



# PRELIMINARY OPTION SELECTION REPORT

EXECUTIVE SUMMARY



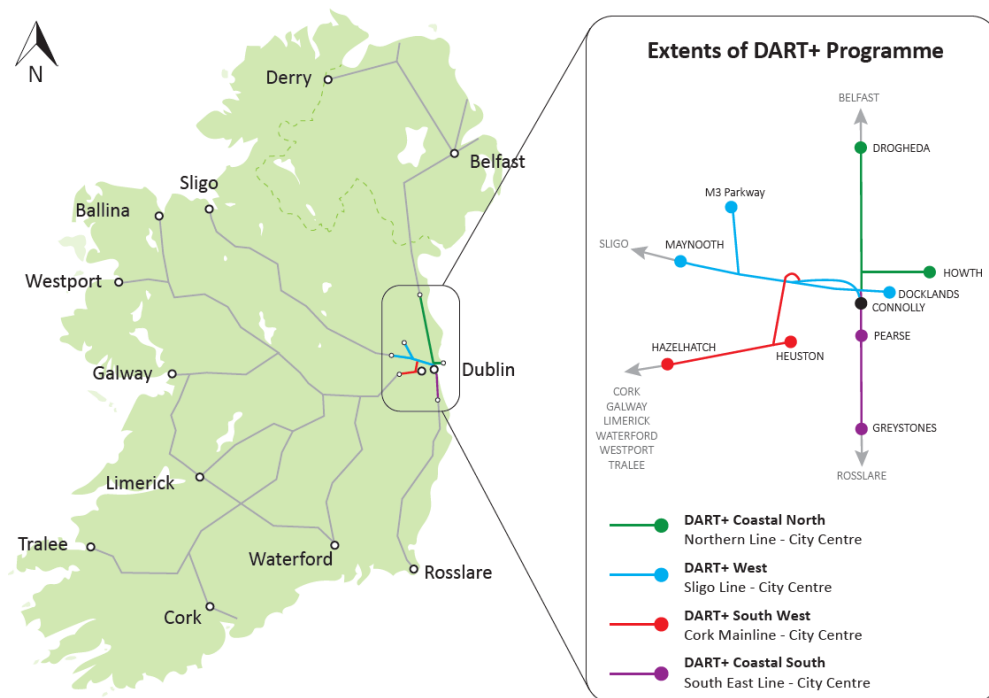


## Executive Summary

### ES1.1 DART+ programme overview

The DART+ Programme is a transformative railway investment programme that will deliver a high quality and integrated public transport system within the Greater Dublin Area (GDA). The DART+ Programme will both modernise and improve the existing rail services in the GDA, providing a range of benefits for both the residents of the GDA itself, as well as those living in surrounding regions.

The DART+ Programme will play a significant role in contributing to Ireland's transition to a low carbon and climate resilient society by providing a sustainable, electrified, reliable and more frequent rail service with improved capacity to meet current and future demands. This will be achieved through the modernisation of existing railway corridors and by utilising electric powered trains in place of diesel trains.



**Figure ES-1: Schematic of Overall DART+ Programme**

The existing, electrified DART network extends from Malahide to Greystones (including the Howth Branch) over a length of approximately 50km. The DART+ Programme will seek to increase the length of high capacity and electrified network to 150km across the four main rail corridors within the GDA.

The modernisation includes the electrification, re-signalling and other specific interventions to remove constraints across the four main rail corridors within the GDA, as follows:

- **DART+ Coastal North (this project)** – circa 50km, extending from Drogheda to Dublin City Centre (north of Connolly Station).
- DART+ Coastal South – circa 30km, extending from Greystones to Dublin City Centre.
- DART+ West – circa 40km, extending from Maynooth and M3 Parkway stations to Dublin City Centre.
- DART+ South West – circa 16km, extending from Hazelhatch & Celbridge Station to Heuston Station and also circa 4km between Heuston Station and Glasnevin, via the Phoenix Park Tunnel Branch Line.

As part of the DART + Programme, Iarnród Éireann is purchasing a new fleet of trains to enhance the capacity on the DART network. This procurement will allow Iarnród Éireann to choose a fleet made up of Electric Multiple Units (EMUs) and Battery Electric Multiple Units (BEMUs). The provision of BEMUs will allow for running enhanced services on the network in advance of full electrification.

## ES1.2 DART+ Coastal North project overview

The DART+ Coastal North project primarily involves the extension of the existing electrified rail network over circa 37km from Malahide to Drogheda, with associated re-signalling and modification of some low clearance overbridges to accommodate the overhead line electrification system. There will also be modifications to existing depots at Drogheda and Fairview to support the new DART+ Fleet. As a principle, the project is seeking to contain works, insofar as possible, within the existing railway corridor. However, some infrastructure such as traction power substations will need to be constructed outside of the railway corridor where space cannot be found.

The project will provide the infrastructure to facilitate an increase to the rail capacity on the Northern Line between Dublin City Centre and Drogheda MacBride Station, including the Howth Branch, by implementing an extended electrified railway network with higher capacity and higher frequency DART trains. The DART+ Coastal North project will serve all existing stations along the railway corridor between Dublin City Centre and Drogheda, including those located on the Howth Branch, using electrical power that has a lower carbon footprint than existing diesel trains.

To achieve this increased capacity and enable a higher frequency of DART services, the DART+ Coastal North project will need track modifications, including the provision of turnback facilities at Malahide, Clongriffin and Howth Junction & Donaghmede stations. These modifications are essential to facilitate the increase in train services by allowing trains to be turned back clear of continuing services on separate tracks at Clongriffin and Malahide stations.

Works at Clongriffin involve the construction of some additional tracks to the east of the station. The original station construction anticipated this construction requirement and therefore it will have minimal impact on the station building/existing infrastructure.

Additional turnback tracks at Howth Junction & Donaghmede Station will allow for a higher frequency and a more reliable service. A platform extension will be constructed at Howth Junction & Donaghmede Station to provide direct access between services on the Howth Branch and southbound DART services to the city centre.

At Drogheda MacBride Station the existing track and depot layout does not provide sufficient operational capacity to meet the planned increase in number of train services. Consequently, track and depot alterations are required, along with associated alterations to signalling, electrification, telecoms and structures. This includes the installation of a new platform and stabling facilities.

To achieve the peak capacity increases proposed by the DART+ Programme, DART+ Coastal North project will seek a reconfiguration of Howth Junction & Donaghmede Station to enable the use of a shuttle service on the Howth Branch. By removing crossing conflicts at Howth Junction, a shuttle DART operation between Howth and Howth Junction & Donaghmede stations will maximise frequency and reliability on the Northern line. The interchange at Howth Junction



& Donaghmede Station will be facilitated by an increase in Northern Line stopping trains from 6 to 11. The removal of crossing conflicts at Howth Junction will also result in a more frequent and reliable Howth DART service at every ten minutes each way, with a change at Howth Junction to access the Northern Line. This would represent an increase to a maximum of six trains per hour per direction from the current three. Final operational decisions will be made subject to demand requirements and assessment.

Initial assessment of the four existing level crossings along the Howth Branch has indicated that these level crossings can continue to operate as per the current arrangements while still providing a more efficient rail service overall.

## Map Part B



## Map Part A



**Figure ES-2: DART+ Coastal North project extents**

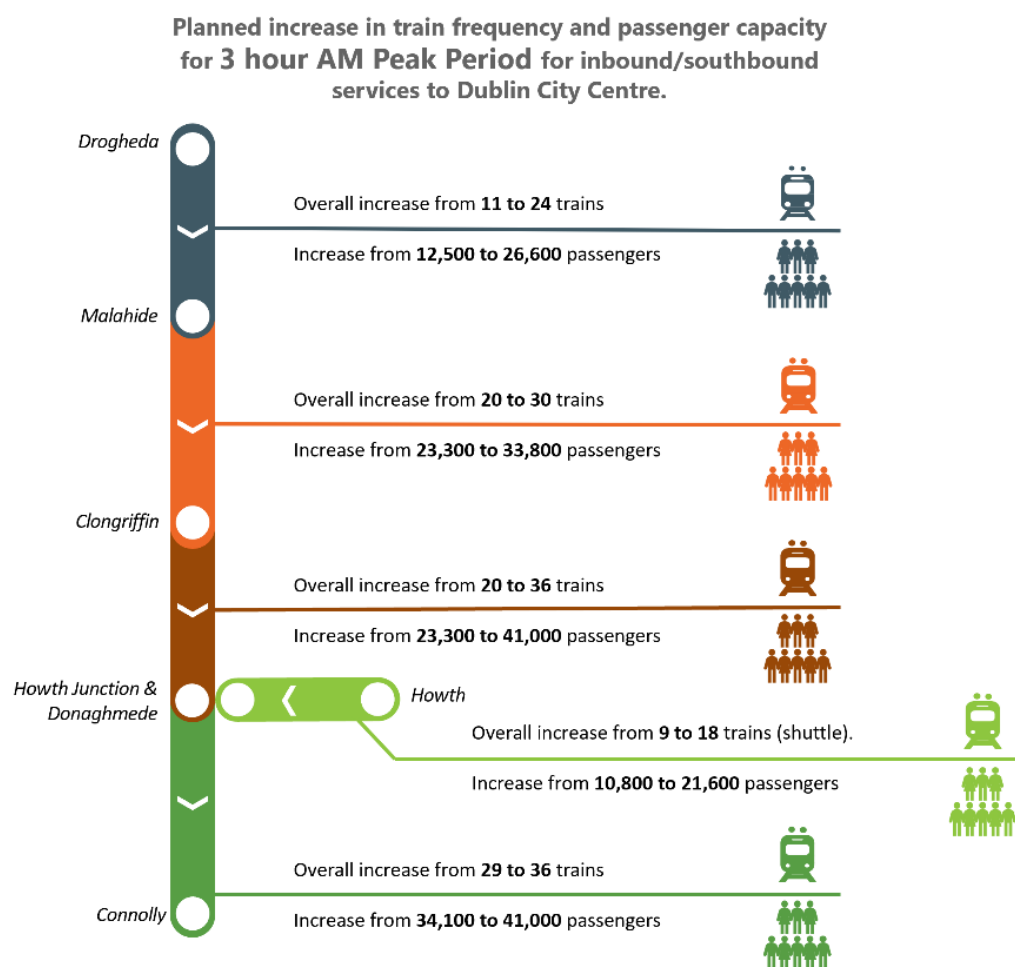
### ES1.3 Capacity increases

The DART+ Coastal North project will improve performance and increase train frequencies in the AM and PM peaks along the full length of the Northern Line. This will include enhanced capacity from the city centre to as far north as Drogheda, and on the entire Howth Branch. Customers will experience the same enhanced levels of service in both AM and PM peaks, and in both southbound and northbound directions.

Additionally, as a result of the DART+ Coastal North project the current AM and PM peak hours will be extended to become peak periods, with DART extending the

proportion of the day it provides its maximum number of trains from 1 hour to 3 hours. This extension of enhanced peak service frequencies will take advantage of infrastructure enhancements and new rolling stock, providing more flexibility, comfort, and capacity to DART customers. (Figure ES-3)

New Battery Electric Multiple Units trains (BEMUs) will be introduced on this section of the network before the DART+ Coastal North project. The timetable for the BEMUs will be different to today's current timetable. The provision of these BEMUs will allow for the possibility of running enhanced services on the network in advance of full electrification. Iarnród Éireann identified the Northern Line as the most suitable route for BEMU deployment and Drogheda MacBride Station and depot area as the preferred charging location. These BEMU works will be delivered under a separate project and the increase in service levels provided will be in advance of the electrification under the DART+ Coastal North project. Accordingly, the increase in service level referred to below compares DART+ Coastal North to service levels post-BEMU.



**Figure ES-3: Inbound/Southbound Services Capacity Increases**



## ES1.4 The Emerging Preferred Option

The process to determine the Emerging Preferred Option for the DART+ Coastal North project followed a two-step optioneering process – Stage 1: Preliminary Assessment (Sifting) (longlist of options), followed by Stage 2: Multi-Criteria Analysis (shortlist of options). This led to the identification of location-specific Emerging Preferred Options in respect of interventions required. These, and general linear works required along the full length of the project, are the key elements of the Emerging Preferred Option. Note not all design features require option selection but are instead subjected to technical assessment only. Consequently, the two-stage approach is not applicable to all general works or interventions that require option selection.

For the purpose of describing the Emerging Preferred Option end-to-end for the project, general linear works to facilitate electrification are described first, followed by interventions at specific locations (from north to south) as follows:

- General linear works to facilitate electrification;
- Works to Drogheda and Fairview depots;
- Works around Drogheda MacBride Station;
- Works to the existing user worked level crossing south of Donabate;
- Works around Malahide Station;
- Works around Clongriffin Station;
- Works around Howth Junction & Donaghmede Station.

## ES1.5 General Linear Works

The following works are required to electrify the Northern Line between Malahide and Drogheda inclusive of the Howth Branch:

- Overhead Line Equipment (OHLE) will be required from the current limit of electrification at Malahide to be extended through to Drogheda. This will be similar to the OHLE currently used on the existing DART network.
- 8 new electrical substations will be required at intervals along the railway line between Malahide and Drogheda to provide power to the network.
- Power supply upgrades may be required on the Howth Branch including provision of a new substation. Studies to confirm the exact requirements are ongoing.
- An assessment has been undertaken to review the existing clearances at all overbridges along the route in regard to future electrification requirements. The preliminary findings from the assessment conclude that a large proportion of the bridges have the necessary clearances and are unlikely to be impacted by the project. At this stage, the structures which will require reconstruction are

those located in and around Drogheda MacBride Station and depot. Further studies and surveys are ongoing for a number of other bridges along the route which shall confirm the extent of interventions required to achieve the necessary clearance for OHLE. These interventions would typically include specialist electrical solutions, lowering the rail track under the bridge or making alterations to the existing bridge.

- OHLE will be required to be fixed and necessitate localised modification to underbridges/viaducts at:
  - Malahide Viaduct;
  - Rogerstown Viaduct;
  - Balbriggan Viaduct;
  - Layton Viaduct.
- Modifications to existing overbridge parapets between Malahide and Drogheda will be required to ensure that parapets are imperforate, climb-resistant and at least 1.8m high. This will reduce the risk of people coming into contact with the OHLE.
- Interfaces with existing utilities, boundary treatments (including new retaining walls and fencing), drainage works, vegetation management and other ancillary works will be required along the length of the project.
- There is an existing user worked level crossing located south of Donabate, connecting farmlands either side of the railway. Intervention at the current crossing is required due to an increase in risk from the electrification of the railway line and greater frequency of trains.

The Emerging Preferred Option is to close the crossing and for IÉ to purchase the associated land to the east of the railway.

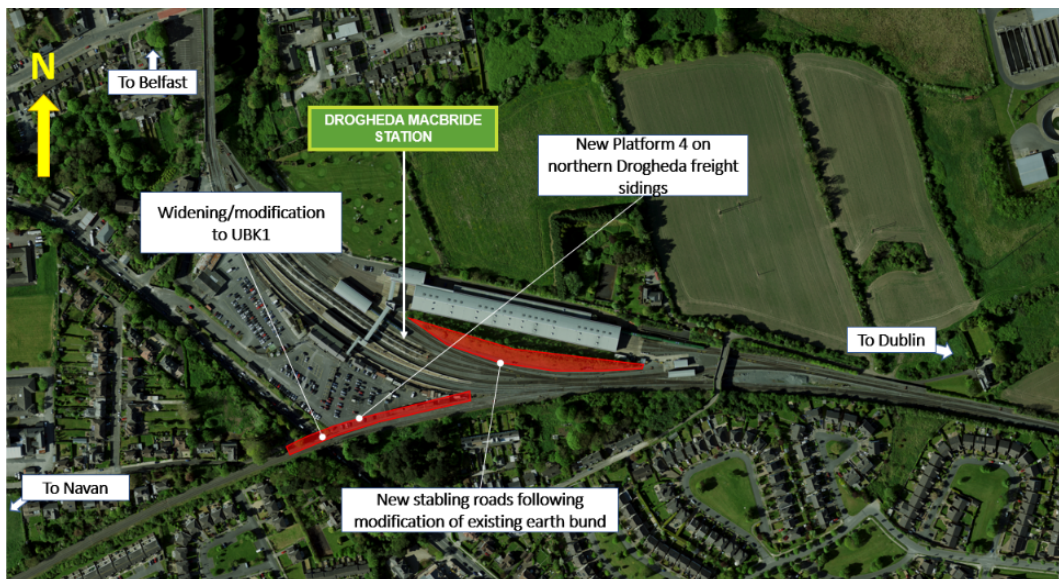
## ES1.6 Depot works

There are two existing depots within the scope of the DART+ Coastal North project: Fairview and Drogheda depot. Modifications at Fairview and Drogheda depots are required to provide the infrastructure, maintenance, and servicing facilities necessary for the new DART fleet. These modifications are predominantly internal to the buildings, although they will also encompass some localised track modifications within the depot compounds.

## ES1.7 Works around Drogheda MacBride Station

At Drogheda MacBride Station the existing track and depot layout does not provide sufficient operational capacity to meet the planned increase in number of train services. Consequently, track and depot alterations are required, along with associated alterations to signalling, electrification, telecoms and structures.

The Emerging Preferred Option provides a new platform on the Drogheda freight siding (see Figure ES-4). The new platform will extend over Dublin Road (R132), hence the existing Dublin Road Underbridge requires widening or replacement. The new platform will be interconnected with the existing Platform 1 and requires modification to allow for pedestrian movements to the new platform. Retaining walls and other civil works are also required to accommodate the new platform. Other track modification works are necessary to cater for the increase in stabling requirements.



**Figure ES-4: General Overview of Works around Drogheda MacBride Station**  
(Source: OSI aerial imagery)



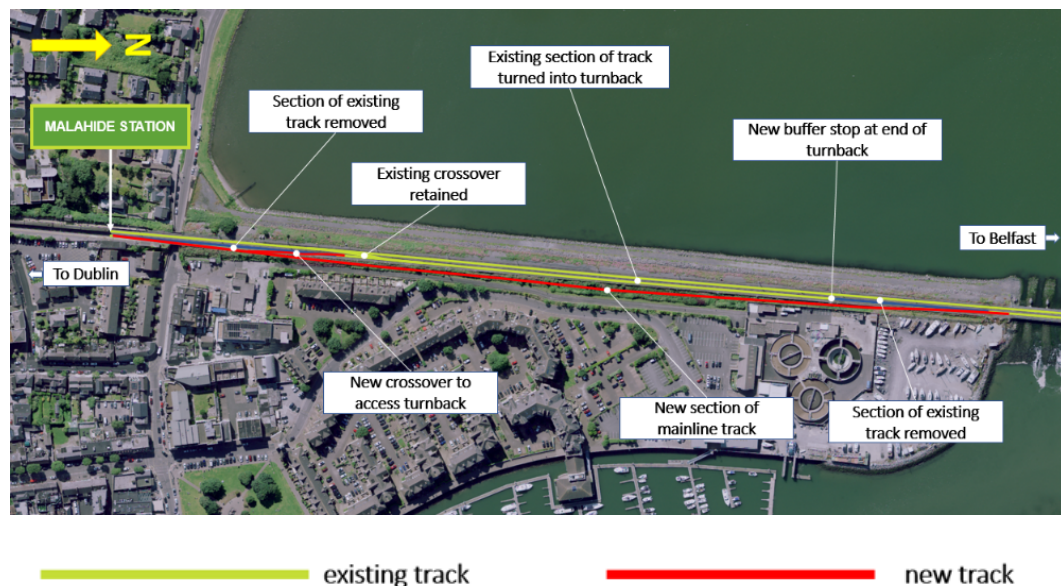
## ES1.8 Works around Malahide Station

The works at Malahide comprise track modification which are essential to facilitate the increase in train services, by allowing trains to be turned back clear of continuing services on separate tracks.

The Emerging Preferred Option is to introduce a turnback immediately north of Malahide Station between the Strand Road Underbridge and the Malahide Viaduct (see Figure ES-5). This turnback will be situated between the two existing running lines which will necessitate the existing running lines to be slewed to the east between the two aforementioned bridges. This slewing will introduce the need to widen the existing embankment to the east, which will be accomplished by building a retaining structure alongside the realigned track.

New OHLE and signalling installations as well as modifications to the existing systems will be required.

The proposed works are in close proximity to Irish Water's wastewater treatment works at Malahide and there is potential interference to third party property rights but further design development and technical and construction related solutions will seek to minimise this.



**Figure ES-5: Schematic of Emerging Preferred Option around Malahide Station**  
(Source: OSI aerial imagery)

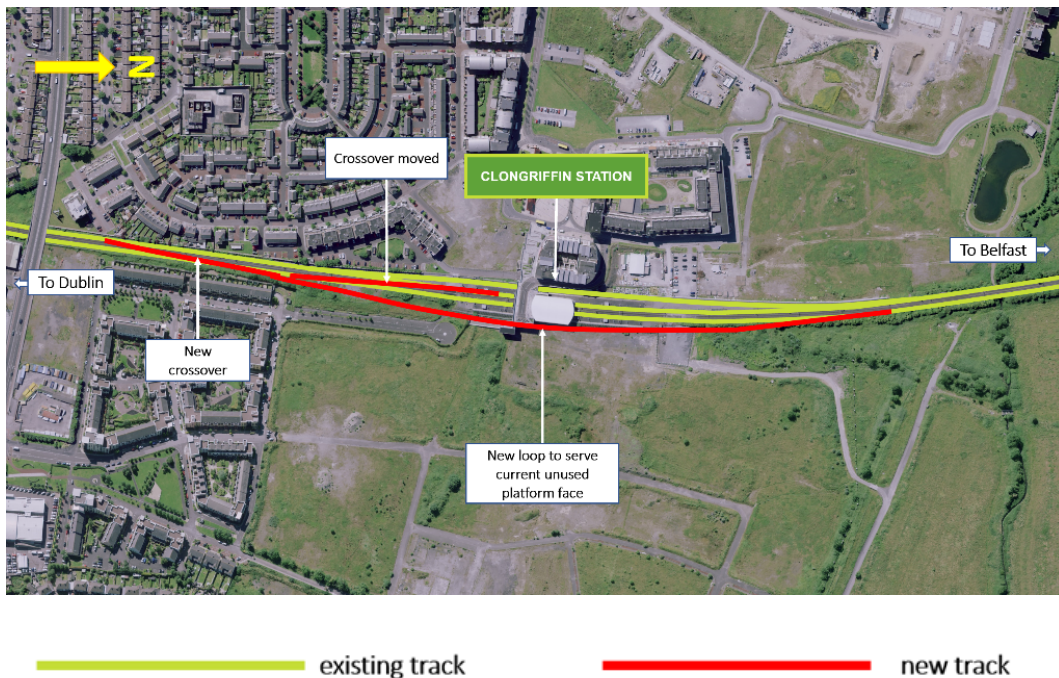
## ES1.9 Works around Clongriffin Station

The works at Clongriffin Station comprise of track modification which are essential to facilitate the increase in train services by allowing trains to be turned back clear of continuing services on separate tracks.

The Emerging Preferred Option is to introduce a new loop to serve a platform to the east side of the station, within the existing railway corridor. It is proposed to use the platform face that was constructed when the station was originally built but is not currently served by any tracks (see Figure ES-6).

Modifications will be made to the track alignment to the south of the station to allow trains to access the new platform. New OHLE and signalling installations, as well as modifications to the existing systems, will be required.

Based upon the level of information at the current concept design stage for Public Consultation No. 1, the development areas to the east may be temporarily affected during construction. Technical and construction methodologies related solutions will seek to minimise these in subsequent design stages.



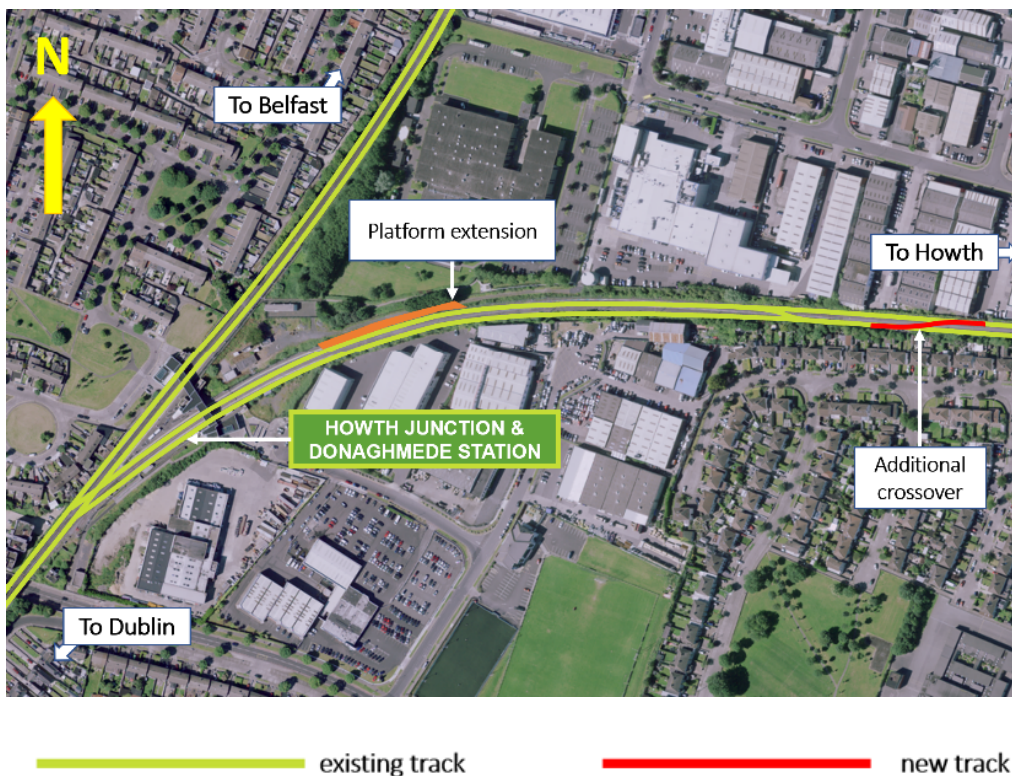
**Figure ES-6: Aerial view of Emerging Preferred Option around Clongriffin Station (Source: OSI aerial imagery)**



## ES1.10 Works around Howth Junction & Donaghmede Station

To achieve the peak capacity increases proposed by the DART+ Programme, the DART+ Coastal North project will seek a reconfiguration of Howth Junction & Donaghmede Station to enable the use of a shuttle service on the Howth Branch. By removing crossing conflicts at Howth Junction, a shuttle DART operation between Howth and Howth Junction & Donaghmede stations will maximise frequency and reliability on the Northern Line. The interchange at Howth Junction & Donaghmede Station will be facilitated by an increase in Northern Line stopping trains from 6 to 11. The removal of crossing conflicts at Howth Junction will also result in a more frequent and reliable Howth DART service at every ten minutes each way, with a change at Howth Junction to access the Northern Line. This would represent an increase to a maximum of six trains per hour per direction from the current three. Final operational decisions will be made subject to demand requirements and assessment.

The Emerging Preferred Option at Howth Junction & Donaghmede Station involves extending the existing Platform 2 to allow the platform to be used by services from Howth without impacting on services running along the Northern Line (see Figure ES-7). Modifications will be made to track to include a new crossover east of the platforms. Alterations to existing OHLE, signalling and telecoms will also be required.



**Figure ES-7: Aerial view of Emerging Preferred Option around Howth Junction & Donaghmede Station (platform extension in orange) (Source: OSI aerial imagery)**



## ES1.11 Howth Branch Level Crossings

There are four level crossings located on the Howth Branch, as listed below:

- Baldoyle Road Level Crossing;
- Sutton Level Crossing;
- Cosh Level Crossing;
- Claremont Level Crossing.

Initial assessment of the four existing level crossings along the Howth Branch has indicated that these level crossings can continue to operate while still providing a more efficient service overall.

Further survey data will be collected to validate the model and assumptions, including additional traffic count surveys and observed level crossing operational data. This information will be used to establish if the proposal to keep the level crossings in operation is feasible, or if more significant interventions are required at the crossing.

## ES1.12 Further design development & option selection

The preliminary option selection and design development that has been undertaken has led to the determination of the Emerging Preferred Option, which is now the focus of public consultation. Following public consultation, all gathered feedback will be reviewed and considered by the project team to inform the next stage of the design development.

Designs will also be informed by further technical and environmental surveys and investigations, as well as consultations with property owners and other stakeholders. This will lead to the development of the Preferred Option, which will be presented to the public at Public Consultation No. 2.

All information gathered by the project team will be used to inform the design development of the project which will be the subject of the Environmental Impact Assessment and Appropriate Assessment (if required), and ultimately the Railway Order application which will be submitted to An Bord Pleanála.