AECOM Imagine it. Delivered.

Docklands Station Options Study
Options Sift 1 Report

National Transport Authority

20th December 2018

Quality information

Prepared by	Checked by	Verified by	Approved by
			
Edwin Marks Associate Director, Transportation	Claire Falkiner, Associate Director, Transportation	Damien Lambert, Associate Director, Transportation	Derval Cummins, Director, European Advisory

Revision History

Revision	Revision date	Details	Authorized	Name	Position
2	03 Dec 2018	Initial issue		Derval Cummins	Director, European Advisory
2	20 Dec 2018	Issue 2		Derval Cummins	Director, European Advisory

Prepared for:

National Transport Authority

Prepared by:

Edwin Marks
Associate Director, Transportation
M: +44 (0) 7921 646147
E: edwin.marks@aecom.com

AECOM Ireland Limited
4th Floor
Adelphi Plaza
Georges Street Upper
Dun Laoghaire
Co. Dublin A96 T927
Ireland

T: +353 1 238 3100
aecom.com

Executive Summary

An assessment is in progress to identify the optimal solution for a DART station in the Docklands/North Lotts area. The process of assessment is divided into distinct stages consisting of:

- Sift 1 assessment
- Sift 2 assessment
- Identification of a preferred solution

This report outlines the approach and findings of the Sift 1 stage of the assessment. The assessment involved the identification of a 'long list' of site options at a joint workshop on 8th of November attended by AECOM, the National Transport Authority and Irish Rail. Eleven site options were identified for consideration on the long list of options for assessment.

These site options were then subject to a 'pre-assessment' using a range of high level criteria. During this analysis site options were discounted for one or more of the following reasons:

- It was not practicable to develop the site option further due to a significant planning/land use issue; or
- It was not practicable to develop the site option further due to a significant environmental issue, for which there was no clear means of mitigation; or
- A nearby site option is as good in some respects and no worse in any respect. This criteria requires some consideration of the technical difficulty in building a station on the site.

All options identified were assessed against these criteria in a consistent manner.

Sites which passed this pre-assessment were then subject to further analysis to determine the technical feasibility of options.

Based on this approach four of the long list site options have been recommended for further assessment as part of the Sift 2 stage.

Site	Verdict	Reason
A: Existing Docklands station site	Take forward	
B: East of Spencer Dock, north of Mayor Street Upper	Take forward	
C: East Wall Yard	Take forward	
F: Ferry Terminal	Discard	No better than C
G: Elevated over Spencer Dock Luas	Discard	Not technically feasible
H: North Wall Quay over Liffey	Discard	Planning and environmental issues
J: Royal Canal south of Sheriff Street Upper	Discard	Planning and environmental issues
K: Samuel Beckett Bridge	Discard	Planning and environmental issues
L: West of Spencer Dock, north of Mayor Street Upper	Discard	Planning issue, no better than M
M: New Wapping Street	Take forward	
N: Mayor Street Upper and Castleforbes Road	Discard	No better than M
P: Combination of A and J	Discard	Planning and environmental issues

Table of Contents

Figures

Tables

1. Introduction

1.1 Study Wider Context

The National Transport Authority (NTA) has appointed AECOM to undertake a Docklands Station Options Study to determine the optimal location and layout of Docklands DART Station.

This study is one of a number of elements of the DART Expansion programme. DART Expansion falls within the period of the National Development Plan 2018–2027. It includes investment in new trains, new stations, electrification, and other infrastructure enhancements, in addition to major station capacity enhancements at Connolly Station. This series of projects is to support a planned future service requirement of up to 44 trains per direction per hour (tpdph) travelling into the Connolly/Docklands area, from the Northern, Maynooth and Phoenix Park Tunnel lines. Figure 1 shows the location of the existing Docklands station in relation to the various routes feeding into the area. The existing Docklands station does not have the connectivity or the capacity to accommodate the planned future service requirement. The station is not linked to the Northern or Phoenix Park lines, and has only 2 platforms.

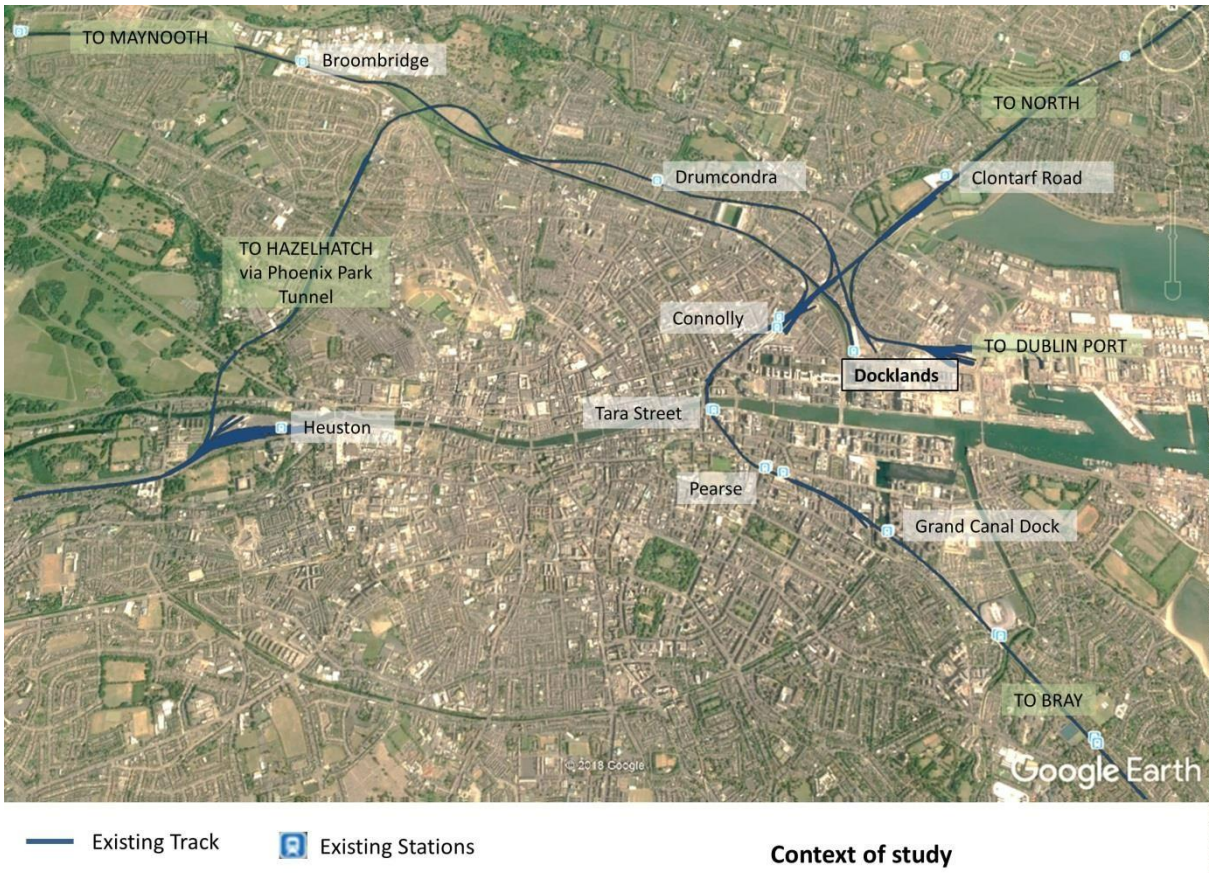

Figure 1: Existing Docklands station in the context of the Dublin rail network

1.2 Docklands Station Options Study Objectives

The overriding objectives stated within the client's brief[1] are:

[1] Tender and Schedule for The Provision of Engineering Consultancy Services for Docklands Station Options Study

- To identify the optimal location and layout of Docklands Station with to the aim of achieving the minimum train capacity requirement, which would best serve the needs of the Docklands area and maximise interchange potential with the Luas; and
- To carry out a comprehensive study for the Docklands Station and how it is accessed, including all connecting rail alignments from the DART radial routes bounded by and including Newcomen, North Strand and East Wall Junctions and freight traffic from East Wall Yard. This study will take cognisance of the station's interface with a potential future DART Underground Station and alignment.

1.3 Sift 1 Report Context

This Sift 1 report covers the initial stages in the establishment of the Emerging Preferred Option for Docklands Station. The final Docklands Station Options Report will cover the whole study process, as set out in Figure 2.

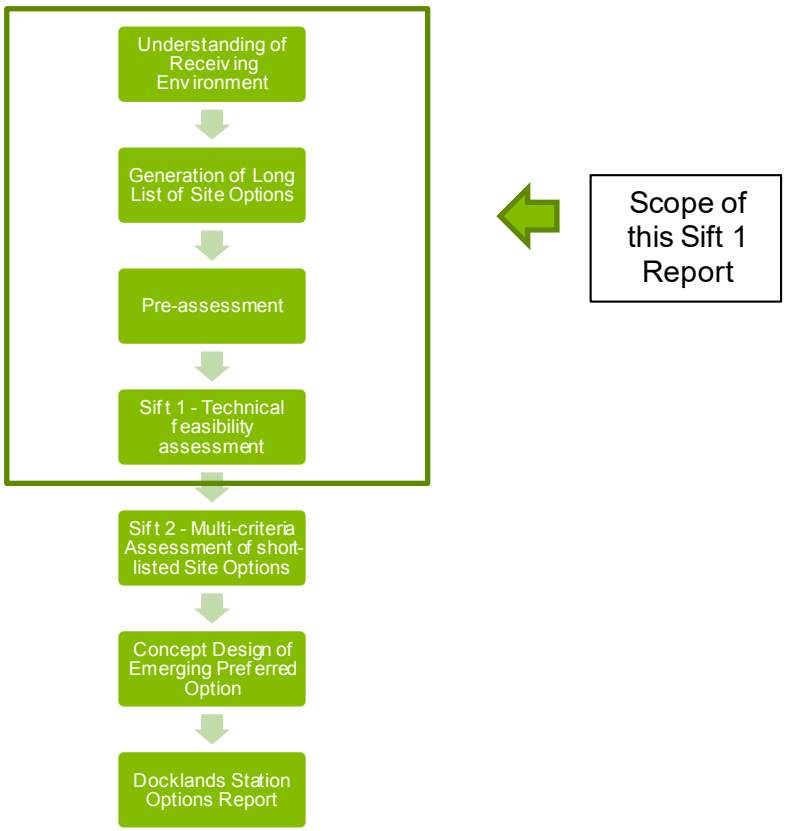

Figure 2: Study Process

This report describes:

- The issues and constraints within the receiving environment, which have been applied in the sifting process to date or are expected to be applied during the course of the study (section 3);
- The work undertaken to generate a long list of station sites which potentially satisfy the study objectives, together with a high level pass/fail pre-assessment of certain sites not being considered for further development (section 4);
- The high level technical feasibility of options, as carried out on those sites which passed the pre-assessment criteria, providing justification for one further site to be excluded from consideration (section 5); and
- The short list of sites recommended to be taken forward for more detailed assessment during Sift 2.

2. Methodology

2.1 Option Generation

The AECOM project team of senior engineering, planning and rail operating professionals undertook an initial desktop identification of site options that could plausibly meet the project objectives; this included site options with space to provide several platforms of the required length. Following this review, the AECOM project team made a site visit on 7th of November 2018. A collaborative workshop took place the following day, with members of the NTA client team and Irish Rail contributing their considerable experience in transport option generation, and their detailed knowledge of the previous engineering and planning studies in the area. This discussion led to some slight modifications to the original list and the addition of further site options. This resulted in a long list of site options to be included in the Sift 1 assessment.

2.2 Pre-Assessment

Further information was gathered following the workshop to inform option assessment. Each long list site option was assessed in a consistent manner against three pass/fail criteria:

- The site option should not be developed further due to a significant planning/land use issue; or
- The site option should not be developed further due to a significant environmental issue, for which no clear means of mitigation exists; or
- A nearby site option is as good in some respects and no worse in any respect. This criterion requires some consideration of the technical difficulty in building a station on the site.

It is recognised that this pre-assessment has an element of subjectivity, and that elements of the assessment process could potentially be used again during the Sift 2 multi-criteria analysis. The purpose of the pre-assessment is to rule out site options which are considered unlikely to progress through to a Railway Order.

2.3 High Level Technical Feasibility

The site options which passed the initial pass/fail criteria were subject to a high level assessment of technical engineering feasibility. This was again assessed on a pass/fail basis.

3. Issues and Constraints

This section describes the issues and constraints identified to date within the receiving environment. These issues and constraints are taken into account in the Sift 1 assessment and will form inputs to the development of the short list of sites for the Sift 2 options.

3.1 Planning and Environmental

This section sets out the key planning and environmental issues which will need to be considered and includes excerpts from the relevant land use zoning maps for the study area. A more detailed review will be carried out for the sites taken forward to Sift 2.

The main issues within the study area from a planning perspective are summarised below.

- Zoning;
- Conservation areas;
- Protected structures; and

- Zones of archaeological interest.

A high-level desktop review indicates there are no Special Areas of Conservation, Special Protection Areas or Natural Heritage Areas within the study area, therefore biodiversity is not considered relevant to the assessment of station sites. Similarly, the impact on air quality, flora and fauna and soil and geology is expected to be similar across all sites therefore these factors are not considered further during this study. Noise and vibration and hydrology may be differentiating factors and will be considered in greater depth during the Sift 2 process.

3.1.1 Zoning

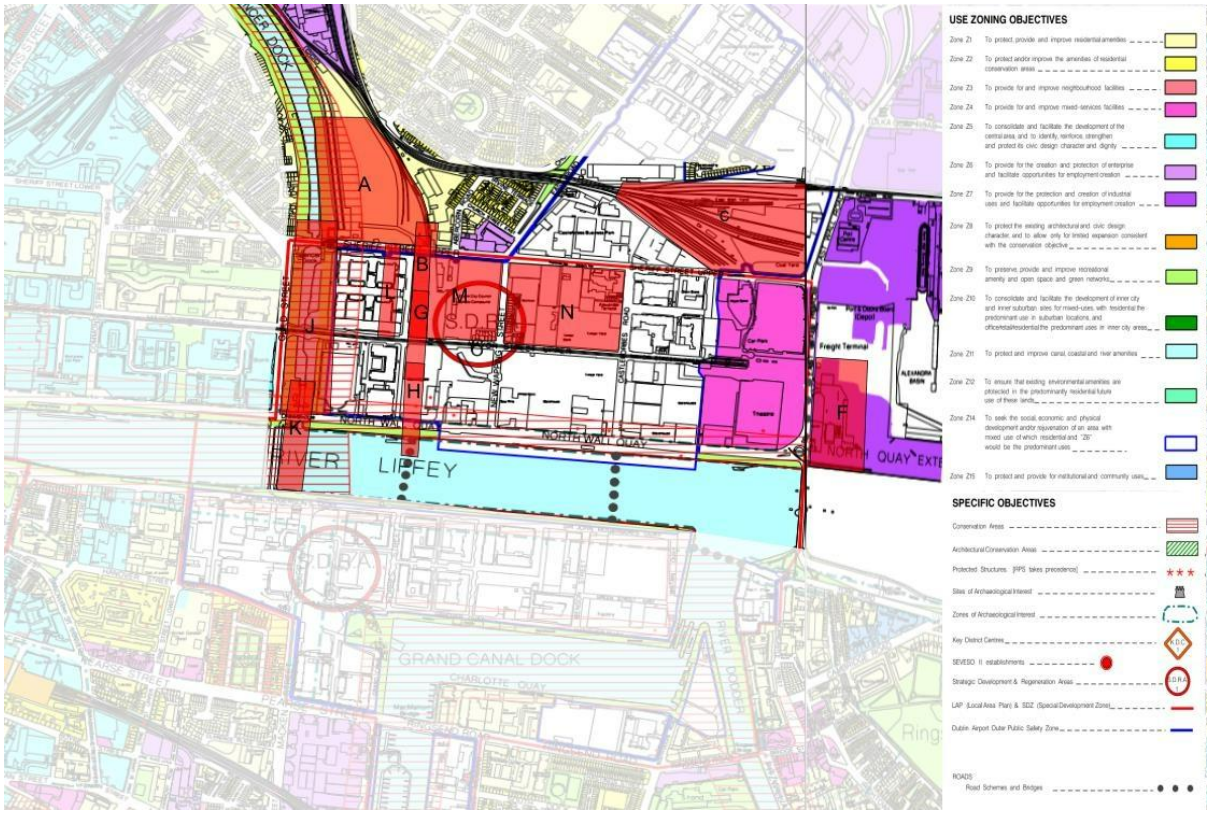

Figure 3: Study Area Zoning Map[2]

The relevant development plan for the study area is the Dublin City Development Plan 2016-2022. The existing Docklands Station site and the lands to its immediate east are zoned as Z1 (residential) and the zoning objective is:

"To protect, provide and improve residential amenities".

The adjoining lands to the west of Docklands Station are zoned as Z9 (green network) and Z11 (to protect and improve the Canal). The lands adjoining the station to the west and its immediate south are also located within a Conservation Area.

The remainder of the study area is predominantly located within Strategic Development and Regeneration Area (SDRA) 6 and is zoned as Z14. SDRAs are key sites, identified in the Dublin City Development Plan 2016 – 2022 as sites capable of accommodating significant housing and employment within the city.

The zoning objective for Z14 zoned lands is:

"To seek the social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and 'Z6' would be the predominant uses"

[2] Source: Dublin City Development Plan 2016 – 2022 Map Set E

A large portion of the study area is also located within the North Lotts and Grand Canal Dock (Docklands) Strategic Development Zone (SDZ). SDZs are sites that are deemed to be of economic or social importance to the State, designated so at Ministerial level. The Docklands SDZ was approved by An Bord Pleanála in 2014 and has the potential to facilitate:

- 2,600 residential units;
- 15,000 – 20,000m^2 of commercial retail;
- 305,000 – 360,000m^2 commercial/office;
- 13,000m^2 of new parks.

Any potential relocation of Docklands Station will need to comply with the land use zoning and site specific objectives of the preferred site and assist with delivering the aims of the SDZ and SDRA designations for sites within the boundaries of same.

3.1.2 Conservation Areas

Conservation Areas have been designated by Dublin City Council in recognition of their special interest or unique historic and architectural character and important contribution to Dublin's heritage. Policy CHC4 of the Dublin City Development Plan 2016 – 2022 aims to:

Protect the special interest and character of all Dublin's Conservation Areas. Development within or affecting a conservation area must contribute positively to its character and distinctiveness.

Development will not:

- *Harm buildings, spaces, original street patterns or other features;*
- *Involve the loss of traditional, historic or important building forms, features, and detailing including roofscapes, shop-fronts, doors, windows and other decorative detail;*
- *Introduce design details and materials, such as uPVC, aluminium and inappropriately designed or dimensioned timber windows and doors;*
- *Harm the setting of a Conservation Area; or*
- *Constitute visually obtrusive or dominant forms.*

Design proposals being put forward within Conservation Areas will need to be cognisant of this policy and the relevant design guidelines set out in the Dublin City Development Plan 2016 – 2022. Designs that compromise the character of Conservation Areas are unlikely to be approved by Dublin City Council.

3.1.3 Built Heritage

There are at least ten protected structures within the study area (demarcated by a red asterisk (*) in Figure 3). Proposals that will have a negative impact or cause physical harm to a protected structure will not be permitted by Dublin City Council.

Dublin City Council's record of protected structures (RPS) will be checked again at Sift 2 to determine if there have been any recent additions to the list that have not yet been shown on the zoning map or online list.

3.1.4 Archaeology

There is a zone of archaeological potential along Dublin's quays (highlighted by the dark green dashed line in Figure 4). Sites that encroach on this area will be reviewed by a qualified archaeologist and may require additional archaeological surveys.

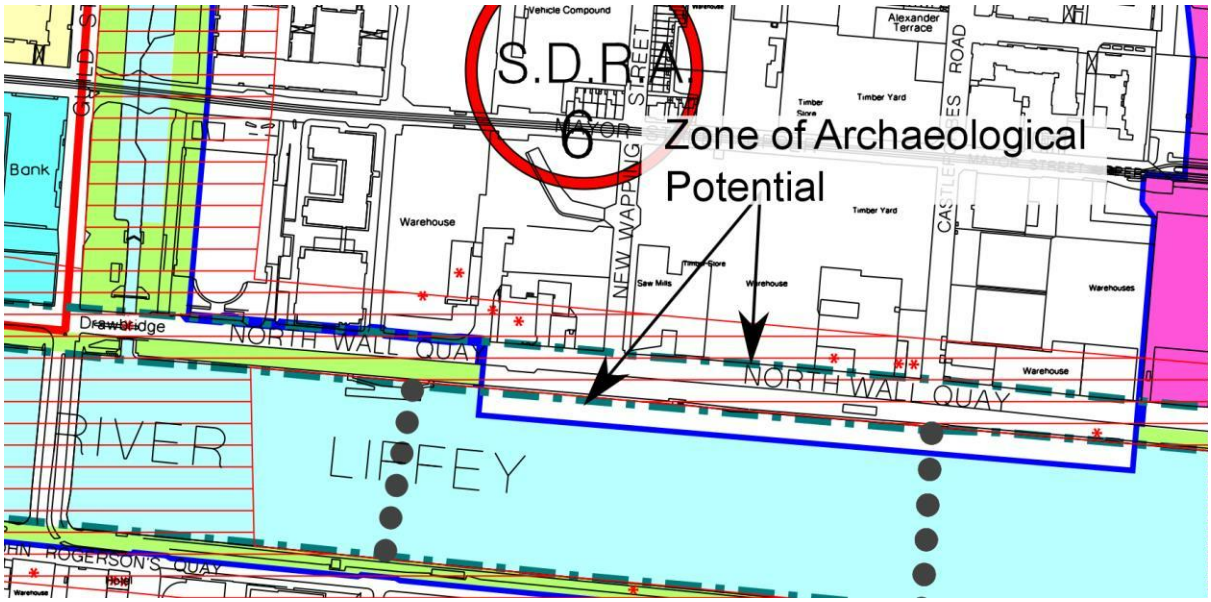

Figure 4: Zone of Archaeological Potential

3.2 Transport Integration

The integration of public transport is one of the cornerstones of local and national transport policy. The existing Docklands Station entrance is located 400m from the nearest Luas stop, Spencer Dock, a distance which adds to the sense of being 'in the middle of nowhere' on arrival at Docklands. There is, therefore, an opportunity to improve transport integration by locating Docklands Station closer to the Luas Red line, and possibly slightly relocating a Luas stop to create a seamless interchange between modes. It should be noted, however, that DART passengers heading for the south and western parts of Dublin City Centre can avail of a train directly serving those areas, and there is interchange prior to arrival at the Docklands terminus (for example Maynooth line passengers can interchange at Broombridge for the Luas Green Line).

The proposed Ringsend Core Bus Corridor passes through the study area. Express buses to/from Dublin Airport, Swords and other parts of North County Dublin via the Dublin Port Tunnel also currently serve the area.

The study area is well served in terms of walking and cycling provision, which will be supplemented by new Liffey crossings connecting the north and south docks.

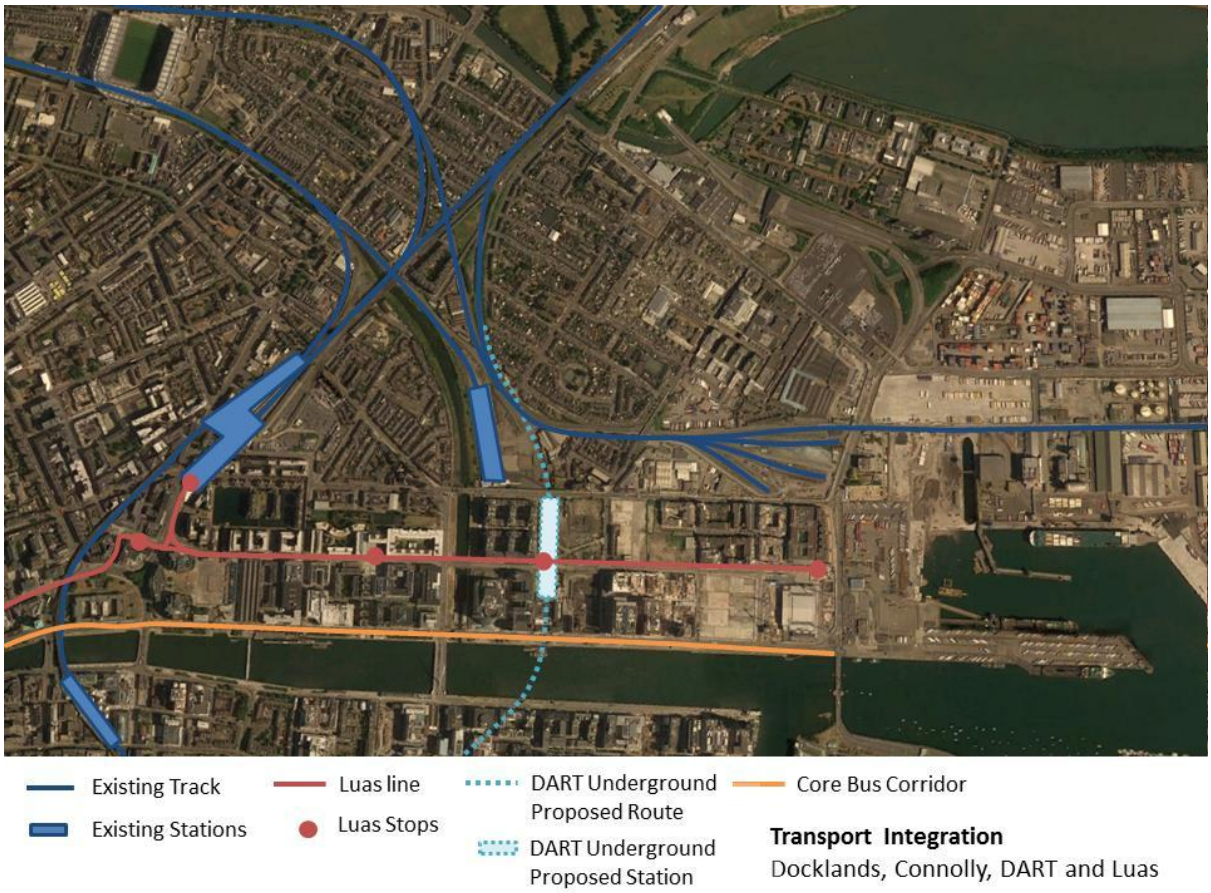

Figure 5: Primary onward transport links in the Docklands area

3.3 Operational

The Appendix to the client's brief states "*The Docklands Station Study shall aim to achieve a target capacity of c.18 tphpd* [trains per hour per direction] *from the combined three radial routes Northern Line, Maynooth Line and Phoenix Park Tunnel Line.*" This implies a flexible layout which can accommodate the 18 trains arriving and departing by various combinations of the three routes, over a 3 hour peak period.

If the layout allows trains to access any platform to/from every route, then four platform faces are considered to be adequate provision for 18 suburban trains turning back in an hour. However, more platforms may be required if some cannot connect to all routes. Conversely, a station with fewer platforms might achieve the objective with measures such as driver step-back[3] For this reason sites smaller or larger than a four-platform station are also considered.

Station platforms are to be a minimum of 174m long. Station platform designs are to take account of the passenger flows resulting from station options and should not be limited to minimum design constraints. Further technical standards are referenced in the client's brief.

Several freight trains per day run to and from the facilities accessed via the tracks on Alexandra Road. The minimum provision for freight within the study area is:

- Single track access between Alexandra Road and the Maynooth, Phoenix Park and Northern routes (this could involve switching between routes at Glasnevin Junction);
- Double track section to be provided for the longest freight trains (450m) to refuge and pass each other between the East Wall Road crossing and any interface to passenger

[3] A practice to reduce turnaround times by having the driver of a previous train positioned at the departure end of the platform to take over an arriving train, rather than expecting the arriving driver to walk the length of the train during turnaround.

trains. This is assumed to be worked manually so applies to a distance between fouling points, with provision for variation in stopping position but no allowance for signalling overlaps;

- Measures such as signals and trapping required to protect passenger trains from freight train movements;
- Safe walkways are required to be constructed for staff to access trains and hand-worked points.

All other rail activities within the study area (specifically engineering in the centre of East Wall Yard and rolling stock storage to the south) will need to be relocated if necessary. The study need not identify alternative sites but should allow an appropriate cost.

3.4 Design

The existing lines in the study area are currently open for freight services and some for passenger services. As noted above, freight trains will continue to access the East Wall Yard and therefore the track alignment will need to be designed to accommodate freight trains. Freight trains generally travel at slower speed and are heavier than passenger trains, so the maximum gradients used on freight lines are typically shallower than those experienced on passenger-only lines. Therefore, the following maximum gradients are recommended:

- Freight / Mixed traffic lines: 1% maximum gradient.
- Passenger only lines: 2.5% maximum gradient, with 3.5% allowed over short distances.

The vertical alignment of the platforms will be limited to a maximum gradient of 0.2%[4]. This minimises the risk of stationary vehicles in the platform rolling away.

These gradient requirements will influence the length of the alignment required in order to provide vertical clearance over features such as highways and watercourses.

The horizontal alignment of the platforms should ideally be straight, to minimise the gaps between train and platform. New platforms may be constructed on radii up to 500m, but this is unlikely to be acceptable and should be avoided where possible[5]. The increased stepping distance at a curved platform is a particular consideration for a busy city station.

[4] Standard I-PWY-1141, Section 2.1.1
[5] Standard I-PWY-1141, Section 2.1.2

3.5 Other Issues

3.5.1 Land Ownership

The approximate CIÉ land ownership boundary is shown in Figure 4. Proposed development outside of CIÉ owned lands is not a reason to discard an option, but will require the landowner's consent or a compulsory purchase order (CPO) of the lands. It should be noted that much of the land in this zone is currently vacant. A coach parking facility is currently occupying the lands immediately to the east of Docklands station.

Figure 6: Approximate CIÉ Land Ownership Boundary

3.5.2 Liffey Crossings

The following issues apply to any structure spanning the Liffey in the Docklands area:

- Moveable structure required, imposing no restriction on vessel height over a channel of at least 32m.
- When closed the structure should provide clearance of at least 3.84m AOD.

3.5.3 DART Underground

The DART Underground project[6] has designed a tunnel ramp approximately following the line of the curve from the Northern line at East Wall Junction down to a portal just north of Church Road Junction. Tracks are proposed to continue in cut-and-cover across the vacant land north of Sheriff Street Upper to a sub-surface station in land east of Spencer Dock. This project has a Railway Order but is not currently going forward. The remit for the Docklands study requires consideration of compatibility with DART Underground but it is agreed this issue should not be a reason to discard options for the Docklands station.

[6] DART Underground Railway Order alignment drawings, DU-RO 106 A-B and DU-RO 106 B-C.

Several of the options described below fall within the footprint of the DART Underground station and/or the portal area. It is expected that the purpose and required functionality of Docklands Station would be superseded if DART Underground went ahead. However, if it was necessary to keep Docklands Station open during the construction of DART Underground, then some of the Underground works might have to be constructed with the station. Further discussion under specific options considers how this issue affects each option.

Additionally, the Railway Order portal design only leaves space for one track each side of the portal in the narrowest part of the railway land. This would significantly constrain capacity for trains between the Northern and Phoenix Park lines and any Docklands station site. This constraint applies to all Docklands options, so is not discussed specifically under each option. While it may be possible to mitigate this issue if the portal was to be moved slightly westward or northward, with some land take to the west, the Docklands study does not consider the issue further.

4. Option Identification and Pre-assessment

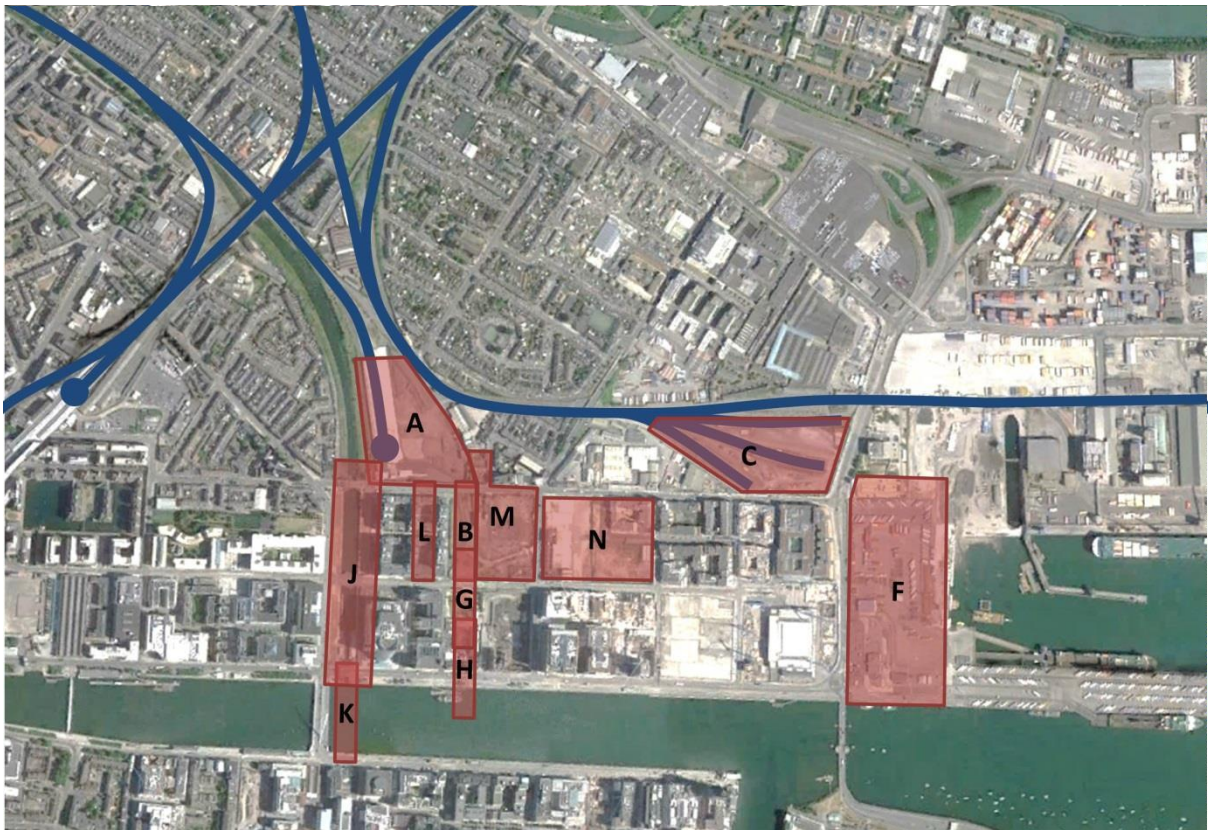

Figure 7: Long list of Site Options identified at workshop

4.1 Overview

Figure 7 shows the broad location of the long list of sites identified during the options identification workshop. The area of the site indicated does not necessarily reflect the expected final footprint of the station, but shows the extent of the site the station could occupy and generally includes the minimum area required for a station with four straight platform faces.

Site C originally generated three separate site options (to include D and E). These were merged during the options generation workshop into a single site option at this stage, on the basis that the assessment of each of the three would be the same at this level of detail. Similarly variants could exist within the broad area identified within other site options. The labels I and O were omitted to avoid confusion with potential future numerical sub-options.

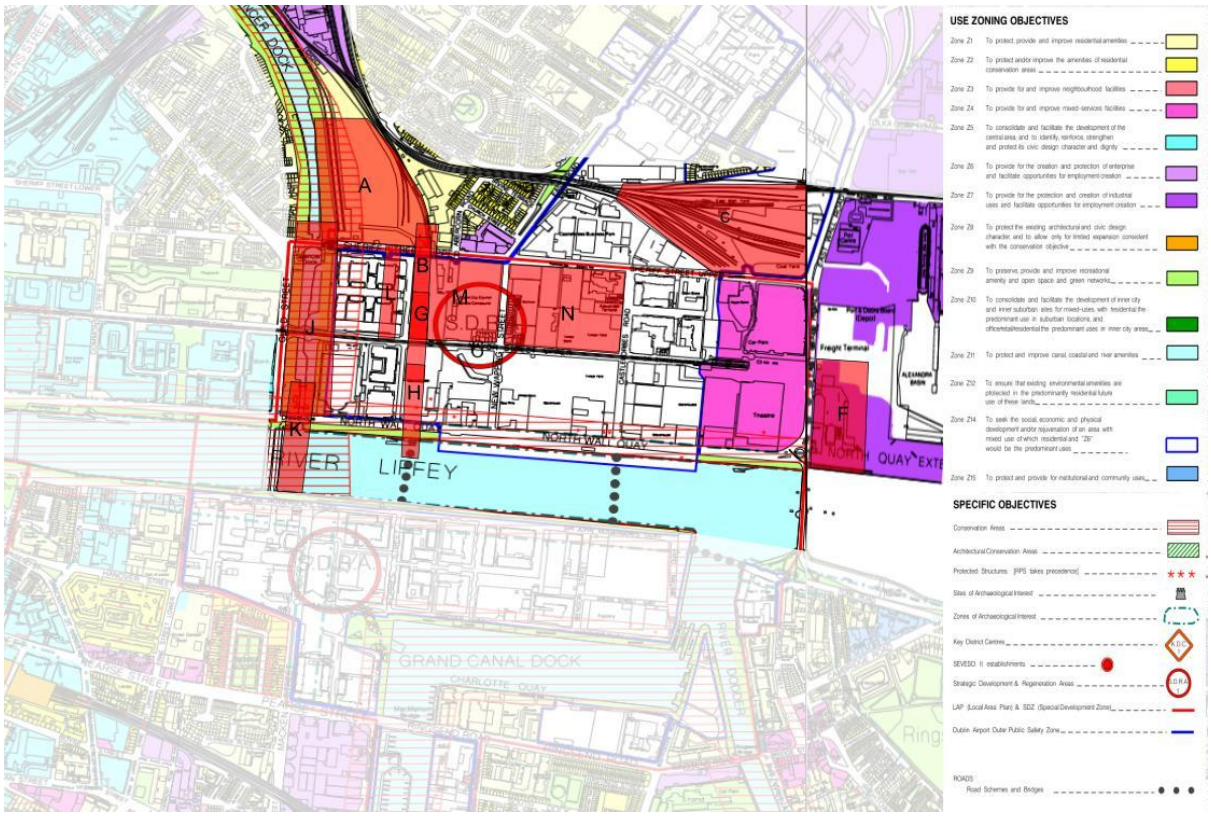

Figure 8: Planning considerations of site options

Figure 8 above shows the general sites of each proposed option overlaid on the Dublin City Development Plan 2016 – 2022 zoning map.

Following the National Transport Authority, Irish Rail and AECOM workshop, further information was obtained on the options. This section discusses those options from the workshop which were assessed as not practicable for further development. The technical feasibility of the options which passed the pre-assessment is discussed in section 5.

4.2 Site F: Ferry Terminal

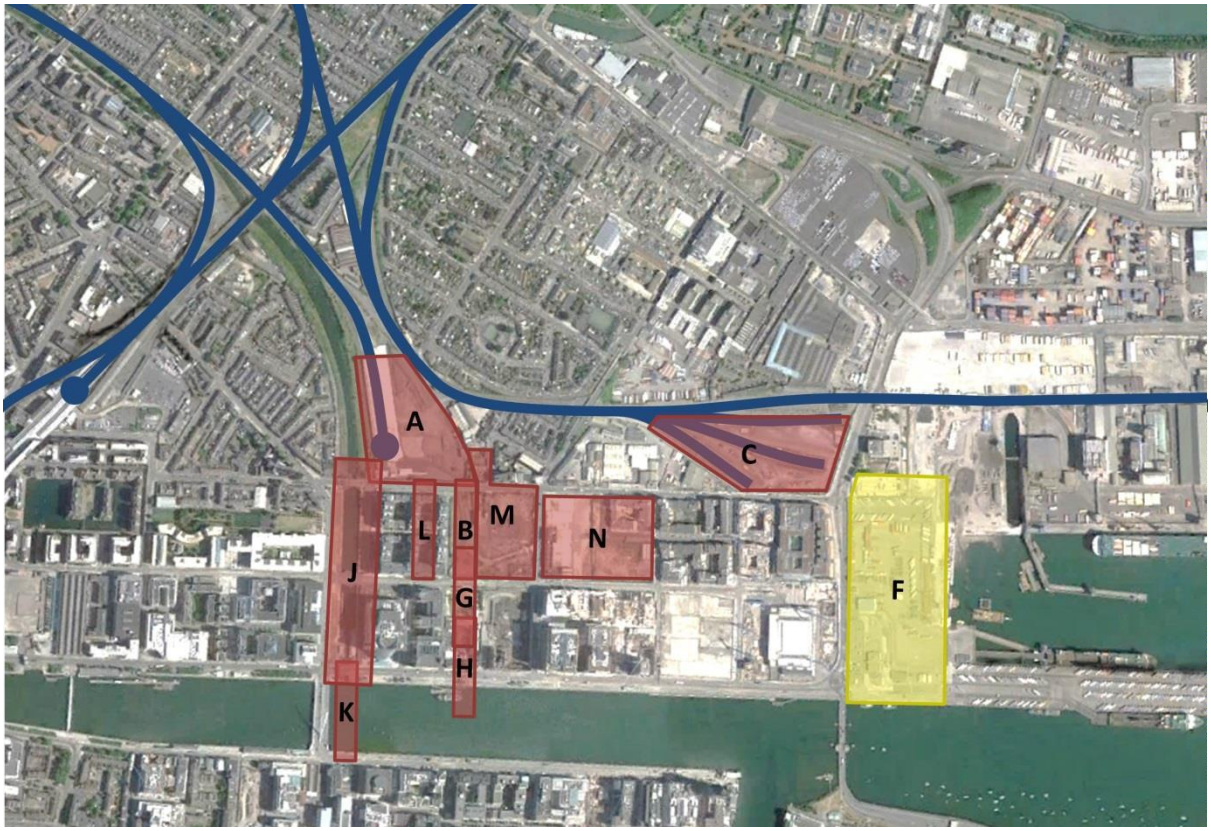

Figure 9: Site F

4.2.1 Commentary

The area east of East Wall Road includes a large, level site currently in use for port activities. In principle, a passenger railway could ramp up in East Wall Yard over East Wall Road. Alternatively the road might be elevated over both the new line and the freight tracks, but interfaces to other roads and buildings make this difficult to achieve. Either existing port activity would have to be relocated, or the station might need to be elevated an a waiting area for road vehicles provided below the station. The site also overlaps the zone of archaeological potential.

To minimise walking distance to the Point Luas stop, the station throat would have to be tightly curved to bring it into a closer north-south alignment east of the Point. This curve and the elevated structure would introduce significant engineering complexity and cost, probably requiring all platform tracks to continue around the curve and over East Wall Road with pointwork in East Wall Yard. The bridge would be long and forbidding for those walking underneath it. Works at Church Road Junction would be the same as Site C, including the potential conflict with DART Underground.

In engineering terms the site is feasible but inferior to Site C due to the additional complexity of crossing East Wall Road. Passenger access is also inferior to Site C, being on the wrong side of the busy East Wall Road and further from Luas and all existing developments. It would also require land purchase, reducing the scope for either port or future residential/commercial development while still taking up a significant part of East Wall Yard.

The site is therefore discarded from consideration on the grounds that Site C is as good or better in all respects.

4.2.2 Assessment

Table 1. Site F Assessment

Criterion (see section 2.2)		Verdict
Significant planning/land use issue?	No	Pass
Significant environmental issue?	No	Pass
Nearby site no worse or better?	Yes	Fail (site C better)

4.3 Site H: North Wall Quay over Liffey

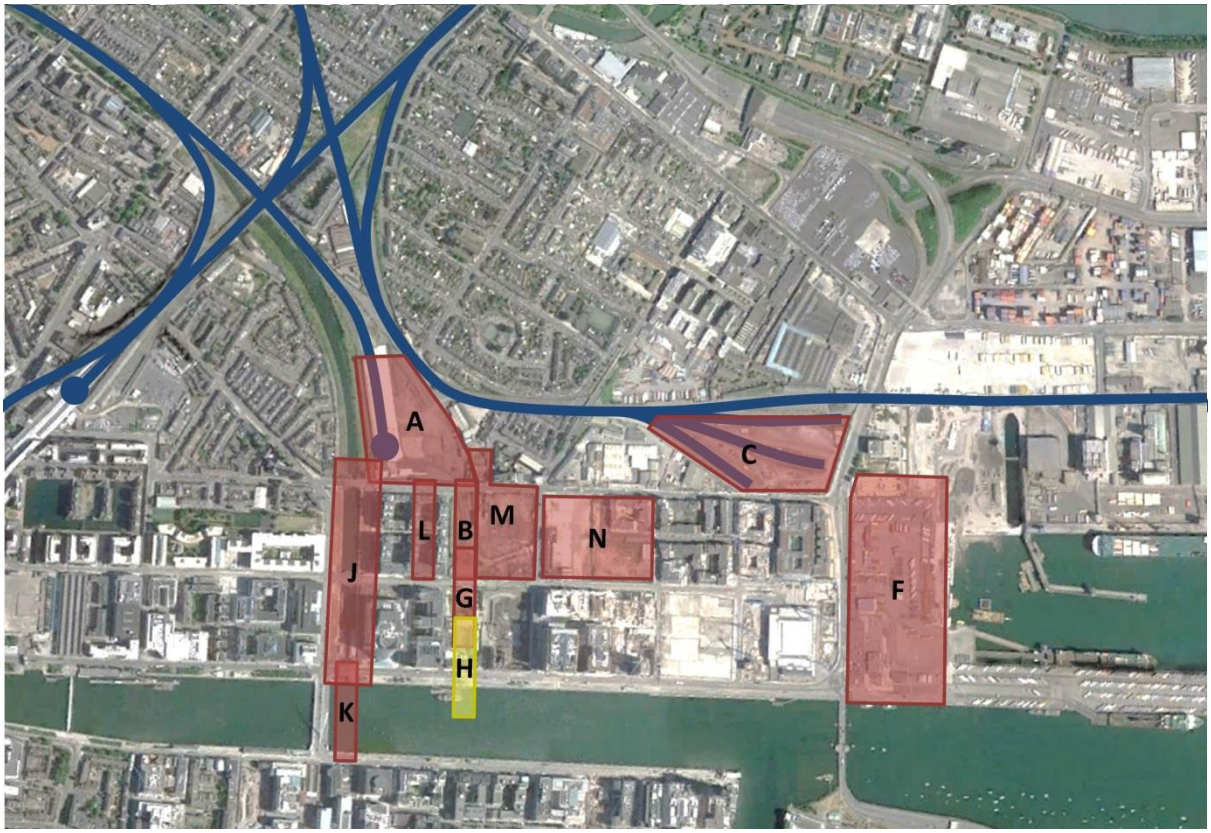

Figure 10: Site H

4.3.1 Commentary

An elevated station extending the whole way across the river was originally considered to give optimum accessibility to the high density employment on the south bank of the Liffey. Information regarding Liffey river navigation (noted in section 3.5.2) was received following the options generation workshop. An elevated station in Site H would therefore have to protrude part way across the Liffey with a pedestrian bridge connecting it to the south banks, in place of the footbridge currently proposed for this location. It is also located within a Conservation Area and Zone of Archaeological Potential (noted in section 3.1) and would severely impact the setting of the former LMS station, a protected structure. Site H is therefore discarded on planning and environmental grounds.

4.3.2 Assessment

Table 2. Site H Assessment

Criterion (see section 2.2)		Verdict
Significant planning/land use issue?	Yes	Fail
Significant environmental issue?	Yes	Fail
Nearby site no worse or better?	No	Pass

4.4 Site J: Royal Canal south of Sheriff Street Upper

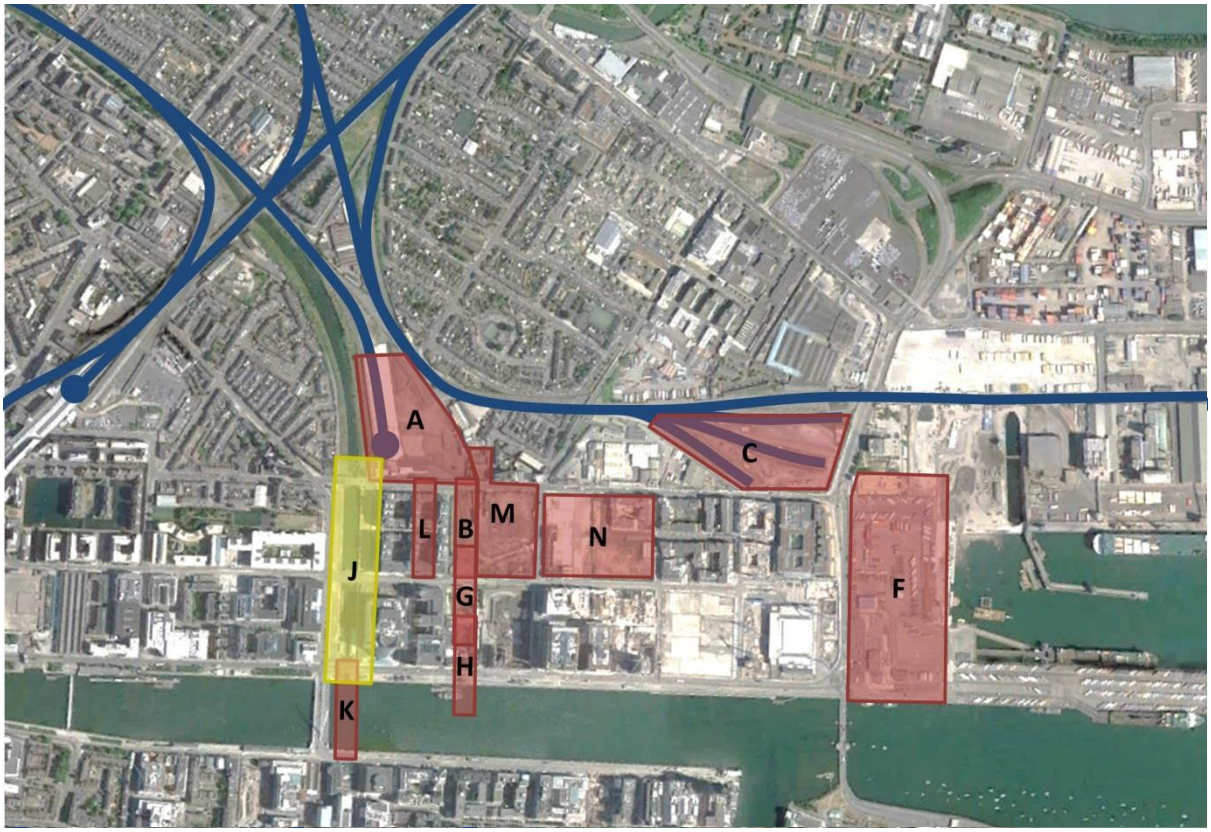

Figure 11: Site J

4.4.1 Commentary

This site straddles the Royal Canal, possibly with two platforms each side. The main entrance would be from Mayor Street Upper, close to the Spencer Dock Luas stop (which could be moved further west) and the north bank Docklands area. Therefore, access to the surrounding area is good, including the south bank via the existing Samuel Beckett Bridge.

There are considerable engineering and environmental challenges associated with this site (noted in section 3). Tracks serving any platforms to the west of the canal would have to cross the site to reach any of the three rail routes, possibly requiring a moveable bridge or a "drop lock" solution that lowers the water level locally. Tracks from at least the Northern and Phoenix Park lines would have to pass over or through the existing station, requiring its demolition or major modification and a reduced service during the transition period. This would probably also require demolition of some of the mixed use Spencer Dock buildings. To pass beneath Sheriff Street Upper the station would have to be below the water table or the street elevated further. If the station extended across Mayor Street as well, the vertical constraints would be more severe.

The environmental impact of this site on the canal in terms of harming the setting of a Conservation Area and constituting a visually obtrusive or dominant form would be significant and considered unlikely to be mitigated through design. It would most likely also require the loss of a historic feature – the bridge where Sheriff Street Upper passes over the canal. A location for the station at the southern extremity of the site would be within the Zone of Archaeological Potential. Therefore this site is discarded on planning and environmental grounds.

4.4.2 Assessment

Table 3. Site J Assessment

Criterion (see section 2.2)		Verdict
Significant planning/land use issue?	Yes	Fail
Significant environmental issue?	Yes	Fail
Nearby site no worse or better?	No	Pass

4.5 Site K: Samuel Beckett Bridge

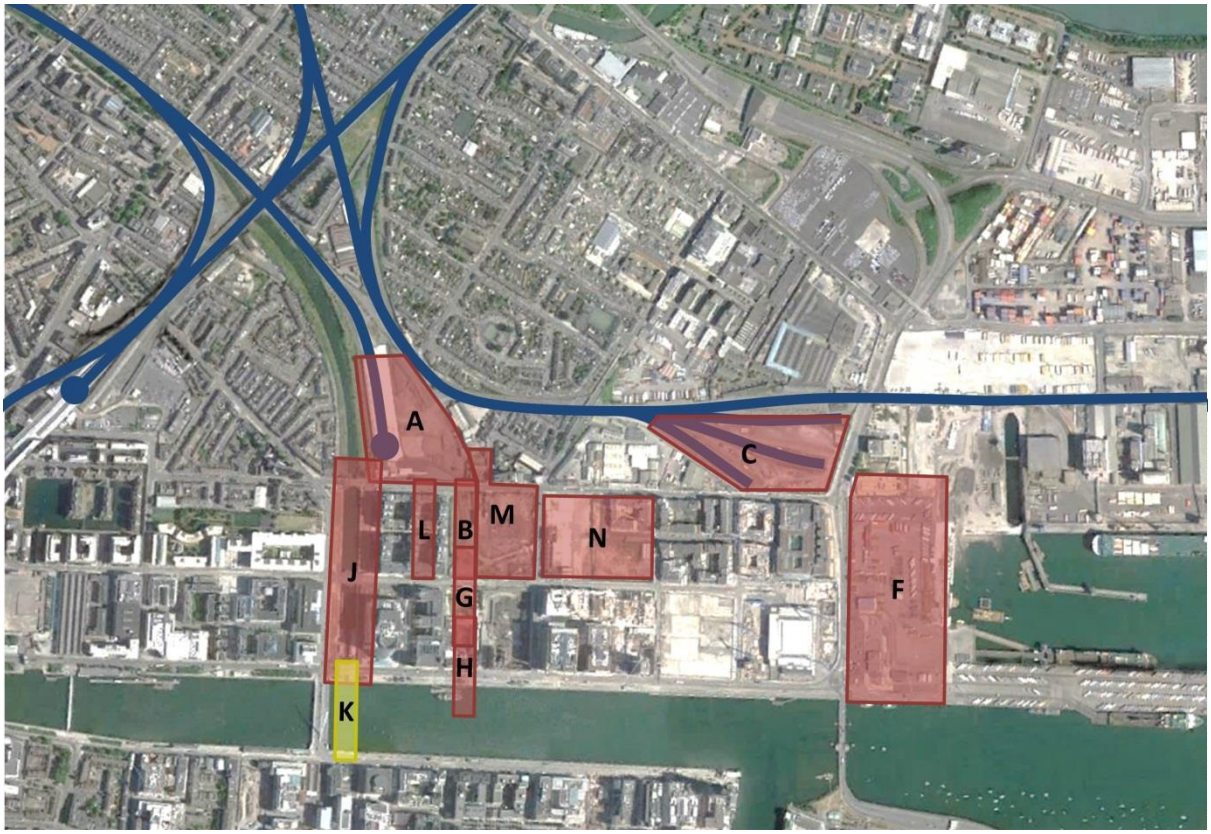

Figure 12: Site K

4.5.1 Commentary

Site K is on a similar alignment to Site J along the Royal Canal but located further south so it straddles the river just east of the Samuel Beckett Bridge. Therefore, like Site J, the environmental impact on the canal in terms of harming the setting of a Conservation Area and constituting a visually obtrusive or dominant form would be significant and considered unlikely to be mitigated through design. It would also impact the lifting bridge where North Wall Quay crosses the canal, a protected structure. There would also be considerable doubt about the feasibility of constructing a station allowing navigation in close proximity to the swing bridge. Therefore this site is discarded on planning and environmental grounds.

4.5.2 Assessment

Table 4. Site K Assessment

Criterion (see section 2.2)		Verdict
Significant planning/land use issue?	Yes	Fail
Significant environmental issue?	Yes	Fail
Nearby site no worse or better?	No	Pass

4.6 Site L: West of Spencer Dock, north of Mayor Street Upper

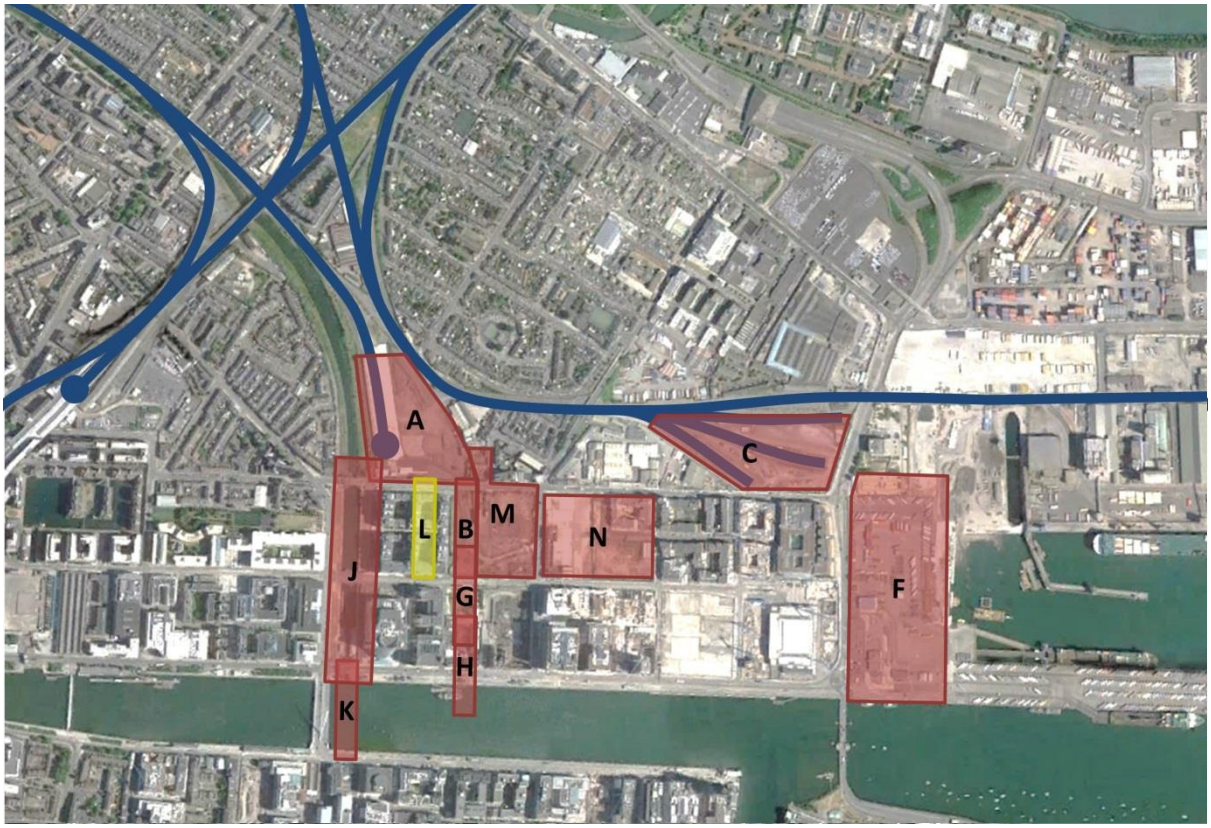

Figure 13: Site L

4.6.1 Commentary

Site L occupies part of the Spencer Dock mixed use buildings, and the demolition of many of these buildings is the principal downside of the site. In engineering terms, it is easier to connect to the three rail routes than option A further north or option B further east, but the need to pass beneath Sheriff Street Upper suggests that like option B the station would be below the water table.

With the principal entrance likely to be on Mayor Street Upper, this site offers good access to the Luas and to the north bank of the Docklands. However, it appears no better than Site M, which has similar engineering and accessibility features but occupies planned rather than existing development.

Therefore the site is discarded on planning grounds and on grounds that it is no better than Site M.

4.6.2 Assessment

Table 5. Site L Assessment

Criterion (see section 2.2)		Verdict
Significant planning/land use issue?	Yes	Fail
Significant environmental issue?	No	Pass
Nearby site no worse or better?	Yes	Fail (site M better)

4.7 Site N: Mayor Street Upper and Castleforbes Road

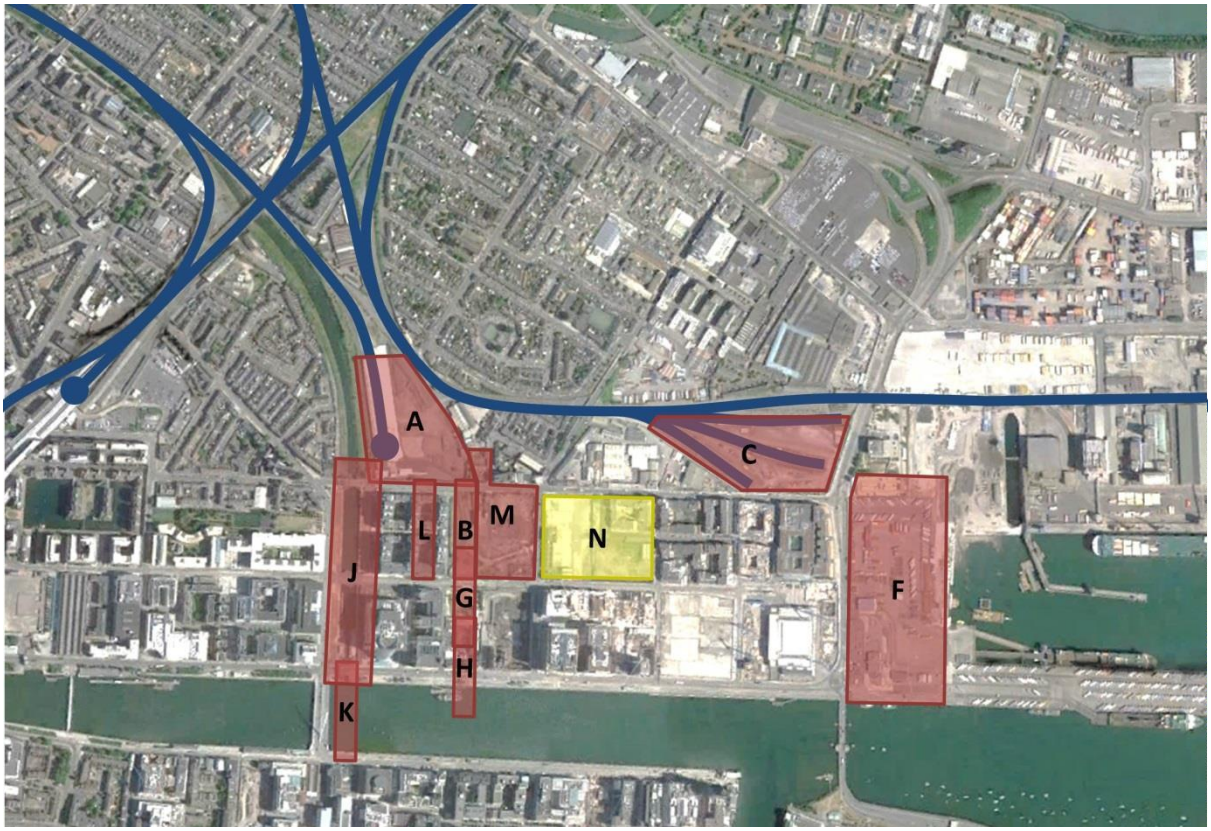

Figure 14: Site N

4.7.1 Commentary

For this site the approach tracks would curve eastwards through the block south of Sheriff Street Upper and west of New Wapping Street, and terminate approximately alongside and parallel to Mayor Street Upper between New Wapping Street and Castleforbes Road. Both blocks have planning permission for a commercial development[7], making Site N worse in this respect than Site M which only affects one block. With Site N there is some conflict with DART Underground if built, and the route would probably have to be elevated to avoid severing of New Wapping Street.

In accessibility terms the likely entrance onto Mayor Street Upper is convenient for most of northern Docklands. A Luas stop is a short walk away but could be relocated or an extra stop added. However, accessibility to Site N is overall slightly worse than for Site B, G or M, as it is slightly further from the centre of northern Docklands and less well placed for river crossings to the south banks.

Site N is therefore discarded on grounds of being worse than Site M in each of planning, engineering and accessibility.

4.7.2 Assessment

Table 6. Site N Assessment

Criterion (see section 2.2)		Verdict
Significant planning/land use issue?	No	Pass
Significant environmental issue?	No	Pass
Nearby site no worse or better?	Yes	Fail (Site M better)

[7] http://www.dublincity.ie/swiftlg/apas/run/WPHAPPDETAIL.DisplayUrl?theApnID=DSDZ2135/18&theTabNo=2

4.8 Site P: Combination of A and J

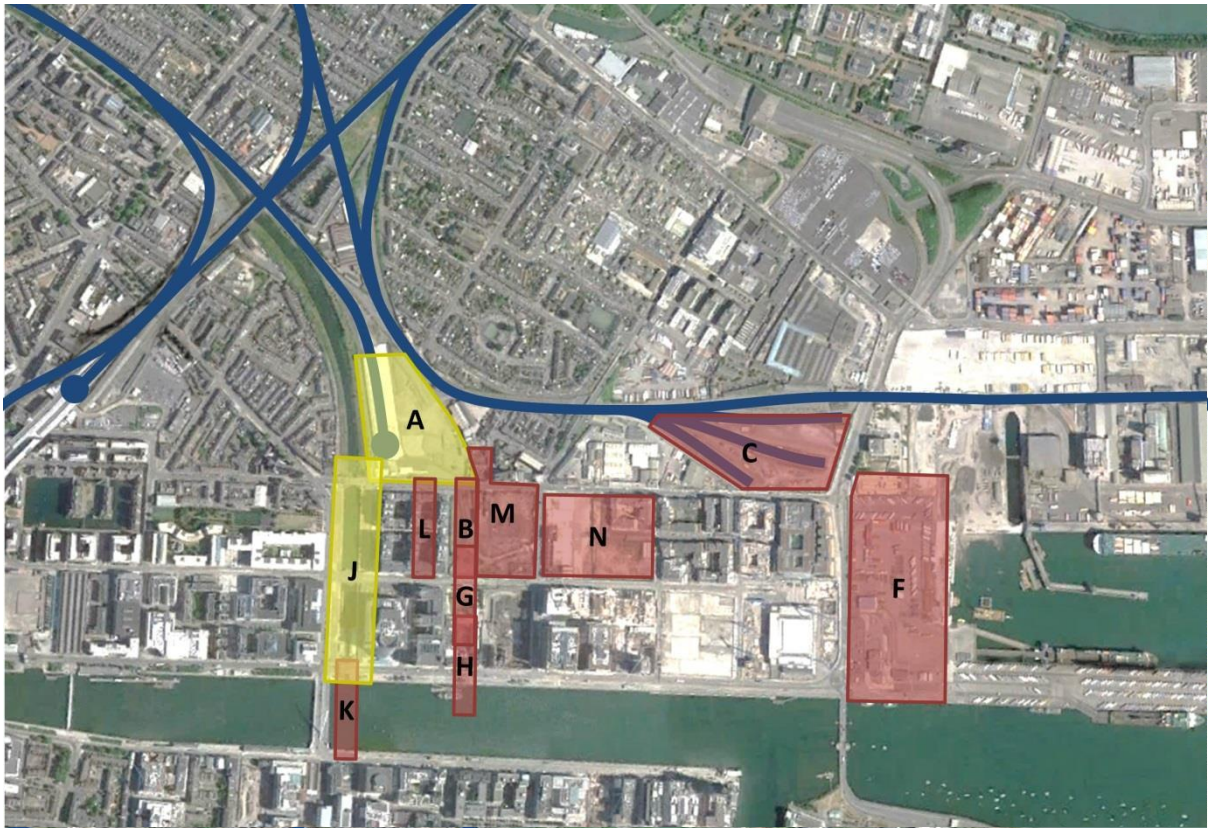

Figure 15: Site P

4.8.1 Commentary

Site P would have some platforms on the existing (A) site north of Sheriff Street Upper, and some alongside the Royal Canal Site J south of Sheriff Street Upper. The station would be integrated by some form of concourse passing under or over Sheriff Street. The south end of the southern platforms would be close to Mayor Street Upper giving good Luas access, but passengers to or from the northern platforms would have a longer walk possibly along the southern platforms. This station layout could be confusing to passengers, although probably no more so than the access to certain platforms at Connolly or Heuston stations.

However, like Site J, Site P is considered to have unacceptable planning/environmental (noted in section 3.1) downsides in relation to impact on the conservation area and the setting of the canal.

4.8.2 Assessment

Table 7. Site P Assessment

Criterion (see section 2.2)		Verdict
Significant planning/land use issue?	Yes	Fail
Significant environmental issue?	Yes	Fail
Nearby site no worse or better?	No	Pass

5. Technical Feasibility Assessment

The sites below are considered practicable on planning and environmental grounds and there is no other site that is equal or better in all respects. Their technical feasibility is therefore assessed in more detail.

5.1 Site A: Existing Docklands station site

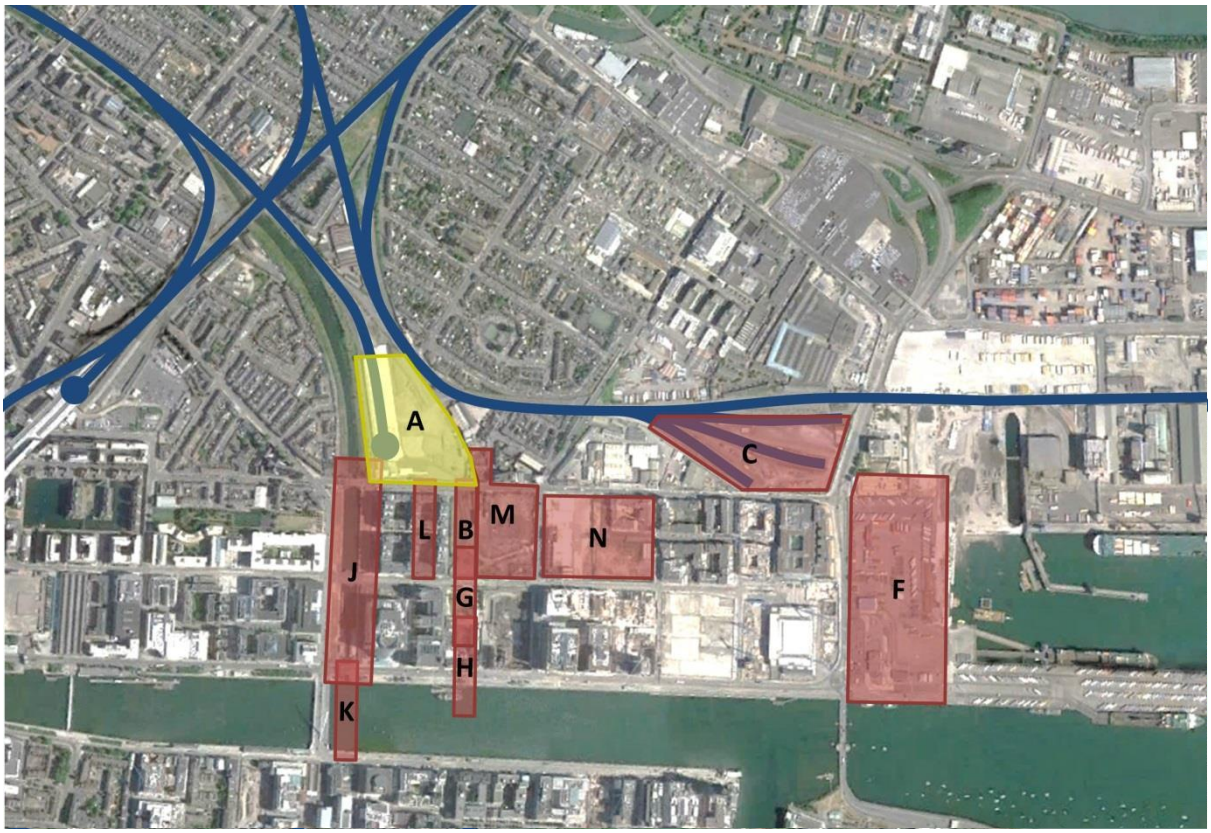

Figure 16: Site A

5.1.1 Commentary

The existing station would be replaced or augmented by platforms in the area bounded by Sheriff Street Upper to the south, the Royal Canal to the west, and the limit of railway land to the east. The station footprint would be mainly or fully on railway land. To the east of the existing station is a coach park, which is considered to be a temporary facility. The western edge of the site is within a Conservation Area but it is considered feasible to avoid any works on this section.

The track layout for this station is challenging, because of the limited space between the northern end of the platforms and the divergence of the three rail routes at differing gradients, and the need for freight connections across the passenger tracks. Initial development has identified a feasible design with two elevated platform tracks for the Northern Line and up to four more at ground level for the other two lines. This does however require land take to the west of the existing railway at Church Road Junction. Design refinement is proposed during Sift 2 to establish definitively whether an at-grade solution is possible, or whether the initial split-level solution can be refined with less land take and simpler structures. In any event freight to and from the Phoenix Park line would almost certainly have to access it via Drumcondra and the link at Glasnevin.

The DART Underground portal would be in the same area, and if constructed may make this site inaccessible to and from the Northern route.

Like the existing station, the passenger entrance to this site would be on Sheriff Street Upper, at the edge of the Docklands development. It currently feels remote from the centre of activity and the nearest Luas stops are about 5min walk away on Mayor Street Upper. However the transition from a station with a few peak-time trains to a busier all-day station would naturally increase footfall and activity. Improved access routes might include covered walkways, moving walkways or relocation of the Luas stop slightly nearer, and the development of the surrounding area.

5.1.2 Assessment

Table 8. Site AAssessment

Criterion		Verdict
Significant planning/land use issue?	No	Pass
Significant environmental issue?	No	Pass
Nearby site no worse or better?	No	Pass
Passes Initial assessment of technical feasibility?	Yes	Pass

It is proposed to take this site forward to Sift 2.

5.2 Site B: East of Spencer Dock, north of Mayor Street Upper

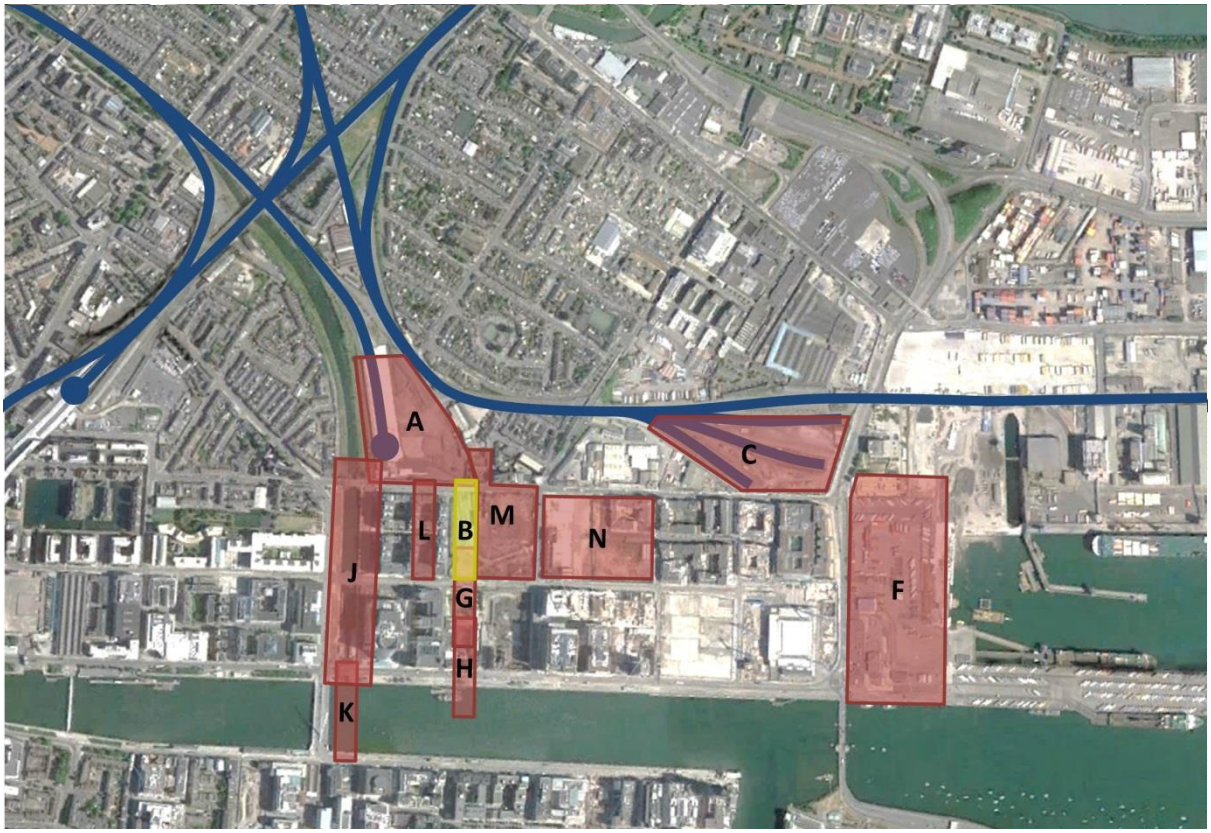

Figure 17: Site B

5.2.1 Commentary

This site is similar to one developed in an earlier study[8] for a terminus parallel to and east of Spencer Dock, with the buffer stops north of Mayor Street Upper. The likely entrance/exit would be located immediately alongside the Spencer Dock Luas stop and close to the centre of the north bank Docklands area. The platforms would extend below Sheriff Street Upper into the railway land beyond.

The previous study developed a broadly viable concept which could link to all three routes and provide the necessary freight connections. It did however identify some engineering constraints and note the high cost of this solution. The bridge where Sheriff Street Upper passes over the platform area would need replacement to lengthen the span, and providing electrification clearances here necessitates lowering the track bed below the water table. This creates a need for "tanking" to prevent water ingress, for a split-level station building, and for possible level changes at Church Road Junction. The previous study also considered only three platform faces where the current study seeks to provide four if possible. As designed the outer end of the platforms would have a radius of 350m, below the absolute minimum of 500m.

Furthermore, the Spencer Dock DART Underground station and its cut-and-cover approaches – if built – would occupy the same footprint as Site B. If it was desired to keep a Site B station open during construction of the Underground, then much of the Underground structure might have to be built with the surface station.

Although the previous design is not acceptable as it stands, particularly in respect of the curved platforms, it is considered that some further engineering development at Sift 2 might

[8] Spencer Dock Terminal Station Feasibility Study, Final Report, Irish Rail, February 2004

produce a viable option. Site M also presents the scope for reducing the curvature at the cost of increased land take on a site where development is planned.

5.2.2 Assessment

Table 9. Site B Assessment

Criterion		Verdict
Significant planning/land use issue?	No	Pass
Significant environmental issue?	No	Pass
Nearby site no worse or better?	No	Pass
Passes Initial assessment of technical feasibility?	Yes	Pass

It is proposed to take this site forward to Sift 2.

5.3 Site C: East Wall Yard

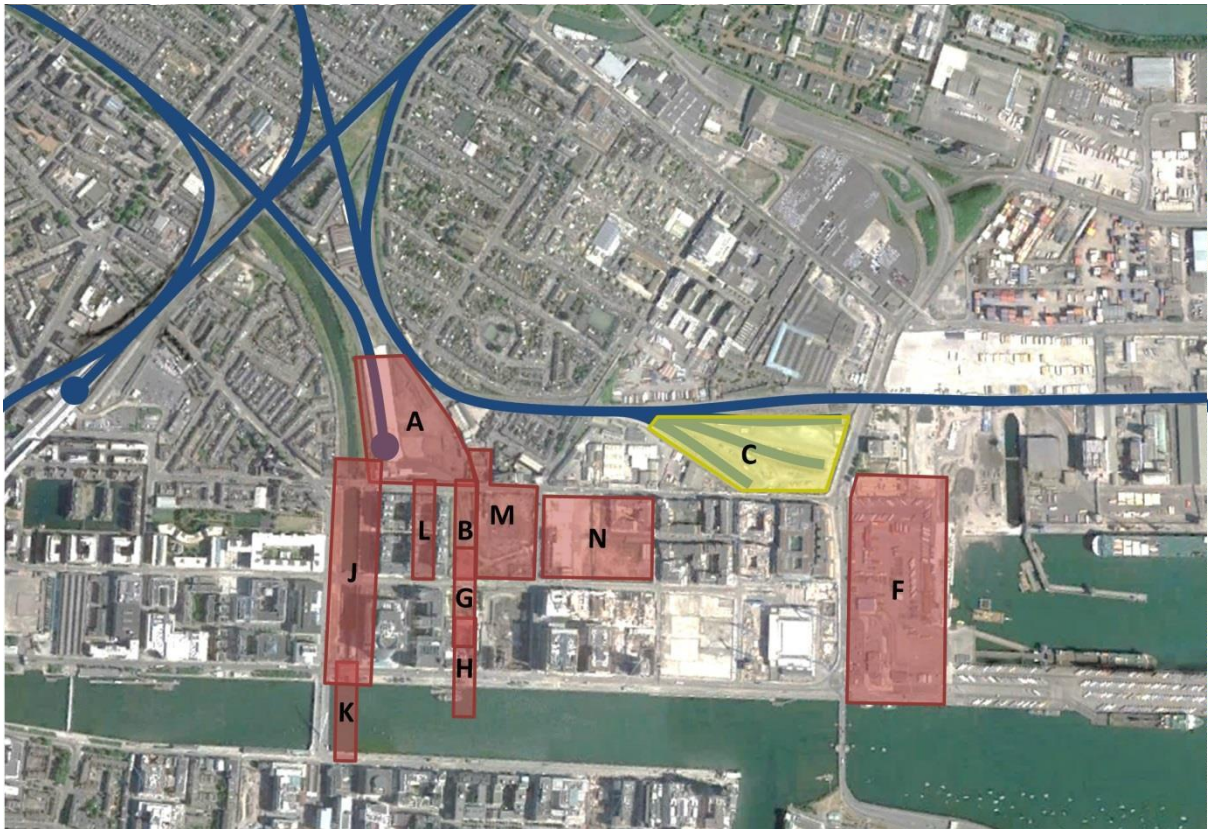

Figure 18: Site C

5.3.1 Commentary

As noted in section 3.3, any or all the existing railway activity in East Wall Yard could be relocated, with the exception of a freight route along the northern boundary of the site to access Alexandra Road. This relocation would free up enough railway land for a Docklands station. Rail access would be found along the existing trackbed to Church Road Junction, where there is width for two passenger and two freight tracks if necessary. East Road overbridge might have to be replaced by a structure with no central pier.

At Church Road a new track layout would be needed to link the passenger and freight tracks to the three routes onwards, but this area is considered to be less challenging than other sites where the platforms would be closer to the junction. However, some of the DART Underground cut-and-cover section might have to be constructed at the same time as the new junction, if it was envisaged that the Site C station would remain in service during or after construction of DART Underground.

Passenger access would be near the east end of Sheriff Street Upper or on East Wall Road itself. It is however rather remote from the western parts of Docklands. The south bank is accessible via Tom Clarke Bridge and the site is well placed should development extend eastwards into what is currently the port area.

In terms of connectivity, the walk from the Point Luas stop is not currently attractive to potential passengers but there is scope for improvement if this site becomes the access to a major station. A short extension of the Luas tramline into the site is likely to be feasible, though it would conflict with the intention to extend the Luas across the river instead.

5.3.2 Assessment

This site should be taken forward to Sift 2.

Table 10. Site C Assessment

Criterion (see section)		Verdict
Significant planning/land use issue?	No	Pass
Significant environmental issue?	No	Pass
Nearby site no worse or better?	No	Pass
Passes Initial assessment of technical feasibility?	Yes	Pass

It is proposed to take this site forward to Sift 2.

5.4 Site G: Elevated over Spencer Dock Luas

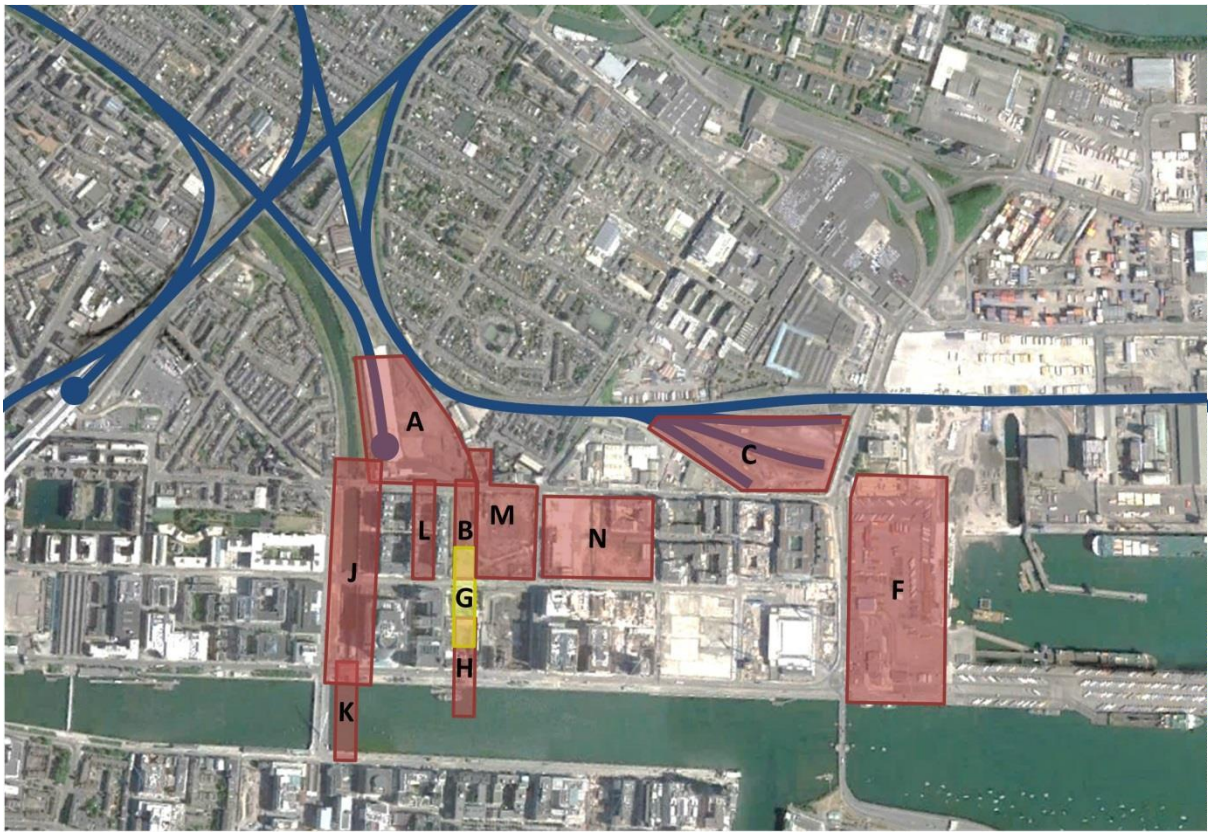

Figure 19: Site G

5.4.1 Commentary

If located here the station would be alongside and to the east of Spencer Dock like Site B, but further south and grade separated so as to pass over Mayor Street Upper and the Luas stop. This creates the opportunity for a southern entrance/exit at the LMS building where a pedestrian bridge to the south bank is also proposed, as well as a central/northern access to interchange with Luas and serve the northern part of the Docklands. However, as with Site B, it would be necessary to include part of the DART Underground station box and approaches when building the Site G station, if it was to remain open during any future construction of DART Underground.

The gradient necessary to pass over Mayor Street from the existing elevation of Church Road Junction is at least 3.9%, which is steeper than the 3.5% permitted by Irish Rail standards and therefore not technically feasible. This conclusion is based on the following worst case assumptions:

- Buffer stops are at the northern side of the protected LMS station building, the further south possible.
- Platforms are at the maximum permitted platform gradient of 0.2% at Mayor Street.
- Vertical curves are the minimum permitted radius of 1000m[9].
- Vertical curves run right up to the platform ends and to the southernmost likely switches and crossings at Church Road Junction.

[9] Standard CCE-TMS-341

The gradient could be eased by raising the track level at Church Road Junction, but this would steepen the gradient between Church Road and East Wall Yard where shunting takes place. Gradient in this area is already in excess of 0.2%.

An underground sub-option might also be considered, but the gradients needed would also be excessive albeit in the opposite sense.

5.4.2 Assessment

Table 11. Site G Assessment

Criterion (see section)		Verdict
Significant planning/land use issue?	Yes	Pass
Significant environmental issue?	Yes	Pass
Nearby site no worse or better?	Yes	Pass
Passes Initial assessment of technical feasibility?	No	Fail

It is recommended to discard this site at Sift 1.

5.5 Site M: New Wapping Street

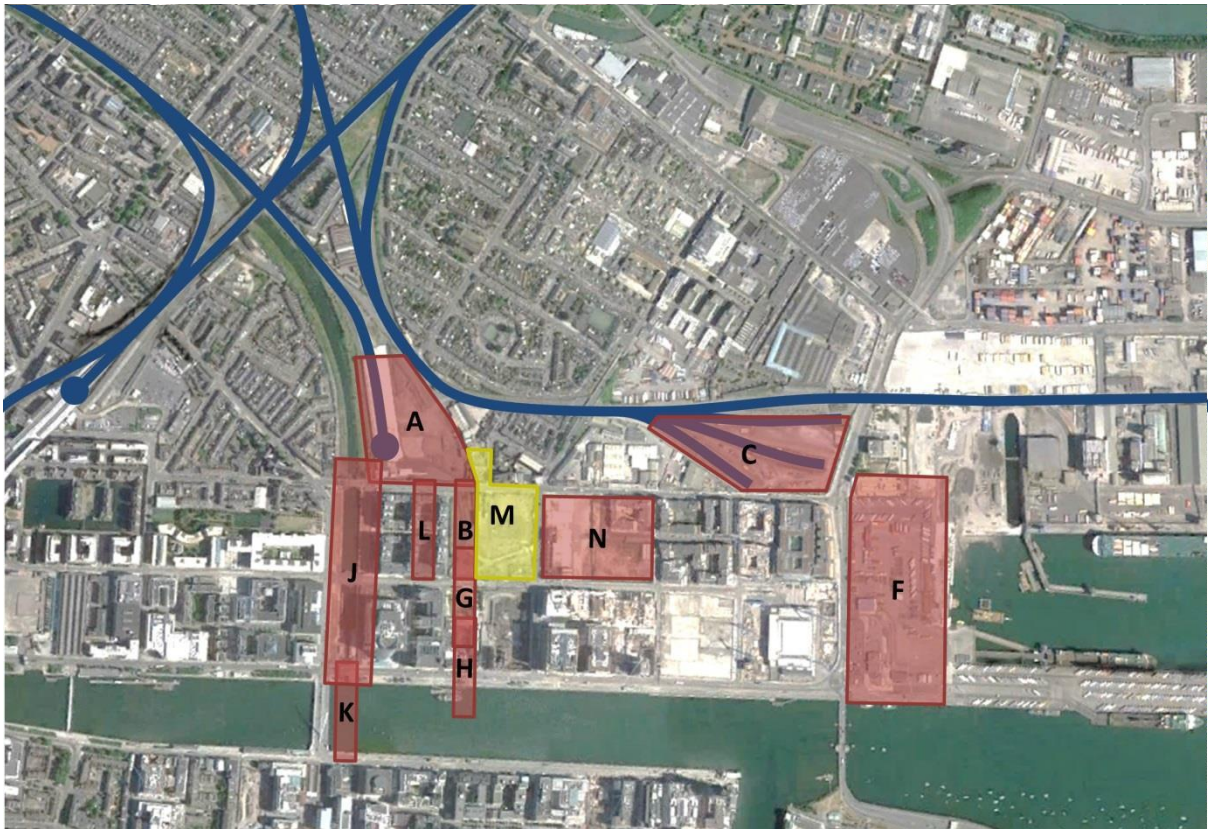

Figure 20: Site M

5.5.1 Commentary

At Site M, the station would lie diagonally across the block south of Sheriff Street Upper and west of New Wapping Street. Site M differs from Site B, as it extends into the eastern part of this block, which is largely vacant though has planning permission for commercial/residential development[10]. There is a terrace of houses in the south-east corner and a pumping station towards the northern edge. If built here the station would also impinge on the potential site of the DART Underground station, probably requiring part of the Underground box to be built if the station was to remain in use during construction of any Underground route.

In engineering terms this site is similar to Site B, as they share the likely need to go below the water table in order to pass under Sheriff Street Upper. However, the curve on approach to Site M would be less than Site B, making it likely that the platforms would be straight or at least straighter.

The property impact of Site M is significantly greater than for Site B. Local access for Site M would be good, as the likely entrance on Mayor Street Upper is close to the centre of the north bank Docklands and a future bridge over the Liffey. The site is slightly further from the Luas than options B or G, but is still easily accessible.

[10] http://www.dublincity.ie/swiftlg/apas/run/WPHAPPDETAIL.DisplayUrl?theApnID=DSDZ2896/18&theTabNo=2

http://www.dublincity.ie/swiftlg/apas/run/WPHAPPDETAIL.DisplayUrl?theApnID=DSDZ2387/18&theTabNo=2

5.5.2 Assessment

Table 12. Site M Assessment

Criterion		Verdict
Significant planning/land use issue?	No	Pass
Significant environmental issue?	No	Pass
Nearby site no worse or better?	No	Pass
Passes Initial assessment of technical feasibility?	Yes	Pass

It is proposed to take this site forward to Sift 2.

6. Sift 1 Conclusions and Recommendations

Table 13. Summary of Sift 1 conclusions and recommendations

Site	Verdict	Reason
A: Existing Docklands station site	Take forward	
B: East of Spencer Dock, north of Mayor Street Upper	Take forward	
C: East Wall Yard	Take forward	
F: Ferry Terminal	Discard	No better than C
G: Elevated over Spencer Dock Luas	Discard	Not technically feasible
H: North Wall Quay over Liffey	Discard	Planning and environmental issues
J: Royal Canal south of Sheriff Street Upper	Discard	Planning and environmental issues
K: Samuel Beckett Bridge	Discard	Planning and environmental issues
L: West of Spencer Dock, north of Mayor Street Upper	Discard	Planning issue, no better than M
M: New Wapping Street	Take forward	
N: Mayor Street Upper and Castleforbes Road	Discard	No better than M
P: Combination of A and J	Discard	Planning and environmental issues

7. Next Steps

With the issuing of this Sift 1 report the project team seek approval of the short-listed options summarised in section 5.

Following the agreement of this short list between AECOM, the NTA and Irish Rail the short-listed options will be taken forward for further assessment within the Sift 2 process. This assessment will include a Multi Criteria Analysis, the content of which is to be proposed by AECOM in the coming weeks.

The preferred option identified by the Sift 2 process will then be further developed within the final report.