

METROLINK

Integrated Transport. Integrated Life.



Preferred Route

March 2019

Contents

1.	Introduction	5
2.	The Emerging Preferred Route	6
2.1.	Public Consultation	6
2.2.	Preferred Route	7
3.	Transport Strategy for the Greater Dublin Area	10
3.1.	Transport and Cities	10
3.2.	Transport Strategy for the Greater Dublin Area 2016–2035	11
3.3.	Integrated Transport	12
3.4.	Climate Change Targets	14
4.	Why do we need MetroLink?	16
4.1.	What is a metro?	16
4.2.	Why does Dublin need MetroLink?	16
4.2.1.	Future Demand and Capacity	16
4.2.2.	Swords to the city centre	17
5.	MetroLink Design Concept Development	18
5.1.	Overview	18
5.2.	Automated Trains	18
5.3.	Tunnel Types	20
5.3.1.	The Twin Bore Proposal	20
5.3.2.	The Single Bore Proposal	21
5.4.	Safety in a Single Bore Tunnel	22
5.5.	The Green Line	24
6.	MetroLink Design Principles	27
6.1.	A Service Designed for all Passengers	27
6.2.	Cycling and walking	28
6.3.	Station Design	29
7.	The Preferred Route	31
7.1.	Estuary Park-and-Ride	31
7.2.	R132	31
7.3.	Seatown	31
7.4.	Swords Central	32
7.5.	Fosterstown	33
7.6.	Dublin Airport	33
7.7.	Dardistown and M50	33
7.8.	Northwood	33
7.9.	Ballymun	34
7.10.	Collins Avenue	34
7.11.	Griffith Park	34
7.12.	Glasnevin	34
7.13.	Mater	36
7.14.	O'Connell Street	36
7.15.	Tara	36
7.16.	St Stephen's Green	37
7.17.	Charlemont	37
7.18.	After Charlemont	37

Contents

8.	Business Case	38
8.1.	Our approach	38
8.2.	International Expertise	38
8.3.	The Business Case	38
9.	Next Steps	42
9.1.	The Railway Order Process	42
9.2.	Property Acquisition	42
9.3.	Stakeholder Engagement	42
9.4.	Information, Public Consultation Report and Data Protection	43
10.	Appendices	44
	Appendix A – Route Overview	46
	Appendix B – Individual route and station maps	47



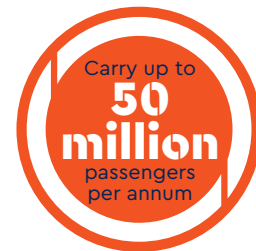
METROLINK

Key Facts

LINKING



PASSENGERS



JOURNEY TIME & DISTANCE

19 kilometre route connecting Swords, Dublin Airport, city centre and Charlemont

20 minutes
travel time from
city centre to Dublin Airport

25 minutes
from city centre
to Swords

3,000   
car spaces at Estuary Park & Ride

4,000    
jobs during construction phase



Helping Ireland meet
climate change targets

STATIONS & VEHICLES



« **60+ metres** »
vehicle length



« **15 new** »
Metro stations



« **30 trains** »
per hour in each direction



1. Introduction

Welcome to MetroLink

Last year, the National Transport Authority and Transport Infrastructure Ireland published the Emerging Preferred Route for a north-south, high-frequency metro line linking Swords, Dublin Airport, Irish Rail, DART, Dublin Bus and Luas services, creating fully integrated public transport in the Greater Dublin area.

This proposal was the merger of two projects, Metro North and Metro South, which have been proposed for over two decades. They were included in the Transport Strategy for the Greater Dublin Area 2016–2035 developed by the National Transport Authority.

MetroLink, BusConnects and DART expansion are three major transport infrastructure projects included in Project Ireland 2040. Together they will enable the development of reliable, sustainable, affordable, integrated public transport that will support the economy, help Ireland meet its climate change targets and make Dublin a better place to live, work, shop or visit.

In March/April 2018, we asked for your views on the Emerging Preferred Route. We've listened and made significant changes to the MetroLink route which we hope will address your concerns and deliver a better project.

Now we are seeking your views on the Preferred Route.

Dublin Airport to city centre in 20 minutes

Linking Dublin Airport, Irish Rail, DART and Luas

3000 Park & Ride spaces

Helping Ireland meet its climate change targets

Cater for 20,000 passengers per direction per hour

2. The Emerging Preferred Route

2.1. Public Consultation

A public consultation took place from 22 March to 11 May 2018 along the full length of the route, including seven public events from Swords to Leopardstown.

Almost 8,000 submissions were received via phone, email, post and comment cards.

Many submissions expressed support for MetroLink particularly from Fingal where people have been waiting a long time for this key service.

"This infrastructure project is of strategic importance for the development of our city. As the success of our national economy is so dependent on the success of Dublin it is also vital to the wider community"

- Stakeholder submission

The issue that attracted most submissions (67 per cent) was the proposed acquisition of lands at CLG Na Fianna on St Mobhi Road for use as the launch site for the tunnel boring machine at the Griffith Park station.

"CLG Na Fianna is one of the largest Gaelic sports and cultural centres in Ireland. With almost 4000 active and registered members and a wider associated community of many more, disruption to the activities would have an enormous and long lasting negative impact"

- Stakeholder submission

The second biggest issue was the construction impact on Our Lady of Victories Church and Boys' National School at Collins Avenue.

Another area of concern was the proposed road closure at Dunville Avenue due to segregation of the upgraded Green Luas line.

"The permanent closure of Dunville Avenue to Beechwood would create huge hardship for local traffic and residents. It would be very obstructive to normal activities"

- Stakeholder submission

Other submissions focused on disruption during construction at several sites, the elevation of the line near Swords, queries about tunnelling and access for cyclists.

"The project's planning must be made cycling friendly for people who will use MetroLink and those who live or work or commute past stations."

- Stakeholder submission

When the consultation period ended concerns continued to be expressed about the impacts of the proposal to upgrade the Green Line to metro standard. While concerns initially focused on community segregation, the emphasis shifted to the issue of line-closure during construction.

"Green Line shut for up to 2 years causing commuter chaos – 45,000 daily commuters will lose the Luas service for between 9 and 24 months during construction"
- ReThinkmetrolink.ie

Concerns were also raised by residents in College Gate, an apartment block located directly over the proposed MetroLink Tara station. This building also houses the Dublin City Council Sports and Fitness Markievicz centre. The Emerging Preferred Route proposed acquiring and demolishing the building. We received a detailed submission from residents who commented on:

"...the severe impact on College Gate apartments to build on a small percentage of the site. An alternative location for the station is proposed that we feel would be more suitable for the station at Tara Street."
- Resident, College Gate

Along with the concerns raised, we indicated that a number of significant design decisions remained under consideration. These included:

- Tunnel type: twin or single bore tunnel.
- Depot location and crossing the M50.
- Elevation of the metro line along the R132.

Every issue, whether from a large group or individual was studied by the relevant teams and where possible, alternatives researched to mitigate the concerns.

The National Transport Authority and Transport Infrastructure Ireland together with the engineering designers Jacobs Idom have carefully analysed and reviewed every aspect of the design.

The full consultation report detailing the public feedback on the Emerging Preferred Route is available on **metrolink.ie**

2.2. Preferred Route

At MetroLink we take seriously our obligations under the Aarhus Convention to facilitate public participation in decision making on major public infrastructure projects. This document is a comprehensive explanation of what we propose to do and why.

It lays out in detail our response to the public consultation on the Emerging Preferred Route; how this has affected technical proposals for the project; where we've been able to respond to feedback; where we haven't and if so, why.

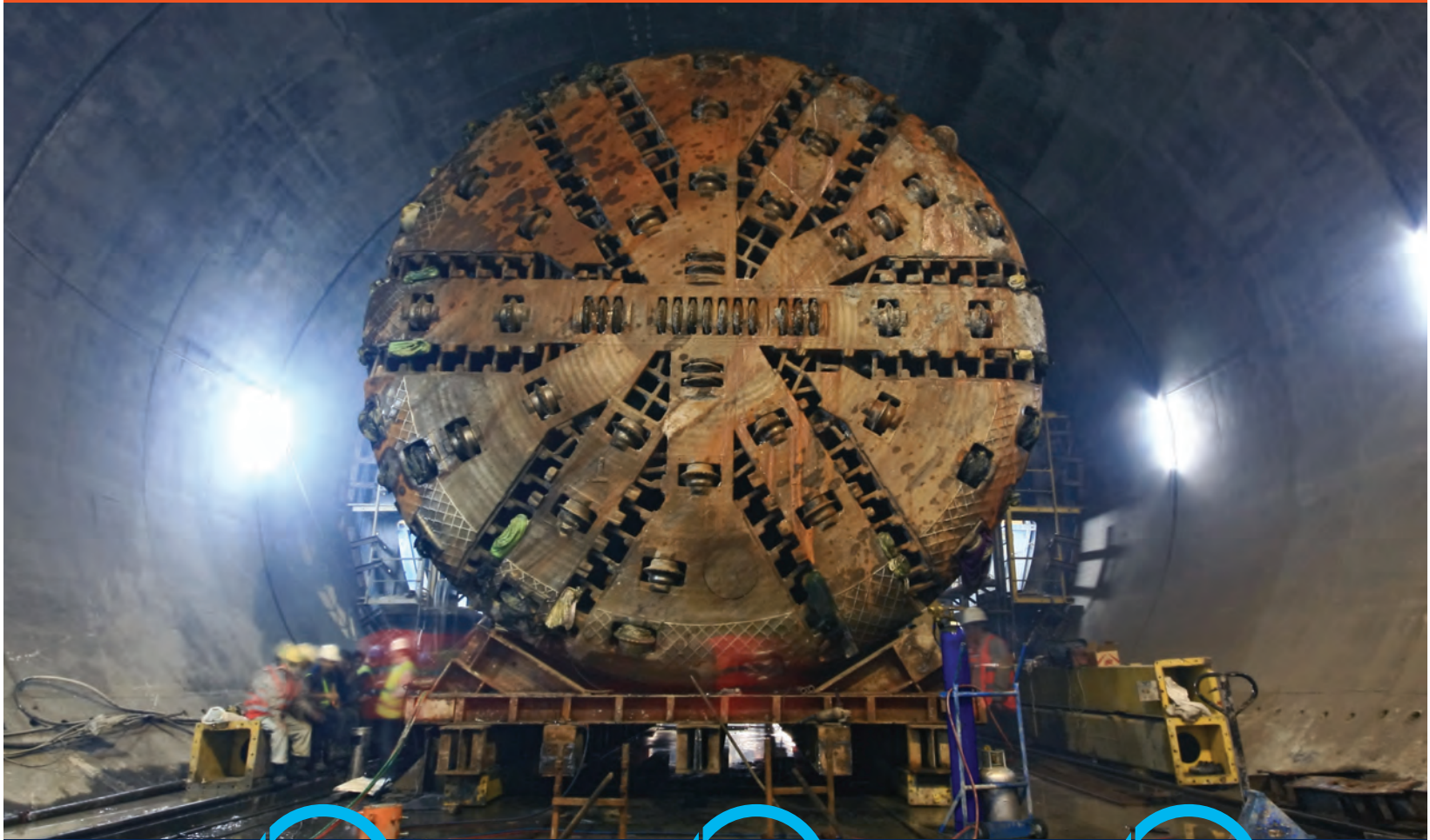
We are now seeking feedback on the Preferred Route. Your views are important to us. When you learn about the new route, please go to **metrolink.ie** to share your thoughts.

Project Schedule



OBJECTIVE:

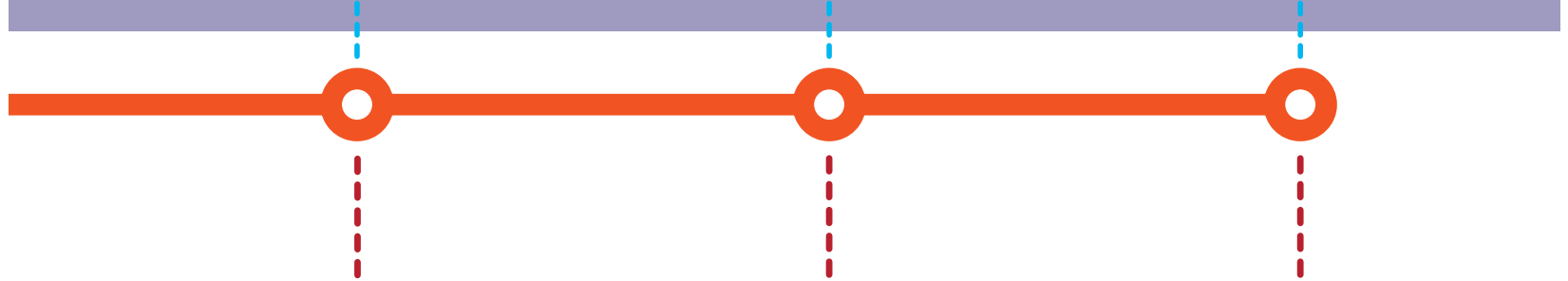
To provide a safe, high-frequency, high-capacity, fast, efficient and sustainable public transport service linking Swords, Dublin Airport, Irish Rail, DART, Luas, Dublin Bus and the city centre.



**Q2
2020**

2021

2027



MetroLink
operational
2027

3. Transport Strategy for the Greater Dublin Area

3.1. Transport and Cities

More than half the world lives in cities and by 2030 that will increase to 60 per cent. Ireland is no different.

Cities have always been shaped by transport. Most of our cities were founded where rivers met the seas, and later, canals and railways became the foundations on which cities flourished.

In the 20th century the car changed the shape of cities by enabling urban sprawl. This has many consequences. It allows people more space to live. That feels good but as individuals and a society we pay a price for that, including:

- Long commutes.
- Costly provision of public services.
- Climate change impacts due to carbon emissions from fuel.
- Health impacts – people who rely on cars walk less than those who use public transport.
- Ability to find employment – if you can't get to a job, it's harder to find a job.
- Difficulty accessing health services and education, especially for low income groups.

This power of transportation to shape how we live and where we live is one of the pillars of Project Ireland 2040. The National Planning Framework projects a 20 to 25 per cent growth in population in Dublin by 2040, resulting in a total population of about 1.4 million for the Dublin region alone.¹

The Framework sets out national goals to provide the housing we need through compact urban development and sustainable mobility – especially in Dublin, our principal economic driver. Dublin desperately needs housing and the imperative is to provide that housing within the existing urban footprint.

The Framework notes that while Ireland ranks within the top twenty countries in the world in areas such as quality of life² and environmental performance,³ Dublin is outside the top thirty cities in the world for liveability.⁴

Current and future residents must have environmentally sustainable public transport to make living in Dublin more liveable.

1. National Planning Framework p29
2. Economic Intelligence Unit 2013
3. Environmental Performance Index 2014
4. Mercer Index 2017 and 2018

3.2. Transport Strategy for the Greater Dublin Area 2016–2035

The age of the car has changed many aspects of our society, but we've reached a point where there are critical levels of congestion on the roads, especially on key routes like the M50 where high value economic trips such as transporting food and other goods are at risk from commuting traffic. Over 70 per cent of all trips in the Greater Dublin Area are made by car.⁵ Relieving traffic congestion is a critical consideration for our whole society.

To address these issues, the National Transport Authority developed the Transport Strategy for the Greater Dublin Area 2016–2035. This sets the framework for transport development across the wider Dublin area for the next twenty years.

The Strategy concludes that:

5. Transport Strategy for the Greater Dublin Area 2016–2035 Chapter 3

- A significant increase in public transport is required.
- A safe cycling network is badly needed.
- All day travel demand from all groups in society must be considered.
- The road network in Dublin has reached capacity and there is limited scope to expand it.
- Most importantly, Ireland is required to decarbonise its transport sector radically. Public transport consumes significantly less energy per passenger km than cars.

Experience has shown that the best way to get people out of cars is to provide attractive, affordable and reliable public transport, but across the world public transport has historically suffered under-investment.

The strategy proposes three major infrastructure projects:

- MetroLink;
- BusConnects; and
- DART expansion.



3.3. Integrated Transport

The purpose of the National Development Plan is to ensure that public investment is targeted towards projects that will fulfill the objectives of the National Planning Framework.

With housing and transport so inextricably linked, the National Development Plan is directing investment towards large scale public transport infrastructure.

Public transport functions best when it's properly integrated. Different modes should complement each other – not compete. A “silo” approach where each type of transport is treated separately isn't sufficiently useful or attractive to get people out of cars.

Park and ride enables commuters to access public transport; buses connect with rail; and different rail lines like DART, Intercity, Luas and MetroLink interconnect with each other. When people can change from one mode of transport to another seamlessly, with timetables and ticketing fully integrated, we open up public transport to all sectors of society.

This principle of integration and accessibility is a key driver of the MetroLink route.

That's why our alignment is taking advantage of the opportunity to integrate with other major transport hubs – not just Dublin Airport. MetroLink will connect with two major Iarnród Éireann lines; the north-western line from Sligo/Maynooth to Dublin, and the south-western commuter line from Newbridge/Hazelhatch to Grand Canal Dock. These converge at Whitworth Road near Glasnevin.

MetroLink will also connect with DART and Iarnród Éireann services at Tara Street and Luas at Charlemont, O'Connell Street, and St Stephen's Green.

BusConnects is being designed to create convenient interchanges along the entire MetroLink route. This integration of public transport is the key strategy behind MetroLink.

Integrated Transport. Integrated Life.



3.4. Climate Change Targets

The transport sector has been the fastest growing source of Ireland's greenhouse gas emissions. Between 1990 and 2016, transport emissions increased by 139.3 per cent with road transport increasing by 145 per cent.⁶

Nearly 20 per cent of Ireland's greenhouse gas emissions come from transport and it accounts for the largest share of energy use.⁷ The European Commission's Strategy for Low-Emission Mobility (July 2016) states that "by mid-century, greenhouse gas emissions from transport will need to be 60 per cent lower than 1990 and be firmly on the path towards zero".

Transport demand and use in Ireland is strongly linked with the economy and in the case of passenger transport, population and employment. Decoupling economic gain from transport related carbon emissions is the problem we have to solve. The Environmental Protection Agency projects that without intervention transport sector emissions will increase by 11.3 per cent over the period 2020 to 2035.⁸

Radical interventions are needed to shift Ireland onto a low carbon pathway as it manages an increasing population and more demand for housing and employment. Project Ireland 2040 proposes an environmentally sustainable public transport system that enables economic growth and meets significant increases in travel demand.

The plan focuses on a decisive shift away from polluting and carbon-intensive systems and investment in public transport in Dublin including MetroLink, DART expansion, and BusConnects. This expansion of attractive and sustainable public transport alternatives to private based car transport will reduce congestion and emissions.

MetroLink also features in the National Mitigation Plan⁹ as an important measure to set transport on a path way to decarbonisation.

MetroLink will be electrified, but its biggest contribution to climate change targets is its capacity: a metro can carry large numbers of people on a daily basis and that's what brings down carbon emissions per person travelling.

Passenger movements on high capacity urban rail systems such as metro require less than a tenth of the energy needed to move individuals by car.

By removing millions of car journeys and vehicle kilometres from the road, MetroLink is vital to reducing Ireland's transport carbon emissions.

6. EPA Ireland's Final Greenhouse Gas Emissions 1990–2016

7. SEAI Energy in Transport 2014

8. EPA Ireland's Greenhouse Gas Emissions Projections: 2016–2035

9. National Mitigation Plan 2017



4. Why do we need MetroLink?

4.1. What is a metro?

There are many kinds of urban rail systems.

In Dublin we're familiar with Luas – a tram that can run along the road with other vehicles and is easily crossed by pedestrians and cyclists. Its integration into the road network has great advantages but also limits its speed and capacity. Trams get caught in traffic and must travel slowly to be safe to other road users.

A metro is something quite different. When large numbers of people need to move around, you need more trains, more often. MetroLink trains will be bigger, faster and there'll be more of them. At present, Luas runs every three minutes during the peak period. MetroLink will be twice as frequent. That is a train every 90 seconds. To achieve the necessary speed and capacity it must be separated from other road users – vehicles, pedestrians and cyclists.

That's why for most of the route, MetroLink will run underground where it can achieve all of this independently of the road network.

4.2. Why does Dublin need MetroLink?

4.2.1. Future Demand & Capacity

As outlined in Section 3.1 the population of Dublin is projected to increase to 1.4 million by 2040. In terms of employment, the city centre has maintained its position as the pre-eminent location for jobs and at the highest levels of intensity¹⁰. The trend is likely to continue. For example, technology companies like Google and Facebook are continuing to migrate to the Docklands area.

The level of employment is now at its highest level ever in the State. In the second half of 2018, the Central Statistics Office reported employment growth in the previous 24 consecutive quarters rising to 2,255,000 people in employment.¹¹ This is good news for the country and the people, but increases both the challenge and the imperative to get people to and from work in a reliable, affordable and sustainable manner.

10. Transport Strategy for the Greater Dublin Area 2016–2035 p30

11. CSO Labour Force Employment Series Q22018

4.2.2. Swords to the city centre

Fingal is the fastest growing region in Ireland. Its population increased by 8 per cent between Census 2011 and Census 2016, more than twice that of the State overall.¹²

Dublin Airport, as Ireland's main international gateway, handled a record-breaking 31.5 million passengers in 2018. Dublin Airport supports 117,300 jobs in the Irish economy, and 19,200 of these are employed directly at the airport and its environs. Yet there is no rail connection to get either passengers or employees to our biggest transport hub.

According to the 2016 Census, Fingal is the top county from which workers flow into Dublin city. Nearly 8,000 of the 20,000 workers in Swords commute to work there.¹³ Cars are used for 72 per cent of all trips in this sector of the city and public transport's share of trips is only 12 per cent, mostly concentrated on the coastal DART line.

In addition, there is significant population and employment growth planned for this corridor.

The Fingal North Dublin Transport Study 2015 considered several alternatives to serve this corridor. Under BusConnects this route will be upgraded to a core radial corridor with improved dedicated bus and cycle lanes. This will result in a greatly improved bus service.

However, the transport study noted that even if we managed to implement the highest capacity bus system, Bus Rapid Transit, its maximum capacity is 4,500 passengers per direction per hour. This doesn't meet the expected demand and so a north-south metro is needed.

The proposed new alignment creates integration and connectivity between other transport hubs, such as Dublin Airport, Iarnród Éireann and DART.

12. Census 2016 Population Change and Historical Perspective p11

13. Census of Population 2016 – Profile 6 Commuting in Ireland



5. MetroLink Design Concept Development

5.1. Overview

Following the first consultation we reviewed the entire design of the route. Some issues affect the entire scheme. Others affect specific stations. In this chapter we discuss some of the issues affecting the fundamental design of the scheme and then in Chapter 7 we lay out the full Preferred Route.

The main issues affecting the overall design are automating MetroLink, tunnel type and the arrangements in relation to the Green Line upgrade. The Preferred Route Design Development Report, analysing the engineering options at key points, is available at metrolink.ie

Benefits of Automated Trains

Safety
Flexibility
Reliability

5.2. Automated Trains

Since MetroLink will be segregated from all other traffic, including pedestrians and cyclists, we have a great opportunity to make it a driverless system. Other train lines are adapting automation into their existing systems which is challenging. MetroLink has a significant advantage as we can design for automation from the start.

MetroLink will model itself on the Copenhagen Metro and the fully automated lines on the Barcelona Metro, which utilise proven automated train control systems.

The trains are supervised from a control centre run by operational, security and safety staff who can monitor every carriage, station and platform through CCTV and communicate with passengers by public address. Passengers can contact controllers directly from their carriage.

Since operators no longer need to work in isolation driving the train, the entire focus of staff switches to passengers' needs. With technology doing so much of the work, train staff become customer-facing, which improves the experience for customers.

Automated systems are extremely safe as the capacity for human error is eliminated and advanced signalling technology improves safety. The platform edge is blocked by screens to prevent anyone falling onto the tracks. When the metro has fully stopped, the train doors line up with screen doors and they open simultaneously so passengers can board the train safely. Then they close together, and the train moves off.

Timetables are both more flexible and reliable as trains can adapt to changing circumstances quickly. Choosing automation also fed into the decision on tunnel types, which will be discussed in the next section.



5.3. Tunnel Types

The underground section of MetroLink is constructed by two separate methods. The stations are constructed using the "cut-and-cover" method – excavating the site from ground level and covering it up again.

The tunnels between stations are bored using Tunnel Boring Machines. At the time of the first consultation, we were reviewing the options on tunnel configuration.

There were two options. Our initial proposal was to bore two separate tunnels (twin bore) each with their own track, one for northbound trains and one for southbound trains. We were also exploring the option to bore a single larger tunnel with the two tracks – north and south – laid side by side.

Based on further research, we've decided to proceed with the single bore tunnel. This decision has significant advantages across the entire scheme.

5.3.1. The Twin Bore Proposal

Originally, we proposed two tunnels constructed by four tunnel boring machines (TBMs). The first pair would be launched north of Dublin Airport, and bore two tunnels southwards to the route's half way point at the playing fields of CLG Na Fianna and Home Farm FC on St Mobhi Road in Glasnevin, from where they would be extracted. This is also the point where the Griffith Park station is to be located.

At the same time, a second pair of TBMs would be launched from the CLG Na Fianna site and tunnel southwards to Charlemont from where they would be extracted. The tunnel would rise out of the ground here to come up to the level of the Green Line.

This meant there would be an extensive construction site on the CLG Na Fianna/ Home Farm FC grounds for up to seven years. This would have impacted on the community in two ways. First, the locality would lose vital sports and social amenities for an extended period of time. Second, there would be significant HGV traffic carrying the extracted material from the tunnels at Glasnevin. While this would be managed it would, nevertheless, have had a significant impact on traffic in a residential city area.

Similarly, there would be major works at the Charlemont end of the route where the tunnel would rise out of the ground to meet and connect to the Green Line.

5.3.2. The Single Bore Proposal

The single bore tunnel vastly reduces the scale of works and the impact on the city. Under the Preferred Route, we propose to bore the tunnel in two phases.

A TBM will enter the ground south of Dublin Airport and bore a short tunnel northwards under the airport. Then it will be extracted and relaunched at Northwood and tunnel the whole way to Charlemont.

The new launch site at Northwood is further out of the city and nearer to the M50, so this takes much of the HGV activity out of the city. The southern launch site for the Dublin Airport section is also nearer the M50. The trucks carrying the excavated material will have a shorter distance to travel to disposal sites, which places a smaller burden on the roads and the environment.

The single bore tunnel eliminates many complexities of the twin bore making construction simpler and faster, which reduces costs. Reducing the number of TBMs offers the potential for savings.

In addition, in a twin bore tunnel cross-passages are constructed between the tunnels to allow for evacuations in an emergency. But these have to be mined manually after the boring and no work can start on the tracks until they are completed. This slows down construction.

Advantages Single Bore

- Reduces number of TBMs
- CLG Na Fianna no longer launch and extraction site
- Construction simplified
- HGV traffic shifted closer to M50

5.4. Safety in a Single Bore Tunnel

Although twin bore tunnels have traditionally been the norm, internationally the trend is moving towards developing metro projects using a single bore arrangement. From a safety perspective, twin bores offered an obvious evacuation strategy in case of an incident or emergency in the tunnel. However, the move to automated trains has created opportunities to address this issue and offer comparable levels of safety.

- Passenger evacuation

If an emergency causes the train to stop between stations, passengers need to evacuate. In a twin bore tunnel with non-automated trains they exit via the carriage doors onto a narrow side platform or shelf. They proceed to one of the cross-passages that connect the twin tunnels at intervals. Since passengers exit the train quicker than they can move down the platform, sometimes this can lead to overcrowding on the narrow walkways.

The move to automated trains offers new opportunities for evacuation that work well in a single bore tunnel. Since there is no driver cab, the front and back of the train is designed to open up and drop down as a ramp onto the track slab. Passengers can exit the train in an orderly manner and move away from the train quickly. This front-back evacuation from an automated train can be used in a twin bore tunnel too, but the space is narrower. In a single bore the extra space is useful. In addition, side evacuation from the train doors onto the vacant adjacent track can also be enabled.

In a twin bore, emergency services use the non-affected tunnel and connecting cross passages to access the train. In a single bore, the bigger tunnel allows them to get closer to the emergency area and have more space to operate.



5.5. The Green Line

The MetroLink proposals published in 2018 envisaged a metro service operating from Swords through the city centre to Sandyford. Between Sandyford and Charlemont the existing Luas Green Line would be upgraded to metro standard and the metro service would replace the existing Luas trams along this section.

The need to upgrade the Green Line arises from the expected passenger growth at key locations along this corridor – in particular, Cherrywood, Sandyford and Dundrum – and the planned extension of the line further southwards to Bray. Taking account of those developments, the number of people seeking to travel on the Green Line in future years will exceed the carrying capacity of the Luas system, requiring its upgrade to a metro service.

But the need to upgrade the Green Line to metro standard will not arise for some time – in the region of twenty years. However, many people are concerned about the need to close the Green Line now for a prolonged period to allow its conversion to a metro system.

We propose an alternative approach that allows the new section of metro line to be built now and the Green Line conversion to occur at an appropriate point in the future.

Under this arrangement the overall metro system from Swords to Sandyford would be delivered on a phased basis. The first phase – the current phase – would comprise the development of the section from Swords to Charlemont, without connecting to the Green Line. But, crucially, the required tunnel boring works to allow the future connection to the existing Luas line would be completed as part of this phase. While the last station would be Charlemont, the bored tunnel would continue to, and terminate south of Ranelagh, aligned to facilitate a future connection onto the Luas line.

A separate phase, potentially two decades from now, would see the connection made from the MetroLink tunnel termination point onto the Green Line. Because the tunnel boring works would have been completed as part of the first phase, the tie-in works would all be constructed from the surface and no bored tunnelling work would be required. All of the details regarding that tie-in and conversion of the existing line would be worked out at that future point and do not need to be developed now.

During the period between the completion of the metro from Swords to Charlemont and the ultimate tie-in to the Green Line at a point in the future, there will be a need to increase the carrying capacity of the Luas Green Line. This will be dealt with as a separate project and will deliver capacity enhancements on an incremental basis over this period.

The MetroLink project will now comprise the delivery of a metro system between Swords and Charlemont with a short tunnel continuation to Ranelagh facilitating a future tie-in to the Green Line. This tunnel extension south of Ranelagh will enable trains to cross-over between tracks and turn back for their return journeys in addition to allowing storage of trains for service commencement at the start of daily operations.

The Green Line route will remain open throughout the development of the route now proposed. When MetroLink is completed, Green Line passengers can connect with MetroLink at Charlemont, St Stephens Green and O'Connell Street for a fast service to Dublin Airport and Swords.



6. MetroLink Design Principles

6.1. A Service Designed for all Passengers

The NTA Greater Dublin Area Transport Strategy states that transport infrastructure and services must be inclusive for all by virtue of their design and layout.

Even with modifications in recent years, older forms of public transport that weren't designed with accessibility as a priority often provide challenges to some passengers with reduced mobility or sensory impairments.

MetroLink will incorporate universal design from inception with "accessibility for all" at the core of the project.

The entire system, including stations, level-boarding trains and platforms will be fully accessible for wheelchair and pushchair users. This will also make luggage easier to handle.

The trains will be equipped with audio and visual 'next stop' announcements to assist people with visual or hearing difficulties.

All written, printed, online and verbal communication of travel information and other news to the public will be produced in a clear, legible and easily understood manner using plain language.

The screens protecting the platform edge prevent falls onto the tracks bringing extra safety.



6.2. Cycling and walking

A key objective of the Greater Dublin Area Transport Strategy is to increase the share of cycling as a form of transport. MetroLink is part of an integrated strategy to provide sustainable mobility. A number of detailed submissions were received with regard to how MetroLink can improve integration with cycling.

In response to those submissions and in line with the National Cycle Policy Framework we intend to ensure that cycling arrangements are appropriately considered during the design of MetroLink. This will include items such as covered bike parking, which we will include at stations wherever feasible.

In addition, underpasses and footbridges will be designed so that they are easily accessible to bikes. As we develop proposals around each particular station and associated traffic management and control, we will ensure that cycle safety is a key consideration.

In accordance with the Transport Strategy, MetroLink will ensure that where feasible permeability and accessibility of public transport stops and stations for local communities is maintained and enhanced.



6.3. Station Design

The station locations have been chosen to make them accessible to the greatest number of people, both from their homes and places of work. The architecture of the stations is important as this is the space passengers will experience most. The design concept for MetroLink stations has been developed by Grimshaw Architects and applied by Idom, the Spanish engineers who have designed metros all around the world including Barcelona.

As urban transport systems have evolved so too has station design, especially at ground level where we expect something more than mere access to an escalator. Modern stations are expected to interact with the urban environment and increase rather than decrease the value of the public space. These may change as the design develops but show where we are right now in the process.














Our design vision has the following goals;

- **People focused**
the stations should be inclusive, accessible, and enjoyable to use by all passengers.
- **Safe and secure**
there should be clear lines of sight with few corners, so people can see who and what is coming towards them.
- **Efficiency**
the stations need to provide elegant engineering solutions.
- **Legibility**
navigation should be naturally intuitive; the space uncluttered and clear up-to-date information easily accessible.
- **Sense of place**
the design should be appropriate to Dublin and provide context and character.
- **Timeless**
the stations should be future-proofed and be easy to maintain and operate.
- **Sustainable**
MetroLink will reduce traffic congestion, encourage regeneration where needed and operate along clean-thinking lines being low carbon where possible.
- **Value for money**
MetroLink will leverage standardisation and economies of scale in station construction to achieve cost effectiveness.



METROLINK

SWORDS - CHARLEMONT

-  MetroLink Station
-  MetroLink Interchange
-  Park & Ride
-  End of Tunnel
-  Bridge
-  Embankment
-  Cutting
-  Surface Level
-  Tunnel
-  DART
-  Commuter Rail Services
-  LUAS - Red Line
-  LUAS - Green Line



7. The Preferred Route

Having reviewed the Emerging Preferred Route, all the concerns raised during the consultation and the major design decisions, we have now arrived at the Preferred Route. We've been able to respond in a meaningful way to most of the issues raised, some of which have been addressed in earlier chapters.

In this chapter we lay out the full Preferred Route. Maps and drawings of each station are in Appendix B.

The Preferred Route Design Development Report, analysing the engineering options at key points, is available at metrolink.ie

MetroLink will be a high-capacity, high-frequency rail line running from Swords to Charlemont, linking Dublin Airport, Irish Rail, DART, Dublin Bus and Luas services, creating fully integrated public transport in the Greater Dublin area.

As well as linking major transport hubs, MetroLink will connect key destinations including Swords, Ballymun, the Mater Hospital, the Rotunda, Dublin City University and Trinity College.

Much of the 19 kilometre route will run underground, an exciting innovation for Irish public transport.

MetroLink will carry up to 50 million passengers annually, cutting journey times from Swords to the city centre to 25 minutes. It will change the way we travel – and how we live.

7.1. Estuary Park-and-Ride

MetroLink begins at ground level at Estuary where a 3000-vehicle, multi-storey park-and-ride facility will be located. We're pulling the location of the station and park-and-ride site slightly south and west from the Emerging Preferred Route. This will minimise the impact on Lissenhall Bridge – a national monument – and it will lie south of the proposed Swords Western Ring Road.

7.2. R132

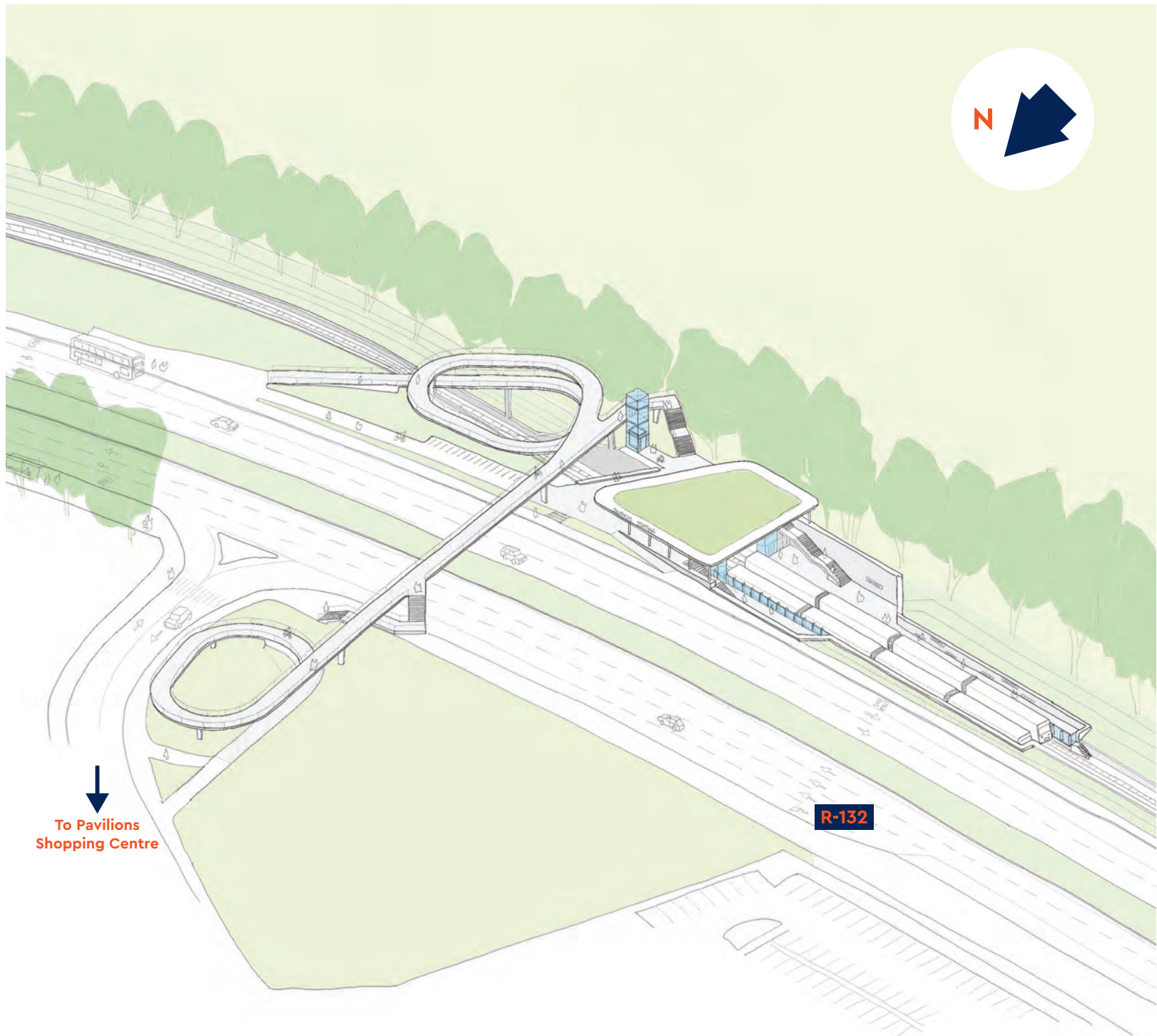
In the Emerging Preferred Route, it was proposed to elevate the rail line above the R132 from Seatown, past Swords and onto Fosterstown. We explained then we were exploring an alternative but are pursuing an entirely new arrangement. We now propose to create a cutting to the east side of the R132. This means MetroLink will run below the road level along the R132 alleviating concerns about its visual impact. The stations which were on the central median will all be moved to this side of the road.

7.3. Seatown

From the depot at Estuary, the route commences to the west side of the R132. The line is adjacent to the pitches at Balheary Park, similar to the proposal under the old Metro North route. We'll be consulting closely with the stakeholders here to mitigate any impacts, especially in relation to access during construction.

Between the Estuary and Seatown roundabouts, the route crosses under the R132 using the cut and cover method to the east side of the road. As explained in Section 7.2, the Seatown station is moving from the central median to the east of the R132 in cutting. It's now in a much better location right beside the junction of Seatown Road and the R132.

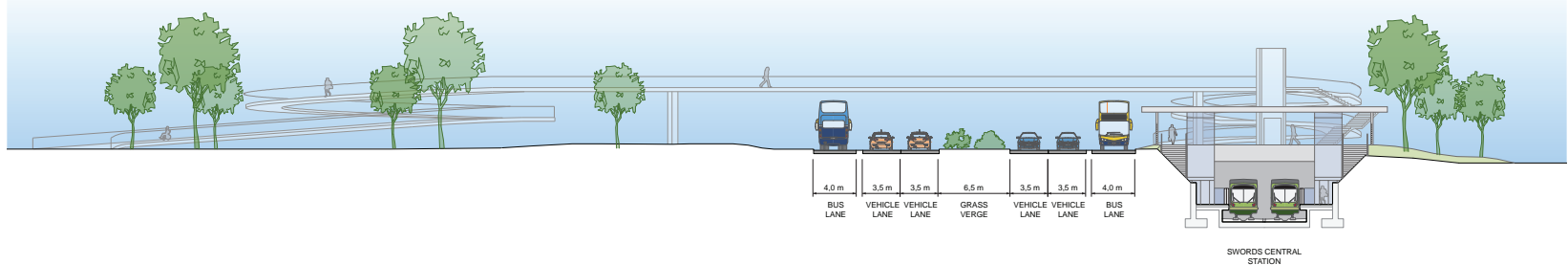
Swords Central Station



7.4. Swords Central

The proposed Swords station was previously located in the median of the R132, south of the Malahide Road roundabout – across the road from the Pavilions Shopping Centre. Now, it will move off the road to the east and a footbridge will provide better and safer connection to the shopping centre, bus stops and Swords town centre.

Swords Central Station Cutting



7.5. Fosterstown

The Fosterstown station was located just north of Airside Retail Park on the R132. It is moving south a little closer to the retail park. We'll construct a footbridge for pedestrians and cyclists so that people in the Boromhe development will have easy access.

The line will continue to follow the R132 and go under the Nevinstown Lane junction. Then, just south of the Texaco station, it will go under the R132 to cross to the west side and continue on in cutting towards Dublin Airport. On the north side of the Naul Road, it will go into the tunnel that will take it under the airport.

7.6. Dublin Airport

There will be two sections of tunnel and the first of these is a short one under Dublin Airport under the proposed ground transportation hub located at what is now the T2 surface car park. We're developing the design of this station in consultation with the Dublin Airport Authority to minimise impact on the airport operation but maximise the benefits to passengers.

7.7. Dardistown and M50

The metro will rise out of the tunnel after Dublin Airport and the whole alignment from Dardistown to Ballymun has moved slightly to the west.

Estuary was originally proposed as the site of the main train depot, but we now consider that Dardistown is a more efficient location for managing train storage. The area has been zoned for employment in the Local Development Plan and we propose to build the station when it is further developed. The proposed alignment will impact on the grounds of Whitehall Rangers Football Club. We will work closely with the club to provide alternative pitches.

This change informed the decision on whether to go under or over the M50 at the R108 interchange as was discussed during the Emerging Preferred Route consultation. Now that Dardistown is the site of the depot and the trains will be on the surface, it makes more sense to cross over rather than under the M50.

7.8. Northwood

As explained in Chapter 5, the change from a twin to single bore tunnel affects Northwood. This will now be the launch site for the TBM that will bore southwards to Charlemont. This site was selected as there is sufficient land for the works and, being closer to the M50, reduces the travelling distance of HGVs removing material from the tunnel.

The Northwood station itself is moving slightly south. Under the Emerging Preferred Route, it was just north of the Gulliver's Retail Park Home Base outlet. The Preferred Route proposal is to pull it south of the retail park.

The station will now sit directly under the junction of the R108 and Northwood Avenue – the development entrance. This will allow passengers to access the station from either side of the R108 without having to cross a busy road. This is far more convenient, especially to those living opposite Northwood Avenue.

The R108 will be affected during construction of the station and we will arrange diversions around the site to maintain movement. We will liaise closely with the local community to mitigate issues concerning access and construction.

When construction of the tunnel is completed, the launch site will be made available for a residential/employment development.

7.9. Ballymun

The Ballymun station is moving slightly. It will now lie adjacent to the R108 partly under the site of the old shopping centre, where plans are in place for a new mixed use quarter following demolition of the old centre. This will cause far less disruption during construction and we believe is a much better solution for Ballymun.

7.10. Collins Avenue

Concerns were raised about the impact of construction of this station particularly on Our Lady of Victories church, and the nearby Our Lady of Victories National School. We've considered these concerns and examined the constraints carefully. Unfortunately, we have limited options for realignment in the area due to the difficulty of diverting traffic.

However, we will ensure that all mitigation measures possible will be taken during construction of the station to minimise disruption. This will include careful site management, protection measures for the stained-glass windows of the church, maintaining access to the church and school and strict construction traffic management.

7.11. Griffith Park

Originally it was proposed that the CLG Na Fianna pitches on St Mobhi Road would be used for the launch and extraction site for the tunnel boring machines, which is why so much land was needed for the entire construction period for MetroLink. As outlined in Chapter 5, the decision to use a single rather than twin bore tunnel, means this site will no longer be a launch site for a TBM.

We consulted with the various stakeholders here and discussed options around the construction of the Griffith Park station itself. These included not building a station here at all, or locating it under either the Na Fianna or Home Farm FC pitches. With three schools and the sports facilities nearby, it's a great location for a metro station. Therefore, in consultation with Home Farm and in line with a more compact station design, we propose to construct it under the Home Farm FC soccer pitch. This means the pitch will be unavailable during construction but will be fully restored afterwards.

The decision to move the launch site significantly reduces truck movements. During station construction there will be strict traffic management and safe arrangements for pedestrians here.

An emergency intervention shaft for the tunnel, will be located in the grounds of Albert College Park.

7.12. Glasnevin

Glasnevin is a key station. This is where MetroLink will interchange with Iarnród Éireann where the north-western line from Sligo/Maynooth to Dublin, and the south-western commuter line from Newbridge/Hazelhatch to Grand Canal Dock converge at Whitworth Road increasing demand for both MetroLink and Iarnród Éireann services. The station location and design are changing slightly so we can avoid impacting the Court Apartment building at Dalcassian Downs.

The scope of the works has increased and is impacting on property to the west of the station. We will work with the local community on issues around construction and with Iarnród Éireann on the interconnection.



7.13. Mater

The Mater station will lie under the small park known as the Mater Plot or the Four Masters Park, which will provide convenient access to the Mater Hospital, St Joseph's Church, Berkeley Street and this north inner-city location. Prior to construction the architectural structures and sculptures will be carefully removed, preserved and restored on completion of the works. Access to the church will be maintained during construction.

This is a challenging site to construct as temporary road closures will be necessary. We will work closely with the local community to manage these. The detailed plans will be submitted as part of the railway order application.

7.14. O'Connell Street

The location and construction of this station in the original proposal would have presented a significant challenge to maintain services on the Luas cross-city line and vehicular traffic on O'Connell Street. An opportunity has arisen to create an integrated station off the street under what was the old Carlton cinema, which is being redeveloped. We are working with the owners of this site to integrate the station into the proposed development.

7.15. Tara

Tara is an important station as MetroLink will interconnect with DART and Iarnród Éireann services here, one of the major strategies behind the new alignment. The Emerging Preferred Route necessitated acquiring and demolishing the College Gate complex and the Sport and Fitness Markievicz centre owned by Dublin City Council. While the site would be available afterwards for new development, the loss of the current apartment block and valued public amenity is a serious impact.

As the financial and social costs here are so high, we've spent significant time and resources investigating alternatives.

These included:

- Locating the station under the Hawkins

House development;

- Moving the station north such that it is predominantly located beneath Ashford House, Tara Street and buildings immediately north west of Tara Street;
- Moving the station south so that it is predominantly beneath Townsend Street and;
- Mining beneath College Gate so that the building need not be demolished.

While these options if implemented may save the College Gate building, each involved the demolition of other residential developments. One would require the full or partial closure of Tara Street to traffic and another requires the full or partial closure of Townsend Street and diversion of large sewers running beneath the station itself.

Mining under College Gate was considered in detail. However this would require moving everyone out of the building during construction for a period of up to two years. It adds significant risks and costs associated with mining to the project.

We have therefore reluctantly concluded that the original proposal remains the most feasible option for construction of the MetroLink station at Tara Street.

We realise this has a severe impact and will take whatever measures we can to mitigate the impact on the residents and users of the fitness centre. We propose to assist residential tenants to secure alternative accommodation and pay the costs of their new accommodation for up to one year. For owner-occupier apartments, we will provide assistance in locating and securing an alternative property, in addition to paying appropriate compensation. With regard to the Sport and Fitness Centre, we are consulting with Dublin City Council on a plan to build a replacement facility. We'll consult with all stakeholders here closely in the near future on these plans.

The full report on the study of these alternatives is on metrolink.ie

7.16. St Stephen's Green

This station will be located as previously proposed at St Stephen's Green East. We're moving the station back slightly from Merrion Row to allow Hume Street to remain open during construction easing the impact on traffic. We're also moving it further west under St Stephen's Green to avoid closing the road during construction and avoid a major sewer that would otherwise require diversion. We are consulting closely with Dublin City Council and the Office Of Public Works on this proposal.

7.17. Charlemont

As discussed in Section 5.3, the most significant change to the Emerging Preferred Route relates to the interface with the existing Green Line and Charlemont Station. In the original proposal, the tunnel emerged above ground just south of Charlemont and connected to the Green Line. This involved major works in the area of Charlemont and Ranelagh and would have involved the temporary closure of a section of the Green Line to enable these works.

Under the revised proposals, MetroLink will terminate at Charlemont and the connection to the Green Line will be postponed to a future date when passenger demand necessitates its provision.

Charlemont station will still be constructed by the cut-and-cover method but there will be no tunnel portal here. There will still be various temporary road closures required, and parts of some gardens will have to be temporarily acquired, but other property acquisitions proposed under the Emerging Preferred Route will not go ahead now.

7.18. After Charlemont

The TBM will continue boring for approximately 650 metres past Charlemont and will terminate underground south of the Ranelagh Luas stop. This terminating tunnel section will be used to construct cross-over arrangements so trains can cross lines and turn back in service, in addition to storing some out of service trains for more efficient operations commencement each day. Importantly, this final tunnel section will be aligned to enable its potential connection to the Green Line in the future.

8. Business Case

8.1. Our approach

MetroLink is categorised as a "mega-project". Mega-projects are defined as large-scale, complex ventures that typically cost €1 billion or more; take many years to develop and build; involve multiple public and private stakeholders; are transformational and bring benefits to many people. Also, mega-projects are usually "once-off" projects, making them challenging for designers and project leadership to forecast costs accurately. This happens across the private and public sector and around the world.

It is important before making a final decision to proceed with MetroLink that a robust cost forecast is developed. Cost forecasting for a one-off mega-project is a challenging process when taking risks and uncertainties into account. We must rely on valid and reliable data from past international projects. We will ensure that best practice is adopted for developing the final forecast cost ranges, rather than relying solely on conventional estimating methodologies.

The forecast of costs can only be established when the final arrangements for the project are sufficiently clear, and the design has been sufficiently advanced to allow a proper realistic assessment of the base costs.

8.2. International Expertise

In October of last year, TII commenced a collaboration with Professor Bent Flyvbjerg and Dr Alexander Budzier of Oxford Global Projects.

Professor Flyvbjerg is the BT Professor and Chair of Major Programme Management at the Oxford Said Business School. He is the most cited scholar in the world in megaproject management, and among the most cited in social science methodology. Dr Budzier is CEO of Oxford Global Projects and a researcher at the Oxford Said Business School. His area of specialisation is in major programme management.

Together they have authored or edited ten books and more than 200 papers in professional journals and edited volumes that have been translated into more than 20 languages. They serve as advisor and consultant to government and business, including the US and UK governments and several Fortune 500 companies. They have worked on some of the largest projects in the world, on all aspects from front-end planning, delivery, and rescue of failing projects.

With the assistance of Oxford Global Projects and access to its database of previous similar project outcomes, we will put in place a comprehensive approach to forecasting project costs. This will ensure that Government decision makers have the best cost forecast information available to them. When final decisions about the project need to be made, all of this information will be included in the overall business case.

8.3. The Business Case

Major projects require comprehensive business cases to be developed and approved before the plans proceed to implementation. A business case is a detailed document that sets out a rationale for the proposal, the basis of selecting the intended scheme, the benefits that would arise from its implementation, cost details for its implementation, risks associated with the scheme and various other details. For a major project in Ireland, there are two significant milestones in the business case process.

The first is when we submit a Business Case to Government for its consideration, prior to making the application for a Railway Order. The second stage occurs subsequent to the planning process, when the final scheme details are fully known. At that stage an updated Business Case is submitted for consideration by the Government in order to inform the final decision on progressing the project into the construction stage.

It is the intention of Transport Infrastructure Ireland and the National Transport Authority that each of these business cases will be published so that people will be able to review and assess the implications of the project.

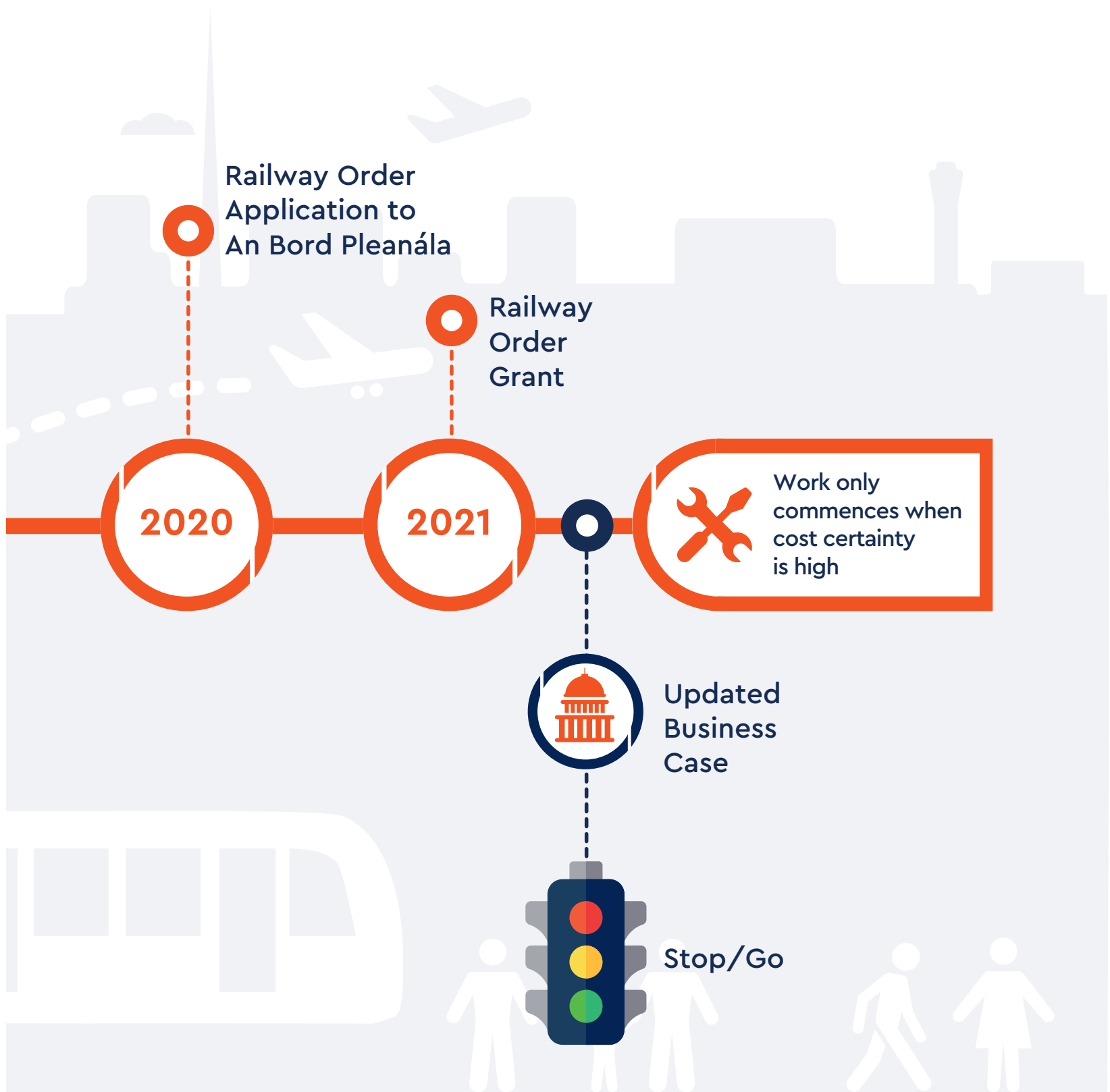


Planning



Decision making process

Integrated Transport. Integrated Life.



9. Next Steps

9.1. The Railway Order Process

Our application to An Bord Pleanála for a Railway Order is broadly similar to the planning process with which most people are familiar.

MetroLink is categorised as Strategic Infrastructure Development (SID) and so we apply directly to An Bord Pleanála for permission. The railway order application process is set out in the Transport (Railway Infrastructure) Act 2001 as amended by the Strategic Infrastructure Act 2006.

We expect that An Bord Pleanála will conduct a full oral hearing. At an oral hearing all the authors of relevant reports and experts will give evidence and be available for questioning.

Any person or body may make a submission or observation in writing to the Board in relation to the application and / or the Environmental Impact Assessment Report. Further information on making a submission / observation in writing to the Board and oral hearing procedures are available from the Board's website www.pleanala.ie

We expect to make the application during 2020.

9.2. Property Acquisition

MetroLink will require the acquisition of a number of residential and commercial properties and we are committed to ensuring that these are managed in a fair and equitable manner. We intend to engage with property owners at the earliest possible opportunity and if your property is affected by surface works you will already have heard from us. We know that this can be a stressful and prolonged process, so owners will be assigned a designated person from MetroLink who will keep you personally updated of current proposals and any changes as the design develops.

9.3. Stakeholder Engagement

We want to hear from you. Having read this document, if there's any aspect of the design or process that you have a comment on, please go to metrolink.ie and make a submission.

As you can see from the consultation on the Emerging Preferred Route, we've listened carefully to everyone's comments and incorporated much of the feedback into the latest design. Tell us what you think about the Preferred Route and we'll continue to work on the design development.

Here are the ways you can contact us:

1. Public Consultation Events

Members of the MetroLink team will be available to meet personally with you and discuss the proposals in more detail.

2. MetroLink.ie

The website has a detailed interactive GIS map of the route, a copy of this document and all the underlying reports. You can make a submission on the website and register to receive updates on the project.

- **Phone**
1800 333 777
Monday to Friday 8.30am-5.30pm
- **Email**
info@metrolink.ie
- **Twitter**
@metrolink_ie
- **Post**
MetroLink
Transport Infrastructure Ireland
Parkgate Business Centre
Parkgate Street
Dublin 8
D08 DK10

9.4. Information, Public Consultation Report and Data Protection

Having regard to the importance of the non-statutory public consultation process in the development of public infrastructure schemes, and in order to ensure that all interested parties can contribute freely to this process, the identities of parties who make submissions as part of the MetroLink non-statutory public consultation exercise will be viewed as confidential by TII/NTA, and treated as such.

All parties should be aware, however, that TII and NTA are subject to the provisions of the **Freedom of Information Act (FOI) 2014 and the Access to Information on the Environment (AIE) Regulations 2007-2014**. Information on FOI and AIE is available at www.foi.gov.ie and www.ocei.ie, respectively.

A summary report of key issues submitted at public consultation stage will be published on the MetroLink website, www.metrolink.ie

Extracts from submissions may be included in the report. Personal information and any commercially sensitive information will be omitted from any published extracts of submissions.

TII and NTA are committed to protecting the rights and privacy of individuals in compliance with the **General Data Protection Regulation and the Data Protection Acts 1988 to 2018**.

By making a submission under this public consultation exercise, you are indicating your acknowledgement of and consent to the above.

10. Appendices

Appendix A – Route Overview

Appendix B – Individual route and station maps



A. Route Overview

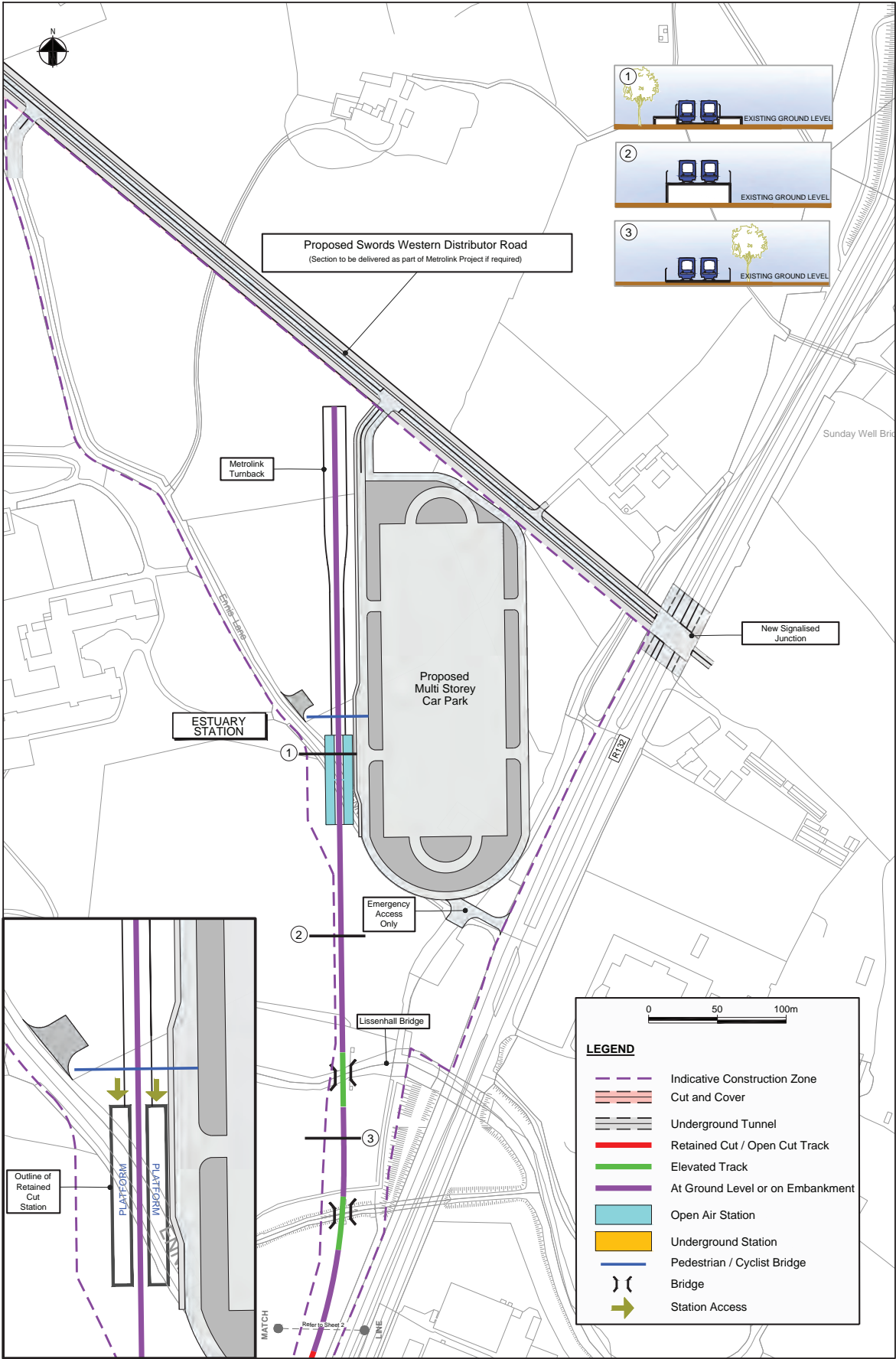
The areas outlined on the map below indicate the individual route & station maps on the following pages.



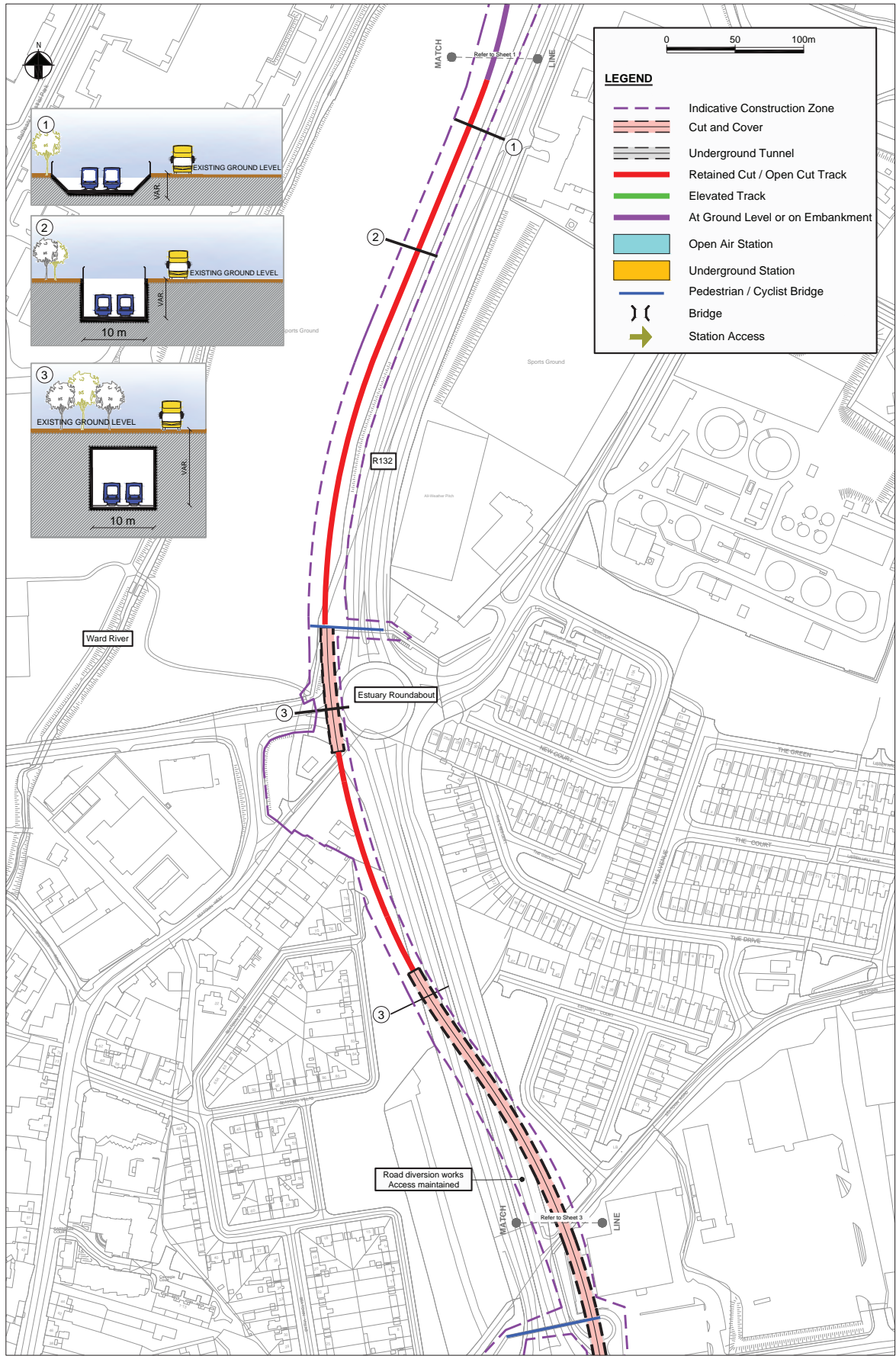
The design details indicated as part of the Preferred Route on the following maps is indicative only and is subject to change following consultation and as part of the design development process.

B. Individual route and station maps

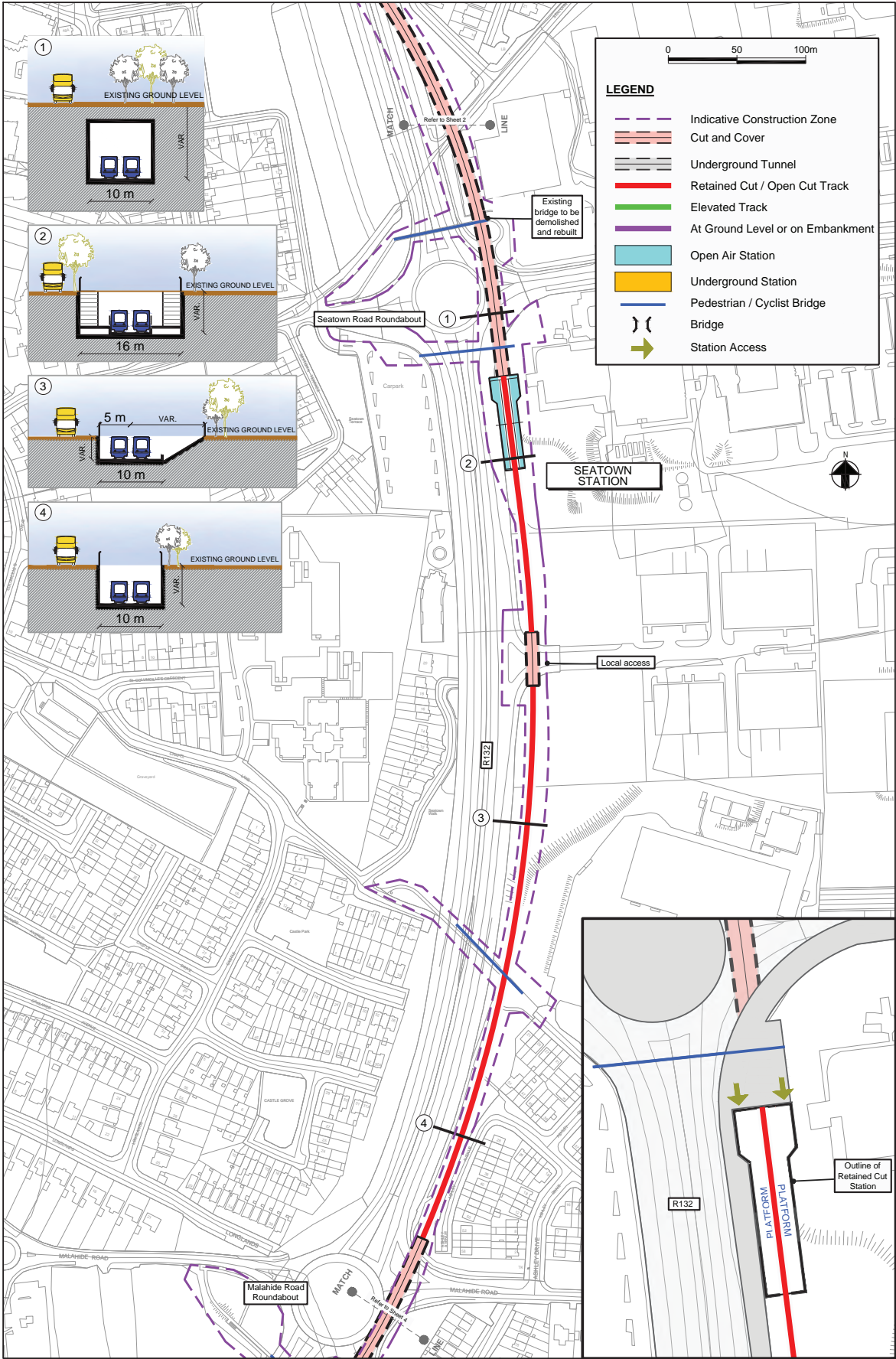
1. Estuary



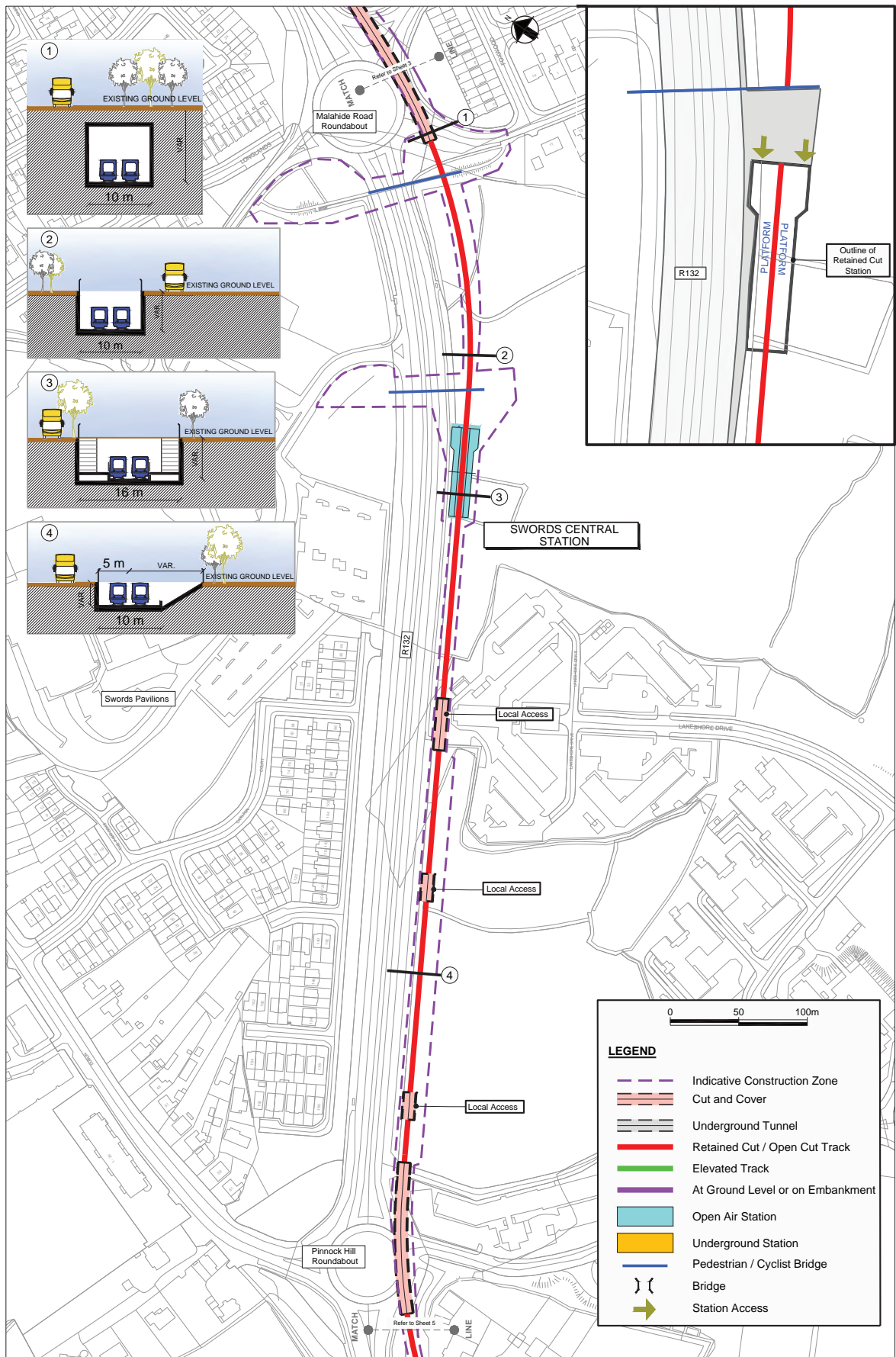
2. Estuary Roundabout



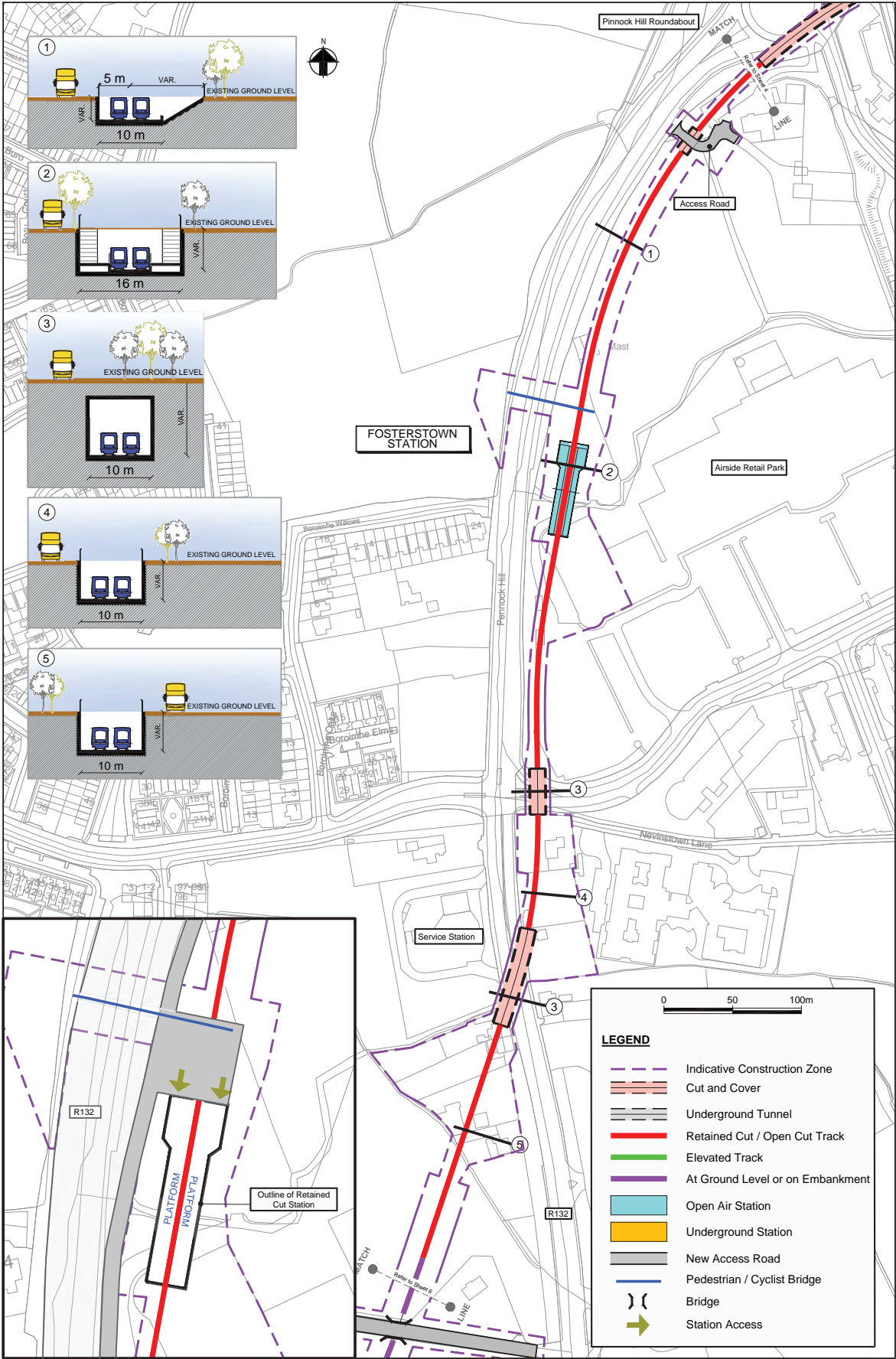
3. Seatown



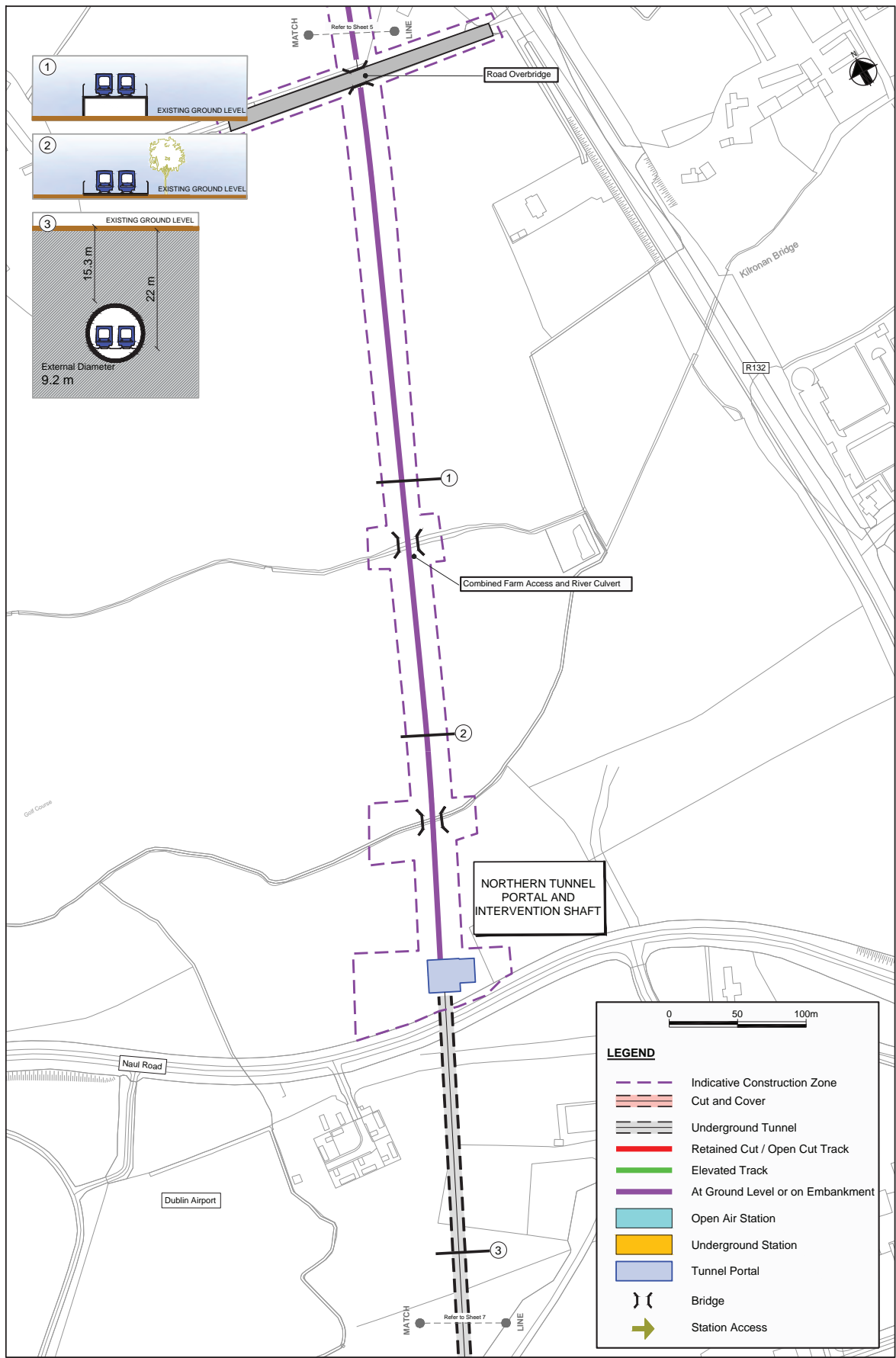
4. Swords Central



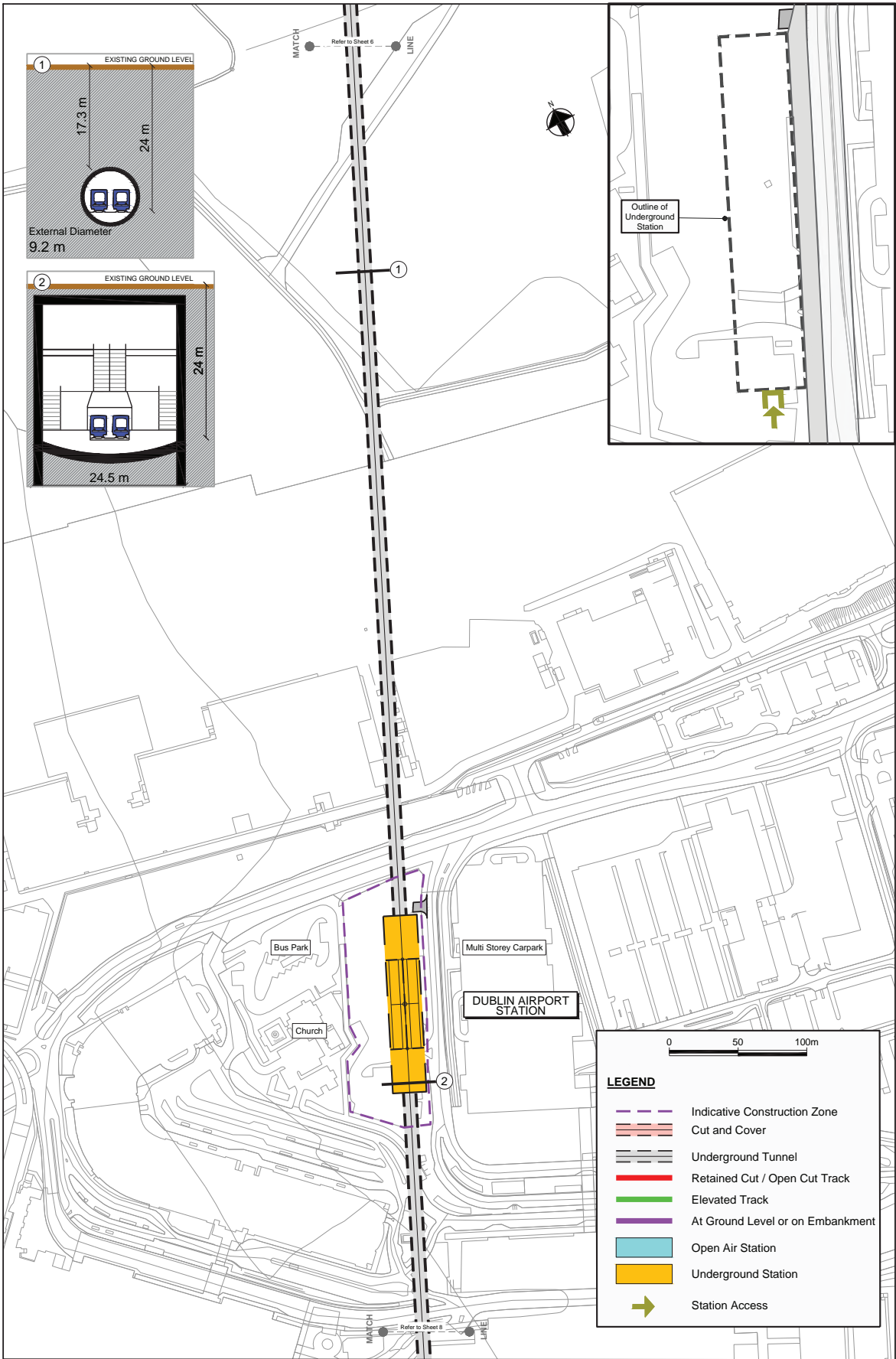
5. Fosterstown



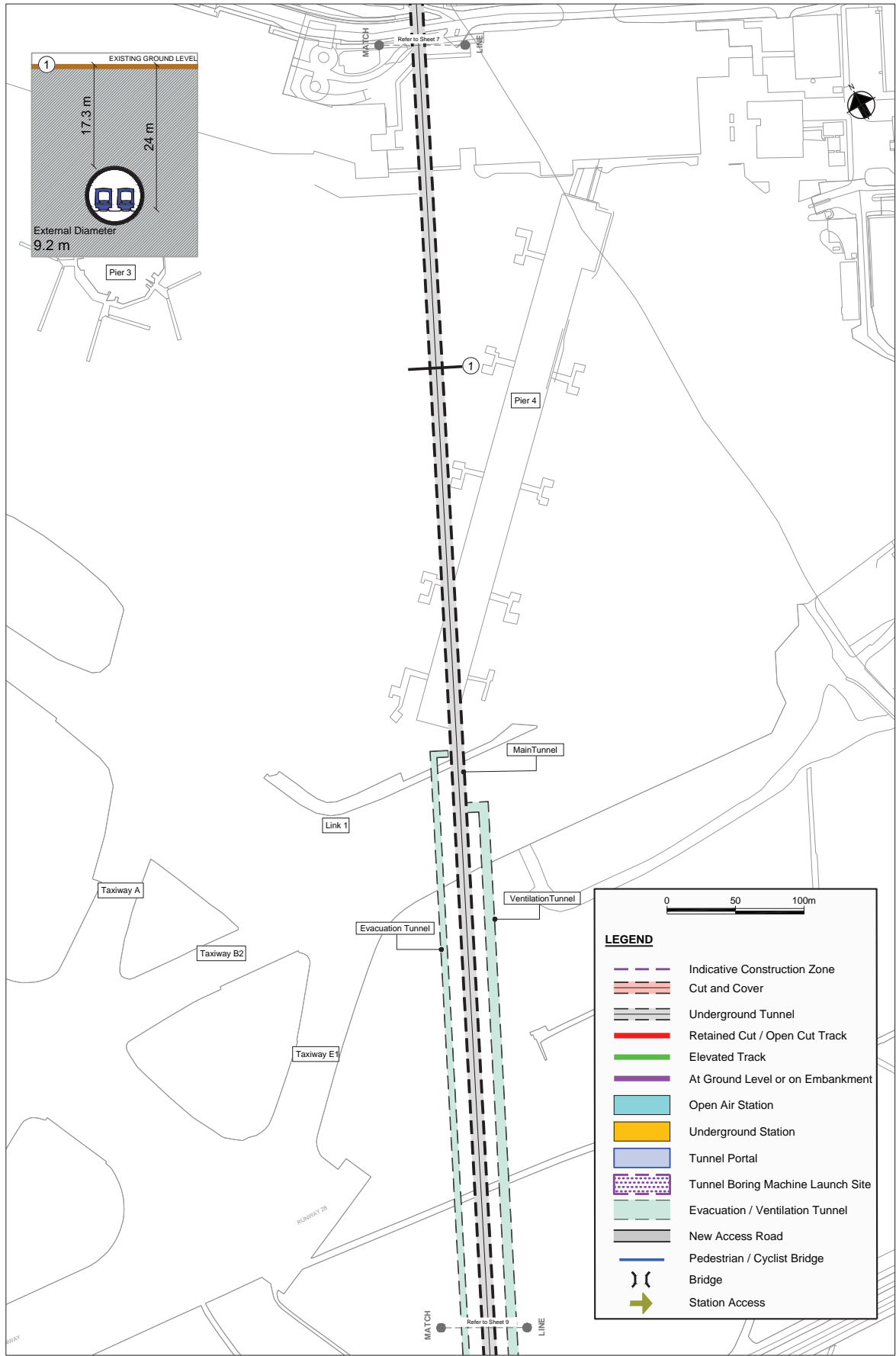
6. Northern Tunnel Portal and Intervention Shaft



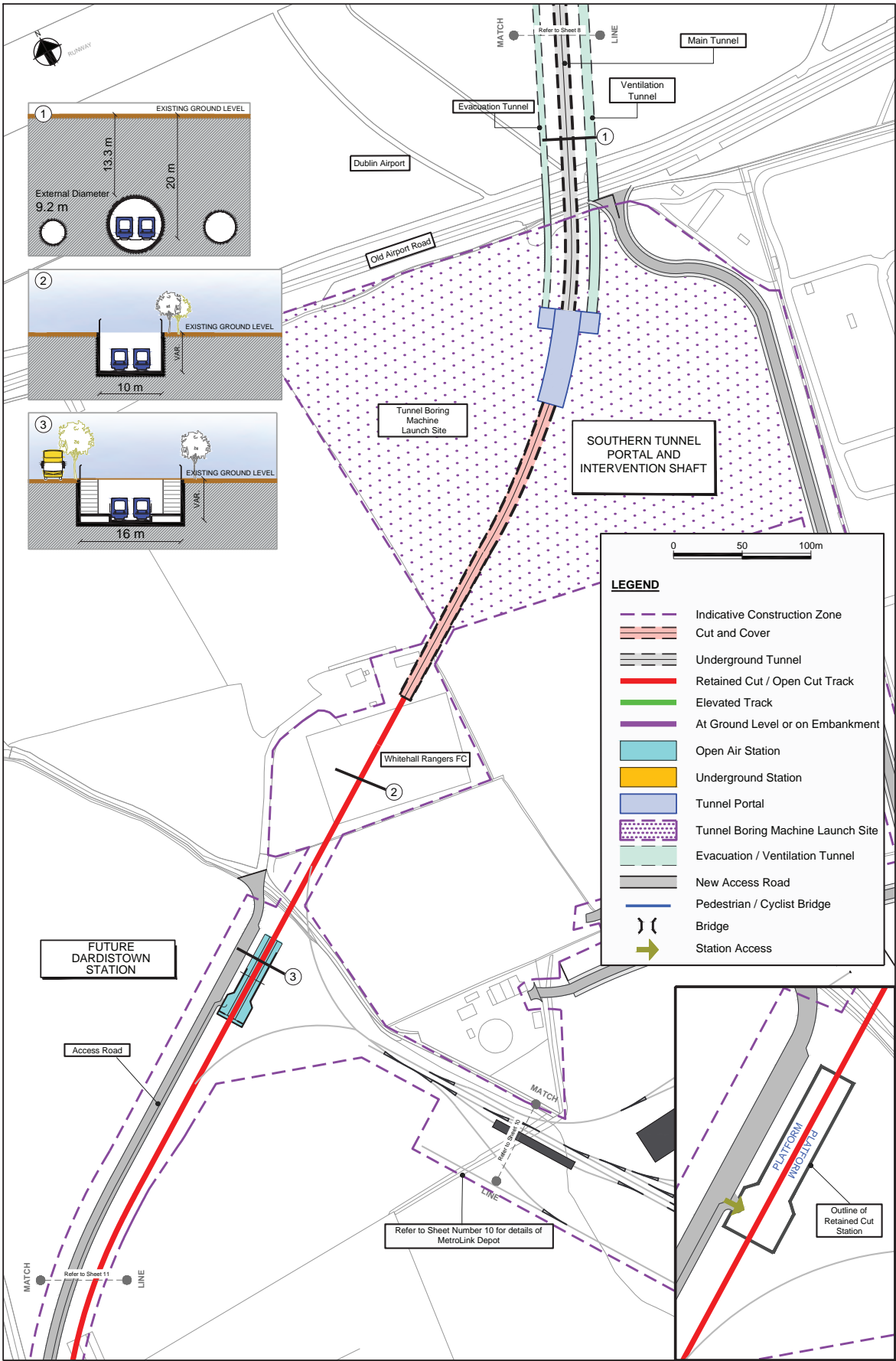
7. Dublin Airport



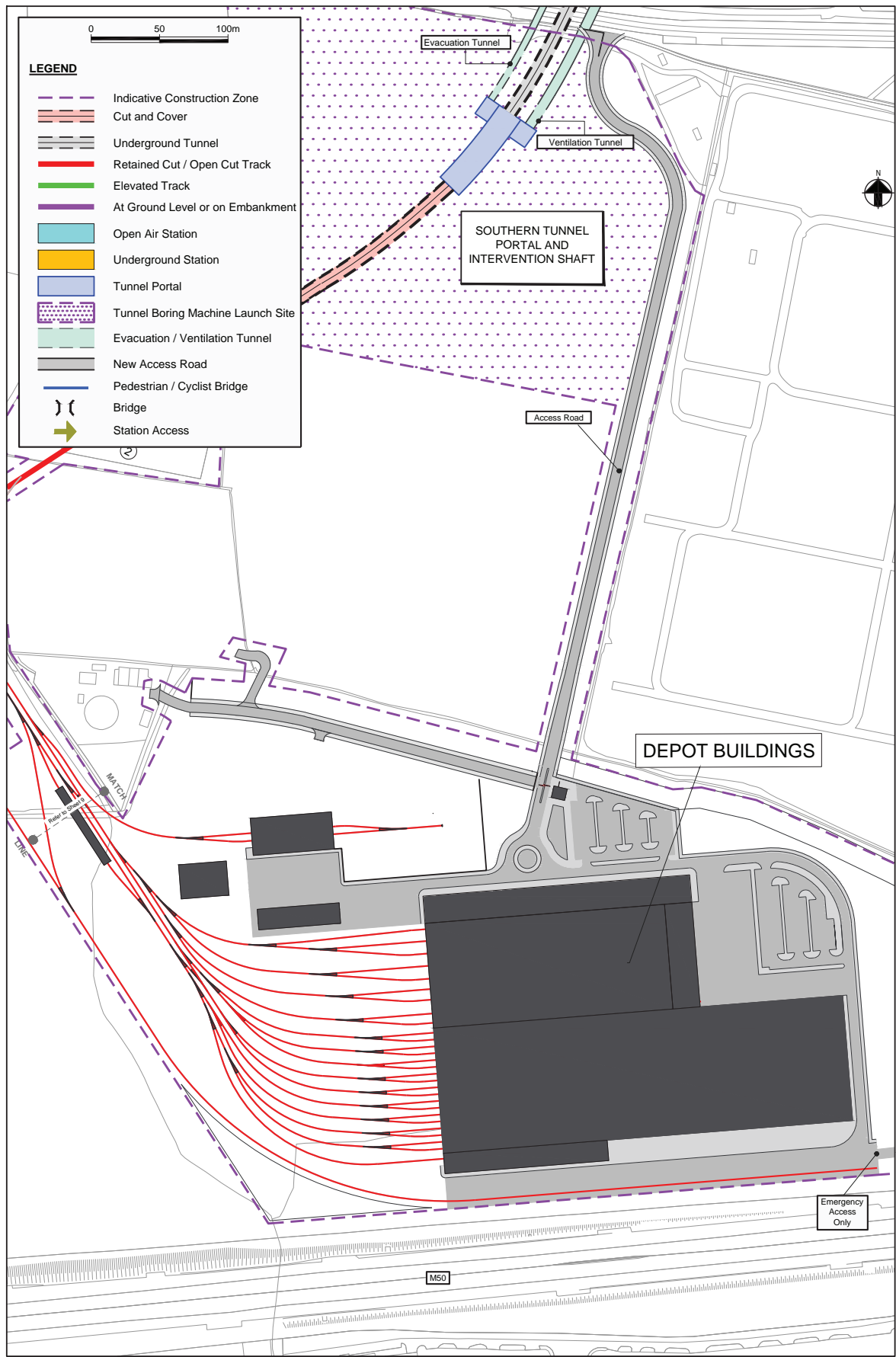
8. Dublin Airport (Continued)



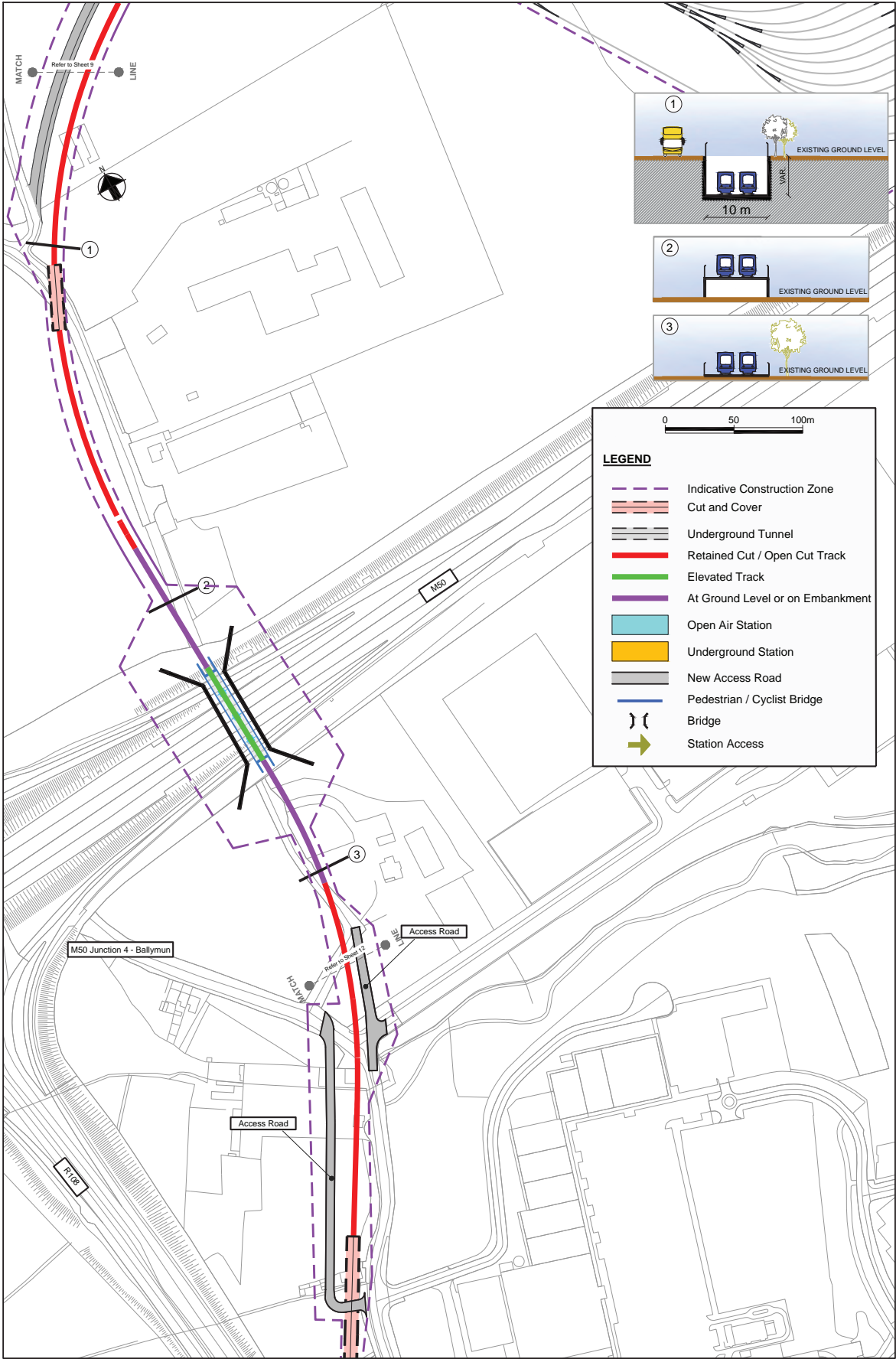
9. Dardistown (Future Station)



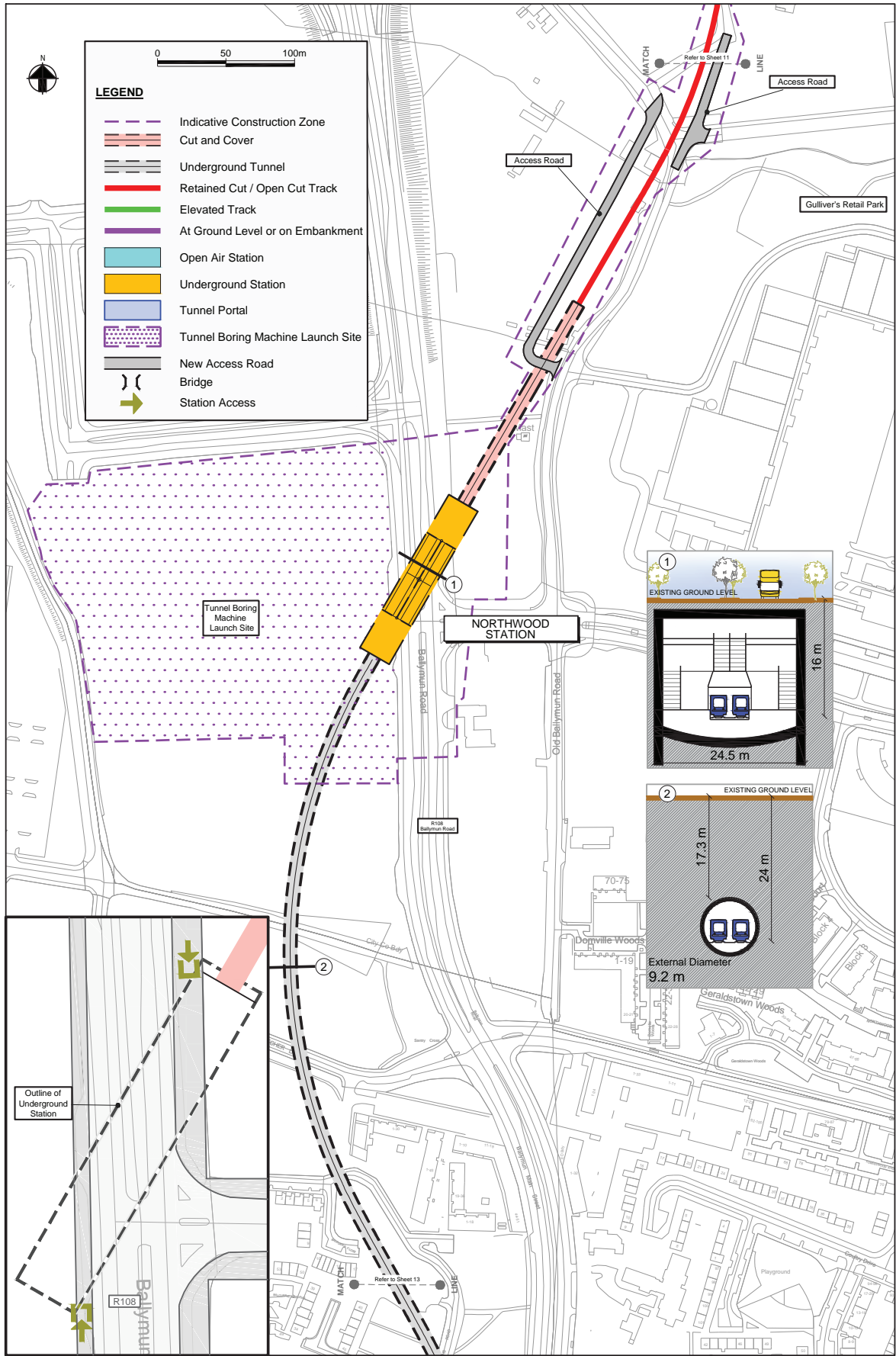
10. Dardistown Depot



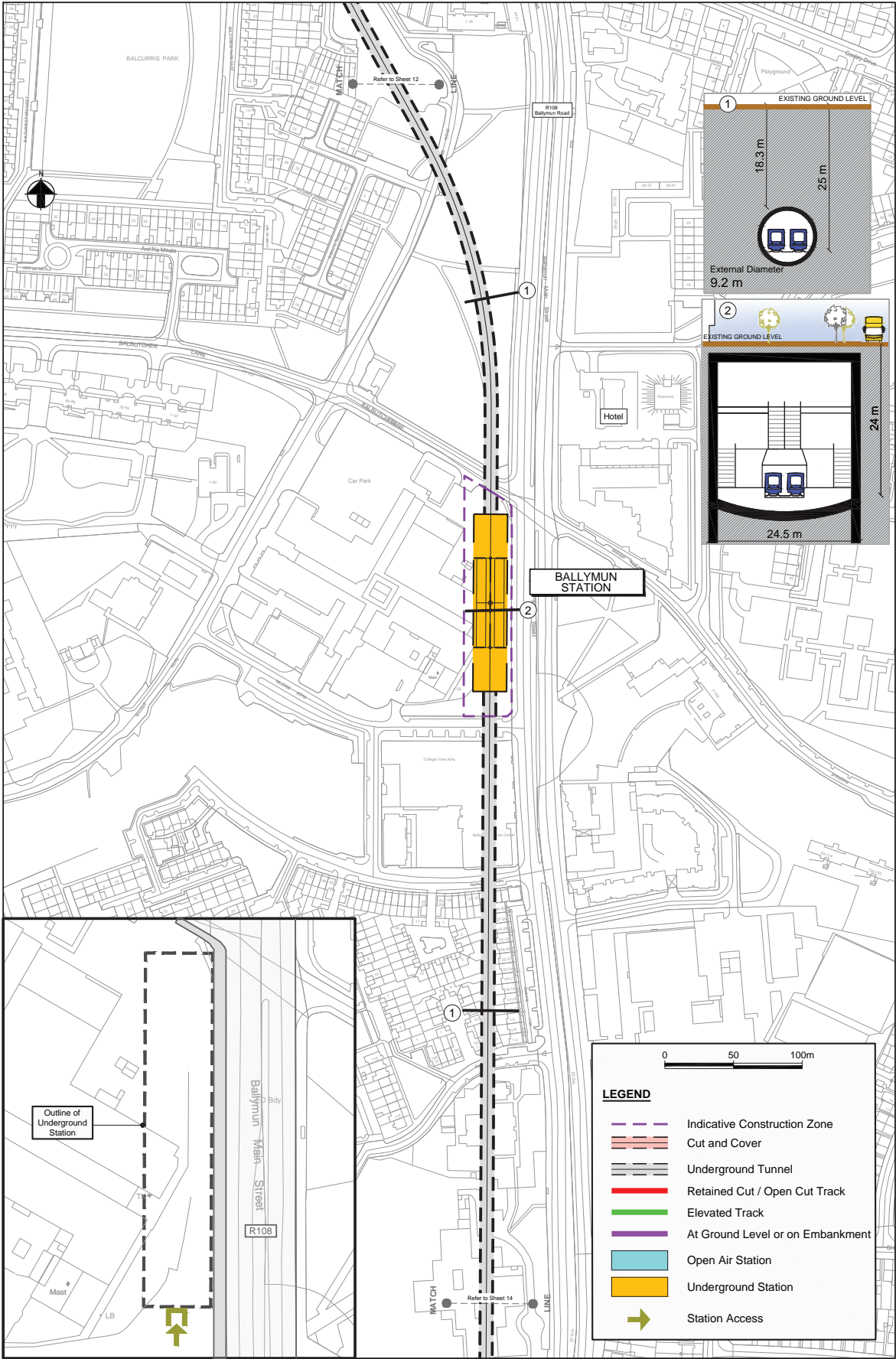
11. M50



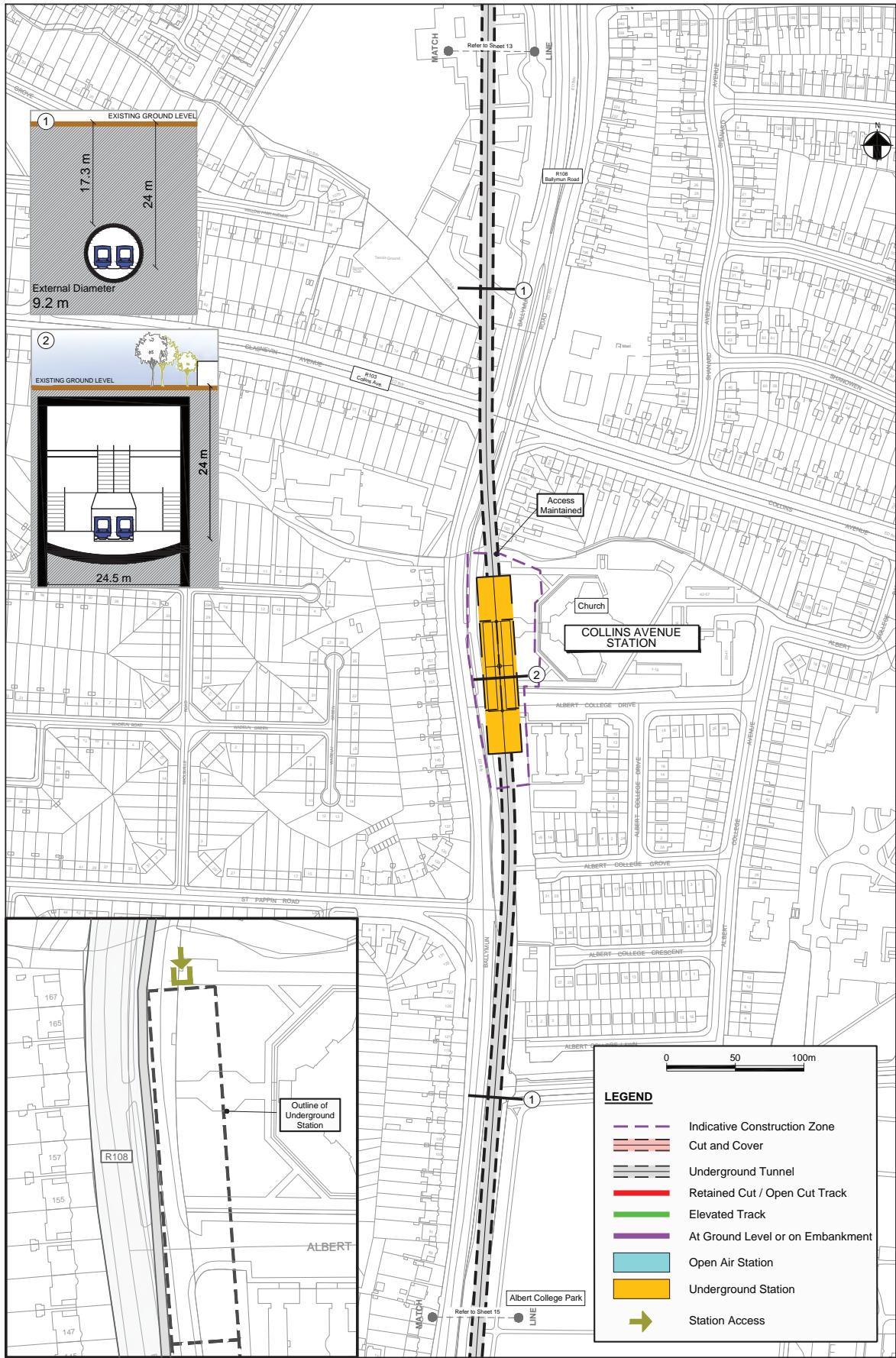
12. Northwood



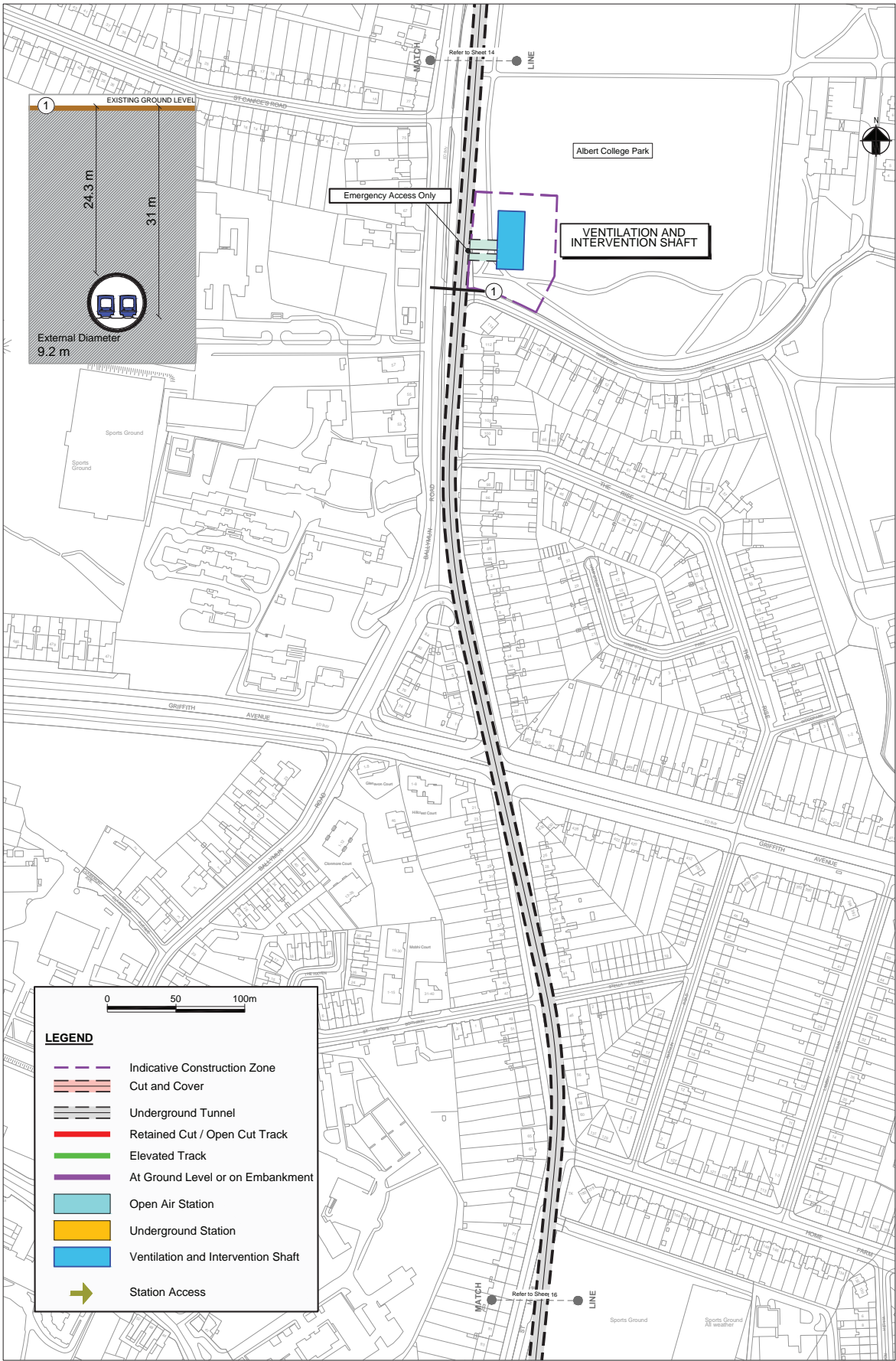
13. Ballymun



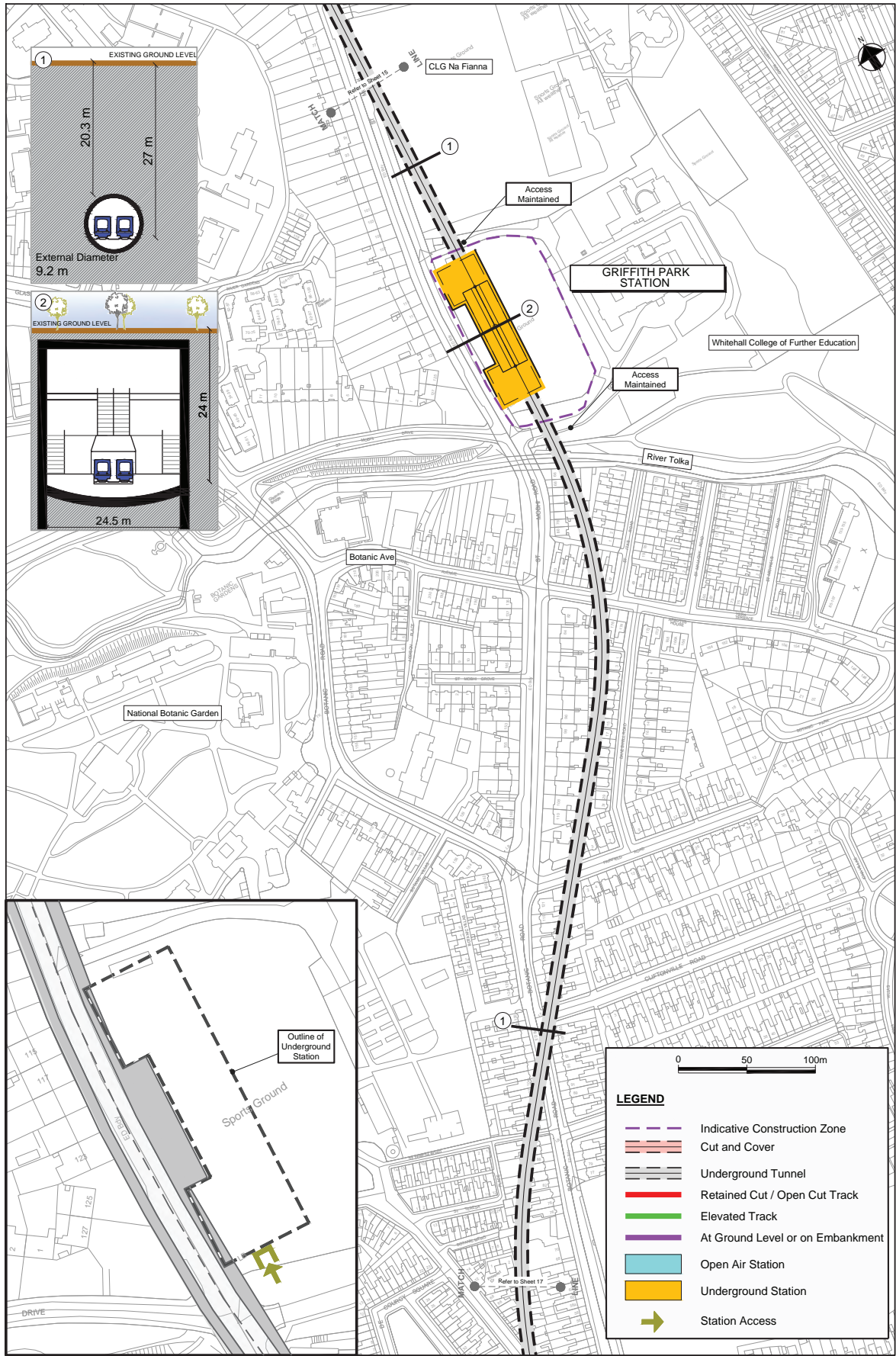
14. Collins Avenue



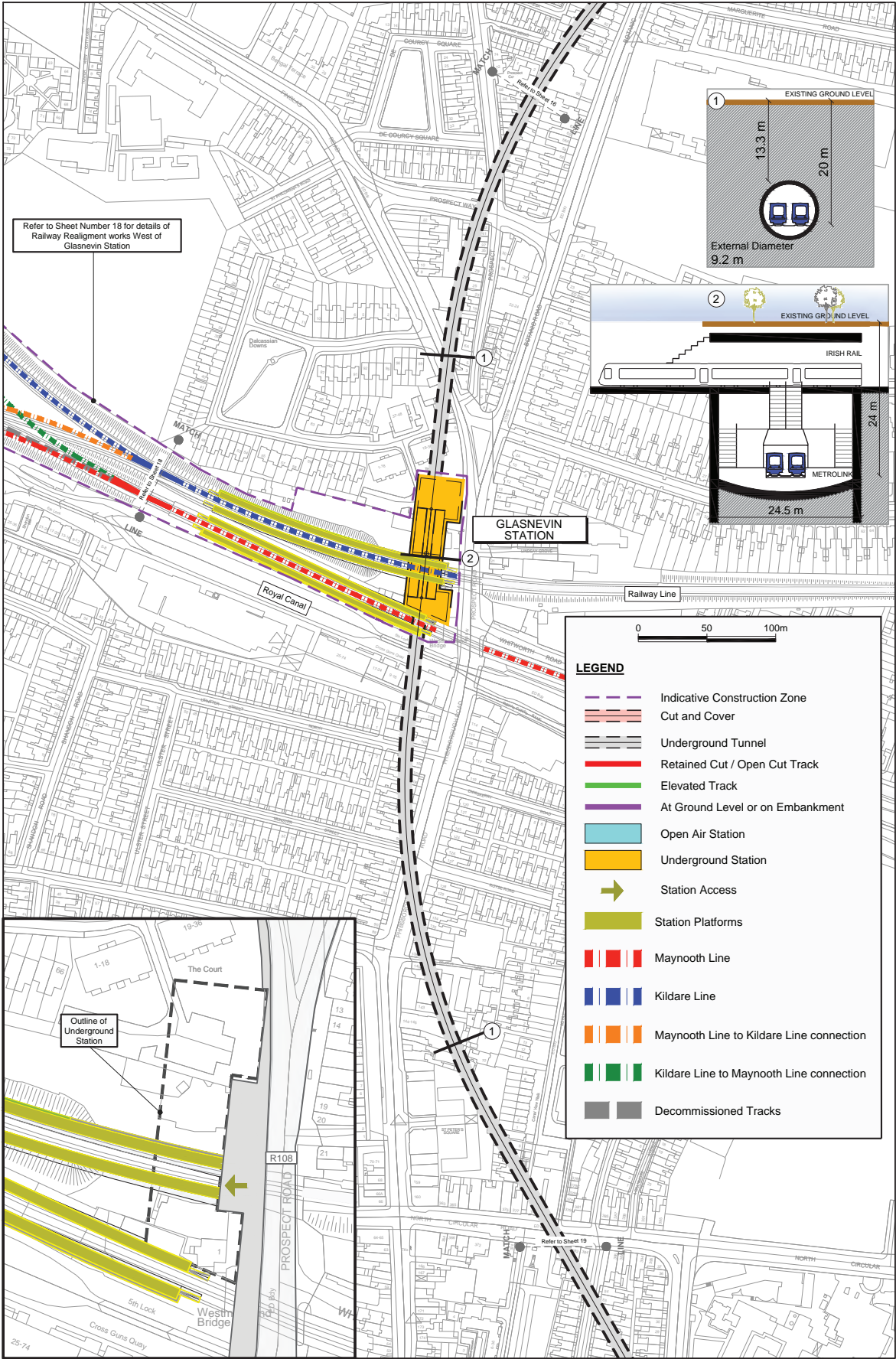
15. Albert College Park Intervention and Ventilation Shaft



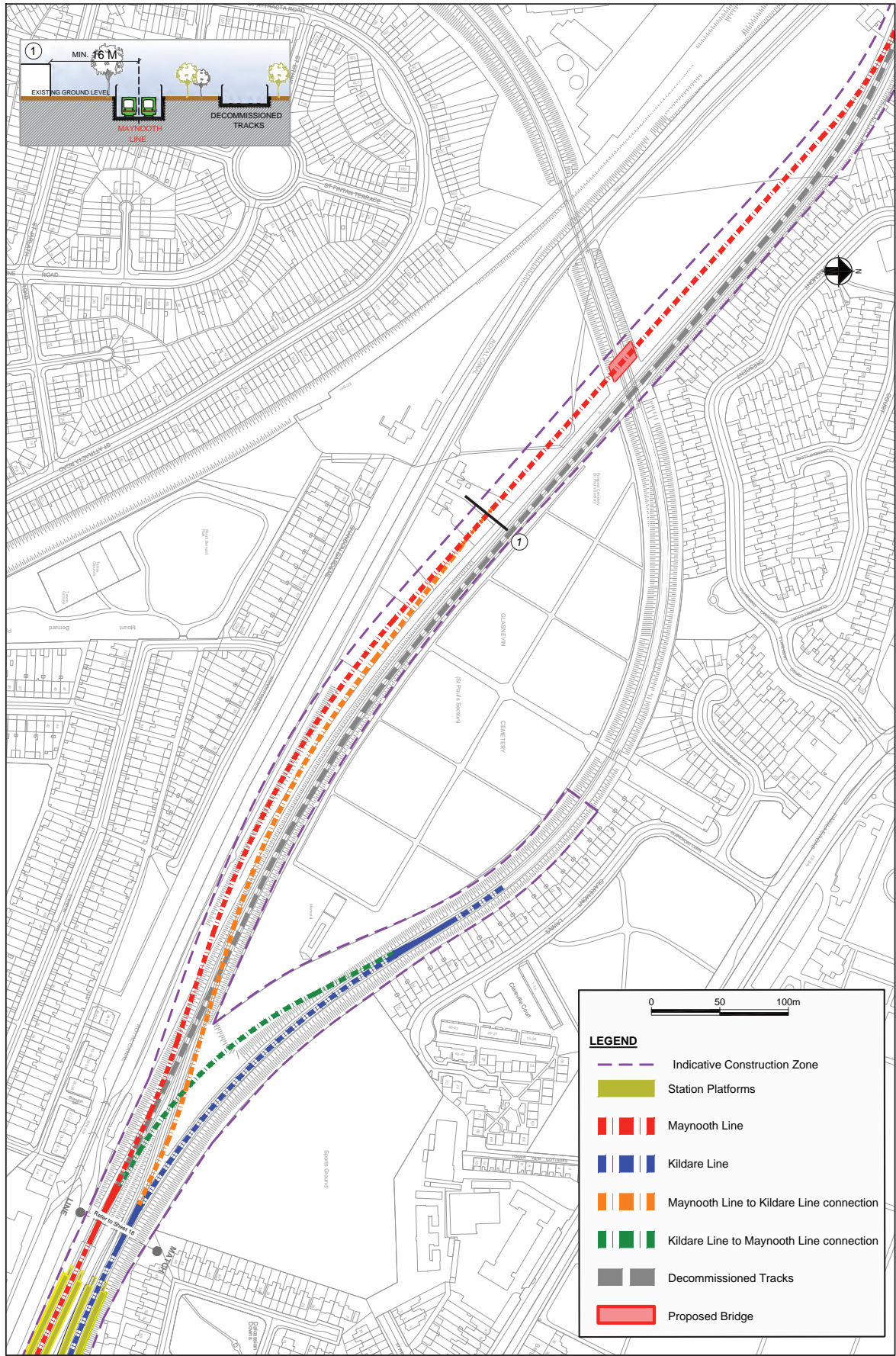
16. Griffith Park



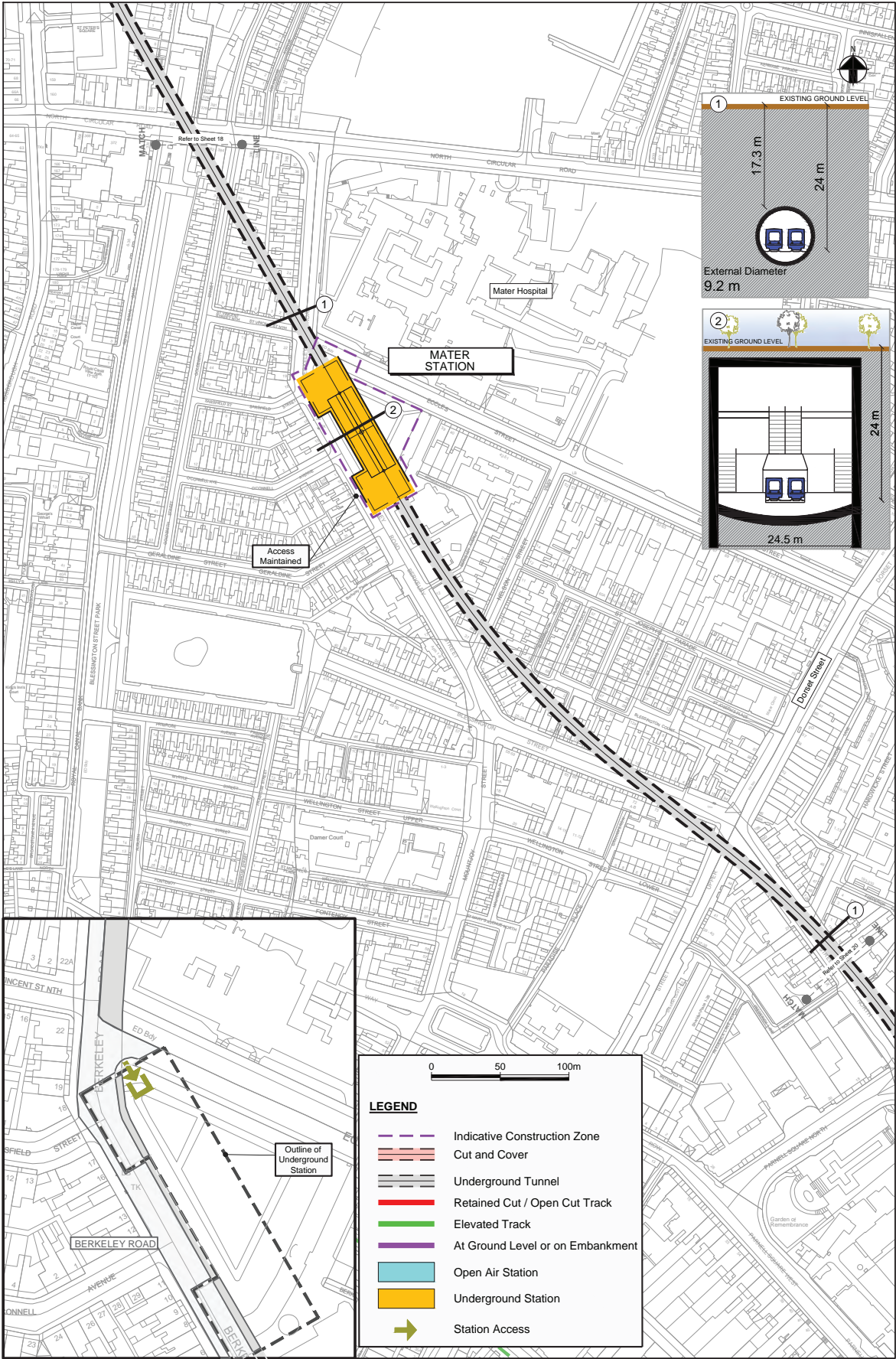
17. Glasnevin



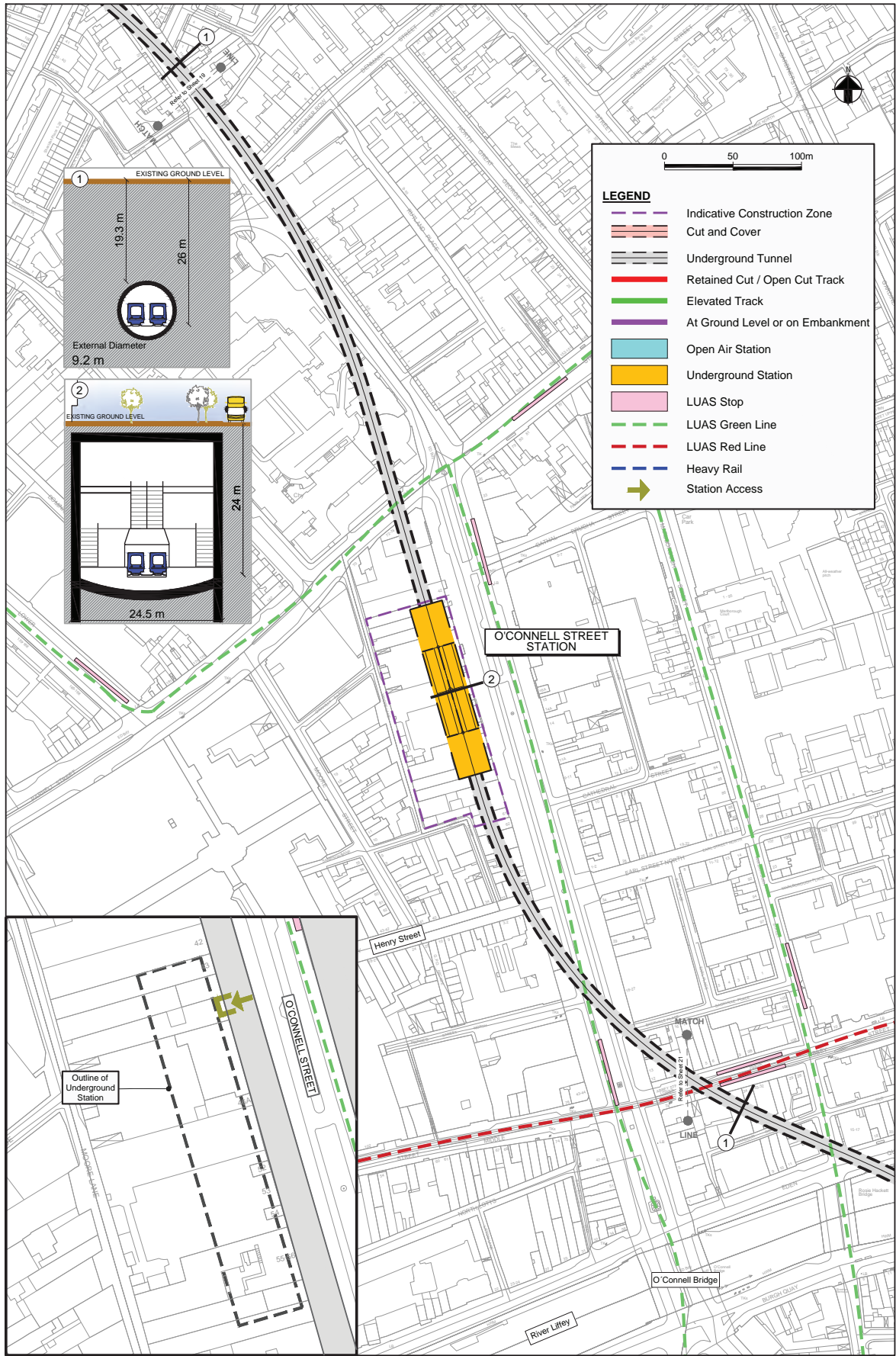
18. Railway Realignment West of Glasnevin Station



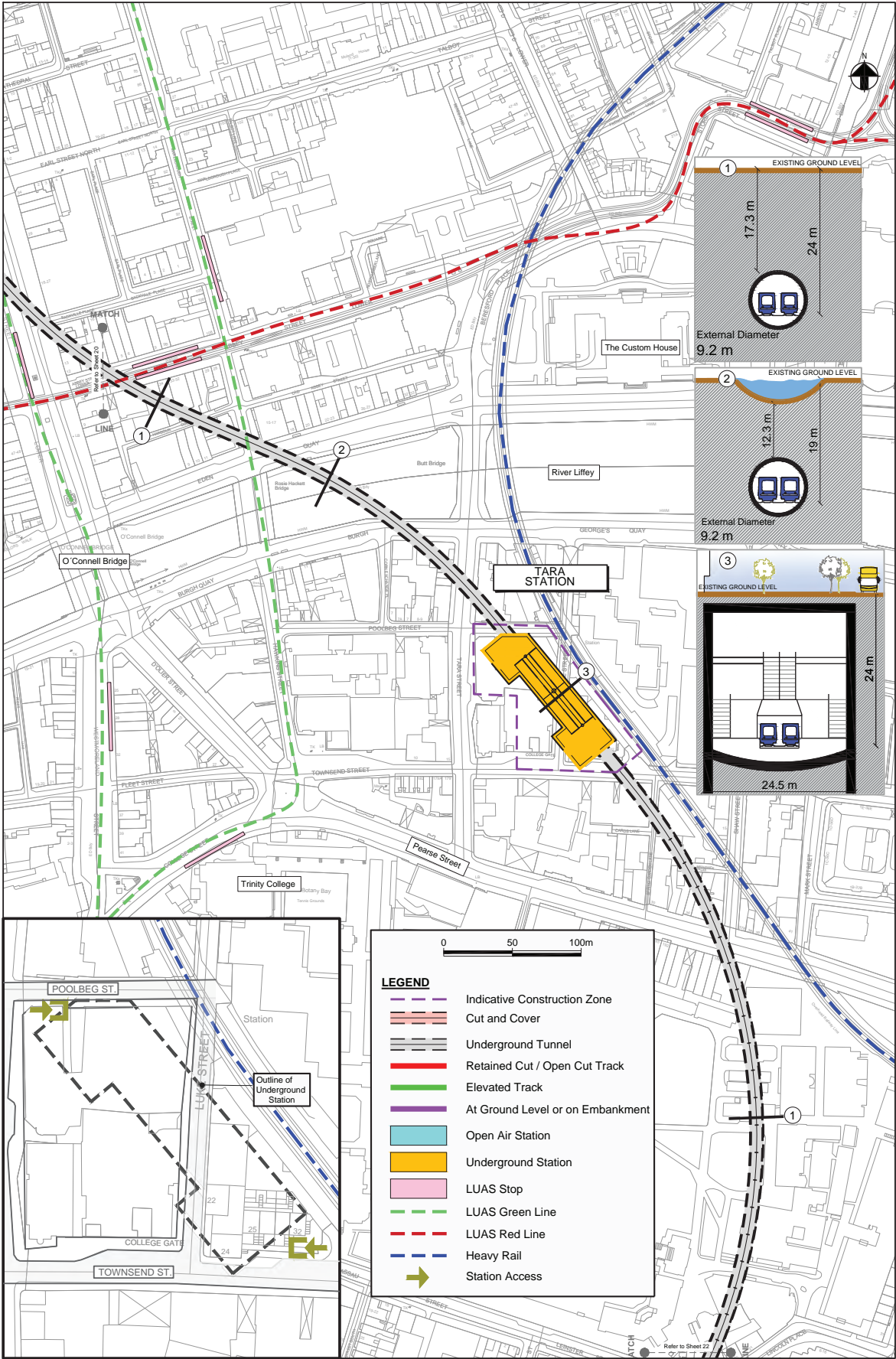
19. Mater



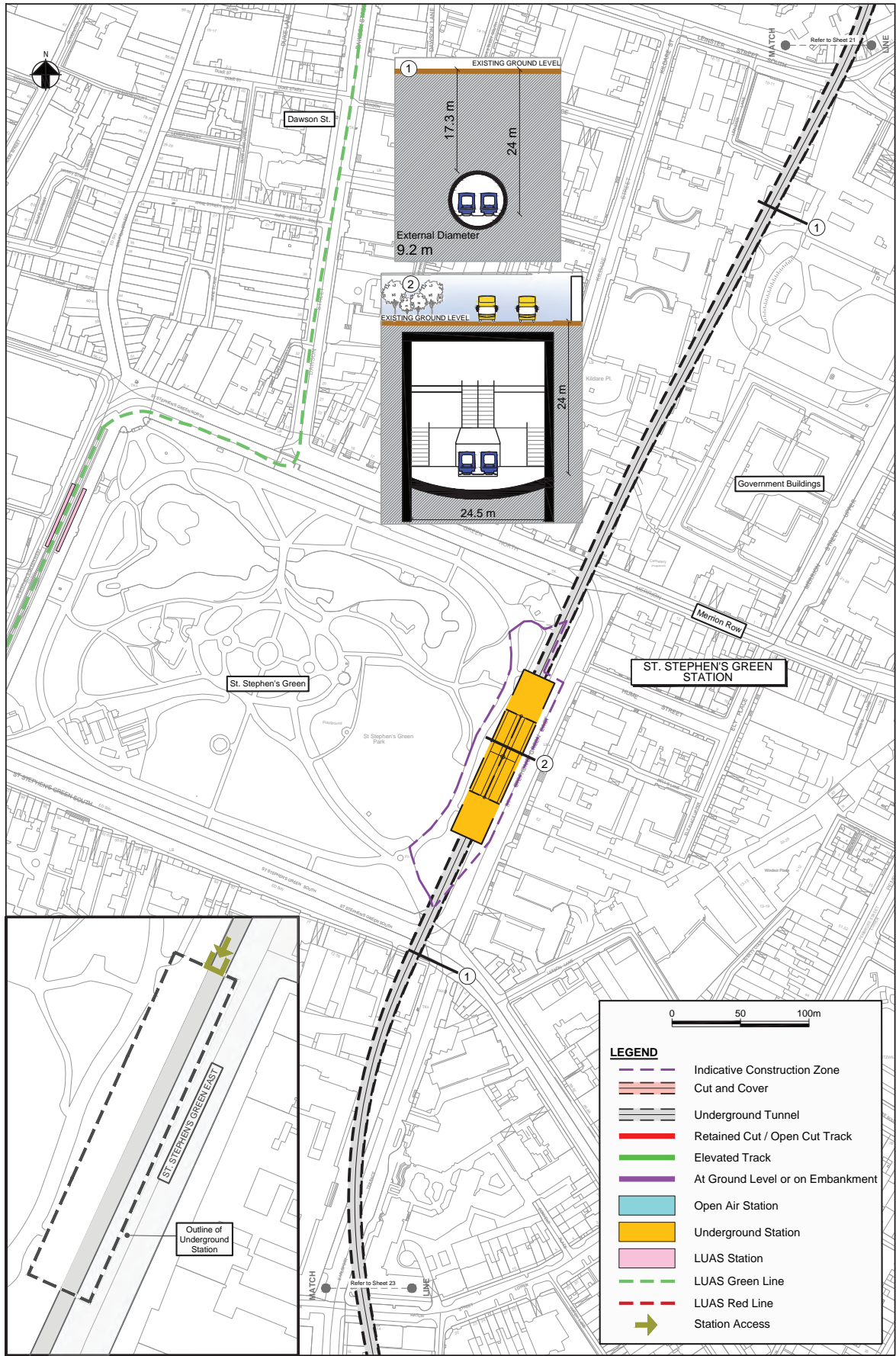
20. O'Connell Street



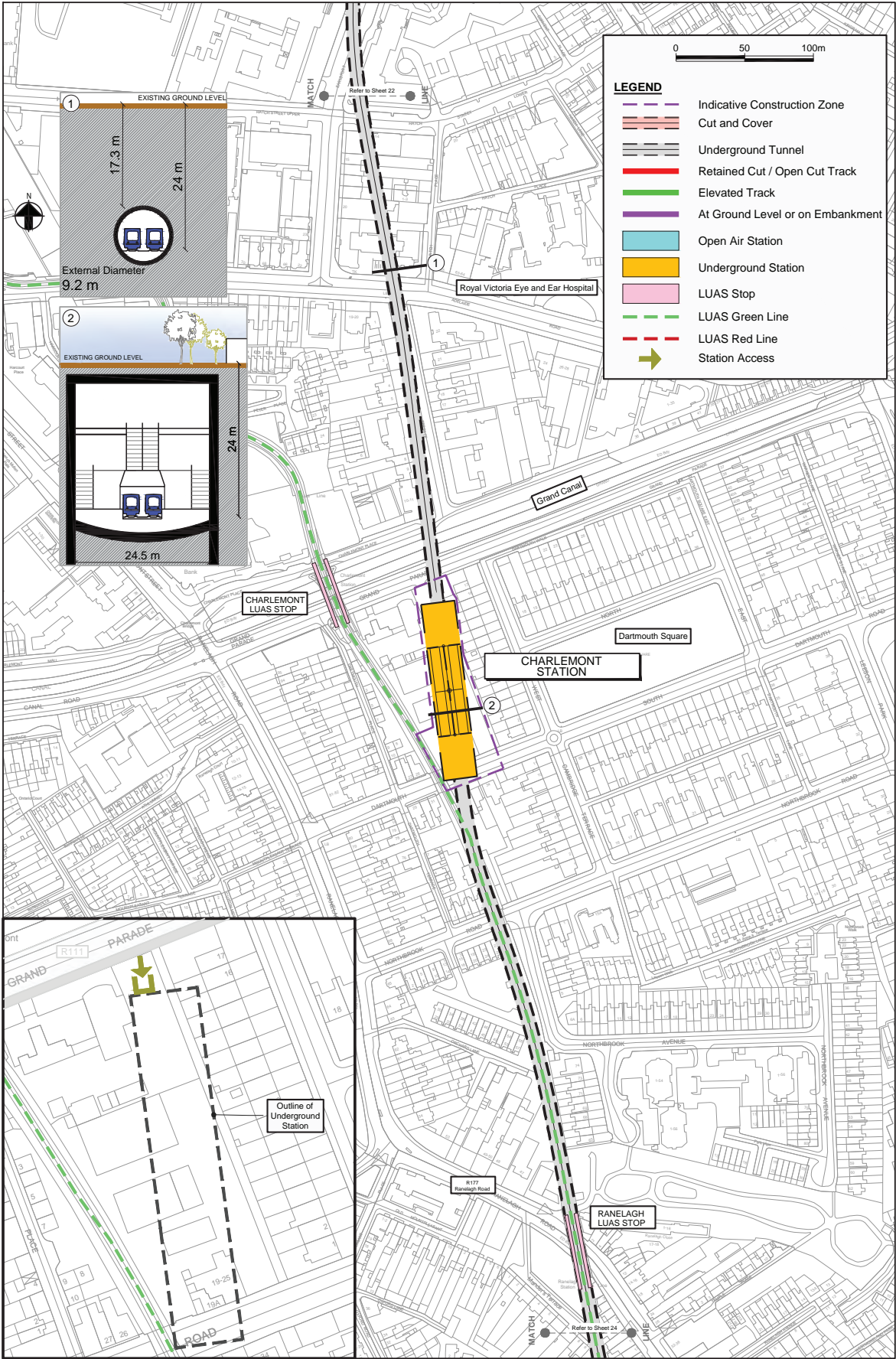
21. Tara



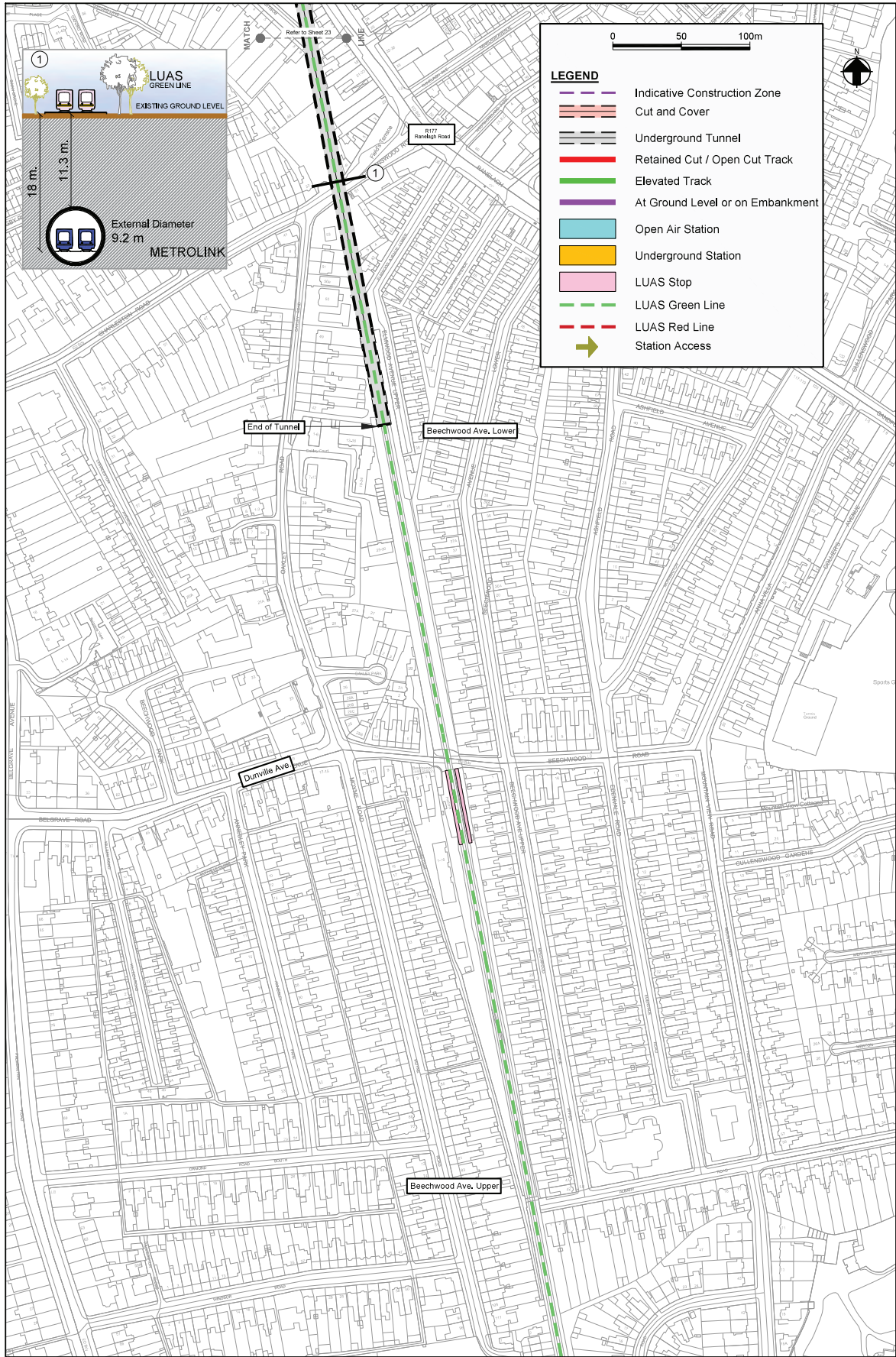
22. St Stephen's Green



23. Charlemont



24. Beechwood



METROLINK

MetroLink

Transport Infrastructure Ireland
Parkgate Business Centre
Parkgate Street
Dublin 8
D08 DK10

Email: info@metrolink.ie

Freephone: 1800 333 777

Operating Hours: Mon–Fri, 8.30am–5.30pm

www.metrolink.ie



Project Ireland 2040
Building Ireland's Future



Údarás Náisiúnta Iompair
National Transport Authority



Bonneagar Iompair Éireann
Transport Infrastructure Ireland