



**METRO NORTH
ORAL HEARING**

**PROOF OF EVIDENCE
DESCRIPTION OF
ARCHITECTURAL DESIGN**

Dr. John Smith
Tuesday April 7th 2009



**Metro North Oral Hearing
Proof of Evidence
Description of Architectural Design
Dr John Smith**

1. INTRODUCTION

- 1.1. My name is John Smith I studied architecture at University College London and obtained a doctorate at the Royal College of Art for research into 17th Century Parisian architecture. I have 24 years of professional experience, including 18 years of designing railway stations. As well as working on the design of Metro North, I have also worked on the Jubilee Line Extension, CrossRail and the East London Line. In Asia I worked on the Singapore Marina line, the Bangkok Transit System and the Hong Kong MTR. My other clients have included Iarnród Éireann, Metronet, Tubelines and the Kowloon Canton Railway Corporation.

2. METRO NORTH ARCHITECTURAL INTRODUCTION

- 2.1. These are all familiar images to any Dubliner but you may be wondering why I'm showing them to you now. The reason is because they all have one important thing in common...they are all within a 10 minute walk of one of the proposed Metro North Stops.

2.1.1.

Image of Fusiliers' Arch
Image of St Stephen's Green Park
Image of Royal College of Surgeons
Image of St Patrick's Cathedral
Image of Bank of Ireland
Image of Trinity College
Image of Dublin Castle
Image of Government Building
Image of Ha'penny Bridge
Image of Custom House
Image of O'Connell Street
Image of GPO
Image of The King's Inn

- 2.2. Dublin is one of the great European cities and I'm showing these pictures to suggest the profound impact Metro North will have on its future development.

- 2.3. All great cities need to be regularly renewed; to be re-shaped in response to the demands and aspirations of a new era. Dublin is gradually being renewed to meet the urban requirements of the 21st Century. Each era makes its own contribution to the historical regeneration of a city with the construction of infrastructure, housing and public buildings.

- 2.4. In the 21st Century, great cities invariably have high quality transport systems. Metro North will be the key component in the re-shaping of Dublin's transport infrastructure. It will link the Luas Green and Red Lines. It will directly link Irish Rail's Maynooth Line into the city's urban railway system. It will provide, via the Red Line, connection between Heuston Station and the airport.

- 2.5. The new metro will provide a North South spine for the city:

- 2.5.1. It will bring people from Swords directly into the centre of the city.

Image of Fingal Council building

- 2.5.2. It will take patients, staff and visitors to the Mater and Rotunda hospitals

Image of Rotunda Hospital

- 2.5.3. It will bring students to Dublin City University and Trinity College.

Image of Trinity College Library

2.5.4. It will bring art-lovers to the Hugh Lane Dublin City Gallery, The National Museum and the National Gallery, as well as the Gate and the Gaiety Theatres.

Image of Hugh Lane Dublin City Gallery

Image of National Museum

Image of The National Gallery

Image of The Gate Theatre

Image of The Gaiety Theatre

2.5.5. And it will bring sports fans to Croke Park.

Image of Croke Park Stadium

2.6. Metro North's impact on urban development can happen in a wide variety of ways:

2.6.1. By significantly improving the speed and ease of travel between people's homes and their places of work, it will begin to affect where people choose to live and where they're able to work. This, in turn, will affect where we decide to build future housing, offices and places of work for many years to come. Also, the areas around stations and transport hubs have the potential for greater density of development.

2.6.2. Bringing more people quickly and comfortably to theatres, museums and galleries can have an impact on the cultural life of the city. Improvements to transport, will help to make Dublin a more liveable place for residents, tourists and other visitors and it will have a major positive effect on the primacy and viability of the city centre.

Image of people in the city

2.6.3. At various points along the line, developments are being planned that will benefit greatly from their proximity to a Metro North stop. Examples include:

- The expansion of the Mater and Rotunda public hospitals.

Image of proposed Mater Hospital development

- The enhancement of Parnell Square as an important cultural quarter for the city.

Image of Dublin's Writers Museum

- The development of Dublin City University and the creation of knowledge-based industries by all of the city's universities.

Image of DCU

- The regeneration of Ballymun.

Image of Ballymun

- Terminal 2 represents a very significant development for Dublin Airport. Metro North will be the other key element in the creation of an international hub for the city. The provision of a modern, integrated, transport system, including a fast link from the airport to the city centre, will play a valuable role in promoting Dublin as a destination for overseas business investment.

Image of T2

And

- Also, new Metro North stops will facilitate the planned expansion of the city to the north – in Swords and on other land designated for development within Fingal.

Image of Swords development

All of these developments will be supported by the connectivity provided by a modern urban transport system.

Image of modern urban transportation system – Luas tram on bridge

3. ARCHITECTURAL VISION

3.1. As Architects, the design of Metro North is both a major challenge and a major opportunity to significantly benefit Dublin's urban development. The city will see a series of fine new public buildings in the form of the stops themselves. So, what will the new Metro North stops be like?

Animation of Metro North stops

3.2. Our architectural vision is to create a single coherent project. The modern clean lines and understated elegance of Luas will be continued and improved in Metro North. Wherever passengers find themselves, they will experience a consistency of style, materials and detail.

Image of Dardistown Stop - in rural location

3.3. To the north, in suburban and rural areas, the metro will have a discrete, modern presence in the form of a series of modestly scaled, ground level stops.

3.4. As we move south towards the city centre, the line goes underground in order to minimise disruption to the existing urban fabric and to preserve the city's historic core. Although the major part of these stops will be constructed below the surface, they will be bright open and spacious. Stops on the edge of the city centre will have entrances and ticket halls in elegant, glazed, pavilions at ground level, for example:

- At DCU

Image of DCU Stop entrances

3.5. Stops in central historic locations will be constructed almost entirely below ground. They will have the most minimal presence at street level so as to preserve the integrity of their settings, for example:

- At St Stephen's Green

Image of St Stephen's Green Stop entrance

3.6. Metro North stops will provide passengers with a high-quality, modern environment. They are designed to be accessible and comfortable to use. I would like to describe the architectural approach we have taken to the design of the stops. These computer-generated images of the new stops, as well as photographs from Luas and actual examples of similar projects illustrate the quality of design that the project seeks to achieve.

Image of a stop in Porto

4. URBAN DESIGN

4.1. The selection of Metro North's alignment has been shaped by a broad range of considerations:

- Local development plans
Image of Ballymun Stop
- Integration of existing and proposed transport infrastructure
- Areas of development and regeneration
- Stakeholder consultation
- And
- Environmental and engineering constraints.

4.2. These considerations have also impacted on the location of stops. In addition, there are particular local issues that have helped to shape the position and design of each stop.

Image of Griffith Avenue Stop entrance

- 4.3. While all stops will have common features to give a consistent identity the design of each Metro North stop – particularly those in the city centre - has been developed in response to the unique characteristics of each location.
- 4.4. Given these many, varied constraints, the aim has been to create civic architecture that will complement, enhance and integrate with its local urban environment.

5. TRANSPORT INTERCHANGE

- 5.1. The integration of Metro North with other transport systems is a key feature of the new line and of the Government's transport strategy, Transport 21. Metro North will link together existing services and future projects. Stops have been designed to allow easy transfer to other rail lines, such as the Luas Green Line at St Stephen's Green, the Luas Red Line at O'Connell Bridge and the Maynooth Line at Drumcondra.
Image of St Stephen's Green Luas Stop
Image of O'Connell Street trams top view
Image of interchange at Drumcondra Stop
- 5.2. The future Metro West project would interchange with Metro North at Dardistown. Irish Rail are also planning the Dart underground, which would be fully integrated with the Metro North stop at St Stephen's Green.
Image of interchange at Dardistown Stop
- 5.3. At other city centre locations, Metro North stops cater primarily for pedestrians and bus passengers.
- 5.4. At suburban stops, dedicated provision has also been made for interchange with cars, taxis and bicycles. Park and ride facilities are provided at: Dardistown, Fosterstown and Belinstown.
Image of interchange at Swords Stop
Image of park and ride at Dardistown Stop
Image of multi-storey car park and ride at Belinstown Stop
- 5.5. Inclusive design is a priority for Metro North, and the aim is that the mobility impaired can move conveniently between modes of transport. Where necessary, additional pedestrian facilities such as signal controlled crossings will be provided.

6. STATION SIZING

- 6.1. To aid the specification and architectural design of stops, a stop sizing assessment was carried out to ensure that peak pedestrian flows could be comfortably catered for at projected levels of usage in the year 2040. The capacity assessments covered all key areas of stops including:
- Platform widths.
Image of Swords Stop platform
 - Number of escalators.
Image of escalators that would typically be installed
 - Widths of stairways.
Image of Ballymun Stop stair way
 - Number of lifts
Image of O'Connell Bridge Stop lifts and escalators
 - Widths of passageways (including over bridges and subways).
Image of Ballymun Stop passageway
 - Number of ticket gates.
Image of Ballymun Stop ticket gateline
- And

- Ticket hall areas and points of access and egress.
Image of O'Connell Bridge Stop ticket hall

- 6.2. The stop assessments employed the station quantification procedures of London Underground to ensure that the designs provide for efficient movement of passengers in all areas of the stops.
- 6.3. For each stop the Central Case demand forecast for 2040 was calculated by the RPA. The forecasts took into account other transport services that are being planned, such as Metro West, Dart Underground and new Luas lines.
- 6.4. Application of the London Underground station planning calculations determined the requirements for facilities at each stop. These were compared with the standard design criteria applied at each stop and the specific stop designs, especially in relation to underground stops. Advice was provided to the architects, including advice on integration with Irish Rail at St Stephen's Green (Dart Underground) and Drumcondra. Further iterations of the designs were assessed and some micro-simulation assessments of selected underground stops was undertaken. These studies addressed key stop planning issues such as ensuring adequate separation of escalators to minimise crowding and delays.
- 6.5. The latest designs were concluded to provide sufficient capacity to accommodate the Central Case morning peak hour demands forecast for 2040.
- 6.6. At Drumcondra the stop will need to cope with event traffic from Croke Park stadium. The design accommodates 20% of stadium capacity passing through the station in 1 hour, with 20% of passengers using Irish Rail Services. The stop will be provided with appropriate gates in the arcade passageway to provide for crowd control.
Image of Croke Park stadium crowd

7. STOP ENTRANCES AND URBAN CONTEXT

- 7.1. The way that stops are integrated into their surroundings will be important. In historic locations, entrances will be restrained in scale and will blend in discreetly with their urban context. Where appropriate, new materials will be selected that respect the materials that already exist in the area. Other members of the RPA design team will describe in more detail the approach to the conservation of historic structures, sculpture and landscape.
Image of a Porto stop escalator entrance
- 7.2. In other locations, Metro North entrances will have a bright, modern design and will form a series of distinctive new structures across the city.
Image of DCU Stop entrances
- 7.3. The project will include local streetscape improvements such as pedestrianisation, road realignments and kerb adjustments to provide better footpath widths. Hard landscaping and features such as seating, lighting, signage and planting will enhance the local environment.
- 7.4. In some locations entrances will be carefully integrated with new developments:-
- The entrance at Mater will be incorporated into the new hospital extension.
Image of Mater Hospital development
 - At Ballymun, the entrances will be integrated with the local regeneration proposals.
Image of Ballymun Stop
 - At the Airport, the stop is integrated with the Terminal 2 Project now moving towards completion

8. SURFACE STOP PLANNING

- 8.1. The planning of surface stops is relatively simple and direct, so that passengers are able to get on and off platforms as quickly and safely as possible.
- 8.2. They have generally been designed with a central island platform or two side platforms.
Image of Swords Stop island platform
Image of Belinstown Stop side platforms
- 8.3. There will be a consistency of style and design across all the surface stops. They will form a series of elegant structures running north from Northwood to Belinstown (although Airport will be underground). High-quality, well-detailed materials, such as glass and stainless steel, will give Metro North a sleek, modern appearance.
- 8.4. While the height of platforms in relation to street level is dependant on site characteristics, they all provide for step-free access. To cater for pedestrian movement from street level to platform level, ramps are provided at the end of platforms. Marked pedestrian crossings are provided at the base of platform ramps to enable passengers to cross between platforms. Special consideration for the mobility impaired includes features such as handrails and tactile paving.
Image of Dardistown Stop
- 8.5. Stops have been designed to integrate conveniently and safely with adjacent roads and with other modes of transport. Dedicated provision has been made for pedestrian crossings, bus stops, car drop-off bays and bicycle parking.

9. UNDERGROUND STOP PLANNING

- 9.1. The planning of underground stops is far more complicated than surface stops, particularly those in or near the city centre. Although the stops vary greatly in their design scale and planning, we have followed a number of common principles.
Image of St Stephen's Green ticket hall
- 9.2. Although underground stops are, by necessity, large and complex, they are designed to be bright, open and safe. Public areas are planned to be clearly legible to passengers, ensuring they can find their way around with confidence. Stop planning follows instinctive wayfinding principles: Passengers will be able to clearly understand where they should be going; there will be a logical progression between street and platform; there will be good visibility and orientation.

10. ENTRANCES AND TICKET HALL

- 10.1. Wherever possible, entrances to underground stops are located so they are easily visible and accessible.
- 10.2. While the specific urban context of each entrance dictates many design features, a level of consistency has been sought to provide familiarity for users. Given any local constraints, the aim is to bring people directly to ticket halls without lengthy passageways or many changes of direction.
- 10.3. Once we move underground, passengers will find bright, open concourses. Areas used by the public will be spacious and the design seeks to incorporate natural light which will flood through roof lights into ticket halls and even down onto platforms.
Image of Drumcondra light to ticket hall level
Image of Drumcondra light to mezzanine and platform level

- 10.4. The ticket hall level can be broadly divided into the paid and unpaid sides, which are separated by the ticket gate line. On the unpaid side of the gate line, passenger facilities such as ticket vending machines, help-points and local area information have been provided.
Image of ticket gate line at Drumcondra Stop
- 10.5. Stop control rooms - which will be staffed during operational hours - will have a view of the ticket hall, ensuring adequate monitoring and enabling staff to provide assistance to those seeking help. Monitored CCTV will give full coverage of all public areas.
Image of stop control room at O'Connell Bridge Stop

11. PLATFORMS

- 11.1. All Metro North platforms are 94m in length, which is sufficient for two joined metro vehicles. Platform widths vary in accordance with the number of people expected to use the stop. Platforms also have to incorporate lifts, escalators and other structures that ensure maximum accessibility without impacting on the minimum areas required for safe, comfortable passenger circulation.
Image of platform level at Drumcondra Stop

12. ACCESSIBILITY

- 12.1. The design of Metro North has been guided by inclusive design principles to enable everyone, including the mobility impaired, convenient access and use of metro services, premises and information. The aim is that all passengers can find their way through the stop instinctively, without over-reliance on signage.
Image of lift
- 12.2. The Metro Accessibility Group will discuss and agree actions to optimise the overall accessibility of the system. The Metro Accessibility Group will include the RPA, and relevant passenger representatives such as the National Council for the Blind of Ireland, the Irish Wheelchair Association, the Association for the Deaf, and the National Council on Ageing and Older People. They will provide ongoing advice and guidance about how to make the stops suitable for all groups within society.

13. ESCALATORS AND LIFTS

- 13.1. Access between street level, ticket hall and platforms will be by escalators and lifts. Given the depth of Metro North stops, escalators will provide the primary means of vertical circulation.
Image of escalators at St Stephen's Green Stop
- 13.2. Lifts provide vertical access within all underground stops, ensuring step free access to all public areas. There will be a minimum of two lifts from street level to platform level, each to hold a minimum capacity of 17 persons.
Image of lifts and escalators at O'Connell Bridge Stop

14. EMERGENCY ESCAPE

- 14.1. Passenger safety is paramount and this has been reflected in the design of all Metro North stops. Emergency means of escape are provided from every level. Escape cores have been carefully designed to ensure that maximum predicted passenger numbers in 2040 can be catered for.
- 14.2. Primary means of escape will be via staircases which connect all levels (including maintenance areas and plant rooms) to street level, where further emergency evacuation

procedures will be in place. In addition, lifts will be provided for the use of emergency services personnel. Emergency lifts will be capable of providing space for two personnel carrying a stretcher. Our fire engineer, Tom Keeper, will give a more detailed explanation of fire safety provisions.

15. MATERIALS AND AMBIANCE

15.1. The materials selected for Metro North stops have been chosen to provide public environments that are both aesthetically pleasing and functional. A consistent approach to the use of materials and finishes will ensure a familiarity between stops and help with the recognition of stops at street level. The choice of materials and finishes will be based on several criteria, including:

- Durability
- Environment
Image of Luas canopy detail
- Ease of cleaning & maintenance
- Slip resistance of paving
Image of slip resistance paving and tactile paving
- Metro branding
And
- Meeting the needs of people with disabilities or visual impairment.

15.2. Materials and finishes will generally be modern, bright and hard-wearing, including:

- Toughened glass
Image of glass detail
- Stainless steel
Image of stainless steel handrail detail
And
- Natural stone

16. ART

16.1. An art budget will be allocated for many stops. This budget will allow the inclusion of art works from artists with the aim of enhancing Metro North.

17. PASSENGER INFORMATION AND FACILITIES

17.1. A comprehensive approach to the provision of passenger information and facilities has been taken in the design of all stops:

18. PASSENGER INFORMATION

18.1. Information regarding services, safety and other matters will be displayed at convenient and suitable locations throughout stops. Information provision includes:

- Passenger Information Displays above gate lines and on all platforms
Image of O'Connell Bridge Stop signage
Image of Swords Stop information and facilities
- Variable message displays at stop entrances and ticket gate lines.
- Directional signage
Image of Airport Stop
- Local area information
- Operator information
- Network maps

And

- Public address systems

19. PASSENGER FACILITIES

- 19.1. The provision of facilities such as emergency help points, passenger help points, ticket vending machines, ticket validation points and gates, shelter, seating, waste bins and clocks will help to ensure a comfortable, safe and convenient experience for passengers.
Image of O'Connell Bridge Stop gate lines and ticket machines

20. ADVERTISING

- 20.1. To help the financial viability of metro, advertising will be used to generate revenue. However the amount of advertising will be controlled and only displayed in locations where it will not detract from the passenger experience or cause visual clutter.
Image of Drumcondra Stop advertising
- 20.2. Digital advertising sites will be located at ticket concourse, mezzanine, circulation areas and on tunnel walls opposite island platforms.
Image of O'Connell Bridge Stop advertising
- 20.3. Surface stops will have advertising displays at locations along the platform.
Image of Luas advertising displays
Image of Swords Stop advertising on platforms

21. DETAILED DESCRIPTIONS OF UNDERGROUND STOPS

- 21.1. I will now go through the design of each underground stop in some detail. I will start with St Stephen's Green and move northwards.

22. AREA 107: ST STEPHEN'S GREEN STOP

22.1. Site location

Image of site location

22.1.1. The proposed location of St Stephen's Green Metro North stop is at the junction of St Stephen's Green and the southern end of Grafton Street.

22.1.2. The surroundings consist of a wide variety of different uses including many retail and commercial properties. There are important government and cultural buildings nearby, as well as many bars and restaurants. The Luas Green Line, numerous bus routes and the proposed Dart Underground means that this stop will become an important transport interchange.

22.1.3. Significant local buildings include the Royal College of Surgeons, The Dáil, The Gaiety Theatre and several five star hotels.

22.1.4. St Stephen's Green park is one of the City's most historic green spaces, the current layout of which dates from the 1880s. The park, and all the associated buildings, features and statues, has recently become a National Monument. St Stephen's Green will be restored to its original Victorian park layout after construction works are complete.

Image of St Stephen's Green Park

22.1.5. The plaza around the North West corner of St Stephen's Green will be pedestrianized. The whole area will be subject to an integrated landscape design to incorporate the new metro north structures. Good quality materials such as natural stone will be used throughout the scheme and historic features such as railings and street furniture will be conserved and reinstated at the end of the works.

22.2. Stop box

Image of St Stephen's Green Stop long section

22.2.1. St Stephen's Green stop will form part of a major interchange station with the proposed Dart Underground. The Dart underground station will be located largely under the northern boundary of St Stephen's Green and will share the Metro North ticket concourse.

22.2.2. The stop is located next to the existing Luas Green Line. There are also plans to extend Luas Green Line to connect to the existing Red Line.

22.2.3. The ticket hall will be constructed under the road at the junction of Grafton Street and South King Street. The main stop box is largely built in the location of the pond in St Stephen's Green park; the box is approximately 120m long, 34m wide and 21m deep. Below the Metro North platforms, another level will be constructed to accommodate part of the Dart Underground station.

22.2.4. The architectural design of St Stephen's Green Stop reflects its status as a major city centre interchange station, with spacious ticket hall and platform areas. However, despite its large scale the design minimises the visual impact on its historic context and the surface expression of the stop is very limited in its scale and its extent.

22.3. Ground Level

Image of ground level plan

22.3.1. Entrances to the stop are designed to respect the character of St Stephen's Green. An understated approach has been used to reduce the visual impact of the

entrances. For this reason, there are no canopies over the entrances. The two escalator entrances are simply enclosed by low walls.

22.3.2. One entrance is located at St Stephen's Green West, close to the Luas Green Line stop and provides easy access between the two systems.

22.3.3. Another entrance is located at St Stephen's Green North.

22.3.4. Other ground level structures associated with the stop are located within the park. These include escape stairs, fireman's lifts and vent shafts. There are three sets of escape stairs and lifts, and as far as possible, these have been located to have the least impact in St Stephen's Green. The top of escape stairs stop flush with ground level and have fail-safe opening hatches.

22.3.5. One fireman's lift and escape stair is located between the footpath and the railings on St Stephen's Green west and another in a similar position on St Stephen's Green north. The third is at the southern end of the pond. Heavy planting of foliage and trees will help to conceal these structures.

22.3.6. Low level vent shafts and a roof light are located within the reconstructed island in the pond. These structures will be carefully hidden behind reinstated 'Pulham' rock, trees and planting. Given the limited scale of ground level structures at this location and the means to screen and integrate them into the park environment, their impact in visual terms will not be significant.

22.4. Ticket hall level

Image of ticket hall level plan

22.4.1. Pedestrian access between street level and the unpaid side of the ticket hall will be provided by two banks of three escalators and by two passenger lifts. The open, clear layout allows passengers to locate the route to Metro North and Dart Underground.

22.4.2. From the gate lines, passengers have a choice between escalators down to Metro North platform level or Dart platform level. Two glazed passenger lifts will serve both Metro North and Dart platforms.

22.4.3. There is a very large area of mechanical and electrical plant rooms at this level. In addition, ESB require a high voltage substation to serve the whole of the Metro North line. This dedicated substation is located below street level, behind the escalators of St Stephen's Green north.

22.4.4. The ticket hall will be spacious and flooded with natural light from roof lights in St Stephen's Green.

Image of computer model ticket hall level

22.5. Platform level

Image of platform level

22.5.1. The platform is 20m wide. This width is required to accommodate large passenger numbers, two banks of two escalators, lifts at the platform ends and stairs down to the Dart Underground platforms.

22.5.2. Natural light is channelled down from the island roof light to emphasise the clean lines and bright internal finishes of the platform area.

Image of computer model platform level

22.6. Changes to Railway Order drawings

Image of changes to Railway Order ground level

22.6.1. We have continued to discuss the proposals with the local authority and other interested parties and a number of improvements have been made to the design. These include:

- The main entrances on both St Stephen's Green west and St Stephen's Green north have been revised in order to locate them nearer to the end of Grafton Street. This change produces a number of improvements:
 - A shorter walk between the entrances and Grafton Street.
 - A reduction in the size of the box construction.
 - Improved access to buildings and streets during construction.
 - And it allows the Luas platform to be extended in the future.
- Passenger lifts have been moved further away from the top of Grafton Street to the western edge of St Stephen's Green Park. This will benefit the design in a number of ways:
 - The north west corner of St Stephen's Green will be kept uncluttered and will become an important civic space, with an uninterrupted view of Fusilier's Arch.
 - One lift will be a shared emergency fireman's lift, thereby reducing the size of one of the escape cores within the park.
 - Passenger circulation is improved within the ticket hall.
- Metro North and Dart Underground escape stairs at St Stephen's Green North have been combined in order to reduce their impact on the park.
- The size of escape hatches has been reduced thereby minimising impact on the park.
- An additional escalator has been introduced between the ticket hall and Dart Underground.

Image of changes to Railway Order ticket hall level

23. AREA 107: O'CONNELL BRIDGE STOP

23.1. Site location

Image of site location

- 23.1.1. O'Connell Bridge stop is located under the River Liffey, with entrances on O'Connell Street Lower and Westmoreland Street.
- 23.1.2. The surroundings predominately consist of shops and offices, with a number of other uses including pubs, restaurants and hotels. The Westmoreland Street entrance is next to Temple Bar.
- 23.1.3. The Abbey Street Stop on the Red Luas Line, and the proposed extension of the Green Luas Line (Line BX) will ensure that this stop becomes an important transport interchange.
- 23.1.4. Significant buildings in the surrounding area include the GPO, Trinity College and the Bank of Ireland. There are also some important statues such as Daniel O'Connell. Conservation issues will be dealt with in later evidence.
- 23.1.5. In July 2001 O'Connell Street was designated an architectural conservation area.

23.2. Stop box

Image of O'Connell Bridge Stop long section

- 23.2.1. The platforms are approximately 28m below street level and directly under O'Connell Bridge. The entrance box at O'Connell Street is approximately 28m deep x 81m long x 24m wide. The entrance box at Westmoreland Street is approximately 28m deep x 81m long x 17m wide.

23.3. South Box ground level (Westmoreland Street)

Image of O'Connell Bridge Stop - Westmoreland Street ground level

- 23.3.1. A bank of three escalators and two lifts on the western side of Westmorland Street will provide access to a sub-surface ticket hall. A low stone wall will surround the escalator entrance, and lifts will be glazed.
- 23.3.2. Escape stair exits are covered by low level hatches to reduce their visual impact.

23.4. South Box ticket hall level (Westmoreland Street)

Image of O'Connell Bridge Stop Westmorland Street ticket hall level

- 23.4.1. Escalators from landing level and lifts from ground level provide access to the unpaid side of the ticket hall. Once through the gate line, passengers can use escalators or lifts to get down to platform level.
- 23.4.2. Double helix stairwells at the southern end of the concourse level provide means of escape.

23.5. North Box ground level (O'Connell Street)

Image of O'Connell Bridge Stop - O'Connell Street ground level

- 23.5.1. A pair of escalators and a lift on both sides of O'Connell Street provide access to a sub-surface ticket hall. The escalator entrances will be enclosed by low natural stone

walls and will have no canopies in order to minimise their visual impact on this historic area. For the same reason passenger lifts will be glazed and escape stair exits are covered by hatches.

23.6. North Box ticket hall level (O'Connell Street)

Image of O'Connell Bridge Stop - O'Connell Street ticket hall level

23.6.1. Passengers reach the unpaid side of the ticket hall by escalators and lifts from both sides of O'Connell Street. Once through the gate line, passengers descend to platform level by escalators or can access two lifts via an open walkway.

23.6.2. The quality of these public spaces will be greatly enhanced by a combination of roof lights and open plan design. Glazed areas on O'Connell Street allow light to filter down to ticket hall level.

Image of computer model ticket hall level

23.7. Platform level

Image of O'Connell Bridge platform level

23.7.1. A bank of three escalators and two passenger lifts lead down from both the O'Connell Street and Westmoreland Street entrances to a broad, open central concourse at platform level.

23.7.2. The central concourse is 10.5 m wide and six passageways lead through to each 4.3m wide platform, giving good distribution of passengers along the length of the trains.

Image of computer model platform level central concourse

Image of computer model platform

23.7.3. Escape stairs, fire fighting lifts and plant rooms are located at each end of the central concourse.

24. AREA 107: PARNELL SQUARE STOP

23.1 Site location

Image of site location

- 24.1.1. Parnell Square stop will be located on Parnell Square East. The surrounding area is a mixture of tourist destinations, commercial properties and hotels. There are a number of significant cultural buildings nearby, including the Gate Theatre, the Hugh Lane Dublin City Gallery and the Dublin Writers Museum.

24.2. Stop box

Image of Parnell Stop long section

- 24.2.1. The stop box is approximately 130m long x 24-38m wide and is between 24-28m deep. It is situated mainly under the road and partly under the grounds of the Rotunda Hospital.

24.3. Ground level

Image of Parnell stop ground level

- 24.3.1. Parnell Square is one of the city's most historic spaces and the aim has been to reduce the visual impact of the stop at ground level. For this reason, there are no canopies over the escalator entrances, which will be enclosed by low natural stone walls. Two pairs of escalators and two glazed passenger lifts are located on Parnell Square East. A glazed roof light flush with the pavement will bring light into the ticket hall below.
- 24.3.2. In order to reduce visual impact, escape stairs are covered by low level hatches and the lifts are glazed.

24.4. Ticket hall level

Image of Parnell Stop ticket hall level

- 24.4.1. Passengers will pass through ticket gates to the paid side from where lifts and escalators will bring them down to platform level via an intermediary mezzanine level.
- 24.4.2. A glazed roof light will bring natural light into the ticket hall.
- 24.4.3. There are a considerable number of plant rooms at this level.

24.5. Platform level

Image of Parnell Stop platform level

- 24.5.1. The platform is 9.7m wide with a passenger lift at both ends.
- 24.5.2. There is limited space for plant rooms at the platform ends. Additional space for plant rooms is provided in an area to the south of the main box.

Image of Parnell Stop short section

24.6. Changes to Railway Order drawings

Image of changes to Rail Order ground level

Image of changes to Rail Order section

24.6.1.

We have continued to discuss the proposals with the local authority, and amongst others, the Rotunda Hospital. Various improvements have been made to the design. These include:

- Surface penetrations have been laid out to better suit future development in the area.
- The fireman's lifts have been combined with passenger lifts to reduce the number of lifts.
- Lifts have been relocated, which removes visually intrusive structures from the public space on Parnell Square East.
- As a result of this replanning there is now an uninterrupted view of Findlater's Church.
- The size of escape hatches has been reduced, minimising their impact on the pavement on Parnell Square East.
- The smoke vents have been rationalised. Two vents are hidden within the gates structure for the Garden of Remembrance. Two more are in a temporary position which allows for their relocation as part of a future development.
- Passenger lifts between concourse level and platform level are in a central location for clear, direct access.
- Escalator locations have been rationalised at platform level.

25. AREA 106: MATER STOP

25.1. Site location

Image of site location

25.1.1. The Mater stop is located on the site of the Mater Misericordiae Hospital between Eccles Street, North Circular Road, Leo Street and Berkeley Road.

25.1.2. As well as the main hospital complex, there is also the Mater Private Hospital on Eccles Street. Dorset St Lower has pubs, shops, restaurants and offices. Otherwise the area is predominantly residential.

25.1.3. The redevelopment of the hospital site will include a new adult hospital and the phased implementation of a new children's hospital on Eccles Street. Access into the hospital site has been reconfigured to provide a dedicated ambulance lane from the North Circular Road.

Image of Mater development

25.2. Stop box

Image of section

25.2.1. The stop box is approximately 22m deep, 167m long x 23-47m wide situated below the hospital car park, directly behind the Victorian terraced housing on Leo Street.

25.3. Ground level

Image of Mater Stop ground level plan

25.3.1. The main stop entrance is located on North Circular Road next to the proposed hospital service vehicle route and will be integrated into the hospital development.

25.3.2. The glazed entrance has been kept small in area to minimise the impact on the hospital's development. Escalators and lifts will take passengers down to concourse level. Provision will be made for future access from the adult Mater Hospital directly to the unpaid side of the ticket hall.

25.3.3. Two buildings will facilitate the ventilation and escape cores to the north and south of the box. The scale of both these buildings will match the existing houses on Leo Street.

25.4. Concourse level

Image of Mater Stop concourse level

25.4.1. At concourse level passengers transfer to separate sets of lifts and escalators to access platform level. Lifts between concourse and platform level are positioned to the north end.

25.4.2. Plant rooms and escape cores are located at both ends of concourse level.

25.4.3. Ground level constraints, such as the service access road, restrict the position where escape stairs arrive at ground level. Escape from platform level requires the escape routes to divert to the east side of the stop at either end of Leo Street.

25.5. Platform level

Image of Mater Stop platform level

25.5.1. The platform is 9m wide with two passenger lifts.

25.5.2. Plant rooms and escape cores are located at each end of the platform. Additional plant rooms are located at trackside which is accessed from mezzanine level.

25.6. Changes to Railway Order drawings

Image of changes to Railway Order ground level

Image of changes to Railway Order section

25.6.1. We have continued to discuss the proposals with the local authority and the Mater Adult Hospital and improvements have been made to some aspects of the design. These include:

- The ground level entrance has been set back to match the proposed Mater development building line.
- The entrance has been rationalised to give better pedestrian access to escalators and lifts.
- The ticket hall has been moved from ground level down to concourse level.
- A roof light has been introduced to allow natural light down into the lower levels.
- The fireman's lift has been combined into one structure with the Mater Hospital security booth in the ambulance lane median – this lift has direct access to the platforms level below.
- The overall height of the stop box has been reduced and the number of floor levels reduced from three to two.

26. AREA 106: DRUMCONDRA STOP

26.1. Site location

Image of site location

26.1.1. Drumcondra Stop will be located on Lower Drumcondra Road, between the junctions of St Alphonsus Road and St Anne's Road North. The stop has been designed to integrate with the existing Irish Rail station and will provide it with a new entrance and ticket hall.

26.1.2. The surrounding land-use is predominately residential, with some retail outlets and pubs located nearby. The wider area has a number of important buildings most notably Croke Park Stadium and the palace of the Roman Catholic Archbishop of Dublin. Holy Cross College is one of a number of educational institutes in the area.

26.2. Stop box

Image of Drumcondra Stop long section

26.2.1. The main stop box is approximately 25m wide, 107m long and 25m deep. It is to be constructed on land between the Lower Drumcondra Road and St Joseph's Avenue.

26.2.2. Site constraints have severely limited the available space for the underground stop box, which has resulted in the need to locate a number of plant rooms at ground level.

26.3. Ground level

Image of Drumcondra Stop ground level plan

Image of computer model towards Metro North escalator

26.3.1. From the main entrance on Lower Drumcondra Road, pedestrians will walk along a retail arcade to the main interchange plaza.

26.3.2. From this plaza, escalators and lifts will provide access down to the Metro North ticket hall and up to the Irish Rail Station.

26.3.3. High level roof lights will bring natural light down to the plaza giving passengers a sense of orientation and openness as they enter the stop.

26.3.4. Plant rooms and the southern escape core are next to St Joseph's Avenue.

26.3.5. The northern escape core and ventilation plant will be located at the junction of St Alphonsus Avenue and St Joseph's Avenue.

26.3.6. As a result of the construction works there will be an unused area of land within the site boundary providing an opportunity for future development.

26.3.7. Streetscape improvements will be made in the area including increasing the footpath width outside the stop entrance. There will also be a controlled pedestrian crossing over Lower Drumcondra Road and landscaping of the median reserve.

26.4. Irish Rail ticket hall level

Image of Drumcondra Stop Irish Rail ticket hall level

Image of computer model view to Irish Rail

26.4.1. From the interchange plaza, escalators and lifts bring passengers up to the Irish Rail ticket hall and platform level approximately 8m above ground level.

26.4.2. An Irish Rail ticket office and other facilities are provided at this level. After passing through the ticket barriers, passengers will have direct access to the northern platform, with stairs and lifts giving access to the southern platform via an overbridge.

26.5. Metro North ticket hall level

Image of Drumcondra Stop ticket hall level

Image of computer model ticket hall

26.5.1. From the ground level plaza, a bank of four escalators lead down to the Metro North ticket hall. Above the escalator landing there is a roof light bringing natural light into the stop.

26.5.2. Once through the ticket barriers, two glazed lifts will provide direct access to the platform level, while escalators will provide access via an intermediary mezzanine level.

26.5.3. Roof lights will allow natural light to flood down into this level above the escalators and ticket gates.

26.5.4. The north part of the box contains escape stairs, plant rooms and ventilation ducts.

26.6. Platform level

Image of Drumcondra Stop platform level

26.6.1. Two glazed lifts and two pairs of escalators give access to the platform.

Image of computer model view to mezzanine and platform level

26.6.2. The platform is 12m wide with escape cores at both ends.

Image of computer model platform level

26.7. Changes to Railway Order drawings

Image of changes to Railway Order ground level

Image of changes to Railway Order section

26.7.1. We have continued to discuss the proposals with the local authority and to make improvements to some aspects of the design. These drawings show the changes that have been made:

- Re-planning of the stop allows for the future possibility of an underpass to connect St Anne's Road North.
- The bridge over Irish Rail tracks have been reduced in scale and height.
- Views down Clonliffe Road have been improved at ground level and at Irish Rail level.
- The space available for retail use has been rationalised and improved.
- The building line on St Joseph's Avenue has been set back from the street to allow for a widened footpath on the east side of the street and to allow for landscaping. The façade of this building is being redesigned to be more sympathetic to the existing housing.

- Passenger circulation has been rationalised. In particular vertical circulation has been re-arranged to give better pedestrian movement between metro and the Irish Rail station. Space within the stop is now more efficiently used.

27. AREA 106: GRIFFITH AVENUE STOP

27.1. Site location

Image of Griffith Avenue Stop site location

- 27.1.1. Griffith Avenue stop is situated directly north of the junction between Griffith Avenue and Griffith Lawns. Griffith Avenue has mainly 1930's housing and is lined by fine rows of trees. DCU has plans to develop its lands around the stop.

27.2. Stop box

Image of Griffith Avenue Stop long section

- 27.2.1. The stop box is approximately 28m wide by 148m long and between 20-25m deep and is largely constructed under a green field site currently owned by Dublin City University.

27.3. Ground level

Image of Griffith Avenue Stop ground level

- 27.3.1. Passengers will access the stop from Griffith Avenue, passing through a forecourt into a glazed ticket hall. The ticket hall has a clear layout and passengers will proceed directly through the gate line to the paid side, where a bank of three escalators and two lifts will provide access to the lower levels. A control room, plant rooms, emergency escape stairs and fire access lift are ranged along the east side of the ticket hall. The emergency escape core opens directly onto a service road which provides access for maintenance staff as well as emergency personnel.

Image of computer model entrance

- 27.3.2. To minimise the visual impact of the stop, only essential structures are located at ground level, including the northern escape core and emergency tunnel exhaust vents. Trees and landscaping will help blend the buildings into the surrounding area.

27.4. Concourse level

Image of Griffith Avenue Stop concourse level

- 27.4.1. Passengers proceed down to concourse level from where they reach two lifts and four escalators giving access to the lower levels of the stop. Roof lights bring daylight down into this area.
- 27.4.2. Provision has been made for a possible secondary entrance at this level from the future University development to the east. A large number of plant rooms and vent shafts are located at the north and south ends of concourse level.

27.5. Platform level

Image of Griffith Avenue Stop platform level

- 27.5.1. Passengers arrive at the 12 m wide platform level by centrally located escalators and lifts.
- 27.5.2. Plant rooms and escape cores are located at both ends of the platforms.
- 27.5.3. A roof light above the glazed double lift shafts allows some natural light to filter down to this level.

Image of Griffith Avenue Stop cross section

28. AREA 105: DCU

28.1. Site location

Image of DCU Stop site location

- 28.1.1. Dublin City University (DCU) stop will be located along the east of Ballymun Road, between Albert College Drive and Albert College Lawn. The site is positioned just north of the main entrance to Dublin City University campus and Albert College Park, and to the south of Our Lady of Victories Church. The surrounding area is mainly residential, with a number of local retail outlets at the corner of St Pappin Road and Ballymun Road. Signalised pedestrian crossings will cater for the large residential area on the west side of Ballymun Road.

28.2. Stop box

Image of DCU long section

- 28.2.1. The stop box is approximately 234m long x 18m wide and 12m deep. The stop has two main levels, the first being ground level ticket halls and the second is platform level.

28.3. Ground level

Image of DCU Stop ground level

- 28.3.1. Access to the existing Scout Hall will be maintained by a private vehicle and pedestrian access gate from Ballymun Road, next to the north entrance.
- 28.3.2. Access to residential areas including Albert College Grove, Albert College Crescent and Albert College Lawn will be maintained as part of the proposal. Semi-mature trees will be planted along the eastern boundary of the site to screen these areas from the stop.
- 28.3.3. The design of the stop includes roof lights over the main platform areas, which also serve as ventilation outlets for smoke in the event of a fire. Solar panels are located on the roof of both entrance pavilions.
- 28.3.4. Tunnel vents will be located at both ends of the stop and these will be surrounded by planting to minimise their visual impact.
- 28.3.5. Two glazed entrance pavilions will be located on Ballymun Road approximately 90m apart.
- 28.3.6. The southern entrance will accommodate the stop control room, staff facilities, ticket vending machines and a gate line. The ticket hall has a simple clear layout and passengers will proceed directly through the gate line to the paid side, where a staircase and a lift will provide access to platform level.
- 28.3.7. The northern entrance pavilion will contain ticket machines, a gate line, a lift and stairs only.
Image of computer model entrance
- 28.3.8. There are no escalators at this stop because of the shallow platform level.

28.4. Platform level

Image of DCU Stop platform level

- 28.4.1. A stair and a lift give access to each end of an 8m wide platform. These stairs will also provide means of escape and the lift will serve as emergency services access. Due to the shallow depth of the stop, dedicated fire escape stairs and emergency services lift are not required.
- 28.4.2. Roof lights bring natural light down to the platform.
- 28.4.3. Plant rooms are located at both ends of the platform.

29. AREA 105: BALLYMUN STOP

29.1. Site location

Image of Ballymun Stop site location

- 29.1.1. Ballymun Stop will be located on Ballymun Main Street between Balbutcher Lane South and Silloge Road, adjacent to the proposed Ballymun Civic Plaza to the east. The surrounding area is predominately residential, with some retail outlets, a community art centre and a hotel nearby. An extensive new shopping centre and residential development is planned to the west of the stop.

29.2. Stop box

Image of Ballymun Stop long section

- 29.2.1. The stop box is approximately 188m long by 31m wide and between 10-12m deep and will be constructed under the Ballymun Main Street
- 29.2.2. It has two main levels, the first being a mezzanine ticket hall level and the second being platform level, 10m below ground.

29.3. Ground level

Image of Ballymun Stop ground level

Image of computer model entrance

- 29.3.1. An entrance to the east of Ballymun Main Street will be accessed from a sunken civic plaza. A lift and stairs will provide access down to this plaza.
- 29.3.2. Two staircase entrances will be located on the west side of Ballymun Main Street between Balbutcher Lane South and Silloge Road. A further lift is provided at the Silloge Road entrance.
- 29.3.3. There are no escalators at this stop because of the shallow platform level.
- 29.3.4. Ground level roof lights in the central reserve allow natural light to filter down to the platform, with openings for ventilation.
- 29.3.5. Tunnel vents will be located on Shangan Road and Ballymun Main Street central median. Escape stairs from the plant rooms have been designed to blend in with the proposed landscaping.

29.4. Mezzanine level

Image of Ballymun Stop mezzanine level

- 29.4.1. The northern entrances open into a ticket hall at mezzanine level. Two separate gate lines lead into the same paid area which is overlooked by a control room. At the civic plaza entrance glazing will allow natural light into the ticket hall.
- 29.4.2. Once passengers have passed through the ticket barriers, they will access the platforms below by stairs or lifts.
- 29.4.3. The southern entrance has ticket vending machines and a separate gate line. There are stairs leading directly down to the platforms. There is a gallery walkway which leads to the northern ticket hall and gives access to lifts down to the platforms. Glass walls allow views down to platform level. Provision is made for a future connection between the stop entrances and Ballymun shopping centre to the west.

29.4.4. There are plant rooms and tunnel vent fans at both ends.
Image of Ballymun Stop ticket hall at mezzanine level

29.5. Platform level

Image of Ballymun Stop platform level

29.5.1. The two side platforms are 3.6m wide, but increase to 7m at the ends to accommodate stairs and lifts. The access stairs per platform will also serve as the means of escape. Each platform will have one emergency lift direct to ground level.

29.5.2. Roof lights located in the Ballymun Main Street central median allow some natural light to filter down to this level.

29.5.3. Due to the shallow depth, there is no requirement for dedicated fire escape stairs and fireman's lifts. Two minor escape stairs are located in the vicinity of the emergency smoke vents to allow escape from the plant rooms at each end of the stop.
Image of Ballymun Stop cross section

29.5.4. Plant rooms are located at the ends of each platform.
Image of computer model platform level

30. AREA 103: AIRPORT STOP

30.1. Site location

Image of Airport Stop site location

- 30.1.1. The stop is located in the centre of the airport to the north east of the existing Terminal 1 building.
- 30.1.2. Dublin Airport Authority has an extensive development programme that includes a masterplan to incorporate the new metro stop, the construction of Terminal 2 and major improvements to the existing terminal.
- 30.1.3. The phased development of a ground transportation centre is proposed which will incorporate the southern stop entrance. There are plans for a new access road and a multi storey car park to the east of the metro site. Covered pedestrian links from the stop to each terminal will be provided as part of the master plan. The number of ground level structures associated with the stop has been kept to a minimum to enable future development of the airport.

30.2. Stop box

Image of Airport Stop long section

- 30.2.1. The underground stop box is approximately 140m long by 31m wide and 22m deep, it will be largely constructed under what is currently a car park.

30.3. Ground level

Image of Airport Stop ground level
Image of computer model entrance

- 30.3.1. Entrances to the stop are designed to complement the airport's new developments, including Terminal 2. The southern entrance will be within a glazed pavilion, with two public lifts and a bank of four escalators. The southern escape core with escape stairs, a fireman's lift, plant rooms and ventilation shafts are next to the entrance.
- 30.3.2. Provision for a second entrance to the north has been allowed and this location takes into account planned airport developments. The northern entrance will be similar to the southern entrance, with a glazed structure over public escalators and lifts.
- 30.3.3. There will be a landscaped plaza between the north and south entrances. Roof lights will bring daylight into the public spaces below.

30.4. Ticket hall level

Image of Airport Stop ticket hall level

- 30.4.1. At the southern entrance, passenger access between street level and the unpaid side of the ticket hall will be provided by a bank of four escalators and by two passenger lifts.
- 30.4.2. The ticket hall has a relatively simple, clear layout that gives easy access to ticket vending machines and the gate line. Two wide gates are provided for passengers with large items of luggage.
- 30.4.3. Once through to the paid side, passengers have a choice of six escalators and four to access platform level.

30.4.4. Roof lights provide natural light to public areas. Voids around the escalators allow light to filter down to lower levels of the stop.

30.4.5. Plant rooms and escape cores are located at both ends of ticket hall level.
Image of computer model ticket hall

30.5. Platform level

Image of Airport Stop platform plan

30.5.1. The platform is 14m wide ensuring ample space for passenger circulation.

30.5.2. Means of escape are provided at both ends.
Image of computer model platform

CONCLUSION

At various points in Dublin's history, there have been important periods of urban renewal and Metro North will be a key component in the re-shaping of the city for the 21st century. It will link the city centre to the Airport, to Swords and beyond. Together with the Luas Green Line, it develops a north-south spine through the city. With the Luas Red Line, and later, Dart Underground and Metro West, it will link the city centre to the West.

Overall, Metro North will provide a significant unifying element for the city and will have a major positive impact on future urban development.

The architectural contribution which Luas has made to the city is extended and improved by Metro North. Great care has been taken to design restrained, yet elegant, modern buildings which I believe will in future years become admired features of Dublin's urban landscape.

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