Our Case Number: ABP-314724-22

An Bord Pleanála

Ruadhan MacEoin
20 Marlborough Road
Donnybrook
Dublin 4

Date: 05 December 2022

Re: Railway (Metrolink - Estuary to Charlemont via Dublin Airport) Order [2022]
Metrolink. Estuary through Swords, Dublin Airport, Ballymun, Glasnevin and City Centre to Charlemont, Co. Dublin

Dear Sir / Madam,

An Bord Pleanála has received your recent submission (including your fee of €50) in relation to the above-mentioned proposed Railway Order and will take it into consideration in its determination of the matter.

The Board will revert to you in due course with regard to the matter.

Please be advised that copies of all submissions/observations received in relation to the application will be made available for public inspection at the offices of the relevant County Council(s) and at the offices of An Bord Pleanála when they have been processed by the Board.

More detailed information in relation to strategic infrastructure development can be viewed on the Board's website: www.pleanala.ie.

If you have any queries in the meantime, please contact the undersigned. Please quote the above mentioned An Bord Pleanála reference number in any correspondence or telephone contact with the Board.

Yours faithfully,

PP SM

Niamh Thornton
Executive Officer
Direct Line: 01-8737247

Teil	**Tel**	(01) 858 8100
Glao Áitiúil	**LoCall**	1890 275 175
Facs	**Fax**	(01) 872 2684
Láithreán Gréasáin	**Website**	www.pleanala.ie
Ríomhphost	**Email**	bord@pleanala.ie

64 Sráid Maoilbhríde
Baile Átha Cliath 1
D01 V902

64 Marlborough Street
Dublin 1
D01 V902

Ruadhán MacEoin
20 Marlborough Road
Donnybrook
Dublin 4
24th November 2022

Re MetroLink planning application, SID no. 314724

Dear Sir or Madam,

I wish to make an observation on the MetroLink application.

In support of this observation, please find attached four documents:

1. A dissertation undertaken as part of a masters degree in University College Dublin in 2017, that reviewed current Dublin rail plans, previous plans, and delivery to date of proposed services. This research found that current rail plans for Dublin are based on assessment maps in which the five kilometre line between Broombridge and Docklands was omitted, which could provide a pathway for airport trains, negating the need for the metro project to tunnel south of Cross Guns Bridge.

2. A design response to the dissertation findings. As shown in this document, when the omitted line is included, it could be useful for providing a pathway from the city centre as far as Glasnevin for the purpose of a rail link to Dublin Airport and Swords, and separately, to bring about the objectives of DART Expansion / DART Underground. Both of these objectives are national policy. A second design alternative is then set out, which would see Dublin Airport and Swords instead connected by two Luas light rail lines into the city centre and beyond. This option emerges as the option of linking Luas to the airport etc. was discounted largely because one Luas line would not have the capacity needed to serve the airport. However, if an additional Luas line were to be provided, the issue of passenger capacity would be resolved. Hence, instead of the current application, for a stand-alone metro service, both of the design alternatives would result in much less construction – with no need to tunnel south of Glasnevin / Cross Guns Bridge, and so result in much less cost, disruption, and negative environmental impact as would be caused by CO2 intensive engineering required by tunnelling under the city centre.

3. An additional study that assesses the prospect of linking Dublin Airport with Charlemont Luas Station via the Port Tunnel by Bus Rapid Transit. A number of route options are addressed, with a prospective travel time of circa 22 minutes identified, which compares favourably to the 20 minute journey time proposed by MetroLink between these two points.

4. A review of recent decisions, reports, and policies that relate to the current proposal. Essentially this review surmises the implications of the cancellation of the Galway ring road (2022), the OECD report; 'Redesigning Ireland's Transport for Net Zero' (2022), Department of Transport; 'National Sustainable Mobility Policy Action Plan (2022), International Transport Forum of the OECD; 'Benchmarking Accessibility in Cities: Measuring the Impact of Proximity and Transport Performance' (2019), Department of Environment; 'National Climate Action Plan' (2021).

Ultimately, it appears to me that the current proposition is based on a flawed assessment, and it seems any of the three options of linking Dublin Airport with the city centre by DART, Luas, and or BRT are likely to be more effective, require less work and capital, and be delivered sooner.

As a result, the Bord is put in a difficulty by the current proposal. Although the MetroLink is National Policy, it has been conceived without proper inclusion of existing railways, which results in the need for tunnelling south of Cross Guns Bridge. However, as it is apparent that there is no need for such a pathway, the granting of consent does not appear justifiable.

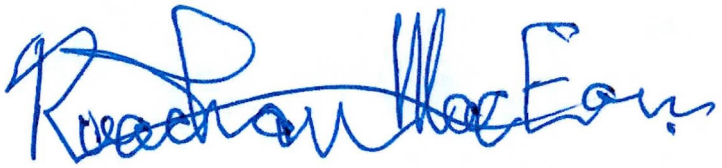
Given this scenario, and in view of the prospect of a BRT service delivering comparable journey times between Dublin Airport and Charlemont, it appears that the inexpensive BRT option should be prioritised – with Dublin Airport linked by either DART or Luas at a later date.

Finally, it is recommended that new stations are opened on the existing Irish Rail lines and emerging DART network in the city, at Croke Park, Cross Guns Bridge, Cabra, Zoo, Inchicore, and Ballyfermot, as this would serve over 100,000 residents within 1 kilometre walking range according to ArcGIS.

I am grateful for consideration of these matters.

Is mise,

Ruadhán MacEoin
MSc., BSc., BA.



University College Dublin

School of Architecture, Planning and Environmental Policy

MSc (Honours)

In

Urban Design

'Democratic Accountability or a Speculator's Blank Cheque: What has been learned from Dublin's experience of Transport 21?'

Author **Ruadhán Mac Eoin**

Supervisor **Dr Luke Kelleher**

This dissertation is submitted as part of the completion of a

Masters of Science in Urban Design (MSc)

September 2017

Abstract

Transport 21 (T21) was the largest capital spending programme in the state's history, yet terminated prematurely, with numerous megaprojects unbuilt, including elaborate Dublin underground plans. This research has sought to evaluate that programme in hindsight, to gauge performance, and identify what if any lessons may have been learned from T21. This project identifies the value of application of the *Common Appraisal Framework* in assessing projects at planning stage – but finds that it does not appear to be consistently applied in preparation of current plans, despite initial official assertion. Moreover, the research uncovers new documentary evidence that suggests the Dublin underground plans date back at least 50 years, and that there appears to be a pattern of the project being promoted during times of prosperity, only to be deferred during recession, only to be rebranded, modified, and represented as a 'new' solution, only for the cycle to occur again – with Dublin transport policy perennially haunted by this zombie megaproject. Meanwhile, significant elements of railway infrastructure that could present another possible option, have been overlooked by policy makers, in an apparent case of *suppressio veri.* All the time, Dublin has gone from being a relatively compact city 50 years ago, to being regarded as a 'worst case example' of car-dependent sprawl. The project also identifies over 100,000 residents in Dublin city centre could be brought onto the Irish Rail network by way of new stations, as based on ArcGIS generated research. It is suggested this research may be of interest to people working in the sector, academia, and possibly others in wider civic society.

Acknowledgements

This research is uniquely indebted to particularly helpful direction by the project supervisor, Dr Luke Kelleher, and also the many who assisted research, including John Burns of the Sunday Times, and others.

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List of Abbreviations

AIE Access to Information on Environment

ArcGIS Geographical Information Systems

BRT Bus Rapid Transit

CAF Common Appraisal Framework

CIÉ Córas Iompair Éireann

CO2 Carbon Dioxide

CSO Central Statistics Office

DART Dublin Area Rapid Transit

DCC Dublin City Council

DTI Dublin Transportation Initiative

DTO Dublin Transportation Office

GDA Greater Dublin Area

LRT Light Rail Transit

HVV Hamburger Vikersund Verkehrsverbund (municipal transport council).

MCA Multi-Criteria Analysis

NDP National Development Plan

NGO Non-Governmental Organisation

NTA National Transport Authority

NSS National Spatial Strategy

NPF National Planning Framework

RPA Railway Procurement Agency

T21 Transport 21

UCD University College Dublin

Declaration

I hereby certify that the material which is now submitted in this dissertation towards the award of the MSc in Urban Design is entirely my own work and has not been submitted for assessment for any academic assessment other than part fulfilment for the award named above.

Reasonable care was taken to ensure that no information has been taken from other sources except where specifically cited and referenced within the text throughout this document.

The author confirms that the Library may lend or copy this dissertation upon request for academic purposes.

Student Name..... Ruadhán Mac Eoin

Student Number..... 95750045

Signature of candidate _____

Date..... September 2017

1.0 Chapter 1

1.1 Introduction

In September 2015, a €10 billion investment programme for transport was announced by the Irish government[i]. This was the largest fiscal commitment since the 2005 launch of *Transport21 (T21),* which had a €34.4 billion budget, and was to be "an integrated solution to Ireland's current and evolving transport needs"[ii]. Megaprojects envisaged by T21 including *DART Underground* and *Metro North* remain unbuilt. Yet the latest plan suggests they will now proceed.

Hence, it seems timely to assess how well T21 proceeded, what lessons may have been learned from the process – and any implications that these may have for policy after T21. It is quickly apparent that no appraisal framework was used at the outset of T21 by which metrics could be applied in later evaluation – an issue compounded by the absence of any official post-programme evaluation, despite its premature demise[iii]. The absence of any metrics in such an important plan makes any attempt to analyse T21 more difficult.

Despite such hurdles, research proceeded and unearthed stark new findings that may have implications for current policy-making. New documentary evidence establishes that *DART Underground* and *Metro North* plans pre-date T21 to 'at least 1966'. There is an apparent pattern of this megaproject being promoted during times of prosperity, only to be deferred during economic downturns, only to then re-emerge, rebranded and slightly altered, yet essentially the same – only for the cycle to repeat, with Dublin perennially haunted by this zombie project. Research work on the last unbuilt Metro North reportedly cost €200 million[iv].

Separately, flaws are apparent in the current evaluations that have led to the underground plans – again – becoming policy (see 4.20, 4.21). A central element of the existing Irish Rail network is being apparently overlooked. Implications of this are examined in this research, with seemingly less-expensive options identified (as per sections 4.31, 6.4).

Meanwhile, Dublin has become a 'worst case scenario' for sprawl[v], with 29% of Ireland's CO2 emissions generated by transport[vi]. Proportional share of public transport use in Dublin is shrinking, while separately Ireland is falling far short of the 20% 2020 CO2 targets[vii] - and will result in fines paid by Irish citizens. Despite railways adjacent at Phibsborough, Cabra, Dublin Zoo, Croke Park, Tolka Bridge and Dublin Ferry Port, there are no stations. Elsewhere, Kishogue Station was built in an undeveloped area and remains closed, as per figure 1.1.1.

By qualitative interviews with 10 authoritative individuals, despite inherent limitations, this research forms a rounded picture of T21: performance was regarded as poor, and pre-planning considered dismal, as per 5.3. Parallel, quantitative assessment has been conducted that estimates 113,146 residents are within prospective Irish Rail catchment areas in the city centre, as per 5.5.

Disturbingly, better practices used to inform planning adopted subsequent to T21, such as assessment by application of the *Common Appraisal Framework (CAF),* are not found to be consistently evident in preparation of the present *2016 – 2035 Greater Dublin Area Strategy.* There presents the potential danger of

repeating aspects of pre-planning of T21 regarding absence of clearly defined metrics that can be used to subsequently evaluate performance.

Institutional architecture to resolve transport needs appears strategically deficient by having a majority of board appointed by the Transport Minister, who also effectively has the right to veto, as per 5.3.7. Ministers are primarily representatives for geographical constituencies, and it is understandable where their primary interest is likely to lie – yet persons effected nationally and in Dublin have little opportunity for recourse or accountability of actions taken in their purported interest. Ultimately there appears little scope for accountability, except possibly the Public Accounts Committee. Meanwhile costly zombie megaprojects may be touted as an apparent solution, as Dublin forever sprawls.


Dublin's last 'ghost station' will cost €2 million to open

It cost around €6.3 million to build.

Jan 29th 2017, 7:30 AM 41,793 Views 19 Comments Share Tweet Email 1

A 'GHOST STATION' on the Dublin to Cork line will lie idle unless Irish Rail is given €2 million to open it – but a review of the station is due this year.

Figure 1.1.1 Kishogue Irish Rail, Co. Dublin; unopen and built in lands yet to be developed – while some built-up areas have railways but no stations.

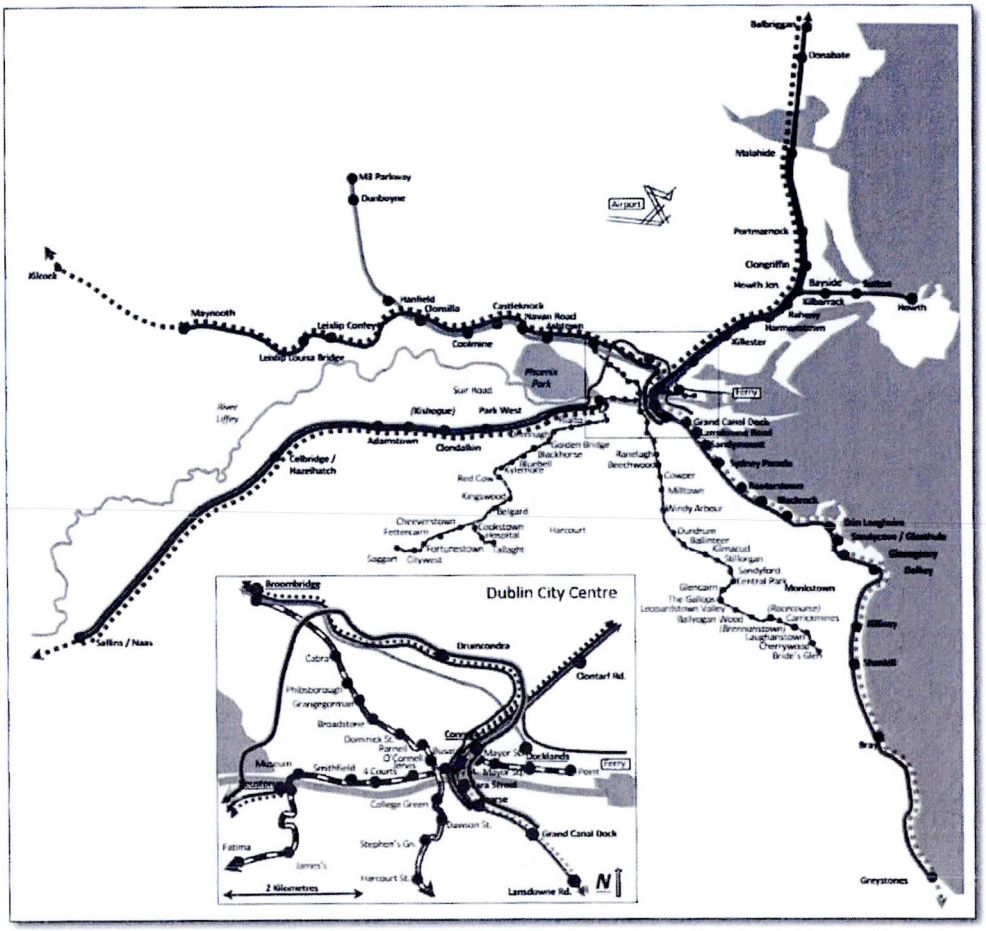
1.2 Background

Against a backdrop of transport issues being perceived as hindering the economy (Wickham 2006), T21 was launched to fund road, rail, and airport projects over a 10-year period[viii]. Notably, it was produced after the National Spatial Strategy (2002 - 2020) – which itself was launched after the 2000 – 2006 National

Development Plan, that had scheduled much motorway building across the island. Consequently, T21 was pulling together initiatives underway – while indicating circa €16bn to be spent on upgrading public transport, primarily within the Greater Dublin Area. Major schemes included[ix]:

- Several new Luas lines, and line extensions.
- Metro North, linking the City Centre to Dublin Airport and Swords.
- Metro West, orbital route
- DART Underground, joining Heuston to Docklands via St. Stephen's Green.
- Electrification of Irish Rail Dublin suburban network (see figure 1.2.1).

Ultimately, relatively little came to pass – except completion of motorways. In the 'National Planning Framework' issues discussion document, issued in February 2017, the network is praised as an example of 'joined-up thinking', and 'an example of successful implantation of an overall strategy, that set out to deliver high quality inter-urban motorways'[x]. Yet critics note the motorway network overly-focused on Dublin, and 'balanced regional development' sought by the NSS was compromised. Separately, less motorway construction was needed to connect the urban end destinations, had the network been planned strategically (see figure 1.2.2)[xi]. As with T21, the NSS was abandoned early; all zones indicated for growth had shrunk, while development occurred elsewhere[xii].



Existing Dublin Commuter & Mainline Rail Services (2017)

Legend

- Existing Irish Rail Station
- Existing Luas Station
- Existing Rail / Luas Interchange Stations
- Newly Built Stations Currently Closed (Luas & Irish Rail)
- Irish Rail station not in commuter service
- Air / Ferry Port
- Landmark

Please note that the Green Luas Cross City extension has been included, as construction is nearing completion, with commencement of services anticipated for December 2017. For purpose of clarity of image, please note the northbound and southbound section between Parnell Street and College Green in the city centre are illustrated as one line only on both maps.

Kilometres
0 2 4 6 8 10

N

Passenger Services Available as of 2017

- Southeast/ Northeast Dart (Howth / Malahide – Bray /Greystones)
- Northeast commuter (Pearse / Connolly – Drogheda / Dundalk)
- Southwest Heuston commuter (Heuston – Sallins)
- Southwest Grand Canal Dock commuter (peak hour service only)
- Northwest commuter (Pearse – Connolly – Maynooth)
- Dunboyne / M3 commuter (primarily peak hour service)
- Belfast mainline (Connolly – Belfast)
- Rosslare mainline (Connolly – Rosslare)
- Sligo mainline (Connolly – Northwest)
- South / West mainlines (Heuston – Cork, Galway, Waterford etc.)
- Irish Rail network not in passenger use (ferry terminal tramway)
- Green Luas (Bride's Glen – Stephen's Green – Broombridge)
- Red Luas (Point – Tallaght / Saggart)

Please Note: Southwest commuters are served by the Rosslare mainline

Please also note that the Green Luas Cross City extension has been included, as construction is nearing completion, with commencement of services anticipated for December 2017. For purpose of clarity of image, please note the northbound and southbound section between Parnell Street and College Green in the city centre are illustrated as one line only on both maps.

Figure 1.2.1: A regional map of Dublin commuter rail services: only the coastal *DART* service is electrified, despite the T21 scheme. Map was specifically prepared for this project.

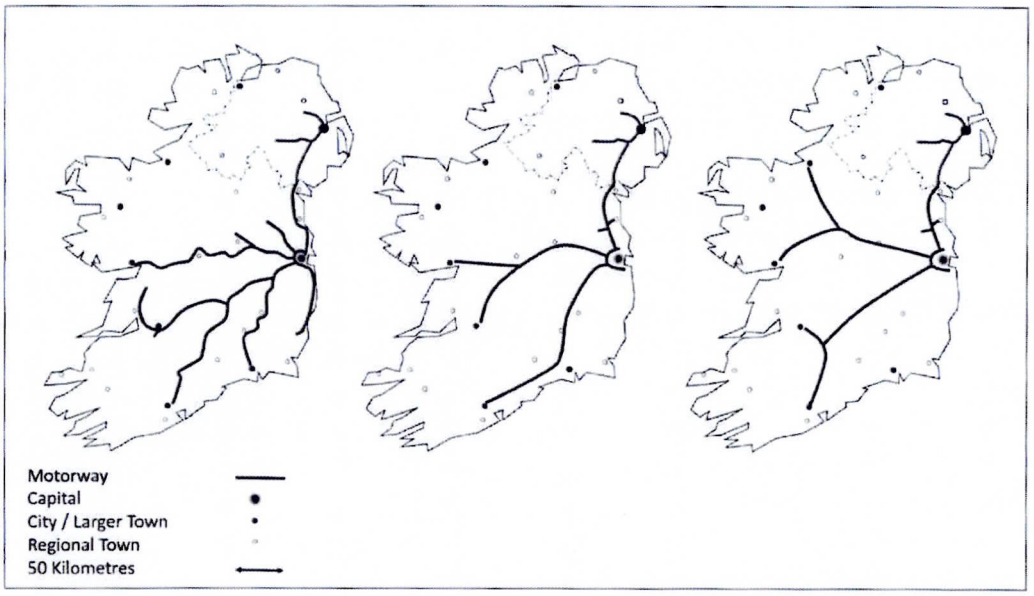


Figure 1.2.2 The motorway network (left) resulted in much more construction than other options, such as centre or right. Maps by author.

1.2.1 Relevance of Research

Although the non-delivery of T21 projects was regretted by some as delaying better sustainable transport[xiii], paradoxically, recessionary times in Ireland saw innovation with transport policy, such as 'Smarter Travel' that encourages cycling and walking[xiv], new use of existing resources (such as the Phoenix Park tunnel), and emphasis on achieving greater 'bang-for-buck' with new public transport schemes such as Bus Rapid Transit (BRT) initiated[xv], compared to more prestigious T21 projects such as Metro North.

With the economy recovering, megaprojects that were part of Transport 21, such as Metro North, are again being advanced by government. However, as per Literature Review, there appears to be a fifty-year pattern of underground railways being promised for Dublin, yet to date little delivery.

There appears to be a danger of megaprojects being advanced by government – until the next economic downturn, by when the scheme may well not to be built. A parallel danger is with emphasis on megaprojects, other cost-effective options may get overlooked. Given T21 proposed these projects, it seems useful to evaluate it in hindsight, identify any longer-term lessons, and potential implications for post-T21 policy.

1.2.2 What will your thesis contribute to planning literature and knowledge?

A partially subjective yet informed analysis of the performance of T21, and the development of subsequent transport policy, particularly affecting Dublin. Although contemporaneous assessment occurred [xvi], subsequent discourse appears relatively absent. It seems timely to probe the subject – particularly in terms of potential implications for the post T21 era.

1.2.3 Purpose of this Research

The purpose of this dissertation is to explore how Transport21 came about, evaluate how effective it was, and any lessons that may be learned subsequently.

1.3 Aims, Objectives, and Hypothesis

1.3.1 Aims

- To evaluate how successful the T21 programme was
- To identify what is any lessons can be learnt from the T21 process, and
- To establish whether such knowledge is now being applied in transport policy and development

1.3.2 Objectives

- To investigate the evolution, effectiveness, and outcomes of T21. This was done by way of interviews with parties considered likely to be knowledgeable or were involved with the programme. This was complemented by both policy and literature reviews.

- To investigate whether policy has evolved since T21, and to examine current mechanisms used when transport plans are assessed. This was first informed by policy and literature reviews, which provided a context. Again, interviews with commentators as well as sectoral and civic stakeholders likely to be knowledgeable on the area were of immense benefit. Ultimately the data collected was then tested and appraised, with a final reference to the NTA, who were unable to substantiate initial assertions of the CAF being appropriately applied.

- To assess the extent of prospective population catchments that could be served if service access along the existing Irish Rail network in the Dublin city centre area was improved by new stations, and by better pedestrian access at existing stations. This was considered useful given little official evaluation to date. This was done based on data created by ArcGIS, as is detailed in the methodology section.

- Arising from conclusions evaluating the performance of a past programme, to establish a series of recommendations for future

stakeholders and or other parties who may have further interest in the area of Irish transport policy at a later date.

1.3.4 Hypothesis

To be effective, Transport Planning needs to be based on clear strategic objectives and a robust appraisal framework with agreed clear metrics, substantiated by transparent participatory planning from the outset. The strategy process should also be well communicated to relevant stakeholders, wider civic society, and should include effective consultation mechanisms to facilitate stakeholder input. The hypothesis of this research is for the T21 programme to have been effective, it must have had clear strategic objectives and a robust appraisal framework.

1.4 Structure of Thesis

1.4.1 Chapter 1 - Introduction

Chapter 1 provides an outline of the report's topic, giving an introduction and definition to the research question. Aims, objectives, and hypothesis are defined, as too is research relevance – and this overview of contents.

1.4.2 Chapter 2 - Literature Review

Chapter 2 provides an overview of relevant literature available, looking at commentary on international practice of evaluating infrastructure and governance, global trends with megaprojects, and opinions regarding T21 and experience in Ireland, with focus on Dublin.

1.4.3 Chapter 3 - Research Methodology

Techniques used in the production of this report are explained in this chapter, with reasoning given why certain research methods were adopted, with others left unused.

1.4.4 Chapter 4 – Policy Review

This chapter reviews the relevant policy guiding transport policy and infrastructural development. New documentary evidence is presented outlining the origins of Dublin's unbuilt underground railway plans dating back to pre-1966. Separately, an analysis of the appraisal reports substantiating underground plans suggests that key elements of existing infrastructure are being overlooked.

1.4.5 Chapter 5 - Findings and Analysis

This section reports and analyses the samples procured during primary research, with qualitative data having been collected by way of semi-structured interviews. Separately ArcGIS generated quantitative data helps provide further analysis. Findings are contextualised by both Policy and Literature Reviews.

1.4.6 Chapter 6 - Conclusions and Recommendations

This gives an outline of the conclusions within each chapter, before setting out the final conclusion.

2.0 Literature Review

2.1 Introduction

This review assesses commentary relevant to evaluating 'Transport 21'. The purpose of this secondary research has been to inform and complement the primary research of the hypothesis. This method is frequently favoured by researchers as it is considered valuable to have other viewpoints when compiling a report on a topic. In this instance, themes identified as most relevant were governance architecture, the international experience of megaprojects – how policy has developed in Dublin, and performance of same. This helped inform the aims of this project; examining how successful T21 was; identifying lessons to be potentially learned from the process, and whether if such knowledge is now being applied. The literature review also assisted the first two objectives of this research; tracing T21, and comparing megaprojects in other cities with the experience of Dublin. The reader should find this section complements the Policy Review, which provides a chronological context of policies.

Helpfully, global commentary can assist when trying to understand the nature of bureaucratic governance structures, and how best regulatory structures may be evaluated. In this regard, The World Bank Handbook on Evaluating Infrastructure Regulatory Systems was found particularly insightful.

Commenting on successful megaprojects, Babalik-Sutcliffe defines characteristics of fruitful urban rail projects (2002). Yet, Flyvbjerg et al take a more critical perspective – providing commentary on the international experience of megaprojects that is particularly informative, with observations

relevant to Dublin. A comparable study assessing risks of megaprojects by Cohen-Blankshtain and Feitelson (2010) is found to complement Flyvbjerg.

Wickham's book 'Gridlock' was found to be particularly informative regarding Dublin transport and published contemporaneously to the launch of T21.It helps provides a benchmark by which progress can be measured. Commentary by Caulfield and Ahern, and separately Rock outline the car-dependent nature of new Dublin suburbs.

'Transport Investment Strategies and Outcomes in Dublin 1941 – 2006' by Leahy was found to have particular relevance for this project as it indicates a pattern of repeatedly failed public transport megaprojects in Dublin. It appears the more expensive a Dublin transport project is likely to be, the less likely it is to be built. Yet, based on new documentary sources (see 4.2), it is contended that these projects are actually not different projects – but are instead are effectively different manifestations of the same Dublin underground scheme, that consists of a Liffey tunnel and an airport connection. It appears the project gets promoted during times of economic prosperity – but never gets built, despite plans dating back to 'at least 1966'. Effectively, Dublin is haunted by an unaffordable zombie megaproject that has distracted from effective provision, with few apparent beneficiaries – other than hustling politicians, and possibly an institutional architecture that has grown alongside the aspirant projections.

An apparent institutional preference favouring prestige projects rather than maximising effectiveness of existing infrastructure was evident according to

commentary on rail policy preceding T21 (Barrett, 2003). Barrett (2011) also commented on the 2009 NTA Act; however, as body has a broader remit to that originally envisaged, with accountability essentially to the Transport Minister rather than a directly-elected Dublin mayor, it was only subsequently such corporate structures could be authoritatively commented upon (O'Connor 2011).

During the post 2008 period the Irish state was effectively bankrupt, with funding from the IMF and EU necessary[xvii]. Hence the contribution by Rau, Hynes, and Heisserer is of particular interest, as it assessed a policy response partially brought about by the downturn. *Smarter Travel* sought to inexpensively innovate by shifting focus to 'soft' measures for sustainable use, such as cycling and walking – with the prospects of continued policy emphasis assessed in the likelihood of economic recovery, and found unlikely.

The Literature Review is complemented by the Policy Review, wherein guidance documents concerning transport planning are evaluated – with that critique having been informed by the issues and themes raised in this section.

2.2 International Perspectives on Evaluating

The World Bank Handbook for Evaluating Infrastructure (2006), 'presents detailed, practical guidance on how to conduct quick, mid-level, and in-depth regulatory evaluations of existing national- and state- or province-level regulatory systems through structured case studies'. The mid-level appears most relevant for this current project, as;

'It reviews both the formal elements of the system and how these formal elements have actually been implemented. It requires extensive interviews with the regulator and government officials, executives in sector enterprises, and consumers. Individuals with widely different perspectives need to be interviewed to ensure that the evaluation will not just reflect what government officials or regulators want it to say'.

The Handbook advises that 'evaluation of regulatory effectiveness must look at both regulatory governance and regulatory substance';

Evaluation should take note of what is good, but focus on what is bad. To do this requires looking at weaknesses in governance and systematically examining bad decisions and their consequences arising from regulatory inaction (sins of omission), as well as bad decisions arising from regulatory actions (sins of commission).

Hence, adopting an agenda of critical analysis for this project appears the correct approach for this project. Accordingly, for example, where it has been found the NTA de-prioritised a long-standing City Council policy objective to develop a railway station at Cross Gun's Bridge in Phibsborough, this is explored further in the Policy Review section of this project. A copy of the World Bank Handbook is included in the Appendix.

2.3 Global Trends in Megaprojects

Megaprojects is a term first coined in the 1970s, of schemes typically exceeding €1 billion in today's money, and have become increasingly popular with governments worldwide. Babalik-Sutcliffe (2002) identifies 4 key factor behind seemingly successful Light Rail Transit (LRT) schemes:

1. Vibrant commercial business districts are more likely to generate trips
2. Planning factors – integrating urban renewal and bus services increased success
3. Operating policies – frequent service, customer friendly and active marketing
4. Active urban planning for enhanced areas, and regeneration etc.

Other external factors also mattered: deregulation of buses in the UK hindered integration, while US cities were found to have made better advantage for urban enhancement, partially as UK planning has become more fragmented.

Flyvbjerg et al has commented extensively on megaprojects. In his seminal work 'Rationality and Power', Flyvbjerg traced a much-lauded public transport plan in Aalborg that still had not been built some 25 years on. Various characteristics he identified that seem bizarre and unique – such as the original rationale of project elements having been forgotten arising out of generational change – are seemingly analogous to Dublin, where the apparent origins of the unbuilt underground project date back 51 years. Flyvbjerg has subsequently further commented on risks involved with megaprojects, which usually involve cost

overruns, delays, and lower-than-expected returns – and how these may be avoided. With 'Underestimating Costs in Public Works Projects: Error or Lie?' (2002), Flyvbjerg et al found;

• Cost underestimation has not decreased over the past 70 years. No learning that would improve cost estimate accuracy seems to take place.

• Cost underestimation cannot be explained by error and seems to be best explained by strategic misrepresentation, i.e., lying.

With 'What causes cost overrun in transport infrastructure projects?' (2004), Flyvbjerg et al found cost escalation highly dependent on the length of the project-implementation phase, with the average increase in cost escalation 4.64% per annum until operations commence; 'sluggishness quite simply may be extremely expensive'. Approaches to risk are conceptualised, as per figure 2.3.1.

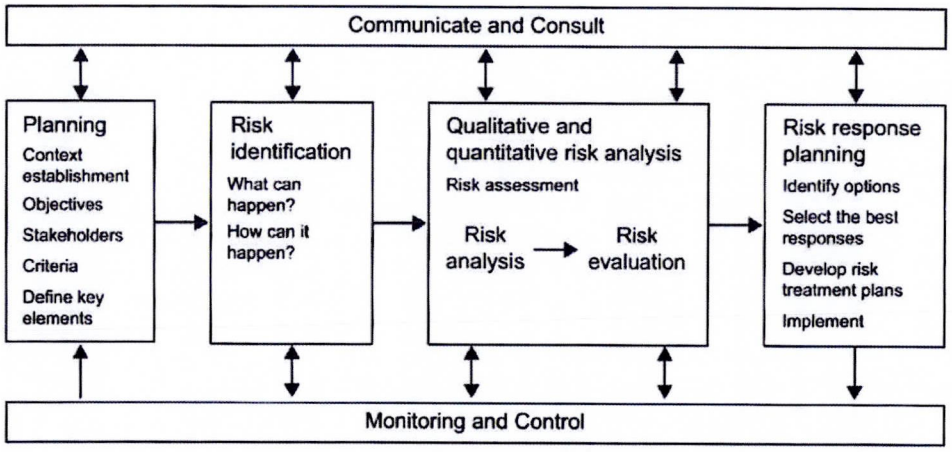


Figure 2.3.1 Risk management process as discussed by Flyvbjerg

Commenting on 'Cost Overruns and Demand Shortfalls in Urban Rail and Other Infrastructure' (2007), Flyvbjerg assessed 44 urban rail projects and found such schemes carry a 'double risk' in terms of exposure to higher construction costs, which averaged out at 44.7% more than anticipated - and lower passenger numbers than predicted, resulting in higher ongoing costs – typically carrying 50.8% less passengers than projected. It is asserted that 'assessment and management of such risk should therefore be central to all phases of the project development cycle in urban and other rail projects, from decision making to planning to construction'. Observations regarding Copenhagen may be relevant to revived Dublin proposals, where the high ridership forecasts provided to justify investment in a 'minimetro' have not yet occurred.

With 'Megaprojects and Risk' Flyvbjerg decries a 'democracy deficit', as 'project promoters often avoid and violate established practices of good governance, transparency and participation'. However, weaknesses of approach can be overcome by emphasizing risk, institutional issues, and accountability; while risk cannot be eliminated, it can be addressed in 'ways much more intelligent than those currently seen'. Yet if this is to occur, a 'high-trust democracy' could be a model for satisfactory megaproject delivery, but that this must be based on 'hard-nosed considerations about risk and democratic accountability'.

Again, a comprehensive overview is provided by Flyvbjerg, where different academic studies that had evaluated projects are perused, the most comprehensive of which was by Aalborg University, which assessed 258

projects in 5 continents and found 90% of transport infrastructure projects to have had costs underestimated, and that rail projects averaged out 45% higher than estimated. Observing that overrun had not decreased over 70 years, it seems no learning was occurring although this being a global phenomenon, such overrun 'cannot be explained by error and seem best explained by strategic misrepresentation, namely lying, with a view to getting projects started'. 'Spectacular' overruns included Suez Canal (1,900%), Sydney Opera House (1,400%), and Panama Canal (200%). Ultimately it is advised 'don't trust cost estimates' – as those frequently cited in media and decision making for transport infrastructure are 'highly, systematically, and significantly deceptive'. Better checks and balances should be developed to deter less deceptive cost estimates. Essentially it is advocated that more accurate, transparent, and accountable means of assessment would be used – and that in instances where costs turn out to be significantly higher than that forecast, the consultants involved would effectively be blacklisted by the state when considering future projects.

Commenting on the same area, Cohen-Blankshtain and Feitelson (2010) found two rationales usually underlie LRT schemes: servicing congested corridors and inducing development in underdeveloped areas. Yet of the U.S. 16 cities were surveyed, it was found that 'goals are only weakly correlated with the challenges'. They concur with Wachs (1995), that 'decisions are inherently political' which lead to such schemes getting sanctioned. Of separate interest, is that they sent surveys to 134 contacts in 16 cities yet received only 26 usable responses – which appears to substantiate the more qualitative approach taken with this research project.

2.4 Transport 21 – An Irish Solution to an International Problem?

2006 was a prosperous year in Ireland[xviii]; the government had launched T21 in November 2005, and an election beckoned. Serendipitously 'Gridlock' was published that year, whereby Wickham definitively set out how Dublin was emerging as the most car-dependent European city, with blame proportioned greatly to vested interests, weak political leadership, and dismal public transport management, with lack of maps, integration, transferable ticketing – and that services were focused on orbital routes, noting 'many areas between the canals have no public transport'. Wickham comprehensively rejected any notion this was unstoppable – and cited Helsinki as being low density with a bus system achieving the 'network effect' as popularised by Mees (2010). Societal damage is immense with obesity overwhelming and transport CO2 emissions rocketing, up 129.4% between 1990 – 2003. Separately Wickham observes the Dart 'notoriously serves primarily the richer suburbs', and asserts Dublin needs a transport authority, and praises participatory district councils such as the Verkehrsverbundes in Germany. Ultimately, Luas should be used to advance civic refurbishment, moving people around as opposed to in and out of Dublin. Wickham's concerns as to Dublin having become car dependent are further substantiated in commentary by Caulfield and Ahern (2014), and Rock.

Leahy provides a concise overview as to public transport projects proposed and delivered since 1946 in Dublin, finding the greatest 'success' by authorities was road-widening – although this irrevocably damaged urban fabric. Yet it is the 1972 An Foras Forbartha Transportation in Dublin and 1975 CIE Dublin Rapid Rail Transit Study that are particularly interesting to this research, as it is evident

that core components of T21 – namely an underground system involving a Liffey tunnel and Ballymun / airport link – were promoted, but not built. As is outlined in the Policy Review, this research has uncovered documentary evidence to suggest this scheme dates back further – yet seemingly only became public then.

Separately Barrett (2003) appraised national rail policy subsequent to publication of 'The National Strategic Rail Review', observing 'previous reviews have found policy to be producer rather than consumer dominated and with a propensity for regulatory capture by the producer interest'. Notably Barrett takes issue with underuse of the north city centre railways, observing; 'The line serves Croke Park, Phibsborough, and Cabra in addition to Drumcondra, the only station on the route now served by the Maynooth line and, apparently, doing well. The reluctance to have passenger trains on the Connolly-Heuston line is a producer rather than passenger decision and requires further analysis'. This research is in part a response.

By 2011, the institutional architecture conceived subsequently and in part to oversee T21 was in place, allowing O'Connor scope for structural appraisal. However, it was found to have 'little or no public representation', 'lack of accountability, an 'unclear relationship' with other transport agencies and an overly 'broad geographic remit'. What had begun as a Dublin Transport Authority to be answerable to a directly elected Mayor has ended up consisting of a board mostly appointed by the transport minister who also gets to veto. By comparison, the public transport federation or German "verkehrsverbund" model (see figure 2.3.1), has increased democratic involvement, combined with

greater powers over operational agencies, and is demonstrably effective at creating sustainable transport networks. It is noted 'Experience from cities like Zürich, which boast an efficient and easy-to-use transport system, suggests that accountability is not just an end in itself but is fundamental to delivering socially accessible and mobile urban environments'.

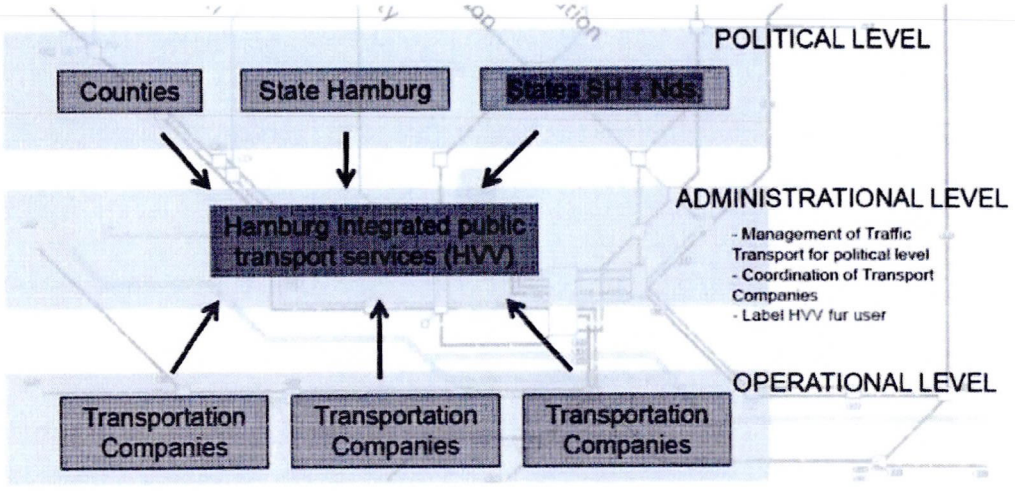


Figure 2.4.1 Organisational Structure of the Hamburger Vikersund Verkehrsverbund (HVV). Image courtesy of O'Connor (2011).

A policy initiative subsequent to T21, *Smarter Travel* was the focus for Rau et al. This represented a mind-shift away from hard engineering to inexpensive 'soft' approaches that sought to 'greening' existing structures and institutions without radical re-engineering, and emphasis on walking and cycling. Yet as observed, many vested car-centric interests are present. Commenting on the institutional architecture governing transport policy, it was noted that 'Transport policy-making in Ireland continues to be opaque', and policy governance remains 'firmly embedded in traditional institutional structures and powerful pro-car networks of policy actors that remain closed to promoters of sustainable

transport'. As confirmed by subsequent policy, they correctly forecast that Smarter Travel would lose significance during economic recovery, with 'business-as-usual' car-centric and engineering-focused decisions again evident.

2.5 Conclusion

That megaprojects typically end up over budget and under-performing is global. Moreover, there appears to be certain indicators of the likelihood of such scenarios occurring – namely where a past record of non-delivery exists (Aalborg), where there is a lack of accountability – including clear metrics agreed at outset – absence of contingency (including phasing) – and an absence of opportunity for the public to meaningfully engage. Vested interests – be it motor related or bureaucratic – also present challenges as they seek to prosper, be that by project promotion or by regulatory capture

Dublin policy developments appear to indicate, that despite innovation that occurred amidst recession, policy guidance has reverted to T21 – and with dates set far into the horizon. However, despite underground projects being presented as 'new', the outline provided by Leahy combined with a new document outlined in the Policy Review indicates that the Dublin underground has been considered for 51+ years, gets publicly advanced during prosperous times – only to be deferred in downturns, before being rebranded and relaunched. Yet Barrett observes that city centre lines are being overlooked. Moreover, as is illustrated in the Policy Review, it appears the basis of the underground's apparent need is partially justified by excluding from both evaluation and readers vision the existence of present infrastructure. A reasonably obvious alternative is never

considered – despite Dublin becoming a worst-case example of unsustainable urban sprawl since the underground was conceived.

The prognosis is not good. With underground railways, you usually expect platforms. Yet to date, the only platform visible is the one being used by politicians seeking re-election. Exchanges in the Dáil suggest €200 million was spent planning Metro North the last time. Such preparations are no longer valid. Meanwhile, contractors and consultants profit preparing evaluations. Dublin looks set to be haunted by an unaffordable zombie project that distracts from achievable objectives – even though the rationale appears part based on *suppressio veri*, as outlined in the Policy Review. One potential maybe the development of 3 BRT routes (see 4.26), and the upgrading of the city bus network; yet reports suggest the Airport – city centre BRT is being deferred until the metro route is finalised (again)[xix].

3.0 Chapter 3 - Research Methodology

3.1 Introduction

This research was conducted to evaluate the process by which Transport 21 (T21) was developed, and its outcomes. The research seeks to identify what if any lessons were gleaned from that experience, and assess any implications for post T21 policy. In preparation, a literature review of methodology used elsewhere when evaluating the performance of comparable programmes helped inform how this process be best conducted.

Normally a policy can logically be reviewed by judging it in comparison to the original criteria that were identified as strategic aims at outset. However, it became evident during the research, that T21 was initiated as a programme – without an attendant framework for policy appraisal outlining evaluation criteria by it could be later measured.

Hence, it became necessary to construct a theoretical framework with relatively objective metrics by which T21 could be measured – with this first informed by literature review, discussions with my supervisor, and peers. Subsequent Irish policy has been informed by appraisal methodology elsewhere, notably the United Kingdom – and hence it seems appropriate to incorporate such criteria when evaluating the outcomes of T21.

Having formalised the theoretical framework, appropriate primary and secondary research techniques were chosen to progress an academically credible research project. Accordingly, this evaluation of T21 consists primarily of a

review by a policy audit and qualitative interviews. The project was further informed by desktop research, with data generated by quantitative ArcGIS used to further analyse circumstance. Lastly, in preparation, Access to Information on the Environment (AIE) Requests were asked of state bodies where appropriate. Although this approach strives to adhere to practice set out by the World Bank Handbook, inevitably the research is restricted by T21 itself having lacked clear metrics at the outset by which it could be later judged – and latterly an absence of any rigorous in-depth evaluation as to the performance of the programme when concluded. Hence, while strenuous efforts are made to objectively evaluate T21, arising from limited empirical evidence, some subjective assessment becomes necessary – and the outcome has had to be partially based on a non-objective conclusion. Nonetheless, it is hoped this provides the grounding for further research in this area, with conclusions and recommendations posited.

3.2 Research Objectives

In attempting to evaluate T21, the following objectives emerged as critical areas to investigate:

1. To assess how effective T21 in terms of outcome. In 2016 the Department of Transport issued the Common Appraisal Framework for Transport Projects and Programmes, which provides criteria on how projects can be best when appraised, which are economy, society, environment, safety, social inclusion and accessibility, and integration. Accordingly, it was considered that these criteria represented the most appropriate metrics by which a previous programme could be measured.

In conducting this assessment, it was considered worthwhile to also ascertain the plan making process led to T21, and whether alternatives were considered.

2. To investigate whether policy has evolved since T21, and to examine current mechanisms used when transport plans are assessed.

3. To assess the extent of prospective population catchments that could be served if service access along the existing Irish Rail network in the Dublin city centre area was improved by new stations and also by better pedestrian access at existing stations. This was considered a worthwhile exercise as there has been little apparent evaluation to date.

3.3 Research Methods

3.3.1 Primary Research

In accordance with objectives, the primary research in this work consists of:

1) Policy review of documents guiding public transport provision in Dublin.
2) Semi-structured interviews with representatives of academic, transport, and civic sectors.
3) An assessment of the effectiveness in serving relevant populations using quantitative data such as size of potential catchments along the Irish Rail network in Dublin city centre, as assisted by ArcGIS.

3.3.1.1 Policy Review

As outlined in the World Handbook, a documentary audit is essential when gauging the effectiveness of official policies / programmes. Accordingly, policies, prior, during and subsequent to T21 are synopsised, analysed, and critiqued accordingly, with commentary as to the effectiveness to date, and any prospective effects. Both this section and the literature review were central to identifying questions later asked of interviewees.

3.3.1.2 Semi Structured Interviews

In conducting research, the best route to gather primary data is often by surveys or interviews. Given this research seeks to evaluate a government programme launched 12 years prior, it was decided that interviews with parties that either had direct contemporaneous engagement or were subsequently involved, would be an effective way by which T21 could be best examined. Accordingly, stakeholders were asked questions directly arising from the research objectives so that fresh data could be generated which could then be analysed so as to attain an informed perspective as to the performance of T21.

Interviews can range from the unstructured where a subject is primarily observed, to the very closely structured - which can result effectively in a questionnaire. Resulting data will latterly range from very qualitative in the first instance, to more likely quantitative data in the second case (Newton, 2010). The attributes of these two types of data is that qualitative methods tend to depend more on the researcher's analytical skills when the data is being collected, while quantitative data can be definitive but lack nuances and be limited in scope.

A semi-structured interview can allow researchers to collect quantitative as well as qualitative data; the relatively limited amount in the first instance being appropriately compensated by good qualitative information gleaned. The format of an interview with planned questions, where may have follow up queries may be included can help ensure the interviewer should be get some information - and may also be positioned to prompt or seek clarification if suitable.

In this instance, primary research was primarily conducted by qualitative data collected by way of semi-structured interviews with 10 parties considered most likely to have an informed viewpoint on the subject, and representative of transport, academic, and voluntary sectors. In some instances, the interviewees had significant experience in two sectors – which allowed them to contribute twice, with 15 samples total. Such data could be later triangulated with data harnessed by policy review, information arising from the quantitative assessment of potential Irish Rail catchments in Dublin's city centre – with the three strands complemented by secondary research in the form of a literature review.

Interviews with the ten parties occurred face-to-face in Dublin and by telephone, with the interview questions having been forwarded prior. One set of nine questions were prepared to best reflect the key viewpoints, with both quantitative and qualitative questions asked. By this means it is intended that sampling methods are scientifically credible, with samples selected and thematically analysed on an equally stratified basis, as detailed in Findings and Analysis. As per UCD policy, viewpoints have been anonymised to protect confidentiality of interviewees, while transcripts were confidentially filed with the supervisor.

Interviewee profiles sampled included persons with extensive senior expertise. It was estimated that interviews would last circa 20 – 30 minutes; ultimately interviews ranged from 14 to 37 minutes.

3.3.1.3 Quantitative Research

As a third probe complementing the research pathways of qualitative research and policy review, it was decided to assess the scale of potential populations residing beside railways in Dublin city centre, but are beyond 1-kilometre walking distance from railway platforms – and effectively without access. This has been done as a method to assess the effectiveness of T21. Arising from a team project work previously conducted in the UCD ArcGIS multi-disciplined masters class (November 2016), certain sites potentially suitable for stations were previously identified, and 1-kilometre catchments quantified by using Dublin City Council (DCC) map data combined with Central Statistics Office (CSO) data. By using ArcGIS, a realistic number of residents living within 1-kilometre actual walking distance was estimated, and contrasting with the 'Euclidian Method', which is criticised for not accounting for obstructions to permeability (O'Connor). As previous research was based on the 2011 census, it seemed appropriate to revise the figures in line with 2016 census trends evident in city centre.

3.3.2 Secondary Research

Secondary research by way of a literature review should inform a researcher what other commentators think about a subject, as well as getting a broad overview, and should complement the data being gathered by primary research. As with the review of policy or programme documents, relevant academic

commentary is sourced, reviewed, analysed, and discussed accordingly. However, a literature review will differ from a policy review, by being thematic rather than chronological. In this instance, international perspectives on megaprojects by commentators such as Flyvbjerg, has been essential – while the experience at home as assessed by Barrett, Leahy and others has also been invaluable. The reader should find this section complements the Policy Review.

3.4 Findings, Analysis, and Conclusion

The penultimate element in the methodology is collate and triangulate the data, analyse, and evaluate the findings, and hence form an overall judgement regarding the research hypothesis. The findings and analysis section is followed by the conclusions and recommendations. Hence, despite the limited empirical evidence project outset – and the resulting conclusion inevitably partially subjective, it nonetheless is intended to provide a rigorous, robust academic work – that if desired at a later date, could be tested, replicated, and built upon.

4.0 Chapter 4 – Policy Review

4.1 Introduction

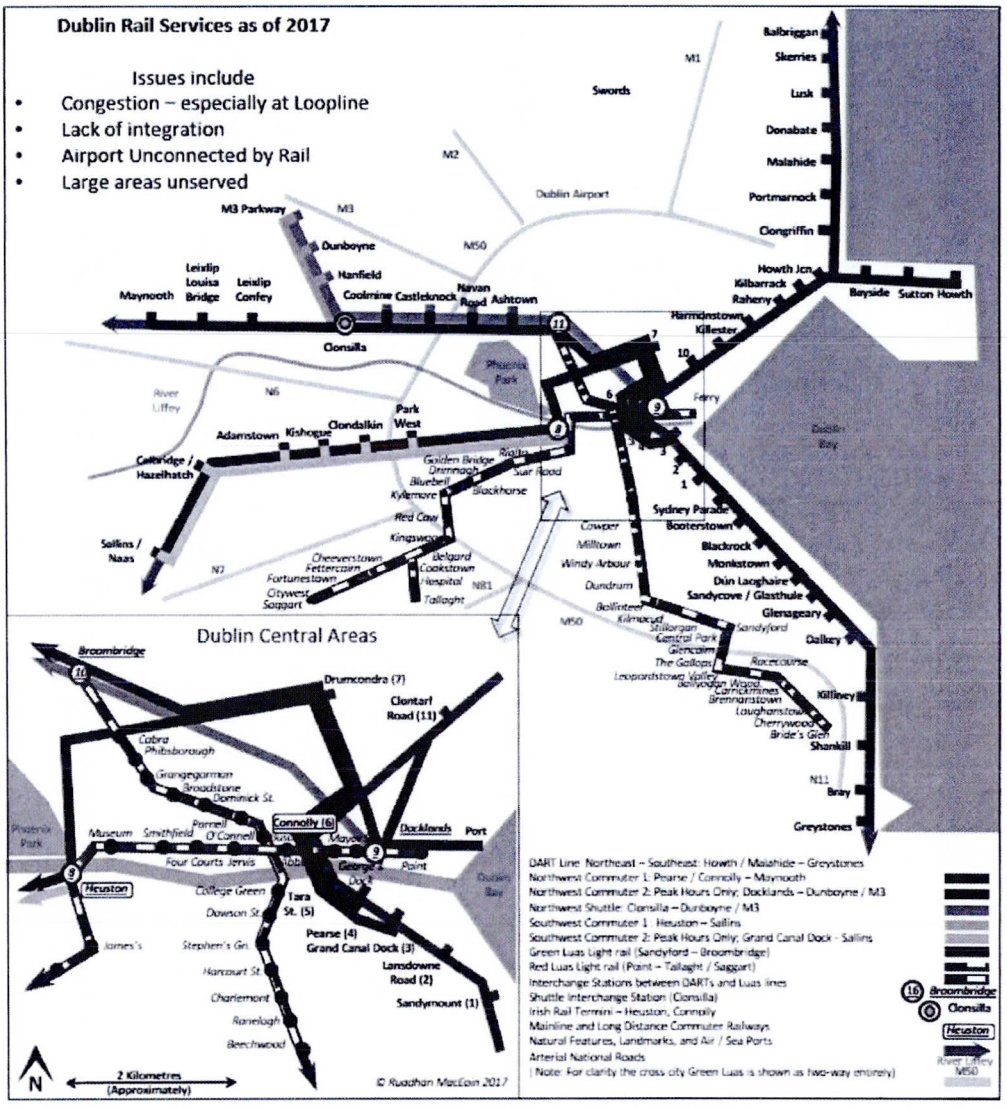


Figure 4.1.1 Dublin rail services, 2017. Schematic map was prepared for this project.

This section reviews documents published prior to Transport 21, T21 itself, and subsequent policy documents. Following discussion with my supervisor and other peers, reports have been methodically viewed, tracing apparent origins of DART Underground and Metro North type schemes as far back as 1966, a fact hitherto not widely known.

It appears T21 did not gestate in isolation, with ideas incorporated from previous plans. Commentary by Leahy (as per Literature Review) provides a good overview regarding delivery of transport infrastructure in Dublin since 1946. Separately, policy documents have been issued by advocacy groups, and Irish Rail itself. As much of the 'big spend' projects in Transport 21 largely relate to railway projects in the Dublin region, appropriate focus is thus accorded.

4.2 UCD School of Architecture *Dublin City Quays* (UCD 1985)

Although not formal policy, this publication provided critical impetus encouraging the urban regeneration of Temple Bar. Much property had become vacant as CIE land-banked for an intended central depot at the heart of an underground rail system – and subsequently it was the abandonment of the depot scheme that enabled 'Temple Bar' to happen. In a paper provided by CIE Senior Architect John Clancy in the book, *The Dublin Transportation Centre Development* provides the earliest documented indication of CIE championing underground railway plans for central Dublin 'at least as far back as 1966'. With tunnels under the Liffey and destinations including Ballymun – this is closely comparable to 'DART Underground' and 'Metro North'. Reasoning given by CIE included the plan being designed to serve areas identified for development by Myles Wright Report, as discussed following.

4.3 Myles Wright *Dublin Regional Plan* (Government Publications, 1967)

The Myles Wright Report was an official plan for the Dublin region. Never formally adopted, it nonetheless was of major consequence – with development occurring broadly in line with its recommendations – including the low-density

suburbs at Tallaght, Clondalkin, and Blanchardstown. It did not envisage any railway or underground development, with Dublin suburban services curtailed to today's DART line (see Myles Wright sections 17:11 – 17:13).

4.4 An Foras Forbartha *Transportation in Dublin* (Government Publications, 1972)

This study recommended an underground to 'more effectively connect up the four existing rail links into the city'[xx], latterly adopted by CIE.

4.5 CIE *Dublin Rapid Rail Transit Study* (CIE, 1975)

The *Study* advanced the *Dublin Area Rapid Transit (DART)* plan, advocating electrifying the Dublin network, with new links to Tallaght, Blanchardstown, and Clondalkin – and new tunnels under the city centre, to link east – west, and southeast – northwest. Ultimately, the only element completed was electrification of the existing coastal corridor in 1984.

4.6 Dublin Transportation Initiative *Final Report* (DTI 1995)

Formed by the Dublin City Business Association and others, this NGO promoted an integrated transport strategy for Dublin, primarily by buses, light rail, and cycling/walking[xxi]. The Final Report of the Dublin Transportation Initiative (DTI) was published in August 1995. Three Luas lines were proposed – the two since built and one to Dublin Airport. Subsequently, the Dublin Transport Office was initiated by government to advance the strategy.

4.7 Irish Rail and Córas Iompair Éireann The Dublin Suburban Rail Strategic Review (Arup's, 2000)

This report recommended major projects, including;

- New rail links to Dublin Airport, Navan, Blanchardstown, and Tallaght West
- A new city centre east – west tunnel to ease congestion and link Heuston, later branded *DART Underground*.
- Upgrading the approach corridors into Connolly and Heuston Stations to three or four tracks.
- Regional electrification
- New stations at Adamstown, Leixlip, and Docklands

Other recommendations were less dramatic but of significant utilitarian consequence;

- Lengthening station platforms to accommodate longer trains
- Upgrading of signalling
- New through platforms at Pearse and Connolly Stations
- Removing level crossings

Transport 21 effectively adopted these recommendations, apart from the Tallaght and airport links which instead were to be served by light rail. Addressing capacity needs in the central network, sections 5.83 – 5.99 outline the option later known as *DART Underground*. Although the Phoenix Park Tunnel (option A22) was assessed, capacity was found too restricted at

Connolly; routing such traffic to Docklands Station was not seemingly examined, despite being little used, having apparent scope – and also direct access to the north-eastern corridor. This appears to provide much justification for *DART Underground.*

Separately, it indicates the Phoenix Park Tunnel was already funded £3 million under the National Development Plan, and was due to open (points 1.5 and 2.30, with costs printed on page 73). However, responding to an Access to Information on the Environment (AIE) Request querying what occurred, given the tunnel was only opened in 2016 following latter investment, Irish Rail stated they have 'no knowledge or recollection of any monies being allocated to these works under the 2000 NDP.'

Separately, although it is indicated that additional 'through' platforms should be built at Connolly and Pearse Stations to relieve congestion, despite refurbishments subsequently occurring, not only did such platforms not get developed – but platforms at Pearse were taken out. The absence of such platforms means that other traffic cannot overtake – which in turn further concentrates congestion on the Loop Line Bridge.

4.8 Dublin Transportation Office *Platform for Change* (D.T.O. 2002)

Published in 2002 by the Dublin Transportation Office (DTO) *Platform for Change*, included light rail proposals – and *DART Underground.* The DTO report rejected Phoenix Park Tunnel, stating among other reasons, that the Drumcondra line lacks capacity to accommodate additional traffic coming from

the Phoenix Park. However, although existing traffic could be rerouted along the little-used Royal Canal line to Docklands Station, this was not considered.

4.9 Department of Transport *Strategic Rail Review* (Booz Allen Hamilton, 2003)

The Strategic Rail Review, evaluated the national railway network, providing observations and recommendations. Use of the Phoenix Park Tunnel was discounted as *offering no real opportunities for passenger services*, arising from perceived congestion issues on the Drumcondra line. In contrast, Dart Underground was praised. As per Literature Review, Barrett (2003) was critical of the apparent under-valuing of the Phoenix Park / Royal Canal railways.

4.10 RailUsers Ireland *D-Connector* Proposal (Dublin, 2004)

RailUsers Ireland is a Non-Governmental Organisation (NGO), that in 2004 published *the D-Connector* plan, which proposed extending Kildare services via the Phoenix Park Tunnel, with new stations open at Cross Guns Bridge and Docklands, as per figure 4.10.1.

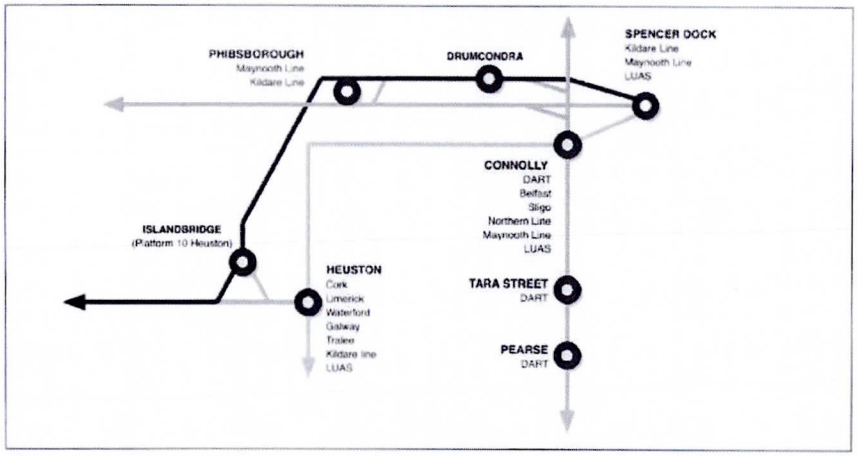


Figure 4.10.1 The *D-Connector* proposal noted Docklands was underused, and suggested extending southwest Kildare commuter services through the Phoenix Park tunnel.

4.11 Department of Transport *Transport 21* (Government Publications, 2005)

In November 2005, *T21* was launched amid fanfare setting out a very ambitious programme, as per figure 4.11.1. Although much of Ireland's motorway network was already under construction, the programme was to oversee this – and also development of primarily public transport in Dublin, for which approximately half of the €34.4 billion budget was earmarked. As per figure 4.11.2, prestige projects were central of T21, including *Metro North,* and *DART Underground* – while a DTO orbital tram route proposal was upgraded to *Metro West*. Yet the Dublin proposals were less extensive than conceived by the DTO, although growth – and sprawl – had exceeded forecasts (Wickham, 2006). Interestingly, the Phoenix Park tunnel appears excluded from maps. *Annual Progress Reports* published subsequently were generally favourable in commentary.

	Completion Dates for Selected Major Projects
2006	Introduction of hourly services on Dublin-Cork rail route Dublin Port Tunnel
2007	New Portlaoise train depot Delivery and introduction to service of 120 intercity railcars M1 Motorway M50 Upgrade (Phase 1)
2008	Joining of the Tallaght and Sandyford Luas Lines in City Centre Luas extension from Connolly to Docklands Luas extension Tallaght to Citywest (subject to developer contributions) Cork commuter rail service to Midleton Ennis – Athenry rail line (Western Rail Corridor)
2009	Dublin City Centre rail resignalling project M3 Motorway Phase 1 of Navan Rail Link Opening of new Dublin City Centre rail station Limerick Southern Ring Road Waterford City Bypass Galway – Athenry commuter rail services
2010	Metro West Phase 1 Tallaght to Clondalkin Kildare rail upgrade Sandyford Luas line extension to Cherrywood Dublin- Cork Inter-Urban Motorway Dublin-Limerick Inter-Urban Motorway Dublin-Galway Inter-Urban Motorway Dublin-Waterford Inter-Urban Motorway M50 Upgrade (Phase 2)
2011	Metro West Phase 2 Clondalkin to Lucan Athenry – Tuam rail line (Western Rail Corridor)
2012	Metro North Luas extension from city centre to Liffey Junction Metro West Phase 3 Lucan to Blanchardstown
2013	Lucan to city centre Luas Rail Safety Programme completed
2014	Metro West Phase 4 Blanchardstown to Ballymun Tuam – Claremorris rail line (Western Rail Corridor)
2015	Interconnector completed Extend Electrification to Balbriggan, Maynooth, Navan, Hazelhatch. Phase 2 of Navan rail link Luas extension Cherrywood to Bray

Note: The 2011-2015 road programme will involve the development of approximately 150 km of dual carriageway, 400 km of 2+1 roads and 300 km of single carriageway. The sequencing of projects for implementation post-2010 will be decided by the National Roads Authority at a later date.

Figure 4.11.1: T21 scheduled megaprojects and ambitious time-lines

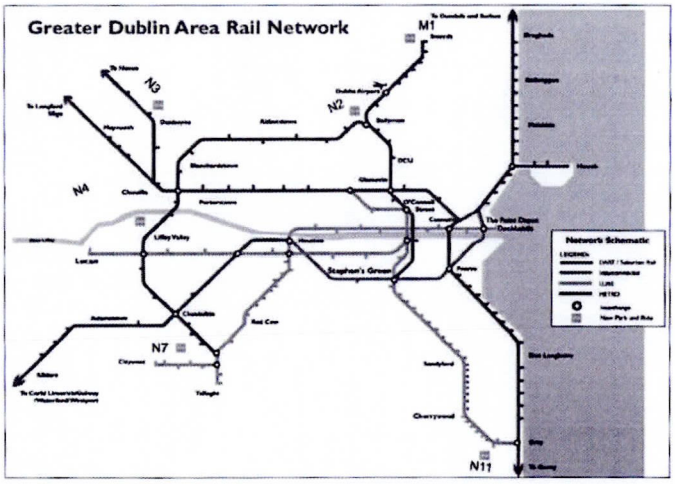


Figure 4.11.2 – T21 Dublin Rail Plans: The blue lines represent the proposed *Metro North* and *Metro West*, while the purple line indicates the *DART Underground* (briefly branded *Interconnector* as above). Phoenix Park tunnel is not apparent.

4.12 Dáil Éireann *Dublin Transport Authority Act* (Irish Statute, Dublin, 2008)

When initially envisaged, the Dublin Transport Authority was conceived to be accountable to a directly elected Dublin Mayor. However, as per Literature Review (O'Connor), the mayoral office did not occur – with this body ending up being answerable to the national transport minister instead. Additionally, the body now has a national policy remit on top of having specific powers to coordinate transport matters in Dublin. As set out by the Act, the NTA must produce and update strategy at regular intervals for the Dublin region, setting out a multi-year vision – such as the *Strategy for the Greater Dublin Area 2016 - 25*. For adoption to occur, the Strategy must be consistent with Regional Planning Guidelines, secure ministerial approval, and be passed by Dáil Éireann having first been presented for 30 days.

4.13 Department of Transport *Smarter Travel* (Dublin, 2009)

By 2009, Ireland's economy crashed, with the International Monetary Fund and European Union funding the country. Nonetheless *Smarter Travel* innovated as it encouraged cycling and walking, on top of T21. Crucially, tax incentives were introduced for cycling to work; today, cycling has grown to circa 7.5% of modal share in Dublin city and suburbs[xxii].

4.14 Chartered Institute of Logistics and Transport (Ireland) *T21 Midterm Review* (Dublin, 2010)

A midterm review was conducted in 2010 appraising the performance of T21. By then the €3 billion annual spend associated with T21 was impossible. The report noted the motorway network had been largely completed within time and budget. With finances clearly limited, the report stated, 'priority should be given to DART Underground and Luas Cross-City over Metro North', with BRT suggested as an alternative to Metro North. Separately, cycling and walking were encouraged, while road user charging was suggested for Dublin.

4.15 Irish Rail *The Business Case for DART Underground* (Buchanan Associates, 2010)

In 2010, Irish Rail commissioned Buchanan Associates to produce *The Business Case for DART Underground*. As with previous reports, using the Phoenix Park Tunnel was disregarded as the Drumcondra line *'does not have the capacity to facilitate the additional traffic'*.

4.16 National Transport Authority *Draft Dublin Strategy 2011 – 2030* (N.T.A., 2012)

As indicated in section 4.12, the NTA has responsibility for coordinating Dublin transport – and previous policy objectives of Dublin local authorities can be overridden, with a new rail station at Cross Guns Bridge to no longer be 'priority' (see *Draft Phibsborough Local Area Plan 2015*). The *Draft Strategy* continued with many of the larger schemes of T21 – even *Metro West*. As with T21, the

Phoenix Park tunnel did not even feature on the maps. The *Draft* was not subsequently approved by then Transport Minister, Leo Varadkar.

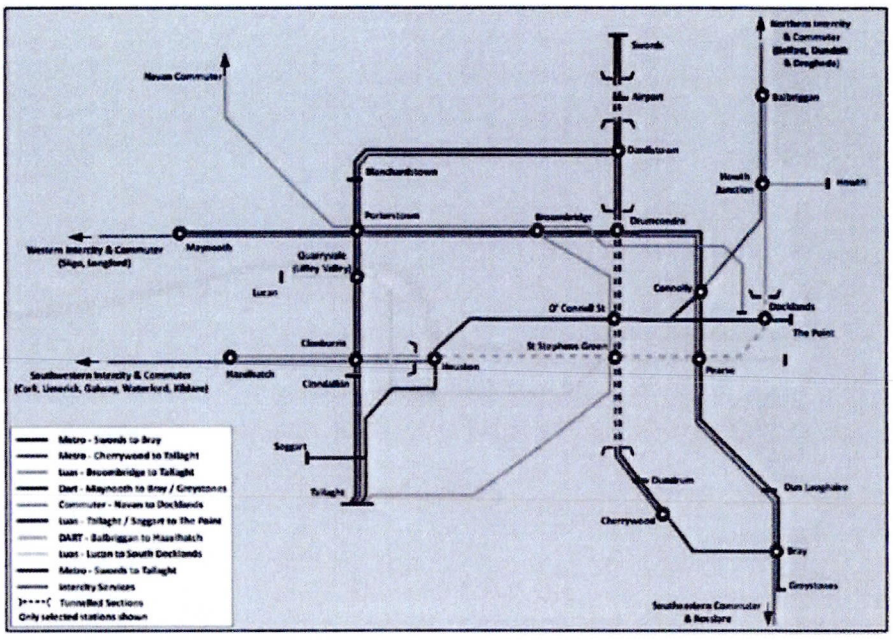


Figure 4.16.1 NTA 2011 Dublin Strategy: Despite the economic crash, Dublin rail plans appeared to be the same as T21, including *Metro West.*

4.17 National Transport Authority *Dublin Implementation Plan 2013* (N.T.A., 2012)

By 2013 all T21 Luas extensions to Cherrywood, Docklands, and Saggart had opened. The *Implementation Plan* seemingly attempted to prioritise and innovate with limited assets – so Luas Cross City was commenced, while Metro North and DART Underground were deferred. Moreover, the Phoenix Park Tunnel was prioritised to be opened to Kildare commuter trains; separately BRT planning began – and other cost-effective bus improvements also occurred.

4.18 National Transport Authority *Planning and Development of Large Scale Rail Focused Residential Areas in Dublin* (Brady Shipman Martin & OMK 2013)

This non-statutory report identifies areas suitable for development around Dublin. However, despite national policy apparently encouraging city-centre living, such sites were excluded purportedly as such lands may be suited to greater development density and are already served by public transport. (See Section 1, page 3, Brady Shipman Martin & OMK 2013).

4.19 Department of Transport & Department of Environment *Design manual for Urban Roads and Streets* (DoT & DoE 2013)

This design guidance was issued as urban streets were being designed with the same criteria as non-urban roads, primarily to move motor traffic. *DMURS* encouraged priority reorientation, with streets not simply being 'transport corridors', but instead environments conducive to walking and cycling, and complementary to *Smarter Travel*

4.20 National Transport Authority *Fingal North Dublin Transport Study Appraisal and Evaluation Reports* (Aecom, 2014 - 15)

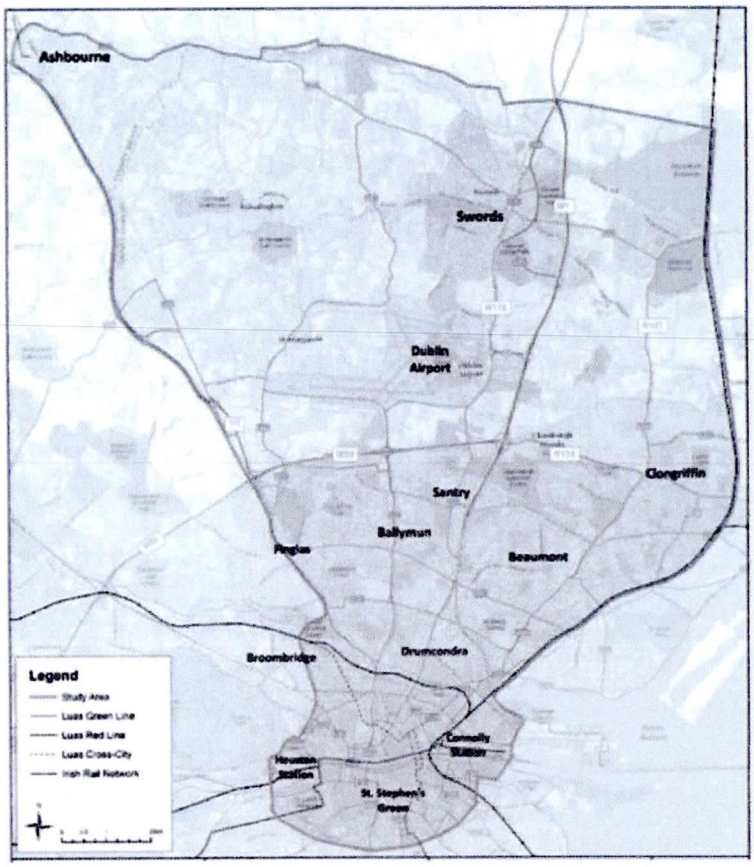


Figure 4.20.1, reproduced from page 1 of the Aecom Fingal / North Dublin Transport Study Appraisal Report, Stage 1 Assessment. Phoenix Park and Royal Canal railways are not apparent, while the ferry port was excluded.

Produced in November 2014 and June 2015, 25 potential modes and routes to connect Dublin city centre, the airport, and Swords, were assessed. Section 6.3 notes study was conducted using the Common Appraisal Framework (CAF) as issued by the Department of Transport. The CAF provides a framework of clear metrics by which potential projects that require public capital investment can be judged (see 4.24).

The 'Multi-Criteria Analysis' (MCA) uses these headings:

- Economy;
- Safety;
- Environment;
- Accessibility and Social Inclusion; and
- Integration

However, separately without apparent explanation, Dublin Port was excluded from the study area, despite 1.8 million passengers p.a[xxiii]. (see figure 4.20.1). The report seemingly ignores the Royal Canal railway, although perceived capacity restraints on the Drumcondra line were cited in rejecting the possibility of a DART link ('HR8' option) to the airport from Cross Guns Bridge. Separately the 'LR4' option of extending the Luas from Broadstone to Dublin Airport and Sword was modelled with the Luas stop removed from the Cross Guns Bridge railway bridge (see figure 4.20.2), despite a Dublin City Council objective to develop a station there[xxiv], while the former Royal Canal Broadstone Branch / Old Ballymun Road corridor was not considered when the Phibsborough Road was found too congested; lastly, rail capacity on O'Connell Street at peak hours was an issue – yet this was based on operating Broombridge trams end-to-end, with shuttle service not considered. There appears to be a possible over-focus on connecting the airport with the city centre, given only 23% of travellers at Dublin Airport seemingly originate their journey from the city centre. The ultimate recommendation was that *Metro North* should be slightly redesigned and advanced.

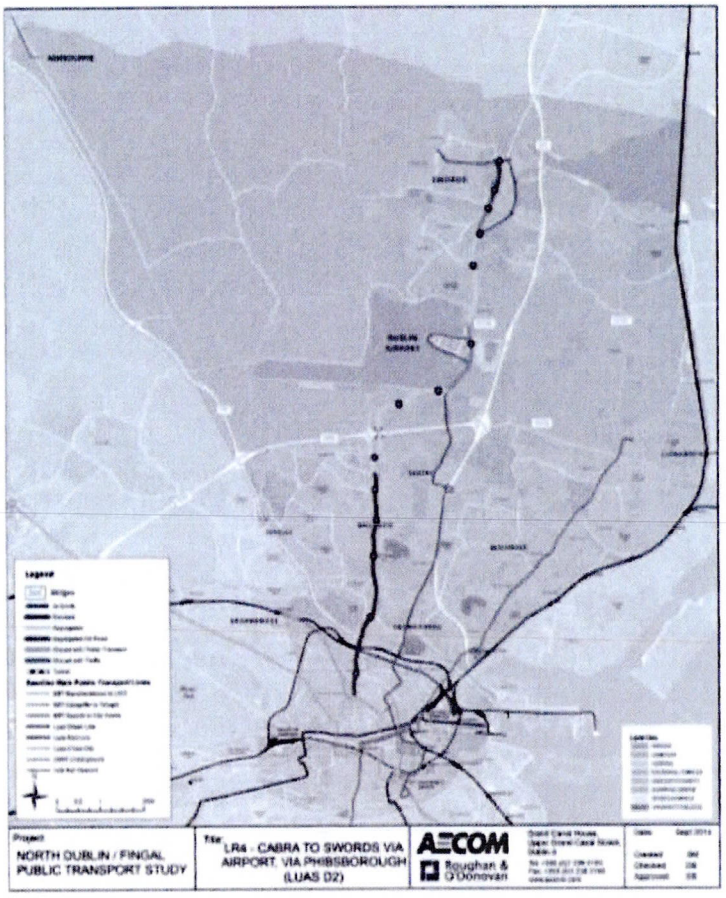


Figure 4.20.2 LR4 Overland Luas option with stop circa 600 metres away from Cross Guns Bridge, despite a Dublin City Council objective to develop a rail station at the location. Map courtesy of Fingal / North Dublin Transport Study Appraisal Report, Stage 1 Assessment (2014).

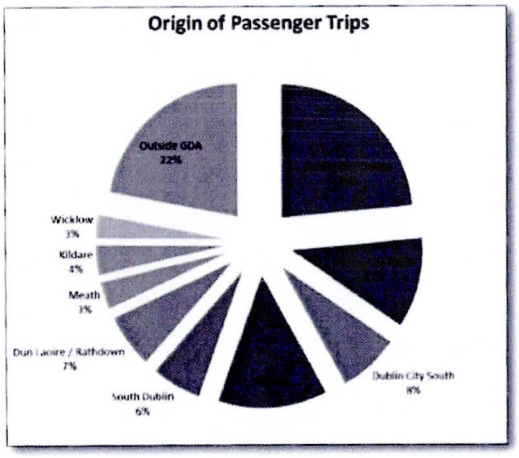


Figure 4.20.3 Dublin Airport Passenger Origins, from 'Dublin Airport Passenger Survey', by the NTA 2011. Only 23% originated in the city centre – suggesting a benefit for passengers to be able disperse at a nodal point such as Cross Guns' Bridge, rather than firstly coming into the city centre.

4.21 Irish Rail *Dart Expansion Programme Business Case* (Aecom / Volterra Partners, April 2015)

Contemporaneously to producing the North Dublin / Fingal evaluations for the NTA regulator, Aecom in conjunction with Volterra were also working for Irish Rail, producing the *Dart Expansion Business Case*. Again, the Phoenix Park Tunnel was examined as an alternative to *DART Underground*, yet, 'the possibility of reduced capacity on the Sligo Line' was a critical issue. Yet with the map used to illustrate this issue, the Royal Canal line is not obvious, as per figure 4.21.1. It is not known why this is not shown. However, the conclusion is effectively the same flawed finding in the North Dublin Fingal Transport Study – albeit in this case blighting a different prospect. Diverting traffic or using Docklands Station is not assessed – with Docklands seemingly not indicated.

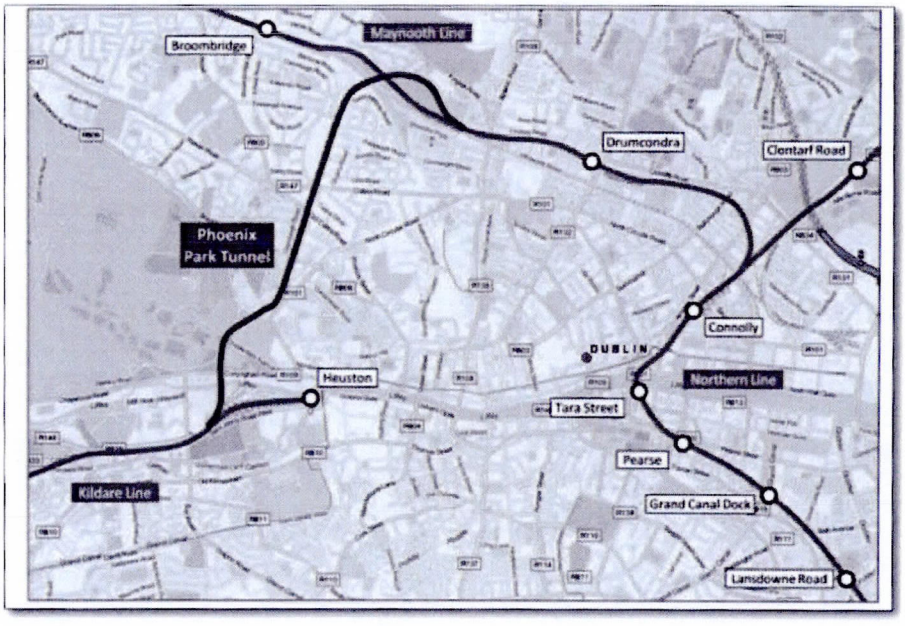


Figure 4.21.1 – The Royal Canal line and Docklands Station appear absent from the map used to indicate the (parallel) Drumcondra line lacks capacity to accommodate Phoenix Park traffic. Map courtesy of *Dart Expansion Programme Business Case.*

Showing traffic modelling for *DART underground,* it seems evident Irish Rail envisage little use for the Royal Canal or Phoenix Park lines, with zero services, as per figure 4.21.2. Hence *DART Underground* effectively proposes a new tunnel between Heuston and Docklands – while abandoning a line between Heuston and Docklands. When previously disused, the line was closed by Irish Rail, as per figure 4.21.3.

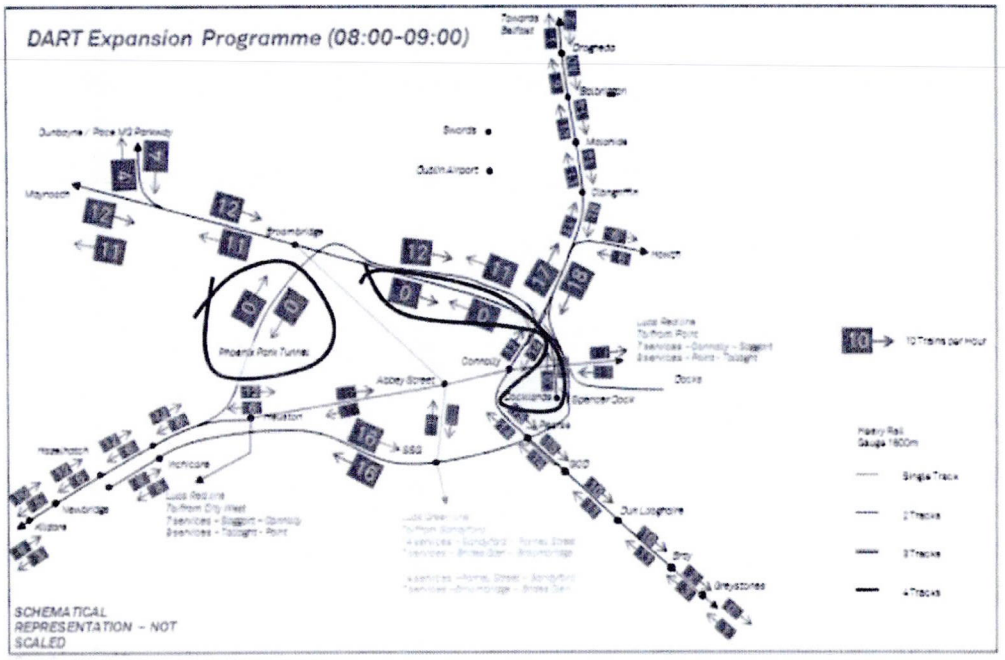


Figure 4.21.2 – Zero services are envisaged by Irish Rail on the Royal Canal and Phoenix Park lines that already link Heuston Station with Docklands in the event of *DART Underground* opening. Courtesy of *DART Expansion Business Case*.

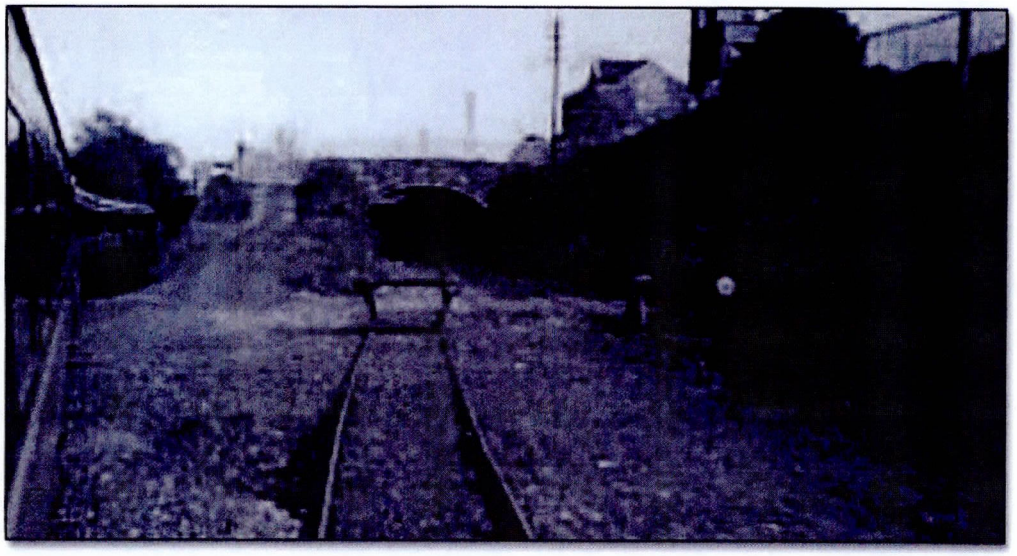


Figure 4.21.3 View east at Glasnevin Junction where the Royal Canal railway was closed when previously disused during the 1990s. Photo courtesy of RailUsers Ireland.

4.22 National Transport Authority *Western Corridor Study* (Jacob's & SYSTRA, September 2015)

As with the *North Dublin Study, the Western Corridor Study* was prepared in advance of the *Transport Strategy for the GDA 2016 – 35* following. In total, the GDA was divided into 8 geographic study areas in advance of *Strategy,* with a further 5 thematic reports, including Park-and-Ride, Core Bus Network, Demand Management, Transport Modelling, and Transport User's Benefits Assessment.

Unlike the *North Dublin Study,* there appears to be no reference to the CAF in the *Western Corridor Study* – and it is not clear why the same criteria were not applied for a comparable study, with both used to inform the *Strategy,* with a metro recommended and a Luas to Lucan in this instance. Moreover, there does not appear to reference to the CAF in the NTA's other background technical reports, except one reference in the User Benefit's Assessment Report.

This study ultimately recommends a Luas from outside Lucan to Trinity College. It is not understood why Trinity as terminus was chosen, as there is seemingly only one reference in the document, and it was outside the study area. Such a location choice for terminus seems sub-optimum given proximity of Irish Rail stations at Pearse (750 metres), and Docklands (2 kilometres), as has been measured on Google Maps. The proposal appears the same as the previous T21 project, Luas Line F, including terminating short of Lucan village, as per figure 4.22.1.

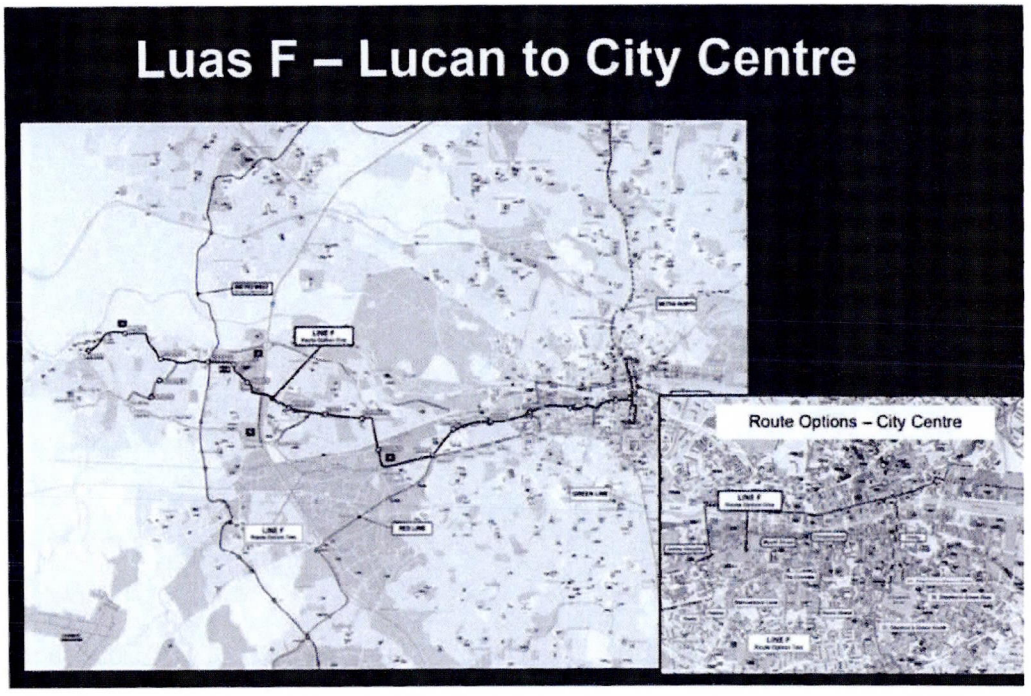


Figure 4.22.1 A presentation previously given by the RPA outlined the 'Luas F' project as envisaged under T21, with route options 1 and 2 indicated by navy and orange lines. The Luas recommended by the *Western Corridor Study* appears to be effectively the same scheme.

4.23 National Transport Authority *Transport Strategy for the Greater Dublin Area 2016 - 2035* (N.T.A., 2015)

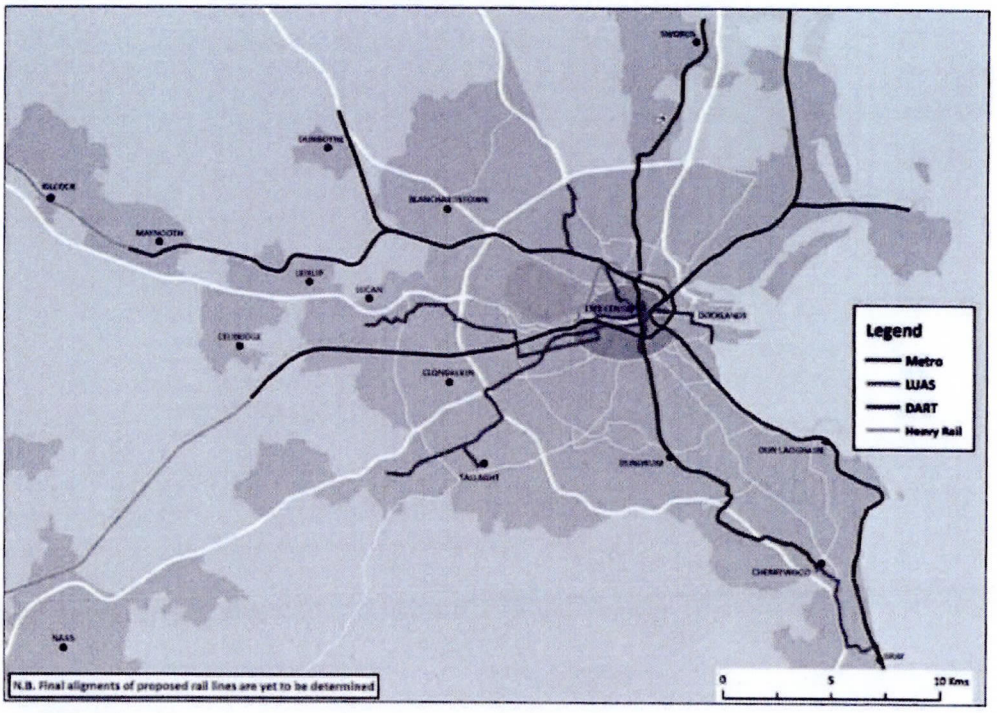


Figure 4.23.1 Overall metropolitan light and heavy railway network as envisaged by the NTA for 2035. Map courtesy of National Transport Authority Transport *Strategy for the Greater Dublin Area 2016 - 2035*

The Strategy provides a vision for the next 2 decades. Excluding *Metro West* and the Navan railway, much of T21 is back on the agenda – and a Poolbeg Luas extension. As per figure 4.23.1. *DART Underground* is a 'cornerstone', yet little indication is given of any new Irish Rail stations, except 2 in suburbia – with no commitment to a Ballyfermot Irish Rail station, despite the Lucan Luas due to intersect there. There does not appear to be reference to CAF in the Strategy; the word 'contingency' is not apparent, and while 5.12 sets out 'Delivery and Phasing', specific dates are notably absent, as per figure 4.23.2.

Commensurate with the 2015 North Dublin Fingal Study (as per 4.20), *New Metro North* would be a modified version of *Metro North*, with new test bores and planning permission needed, as the design is being revised. Previously €200 million was spent preparing the last metro plans[xxv] – and it seems likely similar costs will again be incurred to get the scheme to the point where the previous scheme was abandoned. One benefit of the *North Dublin Fingal Study* is cost estimates per element of infrastructure were provided, including kilometre of Luas – and, it appears such money would almost be enough to afford an overland extension to the airport, by extending a route from Broadstone.

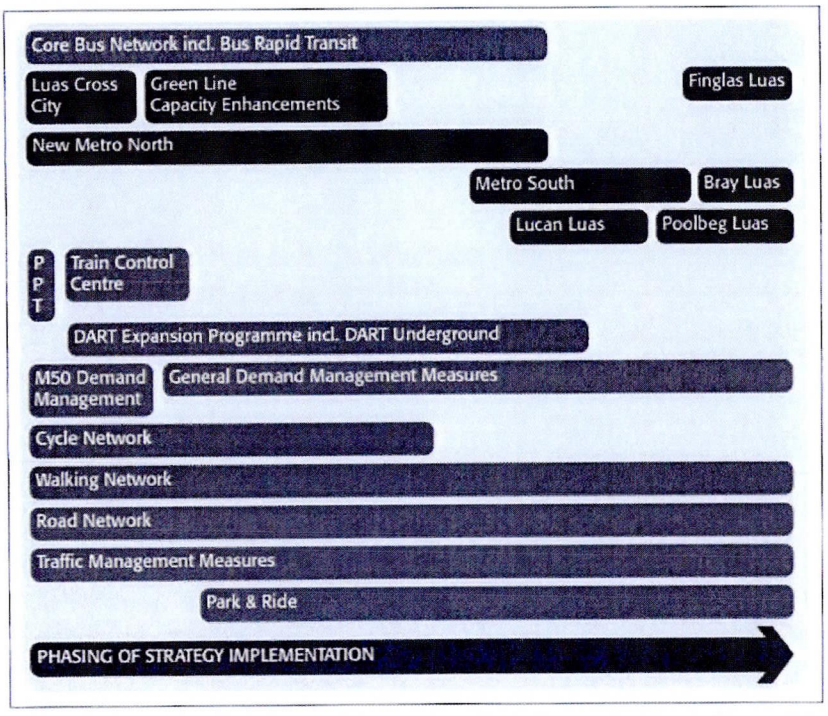


Figure 4.23.2: Phasing of Strategy Implementation, from *2016 – 35 GDA Strategy*. Actual dates are absent with no clear timeline apparent.

A challenge in evaluating official intentions is that maps provided either lack essential details – such as stations – or show one area without context. Accordingly, maps have been prepared for this project, as per conclusion of this review. These show NTA plans, the network today, and lastly, apparent potential value of the overlooked link in facilitating strategic aims.

4.24 National Transport Authority, September 2015, *Options for Dart Underground.*

In 2015, central government suspended *Dart Underground*, and requested review of cost reductions. In September 2015, an NTA illustrates the options considered – and notably using the north city lines does not feature.

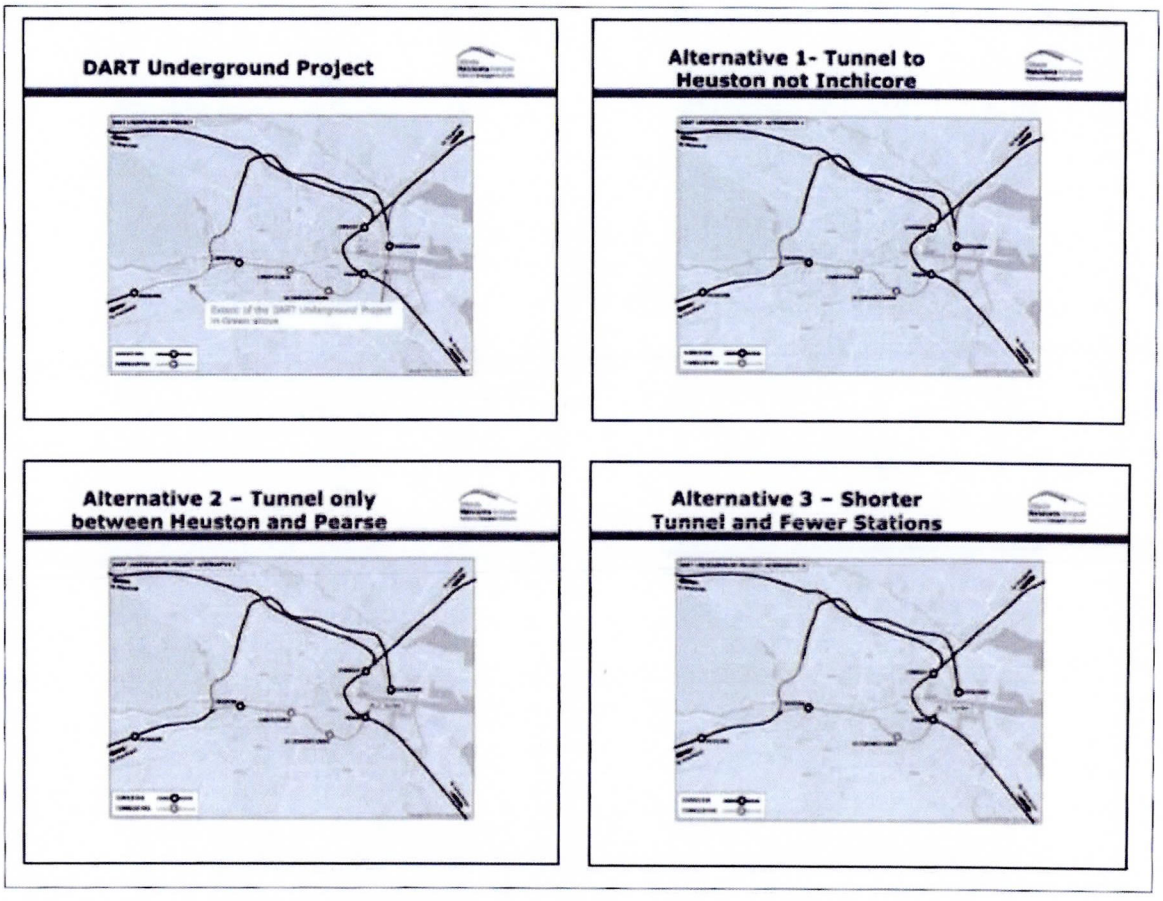


Figure 4.24.1 NTA presentation outlining alternatives to *DART Underground* – using the northside railways is not considered.

4.25 Department of Transport, Tourism, and Sport, *Common Appraisal Framework for Transport Projects (CAF)* (Dublin, 2016)

As with the predecessor 2009 document, the CAF provides appraisal guidance for decision makers when considering projects. Clear criteria are set out in section 4.2.3, 'Economic Appraisal: Multi-Criteria Analysis'. by which projects and alternatives can be judged. The metrics are; safety, economy, safety, integration, environment, accessibility and social integration, and physical activity (where applicable). This approach is in line with best practice elsewhere, such as the U.K., and offers a rigorous method of appraisal. However, application is limited to projects, rather than policy – and it is not understood to be used by the NTA in preparation of the Strategy for Dublin 2016 - 2035.

4.26 Dublin City Council, *Dublin City Development Plan 2016 – 2022* (D.C.C. 2015)

The Development Plan is a statutory Plan that is renewed every 6 years providing planning guidance for the city. The current Plan reiterates commitments 'to maximise the use of public transport infrastructure and minimise car dependence', encourages higher densities at public transport nodes, and reaffirms NTA policy of *Metro North* and *DART Underground*.

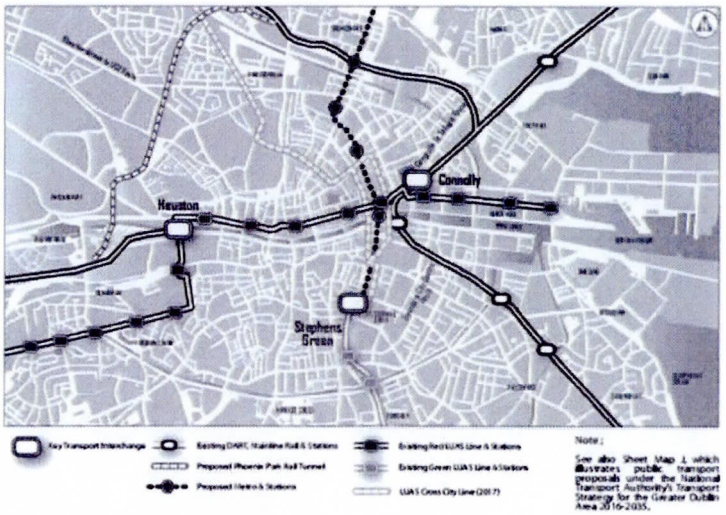


Figure 4.26.1: City centre integrated transport, as per the *City Development Plan 2016 – 2022.* Unlike other cities where locally elected representatives set policy, DCC transport direction is subordinate to the unelected NTA.

4.27 National Transport Authority, *Bus Connects* (Dublin, May 2017)

Bus Connects promises to 'transform' the network by upgrading the busiest bus lanes, introducing 3 BRT routes, redesign the network, and speed up services by ensuring cashless payment on board. Bicycle lanes are also to be incorporated along the new bus lanes. The programme envisages €1 billion being spent, with €300 million presently allocated[xxvi].

4.28 Department of Housing, Planning, Community and Local Government, March 2017, *Rebuilding Ireland.*

Rebuilding Ireland releases state lands suitable for residential development. However, it does not include the derelict lands around Docklands Station, despite it being sufficient to accommodate circa 2,500 apartments, as has shown in a design provided in the appendix. Other major CIE / state-owned lands are

excluded – including marshalling yards, where development could occur overhead. As can be seen from image 4.28.2, much open lands are present.

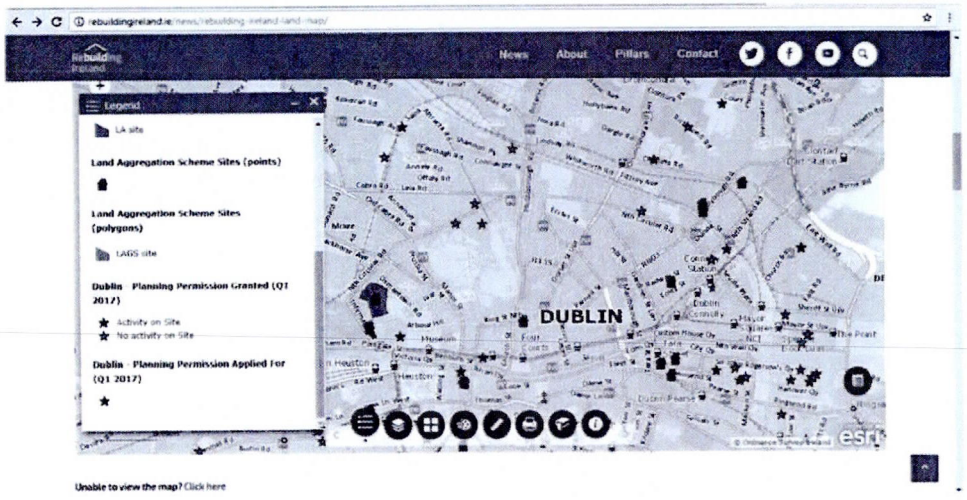


Figure 4.28.1 A screengrab of the *Rebuilding Ireland* map that purportedly shows land suitable for residential development close to the central railway network in Dublin city. Image courtesy of *RebuildingIreland.ie*

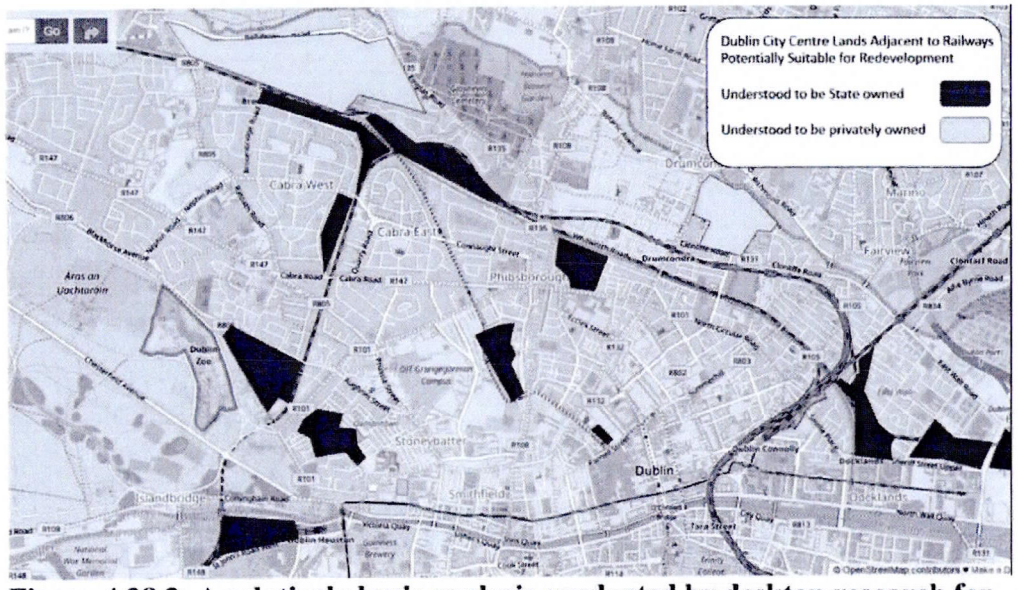


Figure 4.28.2: A relatively basic analysis conducted by desktop research for this project appears to indicate substantially more state-owned land potentially suitable for residential development. One such site at Docklands Station has been quantified as capable of accommodating circa 2,500 apartments, as further outlined in the appendices.

4.29 Department of Communications, Climate Action and Environment, *National Mitigation Plan* (Dublin, July 2017)

Noting transport's role with growth and social inclusion, the *Plan* states 'developing further cost-efficient measures for the sector will be challenging'. *Metro North* is indicated to commence operations in 2026/7; tax incentives for bicycles are continued, and low emissions vehicles are encouraged.

4.30 Department of Communications, Climate Action and Environment, *National Planning Framework consultation* (Dublin, 2017)

Presently a new national planning framework is being produced to replace the abandoned *National Spatial Strategy (NSS).* The *NSS* failed as the urban areas identified for growth had shrunk, while other areas grew[xxvii]. Crucially there was little collegiality between the *NSS* and the *National Development Plan* with motorways planed which preceded. The *NPF* will seek to deter sprawl, encourage urban and regional growth while reducing carbon emissions.

4.31 Conclusion

Rather than being a new plan, core elements of T21, such as Dublin underground railway plans, dated back to 'at least 1966'. Much of the motorways subsequently opened as T21 projects were under way prior to T21. No clear systematic appraisal occurred prior to T21 for the projects that were included; accordingly, appraisal in hindsight is harder given the absence of metrics by

which it could later be judged. Additionally, no official post-programme assessment of T21 was ever published, despite previous indication.

Subsequently the value of systematic appraisal became apparent; in 2009, the *Common Appraisal Framework* (CAF) was issued by Department of Transport, which provides clear criteria when assessing projects or strategies (see 4.25). Although the CAF was clearly applied in the North Dublin Fingal Study, there appears to be no reference in other NTA Dublin area reports, including the *West Corridor Study*, which provides basis for the Western Luas in the *GDA Strategy*. There is apparently no reference the CAF in the GDA Strategy itself. That questions arise regarding universal application of CAF is concurrent with opinions later collected in interviews.

Innovative approaches emerged during recession, including *Smarter Travel* and *DMURS*, emphasizing non-car cost-effective modes. Post-recession, megaprojects appear again to dominate – with the Swords BRT scheme seemingly hindered by planning of Metro North first being finalised[xxviii]. Innovations do not appear properly capitalised upon. Despite the Phoenix Park tunnel being brought into use, services travel non-stop through Heuston and heavily populated areas. Major trip generators with Irish Rail lines present are omitted for station consideration in the *GDA Strategy*, including Dublin Ferry Terminal, Croke Park, Dublin Zoo – and suburbs of Phibsborough, East Wall, Ballybough, Ballyfermot, and Cabra. Accordingly, there is merit in assessing the potential population catchments in these areas, as is quantified in Findings.

Disturbingly, evaluations leading to current much of the Dublin underground plans are seemingly based on a key link in the existing Irish Rail network having been overlooked, as per 4.20, 4.21, and illustrated in maps following. It is noted the same firm of consultants was working for both the NTA and Irish Rail at the same time when the comparable miscalculation appeared in each assessment.

Separately it appears there is a disconnect between transport and land use, as per 4.18 and 4.28. Sizable state-owned under-utilised lands are being seemingly overlooked in assessments. It has been estimated the Irish Rail Docklands Station site could accommodate development of circa 2,500 apartments.

That the Dublin underground plan(s) date back 50 years – but are not yet built, seems analogous to Flyvbjerg's commentary on Aalborg. However, there the zombie plans lasted only 25 years, before being terminated.

It is possible that current NTA plans may be realised, particularly the bus plans[xxix], – and it is encouraging to see €300 million committed to the €1 billion BRT scheme launched earlier this year. However, it also likely Dublin will continue to be haunted by zombie megaprojects that are ultimately unaffordable amid economic downturns – only to then again re-emerge, forever undead.

The following maps indicate NTA's Dublin railway plans, and an apparent option hitherto not considered, as per sections 4.21 and 4.22.

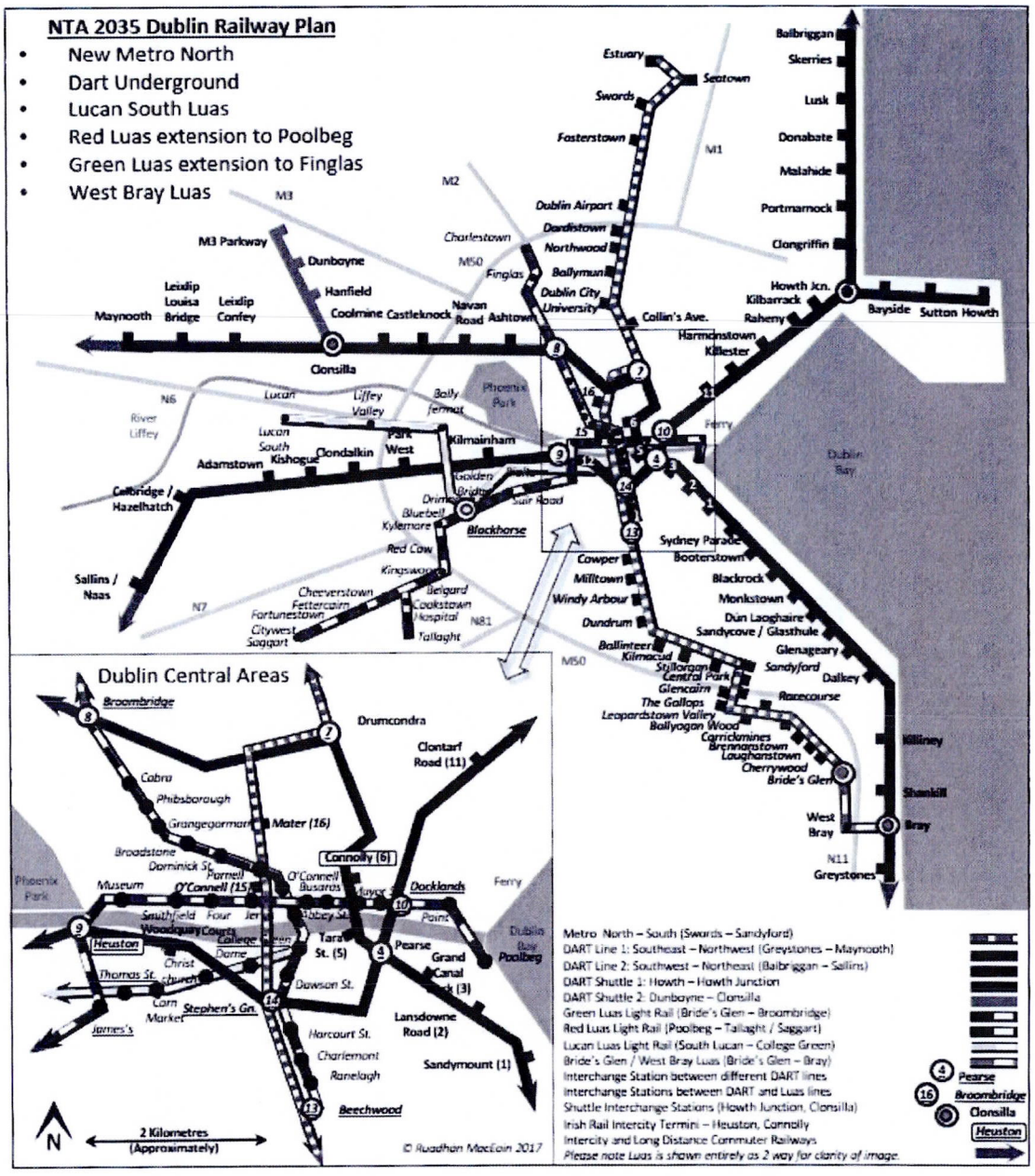


Figure 4.31.1 NTA's plans for Dublin metropolitan railway network in 2035. Schematic map prepared specifically for this project as official plans lack details.

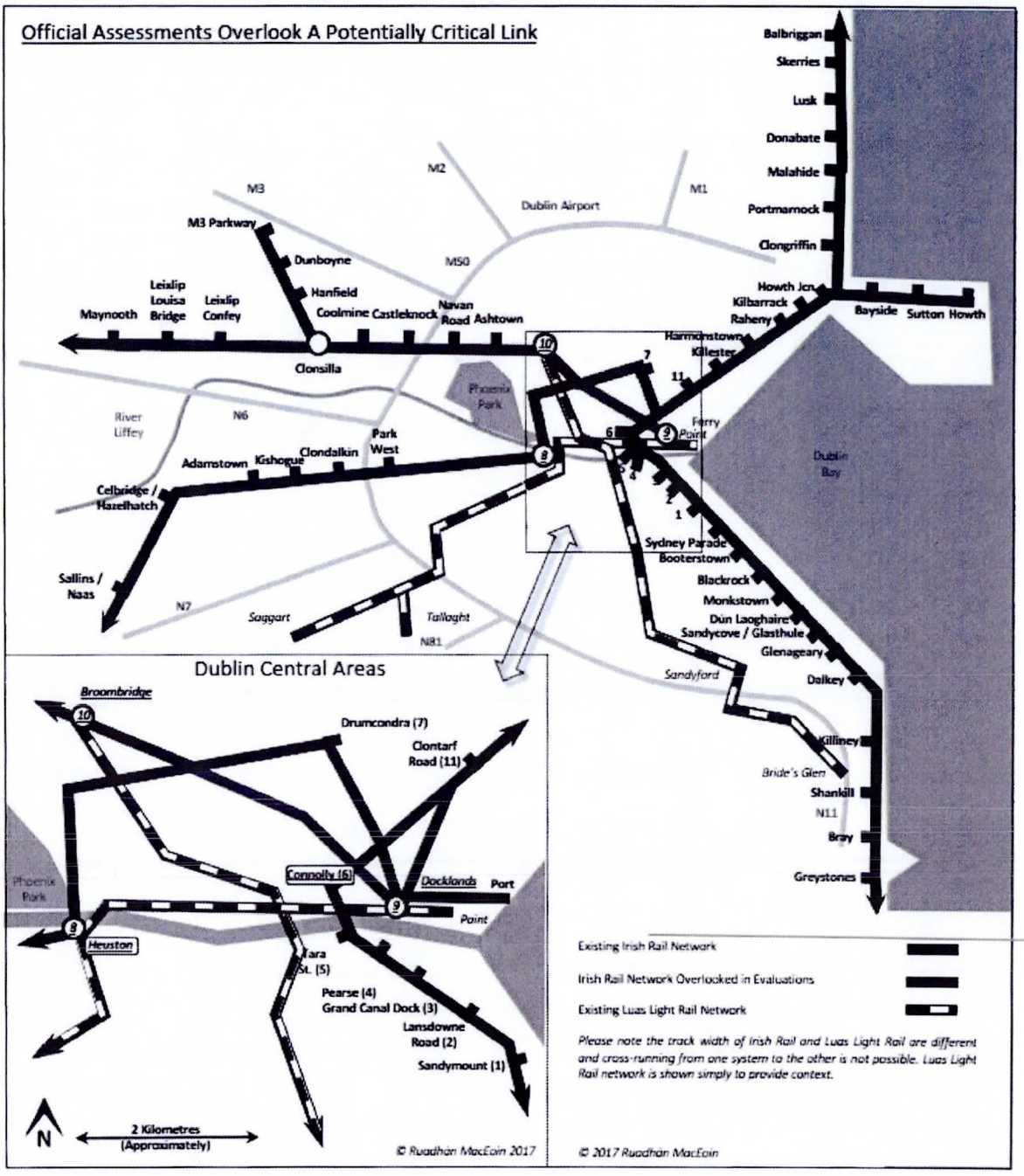


Figure 4.31.2 This schematic map illustrates the network as assessed as per 4.20, and 4.21, with the overlooked Royal Canal railway shown in red. Map was specifically prepared for this project.

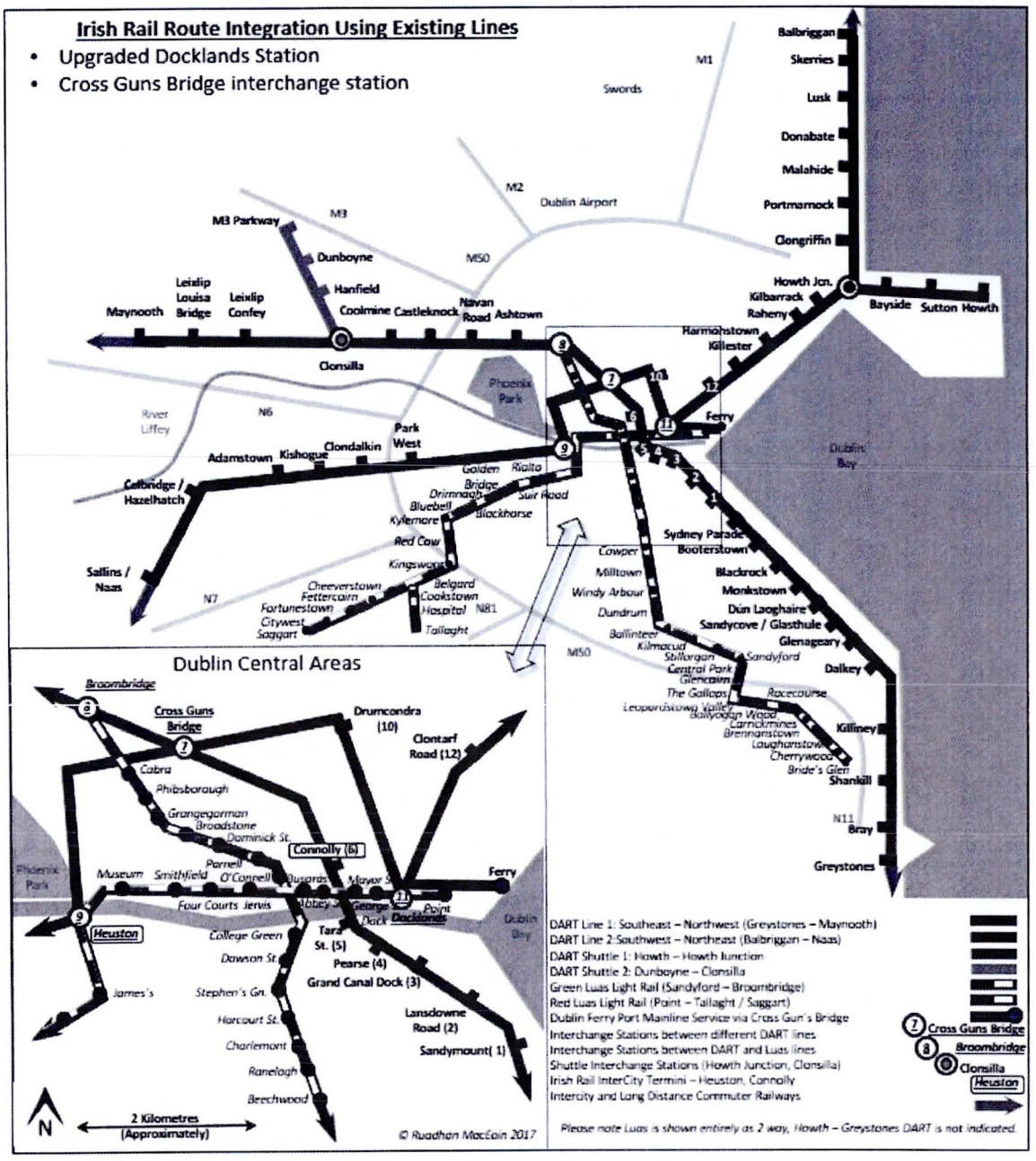


Figure 4.31.3 This map illustrates how the existing Irish Rail network could be used in a manner comparable to *Dart Underground* when the overlooked Royal Canal railway is included during evaluation – yet this option has not been considered. Map created specifically for this project.

5.0 Chapter 5 - Findings & Analysis

5.1 Introduction

This section of the dissertation deals with the content gathered primarily by way of semi-structured interviews. Separately, ArcGIS generated quantitative data has been used as a method to assess the effectiveness of T21 along the Irish Rail network in Dublin City Centre.

As stated in the methodology, 10 persons were selected based on parties representing academic, sectoral, and civic society interests – with these agreed with the Project Supervisor. The project was fortunate as persons with extensive experience were amenable. In several instances, interviewees had experience in more than one sector – with 15 data pools generated from which to sample. To enable straightforward coordination of responses, the same nine questions were asked of all respondents, with these provided before the interviews. Answers were then individually thematically analysed so as to best manage and harness the data. Views were stratified, with those calculated to be most representative provided here – and also, particularly insightful perspectives. Likert scale questions were found to be beneficial, and the criteria currently used in the Common Appraisal Framework (CAF) provides values by which T21 could be judged. Hence, despite the absence of clear metrics at the launch of T21 – or of an official post-completion evaluation – interviewees were able in to appraise T21 in hindsight, and this has generated a reasonably robust means of quantifying the programme's performance.

5.2 Profile of Respondents

In accordance with UCD protocol, interviewees' details have been anonymised, with transcripts confidentially filed with the project supervisor. However, in line with academic practice, profile of the interviewee's experience and relevance is broadly outlined.

Person A – Academic and Sectoral

Person B – Civic

Person C – Academic and Sectoral

Person D – Civic

Person E – Sectoral

Person F – Academic and Sectoral

Person G – Civic

Person H – Academic and Sectoral

Person I – Civic

Person J – Academic and Sectoral

5.3 Interview Responses

5.3.1 Question 1A: T21 Plan Making Process

Please indicate how good you rated the plan making process that led to Transport 21? Kindly indicate your reasons.

Respondents unanimously indicated an absence of awareness of T21 except only after its launch, with the plan making process unapparent, other than at closed senior government meetings. Respondents overwhelmingly regarded the process as essentially non-transparent, and very poor.

5.3.2 Question 1B: Likert Scale Responses on Plan Making Process of T21

Interviewees were invited to assign a score of 1 – 5 as to how well they rated the plan-making process, with 5 being very good and 1 being very poor. Results shown as per Table 5.3.2.1, indicate it was collectively considered dismal.

	Person 1 (x2)	Person 2	Person 3 (x2)	Person 4	Person 5	Person 6 (x2)	Person 7	Person 8 (x2)	Person 9	Person 10 (x2)	Score Spectrum	Score
Safety	1		3	1	3.5	1	1	1	1	1	15 – 75	19.5

Table 5.3.2.1: The collective impression of the T21 plan-making process appropriates a dismal score of 19.5 out of 75 – and barely above the minimal score of 15.

5.3.3 Question 2: Likert Scale responses regarding performance of T21

This question was central to the research, as it sought to evaluate opinions regarding the performance of T21. Hence it was decided to seek qualitative views on relevant values as set out by the CAF, with interviewees also asked to assign Likert Scale values. Accessibility was attributed a category independent of social inclusion, as accessibility was specifically emphasized in contemporaneous approach – and hence separate valuing seemed appropriate.

As with question 1, all interviewees were asked to assign a value from 1 to 5, and the same process was again conducted with appropriate weightings. Interviewees were asked to explain their reasoning primarily so that the Likert Scales would induce a considered response. Person B did not feel appropriately familiar enough with the scheme's effect to pass judgement; accordingly, the sample size was reduced by 1 overall. Separately no response was provided by Person F regarding 2 criteria, with sample sizes also accordingly reduced in those instances. The multi criteria assessment results generated are represented by Table 5.3.3.1.

	Person A (x2)	Person B	Person C (x2)	Person D	Person E	Person F (x2)	Person G	Person H (x2)	Person I	Person J (x2)	Criteria Score Spectrum	Score
Safety	1		3	3	4	3	3	4.5	2	3	14 - 70	41
Economy	2		3	3	3.5	4	1	2	1	3	14 - 70	36.5
Accessibility	1		2	3	3		4	2	2	4	12 – 60	30
Social Inclusion	1		2	3	3.5		2	1	1	2	12 – 60	
Integration	1		2	2	2	4	1	1	1	1	14 – 70	
Environment	1		1	1	2	2	1	1.5	1	1	14 – 70	
Personal Approval Score Spectrum	(12 – 60)		(12 – 60)	(6 – 30)	(6 – 30)	(8 – 40)	(6 – 30)	(12 – 60)	(6 – 30)	(12 – 60)		
Overall Score				15	18	26				28		171

Table 5.3.3.1: Overall results are coded by traffic light colours, with green being 'good', yellow being 'neutral / mixed', and red being '[redacted]'. Overall performance of T21 appears poor: not one person rated it as good overall – and not even one category was collectively considered 'good'.

When the samples are totalled and appropriately weighted, and classifications of criteria have a score spectrum of 14 – 70, the maximum possible variation is 56. Accordingly, overall satisfaction ratings can be broadly classified particular regarding each criterion as; good, mixed, or poor, and as represented by score bandwidths of 70 – 52, 51 – 33, 32 – 14.

Where a spectrum of 12 – 60 arises, after samples are totalled and appropriately weighted, the maximum variation is 48. Accordingly, overall satisfaction ratings can be broadly gauged as good, mixed, or poor, with bandwidths being 60 – 44, 43 – 28, 27 – 12. The same applies in gauging personal approval. Where score spectrum is 12 – 60, bandwidths are 60 – 44, 43 – 28, 27 – 12. Where a score spectrum is 30 – 6, bandwidths are 30 – 23, 22 – 14, 13 – 6. As Person 6 declined to comment on two criteria, their spectrum available ranged 8 – 40, with bandwidths of 40 – 28, 27 – 16, 15 – 8. Person B did not participate as they considered themselves insufficiently aware of the outcomes of T21 to comment.

In terms of overall approval rating, T21 attained a relatively poor rating, with a score of 171 on a spectrum that ranges from 70 to 400, with bandwidths being 70 – 179; 180 – 290, 291 – 400. When assessed by person, 5 of the 9 interviewees appear to rate the outcomes of T21 as sub-standard, and notably not one person seemingly regards it positively overall. In terms of satisfaction by category, again it is notable that not one criteria achieved a performance rating overall as good; outcomes in 3 categories appear to be considered as mixed, while performance in 3 categories is seen as poor.

Safety appears to be regarded reasonably satisfactorily (41 on a score range of 14 – 70), while performance relating to economy and accessibility appears to be regarded as mediocre – with each scoring halfway on the scales. However, social inclusion, integration, and particularly environment, were regarded as having

fared poorly under the T21 programme – with each scoring only a few points above the minimal scores available.

5.3.4 Question 3: T21 Alternatives

Do you believe that there were viable alternatives? If so, were these thought of – and if not, why not?

This solicited a variety of responses, with Person D among many, expressing the opinion 'there are always alternatives'. A number of respondents, such as Person C, asserted that significant lobby groups had commercial interest that profited by large construction, motor interest etc, influenced government approach. Person E suggested the proposed Lucan Luas would benefit the city-centre if extended east beyond College Green. Potential implications of this idea are teased out further in the Conclusion, as per figure 6.2.3.

5.3.5 Question 4: T21 Continuation

Why did the next administration proceed with the same plan, although it had effectively been declared discredited?

This solicited a variety in responses, partly as the immediately subsequent administration continued to have the same major party as the senior government partner. The recession was frequently cited; however, others such as Person H asserted it was 'unaffordable' from the outset. Despite subsequent demise, and separately the scores interviewees assigned in the Likert Scales, there was not total consensus as to T21 being regarded as 'discredited'.

5.3.6 Question 5: Policy Developments Post T21

Has transport policy significantly developed or changed since T21? Please discuss.

Certain policies such as *Smarter Travel* and *DMURS,* were praised – and the emerging *Bus Connects.* However generally, most believed little progress seems apparent – with Person E noting an absence of post-implementation research on infrastructure, and the increase in car usage, saying 'we've gone backwards.'

5.3.7 Question 6: Accountability

In your opinion, are there enough checks and balances to ensure accountability and that public finances are spent responsibly? Please elaborate as to your considered opinion.

Person J emphasized clear metrics agreed at the outset, rather than 'checks and balances'. Commensurate with Flyvbjerg, this appears a crucial aspect in order to be able to gauge success or otherwise – hence the relevance of CAF, particularly with contemporary decision making. Person F asserted the Public Accounts Committee in Dáil Éireann is effective, and that state bodies have to answer to it. However, Person H observed that the majority of board of the NTA is by ministerial appointment, who also has effective veto.

5.3.8 Question 7: Public Participation

How engaged do you consider the public involvement in shaping transport policy and provision in Dublin? Please explain your reasons.

This elicited an almost universally despondent response. Person H noted models of participatory transport councils elsewhere, such as Germany and the U.S.

5.3.9 Question 8: Incrementalism versus Megaprojects

To which would you ascribe priority; increasing efficiencies and service access on Dublin's existing bus and railway network – or would you favour development of new lines such as Metro North and DART Underground? Please give reasons for your answers.

Although this question was aimed at allowing respondents to compare inexpensive local interventions with capital intensive projects, and to feed into section 5.5, regrettably a false dichotomy was unintentionally posed – with the results of only limited value. Nonetheless, ongoing improvements were favoured – yet also, it is important to develop well-planned megaprojects where needed, with Person G observing, 'if you do something good to start with, it'll last centuries'. Nine interviewees responded, *DART Underground* seemed to attract support – with 5 favourable, and 1 against; *Metro North* was supported by 2, with qualified support by another, and one person against. BRT and buses 2 and qualified support of another.

5.3.10 Question 9: Other Reflections on T21 and subsequently

Please elaborate on any outstanding aspects that you consider to be important in reflections of then and now regarding Transport 21.

Not a lot of data emerged that was not already covered. However, Person A raised an interesting point relating to lands belonging to state-owned bodies – like Irish Rail, that may be relevant in considering lands apparently omitted in current state considerations, as per sections 4.18 and 4.28. It was observed that where sales occur, all monies automatically return to the Department of Finance. It was asserted this is a massive barrier in coordinating land and transport. It was

suggested that companies should be entitled to ring-fence such monies in an accountable manner, and be incentivised to optimise both land and infrastructure.

5.4 Summary of Respondents' Views

Respondents were under-whelmed by the outcomes of T21, with pre-planning notably considered dismal. Safety is regarded as better – with economy and accessibility believed to have benefitted to a mediocre extent. However, social inclusion, integration, and environment are all perceived to have fared poorly. Opinions were divided as to subsequent apparent demise – while reticence and some confusion is expressed regarding more recent policy developments.

There appears to be a general perceived lack of accountability of decision makers, matched by a belief that demonstrable opportunities for meaningful engagement by ordinary citizens to shape and or inform transport policy are few and fragmented. Nonetheless, it is apparent that clearly agreed metrics applied in transparent appraisal is of potential great value. However, there was little perception of this visibly occurring. As it has not been immediately identifiable that universal application of the CAF has occurred with all current *GDA Strategy* projects, (and indeed, the Strategy itself), further clarification of this was sought from the NTA. The NTA initially asserted CAF was applied both for the *Strategy* and projects within (see appendices).

However, following further questioning seeking release of documented details of this, particularly meeting reports or minutes regarding application, no further relevant information was made available prior to this project being completed (as per appendices). Consequently, it was not possible to see if and how the CAF is being applied, as was initially stated. However, should it later transpire the CAF is being applied, it would seem apparent that there is in any case a dissonance between how application of CAF is said to occur by officialdom – and how such application is seemingly perceived by knowledgeable persons.

5.5 Quantitative Research

As a means of examining the impact of T21, it was decided to assess the scale of potential populations residing beside railways in Dublin city centre, but are beyond 1-kilometre walking distance from railway platforms – and lacking access. Team project work conducted in the UCD ArcGIS multi-disciplined masters class (November 2016), identified sites potentially suitable for stations, with 1-kilometre residential catchments then quantified by using DCC map data combined with CSO data. In total, 107,964 persons were living within 1-kilometre, and of these, 45,064 people resided within 500 metres; catchment totals are seen in table 5.5.1, while Figure 5.5.2 provides a map prepared for this research indicating the catchment zones.

Station	Population within 500m	Population within 1000m
Heuston	3169	12160
Zoo	3334	8862
Cabra	8108	15926
Crossguns Bridge	5125	16471
Croke Park	6029	15992
Tolka Park	5196	9255
Docklands	2575	5364
Connolly	11468	24134

Table 5.5.1: Residential catchments along city centre railways presently unserved, (as per 2011 census).

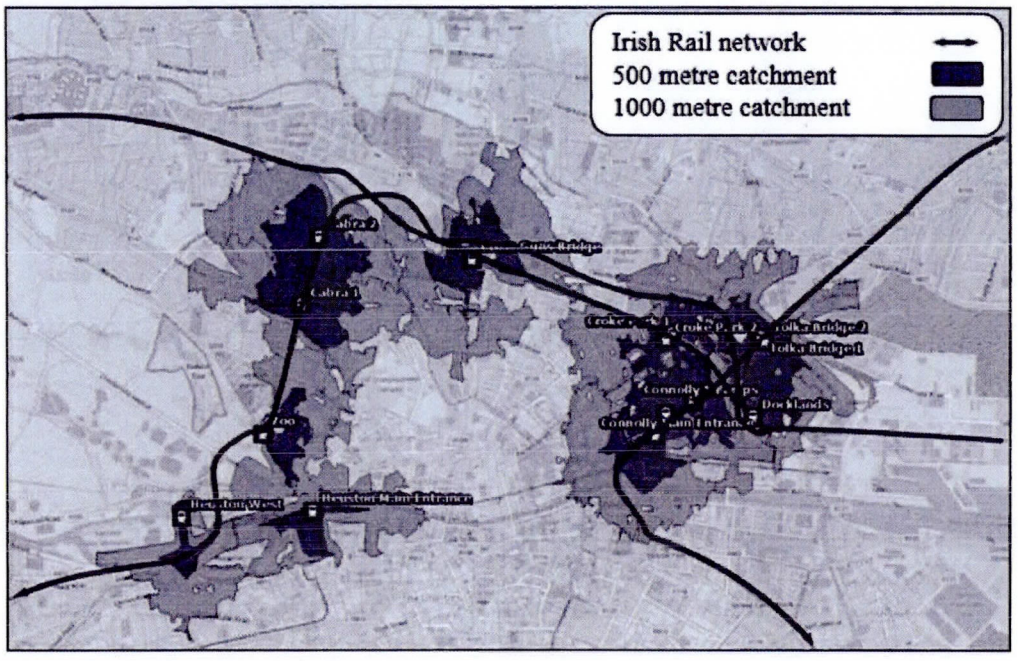


Figure 5.5.2 Residential catchment zones along the Irish Rail's Dublin city centre network that could be serviced in the event of stations and / or better access being provided.

However, as this research was based on the 2011 census, it seemed appropriate to revise the figures in line with the 2016 census trends evident in city centre, where growth has been announced as being 4.8% in the Dublin City Council area[xxx]. Accordingly, the total amount of people estimated to be living within the 1-kilometre catchments is 113,146 – with 47,227 estimated to now be residing within 500 the metre catchments.

ArcGIS analysis has also been conducted as to modes of transport to work. With the map generated, it becomes very evident that people will use railways where accessible. Equally, where railways are present but service is inaccessible, car use is notably high – such as in Cabra, as per figure 5.5.3. Separately, complementing this probe, secondary research has been accessed from Pobál and utilised, whereby the city centre railway network is now presented on top of their deprivation index. A correlation between stations and affluence seems apparent; where there are lines and no stations it possibly indicates or determines poverty.

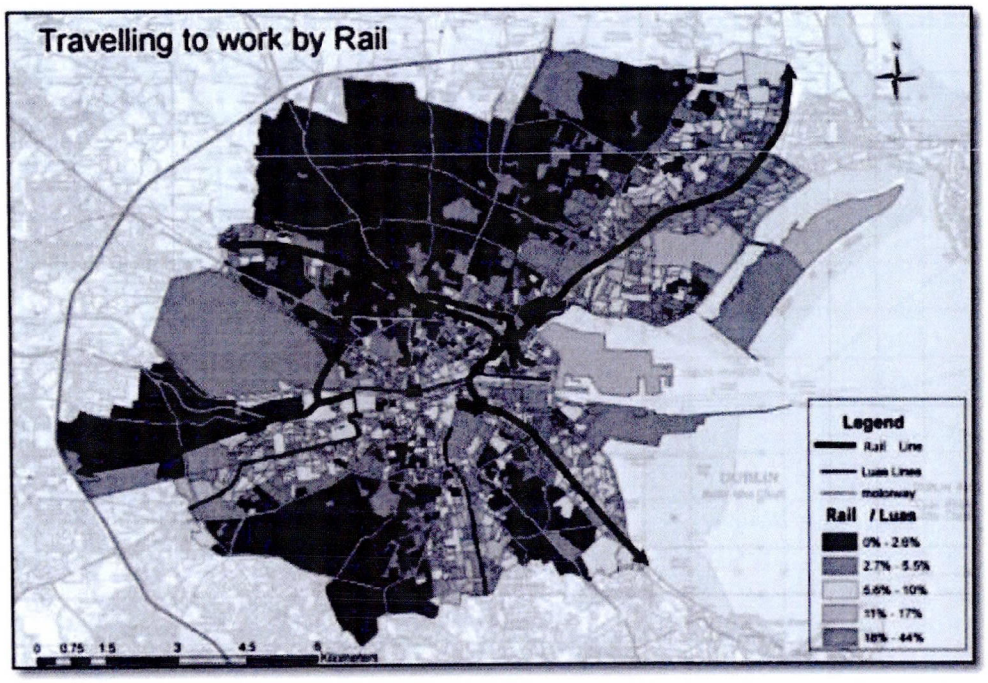


Figure 5.5.3: Residents use railways to commute provided service access is available, such as along the Luas and DART lines. In contrast, areas such as Phibsborough and Cabra have railways but no stations – with car usage significantly greater.

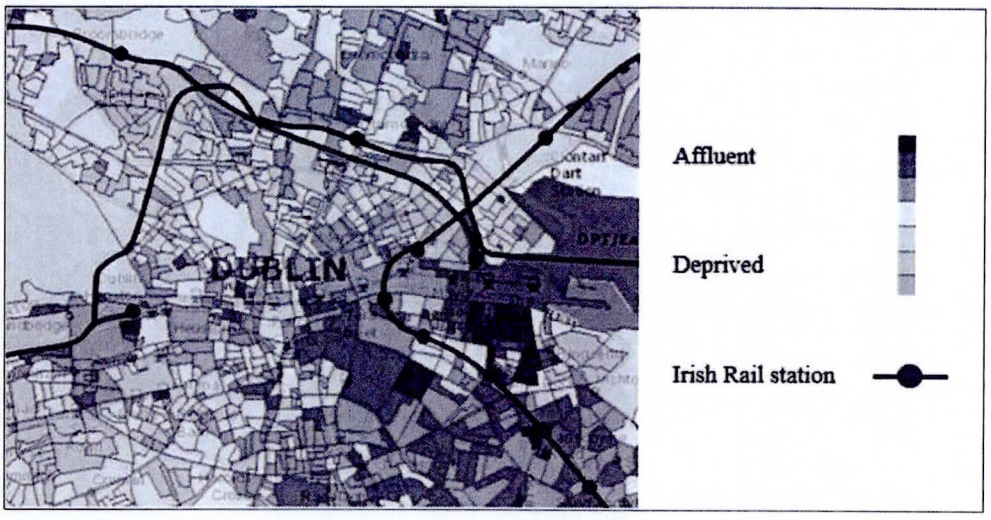


Figure 5.5.4: Affluence and service access appear to correlate. Base map courtesy of Pobal[xxxi].

5.6 Summary of Quantitative Research

Car usage declines where rail stations are provided. There appears to be 113,146 persons residing in the city centre who could be brought into service catchment of Irish Rail, by better pedestrian entrances at Connolly, Docklands, and Heuston Stations, and new stations at Croke Park, Cabra, Cross Gun's Bridge, Zoo Station, and Tolka Bridge. Other significant trip generators such as Dublin Ferry Port etc suggest further latent demand, with only residential interest above. Implications of these findings have been amalgamated with findings from 4.31, and 5.3.4, with one possible scenario presented in figure 6.4.2. It is not suggested the emergent design option is necessarily better than current offering of the *GDA Strategy,* however, the apparent absence of such a scenario having been considered during official evaluation would seem to substantiate the notion that plausible options were not assessed in the preparation of *GDA Strategy.*

6.0 Chapter 6 - Conclusions & Recommendations

6.1 Introduction

Despite being the largest ever capital programme in the state's history, T21 was embarked upon without a plan-making process that involved clear metrics. Consequently, as there was no definitive measuring stick by which to gauge success, it was never going to be possible to provide a definitively objective evaluation as to its success or otherwise. Nonetheless, by rigorous academic approach, it became possible to create a research framework that has facilitated retrospective assessment, that is hopefully academically robust.

Ultimately, it is deemed T21 was not a good programme regarding preparation and delivery. However, one benefit from that experience is the value apparent with accountable planning, based on assessment using a framework with clear metrics of value at outset – such as available with the *Common Appraisal Framework (CAF)*. However, it is not evident the CAF has been universally applied in the evaluation of all megaprojects now proposed by the *GDA Strategy* – or indeed, in choosing the *Strategy* itself. Other evaluations have used the CAF, such as *DART Underground*, but are found to have not considered all options, as per 4.20 and 4.21.

Figure 4.31.3 illustrates initial consideration of possible services that arise as one option. Subsequent to interviews (see 5.4.4), and the quantitative assessments, another design option emerges as possibly better. It is not suggested the option

is necessarily better than current *Strategy*: However, as the option would seemingly cost less and serve more than 100,000 residents and numerous trip generators not currently serviced, it is suggested that this seemingly viable option demonstrates the absence of comprehensive planning whereby alternative options are not being properly considered. Instead, as per Policy Review, the origins for the unbuilt underground in Dublin date back 50+ years, and continue to be offered as the primary solution.

6.2 Summary of Section Conclusions

The literature review is immensely helpful; giving international experience of evaluating infrastructure regulatory governance, the demonstrable tendency of megaprojects to end up sizably over-budget – as occurred in Dublin previously with the Port Tunnel and Luas[xxxii]. Flyvbjerg was comprehensively informative and emphasizes the importance of common agreed metrics of appraisal when considering projects, strategies, programmes, policies, etc. Barrett, Leahy, and O'Connor are particularly relevant regarding Dublin.

New documentary evidence outlines in the Policy Review that the unbuilt underground in Dublin dates back far longer than previously understood, to 'at least 1966' (section 4.2). It is observed the scheme 'comes alive' during prosperous times, but has repeatedly proved unaffordable. Yet never properly terminated, it inevitably re-emerges, re-branded and modified – as the perennial zombie project forever haunting Dublin, and forever undead. The Review also outlines significant oversights in the latest assessments that have again

sanctioned the underground, as per 4.20 and 4.21. Separately, application of the CAF is not found to be evident in evaluations sanctioning projects under the *GDA Strategy*, or the *Strategy* itself. Cost effective approaches such as *Smarter Travel* are found to have 'lost steam'; however, the recent launch of *Bus Connects* offers some encouragement. Separately, there appears to be a dissonance hindering the optimisation of sizable state-owned city centre land banks with (primarily state-owned) transport infrastructure.

The methodology set out the rationale as to why certain research techniques were chosen. The purpose and means was outlined regarding the approach of gathering qualitative data while generating quantitative data that could then be used to evaluate the effectiveness of T21. The methodology also outlined the value of secondary research, such as the Literature Review and the Policy Review, and how these greatly assists forming an overview on the topic.

The findings and analysis section reported the substance of the samples collected, with these critically analysed. The specifically created questions were found to be reasonably good, with question 2 harnessing insightful knowledge, modelled on evaluation values, as set out by the CAF. Overall, T21 was collectively regarded as having a poor outcome following a dismally poor planning process. While values were harvested from a relatively select number of 15 samples, it is suggested the relative consistency of opinion found would be replicated if other knowledgeable parties were interviewed on T21. The quantitative assessment of people living alongside Irish Rail's city centre

network in the event of more stations being opened, and better access, provides an interesting foil to the qualitative and secondary research.

6.3 Limitations

Inevitably limited by time and resources, this research can only reflect the data from select number of samples gathered. As stated at outset, the research was also limited by the absence of any clear metrics at time of launch of T21 – and this was compounded by an absence of official post-implementation research. In attempting to evaluate the effectiveness of such a massive investment programme, the end-product was always going to be partly subjective in its findings, as it would have been impossible in this instance to have evaluated every single T21 project, built or otherwise.

Equally it was not possible to evaluate as many catchment areas as desirable. Application of ArcGIS to the catchment areas of Dublin Bus in the city centre would have merit – as too would assessing potential Irish Rail stations at Ballyfermot and Inchicore. In hindsight, it would have been better had question 8 given interviewees a better choice, as per 5.3.9. Separately, despite repeated efforts made to contact Irish Rail's Communications Director, Barry Kenny, no response was forthcoming. As every effort was made to identify and engage with the opinions of parties' most knowledgeable for this research, it is hoped that the dissertation provides an original, objective, reasoned analysis that is both academically robust and credible.

6.4 Overall Conclusion

It is impossible to give a definitively objective perspective regarding effectiveness of T21. Had clear strategic objectives and a robust framework been in place at outset, it would have enabled retrospective appraisal. Despite such absence, evaluation has been conducted. Potentially, lessons may be of assistance to further policy development.

Four key observations emerge: that agreed metrics at outset is crucial for later evaluation; that megaproject preference continues despite repeated non-delivery; that such non-delivery dates much further back than previously understood; and that plausible alternatives do not seem to be given equitable consideration (see 4.31). Original justification of the Dublin underground appears to be based on non-truths (see 4.03), while contemporary policy may represent *suppressio veri.* Objective evaluation of T21 and contemporary *Strategy* is obstructed by a lack of clearly defined metrics then – and also seemingly inconsistent application of the *CAF* (see 5.4). Institutional cognitive dissonance seems apparent. Effective recourse for accountability appears absent. As a majority of the NTA board are chosen by national ministerial appointment – with ministerial veto also – little connection or accountability appears available at key local level. Nor can ministers be held thematically accountable, as their constituency is a geographic elected area – with local issues deciding parochial elections. Inertia prevails.

One innovation that may prove worthwhile is *Bus Connects.* However, as implementation is yet to occur, it is too early to comment. Separately, reports suggest BRT development is being delayed by Metro plans taking priority.

Yet, under-appreciated assets represent potential opportunities by which both state and civic society might prosper. Apparent opportunities for better use offer prospective means to alleviate CO2 taxes, harness state-owned lands, and help others also realise better opportunities – feeding back into state interest (see Appendix 2). Station opportunities are apparent at Croke Park, Cabra, Cross Gun's Bridge, Tolka Bridge, and Dublin Zoo, as found in 5.6, while better access routes at Connolly, Heuston, and Docklands could also increase the catchment area. Dublin Ferry Port carries circa 2 million passengers per annum, and it seems plausible 20% of those would travel by rail, going by experience of other European cities[xxxiii]. As per figure 6.4, the NTA estimates a station cost of €9 - €14 million. This suggests a likely bandwidth of €54 - €84 million if stations were to be considered at all these places, although this excludes upgrade costs at Connolly, Heuston, and Docklands. 113,146 residents plus workers and visitors (not calculated here) would benefit. Another basic calculation suggests economic uplift of property values likely exceeding €1 billion in the event of such stations being developed, based on economic precedent of 6% added worth[xxxiv], and on dwellings in the catchments have 2.4 occupants as is typical.

Mode	Type	Cost Min (€m)	Cost Max (€m)	Unit
BRT	Tunnelled	n/a	n/a	per km
	At grade	€6.4	€8.3	per km
LRT	Tunnelled	€70	€130	per km
	At-grade	€28	€40	per km
	At-grade Station	€1.3	€2.6	per station
	Underground Station	€44.6	€118.9	per station
Heavy Rail	Tunnelled	€ 145	€ 170	per km
	At-grade (greenfield site)	€ 17	€ 25	per km
	At-grade Station	€ 9	€ 14	per station
	Underground station	€ 120	€ 145	per station

Table 6.4.1: NTA cost estimates per infrastructural unit, as per 4.20

Better use of existing resources offers pathways alternative to new construction. Yet experience of the last 50 years suggests this is not imminent, while instead institutional cognitive dissonance prospers. Instead, based on established trends, it seems Dublin will continue to sprawl out as one of Europe's most car dependent unsustainable cities – while officialdom touts 50-year-old plans that have not yet worked as the 'new' solution.

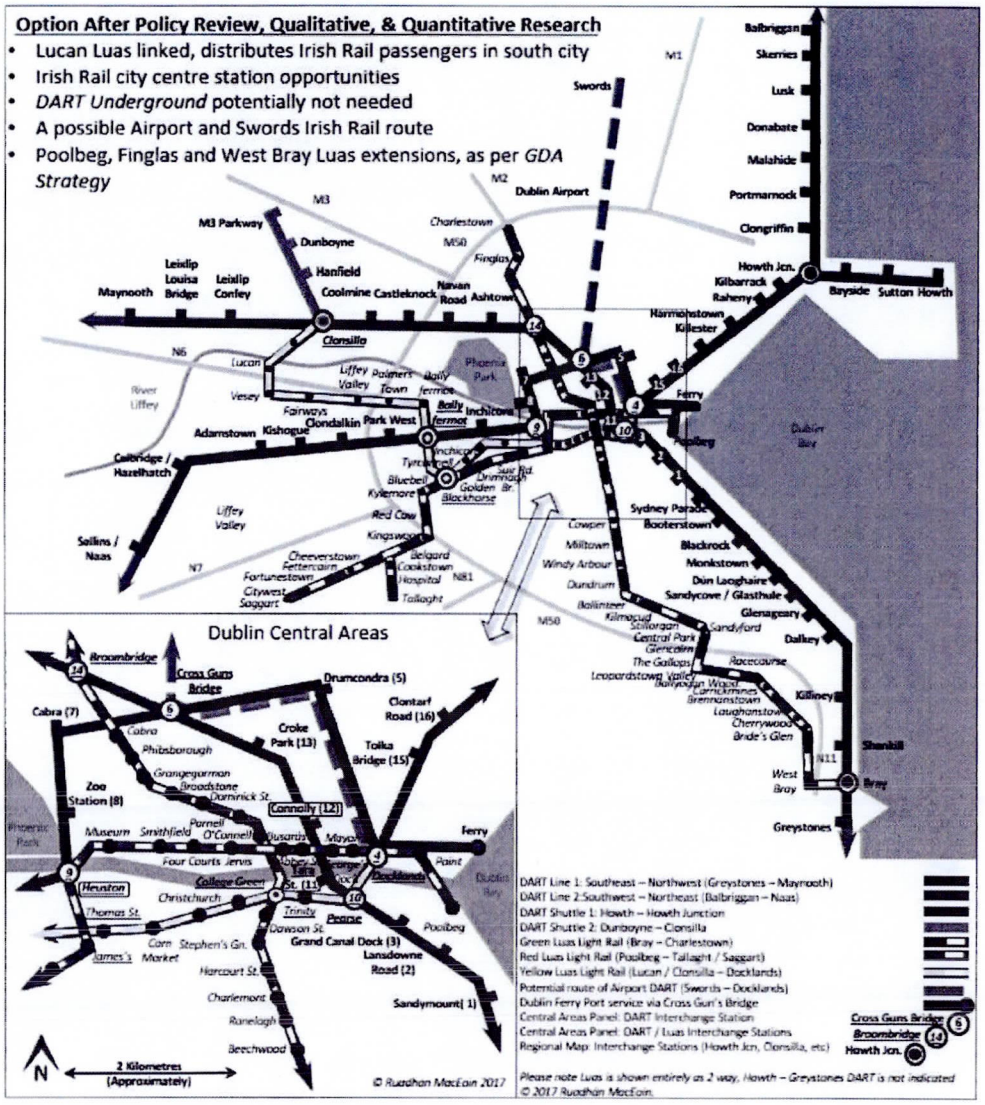


Figure 6.4.2: An apparent option subsequent to policy review, qualitative, and quantitative research. 113,146 residents plus others could avail of Irish Rail services in the event of stations being opened Croke Park, Cabra, Cross Gun's Bridge, Dublin Zoo, and Tolka Bridge, and Connolly, Docklands, and Heuston being improved. The value of the linking Lucan Luas is apparent, complementary to *DART Underground* objectives. A potential pathway from Docklands to Dublin Airport via Cross Gun's Bridge is apparent. In this scenario, no underground stations, (each costing €44.6 – €145 million) do not appear necessary. Schematic map prepared by author.

6.5 Recommendations

Given the capital associated with T21, it merits further study so that lessons may be learned that may have later use. It is disconcerting that the NTA robustly claimed the CAF has been applied to significant projects when evaluated – only to not substantiate this when further questioned, and when release of reports, minutes etc was sought (see Appendix 3). It is not clearly evident from numerous reports used to compile the GDA Strategy that the CAF has been applied. It is a notable coincidence that significant projects in the GDA Strategy, such as the Lucan Luas, appear to be the same as T21 projects – and also that application of the CAF does not appear evident. It is suggested clearer application of the CAF would be of benefit. Separately, it is observed that the same firm of consultants was contracted to both the regulator, the NTA, at the same time as a major operator, Irish Rail – and that this should not be an acceptable practice as however innocent, it could nonetheless lead to a perception of a conflict of interests. On this occasion, it has been demonstrated the resulting reports did not provide all plausible options, and it is not known why this has occurred. As cost implications that arise out of such decisions are potentially immense, it is suggested that the Public Accounts Committee may wish to peruse such issues further. One such probe might examine how much money has been spent to date on the unbuilt Dublin underground, as reports suggested €200 million spent on Metro North. Ultimately, however, that such issues may end up at the Public Accounts Committee suggests that the rest of the institutional architecture is suboptimal. With infrastructural planning, this research finds that established practices elsewhere of having clear metrics at outset, all plausible options published and considered, and sequencing and contingency built-in to be

preferable. A functioning democracy in which decision makers can be held accountable offers a solid long-term way ahead.

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Using Dublin's Forgotten Link: Better alternatives to official rail plans

Author: Ruadhán MacEoin, MSc., BSc.

Date of production: 27-07-2022
Draft 9D

Ruadhan.MacEoin@UCDconnect.ie
20 Marlborough Road
Donnybrook
Dublin 4
Ireland
D04 TD23

Using Dublin's Forgotten Link: Better alternatives to official rail plans

Author: Ruadhán MacEoin, MSc., BSc.

For: Ciarán Cuffe M.E.P.

Date of production: 27-07-2022

Ruadhan.MacEoin@UCDconnect.ie
20 Marlborough Road
Donnybrook
Dublin 4
Ireland
D04 TD23

This document outlines an apparent oversight in current Dublin rail plans, with two alternative options set out. Estimated costs are at 2020 prices.

Please note that every effort reasonably possible has been made in good faith to ensure that the contents of this presentation are fair and accurate. Yet in the event of mistake or inaccuracy, the author bears no responsibility. All copyright belongs to the author unless otherwise stated.

sing Dublin's Forgotten Link
age 2 of 18

tate Policy Aims:
. Rail from Dublin Airport + Swords to entral Dublin and later to Sandyford.
. Organise Irish Rail's suburban ervices into two main corridors, from .E. to S.W., and N.W. to S.E.
. Provide access to quality public ansport in populated areas.

op Left 1A: Existing Irish Rail network. nown in orange, the Royal Canal line as been forgotten in assessments rior to current plans. For ease of giblity, Luas lines are not shown.

op Right 1B: MetroLink and *DART nderground* schemes. The Royal anal railway and Phoenix Park tunnel nown in black would be unsused.

ottom Left 1C: Swords *DART* and ntegrated services using the forgotten ne + seven new stations on existing ailways serving 150,000 residents. At later date, the dashed lines could nk Docklands (19) to Grand Canal ock (23); to Charlemont (30) and on o Sandyford, and to Heuston (2).

ottom Right 1D: Luas lines to airport nd elsewhere plus Integrated Irish ail services with Docklands link. For gibility, Luas stations are not shown.

) Ruadhán MacEoin 27 – 07 – 2022

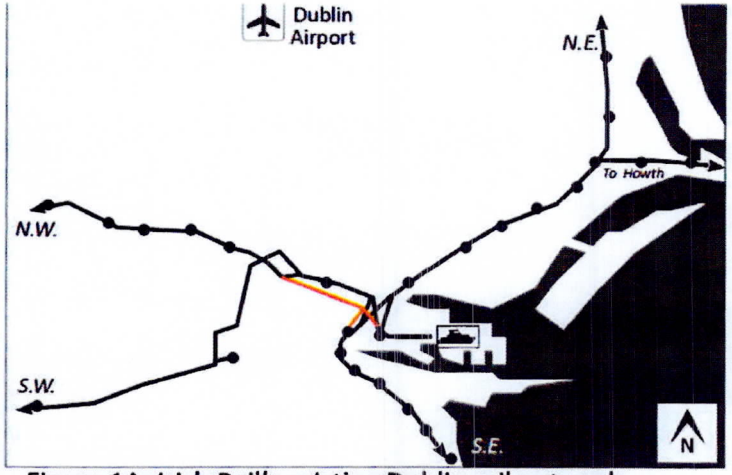
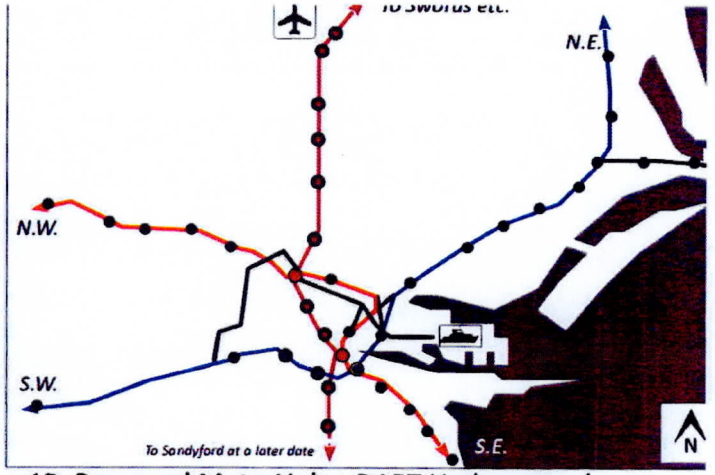
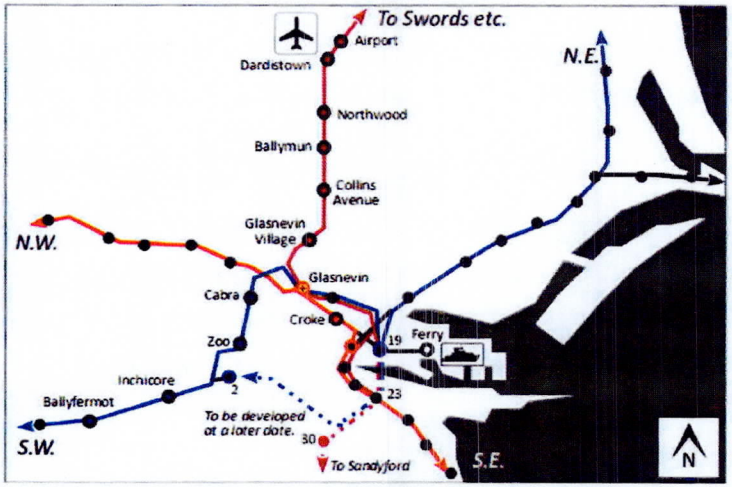


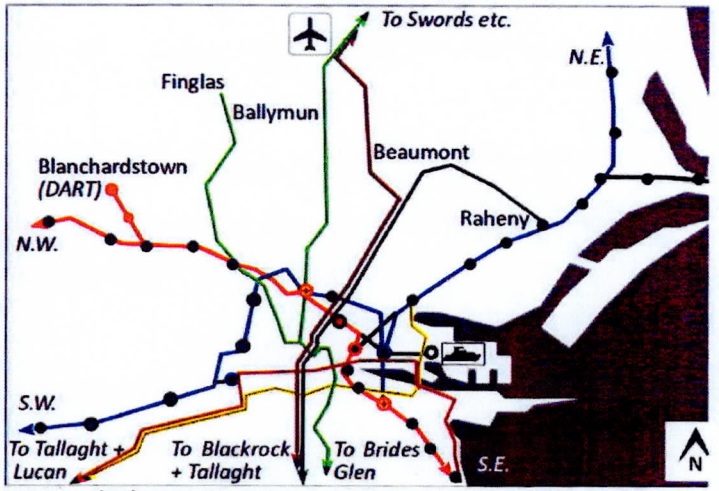
Figure 1A: Irish Rail's existing Dublin rail network. The forgotten line is marked in orange.



1B: Proposed MetroLink + *DART Underground*. 2022 Estimated cost of MetroLink: €8 – 23 Billion



1C: First Alternative: Swords *DART* + Intergated services . No need for tunneling in the city centre at this time.

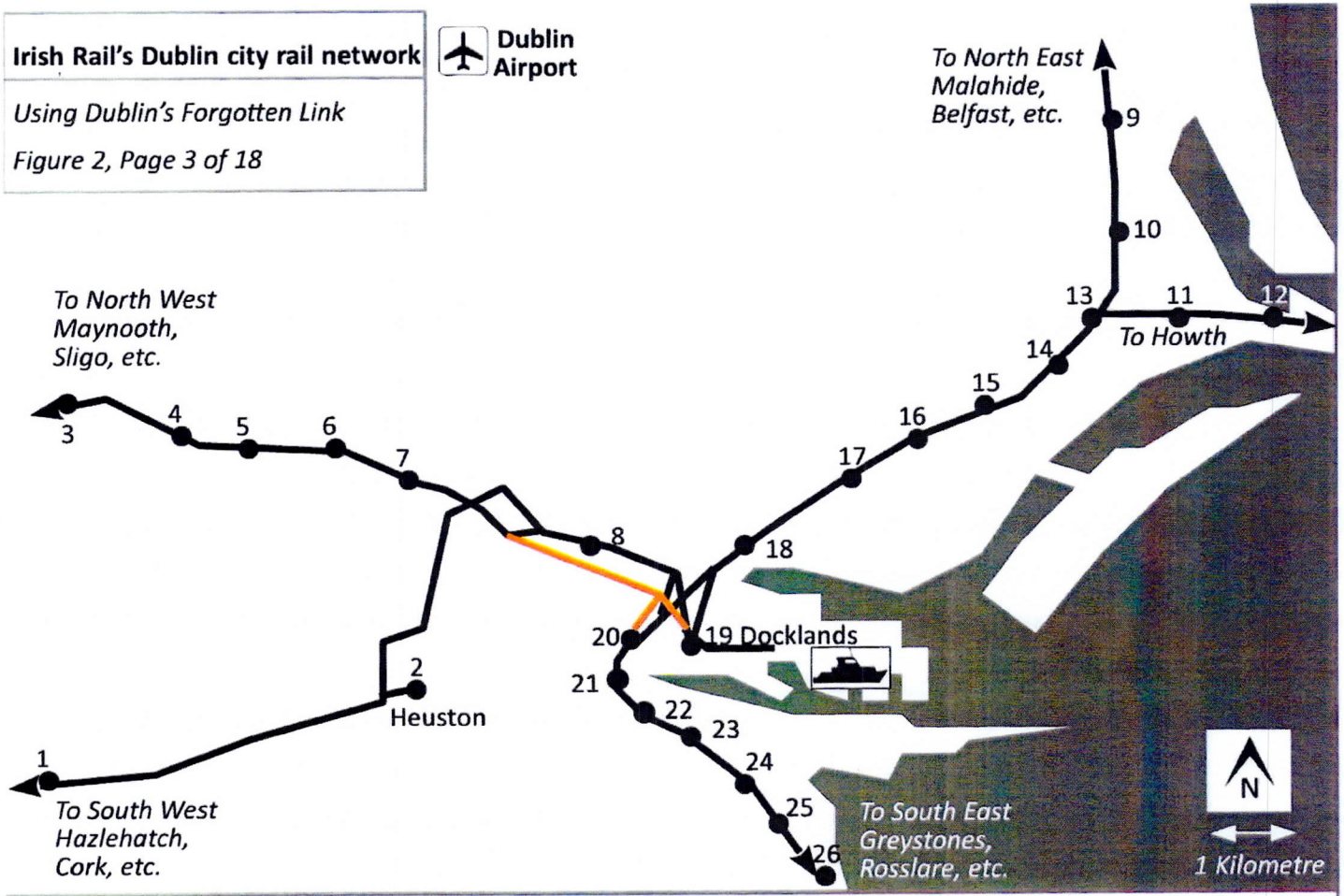


1D: Second Alternative: Luas services to Swords and elsewhe + Integrated Irish Rail services. 1 Metro costs same as 12 Lua

Irish Rail's Dublin city rail network

Using Dublin's Forgotten Link

Figure 2, Page 3 of 18



Existing Irish Rail stations

1.Park West	14 Kilbarrack
2 Heuston	15 Raheny
3 Castleknock	16 Harmonstown
4 Navan Rd. Parkway	17 Killester
5 Ashtown	18 Clontarf Road
6 Pelletstown	19 Docklands
7 Broombridge	20 Connolly
8 Drumcondra	21 Tara Street
9 Portmarnock	22 Pearse
10 Clongriffin	23 Grand Canal Dc
11 Bayside	24 Lansdowne Roa
12 Sutton	25 Sandymount
13 Howth Junction	26 Sydney Parade

Please note: For purpose of visua clarity and ease of explanation, the Green and Red Luas lines are not shown on maps except where relevant.

Figure 2. Irish Rail's existing rail network in Dublin city and airport hinterland. As marked in orange, the railway by the Royal Canal to Docklands has been forgotten in assessments. This line could be used to create new pathways and capacity. The southeast and northwest are well served by stations, yet less so elsewhere.

Government railway schemes
MetroLink airport underground +
DART Underground

Using Dublin's Forgotten Link

Figure 3, Page 4 of 18

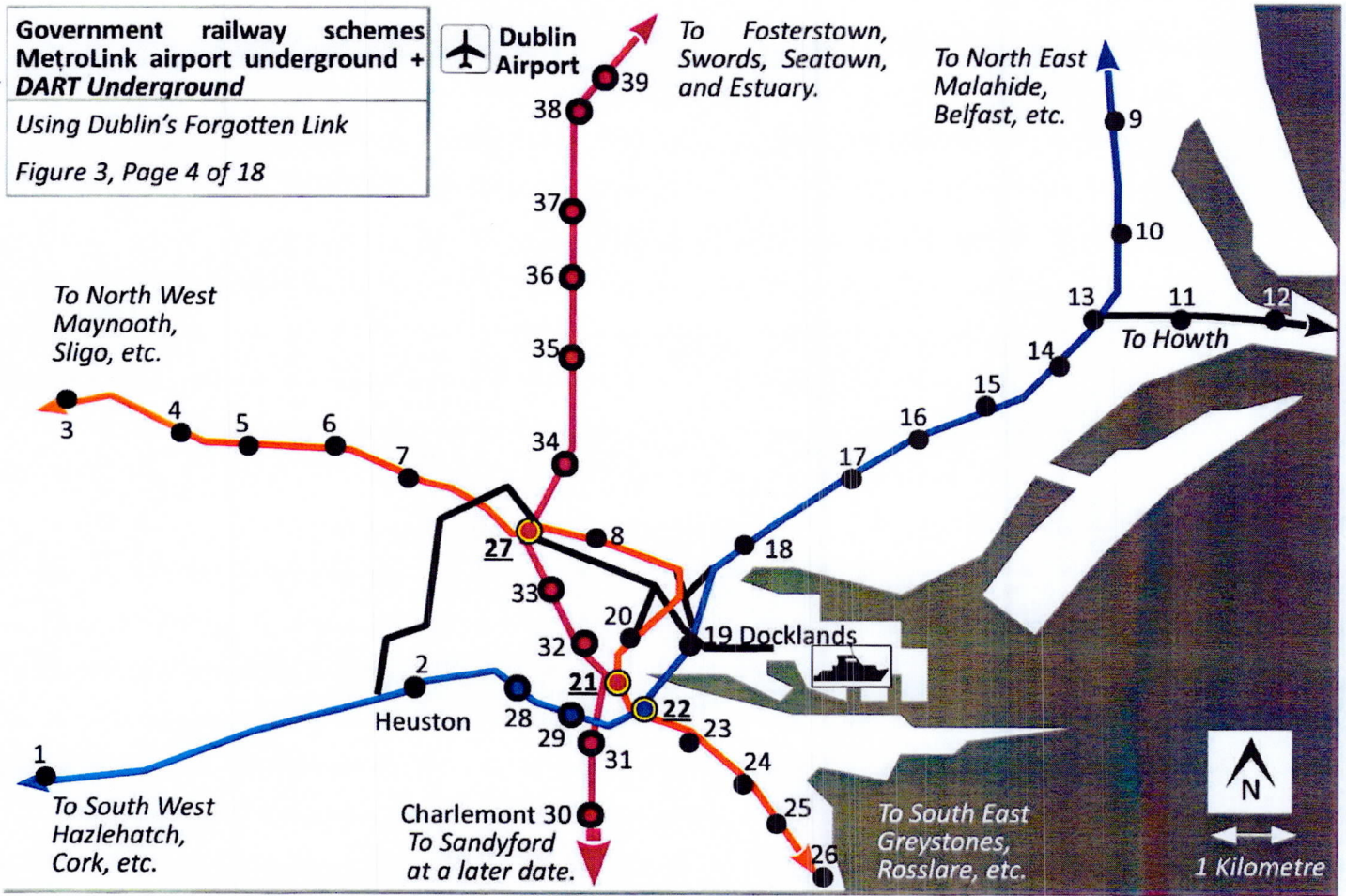


Figure 3. Policy aims to link Dublin Airport and Swords to the city centre, and to organise Irish Rail suburban services as two *DART* corridors; from the north west to the south east, and north east to the south west.

Airport MetroLink — North East – South West *DART* — North West – South East *DART*

Proposed Irish Rail Stations

Upgrades

22 Pearse: New interchange wi existing railway to the south east.

21 Tara Street: New interchange wi Irish Rail's south east line and MetroLinl

19 Docklands (underground station)

New Irish Rail stations

27 Glasnevin: Interchange wi MetroLink airport underground.

28 Woodquay

29 Stephen's Green

Docklands and Heuston are alrea present and thus are shown as standard

Proposed MetroLink stations
(Excluding Tara Street & Glasnevin)

30 Charlemont
31 Stephen's Green
32 O'Connell Street
33 Mater
34 Griffith Park
35 Collins Avenue
36 Ballymun
37 Northwood (To be confirmed)
38 Dardistown
39 Dublin Airport

Four other stations are to be built to t north of this map, and hence are n shown; Fosterstown, Swords Centr Seatown and Estuary.

Supporting Documents 1:
Map in DART Expansion Business Case where link is missing

Using Dublin's Forgotten Link

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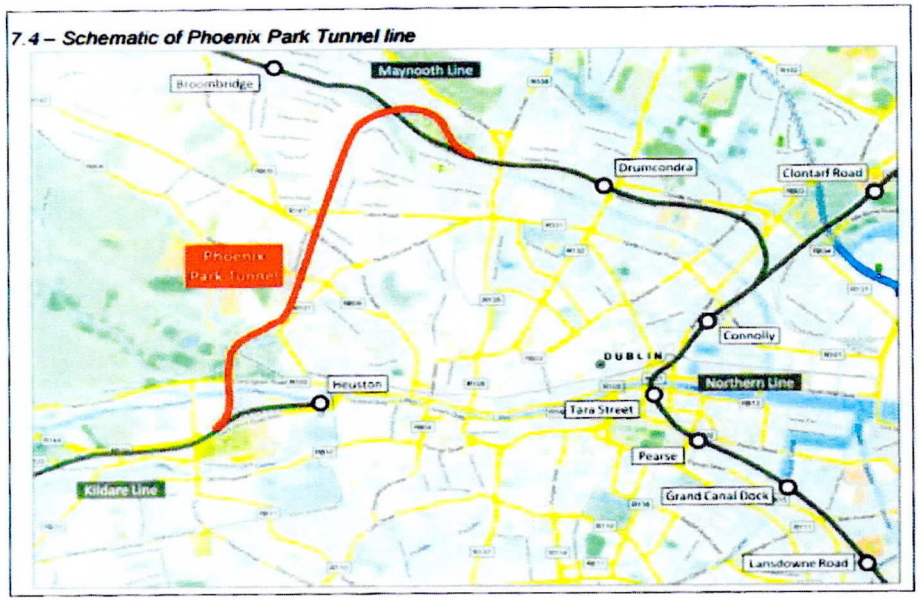
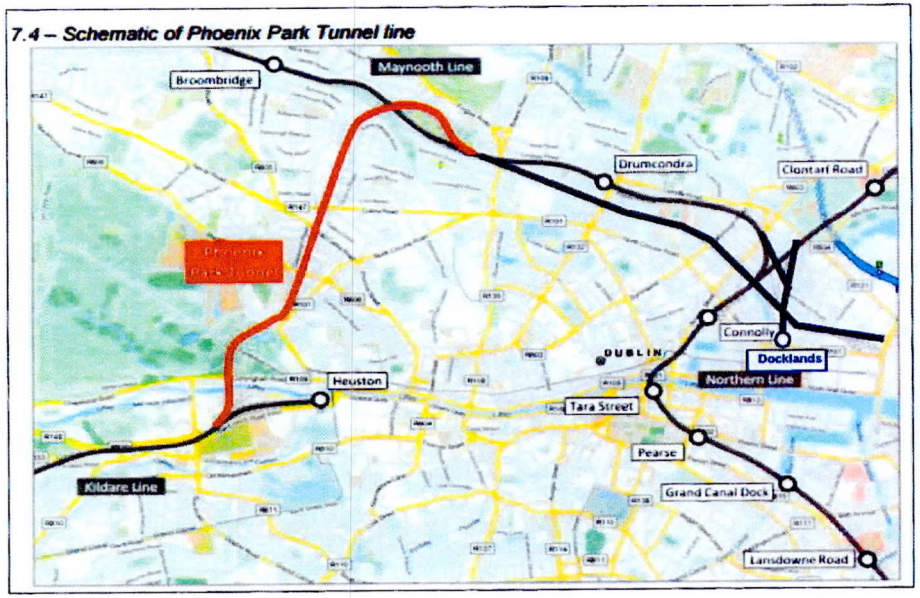
Below left is a graphic from page 53 of the *DART* Expansion Business Case (2015) with the Phoenix Park tunnel highlit in red so as to show it cannot be used for more traffic to the south west because of insufficient network capacity.

A core argument for *DART Underground* is that the Drumcondra line is already congested with northwest traffic, anc that services from two lines will not fit on the one route through Drumcondra. By using second line present, for north west traffic to be rerouted to Connolly or Docklands, this would leave the Drumcondra line free for use.

Below left: Graphic from DART Expansion Business Case.

Below right: Graphic amended so as to show in blue the railway by the Royal Canal for this presentation.





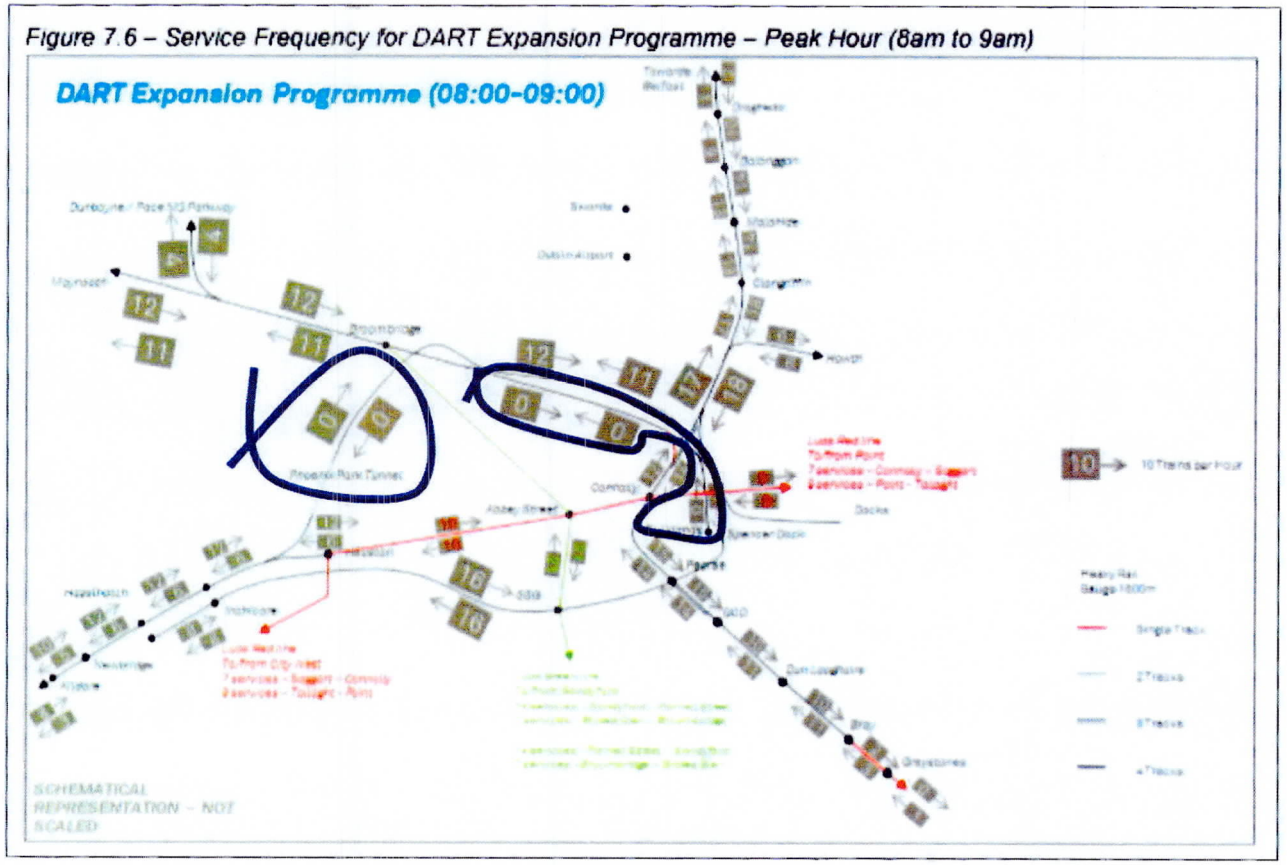
Right: Figure 7.6 on page page 55 of the DART Expansion Business Case (2015) indicating future service frequency when the underground link opens.

For purpose of this presentation, blue loops indicate volumes forecast for the Phoenix Park tunnel and Royal Canal lines, with zero trains per hour shown.

Heuston and Docklands are already linked – yet the official plan is for a new underground line while leaving existing links idle.

Ergo the new line is a duplication.

Figure 7.6 – Service Frequency for DART Expansion Programme – Peak Hour (8am to 9am)



Supporting Documents 3:
Map with links missing in Fingal / North Dublin Transport Study

Using Dublin's Forgotten Link

Image on the right is figure 1.1 from the first page of the Study.

In this graphic, Irish Rail's city centre network is indicated by heavy dark lines, with the Red and Green Luas routes also evident.

Less obvious are the Royal Canal, Phoenix Park tunnel, and Docklands lines, which are shown for purpose of this presentation by the blue lines below right.

The option of diverting Maynooth and Sligo traffic via the Royal Canal line so as to leave free the Drumcondra route for airport *DART* traffic was not recorded. Hence the 'HR8' option of linking Swords and the airport by *DART* to Cross Guns Bridge and into the city by Drumcondra was discounted.

Figure 1 1 Study Area for the Fingal/North Dublin Transport Study

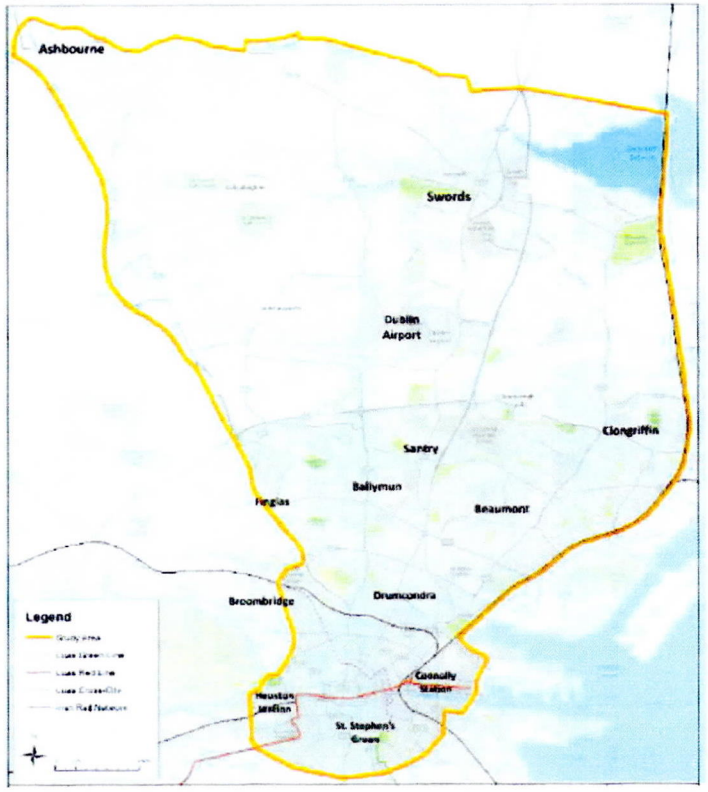
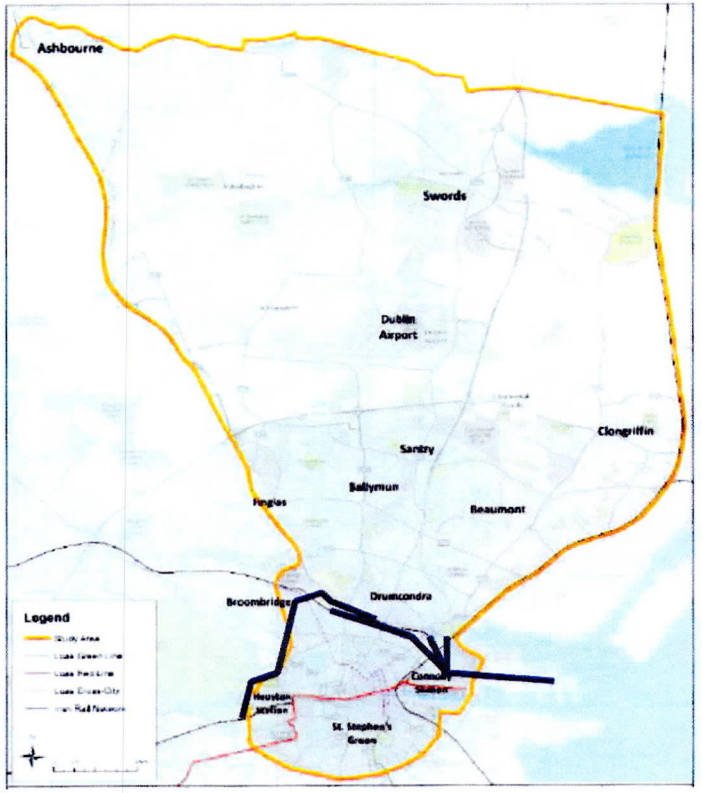


Figure 1 1 Study Area for the Fingal/North Dublin Transport Study

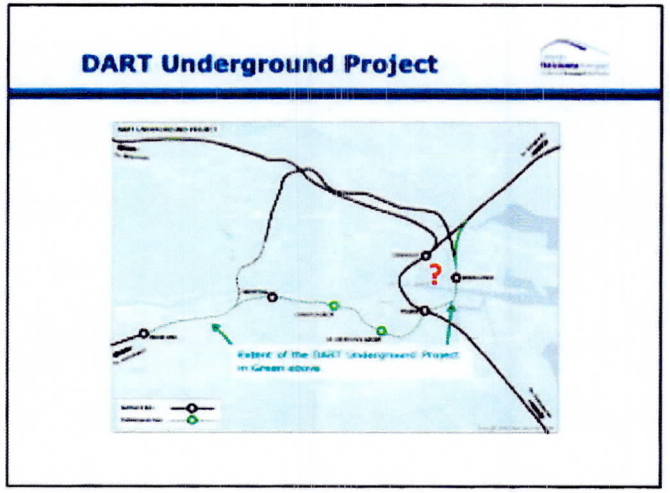


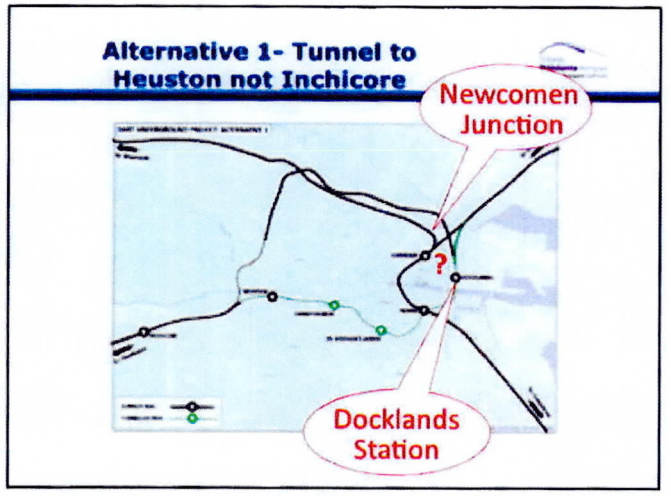
Right: Slides showing lower cost alternatives to DART Underground considered by the National Transport Authority in 2015.

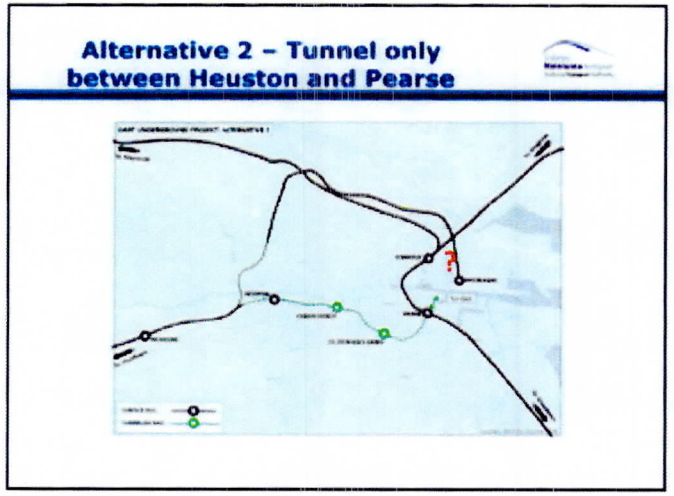
In this instance the Royal Canal line is shown. However the railway is not shown in its totality, with the link between Docklands Station to Newcomen Junction missing, as illustrated for this presentation by the red labels in the slide top right.

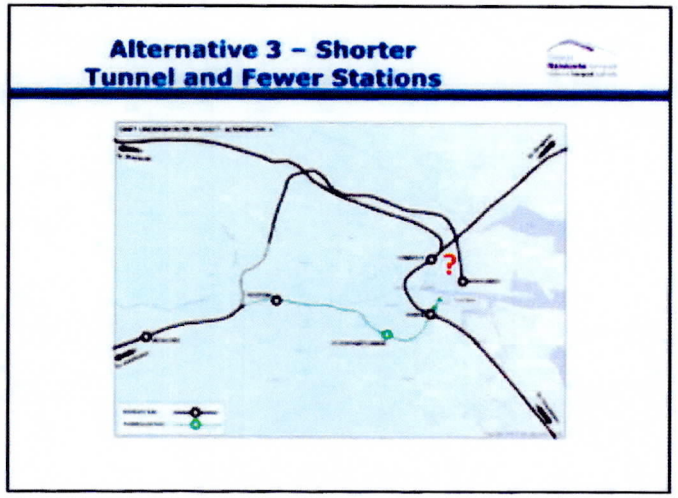
As with other assessments, the railways on the north side are not fully considered. Instead four variants of an underground tunnel on the south side are outlined.

The option of diverting Maynooth and Sligo traffic via the Royal Canal line so as to leave free the Drumcondra route for airport *DART* traffic was not addressed.









DART Underground map showing network benefits

Using Dublin's Forgotten Link

Figure 4, Page 9 of 18

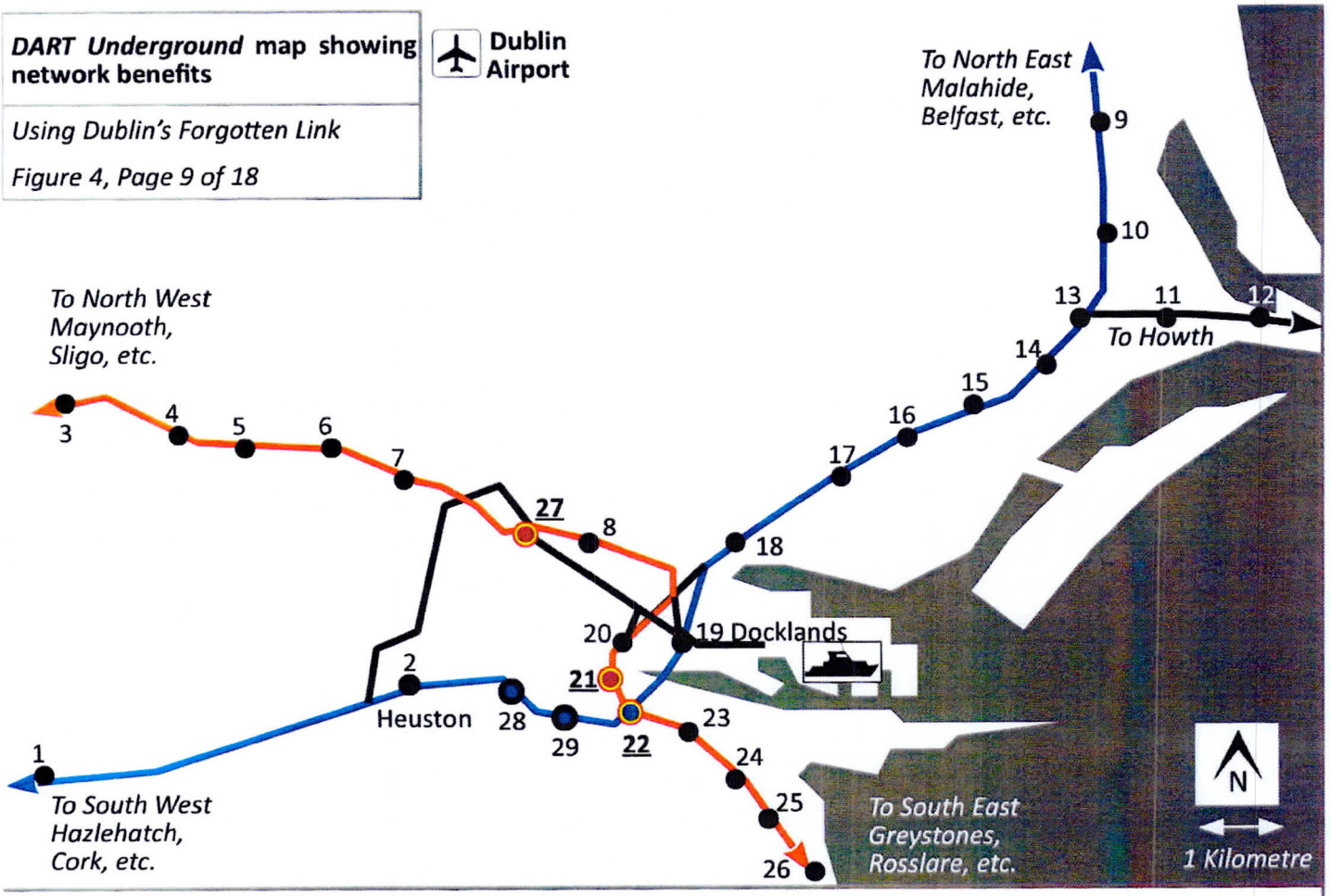


Figure 4. By separating *DART* services into two main corridors, network capacity would be greatly increased. Circa 5 kilometres of tunneling is envisaged, from Docklands (19) to Heuston (2). Three new stations would be opened.
North East – South West *DART* ——— North West – South East *DART* ———

Proposed Irish Rail Stations

Upgrades
- 2 Heuston (underground station)
- 19 Docklands (underground station)
- **21** Tara Street (new interchange wit the new airport underground line)
- **22** Pearse (new interchange wit existing north west – south east lines)

New Irish Rail stations
- **27** Glasnevin (new interchange wit airport underground).
- 28 Woodquay
- 29 Stephen's Green

Docklands and Heuston are alread present and thus are shown as standarc

Existing Irish Rail Stations

1.Park West	14 Kilbarrack
2 Heuston	15 Raheny
3 Castleknock	16 Harmonstown
4 Navan Rd. Parkway	17 Killester
5 Ashtown	18 Clontarf Road
6 Pelletstown	19 Docklands
7 Broombridge	20 Connolly
8 Drumcondra	21 Tara Street
9 Portmarnock	22 Pearse
10 Clongriffin	23 Grand Canal Do
11 Bayside	24 Lansdowne Roa
12 Sutton	25 Sandymount
13 Howth Junction	26 Sydney Parade

First Alternative to *DART Underground* using existing lines

Using Dublin's Forgotten Link:
First alternative
Figure 5, Page 10 of 18

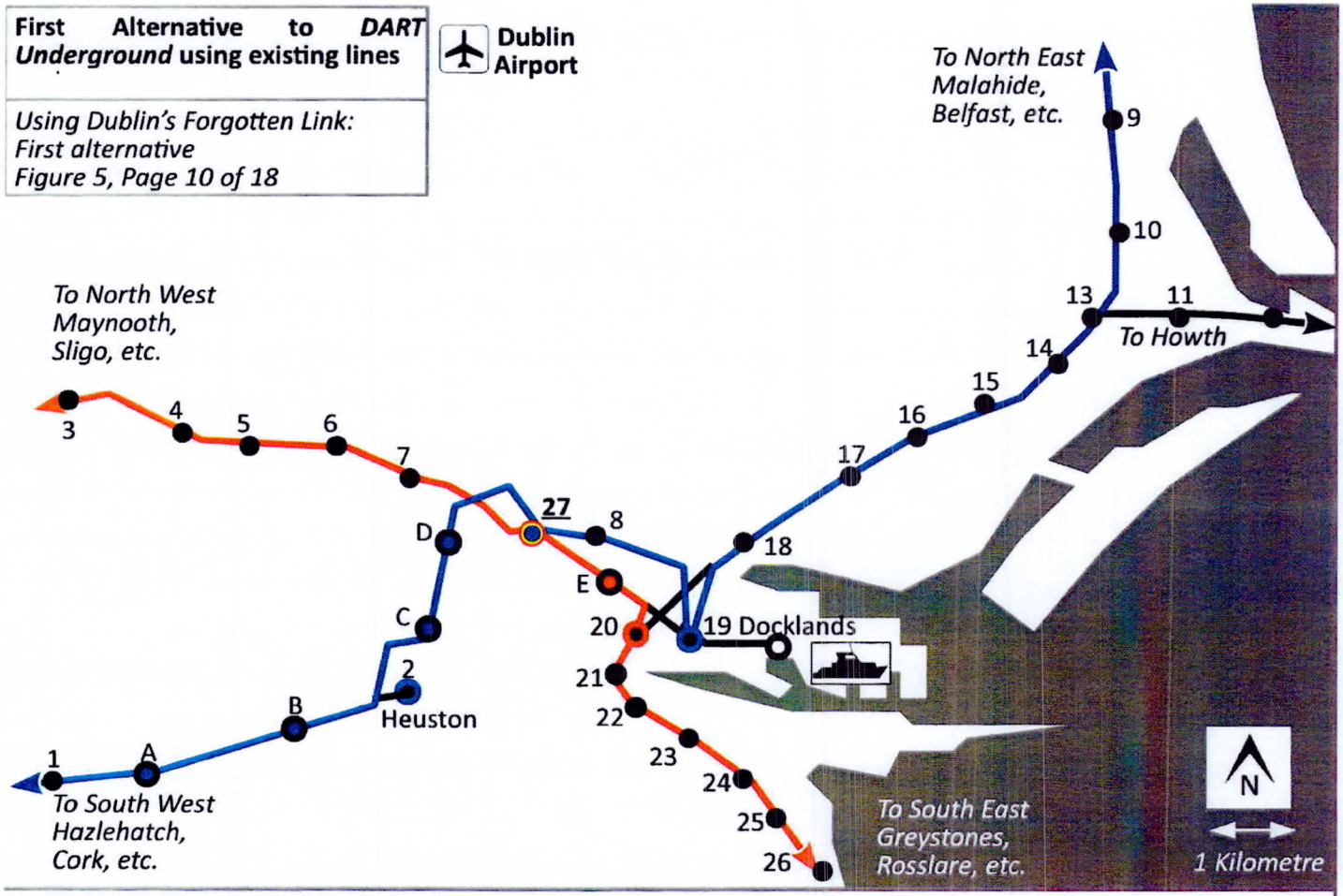


Figure 5. By using the Royal Canal line, north west – south east traffic could be rerouted, so that the Drumcondra (8) line is free for north east – south west traffic using the Phoenix Park tunnel. Services are separated as per *DART Underground*. Six new stations and better pedestrian access at three others would serve circa 150,000 residents.

Alternative Network Use with Stations

New Irish Rail stations

27 Glasnevin Interchange: Nodal po for north east – south west and no west – south east services.

- A Ballyfermot
- B Inchicore
- C Dublin Zoo
- D Cabra
- E Croke Park
- Ferry (*Intercity Terminus*)

Upgraded Irish Rail stations

Better pedestrian access & permeabilit

- 2 Heuston *(new platform & access)*
- 19 Docklands *(platforms & access)*
- 20 Connolly *(platform & access)*

Existing Greystones – Howth DAR services could operate at less frequency

Existing Irish Rail Stations

1.Park West
2 Heuston
3 Castleknock
4 Navan Rd. Parkway
5 Ashtown
6 Pelletstown
7 Broombridge
8 Drumcondra
9 Portmarnock
10 Clongriffin
11 Bayside
12 Sutton
13 Howth Junction
14 Kilbarrack
15 Raheny
16 Harmonstown
17 Killester
18 Clontarf Road
19 Docklands
20 Connolly
21 Tara Street
22 Pearse
23 Grand Canal Do
24 Lansdowne Roa
25 Sandymount
26 Sydney Parade

First Alternative to Airport Metro with less tunneling required: *DART* to airport and Swords.

Using Dublin's Forgotten Link: First alternative
Figure 6, Page 11 of 18

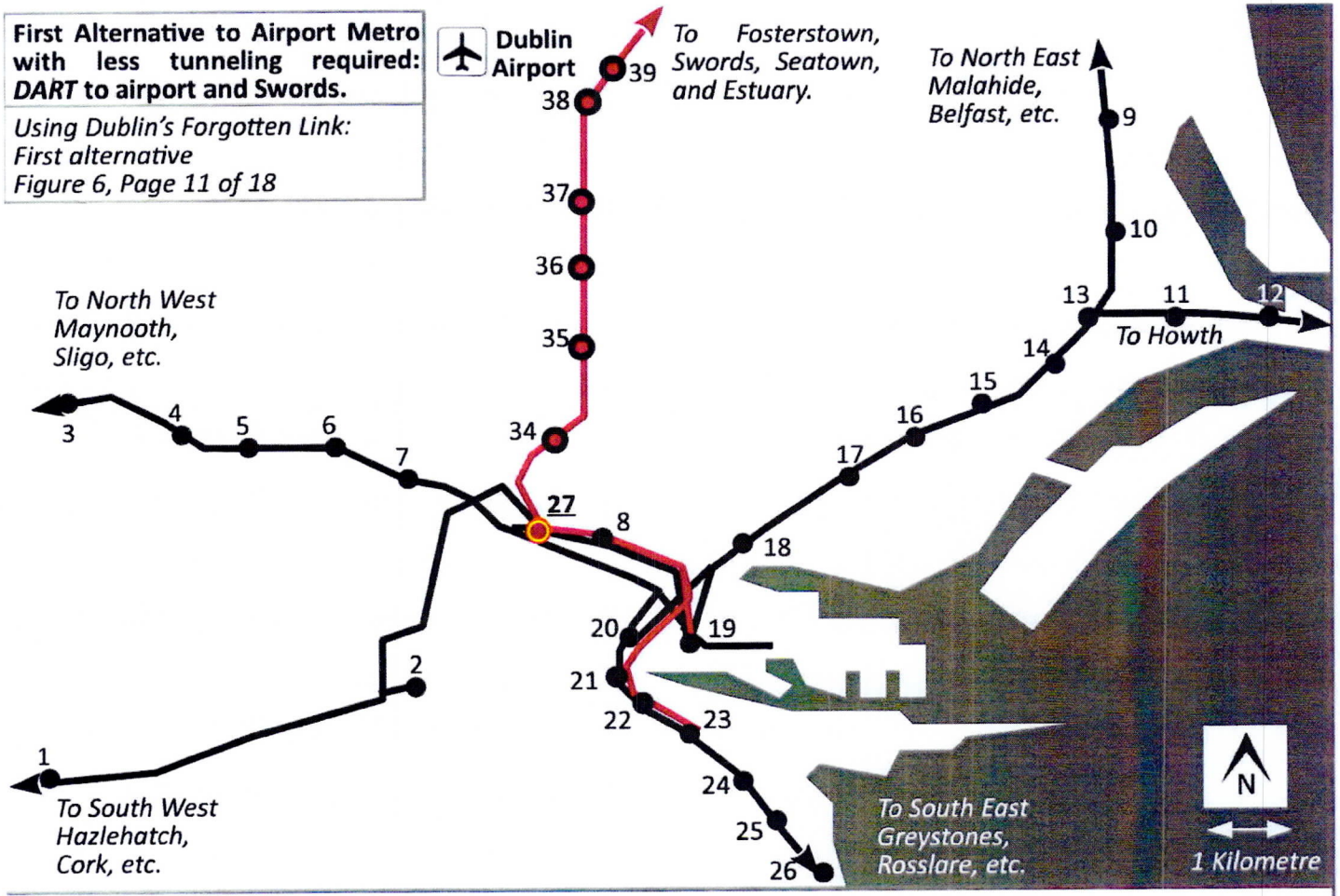


Figure 6. Again, by rerouting northwest traffic via the Royal Canal, the Drumcondra (8) line could be used for services from Swords, Dublin Airport to Docklands (19) and Grand Canal Dock (23). So as to be compatible with Irish Rail's existing city centre network, the new line to the airport and Swords would be built to *DART* standard.

New Airport *DART* Stations

- 27 Glasnevin Interchange
- 34 Glasnevin Village
- 35 Collins Avenue
- 36 Ballymun
- 37 Northwood
- 38 Dardistown
- 39 Dublin Airport

Fosterstown, Swords, Seatown ar Estuary are not shown on this map.

Existing Irish Rail stations

1.Park West	14 Kilbarrack
2 Heuston	15 Raheny
3 Castleknock	16 Harmonstown
4 Navan Rd. Parkway	17 Killester
5 Ashtown	18 Clontarf Road
6 Pelletstown	19 Docklands
7 Broombridge	20 Connolly
8 Drumcondra	21 Tara Street
9 Portmarnock	22 Pearse
10 Clongriffin	23 Grand Canal Do
11 Bayside	24 Lansdowne Roa
12 Sutton	25 Sandymount
13 Howth Junction	26 Sydney Parade

Advantages
Eliminates need for 4 kilometres tunnelling in the city centre. Less cos disruption, and environmental impact.

Disadvantages
Costs remain high as 80% of the met line presently envisaged would be built

Overlay of *DART Underground* and airport line alternatives together

Using Dublin's Forgotten Link:
First alternative
Figure 7, Page 12 of 18

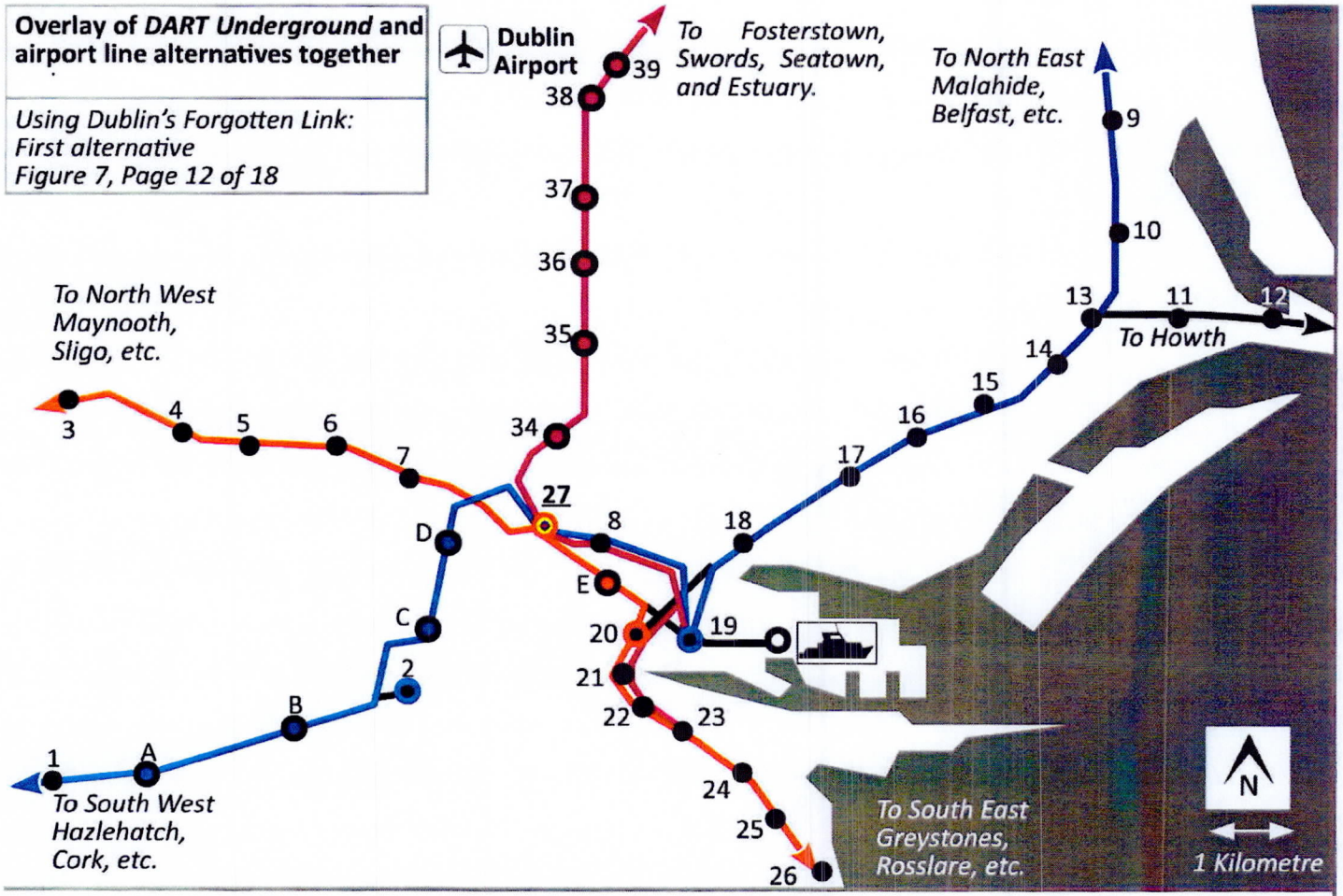


Figure 7. Integrated services linking Heuston (2) to Docklands (19), and the city centre to Dublin Airport (39) with Swords could happen without city centre tunnelling. However north east – south west services would not enter the south city centre, with the main interchange between services being at Glasnevin (27).

New and better *DART* Rail Stations

- 27 Glasnevin Interchange
- A Ballyfermot
- B Inchicore
- C Dublin Zoo
- D Cabra
- E Croke Park
- Ferry (*Intercity Terminus*)
- 2 Heuston *(platform & better access,*
- 19 Docklands *(platforms & access)*
- 20 Connolly *(platform & access)*

City Centre – Dublin Airport – Swords

- 34 Glasnevin Village
- 35 Collins Avenue
- 36 Ballymun
- 37 Northwood
- 38 Dardistown (Subject to review)
- 39 Dublin Airport

Fosterstown, Swords, Seatown a Estuary are not shown on this map.

Existing Irish Rail stations

1.Park West	14 Kilbarrack
2 Heuston	15 Raheny
3 Castleknock	16 Harmonstown
4 Navan Rd. Parkway	17 Killester
5 Ashtown	18 Clontarf Road
6 Pelletstown	19 Docklands
7 Broombridge	20 Connolly
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9 Portmarnock	22 Pearse
10 Clongriffin	23 Grand Canal Do
11 Bayside	24 Lansdowne Roa
12 Sutton	25 Sandymount
13 Howth Junction	26 Sydney Parade

Further Development 1: Linking Docklands to a second network interchange at Grand Canal Dock

Using Dublin's Forgotten Link: First alternative
Figure 8, Page 13 of 18

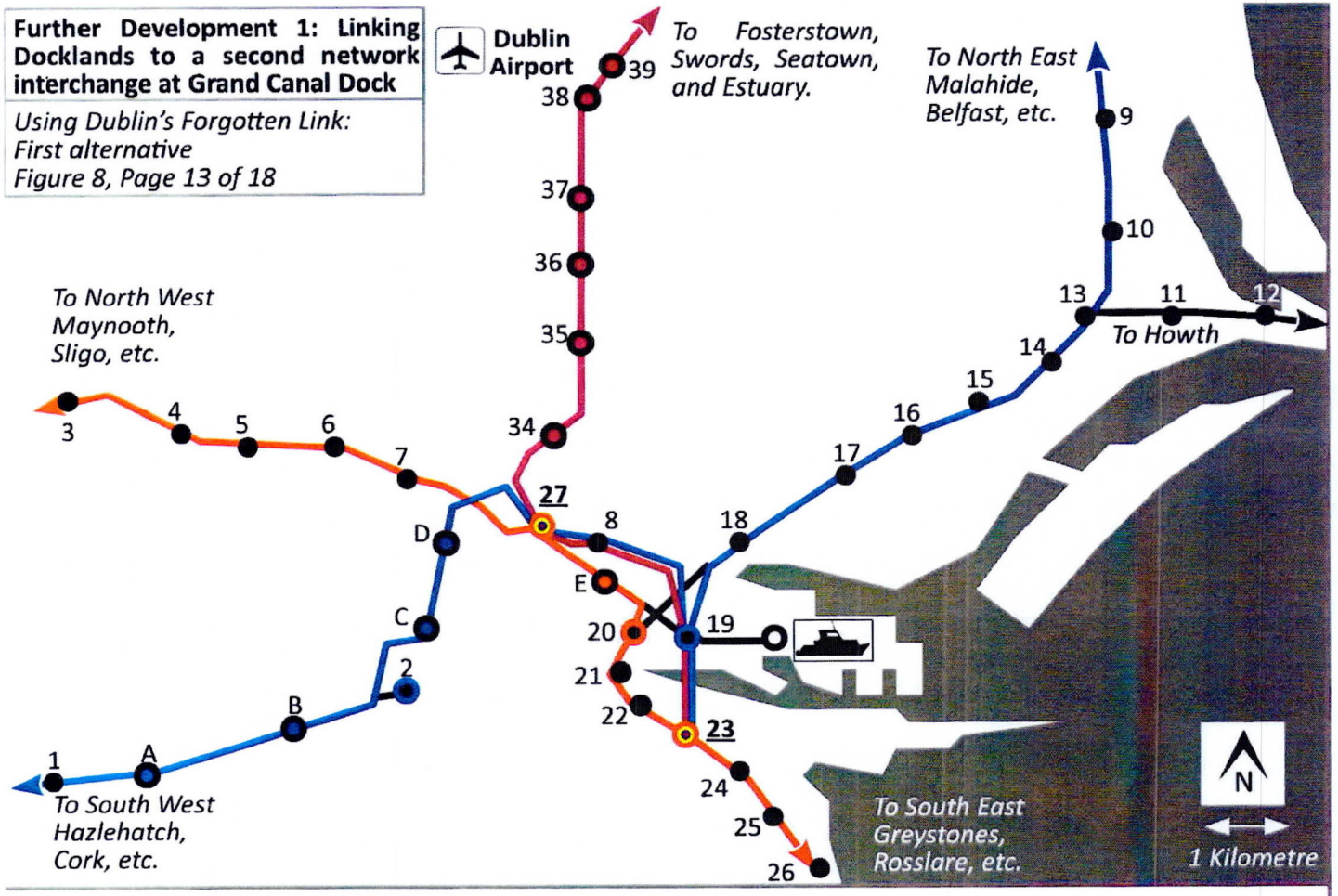


Figure 8. One kilometre link from Docklands (19) to Grand Canal Dock (23) would enable trains from the north east and south west to access the south east city centre. A second interchange station at Grand Canal Dock would give passengers two options for switching between north east – south west and north west – south east services.

New and better DART Rail Stations

- 23 Grand Canal Dock Interchange
- 27 Glasnevin Interchange
- A Ballyfermot
- B Inchicore
- C Dublin Zoo
- D Cabra
- E Croke Park
- Ferry *(Intercity Terminus)*
- 2 Heuston *(platform & access)*
- 19 Docklands *(platforms & access)*
- 20 Connolly *(platform & access)*

City Centre – Dublin Airport – Swords

- 34 Glasnevin Village
- 35 Collins Avenue
- 36 Ballymun
- 37 Northwood
- 38 Dardistown (Subject to review)
- 39 Dublin Airport

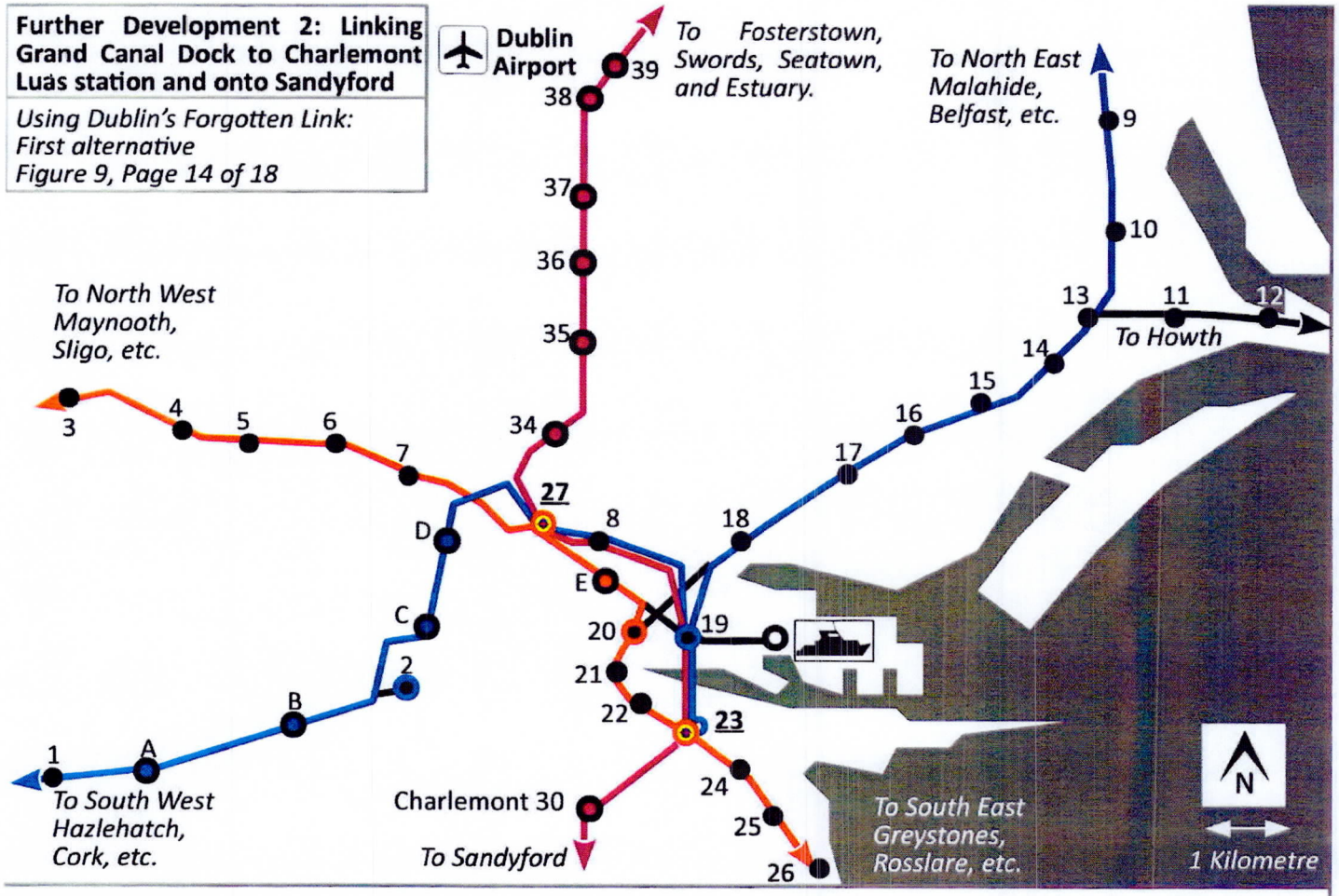
Fosterstown, Swords, Seatown a Estuary are not shown on this map.

Existing Irish Rail stations

1.Park West	14 Kilbarrack
2 Heuston	15 Raheny
3 Castleknock	16 Harmonstown
4 Navan Rd. Parkway	17 Killester
5 Ashtown	18 Clontarf Road
6 Pelletstown	19 Docklands
7 Broombridge	20 Connolly
8 Drumcondra	21 Tara Street
9 Portmarnock	22 Pearse
10 Clongriffin	23 Grand Canal Dc
11 Bayside	24 Lansdowne Roa
12 Sutton	25 Sandymount
13 Howth Junction	26 Sydney Parade

Further Development 2: Linking Grand Canal Dock to Charlemont Luas station and onto Sandyford

Using Dublin's Forgotten Link: First alternative
Figure 9, Page 14 of 18



New and better *DART* Rail Stations

- 23 Grand Canal Dock Interchange
- 27 Glasnevin Interchange
- A Ballyfermot
- B Inchicore
- C Dublin Zoo
- D Cabra
- E Croke Park
- Ferry *(Intercity Terminus)*
- 2 Heuston *(platform & access)*
- 19 Docklands *(platforms & access)*
- 20 Connolly *(platform & access)*

Sandyford – Dublin – Airport – Swords

- 30 Charlemont
- 34 Glasnevin Village
- 35 Collins Avenue
- 36 Ballymun
- 37 Northwood
- 38 Dardistown (Subject to review)
- 39 Dublin Airport

Swords etc. are not shown on this map.

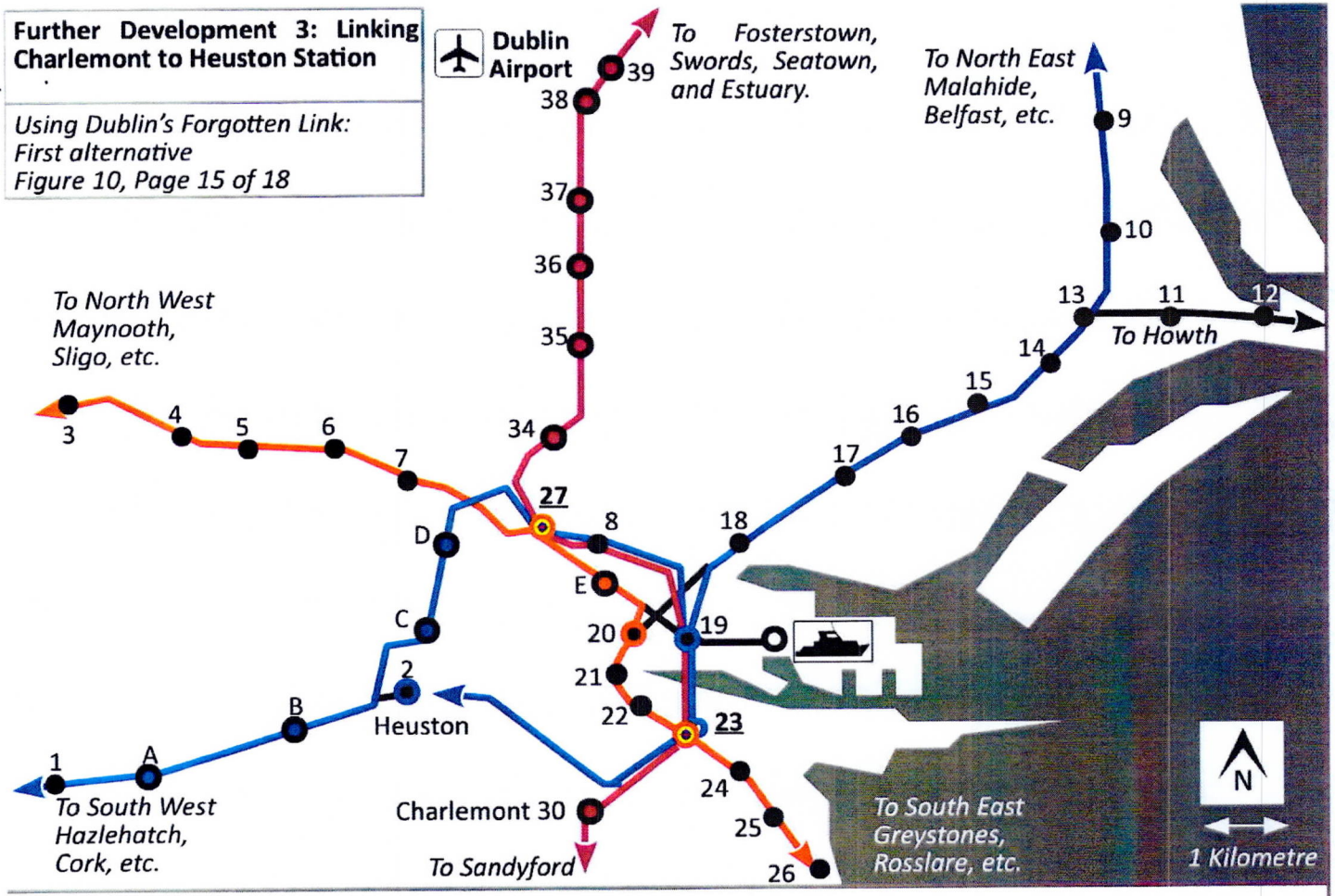
Existing Irish Rail stations

1.Park West	14 Kilbarrack
2 Heuston	15 Raheny
3 Castleknock	16 Harmonstown
4 Navan Rd. Parkway	17 Killester
5 Ashtown	18 Clontarf Road
6 Pelletstown	19 Docklands
7 Broombridge	20 Connolly
8 Drumcondra	21 Tara Street
9 Portmarnock	22 Pearse
10 Clongriffin	23 Grand Canal Dc
11 Bayside	24 Lansdowne Ro
12 Sutton	25 Sandymount
13 Howth Junction	26 Sydney Parade

Figure 9. A turnaround loop at Grand Canal Dock (23) could enable north east – south west trains proceed without having to reverse, and maximise network capacity. Extending the line two kilometres to Charlemont (30) would link the *Airport DART* to the Green Luas corridor, enabling the prospect of *DART* services from Swords to Sandyford.

Further Development 3: Linking Charlemont to Heuston Station

Using Dublin's Forgotten Link: First alternative
Figure 10, Page 15 of 18



New and better *DART* Rail Stations

- 23 Grand Canal Dock Interchange
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- A Ballyfermot
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9 Portmarnock	22 Pearse
10 Clongriffin	23 Grand Canal Dc
11 Bayside	24 Lansdowne Roa
12 Sutton	25 Sandymount
13 Howth Junction	26 Sydney Parade

Figure 10. Linking Charlemont (30) to Heuston (2) would allow north east – south west services travel under the south city centre, rather than via Cross Guns Bridge. This would be similar to the *DART Underground* proposal. By combining *DART Underground* with the airport line, total tunnelling could be reduced by circa 3 kilometres.

Overview of Unnecessary Works, Summary of First Alternative

Using Dublin's Forgotten Link: First alternative
Figure 11, Page 16 of 18

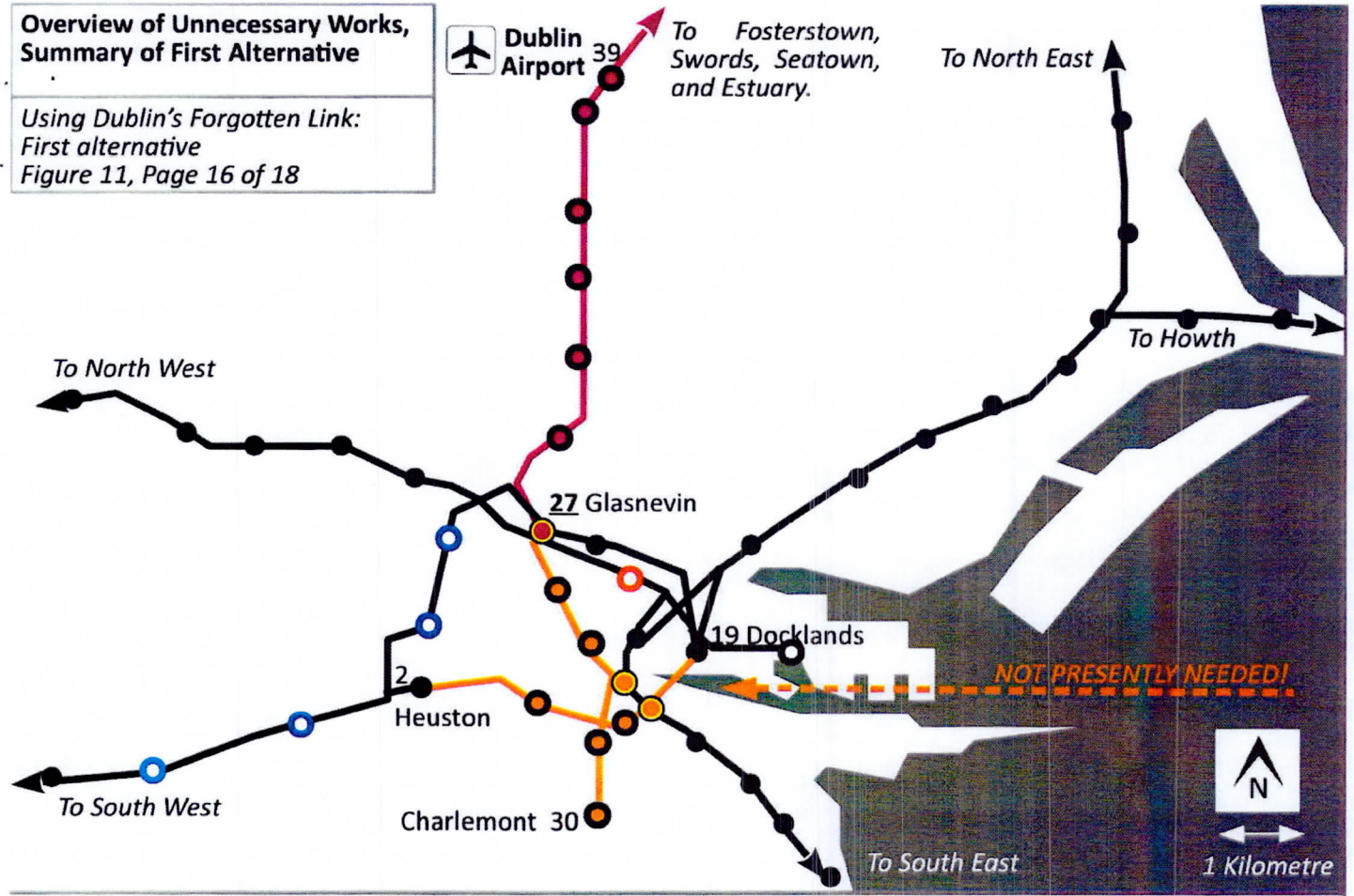


Figure 11. Overview of Unnecessary Works
Necessary underground / part-underground line (*DART*) to link Airport + Swords
Unnecessary underground lines if existing railways are used (circa nine kilometres and eight stations)

Summary of First Alternative

Existing lines could be used to achie government policy without the need f city centre tunnelling, by using the Roy Canal railway. In total, circa ni kilometres and eight undergrou stations seem unwarranted at this stage

Six new stations in populated areas, wi the potential to significantly increa population catchments at three othe and a Intercity terminus at the ferry por

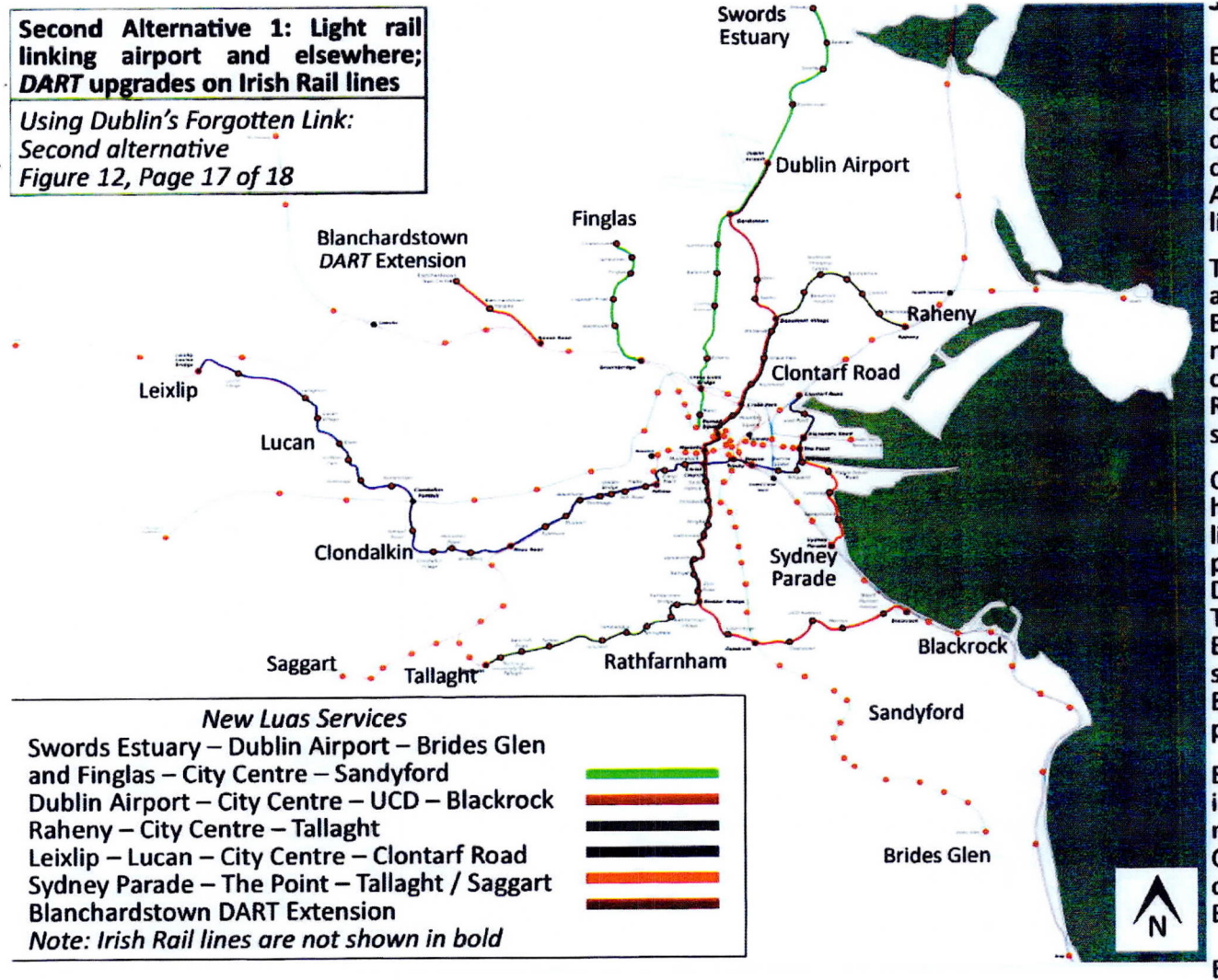
Circa 150,000 residents live within o kilometre walk of the potential statior Major trip generators include Dublin Zc Croke Park stadium, and the ferry port.

Development could be phased so as resolve policy aims sooner and with le cost. This could enable netwc development to be phased, with the ri of project non-delivery greatly reduced.

By combining the airport and *DA Underground* schemes, the total length tunnelling could be reduced from nine circa six kilometres in the city centre the event of a second line bei constructed from Heuston to Docklands

Second Alternative 1: Light rail linking airport and elsewhere; *DART* upgrades on Irish Rail lines

Using Dublin's Forgotten Link: Second alternative
Figure 12, Page 17 of 18



New Luas Services

Swords Estuary – Dublin Airport – Brides Glen and Finglas – City Centre – Sandyford
Dublin Airport – City Centre – UCD – Blackrock
Raheny – City Centre – Tallaght
Leixlip – Lucan – City Centre – Clontarf Road
Sydney Parade – The Point – Tallaght / Saggart
Blanchardstown DART Extension

Note: Irish Rail lines are not shown in bold

Second Alternative 1: Light rail network expansion

Estimated costs for the Airport MetroLink is €1 billion, the same cost as 10 – 12 Luas light rail line of equal length. As Dublin's development is low density, different modes could be prioritised c different roads, as per the Red Luas lin Alternatively bus lanes could be turned into Lu lines, with continued bus use facilitated.

The Fingal North Dublin transport study did n address using the former Broadstone canal and O Ballymun Road to link Green Luas to the airport - nor was the option of two Luas lines to the airpo considered. Separately an assessment of linkir Rathfarnham to the city centre by Luas did n seemingly consider Heytesbury Street as a route.

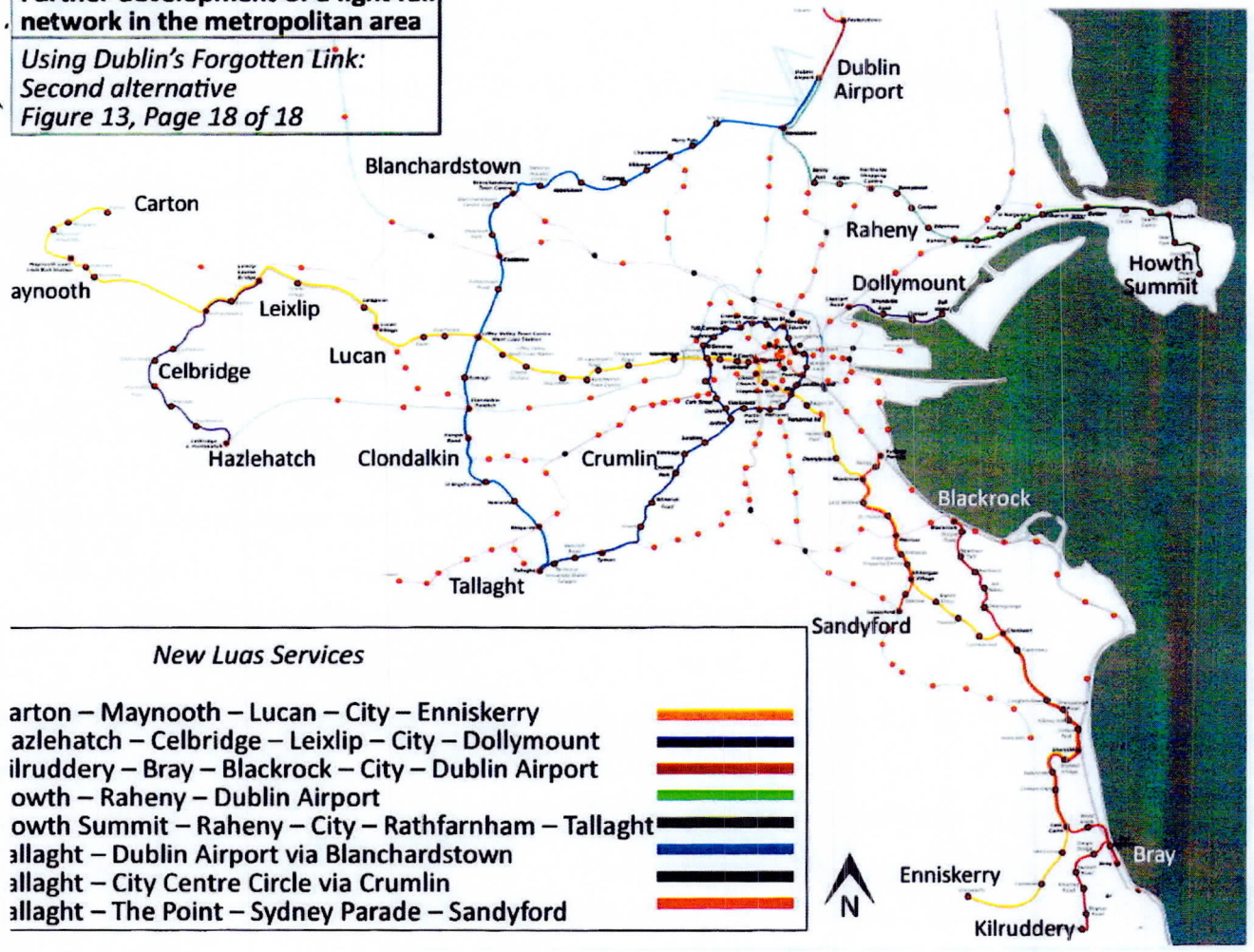
On the left, new Luas services are shown b highlighted lines, which avoid arterial roads. Tw lines serve the airport; the Green Luas line paralleled by the crimson line to University Colleg Dublin and Blackrock, with Raheny, Rathfanham ar Tallaght also linked. Finglas. Lucan, Leixlip, ar Blanchardstown would also be served. 89 ne stations across 76 kilometres of new rail networ Estimated cost of €2,860.5 – €4098 million at 202 prices, excluding depots and land acquisition.

Existing Irish Rail lines would be upgraded to *DAR* integrated using the 'forgotten' line; and feature s new stations with a new tunnel linking Docklands t Grand Canal Dock, In 2020 this was estimated tc cost €1735 – €2328 million. Nine of the twel BusConnects destinations would be served.

Estimated Cost: €4,595.5m – €6,426m (2020 est.)

Second Alternative 2:
Further development of a light rail network in the metropolitan area

Using Dublin's Forgotten Link:
Second alternative
Figure 13, Page 18 of 18



New Luas Services

arton – Maynooth – Lucan – City – Enniskerry
azlehatch – Celbridge – Leixlip – City – Dollymount
ilruddery – Bray – Blackrock – City – Dublin Airport
owth – Raheny – Dublin Airport
owth Summit – Raheny – City – Rathfarnham – Tallaght
allaght – Dublin Airport via Blanchardstown
allaght – City Centre Circle via Crumlin
allaght – The Point – Sydney Parade – Sandyford

Second Alternative 2: Further development

By adding radial and orbital routes, extension and links, Luas could become the primary mod to move around the metropolitan area. Only 25% of trips from the airport are city centre bound. B reallocating the money currently set aside fo one underground line, Dublin could get an entir network of high quality light rail transport. Metr preparation cost €2 billion previously. B contrast, Luas spreads wealth and opportunity.

On the left, new Luas services are again indicate by highlighted lines. These routes would form web interweaving Luas and *DART* services, witl the network extended by circa 91 kilometres witl 126 new stations, so as to bring the overa network to 209 kilometres with 289 stations.

Dublin Airport could have four Luas services from Swords to Brides Glen, and to Howth Tallaght and Kilruddery beside Bray. Bette connections could link Dubliners to coasta amenities at Dollymount, Bray and Howth Heads All BusConnects destinations would be served.

Estimated cost: €3,465m - €4,973.5m

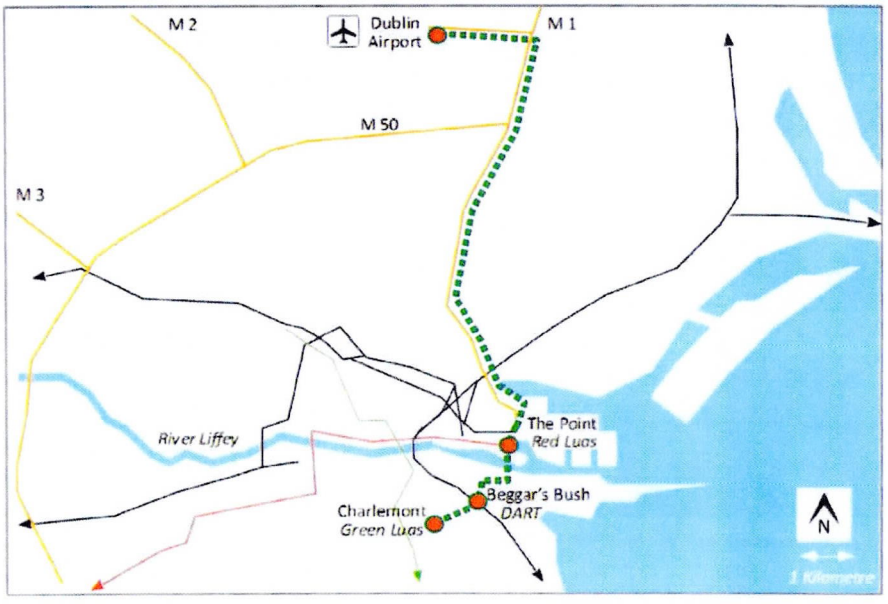
Estimated rolling cost: €8,060.5m – €11,399.5m

Costs were estimated in 2020, and exclude lan acquisition or new Luas depots.

Why spend €10 billion on 1 airport metro whe that capital could create an entire rail network?

The Dublin SMART Report

South Metropolis – Airport Rapid Transit



The Dublin SMART Report

An assessment of linking Dublin Airport with Charlemont Green Luas Station and the South City via the Port Tunnel by way of Bus Rapid Transit

© Ruadhán MacEoin, MSc., BSc., BA 20th November 2022
Contact: Ruadhan.MacEoin@UCDconnect.ie

Image above: Nantes Bus Rapid Transit
Image below: Prospective Dublin Airport BRT Route Option 2

Contents

2.2.5 Option 5:
A combination of Routes Three and Four, to feature a loop from Merrion Square via Fitzwilliam Street and Place to terminate at Wilton Place – with the return journey via Herbert and Warrington Places, onto Upper Mount Street and by Merrion Square.
Route Description
Journey Times
Observations

3.0 Appraisal

4.0 Conclusion

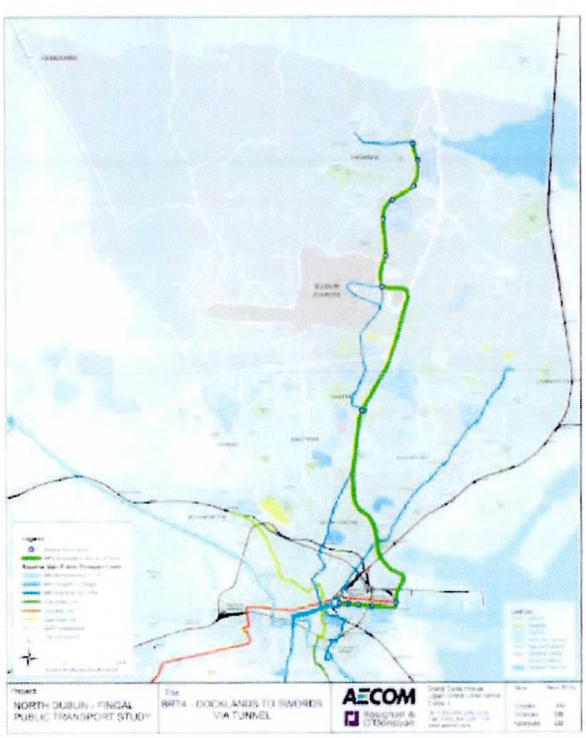
5.0 Appendices
Screen captures of Google Route Finder referred to in the text

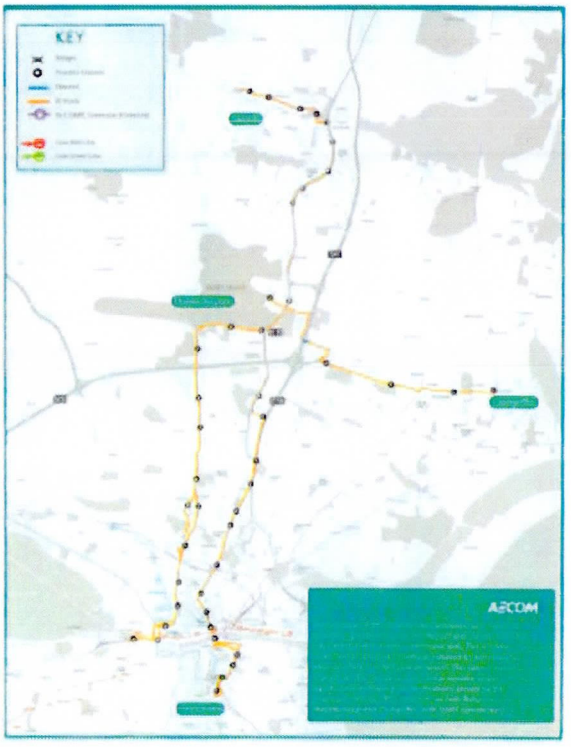
1.0 Purpose

This report sets out to conduct a basic overview of the viability of using the Port Tunnel as a public transport corridor between Dublin Airport and Charlemont Luas Station, by Rapid Bus Transit.

1.1 Introduction

Commissioned by the National Transport Authority, The North Dublin / Fingal Transport Study was conducted in 2014 – 2015, so as to assess the best way to connect Swords and the airport with Dublin city centre. It is this study that provides the basis for current policy. Bus Rapid Transit (BRT) was considered, with BRT Option 4 routed by the Port Tunnel to the Docklands terminating by the Custom House. However, the idea of using the tunnel was then amalgamated with other notional BRT routes, and ultimately dropped altogether, with overland BRT routes instead preferred. Nonetheless, the study noted that major benefits of a route by the Port Tunnel would be low cost at €100 – 130 million (at 2014 estimate), quick delivery, with little negative environmental impact.



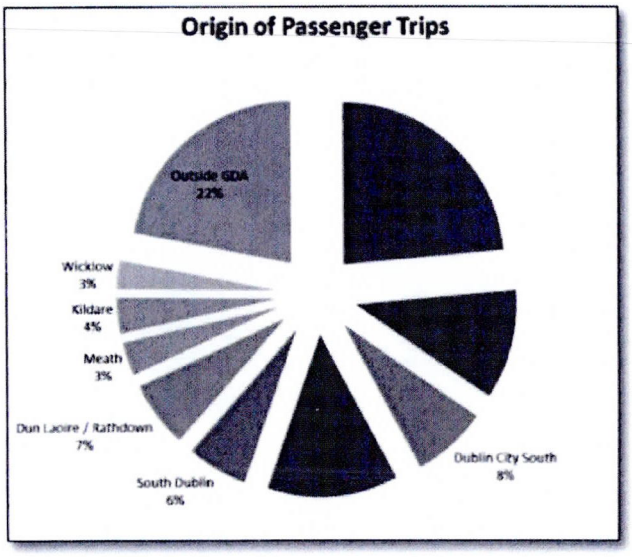


Above left: The North Dublin / Fingal Public Transport Study considered linking Dublin Airport to the city centre through the Port Tunnel, as indicated by the heavy green line. This would have connected Swords to Custom House Quay, and would not have linked to the south city. As seen above right, the idea was not advanced when BRT was brought forward for appraisal, which instead featured a BRT network which did not involve using the Port Tunnel. Ultimately, underground railway emerged as the preferred option, and is now proposed as MetroLink. Images courtesy of the North Dublin / Fingal Public Transport Study.

The proposal to link Dublin Airport with the city centre by underground rail has been mooted for over 50 years but never yet delivered. Over €2 billion was spent on the last failed attempt, the Metro North, for which nothing was delivered. After it was cancelled, a report commissioned by the NTA identified that €100 – 130 million would be sufficient to develop a BRT between the airport and the city centre via the Port Tunnel, as per BRT 4 of the North Dublin / Fingal Public Transport Study.

Since conception of the airport underground, Dublin's suburbs have extended considerably. Hence when the National Transport Authority conducted research on passenger origins of people arriving to fly at Dublin Airport in 2014, only 23% originated in the city centre. Consequently, the value of focusing all resources to develop one transit line between the airport and the city centre merits scrutiny and consideration.

Right: Pie chart showing passenger trip origins of people flying out of Dublin Airport indicating that 23% were from Dublin City Centre; 8% were from Dublin City South; 6% from South Dublin; 7% from Dun Laoire / Rathdown; and 11% from Dublin City North. Fingal accounted for 13%, while 4% were from Kildare, 3% from Meath, and 3% also from Wicklow; the remaining 22% was from Outside the Greater Dublin Area (GDA).Image and data from the National Transport Authority, Passenger Origins Study (2014).



If construction does happen, it is probable that the opening date of service is likely to take at least a decade away. Given the failure of previous underground schemes, and the likely timescale, it seems consideration should be given to alternative methods to reduce car travel as soon as possible in a cost effective manner. Such provision could function during the interim period until delivery of the underground – or indefinitely, in the event of problems occurring with the underground project.

In contrast to the unfortunate record of past underground rail projects, the Port Tunnel is doing a most effective job of removing the heavy goods vehicles from the city centre – and also, a second very useful service of providing a high-speed link between Dublin Airport and the city centre, via the 3 Arena at The Point. Presently, a number of coach and bus services are routed by these two points, with 11 minutes being the fastest time (Aircoach), with journey times typically being under 15 minutes throughout the day during weekdays (Bus Éireann 133X and Dublin Express). All these services are routed from the 3 Arena into the city centre. Consequently, this results in longer journey times than if the services were routed over the Tom Clarke / former East Link or Beckett Bridges.

Hence this study was conducted to look at the prospect of a bus service between Dublin Airport and the vicinity of Charlemont Green Luas Station and Leeson Street bridge, routed via the Port Tunnel. Being two major destinations to be served by the MetroLink route, it seems prescient these be

selected, given the aim of the new project to serve traffic volumes between between these two end points. These points are already served by the Aircoach 700 services that do not pass through the Port Tunnel – and hence, potential values can be compared in terms of likely time differences and savings etc. Moreover, the Bus Éireann 133X also operates between the airport and Sussex Road through the Port Tunnel, providing another comparison.

Presently the former N11 corridor is served by the Aircoach 700 service, which travels overland from Dublin Airport through the city centre, and stops near Leeson Street bridge at Sussex Road, before continuing on to Leopardstown. The service is every 15 minutes for much of the day, with the journey times typically being 34 minutes off-peak, and 46 minutes during most of the day. Numerous traffic lights and junctions feature en-route, and also five bus stops between Terminal Two at Dublin Airport and Sussex Road. As a service for tourists, this executive standard operation functions well, with bus stops convenient to hotels, supervised loading of baggage, etc. However, as this is routed overland through the city centre, it is slower than if it were routed through the Port Tunnel. The potential speed of service is further slowed, by the vehicles featuring only one doorway for boarding and disembarking by passengers, and also that the drivers interact with passengers, by way of charging for tickets, supervising baggage loading and unloading etc.

In contrast, thrice daily the 133X also travels from Dublin Airport to Sussex Road, but through the Port Tunnel, with Wicklow as the ultimate destination. This is timetabled for a journey time of 37 minutes, which occurs during the busy evening period. The journey to The Point takes 13 minutes, which is then followed by a route via Matt Talbot bridge and Westland Row, which takes 24 minutes with five stops, before reaching Sussex Road. This is a more circuitous route than other potential route options, encountering congestion and featuring numerous bus stops; this suggests that another more direct route from The Point to Leeson Street bridge, with less stops, and greater priority on the roadway could result in faster service between Dublin Airport and Leeson Street bridge, beside Charlemont Green Luas Charlemont Station. As with the Aircoach service, coaches are used rather than other vehicle types, resulting in slower speeds than otherwise may be the case.

The Dublin Express is another bus service that operates from Dublin Airport to the city centre through the Port Tunnel. As with Aircoach and Bus Éireann, coaches are used for this service. Unlike those operations, this service does not venture beyond the city centre. Two services are provided, the 782 and the 784, with the first routed through the tunnel and along the River Liffey through the city centre to Heuston Station and back again – while the 784 is routed via the tunnel through the south city centre via Trinity College, Pearse Station and Merrion Square to the Harcourt Luas station by Camden and Charlemont Streets. As the 782 does not stop by the 3 Arena at The Point, it does not provide any time comparisons for this study. However the 784 service does stop at the 3 Arena by The Point throughout the day, with journey times from the airport ranging from 14 – 19 minutes, depending on the time of day, the day of the week, and levels of traffic congestion. Although the 784 does not travel south of the Grand Canal, it does nonetheless terminate relatively near to Charlemont Luas Station and Leeson Street bridge at Charlotte Way, with this being 470 metres from the first and 750 metres from the latter as the crow flies. Consequently, this also provides some indication for travel times between the airport and the area around Leeson Street bridge, with travel time being 30 – 45 minutes on a route featuring relatively little priority for buses.

1.2 Concept

Bus Rapid Transit (BRT) is proven to be a quick, cost-effective way to provide high quality public transport, as seen around the globe, from Nantes in France to cities throughout South America.

Typically services have designated or lanes, similar to the Quality Bus Corridors (QBCs) already established throughout Dublin, and operate at high frequencies of 1 – 2 minutes at peak times. The potential speed, reliability and quality of service is further determined by other factors, including, transit signal priority at junctions, the amount of doors on vehicles, availability of prepaid tickets at machines at bus stops, stops with multiple platforms, general legibility and presentation of the service including high quality vehicles, appropriate street furniture, proper branding and design etc.

A further crucial factor that defines service quality is whether the system is open, closed, or semi-open to other roadway users, such as taxis, bicycles, private vehicles, other buses etc. A totally closed system is free of all other traffic, whereas a semi-closed system may allow other buses, bicycles, etc, and may also feature sections of roadway shared with other users. As road space is limited along the potential route options, and as there are existing businesses and residents that will continue to need vehicular access and parking, it seems a semi-closed system may be most suitable for a prospective BRT service to and from Dublin Airport.

Smooth operation of BRT services can also facilitated by other measures along the route, such as simplified junctions with limited turns etc. Frequently BRT services feature single articulated buses, which provide good capacity – with 120 passengers maximum being typical.

Right: Dublin Bus previously operated articulated buses on the 10 route. Functionality was impeded as only one door on buses was opened at bus stops at that time – and separately, routes featured numerous turns that resulted in passenger discomfort. Photo: Shay Byrne.

1.3 Network Capacity

According to the Bus Rapid Transit (BRT) – Core Dublin Network report (NTA, 2012), it was envisaged to carry a maximum of 3,600 passengers per direction per hour (ppdph), based on a frequency of 2 minutes, using single articulated buses. However, this figure could be increased in the event of higher frequency, such as at peak times; for example the National Association of City

Transportation Officials (NACTO) observe that 8,000 ppdph is attainable on a basis of 80 buses per hour carrying 100 passengers. Capacity can be also increased other measures, such as having multiple platforms at bus stops, over-taking lanes, larger buses, and simplified junctions allowing greater frequency.

It is envisaged that a new service could feature buses carrying up to 150 passengers, which would operate each way every two minutes off-peak, and once a minute at peak times. Hence, capacity could range from 4,500 to 9,000 passengers per direction per hour, depending on the time of day.

1.4 Vehicle Type: Articulated Buses

Currently Dublin Airport is serviced by two different types of buses; coaches and double-deckers. These vehicle types are suited to current operations, local and executive standards services. Yet if a BRT service is to be developed, it is recommended that consideration be given to using single articulated buses with low floors and multiple doors so as to ensure swift journey times, service reliability, and universal accessibility. Greater capacity is also provided by such vehicles; for example, the Mercedes Benz Citaro G class carries a maximum of 152 passengers, consisting of 96 seated and 56 standing.

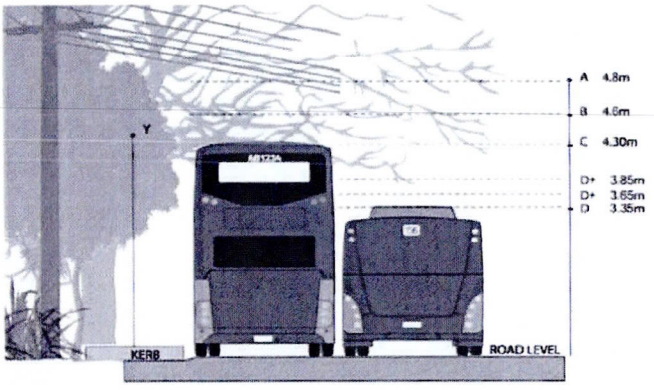
Right: Mercedes Benz Citaro G class carries 152 passengers, as operates in Lisbon. Photo: Lus o Pages.

Previously, Dublin Bus operated articulated buses on the 4, 10 and 65C routes, which began service in 2000. However functionality was greatly impeded as only one door on the buses was opened at bus stops at that time, where passengers both got on and off; separately, drivers accepted cash payments; and finally, routes featured numerous tight turns that resulted in passenger discomfort.

Since then, it has become standard practice on Dublin Buses that doors are opened at stops, while separately, there is now a culture of cashless transactions and prepaid tickets. Hence, with ticket machines at bus stops, on a route that feature few turns, this vehicle type could now be very effective for a BRT service from Dublin Airport to the south city centre via the Port Tunnel.

Height is another major advantage that articulated buses offer as a vehicle type instead of coaches in the Dublin context, for services between the airport and the south city. Presently the Irish Rail /

DART line between Pearse and Lansdowne Road Stations features a half dozen bridges with low clearance insufficient to allow double-decker buses to pass. Of these bridges, Macken Street has an overhead bridge allowing 4.38 metre height clearance, which is sufficient to accommodate the coaches used on the Aircoach 702 and 703 southbound services, which are understood to be about 3.8 metres high, and thus too tall to pass under the others. In contrast, the Citaro G buses have heights of 3.13 metres – and are thus lower than all bridges except Grand Canal Quay, which is in any event pedestrianised. However according to best international practice, in New Zealand and the United States, the minimum recommended overhead clearance is 3.65 metres for single deck buses. Hence, as the bridge at Erne Street has 3.24 clearance, it may not be readily suitable; likewise the South Lotts Road also has 3.35 metre clearance. Qualified technical expertise would be very helpful to better inform and resolve these issues.



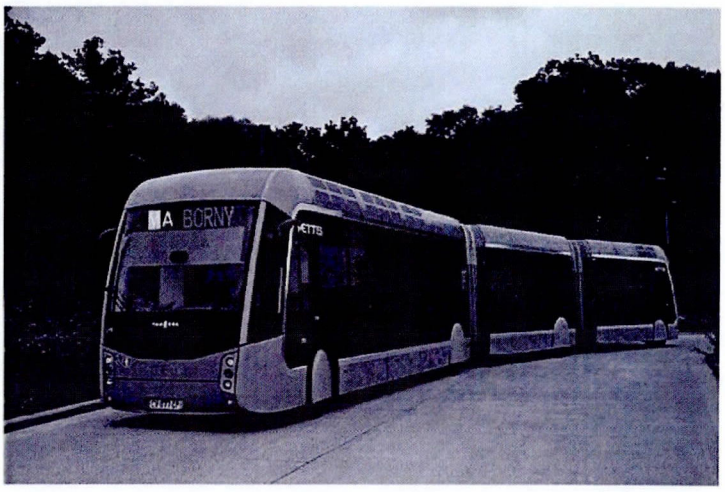
Right: Height clearances for buses as recommended by the New Zealand authorities sets out 1.65 metres as the minimum recommended clearance for single decker buses.

A drawback with using articulated buses on Irish roads is that maximum speed is restricted to 65 kilometres per hour (kph), which would lengthen journey times by about 2 minutes 22 seconds over the M1 motorway section when compared to the potential speeds of other vehicles. Despite this, given all the other benefits this vehicle type offers, it is thought suitable for a prospective BRT service linking Dublin Airport with the Green Luas at Charlemont Station / Leeson Street bridge.

Right: The Belfast Glider BRT service operates on Van Hool single articulated buses. This 'tram on tyres' accommodates up to 125 passengers; it is widely regarded as a success, with an expansion of services due to occur.

Articulated buses can have doors on both sides, or on the one side only. The benefit of having doors on each side is that like a tram, buses can stop at bus stops sited on island platforms in the middle of a street as well as standard bus stops at the side of a road. However, this is not thought preferable, as it reduces the amount of seating available on vehicles, and requires passengers to cross a road so as to board or disembark. As island platforms do not seem to be necessary in Dublin, standard vehicles with passenger doors on one side only appears to be appropriate.

Right: A bi-articulated *Van Hool ExquiCity 24*, as seen here at Metz in France, can accommodate up to 180 passengers. It is not currently proposed that this vehicle type be brought into service in Dublin.



A further benefit of articulated buses that featuring only of one level is that visibility of passengers is much more obvious. This seems to result in less potential for the type of antisocial behaviour that is sometimes occurs in the back area on the upper floor of double-decker buses in Dublin.

However, the articulated nature of the vehicle can potentially pose risks to cyclists, by way of blind spots and unexpected movements. Consequently it is imperative that these factors are priority in any subsequent design or project involving this class of vehicle.

Articulated buses can be powered by a range of fuels. In Belfast the Gider operates on Van Hool buses that are hybrid diesel electric; elsewhere, the Mercedes Benz Citaro class are powered by battery, gas, hydrogen, diesel, hybrid, and overhead cables.

The prospect of bi-articulated buses has presently been discounted, although this could be revisited in the event of greater capacity being desirable. Such vehicles can carry up to 250 passengers.

As there are no other articulated bus services in Dublin, it is thought that the vehicle choice would also be of great benefit for branding and legibility of the new service to the airport.

1.5 Methodology

For purpose of the exercise, three sources and approaches have been found helpful; timetables for existing bus services routed by the Port Tunnel; Google Maps for measuring distances, roadway widths, and local inspection by way of Street View; and Google route finder, as it provides real time information as to expected journey times, depending on the mode selected, i.e. private car, public transport, cycling, or walking. In addition, statutory documents and reports have also been consulted where thought relevant, such as design guidance and speed limits allowed for buses, in order to ensure that any propositions are feasible and compliant with legal requirements.

1.6 Journey Times

Existing timetables provide a guide for bus journey times on certain sections of the study area, such as the Port Tunnel, where different operators are running services both at the same and different

times. Yet elsewhere this is not the case along other stretches, where there are no direct services, such as between the Leeson Street bridge area and the 3 Arena / The Point. Hence there was a need to identify plausible journey times. Consequently, in addition to bus timetables, two other sources have been used to generate realistic journey times where necessary:

Firstly, with Google Route Finder, journey times are provided for private cars; yet these vehicles do not have priority that a bus service may have, such as bus lanes or priority at traffic signals that can enable swifter journey times. Hence route finder is limited to showing the slowest journey time likely – but nonetheless gives some measure of possible outcome, in a worst case scenario of a bus service not having road priority. On some occasions, Route finder also indicates journey times when roads are quiet, however this is not always shown, and thus can only sometimes be recorded.

In contrast, the second method using Google Maps allows for route lengths to be measured that can then be calculated for journey times according to desired speed limits, with 30 kph and 50 kph attributed. Hence this approach identifies Idealised Journey times, that do not take into account stops or turns which inevitably slow progress in the real world.

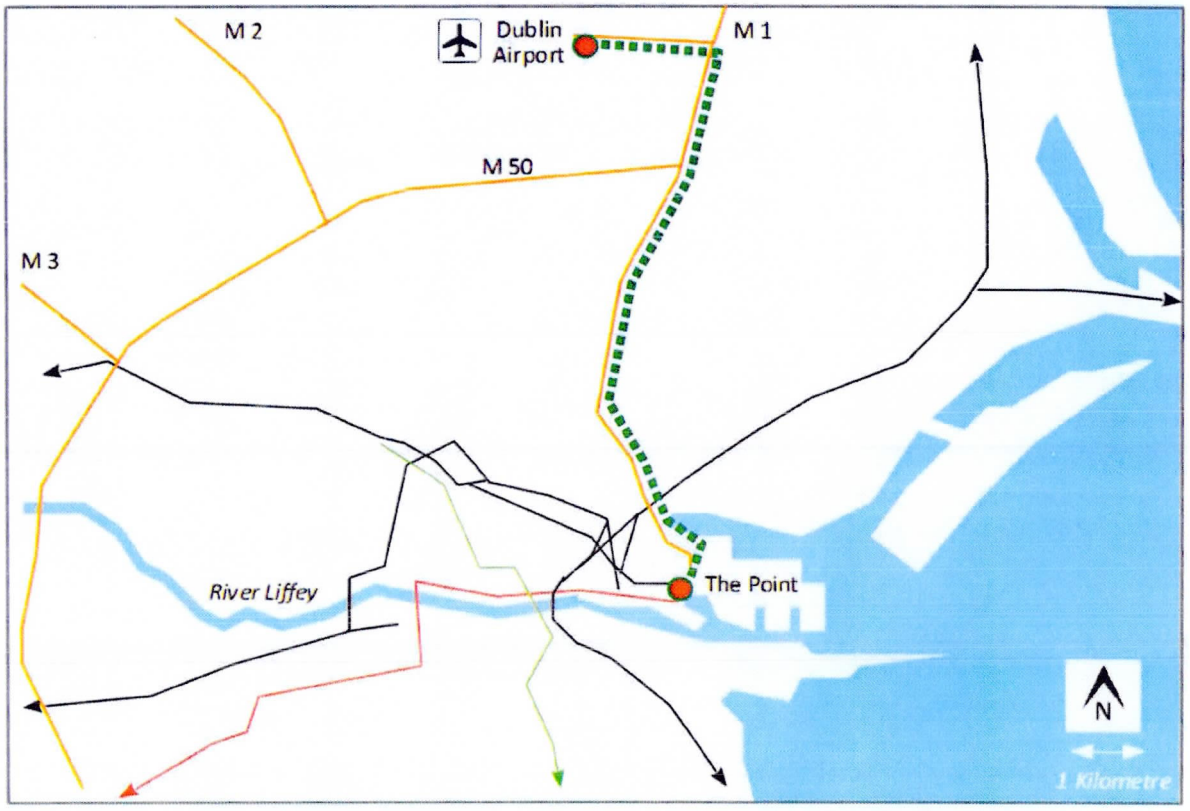
Finally, in the Bus Rapid Transit (BRT) – Core Dublin Network report (NTA, 2012), it noted that in Dublin 'the average commercial speed for a BRT system should be between 20 km/hr and 25km/h', which it said were being achieved on the N11 QBC. As the present concept envisages only one or two intermediate bus stops on a 15 kilometre route, it is thought that 30 kph on city streets is viable.

As none of the above approaches provides a 'perfect fit', yet as each has its own merit, it is thought that a combination of the approaches can help identify realistic estimates for time journeys.

2.0 Overall Route Assessment

Dublin Airport – Charlemont Station / Leeson Street bridge via Port Tunnel

The route between these two points is best broken into two parts for easier analysis. The first part is from Dublin Airport Terminal 2 to the 3 Arena at The Point, as this is the closest bus stop to the Port Tunnel entrance and hence provides reliable bus journey times according to established timetables.



Above: The route from Dublin Airport to The Point as indicated by a broken green line.

The second part of the study are are the route options between The Point and Leeson Street bridge, which is circa 400 metres from Charlemont Station. There are a number of route options available, each with its own pros and cons. Arising from resource limitations, it has not been possible to exhaust every possibility, but instead focus on 5 potential routes, that seem the most obvious.

The route options most apparent to link The Point and Leeson Street bridge for purpose of BRT are:

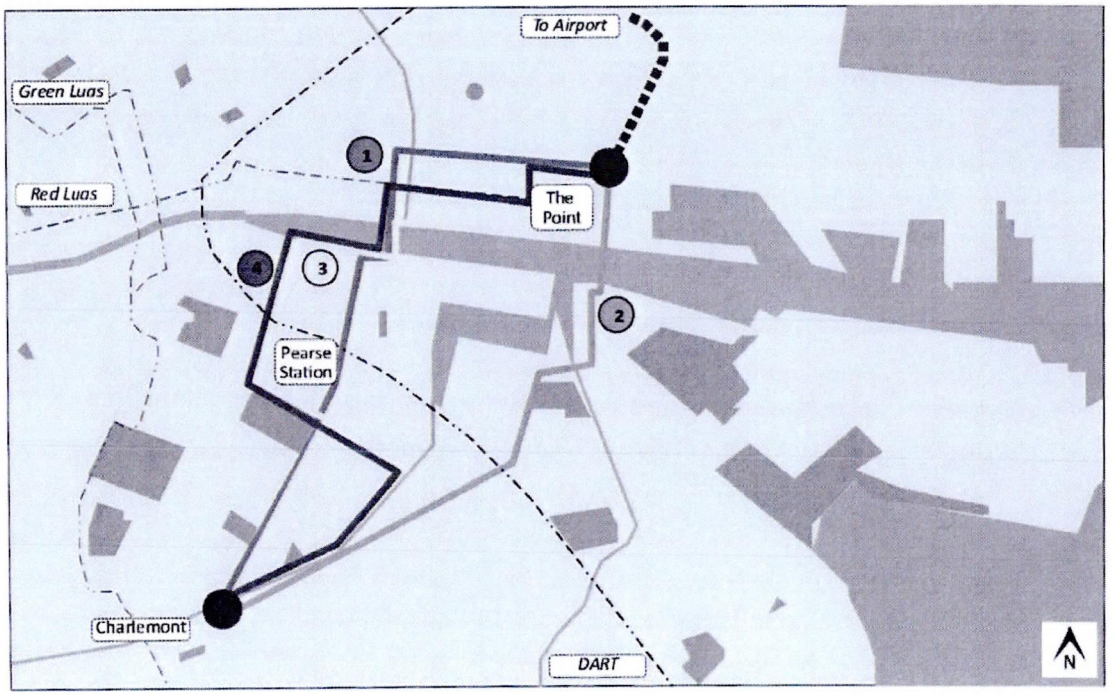
1. From The Point via Beckett Bridge, Lime, Erne, and Holles Streets onto Merrion Square, Fitzwilliam Street, Square and Place to Leeson Street and terminate at Wilton Terrace.

2. From The Point via Tom Clarke Bridge, Thorncastle Street, Ringsend, South Lotts, Haddington, and Mespil Roads to Leeson Street bridge and terminate at Leeson Street Upper.

3. From The Point via Beckett Bridge, Sir John Rogerson's Quay, Lombard Street East, Westland Row, Merrion Street and Square, Fitzwilliam Street, Square and Place onto Leeson Street bridge, and terminate at Wilton Terrace.

4. From The Point via Beckett Bridge, Sir John Rogerson's Quay, Lombard Street East, Westland Row, Merrion Street and Square, Lower Mount Street, Warrington Place, Herbert Place, Wilton Terrace, Cumberland Road, Fitzwilliam Place, Leeson Street, and terminate at Wilton Terrace.

5. A combination of Routes Three and Four, to feature a loop from Merrion Square via Fitzwilliam Street and Place, and to terminate at Wilton Place – with the return journey via Herbert and Warrington Places, onto Lower Mount Street and by Merrion Square.



Above: A variety of route options are available to link the 3 Arena at The Point with Charlemont and the Leeson Street bridge area – each with pros and cons, as discussed in the following pages.

2.1 Route Assessment – Section A: Dublin Airport – 3 Arena / The Point

Route Description

Bus and coach departures and arrivals are conveniently located immediately outside Terminal One and Two. With the current one-way system in situ, this results in buses looping around the gyratory so as to collect or drop-off passengers at the different terminals, typically adding 1.5 kilometres and around 5 minutes on journey times for passengers leaving Terminal 1 destined for the city centre. This arrangement does not seem optimum and probably merits further consideration, but is regarded as beyond the scope of the present exercise. Hence, for purpose of this report, journey times to and from the city centre are measured from Terminal 2, unless otherwise stated.

The 12 kilometre route from Dublin Airport to The Point is predominantly by grade-separated roads, with 4.6 kilometres in the Port Tunnel, and features six traffic lights – three leading to the M1, and three at the East Wall Road. Approaching The Point, a railway level crossing is also present at Alexandra Road, yet is rarely in use – and less so during daytime. Little priority is given to buses over other traffic by way of bus lanes or priority traffic signals.

Journey Times

Route Finder

Despite the absence of priority lanes etc., bus journey times are very quick, typically being 15 minutes. When Google route finder was applied, it is the same amount of time, i.e. 15 minutes, for private cars when gauged at 13.20 on Sunday 13th November 2022. These two journey times are seen to accord, given that buses would have the same priority as cars if travelling at this time.

Bus Timetables

According to current bus timetables for the Bus Éireann 133X, travelling inbound from Dublin Airport to the 3 Arena at The Point takes 13 minutes. The Dublin Express 784 services also typically take 14 – 15 minutes, although this becomes 20 minutes during evening peak hour when going in the prevailing direction of traffic flow. The Aircoach routes 702 and 703 offer another comparison as these are also routed by the Port Tunnel with stops at the 3 Arena / The Point; these take 11 – 13 minutes, depending on the time of day. It is not known why the Aircoach is 7 minutes faster than the Dublin Express, travelling at a comparable time in the same direction; for example, Aircoach 702 leaving 3 Arena at 17.26 arrives at 17.39 at Terminal 2, compared to the Dublin Express 784 service that leaves the 3 Arena at17.33 and arrives at 17.53 at Terminal 2. Nonetheless it seems reasonably clear that a travelling time between the 3 Arena / The Point and Dublin Airport can be done under 15 minutes throughout the day, provided services are routed by the Port Tunnel.

Idealised Journey Times

A number of different speed restrictions en-route, yet as much of the way is 80 kilometres per hour (KPH) with little congestion, swift movement already occurs. On the basis of existing speed limits, an idealised journey time can be calculated. At the airport, the speed limit is 50 kph as far as the Airport Roundabout, from there to the M1 the limit is 60 kph, and from the M1 to the Port Tunnel, the limit is 80 kph, from which the limit is 50 kph to the 3 Arena / The Point. The approximate distances between these points is 0.8 kilometres @ 50 kph, 1.2 kilometres @ 60 kph, 3.5 kilometres

@ 100 kph, 4.6 kilometres @ 80 kph, 1.3 kilometres @ 50 kph. With a total of 11.4 kilometres, this equates approximately to the distance provided by Google route finder, which uses the north east corner of the 3 Arena as a reference point. When the permitted speeds are calculated, this results in 58 seconds, 1 minute 12 seconds, 2 minutes 6 seconds, 3 minutes 27 seconds, 1 minute 34 seconds; a total of 9 minutes 17 seconds for the inbound route. Going in the opposite direction, to Dublin Airport, the idealised journey time is nine seconds longer, arising from the section of 100 kph roadway being 1 kilometre shorter, between the Port Tunnel and M50. This idealised journey time of under 10 minutes from Dublin Airport to The Point can therefore be seen to accord with the 11 minute journey times already provided by Aircoach 702 and 703 services outside of peak hours.

Observation

The assessment of journey times shows that presently 11 minutes is the shortest time, 20 minutes is the longest, while typically most journeys are less than 15 minutes by bus between these two points. Travelling by car also seems to be 15 minutes, as provided by Google route finder – while an idealised journey time has been identified as 10 minutes.

In the Fingal / North Dublin Transport Study, BRT Option 4 identified that the central median along the M1 could be converted into bus lanes, with a grade-separated flyover at the airport junction on the M1; the total cost of which was estimated to be €100 – 130 million based on 2014 prices. The prospect of traffic lights being programmed to give advance priority to approaching buses, combined with QBC provision along the East Wall Road and on the roads linking the airport with the M1, would undoubtedly enhance journey times, reliability of service, and comfort for passengers, as this would result in a swift service with consistent speeds. In such a scenario, the existing 11 minute best journey time could become standard, with even this potentially reduced to 10 minutes, as per the idealised journey time. However, such journey times are based on current vehicles and operations, whereby all passengers are seated on board an executive style coach. In the event of different vehicles being used, such as articulated buses that permit passengers to stand, and are favoured for BRT services, the speed limit must be capped at 65 kph. In that scenario, the idealised journey time would take 1 minute 56 seconds longer for the inbound route, totalling 12 minutes from Dublin Airport to The Point.

2.2 Section B: 3 Arena at The Point – Charlemont / Leeson Street bridge

The second part of the journey is the link between The Point and Leeson Street bridge, which has a number of route options, each with pros and cons. Arising from resource limitations, it has not been possible to exhaust every possibility, but instead focus on 5 of the most obvious potential routes;

From The Point via Beckett Bridge, Lime, Erne, and Holles Streets onto Merrion Square, Fitzwilliam Street, Square and Place onto Leeson Street bridge

From The Point via Tom Clarke Bridge, through a new bus gate onto Thorncastle Street, Ringsend, South Lotts, Haddington, and Mespil Roads and thus onto Leeson Street bridge.

From The Point via Beckett Bridge, Sir John Rogerson's Quay, Cumberland Street, Westland Row, Merrion Street and Square, Fitzwilliam Street, Square and Place onto Leeson Street bridge

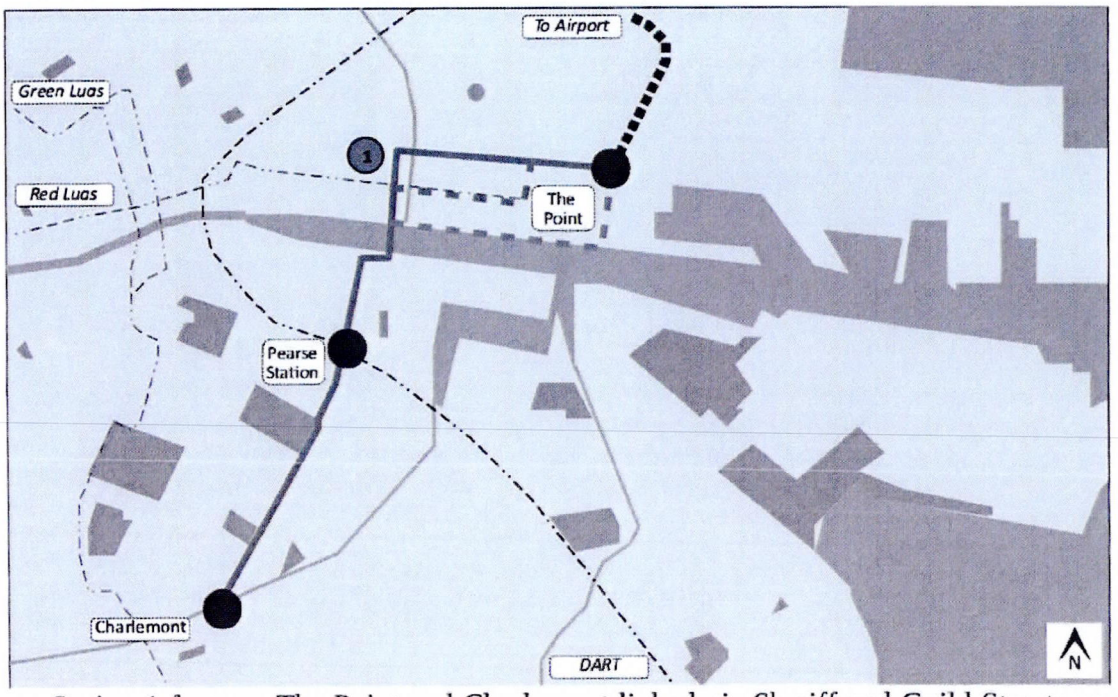
From The Point via Beckett Bridge, Sir John Rogerson's Quay, Lombard Street East, Westland Row, Merrion Street and Square, Upper Mount Street, Warrington Place, Herbert Place, Wilton Terrace, Cumberland Road, Fitzwilliam Place, Leeson Street, and terminate at Wilton Terrace.

A combination of Routes Three and Four, to feature a loop from Merrion Square via Fitzwilliam Street and Place to terminate at Wilton Place – with the return journey via Herbert and Warrington Places, onto Upper Mount Street and by Merrion Square.

Other roads were considered before rationalising the options to the three above, but were discounted for different reasons; for example, Macken Street is parallel to Erne Street, but is often congested; Sandwich Street would result in dog-legged manoeuvres; Brunswick Place is too narrow etc.

Separately as Leeson Street bridge is 400 metres from the entrance to Charlemont Luas Station, it is thought acceptable that the bridge is considered the same destination area as the Luas Station, as the walk from one to the other should be less than 5 minutes. Hence the three aforementioned options are detailed as follows.

2.2.1 Option 1:
3 Arena / The Point – Beckett Bridge – Erne Street – Charlemont / Leeson Street Bridge



Above: Option 1 features The Point and Charlemont linked via Sheriff and Guild Streets as shown by the continuous line, or by Mayor Street or the North Wall Quay, as shown by the broken line. The route crosses Beckett Bridge, before turning from the quays onto an axis with only one bend at the corner of Merrion Square. There would be one intermediate stop at Pearse DART Station.

Route Description

The distance between the 3 Arena and Leeson Street bridge / Charlemont Luas station is 3 kilometres, when routed by the Beckett Bridge onto R813 Sir John Rogersons's Quay, via Lime, Erne, and Holles Street onto Merrion Square, and thus straight by Fitzwilliam Street, Square, and Place to the bridge at Leeson Street, so as to terminate at Wilton Terrace. This route is thought attractive as it is relatively direct, with fewer turns (seven), thus enhancing speed, safety, and passenger comfort.

The most obvious way from the area by the 3 Arena is by the R 801 North Wall Quay to Beckett Bridge; however, there are also two other options available that may merit closer consideration in the event of a bus service being developed; by R 101 Sheriff Street and Guild Street onto the bridge, and by Sheriff Street, Castleforbes Street, and along Mayor Street onto Guild Street and thus onto Beckett Bridge.

These routes are all equidistant from the Port Tunnel to Beckett Bridge, with a 1.25 kilometre distance between the Beckett Bridge and the junction of Sheriff Street and East Wall Road. The North Wall Quay route would result in only two turns between the tunnel and the bridge, and has a bus lane already in place on one side of the road; effectively four traffic lights would be encountered coming from the Sheriff Street / East Wall Road junction and also a roundabout; however this route tends to be the busiest with private traffic. The Sheriff and Guild Street route

would also feature only two turns; however there are no bus lanes, and the route also passes by six traffic lights and over ne Luas level crossing. The third iteration by Mayor Street would result in the most turns, with four in total; however a great benefit of this route is that it is largely free of traffic along Mayor Street, as the road is largely given over for use by the Red Luas line. However development of this as a route for a bus service would require consultation with the tram operator. A final forth scenario could see a combination of these routes, such as North Wall Quay providing one direction, and Sheriff Street providing the other direction. Such approach would possibly have the least amount of impact on the street immediately used, as there would only be need to provide buses with priority in one direction, rather than two-way, which results in more roadway being used. It should also be noted that the junctions at either end of the Beckett Bridge and also at the Guild Street / Sheriff Street junction presently feature traffic restrictions that curtail turns and access; these would need to be amended depending on the route chosen.

At Beckett Bridge, the journey would turn right onto R 813 Sir John Rogerson's Quay before left onto Lime Street, Erne Street and thus Holles Street, where the service would turn left followed by an immediate right on Merrion Square so as to proceed straight up by Fitzwilliam Street, Square, and Place, so as to turn left onto Leeson Street, followed by an immediate left onto Wilton Terrace where the service would terminate. The return journey would leave Wilton Place by turning Cumberland Road, and right onto Fitzwilliam Place, before proceeding back along the same route.

Except for Sir John Rogerson's Quay, and the entrance onto Wilton Terrace, the 2 kilometre route from Beckett Bridge to Wilton Terrace Point is all two-way roads with speed restricted to 50 kph, and features seven traffic light en-route. There is no priority for buses currently in place.

Journey Times

Route Finder

When Google route finder was applied, at 16.44 on Monday, 22nd November 2022, the 1 kilometre journey from 3 Arena to Beckett Bridge was said to take 7 minutes, and 25 minutes for the 2 kilometre journey from Beckett Bridge to the bridge at Leeson Street; a total of 32 minutes at peak hour, with 10 traffic lights encountered, and no priority for the vehicle. As Google route finder for private cars provides only routes that are presently legal, the route was broken up into sections, arising from different traffic restrictions currently in situ, such as the junction at Beckett Bridge onto Sir John Rogerson's Quay where no turns are presently allowed, and hence is not a recommended option in the route finder. **Finding: 32 Minutes.**

Bus Timetables

The Dublin Express 784 passes along part of this route via Fitzwilliam Street and Place, and stops on Merrion Square. However as the service is routed from a preceding stop at Westland Row and terminates on Charlotte Way, it is not possible to accurately gauge likely travel times. Hence no data can provided by this source at this time. **No Data Collected.**

Idealised Journey Times

When this method was applied, when travelling the 3.3 kilometre journey from the junction at Sheriff Street and East Wall Road to Leeson Street bridge without stopping at 50 kilometres per hour, the ideal time would take 3 minutes, 58 seconds. If this service was to operate at 30 kilometres

per hour, which may be thought preferable in urban areas, the travelling time would be 6 minutes 36 seconds. Allowing for one or two bus stops, and also slowing for turns, in a scenario where buses were given priority lanes and traffic lights, it seems plausible that this could take 10 minutes. On this basis, the total journey time between Dublin Airport and Leeson Street bridge / Charlemont Station could be expected to take 21 minutes, as per the Aircoach services that take 11 minutes between the airport and the 3 Arena at The Point. As that time is achieved when traffic is light, it suggests that this would be best assured provided that buses are able to travel unimpeded in the Port Tunnel and on the M1, as per QBC provision referenced by the BRT Option 4 of the Fingal / North Dublin Transport Study. **Finding: 10 Minutes.**

Observations

As already indicated, in the event of a service being desirable along this route, it would be necessary to amend some of the existing junctions on either side of Beckett Bridge, so as to legally allow buses to turn from Beckett Bridge onto John Rogerson's Quay and vice-versa. Depending on the route chosen between East Wall Road and Beckett Bridge, it would also be necessary to amend existing junctions, as no left turn is permitted from North Wall Quay onto Beckett Bridge, or from Sheriff Street onto Guild Street, while separately, no right turn is permitted from Beckett Bridge onto North Wall Quay. In the event of the Mayor Street option being deemed desirable, consultation would be required to ensure agreement with the Luas operator, so as to ensure conflicts do not arise.

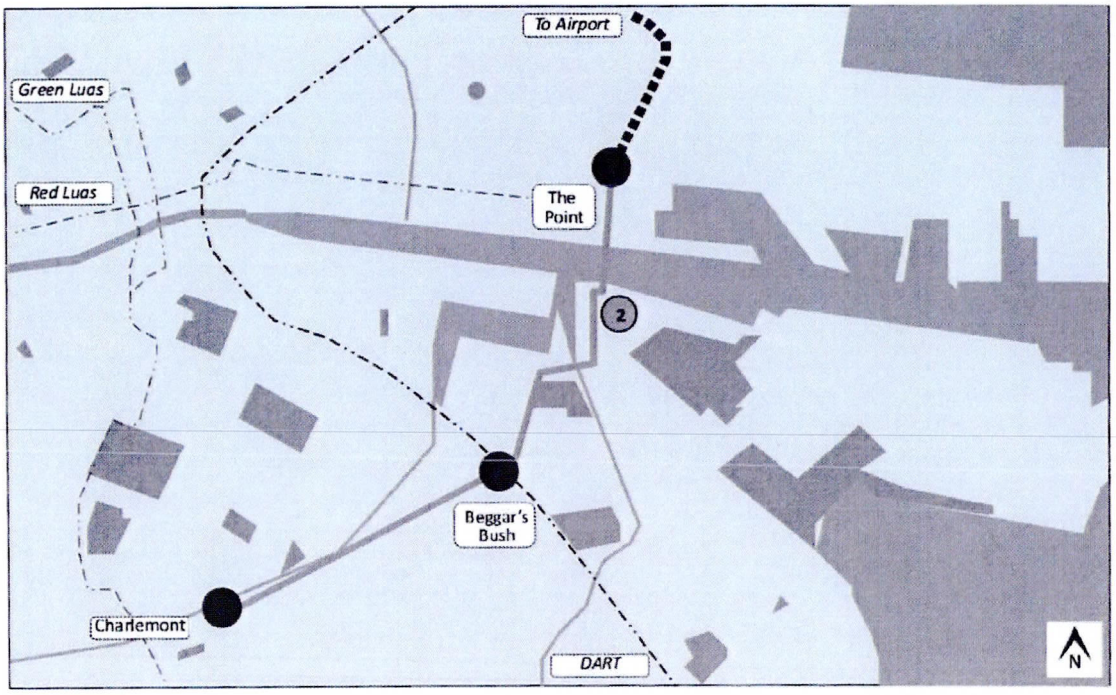
As evident from the time differences on Google Route Finder and the Idealised Journey Time, the prospect of free moving travel is presently impeded by traffic congestion. Hence if it is desired to have a swift and reliable service, it seems logical that consideration should be given to developing a QBC along the route, ideally with traffic lights that would give buses advance priority.

Roadway widths along the route are typically around 9 metres wide, which broaden out to 16.5 metres from Merrion Square along Fitzwilliam Street to Leeson Street. As the Design Manual for Urban Roads and Streets specifies that bus lanes should be 3 – 3.25 metres wide, it seems plausible that roadway with widths of 9 metres could be converted into three lanes, providing for a bus lane in each direction, and a vehicular carriageway in one direction. With Fitzwilliam Street and Place, there would be scope for a bus lane in each direction, and a vehicular carriageway in both directions – or alternatively in one direction with on-street car parking. In the event of the cycle lanes being routed on one side of the road – rather than both sides as at present – more space could be created. Creation of such route with specific bus lanes would help ensure fast services, timetable reliability, and legibility of the service.

However, the major hurdle with this route is the height of the Irish Rail bridge over Erne Street (UBR54), which presently has low clearance of 3.24 metres. This stone arched bridge is one of the world's oldest working railway bridges, and is listed as item 882 on the Record of Protected Structures of Dublin City Council. Effectively another 0.4 metres clearance is needed if buses are to pass underneath, in line with recommended clearance. Hence resolution of this issue may require relatively significant engineering works. The prospect of raising the height of the bridge is not thought desirable, as railway movements requires level ground – and thus, raising the height would also require significant works on the approaches of the railway either side of the bridge for this to be achieved. Moreover such approach would effectively mean removing the arch of the existing

bridge, which should be avoided if possible, given that the bridge is a listed historic structure. Hence the alternative prospect of lowering the roadway by 0.4 metres seems more preferable, as the road could be dipped under the bridge, so as to ensure clearance. However, again there are challenges with this approach; firstly, the foundations of the existing structure must not be undermined – suggesting that the lowered roadway would probably end up being more narrow; secondly, that pipes and utilities in the zone would have to be altered or amended, so that the roadway could be lowered. All these matters would require careful consideration by appropriately qualified professionals if the idea was to be brought forward.

2.2.2 Option 2:
3 Arena / The Point – Tom Clarke Bridge – Ringsend – Haddington Road – Leeson St. Upper.



Above: Option 2 would be the shortest route via Tom Clarke bridge (the former East Link), and has relatively few turns. There would be an intermediate bus stop as shown at Beggar's Bush, 370 metres away from Grand Canal Dock DART Station – while separately, consideration could be given to another bus stop at Ringsend Village, beside the circled motif with number 2.

Route Description

This route differs from all others by going by the Tom Clarke Bridge, formerly the East Link. A great benefit of this way is that it avoids traffic congestion that occurs around the Beckett Bridge. At 3 kilometres distance between the Sheriff Street / East Wall Road junction and Leeson Street bridge, this route would also be 300 metres less than that by Beckett Bridge, Erne, and Fitzwilliam Streets.

On leaving The Point the service would cross the Tom Clarke Bridge, where it would share road space with other users, arising from physical constraints. The service would then proceed from the bridge directly onto Thorncastle Street, where presently only pedestrians and cyclists are currently allowed pass; this would reduce the overall length of journey by circa 1.6 kilometres, than if the service were to follow the R131 Seán Moore Road. In Ringsend the service would turn onto the R802, where it would again share road space with other users so as to cross the bridge over the River Dodder, before turning again onto South Lotts Road, and then proceeding onto the R111 at Haddington Road and Mespil Road, before turning at Leeson Street bridge, so as to terminate at the existing bus stop at Upper Leeson Street, The return journey would turn onto Sussex Road, and thus back onto Mespil Road, so as to return the same way. Coming from the junction of Sheriff Street and East Wall Road, presently there is one roundabout en route, and about seven traffic lights encountered. Little provision is in place in terms of bus lanes or bus priority traffic lights.

Journey Times

Route Finder

Arising out of restrictions currently in place, preventing private cars from passing onto Thorncastle Street from Tom Clarke Bridge, this journey was also broken into two sections. According to the route finder, the Port Tunnel to the Tom Clarke Bridge, the 850 metre distance is estimated to take 1 minute by private car. From Thorncastle Street to Leeson Street bridge, a distance of 2.5 kilometres via South Lotts Road, it is estimated by Google Route Finder that travelling time by car takes 10 minutes. These times were gauged at 17.30, Thursday, 10th November 2022. **Finding: 11 minutes.**

Bus Timetables

Presently there are no known bus services on Mespil, Haddington, and South Lotts Roads, or Thorncastle Street, which would comprise much of the route. Hence no data can provided by this source at this time. **No Data Collected.**

Idealised Journey Times

In a scenario of travelling 50 kilometres per hour without stops, the 3 kilometre distance between the Sheriff Street / East Wall Road junction and Leeson Street bridge should take 3 minutes 36 seconds; at 30 kilometres per hour this would be 6 minutes. Allowing for a stop en-route, and slowing for turns, it seems plausible that the journey could be achieved in 8 minutes. **Finding: 8 minutes.**

Observations

As already indicated, in the event of a service being considered for this route, it seems necessary to amend the area on the south side of Tom Clarke Bridge, so as to legally and physically allow buses turn directly onto Thorncastle Street and vice-versa. Unlike the route by Beckett Bridge and Erne Street, there is not as much traffic congestion along this route, and hence the difference in the journey times by between Google Route Finder and Idealised Journey Times is very little at 3 minutes. As such there may be less need to develop a completely segregated QBC along this route, than that along Fitzwilliam or Erne Streets. Nonetheless, if it is desired to have a swift and reliable service, consideration should be given developing bus lanes and priority signals where appropriate so as to help ensure fast services, timetable reliability, and legibility of the service. A further benefit of this route over other options, is that this route would avoid impact on the 'South Georgian Mile' of Fitzwilliam Street and Place.

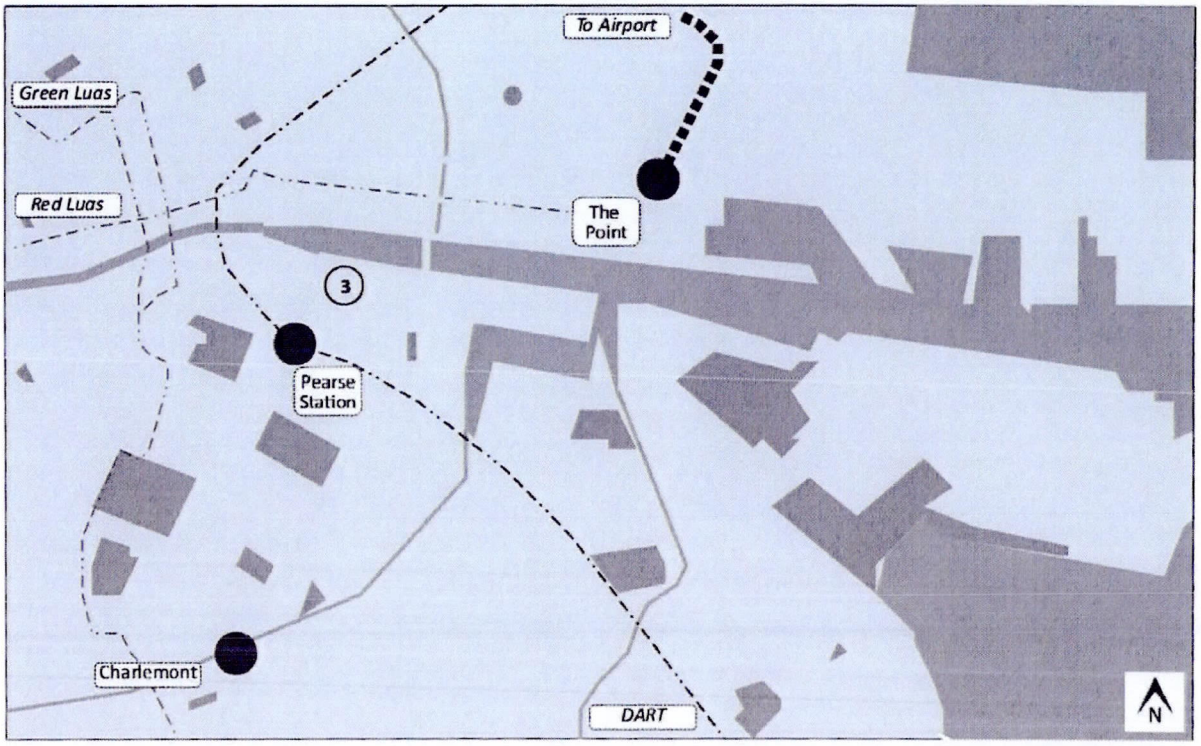
Much of the roadway along this route is 9 metres wide, although this varies with Mespil Road (11 – 13 metres width) and Haddington Road (11 metres width) being wider than South Lotts (typically 9 metres width), or Ringsend Bridge (circa 6 metres width). As already noted, it would be necessary for the service to share the carriageway each way with other vehicles over both Ringsend and Tom Clarke Bridges; however this could probably be mitigated by traffic signals to give buses priority.

However, as with the first option, again there is significant obstacle in the form of a railway bridge with low height clearance spanning South Lotts Road, with a stated height clearance of 3.35 metres.

However, unlike Erne Street, this modern bridge has no curved arch and is 10 centimetres higher, with a stated clearance of 3.35 metres clearance. Guidance for overhead signs directs that stated clearance should be at least 0.075 m less than the measured height, which suggests that the actual clearance is probably at least 3.41 metres. Hence, although the recommended minimum height clearance of new structures over routes featuring single decker buses is 3.65 metres, it seems likely that an articulated bus with a height of 3.13 metres, such as Mercedes Benz Citaro vehicles, should be able to pass underneath, with clearance of circa 0.28 metres. Unlike Erne Street, this bridge is not listed on the Record of Protected Structures, having been significantly altered when the DART service was opened overhead in 1984. However, the clearance of width underneath the bridge is narrower, having a roadway that is circa 6 metres wide, which may pose further management issues. It may be possible to curtail other vehicular traffic from South Lotts bridge by local diversions, so as to minimise disruption to others when going about daily business, and thus have a 'bus gate' at this location. In the event that more clearance is desirable, lowering the road by 0.3 metres would result in a clearance height of 3.65 metres, in line with the minimum recommended clearance heights for single storey buses. In such a scenario, with bus lanes and priority signals, it seems reasonable that journey time could be 19 – 20 minutes from Dublin Airport to Leeson Street bridge, which appears to be equal or superior to the 20 minutes envisaged by the MetroLink proposal.

2.2.3 Option 3:

3 Arena – Beckett Bridge – Sir John Rogerson's Quay – Westland Row – Merrion Street and Square – Fitzwilliam Street – Leeson Street – Wilton Terrace



Above: As with the first route, Option 3 would also be routed by the Beckett Bridge, passing along the North Wall Quay as shown here by the continuous line or by Mayor or Sheriff Streets, as shown by the broken lines. South of the river, the route would pass by the front of Pearse Station, where there would be one intermediate bus stop between The Point and Charlemont.

Route Description

As with Option One, the service would proceed from the junction of Sheriff Street and East Wall Road to the Beckett Bridge, by either the North Wall Quay; Sheriff Street and Guild Street; or by Sheriff Street, Castleforbes Street, Mayor Street, and Guild Street. All routes are equidistant at 1.25 kilometres, but some are more congested than others, and there are also presently legal restrictions in place; please see second and third paragraphs under Route Description of Option One for more.

At Beckett Bridge, the service would turn onto Sir John Rogerson's Quay, as also per Option One; however, rather than turning onto Lime Street, the service would continue west along the Quay, until turning left onto Lombard Street East (R814), where the route would continue straight onto Westland Row, before turning onto Merrion Street East, and then onto Merrion Square, after which it would continue by Fitzwilliam Street, Square and Place, before turning onto Leeson Street, and thus into Wilton Terrace, where the service would terminate. The return journey would be by Cumberland Road and onto Fitzwilliam Place and thus back by the same route.

At 3.85 kilometres in length between Leeson Street bridge and the junction of Sheriff Street and East Wall Road, this route is circa 500 metres longer than by Lime and Erne Streets, and 850 metres more than by Tom Clarke Bridge. This route also encounters more congestion by passing closest to the city's centre, and has the most traffic lights with ten between Beckett Bridge and Wilton Terrace.

Journey Times

Google Route Finder

When measured at 18.30, Thursday, 10th November 2022, this was found to take 6 minutes for the 1.6 kilometres from the Port Tunnel to the Beckett Bridge via North Wall Quay, and 14 minutes for the 2.5 kilometres from Beckett Bridge to Leeson Street bridge via Westland Row. **Finding: 20 minutes.**

Bus Timetables

Presently there are no known bus services travelling much of the route. Hence no data can provided by this source at this time. **No Data Collected.**

Idealised Journey Times

In a scenario of travelling 50 kilometres per hour without stops, the 3.85 kilometre distance between the Sheriff Street / East Wall Road junction and Leeson Street bridge should take 4 minutes 37 seconds; at 30 kilometres per hour this would be 7 minutes 42 seconds. Allowing for a stop en-route, and slowing for turns, it seems plausible that the journey could be achieved in 11 minutes. **Finding: 11 minutes.**

Observation

As with Option One, the time difference between Google Route Finder and the Idealised Journey Time is more significant than Option Two, thus illustrating the delays caused by traffic congestion. Hence if this route was selected, it would be essential that a QBC would be developed so as to ensure a swift and reliable service. Although all the roadways are at least 9 metres wide, this route would probably cause the most amount of disruption to other road users, as it is the most congested.

Westland Row would pose an obvious challenge, as the heavily trafficked road can only accommodate three lanes, with one northbound already allocated as a bus lane. Hence there would be have to be a choice made between having a QBC in both directions, or leaving as is, with the westbound carriageway carrying both buses and private traffic. Installation of priority traffic lights for buses in the approaches may help alleviate the problem, if the latter choice as chosen.

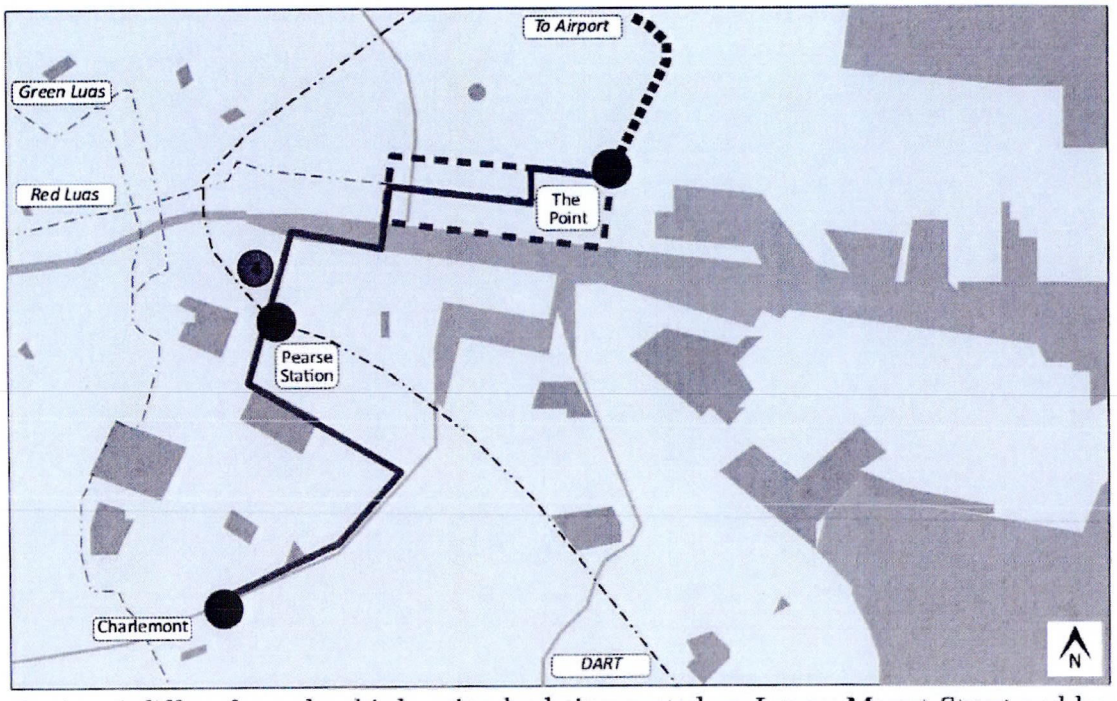
In total, it seems plausible that a 22 minute journey time could be achieved between Dublin Airport and Leeson Street bridge, provided that the Idealised Journey Time be achieved. Yet given the levels of congestion, this prospect does not seem as reliable as times by the first two options.

There are however two major benefits to this route. Firstly, the railway bridge over Westland Row has sufficient clearance to allow regular services by double-deckers – and thus would not need to be altered, allowing a service to be developed without major engineering works or other delays.

Secondly, this route would also be most convenient for passengers wishing to connect to the DART or other railway services, as the bus route would pass the front door of Pearse Station. In contrast, the distance from Erne Street to the side entrance of the station is circa 170 metres, while the route by South Lotts Road would be about 300 metres to the entrance of Grand Canal Dock Station.

2.2.4 Option 4:

3 Arena – Beckett Bridge – Sir John Rogerson's Quay – Westland Row – Merrion Street and Square – Lower Mount Street – Warrington and Herbert Places – Wilton Terrace



Above: Option 4 differs from the third option by being routed on Lower Mount Street and by the Grand Canal instead of along Fitzwilliam Street and Place. As shown by the continuous line, the route could pass along Mayor Street, or else along Sheriff Street or the North Wall Quay.

Route Description

The fourth route is similar to the third option, and would be the longest of all, being circa 4.3 kilometres from the junction of Sheriff Street and East Wall Road to the terminus on Wilton Terrace, and featuring about 16 traffic signals, and 8 turns en route (as per the third route).

Although not as immediately obvious or attractive as shorter options, this route has a number of advantages;

- Firstly, there would be no height clearance issues;
- Secondly, much of the way already has some form of bus lane provision, i.e. Merrion Square, Lower Mount Street;
- Thirdly, all other options would involve redesignation of road space along major orbital routes, which this would largely avoid;
- Fourthly, this route would avoid impact on the 'South Georgian Mile'.

As such this route would probably have less impact on existing arrangements and environment than other options.

As with Routes One and Three, this service would proceed from the junction of Sheriff Street and East Wall Road to the Beckett Bridge, by either the North Wall Quay; Sheriff Street and Guild

Street; or by Sheriff Street, Castleforbes Street, Mayor Street, and Guild Street. All routes are equidistant at 1.25 kilometres, but some are more congested than others, and there are also presently legal restrictions in place; please see second and third paragraphs under Route Description of Option One for more.

As per Option One, at Beckett Bridge, the service would turn onto Sir John Rogerson's Quay, and continue west until turning left onto Lombard Street East (R814), where the route would continue straight onto Westland Row, before turning onto Merrion Street East, and then onto Merrion Square; after which it would continue by Lower Mount Street before turning onto Warrington Place and straight on by Herbert Place onto Wilton Terrace, before turning onto Cumberland Road, and then onto Fitzwilliam Place, again onto Leeson Street, to thus terminate at Wilton Place. The return journey would proceed straight back by Herbert and Warrington Places etc., along the same route.

Journey Times

Google Route Finder
When measured at 17.30 on Monday November 21st, the route from Beckett Bridge to Wilton Place was found to take 14 minutes, with 8 minutes indicated when without traffic; the route to Beckett Bridge from Sheriff Street / East Wall Road junction was found to take 5 minutes at this time, and shown to be 3 minutes without traffic. Hence the total travelling was found to be 19 minutes, although this could be 11 minutes at quieter times. **Finding: 19 Minutes.**

Bus Timetables
Although sections of the route feature bus lanes, there is no service over substantial parts, such as Sir John Rogerson's Quay, Warrington and Herbert Places. **No Data Collected.**

Idealised Journey Time
In a scenario of travelling 50 kilometres per hour without stops, the 4.3 kilometre distance between the Sheriff Street / East Wall Road junction and Leeson Street bridge should take 5 minutes 10 seconds; at 30 kilometres per hour this would be 8 minutes 36 seconds. Allowing for a stop en-route, and slowing for turns, it seems plausible that the journey could be achieved in 12 minutes. **Finding 12 minutes.**

Observation

As outlined by the Route Description, this route has numerous merits; no height clearance issues requiring resolution; lesser impact on arterial routes; and no impact on the 'South Georgian Mile'.

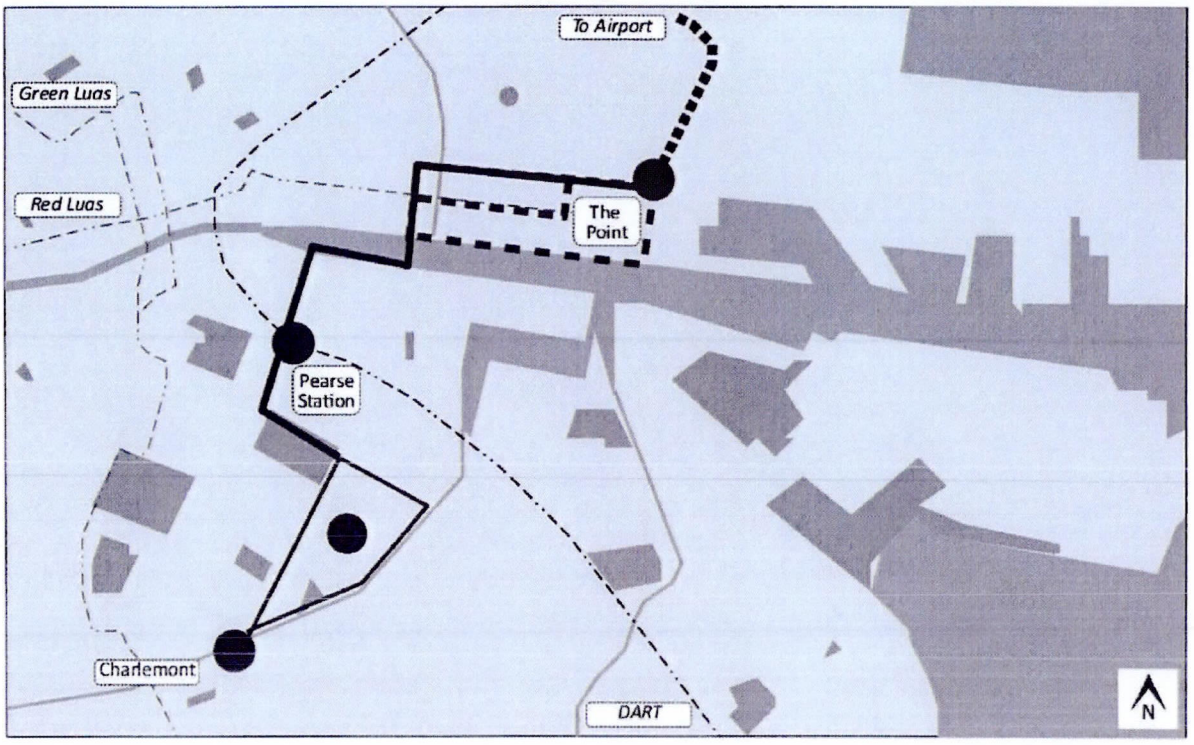
Unlike other options, this route would use the R118 Lower Mount Street, as well as Warrington and Herbert Places. The roadway along Lower Mount Street is typically 13 metres wide, and features a bus lane part of the way in each direction as well as on-street car parking for about 22 vehicles, two loading bays, and a City Bikes station. A reconfigured spatial allocation could provide a bus lane in each direction, and a vehicular carriageway in each direction – or a one-way with on-street parking.

Warrington and Herbert Place, and Wilton Terrace all form part of the Grand Canal cycleway, and consequently the formerly wide roadway was reconfigured to provide a high quality two-way

cycleway beside a 9 metre wide vehicular carriageway which has each-way traffic and car parking. In the event of a this way having a BRT service, it would be necessary to reduce other road traffic as much as possible. The most obvious approach would be to develop two-way bus lanes, with one way for vehicular traffic so as to permit access, etc. However, removing car parking in this instance is not thought desirable, given the needs of the adjacent residential population. Hence, consideration could be given to a configuration of a bus lane in one direction, a shared carriageway in the other direction, with on-street car parking retained – and access for private traffic limited by restrictions on junctions combined with an approach of traffic cells.

2.2.5 Option 5:

A combination of Routes Three and Four, to feature a loop from Merrion Square via Fitzwilliam Street and Place to terminate at Wilton Place – with the return journey via Herbert and Warrington Places, onto Upper Mount Street and by Merrion Square.



Above: Option 5 is a combination of routes three and four, with the service looped from Merrion Square via Fitzwilliam Street in one direction, and Lower Mount Street in the other way.

Route Description

As with Option Three, the service would proceed from the junction of Sheriff Street and East Wall Road to the Beckett Bridge, by either the North Wall Quay; Sheriff Street and Guild Street; or by Sheriff Street, Castleforbes Street, Mayor Street, and Guild Street. All routes are equidistant at 1.25 kilometres, but some are more congested than others, and there are also presently legal restrictions in place; please see second and third paragraphs under Route Description of Option One for more.

At Beckett Bridge, the service would turn onto Sir John Rogerson's Quay, as also per Option One; however, rather than turning onto Lime Street, the service would continue west along the Quay, until turning left onto Lombard Street East (R814), where the route would continue straight onto Westland Row, before turning onto Merrion Street East, and then onto Merrion Square, after which it would continue by Fitzwilliam Street, Square and Place, before turning onto Leeson Street, and thus into Wilton Terrace, where the service would terminate. The return journey would be by Wilton Terrace, Herbert and Warrington Places, Lower Mount Street onto Merrion Square, and thus back by the same route.

Journey Times

Google Route Finder

As this is an amalgamation of two route options already outlined, it is possible to appropriate those travel times already identified. Hence it is thought that 19 – 20 minutes travel time from The Point is possible, provided that buses are given priority by way of dedicated lanes and traffic signals. **Finding 20 minutes.**

Bus Timetables

Although sections of the route feature bus lanes, there is no service over substantial parts, such as Sir John Rogerson's Quay, Warrington and Herbert Places. **No Data Collected.**

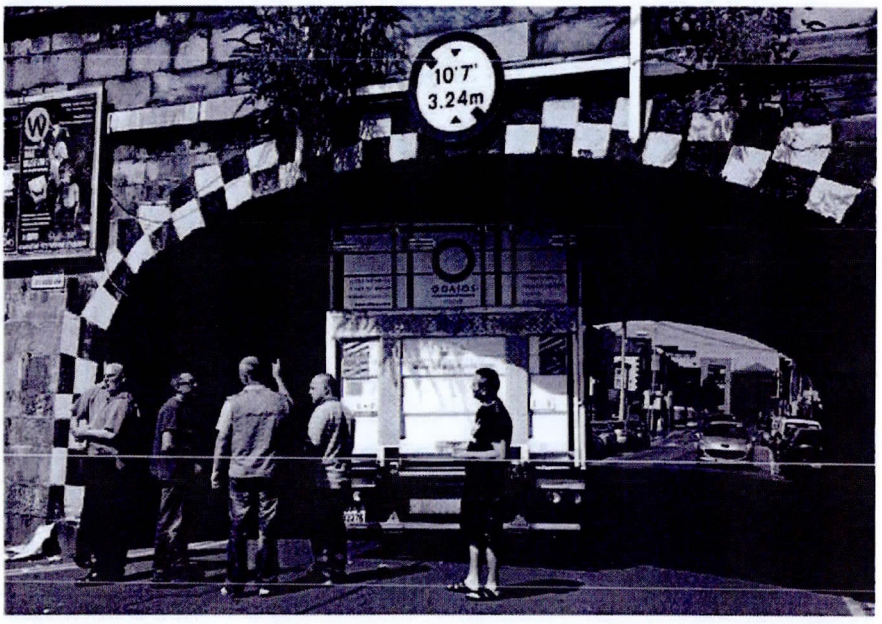
Idealised Journey Time

In a scenario of travelling 50 kilometres per hour without stops, the 4.3 kilometre distance between the Sheriff Street / East Wall Road junction and Leeson Street bridge should take 5 minutes 10 seconds; at 30 kilometres per hour this would be 8 minutes 36 seconds. Allowing for a stop en-route, and slowing for turns, it seems plausible that the journey could be achieved in 12 minutes. **Finding 12 minutes.**

Observations

Ostensibly the fifth option shares the major benefit of the third and fourth options, in that no resolution is required of any overhead bridges. In addition, as there would only be the need for one bus lane in one direction on the streets between Merrion Square and the terminus at Wilton Terrace, the impact would be less in the immediate environs than a bus lane in both directions. For example, the bus lanes along Lower Mount Street could be consolidated into one bus lane in the direction required – while Fitzwilliam Street would also be left with more space so as to allow on-street car parking and two-way traffic. However this approach would nonetheless impact on more roads than the other approaches, and result in a less obvious system with less legibility for users.

3.0 Appraisal



Right: The low clearance height and arched nature of Irish Rail bridges poses a challenge, and restricts the vehicle type usable, as seen here where a truck became stuck at Erne Street, which has a stated clearance of 3.24 metres. Photograph courtesy of Independent. ie.

Each of the five options have merits. The first option, from Port Tunnel via Beckett Bridge, Erne, Holles, and Fitzwilliam Streets, has very few turns en-route and could serve Pearse Station with a stop on Erne Street. However the low height clearance caused by the overhead bridge on Erne Street would require resolution. This route would also impact on the city council's inner orbital route for private traffic, along Fitzwilliam Street and Place, where choices would have to be made between permitting two-way traffic or on-street car parking. It is thought that journey time between Dublin Airport and Charlemont by this route, with intermediate stops at The Point and by Pearse Station would be about 22 – 25 minutes, with another five minutes walk to be at the Luas platform, resulting in 27 – 30 minutes overall.

Above: The bridge over South Lotts Road is also low, with stated height clearance of 3.35 metres

The second option provides the shortest and seemingly quickest route by Ringsend, but again the low height clearance over South Lotts Road would require resolution. Unlike Erne Street, this modern bridge has no curved arch and is 10 centimetres higher, with a stated clearance of 3.35 metres clearance. Guidance for overhead signs directs that stated clearance should be at least 0.075 m less than the measured height, which suggests that the actual clearance is probably at least 3.41 metres. Hence, although the recommended minimum height clearance of new structures over routes featuring single decker buses is 3.65 metres, it seems likely that an articulated bus with a height of 3.13 metres, such as Mercedes Benz Citaro vehicles, should be able to pass underneath, with clearance of circa 0.28 metres. Enquiries to the management of the Dublin Bus Donnybrook Garage have found that it would not be their immediate preference to route buses under a bridge with such low clearance, although 'other operators might'. In the event of it not being possible to route a bus this way because of the limited height, an alternative way forward could be to dip the road under the bridge by 0.3 metres, which would bring the clearance height to 3.65 metres, in line with recommended clearance heights for such vehicles. This route would also impact on the city council's outer orbital route along Haddington and Mespil Roads, and choices would have to be made as to road space allocation. In the event of bus lanes in each direction, it seems likely that either all on-street car parking would have to be removed, or else that the road becomes a one-way. Elsewhere, there would be a need for the service to share road space with other vehicles where space is constrained, such as crossing both the Ringsend and Tom Clarke Bridges – although this could possibly be mitigated with the assistance of advance signals to give buses advance priority. Although this route would not be as convenient to the central south city core by Merrion Square, it would nonetheless be useful for serving the 'Google Quarter' by Barrow Street, where there is also an Irish Rail DART station. With intermediate bus stops at The Point and on South Lotts Road, it is thought that journey time between Dublin Airport to Leeson Street Upper using this route would be in the region of 20 minutes, which would result in 25 minutes platform to platform service, when the short walk is included to the Charlemont Luas Station.

The third option is longer than the first two routes, being routed via Westland Row, but requires no engineering works to resolve height clearance issues, and could stop outside the front door of the Pearse Irish Rail / DART Station. However, as with the first option, this would also have significant impact on Fitzwilliam Street and Place where it would be necessary to make potentially challenging choices as to road space allocation. Westland Row is also constrained, with three lanes present, and hence also poses challenges. Nonetheless, the obvious benefit of this route is that it could be developed with little delay. With intermediate bus stops at The Point and at Pearse Station, it is thought that journey time between Dublin Airport to Leeson Street Upper by this route, would be about 23 – 24 minutes, with another 5 minutes walk onto the platform at Charlemont Luas Station, resulting in 28 – 29 minutes from platform to platform.

The fourth option is longest of all routes, being routed by Westland Row and Lower Mount Street, and also has the challenges of the spatial constraints of Westland Row as per the third option. Yet unlike other options, this route would have less impact on the city council's orbital routes, by avoiding both Fitzwilliam Street and Mespil Road. As described under this option's observation, the prospect of reallocation of road space along Lower Mount Street and reorganisation of priorities along Warrington and Herbert Places is thought feasible, provided it is done in a considered manner. With intermediate bus stops at The Point and at Pearse Station, it is thought that journey time

between Dublin Airport to Wilton Place by this route, would be in the region of 25 minutes, which would result in about 30 minutes travel from the platform at Terminal 2 to the Luas platform.

The fifth option proposed the same route as the third and fourth options, with a loop from Merrion Square by Fitzwilliam Street in one direction – with Wilton Terrace, Herbert and Warrington Place, and Lower Mount Street providing the other direction. As with the third and fourth options, there are no height clearance issues requiring resolution. This was considered very attractive in terms of minimising impact on immediate street environment, but results in a larger impact overall with less legibility of the new service. Consequently, this option is less preferred than the fourth option. With intermediate bus stops at The Point and at Pearse Station, it is thought that journey time between Dublin Airport to Wilton Place by this route, would again be about 25 minutes, which would result in about 30 minutes travel from the platform at Terminal 2 to the Luas platform.

On consideration of the various options, there is good reason for a strong preference of the second option – via Tom Clarke Bridge, Ringsend, South Lotts, Haddington and Mespil Roads – as this is the shortest route, and has repeatedly been found to have the lowest levels of traffic congestion at all times of day and night. As this would likely provide the fastest route between the two end points, with a reliable timetable, this option is considered most preferable.

The first option of the route via Beckett Bridge, Erne, Holles, and Fitzwilliam Streets to Wilton Place is also appealing, as it would feature few turns and is the second shortest option. However this would be more likely to require engineering to resolve height clearance issues. Consequently, that in the event of the routes by Erne or South Lotts proving problematic, it is though that a route via Westland Row may be desirable until progress is possible on either of the first two options.

When the last three options were considered, with each routed by Westland Row, the fourth option was thought best, featuring a route via Beckett Bridge, Westland Row, Lower Mount Street, Warrington and Herbert Places to Wilton Terrace, as it appears to have least potential impact on existing arrangements and environment, while being likely to provide good journey times, reliability of service, and legibility. The fifth option of the looped route was considered also to be good, as was the third which would feature two-way bus lanes along Fitzwilliam Street as per the first option – yet neither seem as good as the aforementioned fourth option.

Consequently, although the routes via South Lotts Road or Erne Street appear preferable, there would need to be clarity on the prospect of routing buses underneath bridges with low clearance, or else resolution by way of engineering works so as to ensure free passage. In the event that neither of these routes is immediately feasible, the fourth option emerges as the most preferable – featuring the route via Beckett Bridge, Westland Row, and Lower Mount Street – followed by the third and fifth options.

4.0 Conclusion

In the course of this study it has become clear that there are a number of different route options to link Leeson street bridge with Dublin Airport via the Port Tunnel, which would result in a quality public transport rapid transit route.

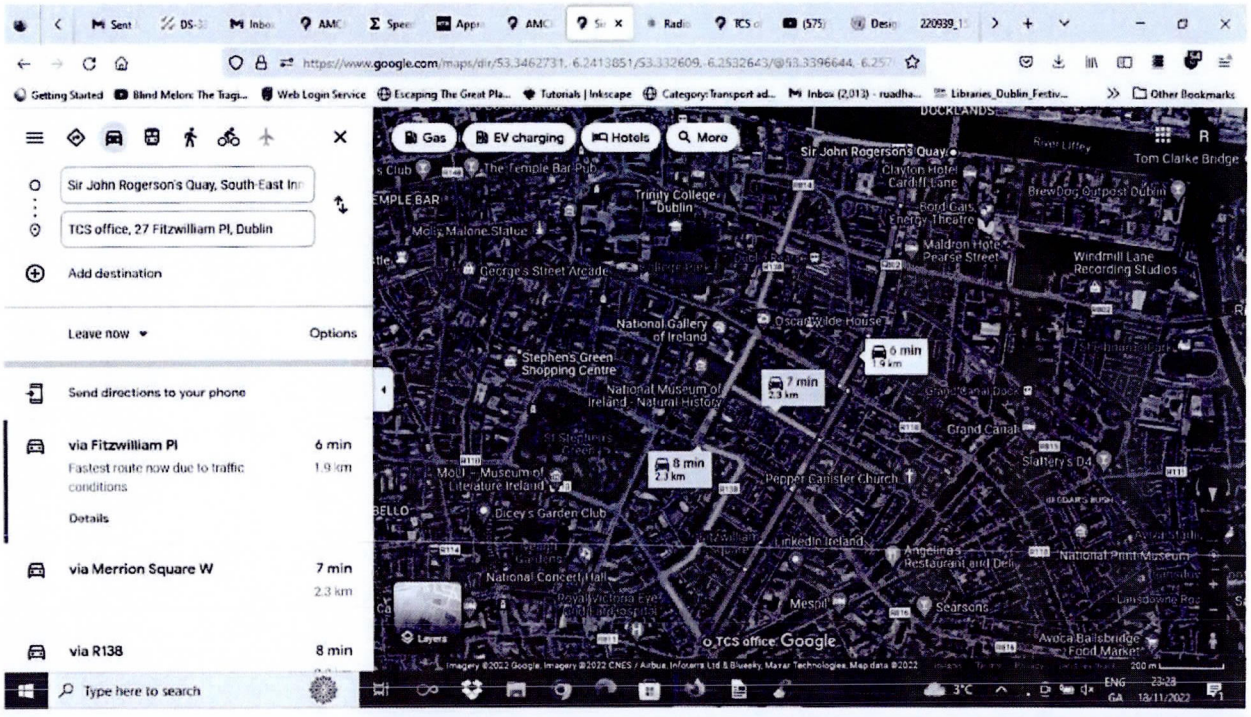
Five prospective options have been looked at, each with its own pros and cons. On balance, it is thought that Route Option 2, by the Tom Clarke Bridge, would be most effective, as this is the shortest route with least traffic, and thus offers the most obvious way forward. As this has least traffic congestion, in the event of a QBC being developed along this route, it may not be necessary to have fully segregated bus lanes in each direction that would be needed on more congested roads. As already noted, there is however an issue regarding height clearance at South Lotts Road, where the stated clearance height is 3.35 metres, and although single decker buses are 3.13 metres, 3.65 is the minimum recommended clearance. Hence this appears to be sufficient although not ideal; in the event of the 3.65 metres being required, lowering the road by 0.3 metres would resolve this matter.

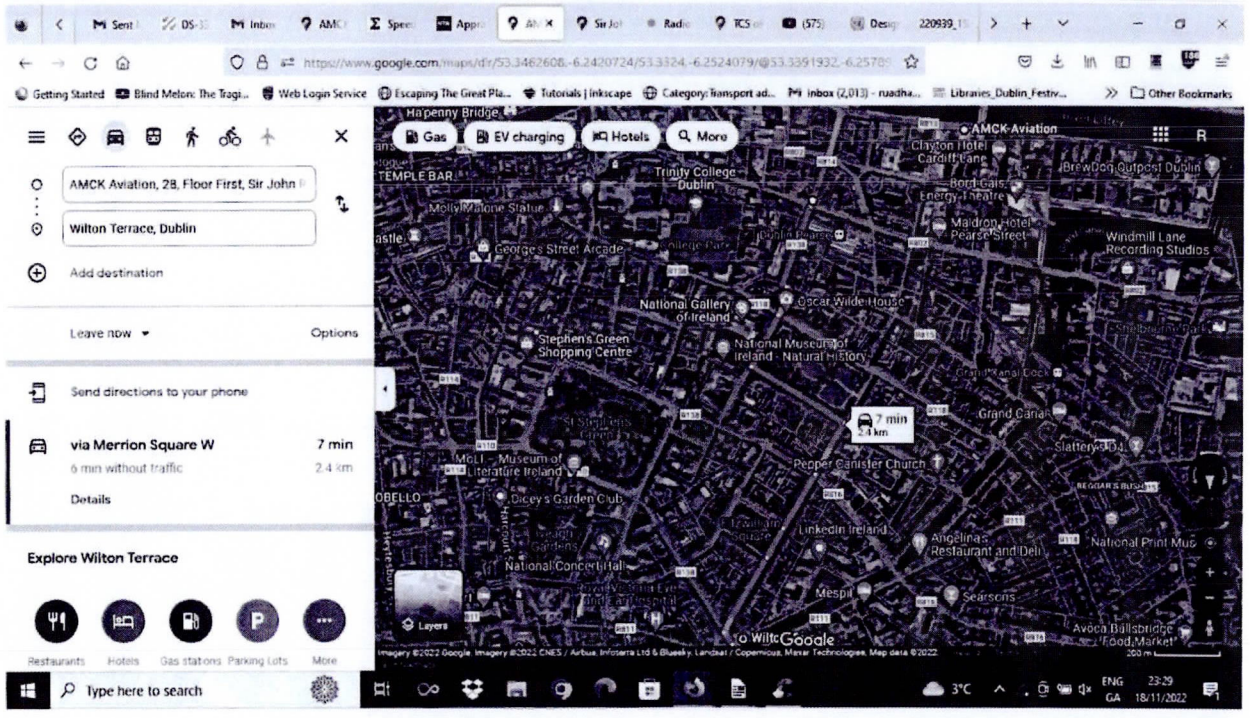
In a scenario of a BRT service by Tom Clarke bridge, it is thought plausible that the potential journey time for services from Dublin Airport to Leeson Street bridge could be as little as 17 minutes, based on data from Google Route Finder. However, allowing for two or three intermediate bus stops at The Point, Beggar's Bush and possibly Ringsend, and also the 65 kph speed limit on articulated buses, it seems plausible to anticipate a journey time of 22 minutes each way, between Dublin Airport and Leeson Street bridge. If this service was to have a two minute service frequency, with buses that have a 150 passenger capacity, the system could deliver 4,500 passengers per direction per hour. If desirable, during peak hours, capacity could be raised to 9,000 passengers per direction per hour, based on a frequency of one bus every minute.

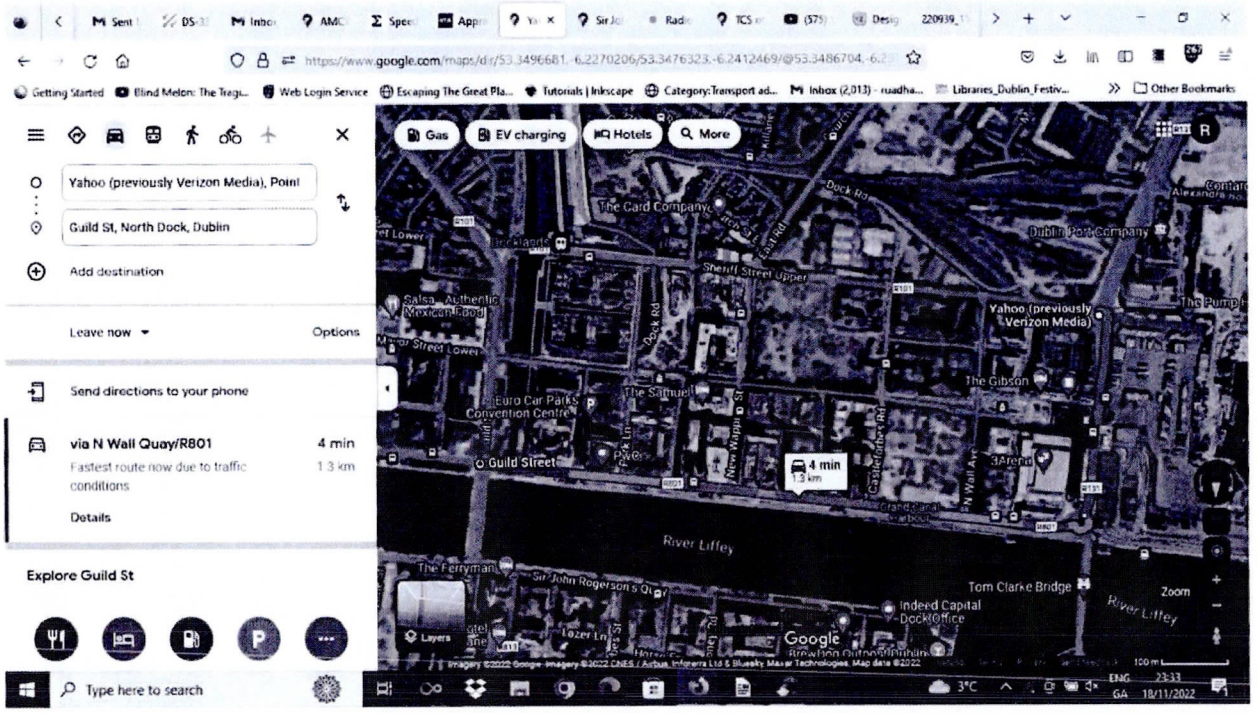
In the event of the route by South Lotts requiring engineering works, it is recommended that a route by Westland Row could be used as an interim measure. As this is routed through a more congested part of the city, there would likely be a greater need for bus lanes in each direction, than by Route 2. As discussed already, three different route options are apparent this way, with the emerging preference being for the fourth option of a two-way route via Lower Mount Street. Again this would have the same capacity as other route options, of 4,500 – 9,000 passengers per direction per hour. However by virtue of this being a longer route, this option would likely result in longer journey times, of about 25 – 26 minutes from Dublin Airport to Leeson Street bridge, when the 65 kph speed limit and intermediate bus stops are included.

Ultimately, it is thought that a BRT service from Leeson Street bridge to Dublin Airport could deliver travel times of 22 – 26 minutes depending on the route chosen. This is considered to be very favourable when compared to the 20 minute travel time envisaged by the MetroLink project.

5.0 Appendices – Screen captures indicating travel times according to Google Route Finder



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Fastest route now due to traffic conditions
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Gas
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Dublin Port Company
Sheriff Street Upper
Salsa - Authentic Mexican Food
Yahoo (previously Verizon Media)
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3Arena
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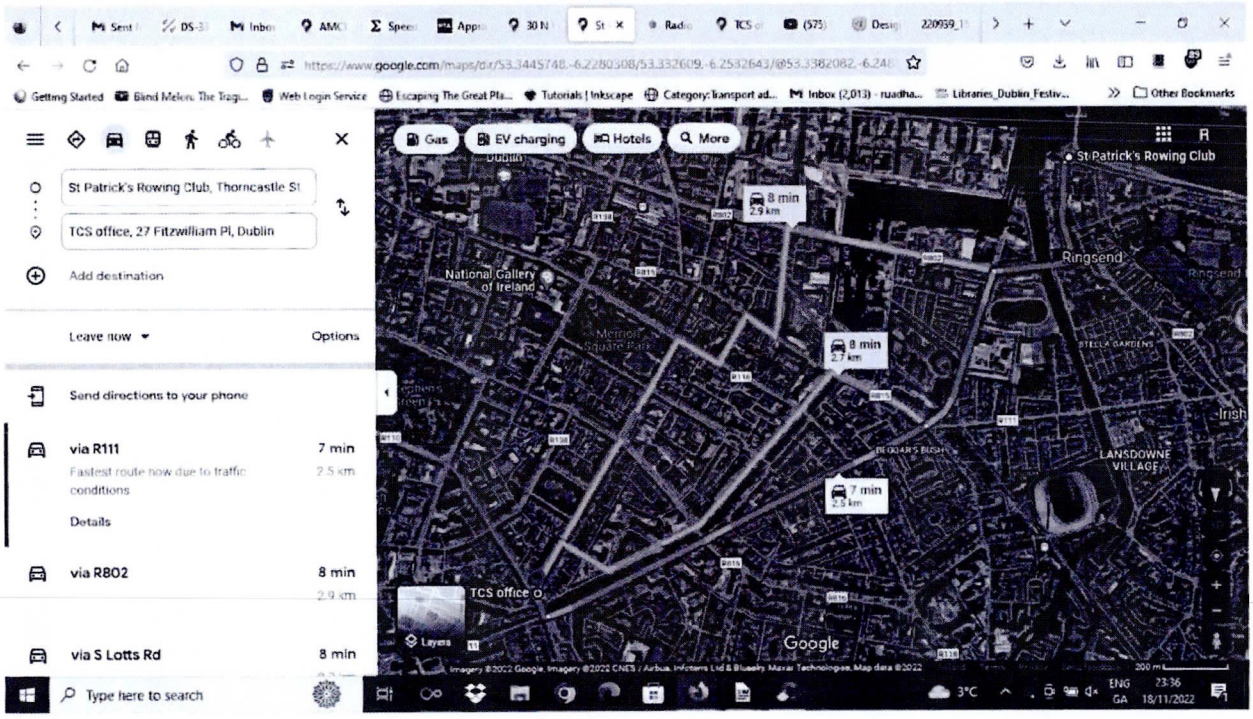
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National Gallery of Ireland
Merrion Square Park
Ringsend
LANSDOWNE VILLAGE
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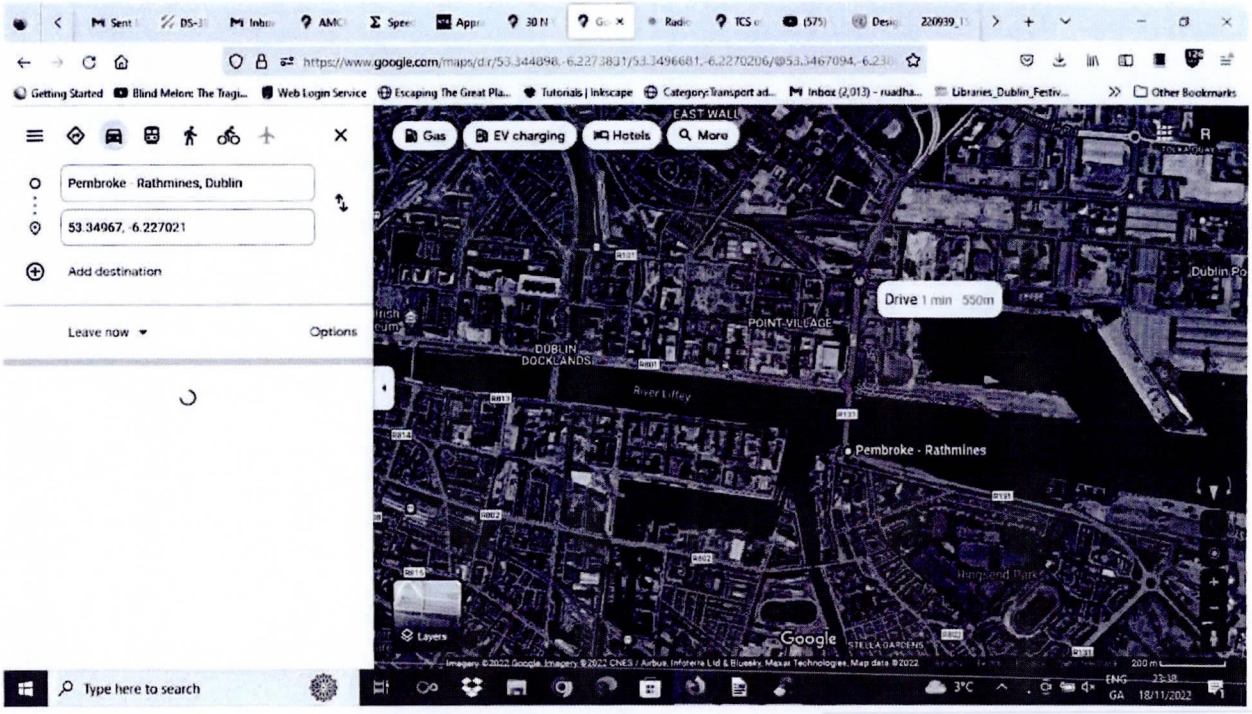
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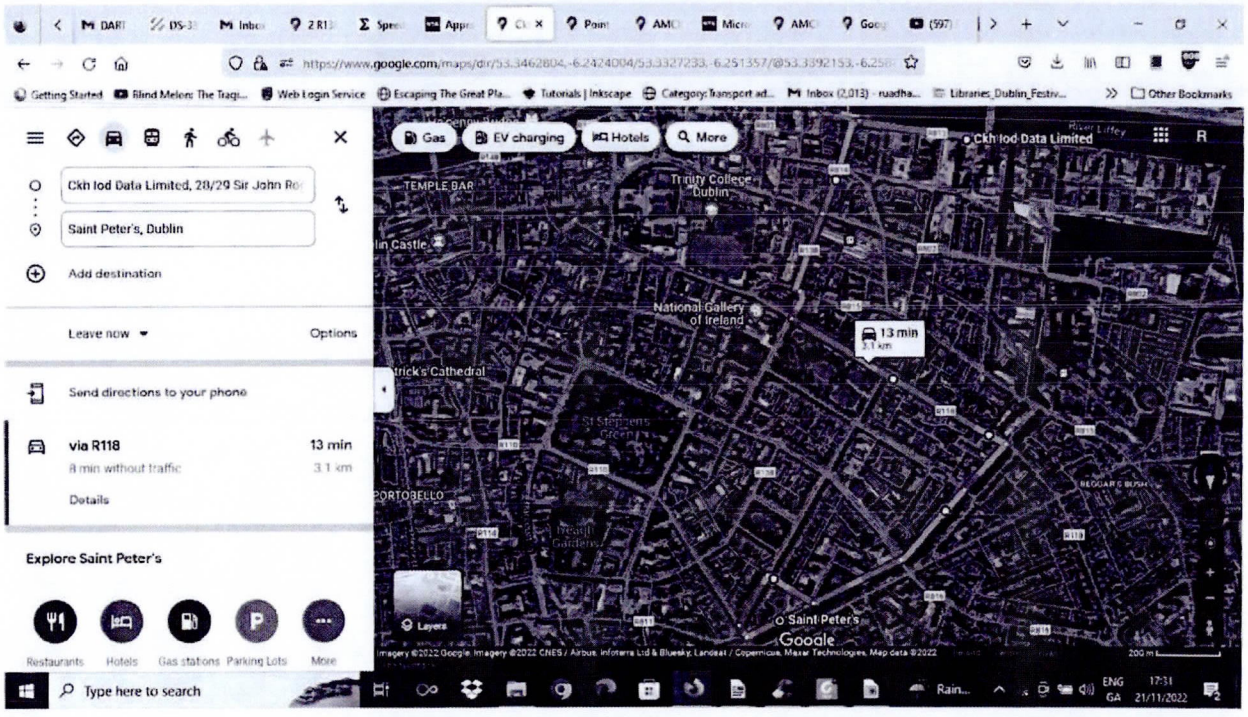
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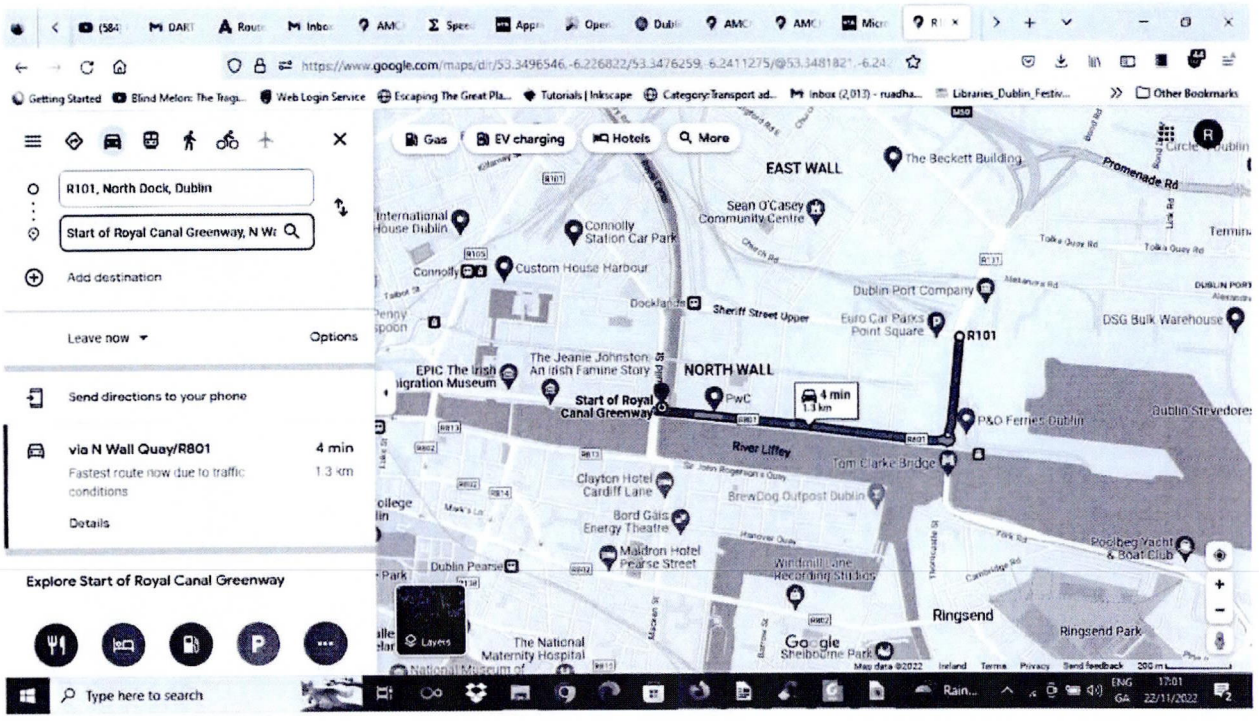
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NORTH WALL
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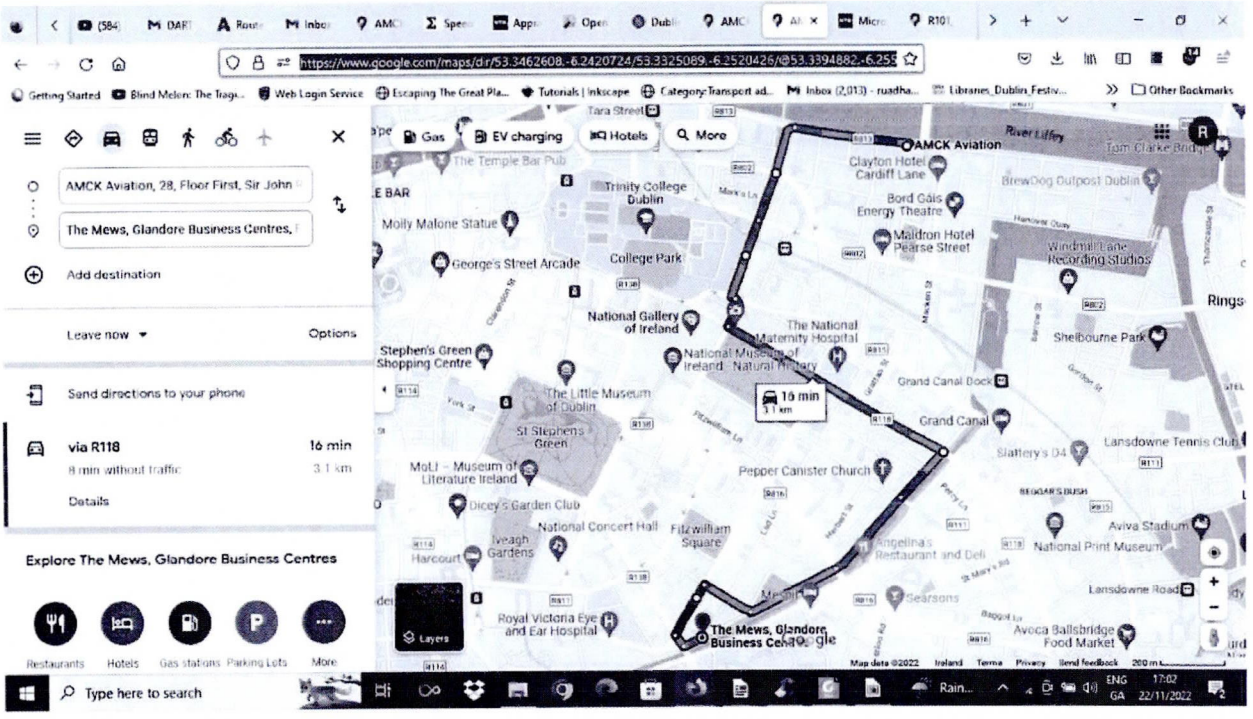
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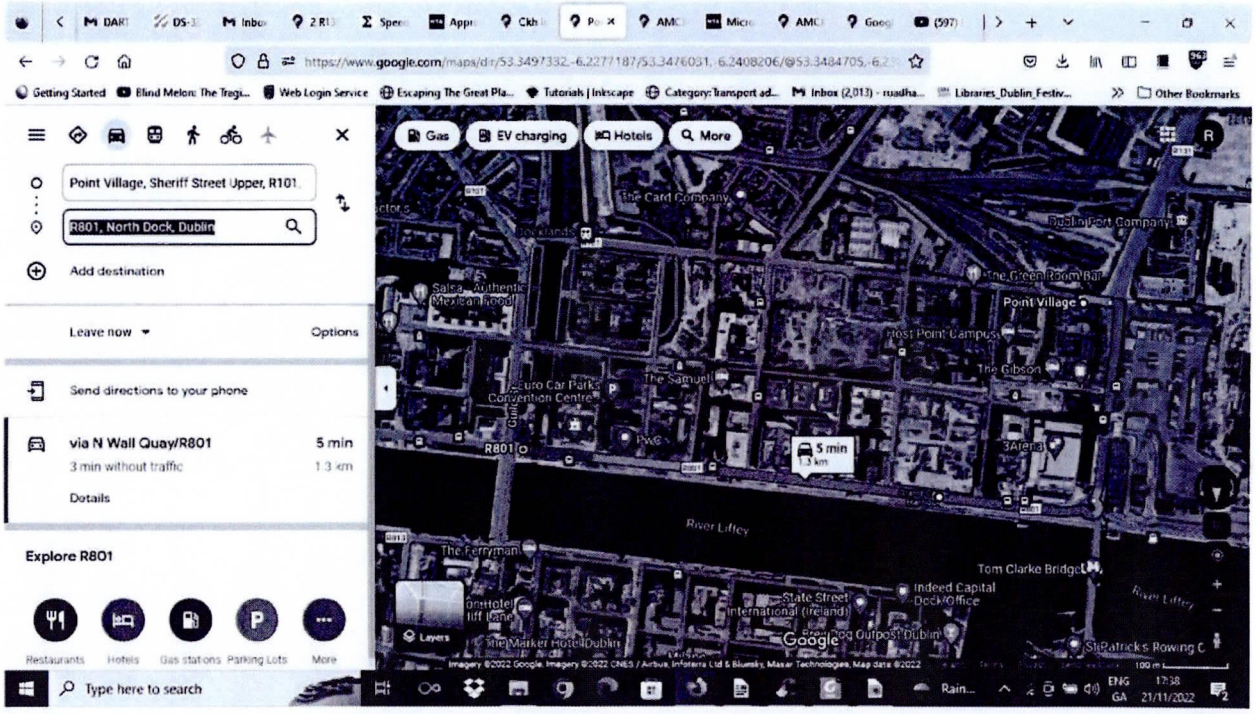
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The Card Company
Dublinport Company
The Green Room Bar
Point Village
Salsa - Authentic Mexican Food
Euro Car Parks Convention Centre
The Samuel
The Gibson
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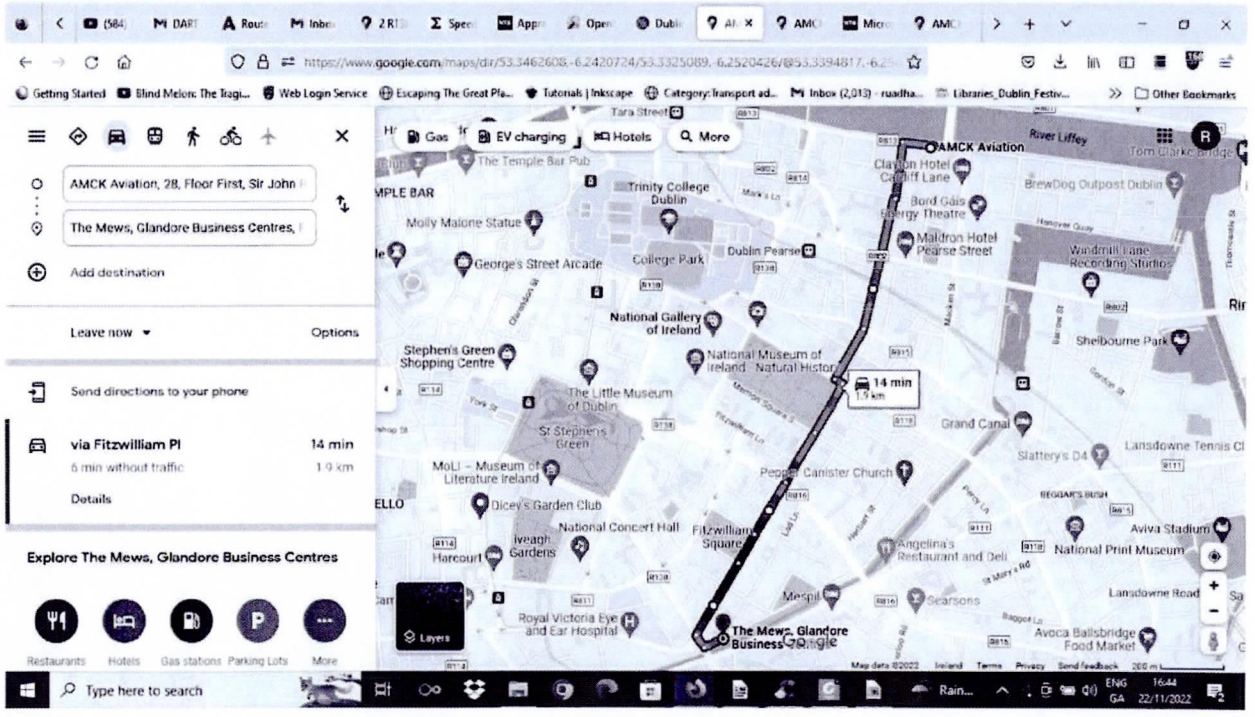
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Parking Lots
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AMCK Aviation
The Temple Bar Pub
Trinity College Dublin
Molly Malone Statue
George's Street Arcade
College Park
Dublin Pearse
National Gallery of Ireland
National Museum of Ireland - Natural History
Stephen's Green Shopping Centre
The Little Museum of Dublin
St Stephen's Green
MoLI - Museum of Literature Ireland
Dicey's Garden Club
National Concert Hall
Iveagh Gardens
Harcourt
Fitzwilliam Square
Royal Victoria Eye and Ear Hospital
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Grand Canal
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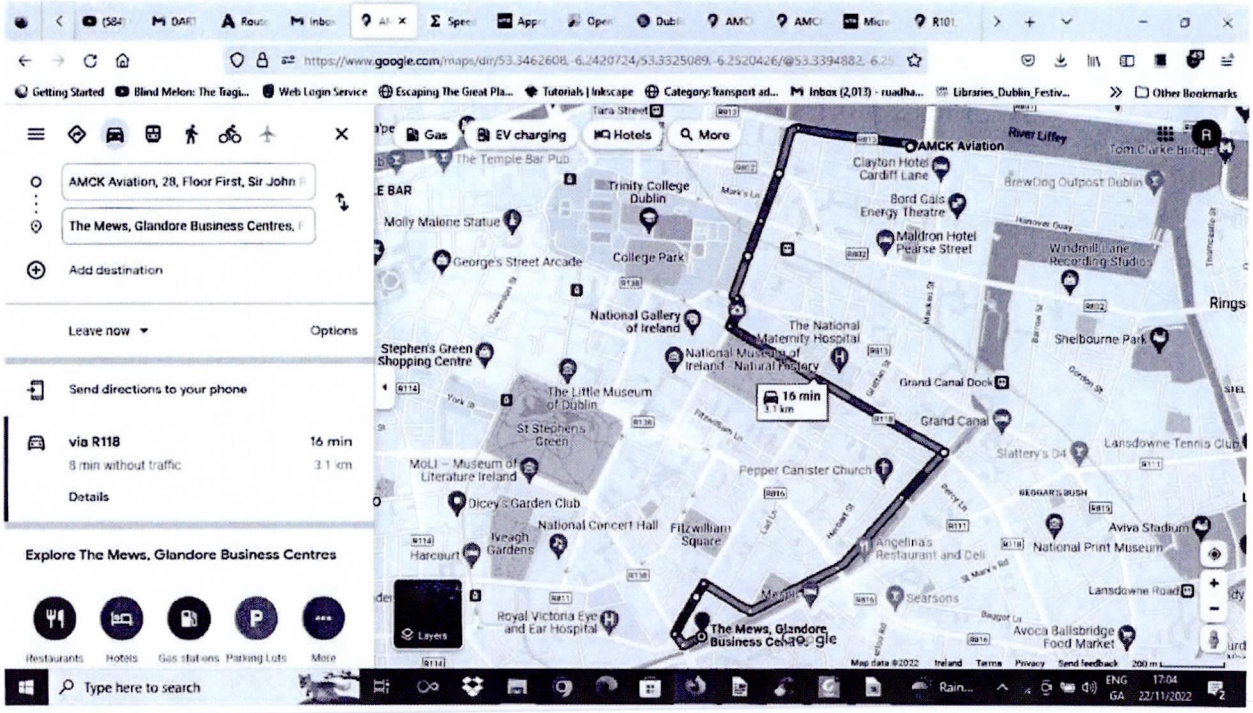
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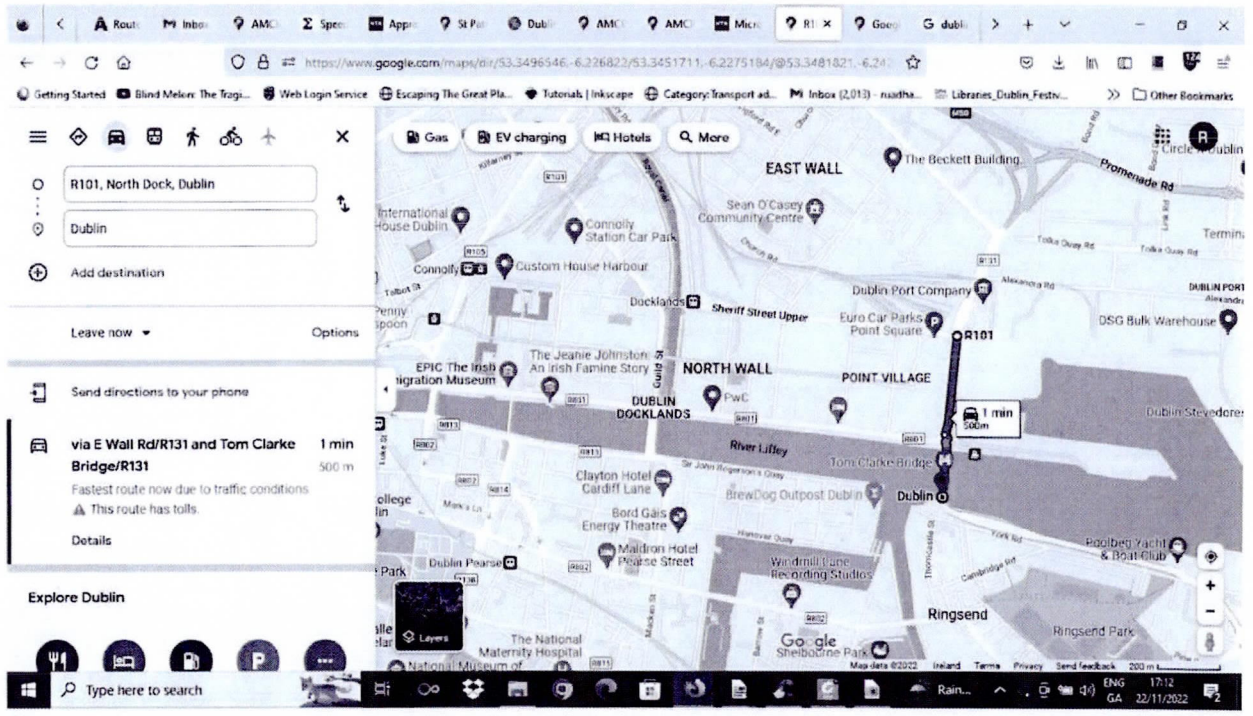
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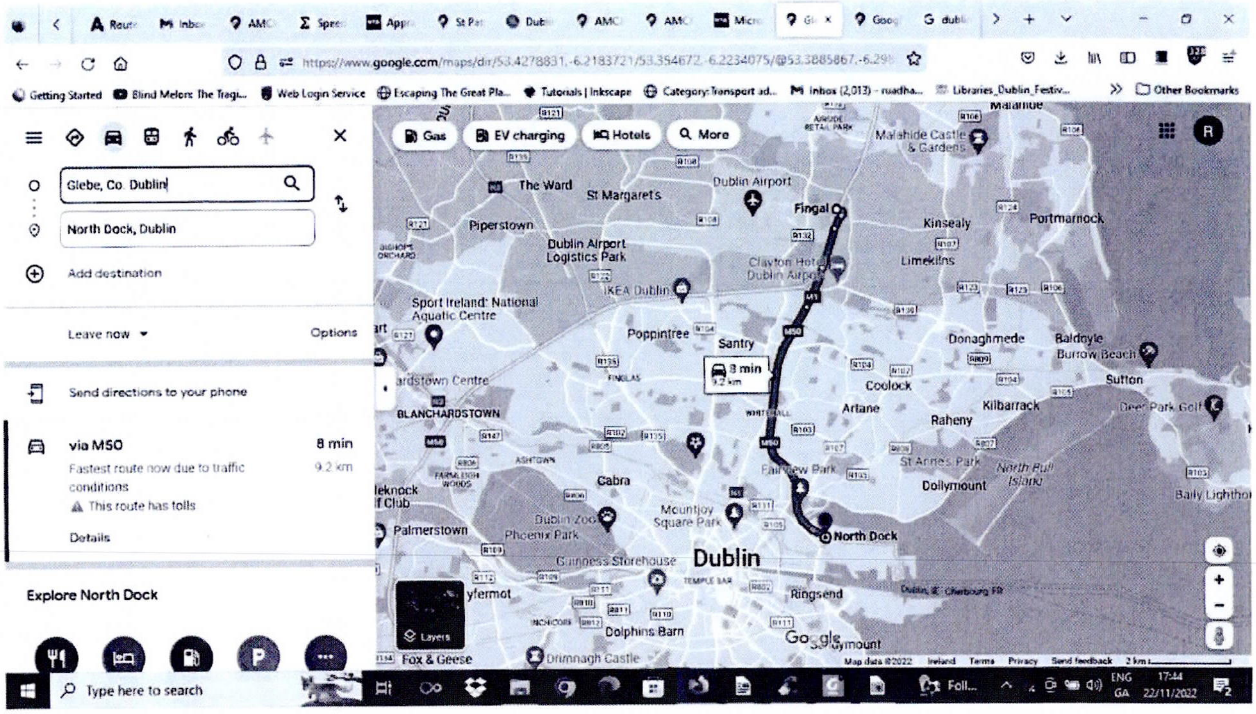
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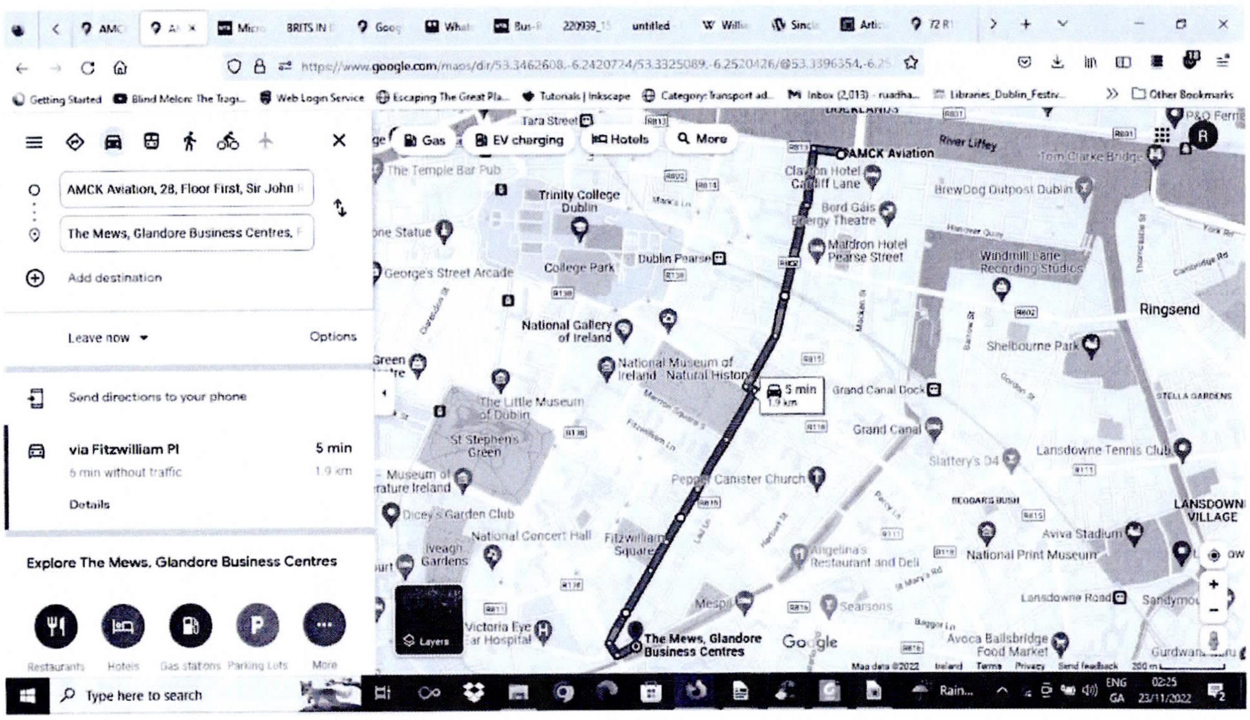
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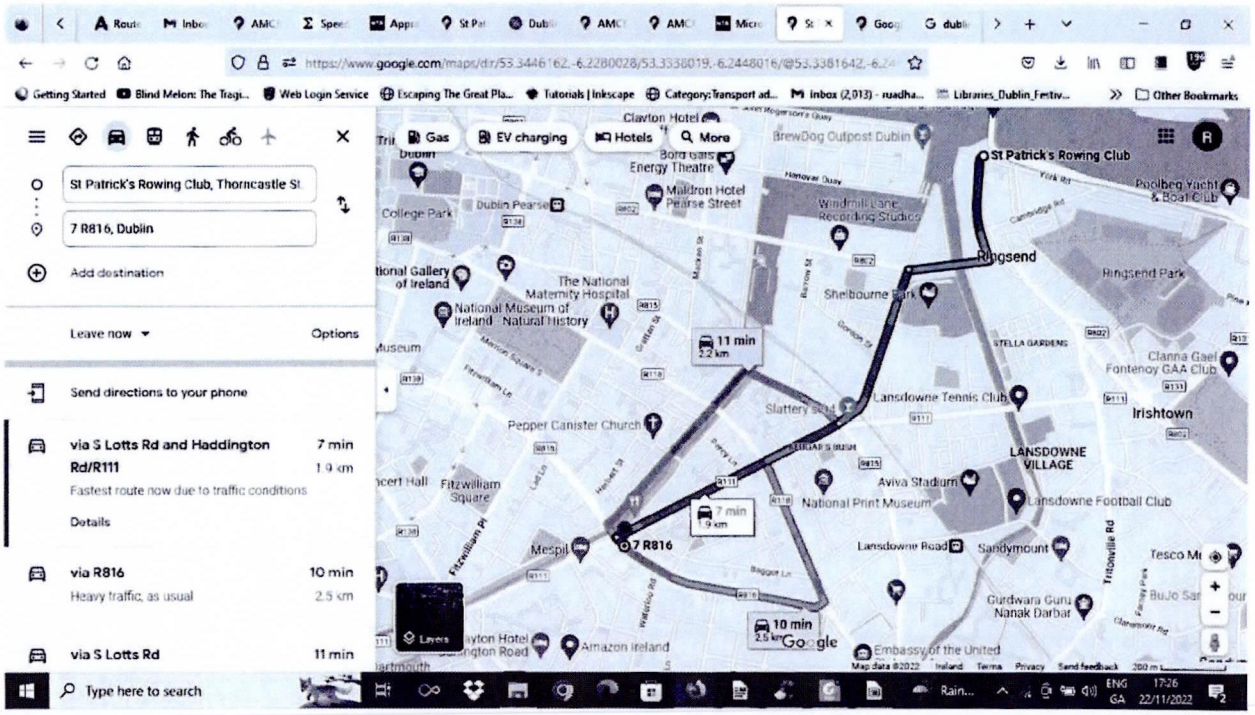
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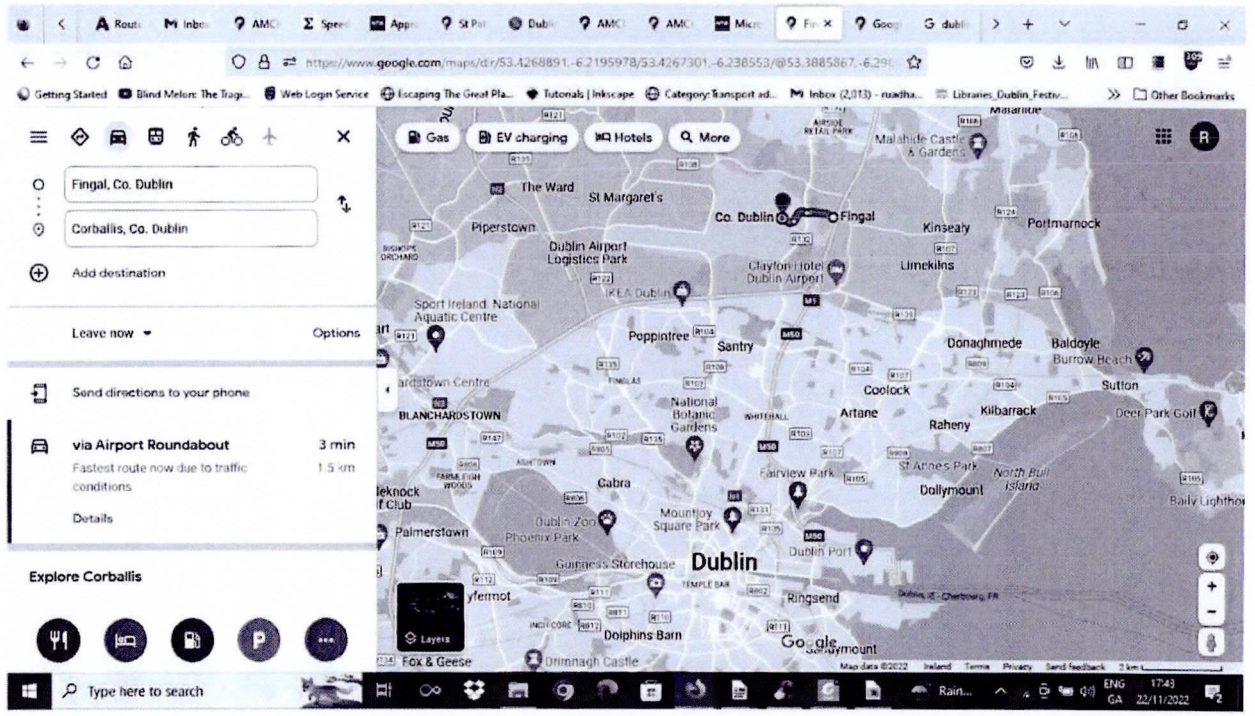
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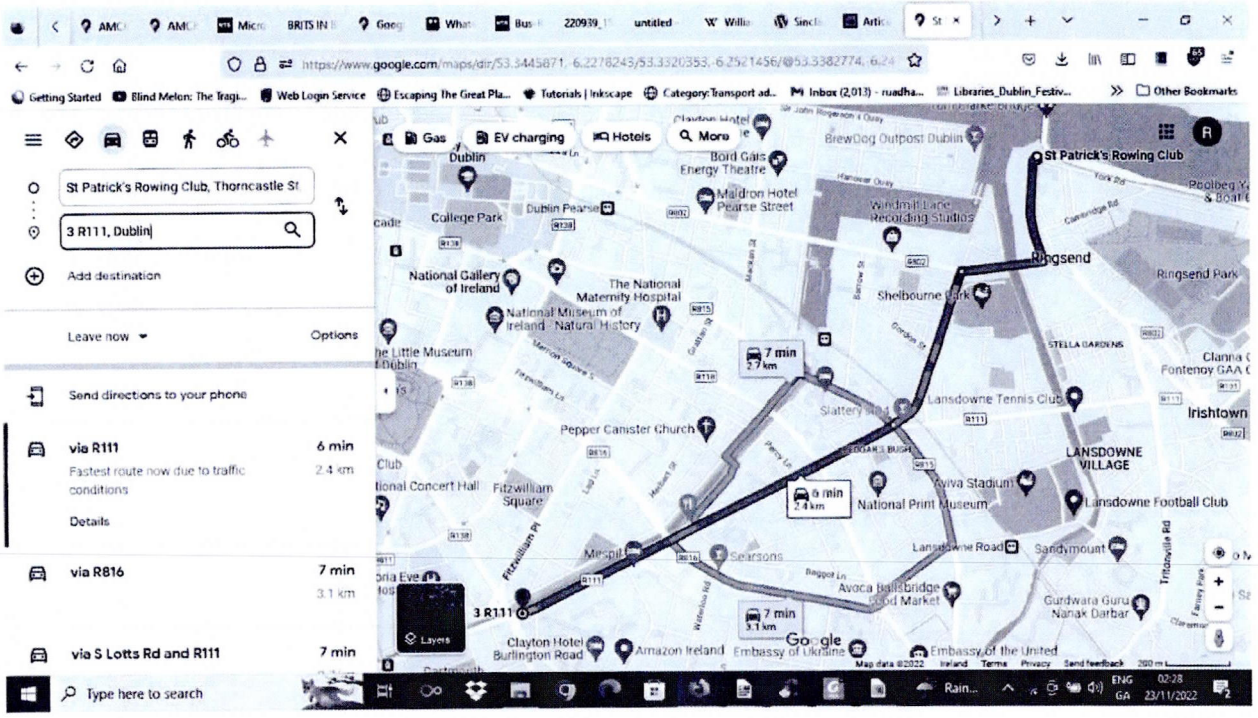
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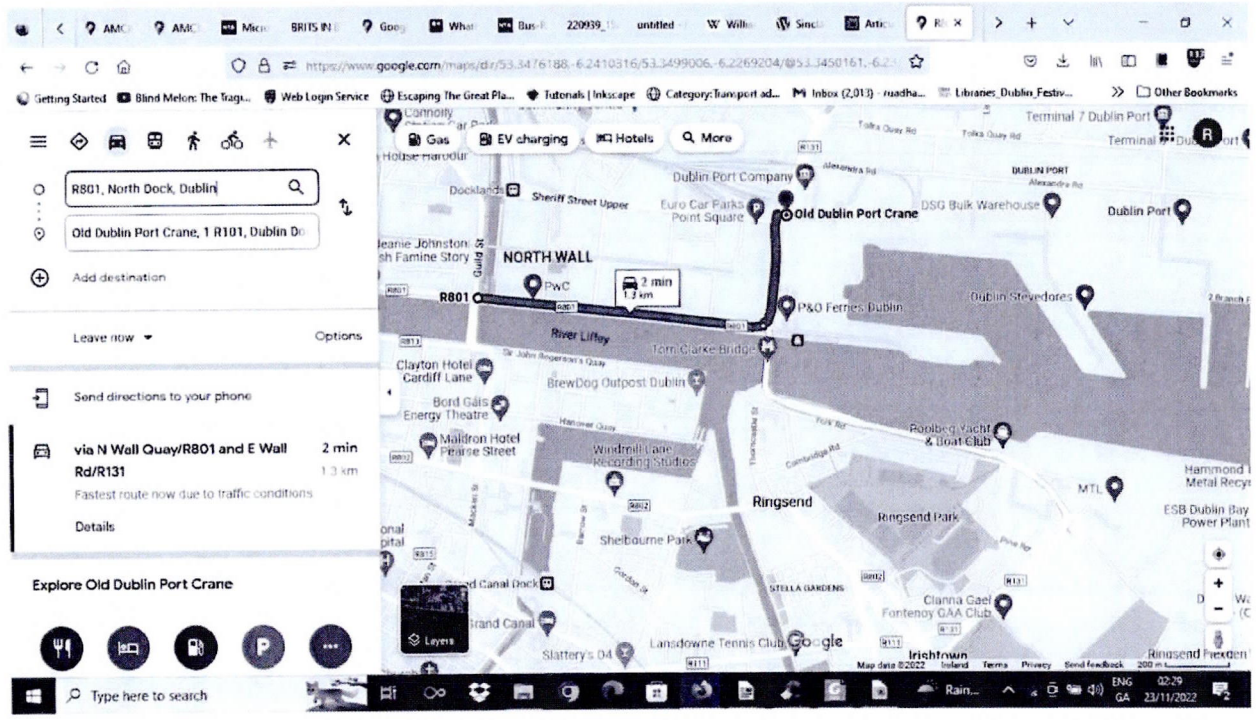
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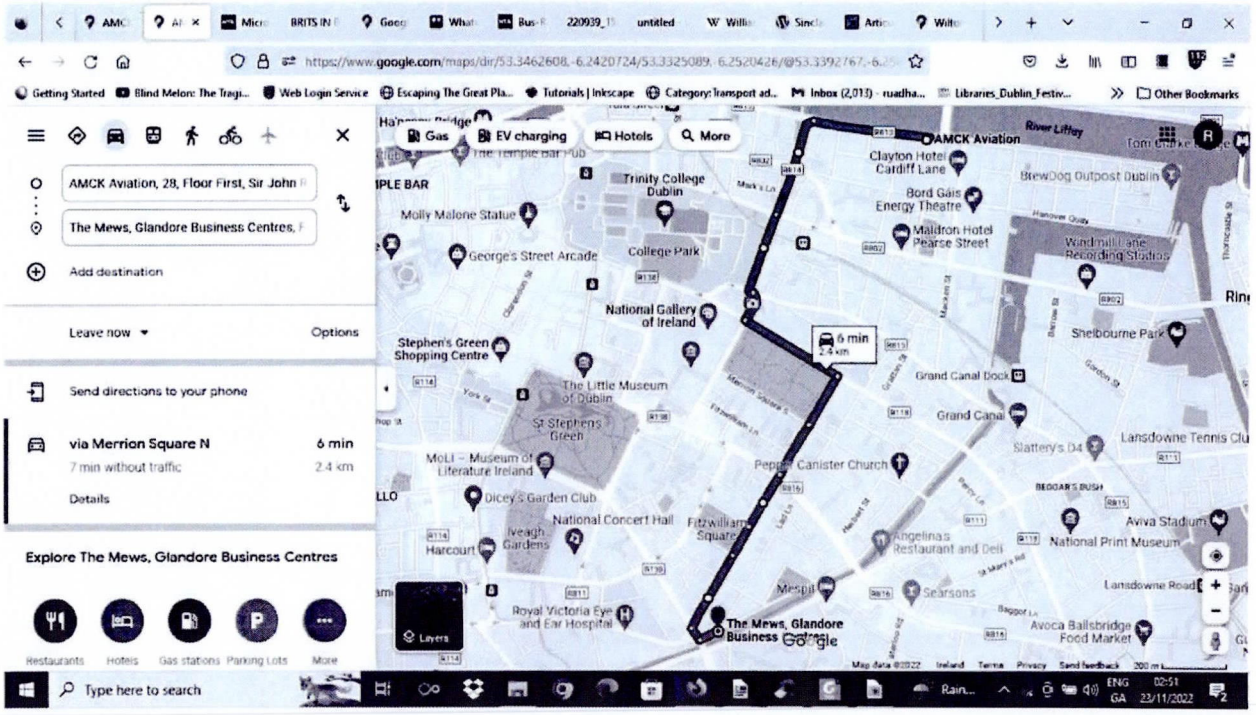
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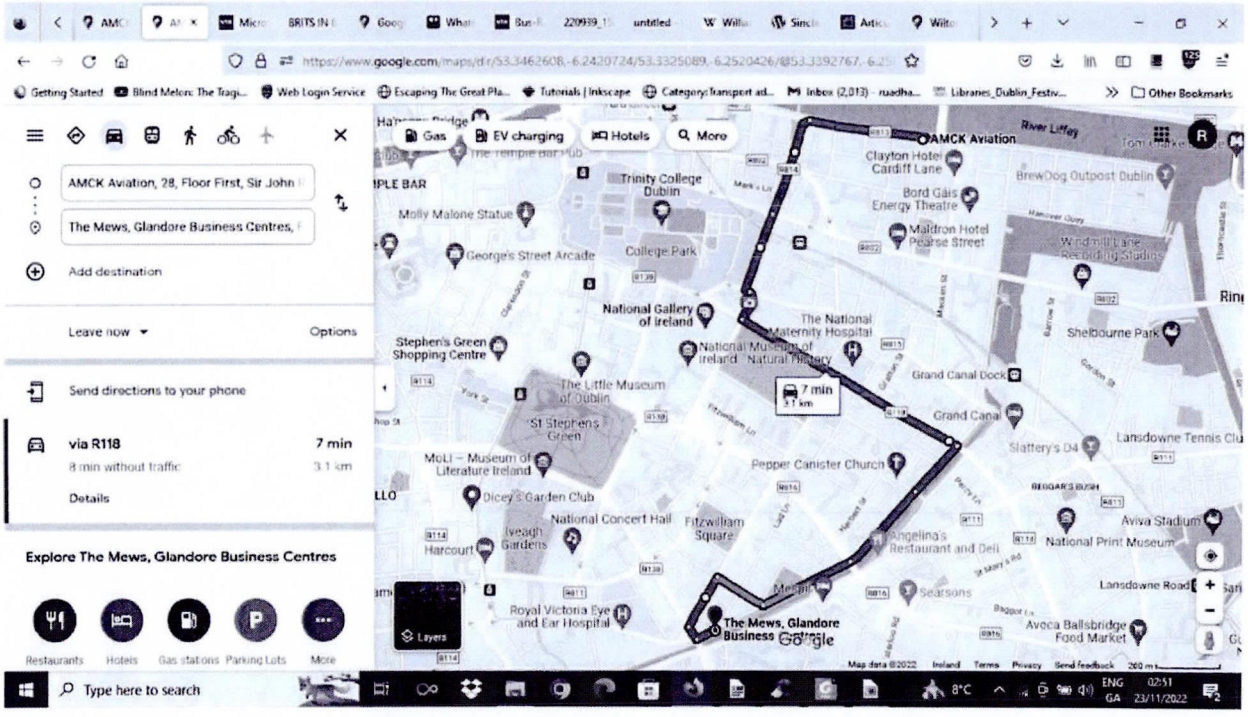
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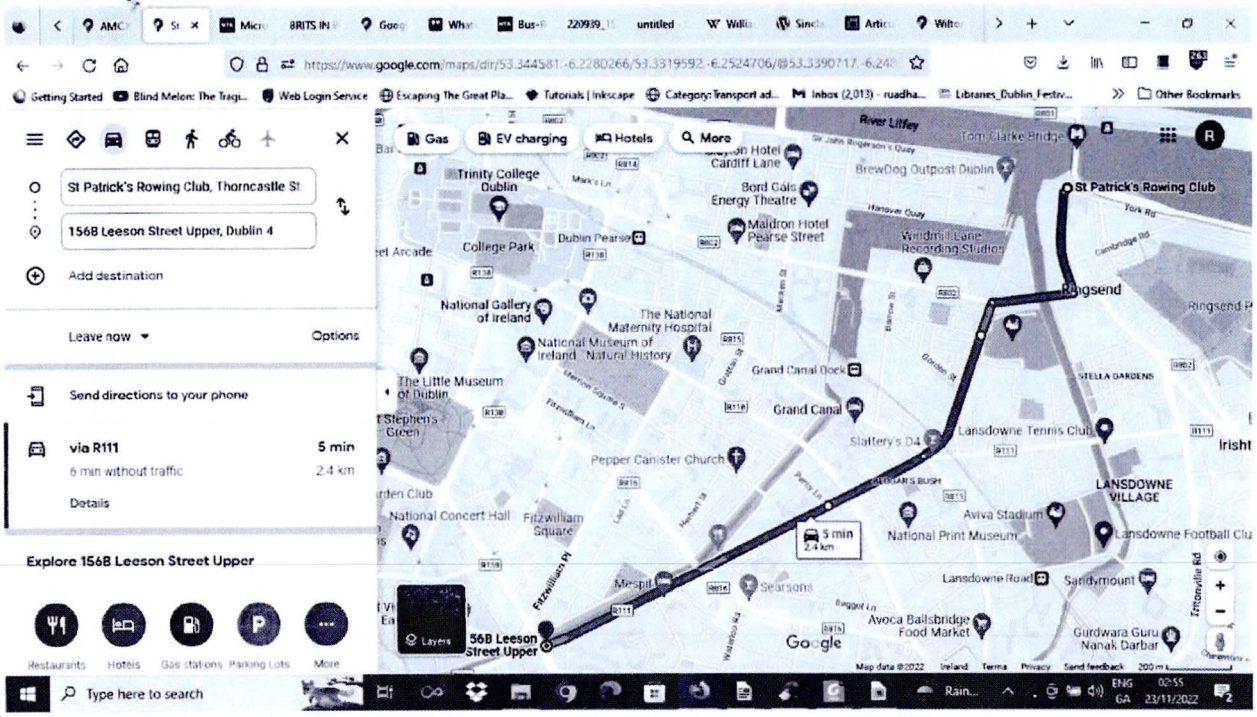
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Windmill Lane Recording Studios
BrewDog Outpost Dublin
St Patrick's Rowing Club
Ringsend
National Gallery of Ireland
National Museum of Ireland - Natural History
The National Maternity Hospital
The Little Museum of Dublin
Grand Canal Dock
Grand Canal
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Lansdowne Tennis Club
LANSDOWNE VILLAGE
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Review of Decisions, Reports, and Policy

A number of reports, decisions, and policy documents have emerged in the recent period that have particular relevance to the current application.

1. An Bord Pleanála Decision 14 – 10 – 2022: Cancelling of Galway Ring Road Planning Consent

Reference: https://www.rte.ie/news/connacht/2022/1014/1329237-galway-ring-road/

Commentary

As reported in national media on 14th October 2022, An Bord Pleanála did not take into account the National Climate Action Plan when considering the application for the development – and hence has cancelled consent. The Climate Action Plan requires "a modal shift to transport modes with lower energy consumption", such as increased public and active travel. The implications of the Climate Action Plan are commented upon under its own heading in detail later in this document.

The over-arching logic of this decision is that making 'a modal shift' must be priority. In Galway that would not have been achieved by building a motorway, as it would not provide people with access to sustainable transport: In Dublin, this cannot be achived without providing service access to DART rail services that are proposed to be routed through populated areas.

2. OECD (2022), *Redesigning Ireland's Transport for Net Zero: Towards Systems that Work for People and the Planet*

OECD Publishing, Paris.
https://doi.org/10.1787/b798a4c1-en.

Executive Summary

Key Findings

The Irish transport system fosters growing car use and emissions by design, and is thus unfit to enable the country to meet its greenhouse gas reduction goals while improving well-being. Growing car use in Ireland is largely determined by car-dependent transport and urban systems, organised around increased mobility and characterised by three unsustainable dynamics: induced car demand, urban sprawl, and the sustainable modes low-attractiveness trap.

Aiming at decarbonising the system via private vehicle improvements is unlikely to lead to substantially different patterns of behaviour, rapid emissions reductions, and large well-being improvements.

Implemented policies and those expected to bring the highest emission reduction shares according to Ireland's Climate Action Plan 2021 are unlikely to help the country transform its car-dependent system. Most efforts in Ireland have been allocated to policies with a low to medium potential to transform the current system (e.g. electric vehicle incentives for private cars, increasing the budget allocated to public transport infrastructure compared to what is allocated to car infrastructure, carbon and road prices, infill/brownfield development targets).

Key recommendations

Redefine the goal of the transport system as sustainable accessibility. This calls for challenging ingrained mindsets and shifting away from identifying high/growing mobility with well-being. Revisiting measurement frameworks and models is also relevant. Setting sustainable accessibility as a goal for land-use/housing planning is also necessary, as ensuring proximity is key for delivering sustainable accessibility

Aiming at decarbonising the system via private vehicle improvements is unlikely to lead to substantially different patterns of behaviour, rapid emissions reductions, and large well-being improvements.

Implemented policies and those expected to bring the highest emission reduction shares according to Ireland's Climate Action Plan 2021 are unlikely to help the country transform its car-dependent system. Most efforts in Ireland have been allocated to policies with a low to medium potential to transform the current system (e.g. electric vehicle incentives for private cars, increasing the budget allocated to public transport infrastructure compared to what is allocated to car infrastructure, carbon and road prices, infill/brownfield development targets). Currently prioritised policies, such as electric vehicle incentives, also reinforce car dependency, further locking the country into a system that fosters growing car use and emissions by design.

4. Redesign

[This chapter] explains why a system focused on mobility is not fit for the purpose of achieving emission reductions and high well-being outcomes and calls for the redefinition of the transport system goal as sustainable accessibility.

2.2. Transport systems with sustainable accessibility as their goal

Transport policy literature suggests that transport systems' contribution to human well-being ought to lie in the provision of accessibility, meaning easy access to opportunities and places of interest (e.g. jobs, consumption, leisure or health services) (OECD, 2019[20]; ITF, 2017[16]). Transport systems whose goal is sustainable accessibility, meaning the provision of access via sustainable transport modes (active modes and micro-mobility, public transport and other shared services), can ensure this provision over time and thus support present and future well-being.

Accessibility-oriented transport systems can foster sustainable patterns of behaviour and help Ireland meet its reduction targets.

Several policy documents and decision-making processes are taking steps in the right direction. For example, the Irish well-being framework includes access to services and the environment as key components of better living (Department of the Taoiseach, 2021[27]). The new Sustainable Mobility Policy also reflects an effort to move away from a car-centric mentality. Sustainable mobility is defined by the SMP as "connecting people and places" (Department of Transport, 2022[22]), appropriately shifting attention towards access. At the same time, however, the focus on how to deliver such access is kept on mobility, even if via sustainable modes. The document states

that the support of: [s]afe, accessible, comfortable and affordable journeys to and from home, work, education, shops and leisure; [t]ravel by cleaner and greener public transport; [and a] shift away from the private car to greater use of active travel and public transport" (Department of Transport, 2022[22]) are the main ways in which it will connect people and places. Attention is therefore mostly directed throughout the document to the transport links between people and places rather than to the location and characteristics of places and the need to create proximity (land use).

The document also discusses the importance of encouraging the "15-minute city" model (Department of Transport, 2022[22])6.

As noted by the OECD (2021[4]), accessibility-based planning and accessibility indicators are indispensable for "15-minute city" strategies, among other things.

Commentary

Current policy is over-dependent on electric cars and is unlikely to address climate change needs. There is a clear need to adopt measures that are not car-dependent.

'Sustainable accessibility' is crucial and 'proximity is key for delivering sustainable accessibility'. Policy has been over-dependent on electric cars, which does not work. Modal shift is needed: surely the DART should have service access at the most populated areas along its routes – and so help address this issue?

Accessibility-oriented transport systems should be a priority. A core assertion of this observation is that it is logical that accessibility needs to be prioritised where populations are most concentrated, which the current application fails to do, by not stopping at Croke Park, Cross Gun's Bridge etc. Both the OECD and the Department of Transport agree about encouraging the '15 minute city'; however, the OECD asserts that 'accessibility-based planning' is vital for delivery, again indicating the need to facilitate access to public transport infrastructure routed through populated areas

[20] OECD (2019), *Accelerating Climate Action: Refocusing Policies through a Well-being Lens*, OECD Publishing, Paris, https://doi.org/10.1787/2f4c8c9a-en.
[16] ITF (2017), *Income Inequality, Social Inclusion and Mobility*, ITF Roundtable Reports, No. 164, OECD Publishing, Paris, https://doi.org/10.1787/g2g7ae77-en.
[27] Department of the Taoiseach (2021), *A Well-being Framework for Ireland*, Department of the Taoiseach, https://www.gov.ie/en/campaigns/1fb9b-a-well-being-framework-for-ireland-join-the-conversation/ (accessed on 10 June 2022).
[22] Department of Transport (2022), *National Sustainable Mobility Policy*, Department of Transport, https://www.gov.ie/en/publication/848df-national-sustainable-mobility-policy/ (accessed on 13 June 2022).
[4] OECD (2021), *Transport Strategies for Net-Zero Systems by Design*, OECD Publishing, Paris, https://doi.org/10.1787/0a20f779-en (accessed on 10 June 2022).

3. Department of Transport (2022) National Sustainable Mobility Policy Action Plan 2022 - 2025

People Focused Mobility

Goal 6: Take a whole of journey approach to mobility, promoting inclusive access for all

48. Promote the principle of 'Access for All' across sustainable mobility services through:

- Enhancement of rail station accessibility including platform access, lift reliability, information provision and signage. (Second bullet point)

Commentary

This aim of the Department of Transport emphasizes 'inclusive access for all', with the second measure specifying 'rail station accessibility' as priority. Again, it seems reasonable to achieve this aim by ensuring service access in the most populated areas along a public transport route.

4. ITF (2019), "Benchmarking Accessibility in Cities: Measuring the Impact of Proximity and Transport Performance", International Transport Forum Policy Papers, No. 68, OECD Publishing, Paris.

Access to services in European urban areas

Is public transport inclusive?

(Page 64)

Since the 1970s, policies have aimed at making public transport affordable to poor households in most European cities (Faivre d'Arcier, 2012). Better accessibility by public transport is recognised as a lever to improve access to opportunities for deprived neighbourhoods and has been shown to be crucial for upward economic mobility. For instance, Chetty, Hendren and Katz (2016) have shown that shorter commuting time is the strongest factor in the odds of against escaping poverty. Public transport brings wider social benefits through providing better access to services and opportunities to disadvantaged groups and thereby promoting social equity.

Reference: Faivre d'Arcier, B. (2012), "VIII. Le financement des services publics de transport dans la perspective d'une mobilité durable", Annuaire des Collectivités Locales, 32(1), pp.141-150.

Commentary

Throughout the 2022 OECD report, 'Redesigning Ireland's Transport for Net Zero', references are made to the document from which the above extract is copied. The cited section has particular relevance. On the DART network, in the more affluent parts of Dublin there tends to be relatively easy access – with 6 stations in 4 kilometres between Tara Street and Sydney Parade. Yet in the less affluent areas, there is less access to the Irish Rail network – despite being more populated, and with more railway lines present. For example, between Connolly and Park West stations, there is

only 1 stop in 15 kilometres at Drumcondra – while from Docklands to Broombridge, there is not one stop on the 5 kilometres of line by the Royal Canal.

5. National Climate Action Plan 2021

15 Transport

15.1 State of Play

Transport accounts for approximately 20% of Ireland's greenhouse gas (GHG) emissions. Road transport is responsible for 96% of those GHG emissions and is also directly responsible for a range of air pollutants that negatively impact both human health and the environment. The levels of noise, accidents, and congestion associated with road transport reduces quality of life, deters active travel, and costs society hundreds of millions of euro per annum in wasted time. Promoting cleaner, safer and more sustainable mobility is critical for climate policy, and it also represents an opportunity to improve our health, boost the quality of our lives, meet the needs of our growing urban centres, and connect our rural, urban and suburban communities.

Improved planning and radical redesign are required to shift our built environment from being "vehicle centered" to being "people centered". The concept of the "15-minute neighbourhood", which gained prominence during the COVID-19 pandemic, is representative of this broad ambition. Specifically, promoting and supporting communities in which people can live and access most of their daily needs within a 15 -minute journey, mainly by sustainable modes (public transport, cycling and walking).

15.2 Targets

To meet the required level of emissions reduction, by 2030 we will:

• Provide for an additional 500,000 daily public transport and active travel journeys (First bullet point)

15.3 Measures to Deliver Targets

15.3.1 Sustainable Mobility

Expanding sustainable mobility options to provide meaningful alternatives to everyday private car journeys is necessary to reduce transport emissions. Continued and enhanced investment in our walking, cycling and public transport infrastructure and services across the country is required on a scale not previously seen. We are committing to delivering an additional 500,000 daily sustainable journeys by 2030 (c. 14% increase on current levels) through the implementation of major transport projects such as:

• Expanding rail services and infrastructure in, and around, major urban centres (Third bullet point)

15.3.2 System Efficiency and Demand Management

Government planning policy will also continue to work to address low density/suburban sprawl (which increases the distance people must travel, locking in car-dependent patterns of development and behaviour) by promoting compact urban growth as a key mechanism to enable sustainable development as well as action on climate change and congestion. This will involve not just the

design of new developments, but also the addressing of issues within existing developments. Planning policy will work to:

- Reduce demand for travel by car, travel distances, and journey times
- Increase travel choices, reduce car dependency, and mitigate traffic congestion
- Reduce air pollution and promote cleaner and more active modes of transport
- Sustain economic and social activity at street level creating vibrant communities
- Increase access to shops, employment, transport services, and local amenities by sustainable modes

Commentary

In line with Ireland's international commitments, the National Climate Action Plan 2021 sets out ways for different sectors to reduce greenhouse gas emissions. Chapter 15 is devoted to transport, as this accounts for 20% of emissions, with road transport being responsible for 96% of transport emissions. In order to achieve the aims, 'improved planning' is stipulated so as to bring about 'communities in which people can live and access most of their daily needs within a 15 -minute journey, mainly by sustainable modes (public transport, cycling and walking).' Accordingly, the very first target of this policy is to provide for 1/2 million more public journeys by 2030.

The present application presents the Bord with a prime opportunity to ensure that "improved planning" happens, to bring about 500,000 journeys by public transport per annum. By contrast, if consent were to be granted to the current application in the absence of ensuring adequate service access from day one at Croke Park or Cross Guns Bridge, it would not align with policy.

Under 'Measures to Deliver Targets', 'Sustainable Mobility' is specified as a key priority, with 'expanding rail services and infrastructure in, and around, major urban centres' stipulated as the third bullet point. This statement is of relevance to the present application, and the logic is very clear; improving rail services and infrastructure must happen 'in' urban areas as primary priority – with improvements 'around' urban areas being a sensible extension of this logic. As the DART West proposal is to improve services around an urban area without improving services in the populated areas through which the services are to pass, it does not seem to align with national policy.

Section '15.3.2 System Efficiency and Demand Management' further details the philosophy of the planning approach being adopted, whereby 'compact growth' is prioritised. Notably it says 'This will involve not just the design of new developments, but also the addressing of issues within existing developments.' Thus, where an application is made to retrofit an existing development, in this case a railway, it is of equal importance to a new development. Hence it is logical the standards expected of a new development must also be applicable in an application seeking to retrofit an existing development. In this instance, it seems highly unlikely that the authorities would entertain an application for a scheme proposing 5 kilometres of new high-capacity twin track railway through an urban area unless stations were incorporated. Ergo, any project seeking to retrofit the line linking Docklands with Broombridge must include stations at logical points, such as Croke Park and Cross Guns' Bridge (with these operational from the first day of service), if the project is to adhere with national policy set out above, international obligations, and also local policy (DTO Platform for Change 2001, Dublin City Council Plan 2008 onwards).

The final part of the policy relevant sets out that:

'Planning policy will work to:

- *Reduce demand for travel by car, travel distances, and journey times*
- *Increase travel choices, reduce car dependency, and mitigate traffic congestion*
- *Reduce air pollution and promote cleaner and more active modes of transport*
- *Sustain economic and social activity at street level creating vibrant communities*
- *Increase access to shops, employment, transport services, and local amenities by sustainable modes'*

Notably this statement opens with the phrase that 'planning policy will work',with aims subsequently listed. This is important as it commits the system to utility and function, and is not left open to interpretation – in contrast to say, a phrase such as 'Planning policy should consider'. Thus, there is, inherently, a new onus on decision-makers to ensure that projects comply with policy. This is of particular importance in Ireland where proper planning is often more dependent on development control, rather than on forward planning.

The five bullet points provide a very useful metric by which the DART West application can be measured for the section of 5 kilometres of railway between Docklands and Broombridge, and wherein no stop is to feature on the first day of service.

1. Would the proposal 'Reduce demand for travel by car, travel distances, and journey times'?
Without adequate service access, there would be a little reduction of car travel in the Docklands – Broombridge section, although journey times should be better for people outside the area.

2. Would the proposal 'Increase travel choices, reduce car dependency, and mitigate traffic congestion'?

'Travel choices' cannot be increased by high quality public transport passing through built-up areas without stops and service access. Although the proposal should help relieve car dependency outside the area, the potential for traffic reduction in the area is vastly reduced without service access.

3. Would the proposal 'Reduce air pollution and promote cleaner and more active modes of transport' in the area?

Yes, replacing diesel powered trains with electric is progressive. However the lack of service access will deter citizens from relying on public transport.

4. Would the proposal 'Sustain economic and social activity at street level creating vibrant communities'?

No. There will be no advantage in this area, and the only likely difference will be increased noise from the increase of frequency of trains passing through the area.

5. Would the proposal 'Increase access to shops, employment, transport services, and local amenities by sustainable mode'?

No. Without service access, there would be no improvement.

When the above five metrics are applied, it appears that none can achieve a clear positive response, although part positive response can be attributed to three of the questions. In other words, out of a score of 5, the current proposal achieves 1 1/2 in terms of impact in this area. Ergo, the proposal cannot be seen to satisfactorily resolve the requirements of policy in its current form.

When this approach is applied to the nearby line linking Broombridge and Connolly, also 5 kilometres long, it appears there is a similar outcome, as there is only one station at Drumcondra.

Hence, the DART West project proposes to electrify the rail lines linking Broombridge to Docklands and Connolly stations through the north city centre, which are 10 kilometres in total; yet there is only 1 station that is to be operable from the opening day of service. Such allocation of service access is in marked contrast to the 4 kilometres of line between Sydney Parade and Tara Street stations, between which there are 4 stations.

Summary

As evident from the above recently published policies, reports, and decisions, there is a fresh focus on the Irish planning system so that there is sustainable access to sustainable transport, in order that there is compliance with both national policy and international law.

The recent decision by An Bord Pleanála to rescind consent for the Galway ring-road arises from the need to adhere with the National Climate Action Plan 2021, which follows from Ireland's international legal commitments. As consideration had not been given to section 15 of the Climate Action Plan, which emphasizes the need for 'modal shift', the Bord were obliged to cancel consent. In Galway that would not have been achieved by building a motorway, as it would not provide people with access to sustainable transport: In Dublin, this cannot be achieved without providing service access to DART rail services that are to be routed through populated areas.

With the second document, the OECD report on transport in Ireland, it is viewed that current policy is over-dependent on electric cars, and is unlikely to address climate change needs. Instead 'Sustainable accessibility' is crucial, and 'proximity is key for delivering sustainable accessibility'; the OECD also asserts 'accessibility-based planning' is vital for delivery of the '15 minute city'.

With the Department of Transport's 'National Sustainable Mobility Policy Action Plan 2022 – 2025', there is great emphasis on 'inclusive access for all', with the second measure specifying 'rail station accessibility' as priority.

"Benchmarking Accessibility in Cities: Measuring the Impact of Proximity and Transport Performance" (2019) by the International Transport Forum of the OECD, also emphasizes the need to ensure that public transport as accessible, particularly in less affluent neighbourhoods. Since the

1970s, better accessibility by public transport has been recognised as key to improving social opportunities and creating economic uplift.

The 'National Climate Action Plan' provides the final document reviewed above, on which there must be fresh emphasis, following the decision regarding the Galway Ring Road. It must be noted that the Plan mandates the DART West proposal as an action to address climate change – but equally it requires that developments are compliance with the standards which it sets out.

It is a core objective that 500,000 journeys by public transport are conducted by 2030 – and hence there is an onus on the Bord to ensure that any project proposing transport must maximise its utility. This logic is further refined by the emphasis on improving rail services and infrastructure 'in' urban areas, where existing populations are most concentrated, with this latter additionally supported by the statement that 'This will involve not just the design of new developments, but also the addressing of issues within existing developments.'

The final part of the Climate Plan referred to is the statement asserting that 'Planning policy will work' with five bullet points provided. As already discussed in detail, the phrase 'will work' refreshes the position of decision makers to ensure that proposals by developers are compliant with policy objectives. The five bullet points were then used to gauge the impact of the proposal for the five kilometres of railway between Docklands and Broombridge, and it appears that the current proposal only achieves 1 1/2 of the 5 metrics, primarily because there is an absence of service access along the route, and hence 'modal shift' cannot occur.

The logic of the above decisions and policy documents is clear: Modal shift is needed, sustainable access to sustainable transport is crucial, and it is imperative that this occurs where a high quality transport service is being routed through populated areas. In essence, the proposal to upgrade 10 kilometres of lines through urban areas between Broombridge and Docklands, and Connolly, must have more than 1 station in order to adhere to established international practice, international climate action commitments, national policy, and local planning objectives.

Ultimately, the Galway ring road was cancelled because it would not have provided sustainable access to sustainable transport: As the current DART West proposal would not provide adequate service access in the most populated areas along its route, the same rationale must be applied.

Niamh Hickey

To: Niamh Thornton
Subject: RE: Fao Niamh Thornton, Re. ABP-314724-22: Request to correct an error and add a presentation of five slides before 16th January

From: ruadhan maceoin <maceoin.ruadhan@gmail.com>
Sent: Thursday, January 12, 2023 2:42 PM
To: Bord <bord@pleanala.ie>
Subject: Fao Niamh Thornton, Re. ABP-314724-22: Request to correct an error and add a presentation of five slides before 16th January

Ruadhán MacEoin
20 Marlborough Road
Donnybrook
Dublin 4

Your Case Number: ABP-314724-22

Re Railway (MetroLink - Estuary to Charlemont via Dublin Airport) Order [2022]

Dear Niamh Thornton,

I am grateful for receiving the receipt from your office for my recent submission on the above application, as issued on 05 December 2022.

Firstly, on reflection, I realised that I made an error as per point 2 on the second page of my submission, which referred to preparatory works for the previous Metro North scheme having cost €2 billion - when in fact the cost was €200 million. For purpose of an accurate record, I would be very keen that the error be corrected if that is possible?

Secondly, if possible I would be most grateful if the attached document, consisting of a presentation of 5 slides, could be added to my submission? This document clearly sets out; the existing status quo of railway operations around Dublin and policy objectives; using railways already in place to achieve policy aims; new links to Dublin Airport by way of Luas line extension and a Bus Rapid Transit (as an alternative to the proposed MetroLink application), and the prospect for future network developments. Given the relevance of this document to the decision making process for MetroLink, it seems a priority you should have it without delay. Hence, please find the slides attached.

I am most grateful for your consideration on these two matters. I apologise that the original submission contained an error and was incomplete. If I had become aware on the last day that the period for observations was being extended (to January 16th), I would have provided the observation with the attached document, and also, the error on page two rectified.

As the deadline is this coming Monday, January 16th, if there are difficulties regarding incorporation of the above point and attached document, I would be happy to resubmit the observation in its entirety as a single document, if that is of assistance?

Yours sincerely,

Ruadhán MacEoin

DRAFT 3

RAPID + SMART + Luas X

3 Steps for Effective Integrated Dublin Transport

Railways Already Present In Dublin
Using the capital's 'forgotten railway' to serve 100,000 more Dubliners

South Metropolis – Airport Rapid Transit
Swords – Sandyford express bus service via Port Tunnel

Luas X
Green Luas Line Extension to Airport & Swords

North East – South East *DART* Services

Malahide
Portmarnock 22
Clongriffin 23
Howth 36
Sutton 35
Bayside 34
Howth Junction 24
Kilbarrack 25
Raheny 26
Harmonstown 27
Killester 28
Clontarf Road 29
Connolly 7
Tara Street 8
Pearse 9
Grand Canal Dock 10
Lansdowne Road 11
Sandymount 12
Sydney Parade 13
Booterstown 14
Blackrock 15
Seapoint 16
Monkstown 17
Dun Laoghaire 18
Glenageary 19
Dalkey 20
Killiney 21
Shankill
Bray
Greystones

North West Services

Maynooth
Leixlip Louisa Bridge
Leixlip Confey
M3 Parkway
Dunboyne
Hansfield
Clonsilla
Coolmine 1
Castleknock 2
Navan Road 3
Ashtown 4
Pelletstown 5
Broombridge 6
Drumcondra 31
Connolly 7
Tara Street 8
Pearse 9
Docklands 30

South West Services

Grand Canal Dock 10
Pearse 9
Tara Street 8
Connolly 7
Drumcondra 31
Heuston 32
Park West 33
Clondalkin & Fonthill
Adamstown
Celbridge & Hazlhatch
Sallins & Naas

RAPID + SMART + Luas X

3 Steps for Effective Integrated Dublin Transport

Present Irish Rail and Luas Networks

& Current Official Plans

09 – 12 – 2022

The Irish Rail network around Dublin is due to be electrified to *DART* standard. The upgrade should improve frequency, but without reform, major issues remain – and relatively little benefit will be achieved.

Issues:

Disjointed services, Loopline overuse, congestion.

Lack of city centre stations

Underuse of the 'forgotten railway' to Docklands.

Restricted access at Heuston, Docklands, and Connolly.

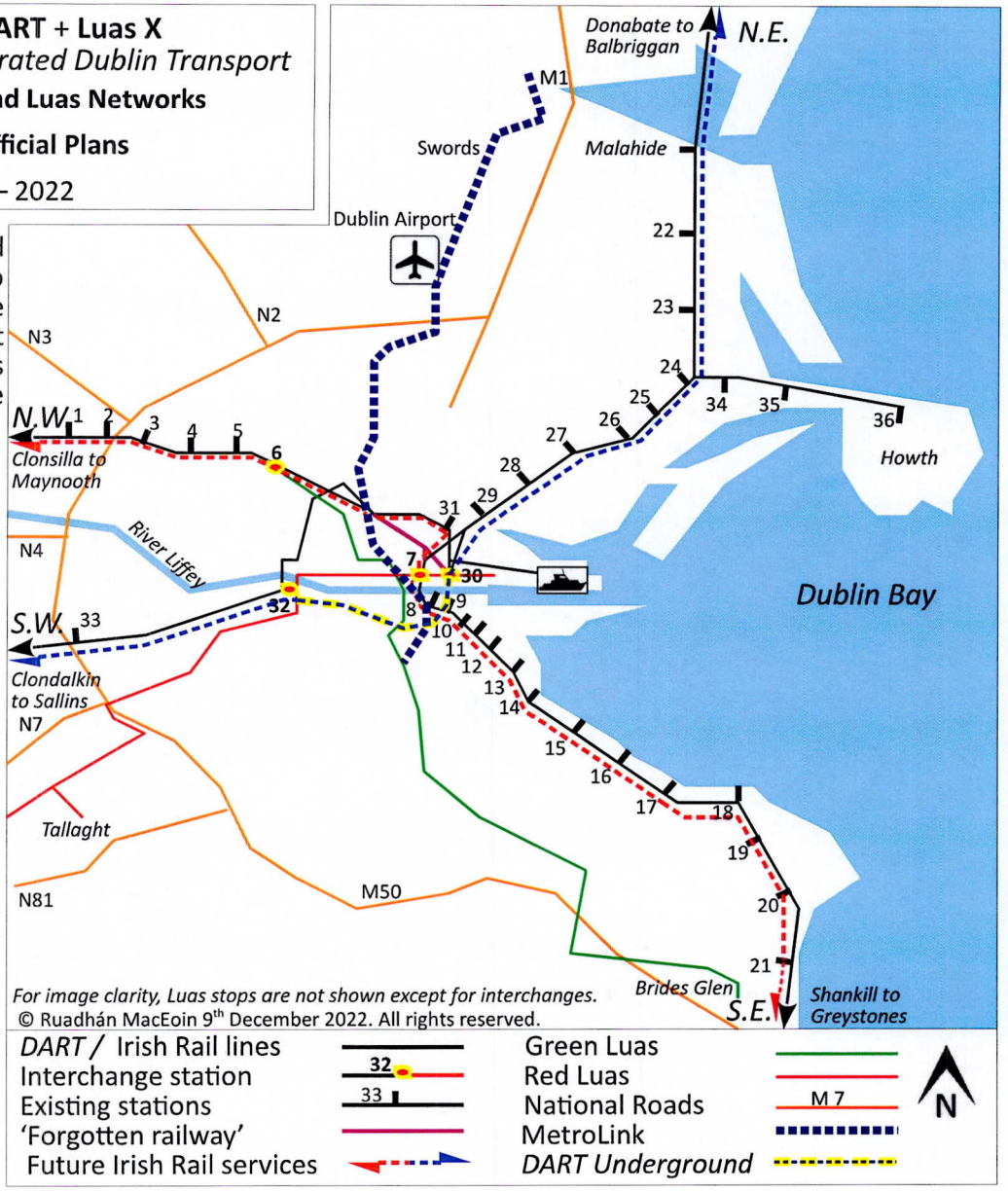
Airport and Swords: Not linked.

Ferry port is not served, despite an adjacent railhead.

Official Plans Propose:

MetroLink to Airport & Swords - A €10 bn+ underground line.

Irish Rail services to be sorted into two main corrridors, N.W. – S.E., N.E. – S.W. To do this, they propose the 4.5 km *DART Underground* tunnel.



North West – South East

Kilcock
Maynooth
Leixlip Louisa Bridge
Leixlip Confey
Clonsilla
Coolmine 1
Castleknock 2
Navan Road 3
Ashtown 4
Pelletstown 5
Broombridge 6
Cross Gun's Bridge
Croke Park
Connolly 7
Tara Street 8
Pearse 9
Grand Canal Dock 10
Lansdowne Road 11
Sandymount 12
Sydney Parade 13
Booterstown 14
Blackrock 15
Seapoint 16
Monkstown 17
Dun Laoghaire 18
Glenageary 19
Dalkey 20
Killiney 21
Shankill
Bray
Greystones

North East – South West

Balbriggan
Skerries
Rush & Lusk
Donabate
Malahide
Portmarnock 22
Clongriffin 23
Howth Junction 24
Kilbarrack 25
Raheny 26
Harmonstown 27
Killester 28
Clontarf Road 29
Docklands 30
Drumcondra 31
Cross Gun's Bridge
Cabra
Zoo
Heuston 32
Inchicore
Ballyfermot
Park West 33
Clondalkin & Fonthill
Adamstown
Celbridge & H/hatch
Sallins & Naas

Howth Branch

Bayside 34
Sutton 35
Howth 36

RAPID + SMART + Luas X

3 Steps for Effective Integrated Dublin Transport

Railways Already Present In Dublin
More *DART* services by using Dublin's 'forgotten line'
8 new & 3 more accessible stations
Resolves *DART Underground* aims without tunnelling

Reformed Routes =
Better Integration, Increased Frequency, Grade-separated Routes... Improved Services.

8 New *DART* / Irish Rail stations
* Dublin Zoo
* Croke Park stadium
* Dublin ferry port
* Cabra
* Ballyfermot
* Inchicore
* Cross Gun's Bridge
* Kilcock

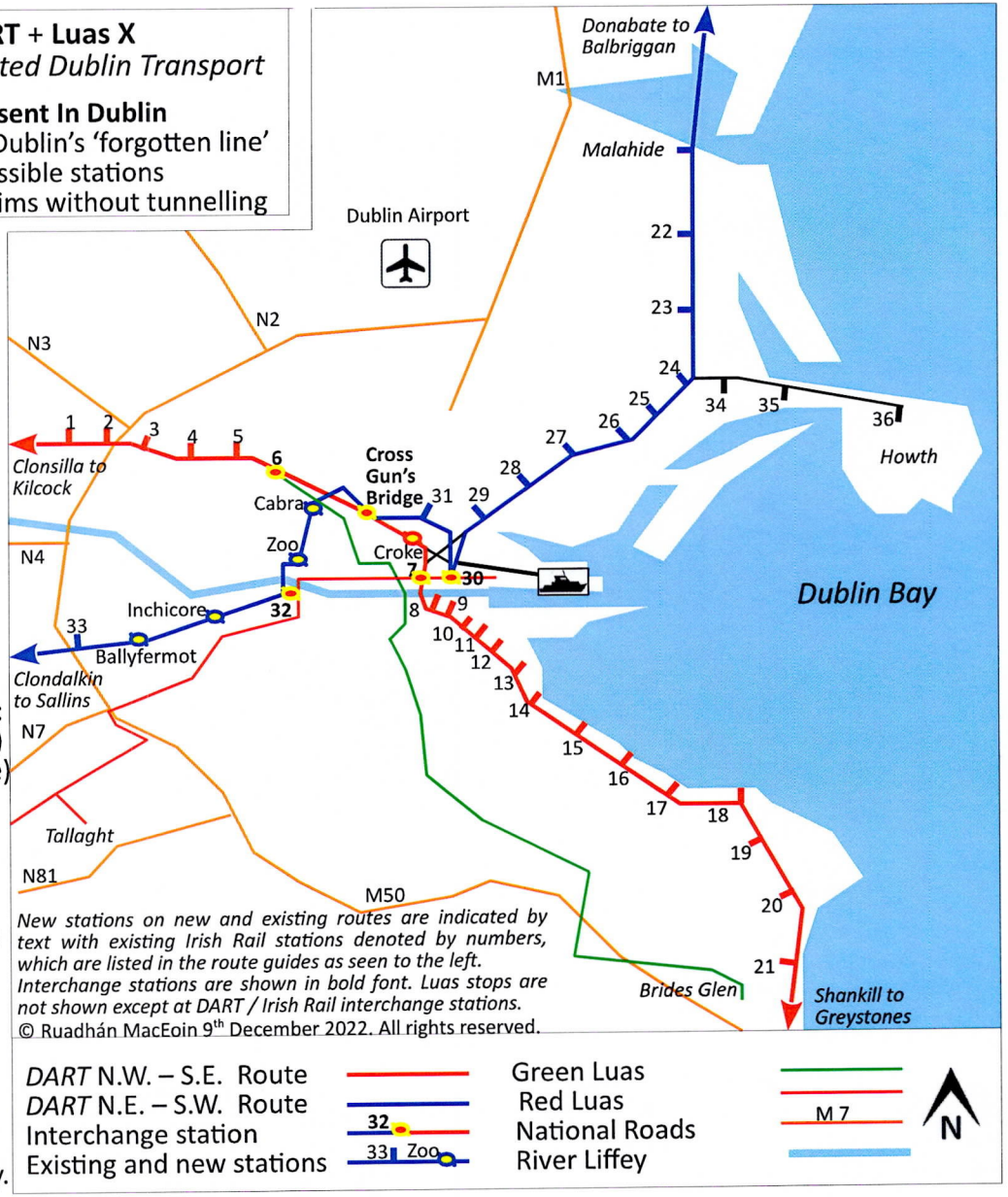
3 Upgraded stations with better pedestrian access & platforms:
* Heuston (inc. New shuttle bus)
* Connolly (Five Lamps entrance)
* Docklands (East Wall access)

Over 100,000 Dublin residents to be served by new stations.

No tunnelling is needed by using existing lines – greatly cutting cost, delay and disruption.

Howth to Bray *DART* services to continue at lower frequency.

Ferry port to be a new terminus for some Intercity services according to timetable suitability.



New stations on new and existing routes are indicated by text with existing Irish Rail stations denoted by numbers, which are listed in the route guides as seen to the left. Interchange stations are shown in bold font. Luas stops are not shown except at DART / Irish Rail interchange stations.

North West – South East

Kilcock
Maynooth
Leixlip Louisa Bridge
Leixlip Confey
Clonsilla
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Sandymount 12
Sydney Parade 13
Booterstown 14
Blackrock 15
Seapoint 16
Monkstown 17
Dun Laoghaire 18
Glenageary 19
Dalkey 20
Killiney 21
Shankill
Bray
Greystones

North East – South West

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Skerries
Rush & Lusk
Donabate
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Portmarnock 22
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Zoo
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Inchicore
Ballyfermot
Park West 33
Clondalkin & Fonthill
Adamstown
Celbridge & H/hatch
Sallins & Naas

Howth Branch

Bayside 34
Sutton 35
Howth 36

RAPID + SMART + Luas X

3 Steps for Effective Integrated Dublin Transport

South Metropolis – Airport Rapid Transit

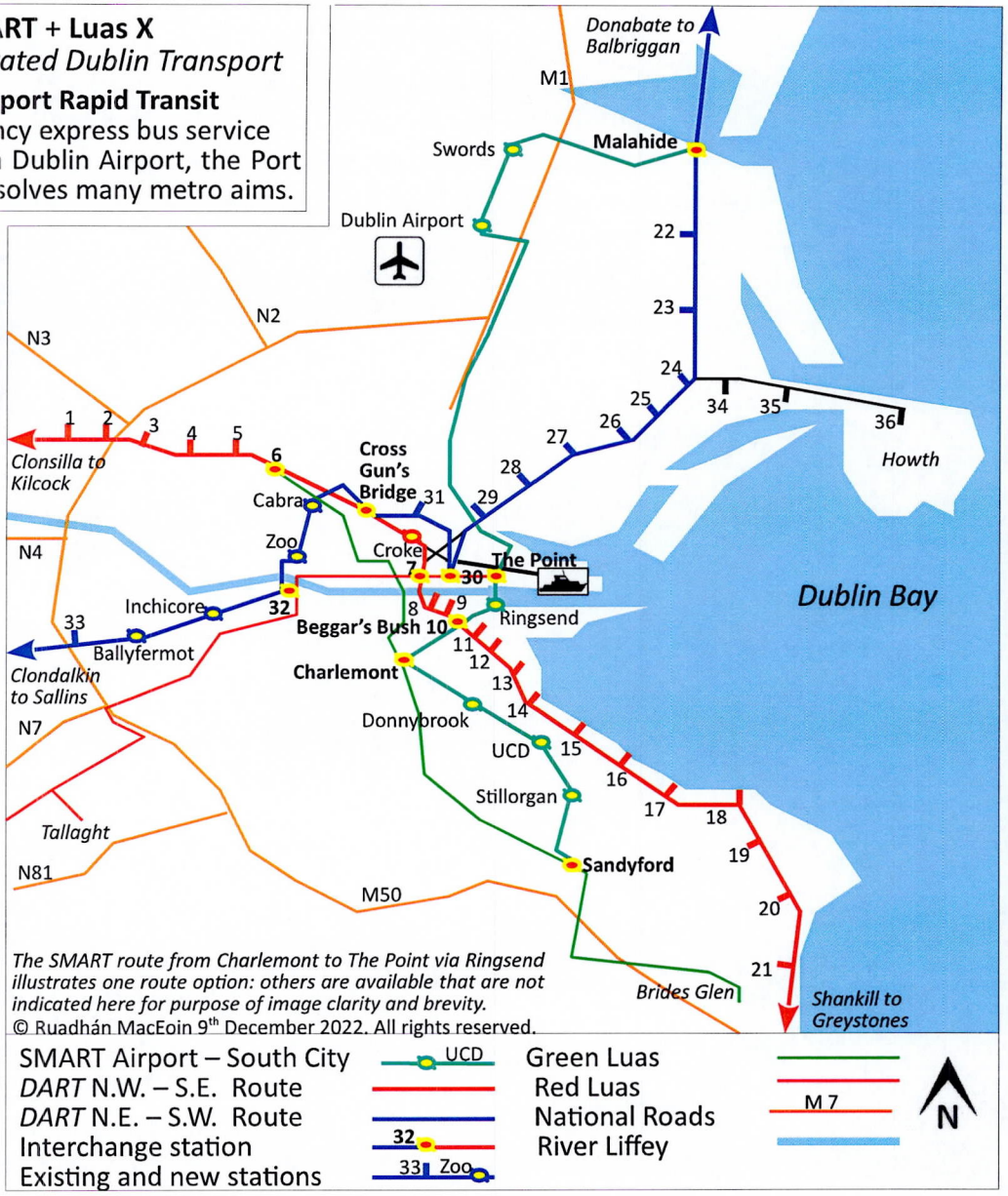
New high quality, high frequency express bus service Links Swords to Sandyford via Dublin Airport, the Port Tunnel, and the south city. Resolves many metro aims.

Dublin Airport to:	*Minutes*
Red Luas @ The Point	*15*
DART @ Grand Canal Dock	*20*
Green Luas @ Charlemont	*25*
University College Dublin	*35*
Green Luas @ Sandyford	*45*
Swords to Sandyford	*55*

Features:
– Route via Port Tunnel
– Lower buses to fit bridges

Swords – Sandyford
New SMART BRT Route

Malahide
Swords
Dublin Airport
The Point
Ringsend
Beggar's Bush 10
Charlemont
Donnybrook
UCD university
Stillorgan
Sandyford



The SMART route from Charlemont to The Point via Ringsend illustrates one route option: others are available that are not indicated here for purpose of image clarity and brevity.

North West – South East

Kilcock
Maynooth
Leixlip Louisa Bridge
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Coolmine 1
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Pelletstown 5
Broombridge 6
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Shankill
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North East – South West

Balbriggan
Skerries
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Inchicore
Ballyfermot
Park West 33
Clondalkin & Fonthill
Adamstown
Celbridge & H/hatch
Sallins & Naas

Howth Branch

Bayside 34
Sutton 35
Howth 36

RAPID + SMART + Luas X

3 Steps for Effective Integrated Dublin Transport

Luas X

New Green Line Extension to Airport & Swords to link Dublin's Luas on the north side to airport and Swords, complementing the SMART / South Metropolis – Airport Rapid Transit service to the south side.

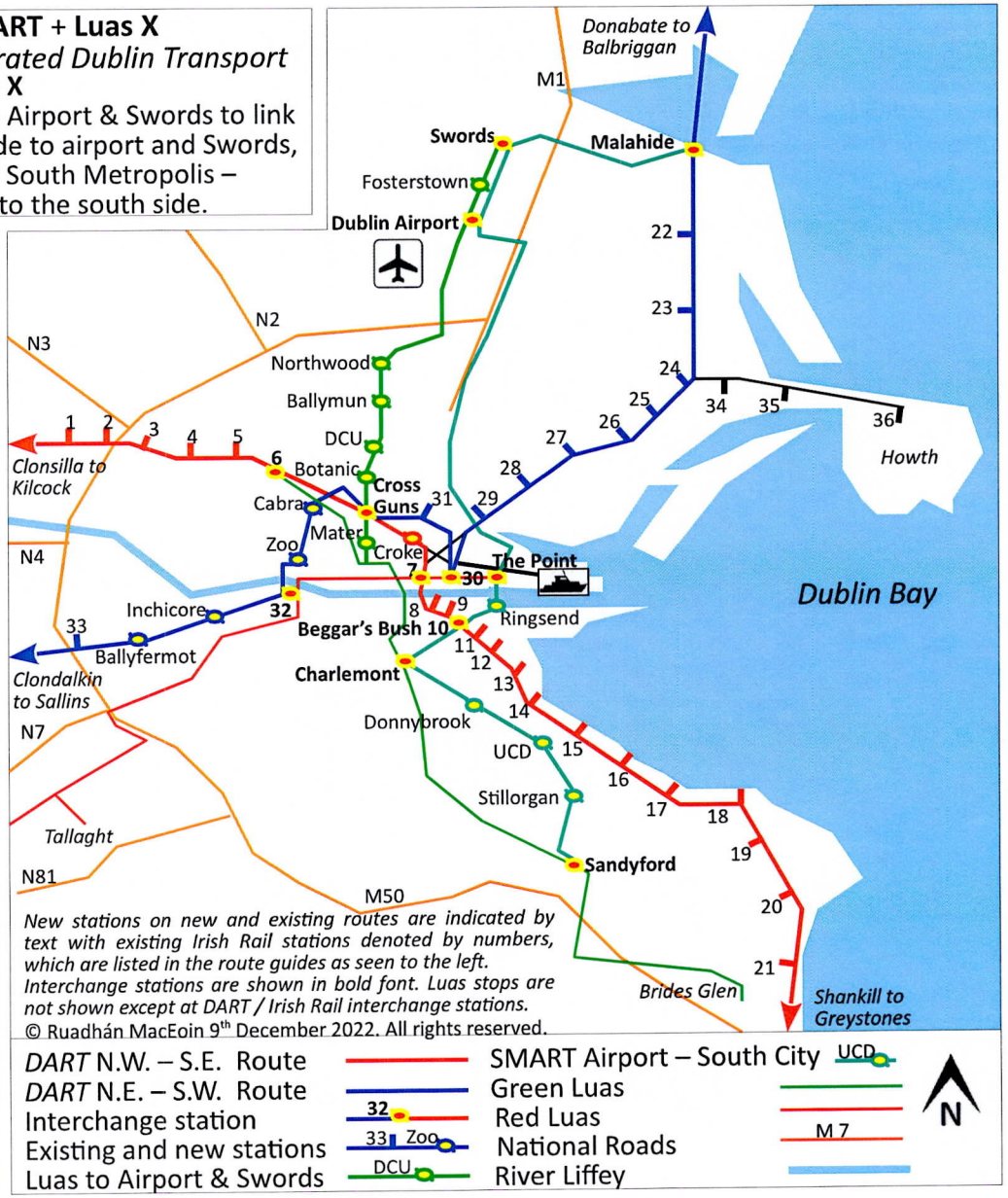
Swords – Sandyford

Integrated Transit Corridor

New Luas X Route

New SMART BRT Route

Malahide
Swords
Fosterstown
Dublin Airport
Northwood
Ballymun
DCU university
Botanic
Cross Gun's Bridge
Mater
Dominick Street
(existing Luas line)
The Point
Ringsend
Beggar's Bush 10
Charlemont
Donnybrook
UCD university
Stillorgan
Sandyford



New stations on new and existing routes are indicated by text with existing Irish Rail stations denoted by numbers, which are listed in the route guides as seen to the left.
Interchange stations are shown in bold font. Luas stops are not shown except at DART / Irish Rail interchange stations.

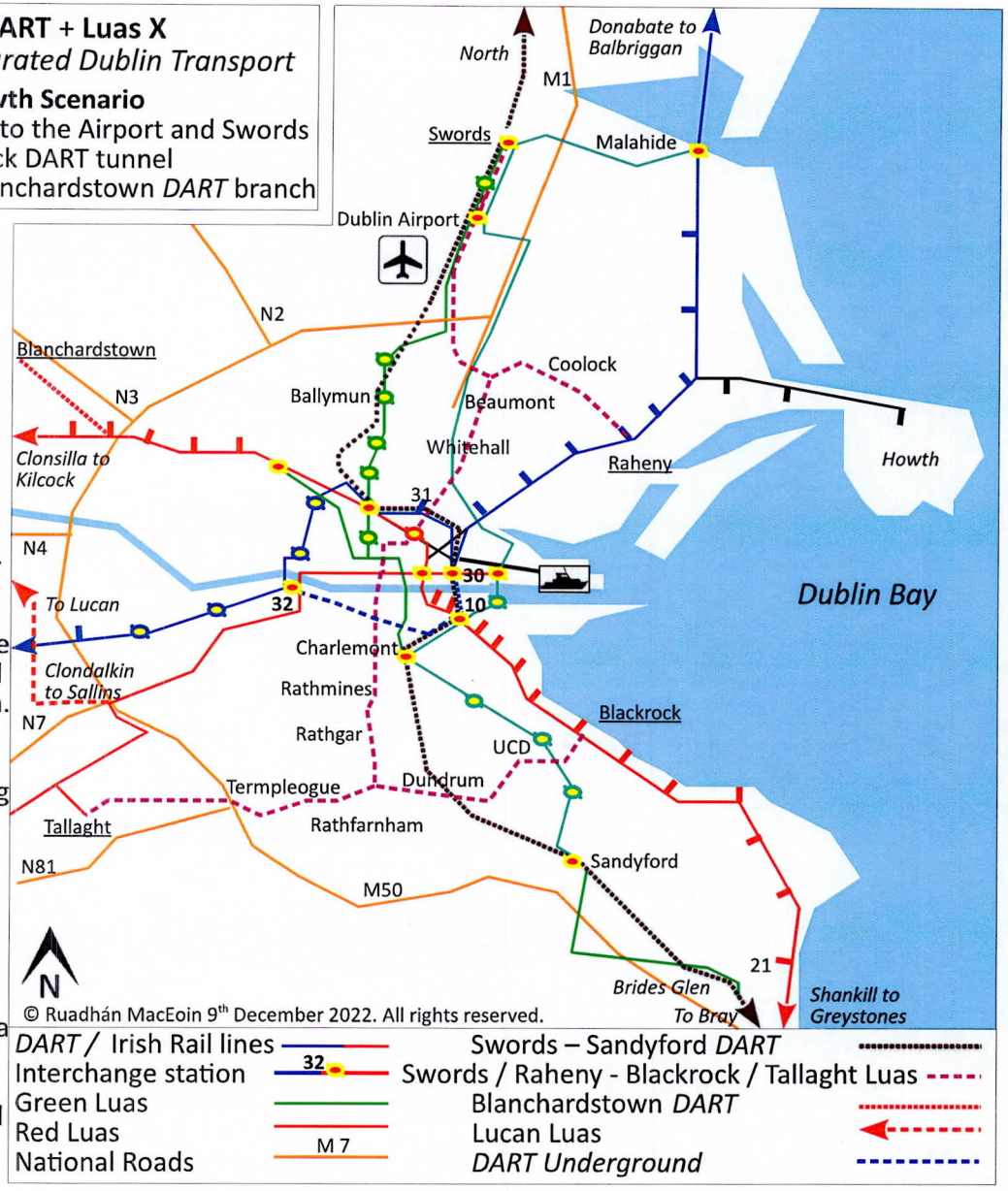
DART N.W. – S.E. Route
DART N.E. – S.W. Route
Interchange station
Existing and new stations
Luas to Airport & Swords

SMART Airport – South City
Green Luas
Red Luas
National Roads
River Liffey

N

Going Forward

RAPID + SMART + Luas X
3 Steps for Effective Integrated Dublin Transport
Future Growth Scenario
Additional Luas and or DART to the Airport and Swords
Docklands – Grand Canal Dock DART tunnel
Luas network extensions, Blanchardstown *DART* branch



Preceding images illustrate a cost effective way to resolve policy aims so that the airport and Swords would be connected into Dublin by an integrated transit corridor featuring a Luas line extension on the north of the city with a rapid bus service to the south side.

Yet alone, these are really only answers to yesterday's problems – and cannot cope for ongoing growth in the city and around the airport. In parallel, the Port Tunnel is likely to become more congested over time – and so the efficacy of any dependent system will diminish as time passes. Hence SMART is put forward as an interim provision that will need to be surpassed. As it will be necessary to create more capacity on the links between the airport and the city, choice of mode again becomes vital. Buses are attractive for Port Tunnel use, but less so otherwise. After 30 years, buses become more expensive than trams, arising from turnover of vehicles, increased labour and associated pension costs etc. Hence rail based modes are more appealing over medium and longer terms.

Accordingly, two options are apparent. Firstly, as the 'forgotten railway' enables traffic to be diverted away from the Drumcondra rail line, this opens a pathway from both Connolly and Docklands to Cross Gun's Bridge, from where a link to the airport and Swords could branch. The railhead at Docklands (30) could be extended by 1 kilometre to Grand Canal Dock (10), which would also enable *DART* services on the blue line to twice interchange with the Red line *DART* services. Logically, this could be extended to Charlemont, from where the existing Green Line Luas could be upgraded to *DART* so as to take services to Sandyford and ultimately on to Bray if desired. However, tunnelling would be required from Cross Gun's Bridge towards the airport, and from Docklands to Grand Canal Dock – and then onto Charlemont if wanted. This line could also provide part of the pathway for a *DART Underground* link to Heuston if that becomes desirable, reducing the overall build needed.

A second option would be development of a second Luas line from Swords and the airport in through the city so as to form a parallel corridor to the Green Luas Line. This would cost a fraction of the tunnelling associated with the first proposition, and could serve more areas, relieve crowding on the Green Luas line – but would have less capacity. As shown, a Luas line towards Lucan (shown) is thought desirable, and in line with official strategy – as would be a Luas extension to Finglas (not shown for purpose of image clarity). Elsewhere, it is thought a short *DART* line extension to Blanchardstown would also be very desirable.