Upper Tier Establishment and two Lower Tier Establishments are identified within County Dublin⁴⁵:

- BOC Gases Ireland Ltd. PO Box 201, Bluebell Industrial Estate, Dublin 12.
- Iarnród Éireann. Iarnród Éireann Maintenance Works, Inchicore, Dublin 8.

⁴https://www.hsa.ie/eng/your_industry/chemicals/legislation_enforcement/comah/list_of_establishments/upper_tier_sites_5th_may_2020.pdf

⁵https://www.hsa.ie/eng/your_industry/chemicals/legislation_enforcement/comah/list_of_establishments/lower_tier_25aug20.pdf

- Kayfoam Woolfson. Bluebell Industrial Estate, Bluebell Avenue, Naas Road, Dublin 12.

2.1.2. General Issues for Further Consideration: Population

Further to the location specific issues identified above, consideration has also been given to aspects of the development that may result in further constraints for the project deliver. These are briefly summarised below and will be established as part of the EIAR.

- Increases in population due to the construction phase - specialised personnel from outside the development area may be required.
- Changes in population trends within Dublin and Kildare – see the relevant Development Plan zoning.
- Traffic nuisance during bridge works, nuisance to the wider community.
- Noise nuisance from proximity and frequency increases.
- Health.
- Land take from nearby landowners and nuisance surrounding construction access points.
- Disruption to commuting / travel times.
- Impact on tourist locations e.g. Phoenix Park
- Traffic, bridge works and footbridge access may be altered.

Reference Appendix C – Constraints Mapping Population and PRIME2 Data and Appendix D - MyPlan Zoning with GZT Labels.

2.2. Air and Climate

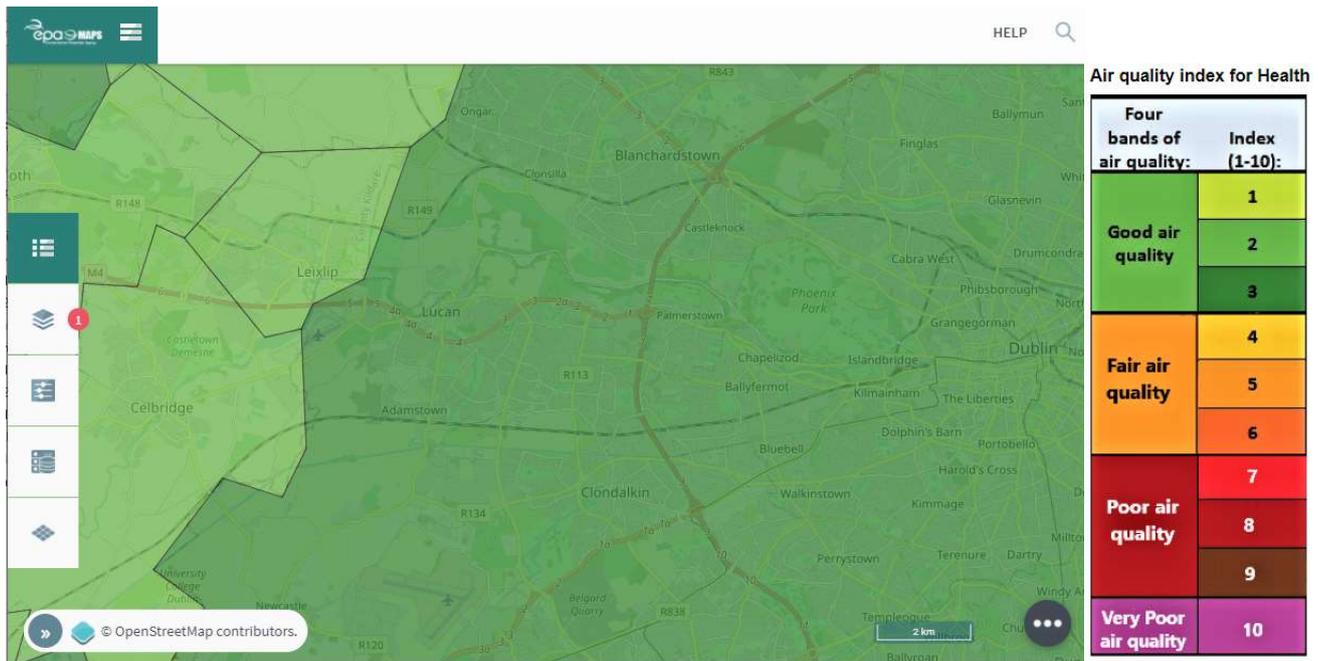
Under the Clean Air for Europe (CAFE) Directive, EU member states must designate 'Zones' for the purpose of managing air quality. For Ireland, four zones were defined in the Air Quality Standards Regulations (2011). The zones were amended on 1 January 2013 to take account of population counts from the 2011 CSO Census and to align with the coal restricted areas in the 2012 Regulations (S.I. No. 326 of 2012). The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). The four air quality zones in Ireland are:

- Zone A: Dublin;
- Zone B: Cork;
- Zone C: Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise; and
- Zone D: Rural Ireland i.e. the remainder of the State excluding Zones A, B and C.

The proposed scheme is situated within Zone A – Dublin, and Zone C – Other cities and large towns.

Additionally, the majority of the study area is located within the 'Dublin City' Region of the EPA Air Quality Index for Health (AQIH), with parts also located within the 'Large Towns' AQIH Region. The AQIH currently indicates that the air quality for the 'Dublin City region' is '3-Good' and the air quality for 'Large Towns' is '2-Good'; both are currently below the ambient air quality limit values. **Figure 2.1** shows the air quality index for Dublin and Kildare.

The constraints information on Air and Climate has been desk-based to date.



Source: EPA Maps, environment and Wellbeing, Air Quality Index Regions, <https://gis.epa.ie/EPAMaps/>

Figure 2.1: EPA Air Quality Index for Health

2.2.1. Key Constraints

Existing sources of pollution in the study area include road traffic on the local road network, railway traffic on the existing rail line, motorway associated traffic such as the M50 that intersects the study area at Park West and agriculture (dusts, odours, etc.). Receptors identified in terms of Air Quality are located along the DART+ South West project centreline within the study area and include:

- Residential locations (street and estate) adjacent to the proposed scheme, particularly to the north at Inchicore, Cherry Orchard and Park West Station;
- Residential properties, particularly those in close proximity and adjacent to proposed bridge removals/reconstructions;
- Isolated housing areas such as Adamstown, and scattered housing in those more rural locations along the proposed scheme;
- Business e.g. commercial properties, retail and local services;
- Schools, churches, recreational areas and sports and community facilities; and
- Wider impacts from traffic reallocation at bridge locations where reconstruction is required.

Table 2.1 outlines the numbers of properties within various buffer bands from the DART+ South West project centreline.

Table 2.1: Property Counts within Various Buffers of the DART+ South West Project Centreline

Buffer Band	0-50m	50-100m	100-200m	200-300m	300-500m
Category					
Residential	1,601	2,564	5,163	5,291	11,060
Commercial	119	124	252	242	682
Both	2	10	32	89	100
Unknown	18	15	32	80	205
Total	1,740	2,713	5,479	5,702	12,047

2.2.2. General Issues for Further Consideration

In general, the proposed scheme and its wider area experiences 'Good' air quality with the absence of any major sources of pollution. Further details and trends will be confirmed in due course.

2.3. Noise and Vibration

The electrification of the line as part of the DART+ South West project will result in increased train passing frequency and similarly to air quality, the constraints relating to Noise and Vibration on a proposed railway project are largely concerned with the potential to impact sensitive receptors. Identifying the potential receptors at this stage in the process allows them to be taken into account in the route selection and design process to avoid or minimise adverse impact on sensitive receptors.

A sensitive receptor in the context of Noise and Vibration relates to the following types of features:

2.3.1. Noise

- Any location in which the inhabitants may be disturbed by noise from the railway;
- Dwelling or house;
- Hotel or hostel;
- Health building (providing patient services);
- Nursing/retirement home;
- Educational establishment;
- Place of worship or entertainment;
- Any other facility which may justifiably require, for its proper use, the absence of noise at nuisance levels. This definition may include areas of particular scenic quality or special recreational amenity importance designated in a Development Plan; and
- Locations where children are aged under six e.g. creches, or those with special needs will also be included.

2.3.2. Vibration⁶

- Any location in which the inhabitants may be disturbed by vibrations from the railway;
- Protected structures;
- Residential day care centres;
- Operating theatres;
- Premises with optical microscopes, microbalances, large turbines and data centres;
- Premises with electron microscopes; and
- Premises with sensitive lithography equipment.

Key sources of information relating to these types of features have been identified with reference to: TII Strategic Noise Mapping, EPA Noise Monitoring Locations, The Dublin Noise Action Plan 2018-2023, County Kildare Third Noise Action Plan 2019-2023, The National Road's Authority's document '*Guidelines for the Treatment of Noise and Vibration in National Road Projects*' (2004) and WHO Environmental Noise Guidelines for the European Region 2018.

The constraints information on Noise and Vibration has been desk-based to date.

2.3.3. Key Constraints

2.3.3.1. Residential and Commercial Properties

The majority of noise sensitive receptors within the study area are residential dwellings commercial premises, and community facilities that are close or adjacent to the DART+ South West corridor and situated within its environs. Other receptors will include commercial properties, retail areas, schools, churches, recreational areas, sports and community facilities, and local services located within the area. A list of the key constraints at this stage are provided below (refer also to the key constraints listed under Population, **Section 2.1**):

- Proximity of the DART+ South West corridor to residential properties particularly those located at Landen Road and Kylemore Drive;
- Noise and vibration associated with significant structural works for overpasses and structures at various locations where four-tracking is required;
- Speed and train count increases associated with four-tracking sections of the line during operation and associated noise and vibration increases;
- Noise and vibration associated with structural works where four-tracking is required. Night time work can be an issue for residents including any potential land take to accommodate this;
- Railway lines in the northern half of the proposed scheme. Currently, this section of rail line (Cabra/Glasnevin) have no significant rail traffic and the train numbers as a result of the upgrade of the northern spur may significantly increase noise and vibration;
- High numbers of residential properties in terms of apartment blocks should also be considered as areas of higher population density, and thus a more sensitive receptor. Some accommodation blocks around Heuston Station are relatively new;

⁶ Note: There are four thresholds for vibration: (1) Normal structures, (2) old/weak structures, (3) Human sensitivity and (4) sensitive instrumentation/ equipment.

- Con Colbert Road has two data centres e.g. Con Colbert House Data Centre, and vibrations would be a concern here; and
- Special needs schools can be particularly sensitive to changes in noise and vibration e.g. St. John Of God School, Islandbridge.

2.3.3.2. Strategic Environmental Noise Mapping: Major Sources

The Environmental Noise Directive (END) (2002/29/EC) sets out the obligation of member states to assess and manage environmental noise and is the main EU instrument to identify noise pollution levels. The Directive mandates that Member States must prepare and publish, every 5 years, noise maps and noise management action plans for:

- Agglomerations with more than 100,000 inhabitants;
- Major roads (more than 3 million vehicles a year);
- Major railways (more than 30,000 trains a year); and
- Major airports (more than 50,000 movements a year, including small aircrafts and helicopters).

The mapped contours for the Round 3 Noise Mapping for the Dublin and east Kildare area are shown in Appendix E - Round 3 Rail Noise Lden with PRIME2 and Round 3 Rail Noise Lnight with PRIME2. It should be noted that the Luas light rail line is designated as Major rail as all operational Luas lines exceeded the threshold of 30,000 train passages per year. The results indicate that the rail noise is generally within the immediate environs of the existing railway network as well as the major roads due to the presence of Luas infrastructure.

2.3.4. General Issues for Further Consideration

Other potential constraints relate to sensitive properties (such as cultural heritage sites, buildings, monuments and bridges) that are particularly sensitive to the potential for ground borne noise and vibration during both construction as well as operational phase railway traffic. Additionally, sensitive species should also be considered which are particularly sensitive to noise such as birds. This may include birds associated with EU and nationally designated sites.

2.4. Biodiversity

The presence of the existing rail line has reduced biodiversity potential along the route to a large degree, however there remain hotspots of interest in relation to hedgerows and treelines for bats in particular. The potential for spreading of invasive species is also of concern.

This section identifies the constraints aspects of the proposed project in relation to biodiversity. A sensitive receptor in this context relates to the following types of features:

- Designated/ protected site e.g. Special Areas of Conservation (SACs) and Special Protection Areas (SPAs);
- Nationally designated sites e.g. Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs);
- Protected species e.g. Annexes II and IV;
- Habitats (artificial, built and natural) e.g. Annex I;
- Birds and mammals;
- Invasive or alien species (IAPS);

- Fisheries; and
- Watercourses and wetlands.

Key sources of information relating to these types of features have been identified with reference to: National Parks and Wildlife Service (NPWS); National Biodiversity Data Centre (NBDC); Environmental Protection Agency watercourse and water quality data; Geological Survey of Ireland (GSI) geology, soils and hydrogeology data; Ordnance Survey maps and orthophotography; Kildare County Development Plan 2017-2023; South Dublin County Council Development Plan 2016-2022; and Dublin City County Development Plan 2016-2022.

The constraints information on biodiversity has to date constituted a desk-based study as well as a field walk along the entirety of the existing rail line from Glasnevin to Heuston, and Heuston to Hazelhatch, undertaken August 25th – 27th 2020. Appendix F - outlines the key biodiversity constraints along the length of the project extent.

2.4.1. Key Constraints

2.4.1.1. European Sites

There are no European Sites or nationally designated sites which are directly traversed by the DART+ South West project. However there are a number of protected sites which may have a pathway to the project (namely hydrological connectivity). These sites are:

- **South Dublin Bay & River Tolka Estuary SPA (Code 004024):** Special Conservation Interests (SCIs) include brent goose, oystercatcher, plover gulls, terns, dunlin, knot, sanderling. Approx. 2.8km to the east of the project.
- **Rye Water Valley/ Carton cSAC (Code 001398):** Qualifying Interests (QIs) include petrifying springs, Salmon, Crayfish, Vertigo snails. Approx. 3km to the north and north-west of the project.
- **South Dublin Bay SAC (Code 000210):** Mudflats and sandflats, vegetation of drift lines, Salicornia and dunes Approx. 5km to the south-east of the project.
- **North Dublin Bay SAC (Code 000206):** Mudflats and sandflats, vegetation of drift lines, Salicornia, salt meadows, dunes and Petalwort. Approx. 6km to the east of the project.

2.4.1.2. Nationally Designated Sites

There are no NHAs traversed by or in proximity to the project. There are a number of Proposed NHAs which are in proximity, including:

- **South Dublin Bay pNHA (Code 000210):** See SAC above.
- **Rye Water Valley/ Carton pNHA (Code 001398):** See SAC above.
- **Grand Canal pNHA (Code 002104):** Otters, rare aquatic flora and molluscs. Less than 1km away from the south side of and running generally parallel to the existing rail line and the length of the project.
- **Liffey Valley pNHA (Code 000128):** Diverse habitats including rare and threatened flora. Approx. 1.2km.
- **Royal Canal pNHA (Code 002103):** Otters, Rare aquatic flora and molluscs. Less than 3.7km.
- **North Dublin Bay pNHA (Code 000206):** See SAC above.

2.4.1.3. Other Significant Ecological Features

There were a number of biodiversity features which were recorded along the existing rail line and were noted from surveys conducted during the 2011 EIS as follows:

- Butterflies were noted at the low berm at Hazelhatch, the former bridge abutments near Kylemore Bridge and the revegetated spoil heaps at Inchicore works.
- Artificial ponds were noted at Hayden's Lane.
- Invasive species were found at Inchicore works and Hazelhatch.
- Bat roost off-line at the former Lime Kiln at Stacumny.
- Bird species of note included yellowhammer (Red-listed), as well as House Martins, House Sparrow, Snipe Swallow and Starling (Amber-listed).
- Insects noted included commonly occurring bees and wasps, especially around the butterfly bushes at Inchicore works. Snails were common along the banksides along the railway cuttings and common species included Brown Lipped snail *Cepaea nemoralis*, and Garden Snail *Helix aspersa*.
- The common lizard *Lacerta vivipara* were seen near Cherry Orchard during the habitat surveys for the 2011 EIS.
- An otter spraint was noted in a stream to the north of a proposed compound at Hazelhatch. No holts were found.

A field walk was undertaken in 2020 along the Iarnród Éireann-owned DART+ South West corridor, and noted the following key ecological features as outlined below:

- The River Liffey and a tributary – the Griffeen River, are known salmon-bearing streams and all stream crosses by the railway feed to salmonid waters.
- The Rye Water River (entering the River Liffey at Leixlip) is also known to bear trout.
- The section of the River Liffey traversed by the existing rail line at Islandbridge is classed as Annex I habitat (estuaries).
- The Bat Conservation Ireland database has recorded roosts for a bat species 2km to the northwest in Celbridge which would be within the nightly flight range of this species.
- Bat roost potential was noted at the following locations:
 - The twin-arch underbridge at the Luas line in Cabra;
 - The Phoenix Park Tunnel;
 - Old building opposite Inchicore works, on the northern side; and
 - Offline old bungalow-type building, on the northern side of line at Stacumny.
- Invasive and alien species (IAPS) were noted at the following locations:
 - Sapling of Himalayan balsam on the train tracks at Cabra;
 - Balsam at the bridge over the Old Cabra Road, R805;
 - A stand balsam on the south-east side of the bridge extending upslope at Blackhorse Avenue;
 - Extensive Japanese knotweed on Iarnród Éireann lands between apartments and the track 10 platform. This extends from the Liffey bridge to the bridge at the South Circular Road;
 - Japanese knotweed was also noted in the South Circular Road area; and
 - Small stand of Japanese knotweed around the Iarnród Éireann junction box adjacent the line on Balscott Lane L6005. Extends upslope and into private hedge line.
- Several signs of badger activity (scat and latrine evidence) were found at the following locations:
 - Along the stretch of line between Blackthorne Avenue and Garda Terrace;

- Old badger scat was also recorded on Kishoge’s southern side station platform. The nearby access gate would not prohibit badger activity; and
- 2 x old scat on Adamstown platform. Though gated, the platform access would not preclude badger being able to access the area.
- Ponding was recorded between the existing rail line and the former cement storage yard. These are small ephemeral ponds comprising standing water, alkaline plants. Has low potential for the presence of amphibians.
- A line of screening hedging was noted to be recently replanted on the northern side of the track, and on the west side of the Western Parkway Motorway.
- There is an NBDC record of otter potential, associated with the Castletown River/ car park at Hazelhatch station. There are also a number of NBDC records noted up- and downstream of the bridge crossing the River Liffey.

2.4.1.4. Other Issues of Note for Biodiversity

The Biodiversity section will consider the following at the next stage of the process:

- Establish the potential for bridges, particularly old or historic ones, and the Phoenix Park Tunnel to contain bats and / or roosts.
- Establish the extent of the loss of vegetated embankments and hedgerow along the denser part of the alignment, particularly with regard to loss of habitat for badger, bats, birds and near water, otter.
- Consider the crossing of the Liffey River and the habitats and species associated with the river and issues arising especially during construction.

2.4.2. General Issues for Further Consideration: Biodiversity

Further to the location specific issues identified above, consideration has also been given to aspects of the development that may result in further constraints for the project delivery. The ecological impact assessment (EclA) will address the ecological impact from the development based on defined habitat types, character of the areas traversed and land use activities. It will provide comprehensive information on habitat loss habitats and species disturbance, impacts on watercourses and impacts to national and EU designated area and qualifying interests. Pathways for potential impact on biodiversity from excavation and construction works, and new overhead and underground infrastructure include disturbance to habitats and species from:

- Loss and/ or damage of habitat (trimming of hedgerows);
- Fragmentation of commuting/foraging corridors;
- Spread of third schedule invasive alien species;
- Disturbance (e.g. noise and vibration) resulting from machinery use during construction and operation;
- Disturbance to protected species (e.g. nesting birds and roosting bats);
- Collision risk associated with new infrastructure; and
- Alteration / deterioration in water quality.

Appendix F - outlines the key biodiversity constraints along the length of the project extent.

2.5. Water

This section identifies the constraints aspects of the proposed project in relation to hydrology and hydrogeology. A sensitive receptor in the context of hydrology and hydrogeology is determined based on the sensitivity of the receptor and the ability it has to dilute or stand the level of discharge. Sensitive receptors for surface water are considered to be:

- The surface waters which are abstracted downstream of the project for drinking purposes;
- Those with ecological significance (classified by EPA);
- Important aquifers (classified by GSI);
- Flood extents.

Key sources of information relating to these types of features have been identified with reference to; Environmental Protection Agency (EPA) GIS Maps, Office of Public of Works (OPW) flood Mapping, A review of Ordnance Survey (OS) maps and ortho-photography, EPA Catchments, Geological Survey of Ireland (GSI) – hydrogeology; and, All-Island Research Observatory (AIRO) - Environmental Sensitivity Mapping.

The constraints information on Water has been desk-based to date.

2.5.1. Key Constraints

2.5.1.1. Watercourses, Water Quality and Status

According to the EPA, the study area is located within the Liffey and Dublin Bay WFD Catchment (Hydrometric Area No. 9). All of these water features, rivers and streams are contained within the Liffey and Dublin Bay catchment. In general, watercourses within the study area flow in a south west to north east direction where they all ultimately drain into the River Liffey. The central river waterbody within this catchment is the River Liffey. The River Liffey is a key river to consider as it is the largest within the constraint study area and is an important water course for fisheries habitat. It is known to support Atlantic salmon, brown trout, sea trout, white-clawed crayfish, European eel and lamprey (river and brook), therefore making this catchment very sensitive to environmental impact (refer also to Biodiversity, **Section 2.4**).

For the purposes of assigning water quality and “Ecological Status” under the Water Framework Directive (WFD, 2000/60/EC), rivers have been divided up into contiguous sections (water bodies). The WFD ecological status and their risk of not achieving their water quality objectives are outlined in **Table 2.2**. Under the WFD, the minimum objectives for a water body are to achieve at least Good status (or Good potential for artificial/ highly modified water bodies), and no deterioration of existing status. Note that even where a water body may have achieved Good status, it may still be classed as *At Risk* or under *Review* by the EPA where there is evidence that indicates the water body may not maintain that status e.g. due to existing or increasing pressures on the water body, or due to its limited assimilative capacity, or more stringent quality objectives needed to support any protected area designation.

Table 2.2: WFD Surface Water Status and Risk

EPA Waterbody Name [EPA River Name]	WFD Surface Water Status (2013-2018)	EPA-approved Water Body Risk of Not achieving WFD Objectives (WFD Cycle 3)
Liffey_150 [River Liffey]	Good	Review
Liffey_170 [River Lucan / Griffeen]	Good	Review
Liffey_190 [River Liffey]*	Moderate	At Risk
Camac_040 [River Camac]	Poor	At Risk
Castletown (Dublin-Kildare)_010 [River Shinkeen]	Unassigned	Review
Liffey Estuary Upper [Liffey Estuary – Transitional]	Good	Review
Grand Canal Main Line (Liffey and Dublin Bay) [Grand Canal]	Good	Not at Risk

Source: EPA Catchments, <https://gis.epa.ie/EPAMaps/Water>

* Note: The Liffey_190 is not directly traversed by the project but it inputs into the Upper Liffey estuary which is crossed by the Sean Heuston Bridge.

2.5.1.2. Groundwater Quality

The study area lies within the Dublin (WFD Code: IE_EA_G_008) groundwater body (GWB) which is a poorly productive bedrock GWB.⁷ The GWB is approximately 837km² in area and spans across Dublin City into County Kildare and County Meath in areas which are low-lying, with little change in surface topography. Groundwater flow in the water body will be towards the River Liffey and the coast, though flow will have localised paths (<1km in extent) occurring along fractures, joints and major fault zones. Most of the groundwater flow will be in the upper weathered zone, but flow in conduits is commonly recorded at depths of 30 to 50 mbgl.⁸ The Dublin GWB is currently at Good WFD Status for the 2013-2018 monitoring cycle, however the GWB Risk classification is currently under 'Review' with regard to achieving its WFD objectives.

2.5.1.3. Flooding

The proposed development intersects a number of the water bodies listed above and thus areas at risk of flooding can pose a risk to proposed infrastructure. The Office of Public Works (OPW) flood maps (<https://www.floodinfo.ie/map/floodmaps/>) indicates the flood extent probabilities for fluvial and coastal flooding.

The extents for the medium and high probabilities for coastal flooding (Liffey Estuary) are shown in **Figure 2.2**. In terms of coastal flooding within the Liffey and Liffey Estuary, moderate (Annual Exceedance Probability (AEP) of 1%) to high (Annual Exceedance Probability (AEP) of 10%) probabilities are also seen. Regarding the Castletown water body that intersects the railway line, this area is currently "under review" by the OPW and will be updated on the online maps in due course. More recent flood modelling conducted by RPS on behalf of the Kildare County Council for the Hazelhatch area indicates Hazelhatch as having low to high probabilities for flood risk.

The extents of the medium and high probabilities for fluvial flooding at each intersection of the railway line with a water course are shown in **Figure 2.3 to Figure 2.6**. In general, river crossings along the railway line show medium (Annual Exceedance Probability (AEP) of 1%) to high (Annual Exceedance Probability (AEP) of 10%)

⁷ https://secure.dccae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/DublinGWB.pdf

⁸ mbgl - metres below ground level

probability of fluvial flooding particularly where the Liffey_170 [Griffeen] and the Liffey_190 [Liffey] intersect the development. These become increasingly apparent with Mid-Range Future Scenario extents.

The OPW maps also indicate that a number of notable flood events have occurred along the existing Cork Main line:

- Bridgewater Quay Apartments, Islandbridge, Dublin 8. on 24th Oct 2011;
- Beech Row, Ronanstown – recurring flooding issues (to west of Lucan-Newlands Road, L1015);
- Shinkeen, Hazelhatch River Road Nov 2000; and
- Shinkeen Hazelhatch Recurring – recurring flooding issues (to approx. 200m SE of the rail line, on the Hazelhatch Road, R405); and
- One flooding event along Hazelhatch railway lines caused closure of the southern train services (RPS, 2020).⁹

Key (OPW – Floodinfo.ie)

Rivers

River - Medium Probability

Legend:

River - High Probability

Legend:

Coastal

Coastal - Medium Probability

Legend:

Coastal - High Probability

Legend:

Source: OPW, <https://www.floodinfo.ie/map/floodmaps/>

(a)

(b)



Figure 2.2: Present (a) & Future (mid-range) (b) Coastal Flood extents - River Liffey/Liffey Estuary

⁹ RPS (2020) for Kildare County Council. Hazelhatch Further Study - Hydrological and Hydraulic Analysis Report.

(a)



(b)

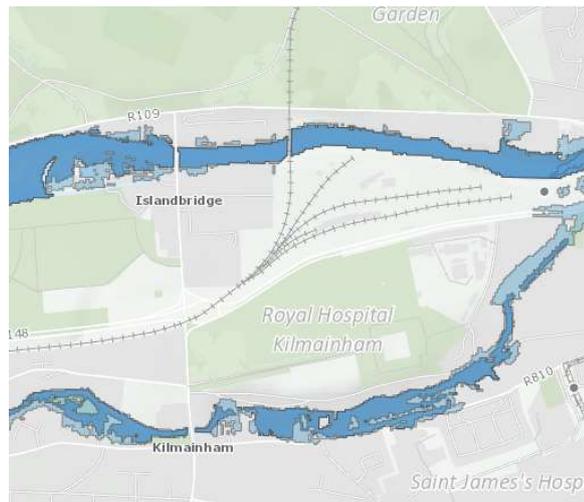
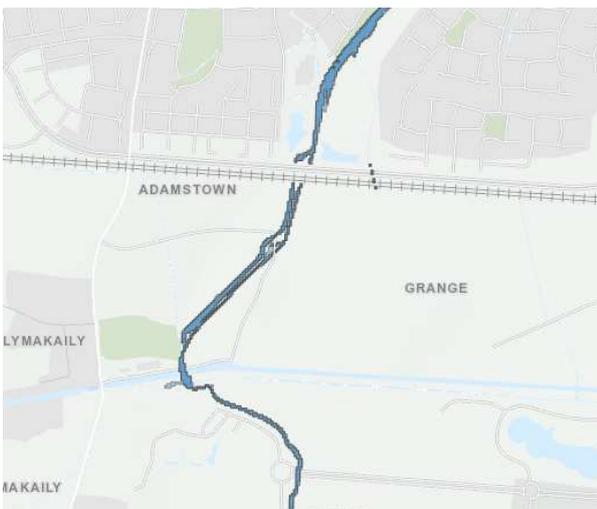


Figure 2.3: Present (a) & Future (mid-range) (b) Fluvial Flood extents - Liffey_190 [Liffey]

(a)



(b)

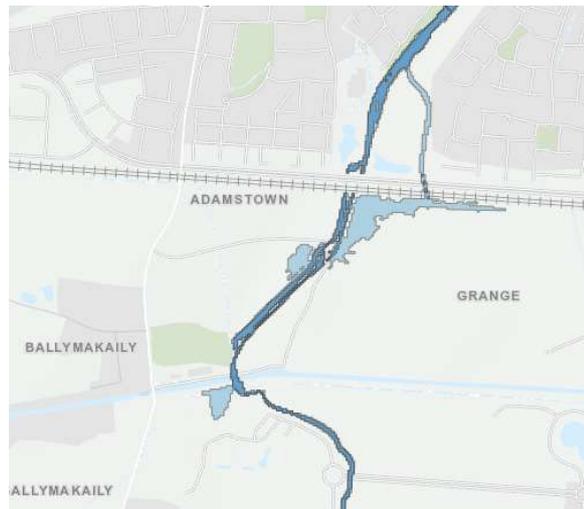
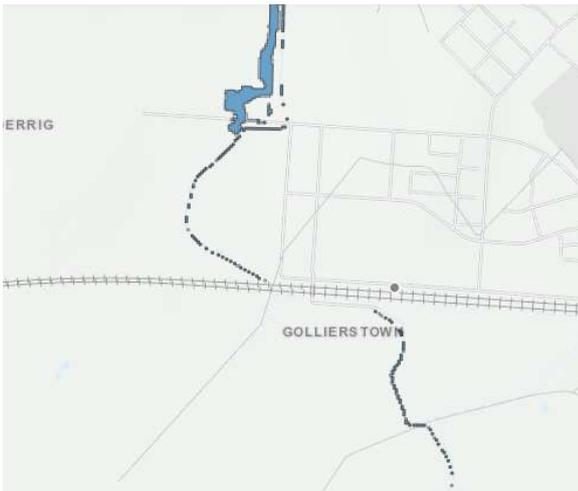


Figure 2.4: Present (a) & Future (mid-range) (b) Fluvial Flood extents - Liffey_170 [Griffeen]

(a)



(b)



Figure 2.5: Present (a) & Future (mid-range) (b) River Flood extents - Liffey_170 [Lucan]

(a)



(b)

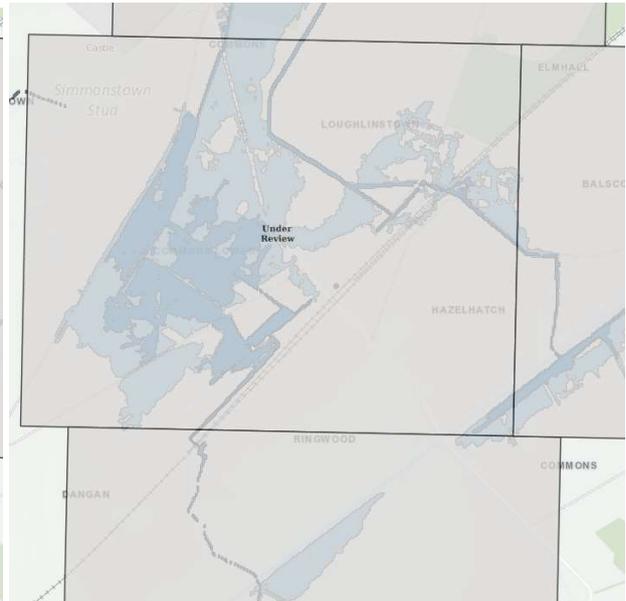


Figure 2.6: Present (a) & Future (mid-range) (b) Fluvial Flood extents – Castletown (Dublin-Kildare)_010 [Shinkeen River]

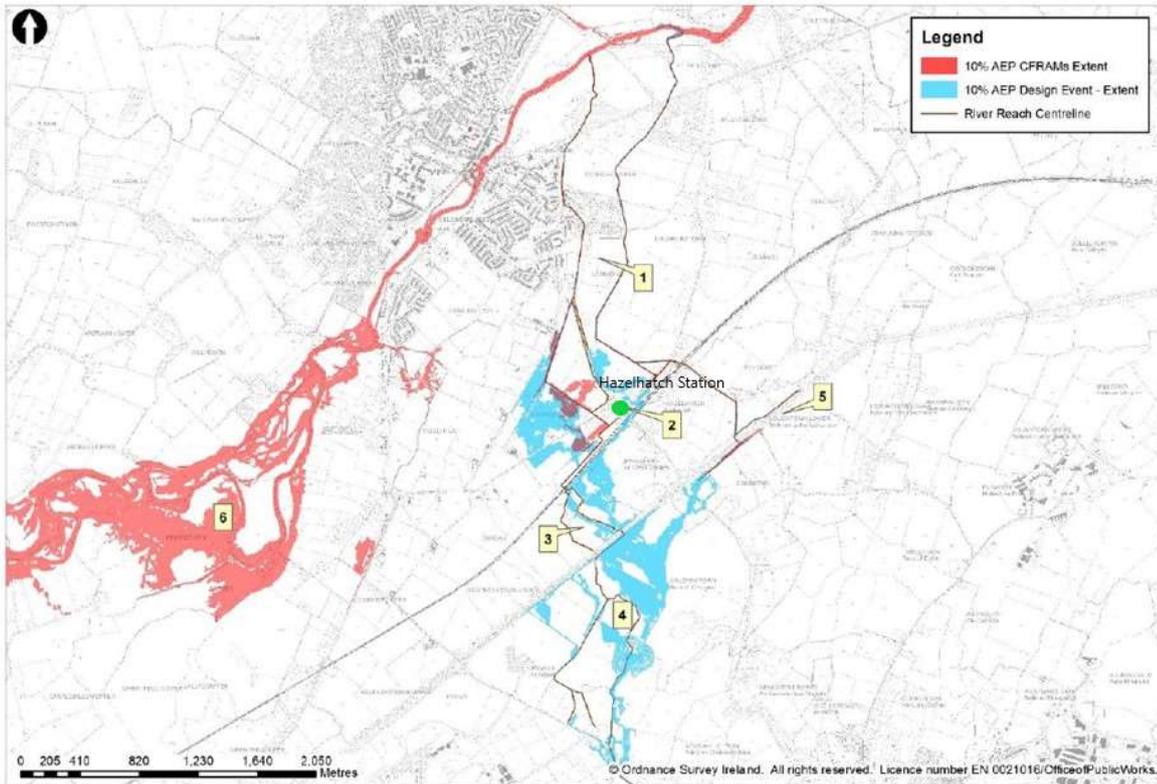


Figure 2.7: Hazelhatch Flooding Further Study (2020) - 10% AEP (High Probability) Design Event and CFRAMs Comparison of Extents

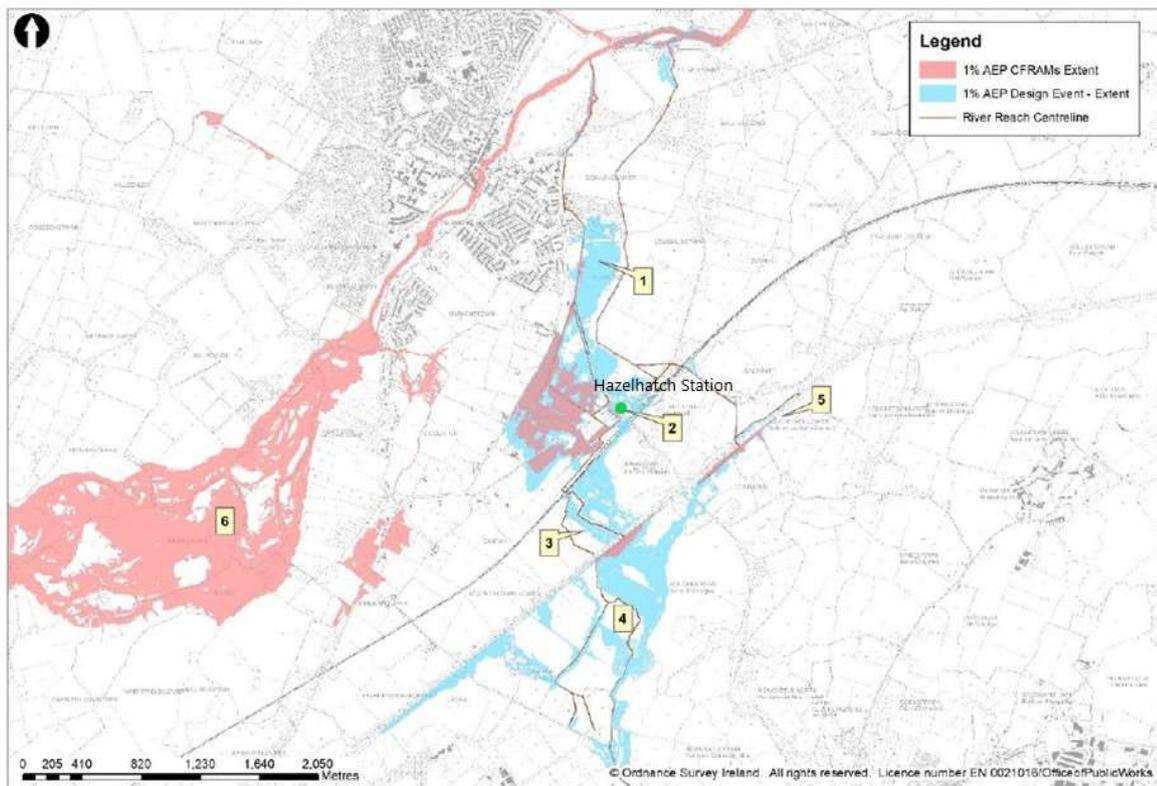


Figure 2.8: Hazelhatch Flooding Further Study (2020) - 1% AEP (Medium Probability) Design Event and CFRAMs Comparison of Extents

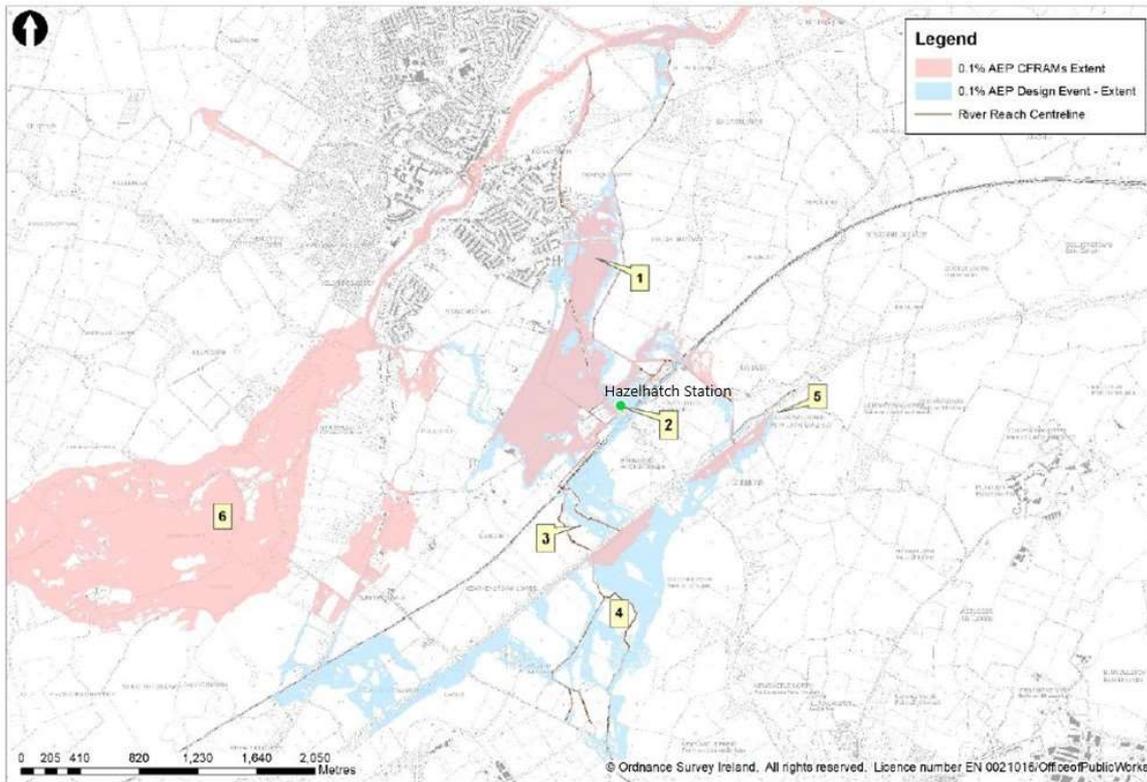


Figure 2.9: Hazelhatch Flooding Further Study (2020) – 0.1% AEP (Low Probability) Design Event and CFRAMS Comparison of Extents

2.5.2. General Issues for Further Consideration

The key issues which need to be considered going forward relate to:

- **Pollution**
 - Potential for accidental spillage of fuel, chemicals or sewage service failure causing pollution to surface or ground water during construction or maintenance activities.
 - Road access to remote areas, topsoil stripping and the installation of foundations could have the potential to create sedimentation issues through increased suspended solids and sediment deposition.
 - Construction works may have an impact on the wastewater collection networks serving the study area where these potentially interact with surface water networks.
- **Substantial damage of existing watercourses**
 - Any works that take place adjacent to water channels, (rivers and streams), have the potential to cause substantial damage. Physical damage can impact on the hydromorphology of the watercourse and therefore the ecological status.
- **Flooding**
 - Records indicate flooding east of Hazelhatch Station at the location where the Shinkeen River crosses the track and at the Griffeen River to the east of Lucan.
 - Areas at risk of flooding can pose a risk to locating any new sub-stations or extending the footprint of existing infrastructure. In addition, flooding could lead to erosion of material at the base of proposed overhead line structures.

2.6. Landscape and Visual

This section identifies the constraints aspects of the proposed project in relation to landscape. A sensitive receptor in this context relates to the following types of features:

- Designated Landscapes – afforded a level of protection and conservation owing to their scenic quality, amenity value and, in some cases, historic or cultural importance. These include:
 - Designated Conservation Areas (within Dublin City);
 - Special Amenity Areas (South Dublin County Council);
 - Areas of High Amenity (Kildare County); and
 - Historic Landscape Areas (Celbridge LAP).
- Land-use Zonings as Public Open Space or other landscape and amenity related purpose;
- Landscape character areas which are categorised in the published county development plan as being of high sensitivity;
- Trees which are subject to Tree Preservation Order (TPO); and
- Any landscape the characteristics of which are such that it would be of high sensitivity to the proposed change.

There are also a number of sensitive receptors in relation to visual amenity; these constitute:

- Designated Scenic Routes, Views or Prospects documented as such in relevant County Development Plans; and
- Viewer types located in proximity to the proposed change, examples of which are:
 - Residents of dwellings - Residents for whom a dramatic change in the existing view (which is of proprietary and continuous interest) will arise through either wholesale loss of vegetation or open space and / or introduction of built structures such as large retaining walls which will obstruct existing views attained across the landscape or townscape where the existing railway line is visible but does not currently obstruct views. These effects are of greatest significance where experienced in residential conservation areas;
 - Recreational visitors to important cultural landscapes where the landscape and setting is an important part of the experience where the appreciation of same could be affected by the proposed change;
 - Recreational users of promoted walking routes in proximity to the proposed change; and
 - Historic Landscape Areas (Celbridge LAP).

The key sources of information are therefore the following city and county development plans (CDPs): Dublin City Development Plan 2016-2022; South Dublin County Development Plan 2016-2022; Kildare County Development Plan 2017-2023; Celbridge Local Area Plan 2017-2023; and available mapping including aerial photography and Ordnance Survey (OSi) mapping.

The constraints information on population has been desk based to date.

Landscape and visual constraints are illustrated Appendix G, with Appendix G1 showing features in proximity to the rail line, while Appendix G2 illustrates the wider landscape considerations for Celbridge and the surrounding environs.

2.6.1. Key Constraints – Landscape

There are a number of designated conservation areas, landscape designations, and zoning objectives which need to be considered. These are outlined in the following sections.

2.6.1.1. Dublin City Development Plan 2016-2022

- **Designated Conservation Areas:**

- Royal Canal;
- Phoenix Park;
- River Liffey;
- Royal Hospital Kilmainham;
- War Memorial Gardens Islandbridge; and
- Cammock River.

- **Zoning Z2 – Townscapes zoned as residential conservation areas:**

- North Circular Road (including houses on both sides of the road) extending south to the boundary of the Phoenix Park;
- Inchicore (area south of Sarsfield Road);

- **Zoning Z9 – To preserve provide and improve recreational amenity and open space:**

- Public Parks at or close to the proposed change;

- **Zoning Z11 – To protect and improve canal, coastal and river amenities. Particular locations include:**

- Royal Canal;
- River Liffey;
- Tolka River; and
- Cammock River.

2.6.1.2. South Dublin County Development Plan 2016-2022

- **Zoning OS – Public Open Space:**

- This includes a number of locations adjacent or close to the rail line.

2.6.1.3. Kildare County Development Plan 2017-2023

- **Landscape Character Area (LAC):** River Liffey Valley LCA (class 4 special sensitivity)
- **Designated Landscape:** Liffey Valley Area of High Amenity

2.6.1.4. Celbridge Local Area Plan 2017-2023

Historic Landscape Area – the historic demesnes of:

- Castletown;
- St. Wolstan's; and
- Donaghcumper.

2.6.2. Key Constraints – Visual Amenity

2.6.2.1. Dublin City Development Plan 2016 to 2022

Reference to Views and Prospects is made in the CDP. The Plan states that a views and prospects study is due to be undertaken and also makes reference to important views in the city in Figure 4 of the Plan entitled *Key Views and Prospects (Indicative)*. Those of relevance are located as follows:

- Wellington Monument, Phoenix Park;
- Royal Hospital, Kilmainham;
- Heuston Station; and
- Collins Barracks.

2.6.2.2. South Dublin County Development Plan 2016-2022

Views and Prospects are documented in the written statement and maps of the CDP. None of these occur in proximity to the proposed change.

2.6.2.3. Kildare County Development Plan 2017-2023 and Celbridge Local Area Plan 2017-2023

The following views and prospects are documented in the CDP and LAP as follows:

- **Scenic Routes:**

- Scenic Route no. 31 refers to Views within Castletown – Donaghcumper rural area
- Scenic Route no. 32 refers to Views of the River Liffey from the main avenue of Castletown House, Castletown.
- Scenic Route no. 10 refers to Views of the West Plains on the Oughterard Road (L2009).
- Scenic Route no. 11 refers to Views of the Upland Areas on the Oughterard Road (L6018).

- **Scenic Views:**

- Scenic View RL 2 – Views from New Bridge, Coneyburrow.
- Scenic View RL 3 – Views from Celbridge Bridge, Celbridge;
- Scenic View GC 2 – Views from Henry Bridge Clonaghllis.
- Scenic View GC 3 – Views from Ponsonby Bridge.
- Scenic View RL 4 – Views from Straffan Bridge.

2.6.3. General Issues for Further Consideration

The following points for further consideration are outlined below with respect to both landscape and visual amenity, and issues that are not location-specific, as follows:

- Bridges within the townscape.
- A big constraint is on recreational users and residents of dwellings where landscape is an important experience within Dublin City.
- Hazelhatch and its surrounds is a very sensitive area, local residents and their views at Hazelhatch should be an important consideration.
- Increases in population due to the construction phase. Specialised personnel from outside the development area may be required.
- Changes in population trends within Dublin and Kildare – see CDP zoning.
- Traffic nuisance during bridge works, nuisance to the wider community
- Noise nuisance from proximity and frequency increases
- Land take from nearby landowners and nuisance surrounding construction access points.
- Disruption to commuting / travel times
- Impact on tourist locations e.g. phoenix park
- Traffic, bridge works, footbridge access may be altered.

Reference Appendix G1 - Landscape Constraints – Project Extent, Appendix G2 - Landscape Constraints – Celbridge

2.7. Cultural Heritage

The purpose of the cultural heritage section is to highlight the recorded archaeological sites and recorded sites of architectural heritage significance within the study area. This will allow the design team to make informed developmental and structural decisions based on available desktop cultural heritage information at this stage of the project. This section identifies the constraints aspects of the proposed project in relation to cultural heritage.

A sensitive receptor in the context of Archaeology and Architectural Heritage relates to the following types of features:

Archaeology:

- National Monuments in State care, as listed by the National Monuments Service (NMS) of the Department of Culture, Heritage and the Gaeltacht (DCHG);
- National Monuments with Preservation Orders;
- Sites listed in the Register of Historic Monuments;
- Record of Monuments and Places (RMP) and the Sites and Monuments Record (SMR) from the Archaeological Survey of Ireland;
- Designated Zones of Archaeological Potential (Dublin City County Development Plan); and
- General Areas of Archaeological Potential.

Architectural Heritage:

- Record of Protected Structures (RPS);
- Architectural Conservation Areas (ACAs);
- National Inventory of Architectural Heritage (NIAH) -Buildings;
- National Inventory of Architectural Heritage (NIAH) -Gardens;
- Building & structures (outside of NIAH and RPS);
- Areas as designated through relevant Policies of County Development Plans in relation to Cultural Heritage;
- Infrastructural features (coach roads, military roads etc.); and
- Industrial Heritage Features.

Key sources of information relating to these types of features have been identified with reference to; OSI Historic Mapping Archive, Ordnance Survey historical mapping, Aerial Imagery, Archaeological Survey of Ireland, National Monuments Service (NMS) of the Department of Culture, Heritage and the Gaeltacht (DCHG), Register of Historic Monuments, the Irish archaeological excavations catalogue, NIAH Building Survey, NIAH Garden Survey, information and mapping available from the relevant County Development Plans, County Heritage Surveys and County Industrial Heritage Surveys.

Cultural Heritage constraints mapping are provided in Appendix H.

2.7.1. Key Constraints

2.7.1.1. Archaeological Heritage

The key constraints for architectural heritage are highlighted as follows:

Record of Monuments and Places (RMP):

- Zone of Archaeological Potential (ZAP) for Dublin City (DU018-020). This zone incorporates the sites of 3 early medieval burial sites stretching from Inchicore to Heuston Station, there is also a large zone of potential around Phoenix Park, (DU018-020272);
- RMP sites in proximity to the rail line at Heuston station and included within the ZAP include;
 - Kilmainham Ecclesiastical site (DU018-020283), cross (-020-284), burials at Bully's Acre
 - Military Road (DU018-020293)
 - Infirmary (DU018-020292)
 - Mill race (DU018-020293447)
 - Dr Steevens' Hospital (DU018-020341)
 - Hospital (DU018-020292)
 - 18th-19th Century House (DU018-020255)
 - Designed landscape feature (DU018-020528)
 - Pit Burial (DU018-112)
- Phoenix Park – the park contains several archaeological sites dating from the prehistoric period;
- Late Post medieval period sites- Prospect Cemetery at the northernmost end of the scheme is a sensitive area as it is a burial ground that is currently in use. Monitoring/testing will be required due to the track being immediately adjacent to the historical burial site.

West of Memorial Park to Kildare:

- At Ballyfermot Lower there is a castle, gatehouse, church and graveyard site (DU 018-031-01-04) north of the railway line;
- An Early Christian cemetery site was revealed recently with the construction of the Park West Business Park;
- From the townland of Ballyfermot Lower westwards, there are no known monuments or stray finds adjacent to this section of railway line;
- Kylemore Station: This is a generally low potential area;
- General potential- archaeological sites in greenfield areas in the vicinity of the route have been found in the past with no previous evidence of them. This area as a result could still reveal previously unidentified sites if the line was to expand beyond the existing route.

2.7.1.2. Architectural Heritage

In a wider context, the railway line itself is part of Kildare and Dublin's industrial heritage; the Dublin Heuston to Cork Kent Railway line was opened in 1846-47 and was operated by the Great Southern & Western Railways (GSWR). While much of the old line has been replaced over the years, the route itself remains in operation. Heuston Station likewise has numerous heritage designations (NIAH, RPS and Industrial Heritage). As the

terminus of the GSWR, then known as Knightsbridge, the station opened in 1846. It forms an imposing landmark at the western end of Dublin's quays.

Some of the other key architectural heritage features along the existing rail line include the following:

- NIAH identified road/foot bridges and tunnels e.g. Phoenix Park tunnel. This section of the GSWR was built in 1876-77 to link the GSWR with the Midland and Great Western Railway via this tunnel.
- Structures with architectural merit e.g. overbridges and underbridges, the Lime kiln at Stacummy, signal houses and locomotive sheds e.g. the signal box and locomotive shed at Inchicore.
- Identified features on the Record of Protected Structures (RPS).
- Features on the Dublin and Kildare Surveys of Industrial heritage (paper maps).
- There are several identified Architectural Conservation Areas (ACA) within the wider area in both Dublin City, South Dublin and Kildare. However none are traversed by the rail line or located within 250m of the DART+ South West project centreline.

Due to the overlapping nature of some architectural heritage designations, particularly the NIAH, RPS and Industrial heritage records, **Appendix B** outlines a comparison of these designations within the Iarnród Éireann DART+ South West corridor.

2.7.2. General Issues for Further Consideration

There are several archaeological sites within the area but at a distance from the existing rail line. The area of greatest archaeological potential and significance is within the Zone of Archaeological Potential (ZAP) for Dublin. The stretch of railway from Inchicore (War Memorial Park) eastward to Heuston Station has significant potential to reveal medieval burials and artefacts.

The Phoenix Park is also an area of archaeological potential and any earthmoving works here also has the potential to reveal archaeological remains. Archaeological features that may exist here would be subsurface in nature and is not a consideration that can influence design, it will be a significant issue for the construction of the corridor where archaeology must be considered at the earliest stages of the construction or enabling works phase (time and budget for archaeological investigation and resolution).

In terms of architectural heritage, the main constraints will be largely be confined to the existing line, these take the form of features such as bridges and locomotive sheds. Four-tracking, track expansion and vertical clearances in relation to features such as bridges are deemed significant constraints for architectural heritage. Appendix H - Cultural Heritage Constraints.

2.8. Soils, Geology and Hydrogeology

This section identifies the constraints aspects of the proposed project in relation to soils, geology and hydrogeology. A sensitive receptor in this context relates to the following types of features under the three headings:

Soils and Geology:

- Geological National Heritage Areas and County Geological Sites (some of which may be further recommended for Geological NHA);
- Existing quarries or pits;
- Economically viable or extractable mineral resources;
- Landfills and the degree and extent of areas where there is soil contamination; and

- Well-drained and/or high fertility soils.

Hydrogeology:

- Groundwaters that support EU-level designations, such as a groundwater-dependent terrestrial ecosystem (GWDTE); and
- Locally and regionally important aquifers, inner and outer source protection areas for water supplies, as well as locally important water supplies.

Hydrology (environmental receptors of which will overlap with the water/flooding and biodiversity disciplines as well):

- Water bodies protected under nature designations such as SACs, as well as all other water bodies covered under the Water Framework Directive;
- Regionally and locally significant potable water supplies;
- Flood plains that protect properties from flooding;
- Salmon fisheries, as well as coarse fisheries; and
- Areas of water-based local to regionally important amenity value.

Key sources of information relating to these types of features have been identified with reference to: Geological Survey of Ireland (GSI) – geology, soils, subsoils and hydrogeology datasets; Environmental Protection Agency (EPA) datasets on water quality, groundwater source protection zones; Teagasc Irish Soil Information System mapping; and a review of Ordnance Survey Ireland (OSi) maps and orthophotography.

The constraints information on soils, geology and hydrogeology has been desk-based to date.

2.8.1. Key Constraints

2.8.1.1. Soils and Geology

The soils/ subsoils of Dublin and Kildare are in general characterised as glacial tills derived from the underlying limestone bedrock. Alluvial soils are associated with the rivers in the areas. The underlying bedrock geology is comprised of the “Calp” limestone. The dominant rock types are dark grey to black limestone and shale. Generally, the Calp is described as strong to very strong fine-grained microcrystalline, argillaceous limestone inter-bedded with calcareous mudstone.

Soil and leachate sampling were carried out at 11 No. boreholes at the Inchicore works for the EIS in 2011. Exceedances for polycyclic aromatic hydrocarbons (total PAHs) occurred in three No. boreholes (BHIW20, BHIW22 and BHIW23) located at the eastern extremity of the proposed scheme at the Inchicore Works. GI works carried out in 2011 did not reveal any evidence of ground contamination at possible construction compound locations, substation locations and at both Le Fanu and Kylemore Road Bridges; however areas of contamination would need to be reconfirmed or identified through the forthcoming ground investigation works.

There are no active quarries or pits within proximity to the rail line. However there are a number of historical pits which date back from the early to mid-19th century and the early to mid-20th century. These are mostly gravel pits and several coincide with areas of exposed bedrock.

One of these pits is traversed by the existing line near Islandbridge, an old gravel pit that dates to between 1900-1950.

The granular aggregate potential of the area around the River Liffey have been classed by GSI as having very low to moderate. The area surrounding the existing rail line is generally classed as having moderate to very high crushed rock aggregate potential.

2.8.1.2. Geological Heritage

The Phoenix Park is a County Geological Site (CGS), also recommended for designation as a Geological Natural Heritage Area (NHA) and ranked as a high importance receptor. It is the only CGS traversed by the existing rail line, however it has been heavily modified by human activity; the Phoenix Park Tunnel runs underneath the park rather than directly through any surface geological features. The park represents a Quaternary (Ice Age) geological landscape, but very heavily altered by human activity. It's unusual for the complexity of its geomorphology and glacial forms. It's a CGS recommended for Geological NHA.

Glasnevin Cemetery GCS is located approx. 150m to the north of the DART+ South West project centreline. It is important for cultural and historic reasons and provides a range of worked rock types accessible to view. Further afield, the Guinness Wells CGS are located 600m to the east of Heuston Station; these are noted for their industrial and cultural heritage importance.

2.8.1.3. Hydrogeology

The Calp limestone is a locally important aquifer that is moderately productive only in local zones (LI).

Significant water strikes were previously encountered in the bedrock interface and within the porous layers of the limestone during the geotechnical investigation.

GW quality sampling was carried out in 2011 at a number of BH particularly focused in areas proposed for 4-tracking, the proposed new bridges and the cut and cover works in Inchicore Works. Some Exceedances were found for some parameters.

There are several wells from the GSI's borehole and well database in proximity to the existing rail line as follows:

- 3 No. to north of Glasnevin line;
- 1 No. industrial use in Smithfield, to east of Heuston;
- 1 No. industrial use south of the line in Kylemore Industrial Estate, and another in Clondalkin; and
- 1 No. unknown usage north of the line in Stacumny, one at Loughlinstown Pitch 'n Putt.

Information obtained from the GSI website indicates that the groundwater vulnerability in general ranges from low at Glasnevin, through to moderate south of the Liffey and high at the M50 and Park West. The remainder of the proposed project runs through areas of generally high to extreme vulnerability. Extreme vulnerability is mainly due to the presence of a thin overburden where the rock is close to the surface, or where there is exposed rock. These areas are more vulnerable to groundwater pollution and runoff due to shallow or lack of soil/ subsoil cover.

2.8.1.4. Hydrology

There is considerable overlap between hydrology and other related disciplines such as biodiversity (particularly aquatic ecology) as well as water and flooding; see **Sections 2.4 (Biodiversity) and 2.5 (Water)**.

While there are a number of boreholes and wells within proximity to the rail line as noted above, there are no Source Protection Areas for public water supplies traversed by or directly adjacent to the proposed project. Of note is a fault line which trends NE-SW and runs through the area of Stacumny.

2.8.2. General Issues for Further Consideration

The key issues for soils, geology and hydrogeology are likely to be removal of soils and subsoils, and potential for localised effects on water table for boreholes and wells. This will depend on the proximity of any overburden removal works and the potential to encounter contaminated materials. Areas of contamination would need to be reconfirmed or identified through ground investigation works carried out as part of this project. Reference Appendix I - Soils and Geology Constraints and Appendix J - Hydrology and Hydrogeology Constraints.

2.9. Material Assets

The proposed project encompasses urban as well as rural area, and the proposed development will serve several established communities along its length. The project itself will contribute to and enhance the rail service for communities and businesses along the existing rail line from Dublin City Centre to Hazelhatch in County Kildare.

This section identifies the constraints aspects of the proposed project in relation to material assets. A sensitive receptor in the context of material assets relates to the following types of features:

- **Built Assets:** Infrastructure relating to energy, water supply, waste water management, telecommunications, pipelines, loss of land e.g. agricultural or developed land, contaminated land, use of materials, housing and residential properties.
- **Natural Assets:** Minerals, water courses, non-agricultural land etc.

Key sources of information relating to these types of features have been identified with reference to: ESB and GNI utilities data; EPA information on public water supplies and licensed facilities; Health and Safety Authority (HSA) information on Seveso sites; as well as reference to the Dublin City, South Dublin and Kildare Development Plans.

The constraints information on material assets has been desk-based to date. There is a degree of overlap with other topic areas: residential and business properties have been covered under **Sections 2.1 to 0**. Water courses are covered under **Section 2.5**. Mineral assets/ potential is covered under **Section 2.8**. These constraints are not dealt with further in this section.

2.9.1. Key Constraints

2.9.1.1. Road and Rail Infrastructure

The constraints study area contains a road network comprising of a number of regional and local roads including; R147, R805, R101, R109, R148, R833, R112, R113, R136, R120 and the R405.

The M50 traverses the existing railway line approximately 0.35 km west of Park West train station. The M4 is also located approximately 2.5 km north of the railway line, near Hazelhatch. Key rail infrastructure is outline in Figure 2.10 to Figure 2.11.

2.9.1.2. Utilities

The overhead electricity transmission lines and natural gas transmission pipelines crossing and in proximity to the existing rail line are shown in Appendix K. More detailed drawings showing these utilities in addition to water/ foul sewerage pipe and telecoms lines are available to the design team.

2.9.1.3. Licensed Facilities

Appendix K shows there are several EPA licensed facilities in proximity to the existing rail line. These are:

- Industrial Emissions facility: Henkel Ireland Operations and Research Limited (Ballyfermot) [EPA Licence: P0078-01]
- Industrial Emissions/ Waste Facility: Thorntons Recycling Centre (Ballyfermot) [EPA Licence: W0044-02]
- Industrial Emissions/ Waste Facility: Greyhound Recycling & Recovery [EPA Licence: W0205-01]
- Industrial Emissions facility: Metal Processors Limited [P0401-01]

2.9.1.4. Seveso Sites

As noted under **Section 2.1.1.6** (Population and Human Health), there are three Seveso sites in proximity to the existing rail line, one upper tier site and two lower tier sites.

2.9.2. General Issues for Further Consideration

Regarding Seveso sites there is a need to account for consultation distances and consultation with the Health and Safety Authority (HAS) as a result.

The Henkel facility (which manufactures superglue) may require further engagement with respect to the potential to encounter groundwater contamination.

Site investigation works will be required at Inchicore based on the information gathered from the 2011 EIS. Excavations of soils and removal of ground contamination may be required. As noted under **Section 2.8.1.1** (Soils and Geology), some soil contamination and groundwater parameter exceedances were noted. Areas of contamination would need to be reconfirmed or identified through ground investigation works carried out as part of this project.

Localised flooding may be a source of this during design. Refer to **Section 2.5** for further detail on areas mapped for flooding which are traversed by the existing rail line.

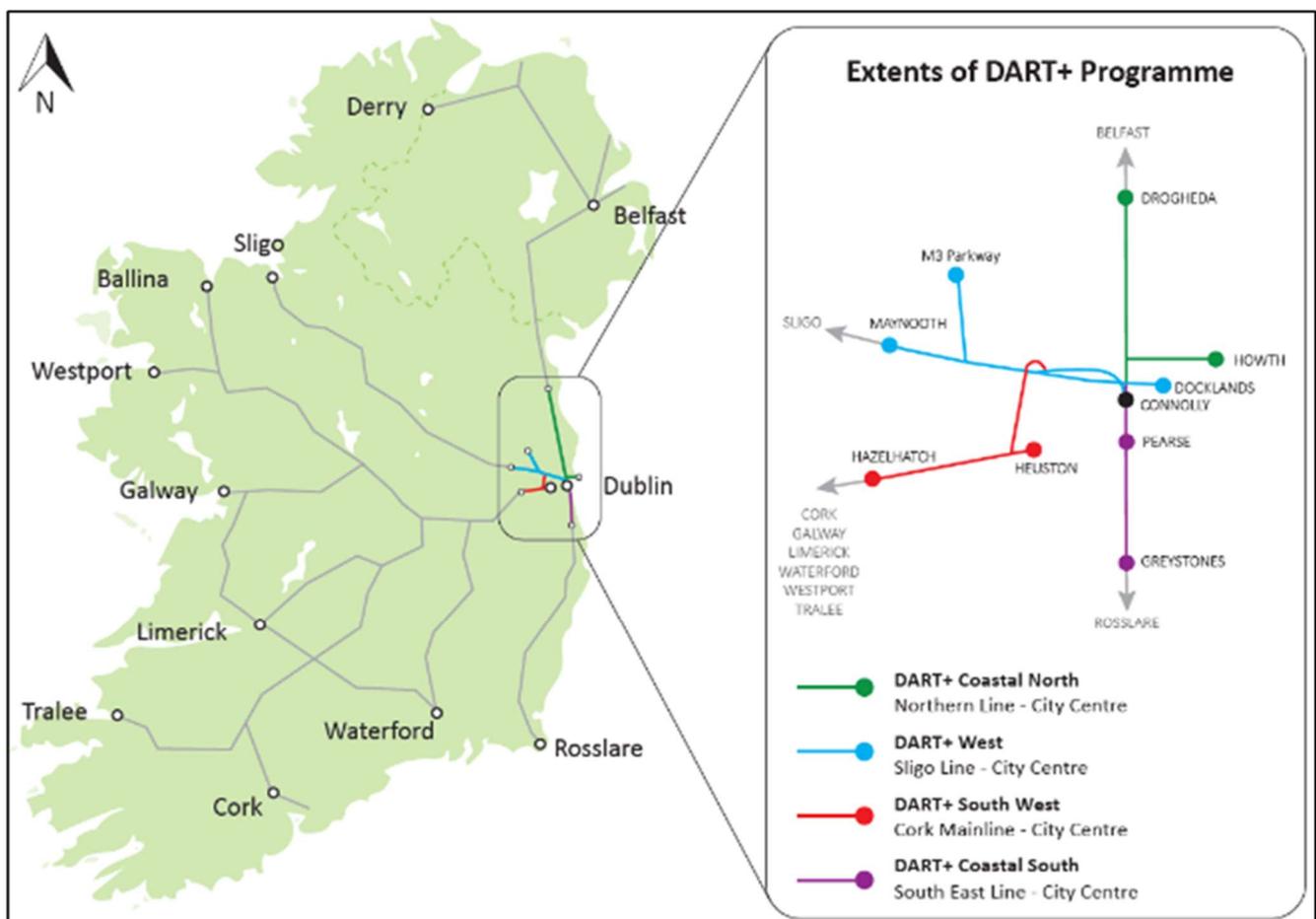


Figure 2.10: Geographic Extent of the DART+ Programme

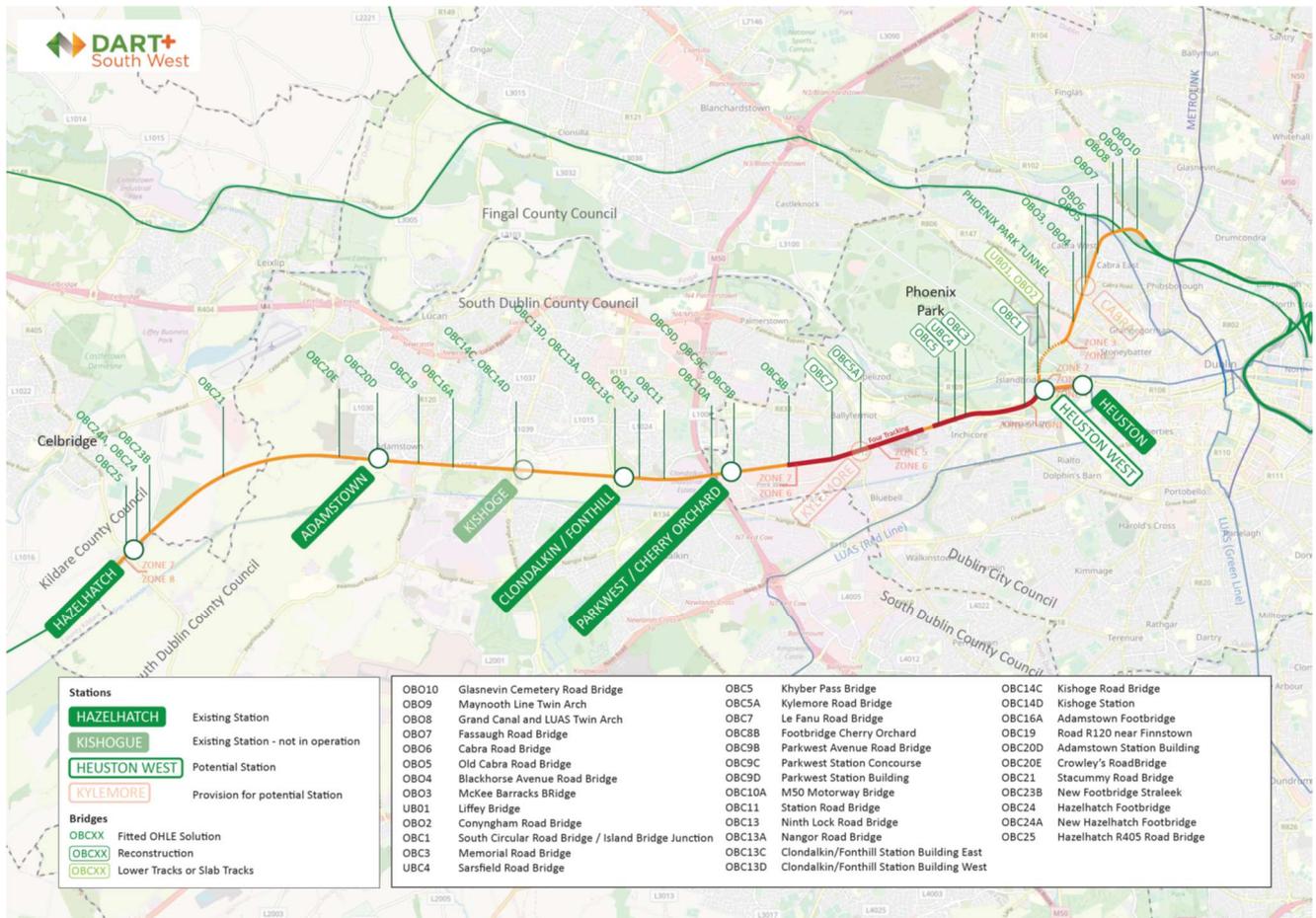
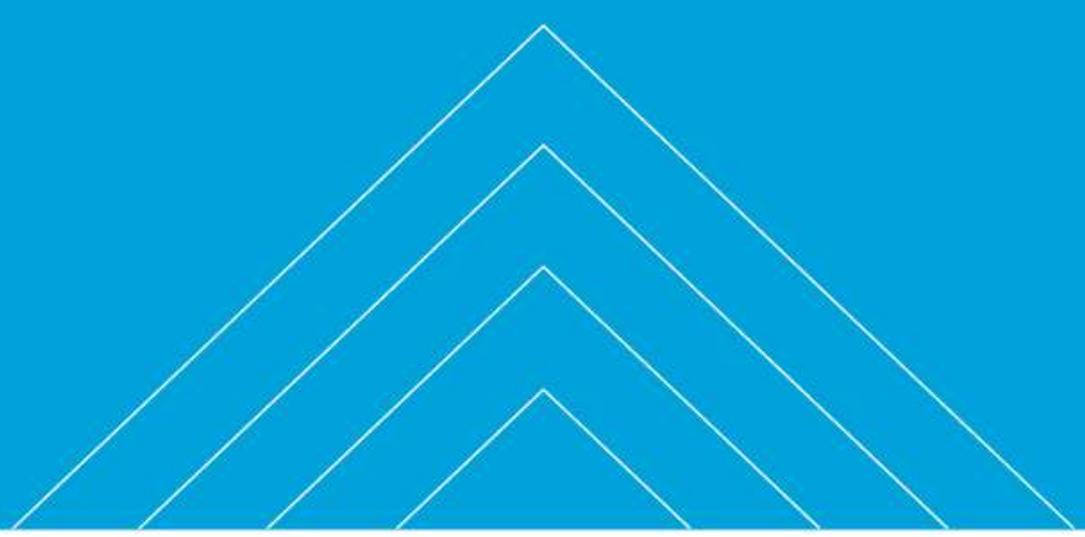


Figure 2.11: Key Rail Infrastructure

Appendices



Appendix A. Planning Applications Monitor*

The Planning Application Monitor is a live document. The version included in the Constraints Report is current to March 2021. The monitor will be updated over the course of the project and will be published periodically alongside other project information as part of public consultation activities.



Appendix B. Heritage Memo



Appendix C. Constraints Mapping – Population Constraints

Appendix D. Constraints Mapping – My Plan Zones



Appendix E. Constraints Mapping – Round 3 Rail Noise Lden



Appendix F. Constraints Mapping – Biodiversity Constraints



Appendix G. Constraints Mapping – Landscape Constraints



Appendix H. Constraints Mapping – Cultural Heritage Constraints



Appendix I. Constraints Mapping – Soils and Geology Constraints



Appendix J. Constraints Mapping – Hydrology Constraints



Appendix K. Constraints Mapping - Key Utilities and Licensed Facilities

