Appendix B: MetroLink Route Options Multi-Criteria Analysis Summary

This appendix is a summary of the assessment of alternatives report prepared by TII's engineering designer Jacobs / Idom.

As recommended in the Stage 1 CAF Appraisal, a metro scheme was identified as the preferred alternative to meet the scheme objectives. However, identifying the preferred mode alone is not sufficient to determine the preferred option to bring forward for detailed appraisal. An option selection study was carried out to determine the preferred route for the proposed metro scheme. A detailed Route Option Selection Study was carried out in the 2018 'New Metro North Alignment Options Report' to determine the preferred Metro Route option.

The New Metro North Alignment Options Report aim, and purpose was to identify 'feasible and practical' route options for MetroLink by considering transport demand, and potential station locations and alignments to serve this demand. Based on the CAF, the report adopted a Multi-Criteria Assessment approach, whereby each route option was assessed on its ability to meet the economic, integration, accessibility and social inclusion, and environmental objectives of the scheme.

The study considered a number of options with varying station locations, route lengths, costs and passenger demand numbers, which were each assessed on their potential for interchange, potential trip demand, key trip attractors and directness, and potential impacts on the environment. These routes were assessed comparatively identifying any advantages / disadvantages each option has against the others.

Ten end-to-end feasible Metro route options were identified and subjected to the MCA defined in this route option study. Descriptions of the station services of the ten options are provided below, with maps of the preferred options given in the next section.

- Option 1 (A1-B6-C4) serves Charlemont, College Green, O' Connell Street, Mater Hospital, Drumcondra, St. Patrick's College West, DCU at Collins Avenue West, Santry Village, Northwood Central, Dardistown, Dublin Airport, Fosterstown, Swords Central, Seatown and Estuary Park & Ride;
- Option 2 (A1-B6-C11) serves Charlemont, College Green, O'Connell Street, Mater Hospital, Drumcondra, St. Patrick's College West, DCU at Collins Avenue West, Santry Village, Northwood Central, Dardistown, Dublin Airport, Airside Retail Park West, Pavilions Shopping Centre, North Street and Estuary Park & Ride;
- Option 3 (A1-B10-C4) serves Charlemont, College Green, O'Connell Street, Mater Hospital, Drumcondra, Griffith Park East, DCU at Collins Avenue Junction, Ballymun Village, Northwood West, Dardistown, Dublin Airport, Fosterstown, Swords Central, Seatown and Estuary Park & Ride;
- Option 4 (A1-B10-C11) serves Charlemont, College Green, O'Connell Street, Mater Hospital, Drumcondra, Griffith Park East, DCU at Collins Avenue Junction, Ballymun Village, Northwood West, Dardistown, Dublin Airport, Airside Retail Park West, Pavilions Shopping Centre, North Street and Estuary Park & Ride;
- Option 5 (A2-B6-C4) serves Charlemont, St. Stephen's Green East, Tara Street, O'Connell Street, Mater Hospital, Drumcondra, St. Patrick's College West, DCU at Collins Avenue West, Santry Village, Northwood Central, Dardistown, Dublin Airport, Fosterstown, Swords Central, Seatown and Estuary Park & Ride;
- Option 6 (A2-B6-C11) serves Charlemont, St. Stephen's Green East, Tara Street, O'Connell Street, Mater Hospital, Drumcondra, St. Patrick's College West, DCU at Collins Avenue West, Santry Village, Northwood Central, Dardistown, Dublin Airport, Airside Retail Park West, Pavilions Shopping Centre, North Street and Estuary Park & Ride;

- Option 7 (A2-B10-C4) serves Charlemont, St. Stephen's Green East, Tara Street, O'Connell Street, Mater Hospital, Drumcondra, Griffith Park East, DCU at Collins Avenue Junction, Ballymun Village, Northwood West, Dardistown, Dublin Airport, Fosterstown, Swords Central, Seatown and Estuary Park & Ride;
- Option 8 (A2-B10-C11) serves Charlemont, St. Stephen's Green East, Tara Station, O'Connell Street, Mater Hospital, Drumcondra, Griffith Park East, DCU at Collins Avenue Junction, Ballymun Village, Northwood West, Dardistown, Dublin Airport, Airside Retail Park, Pavilions Shopping Centre, North Street and Estuary Park & Ride;
- Option 9 (A4-B12-C4) serves Charlemont, St. Stephen's Green East, Tara Station, O'Connell Street, Mater Hospital (on Eccles St), Whitworth, Griffith Park West, DCU at Collins Avenue Junction, Ballymun Village, Northwood West, Dardistown, Dublin Airport, Fosterstown, Swords Central, Seatown and Estuary Park & Ride; and
- Option 10 (A4-B12-C11) serves Charlemont, St. Stephen's Green East, Tara Street, O'Connell Street, Mater Hospital (on Eccles St), Whitworth, Griffith Park West, DCU at Collins Avenue Junction, Ballymun Village, Northwood West, Dardistown, Dublin Airport, Airside Retail Park West, Pavilions Shopping Centre, North Street and Estuary Park & Ride.

The outcome of this ten-route option assessment is shown in the table below, where a comparative five-point scale was adopted to measure how well each option addressed the project objectives.

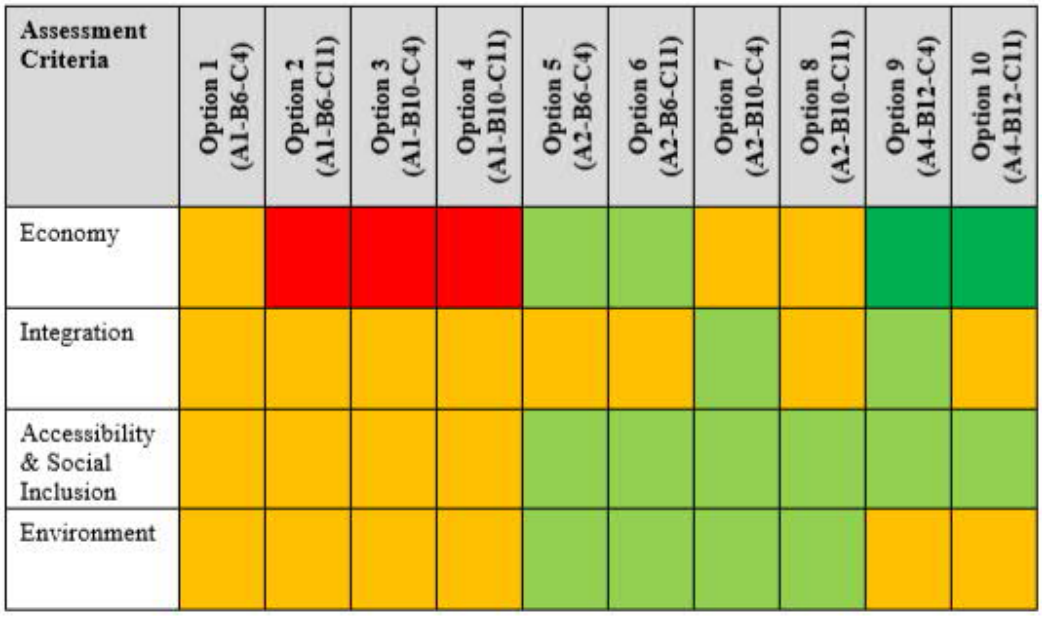

Figure 0-1 - Comparative MCA of the Ten Route Options from Arup Metro Route Option Assessment

One component of the economy section of the assessment is to use TUBA to calculate a BCR for all ten options considered. This shows that all ten routes generate a BCR significantly greater than one, with this result being used to help inform Figure 3-1.

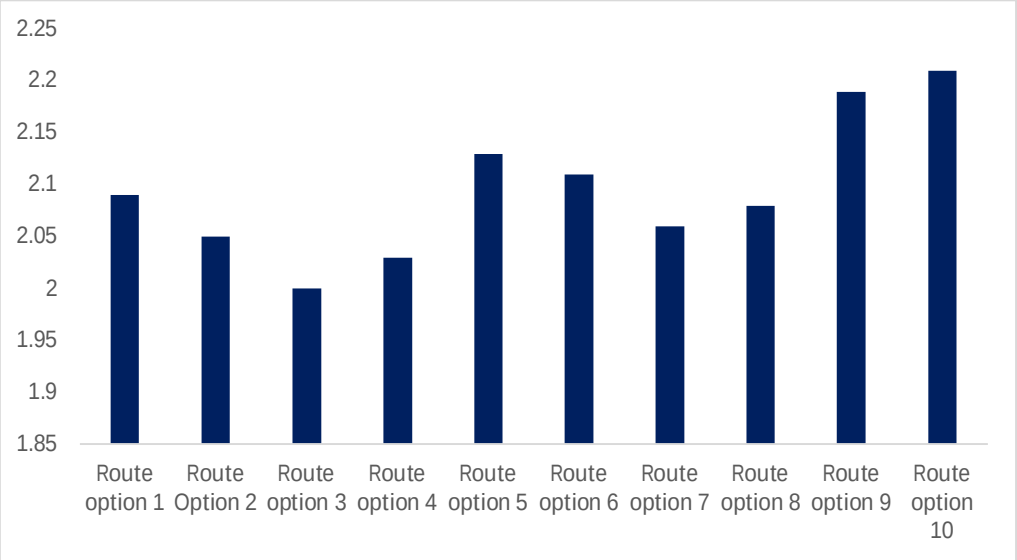

Figure 3-2 – BCRs of the Ten Route Options from Arup Metro Route Option Assessment

From Figure 0-1 and Figure 3-2 above, it is evident that the Metro Route Options 9 and 10 emerge as being the most favourable. This is based on the public transport integration criterion, as well as the economic differences, and impact on land-use policy Integration.

In summary, Option 9 and Option 10 are more consistent with the Transport Strategy for the Greater Dublin Area as they allow for interchange with the Maynooth and Kildare Irish Rail lines at Whitworth Station (now called Glasnevin), facilitating better coverage of the region. It also allows for a larger and more unique geographic area to be included in the catchment areas, that is not served by stations up or downstream.

The number of passenger transfers and direct passengers boarding is also much higher at Whitworth Station than an alternative interchange location at Drumcondra (which was included in some of the other route options above) and therefore is a more relevant station in the context of overall potential transport network integration opportunities. Similarly, as there is an earlier opportunity for interchange and a shorter physical interchange distance at Whitworth Station than at Drumcondra, options including Whitworth Station thus have a shorter journey time.

Identifying the Preferred Route Option

To determine the Preferred Option for the proposed scheme both Option 9 and Option 10 from the Route Option Selection Report was assessed individually on how well each option addresses the scheme's defined objectives set out in the Preliminary Business Case Document.

Like the previous stage 1 assessment, a five-point scale was adopted to assess each option in relation to how well each option addresses the defined project objectives.

Score	Description
	Fully addresses objective
	Addresses objective well
	Addresses project objective
	Addresses objective poorly
	Does not address objective

Figure 0-3 - Scale Used for MCA of Options 9 and 10

Option 9

Option 9 (A4-B12-C4) is shown below.

Figure 0-2 - Map of Route Option 9 ('New Metro North Alignment Options Report' (2018))

Option 10

Option 10 (A4-B12-C11) is shown below.

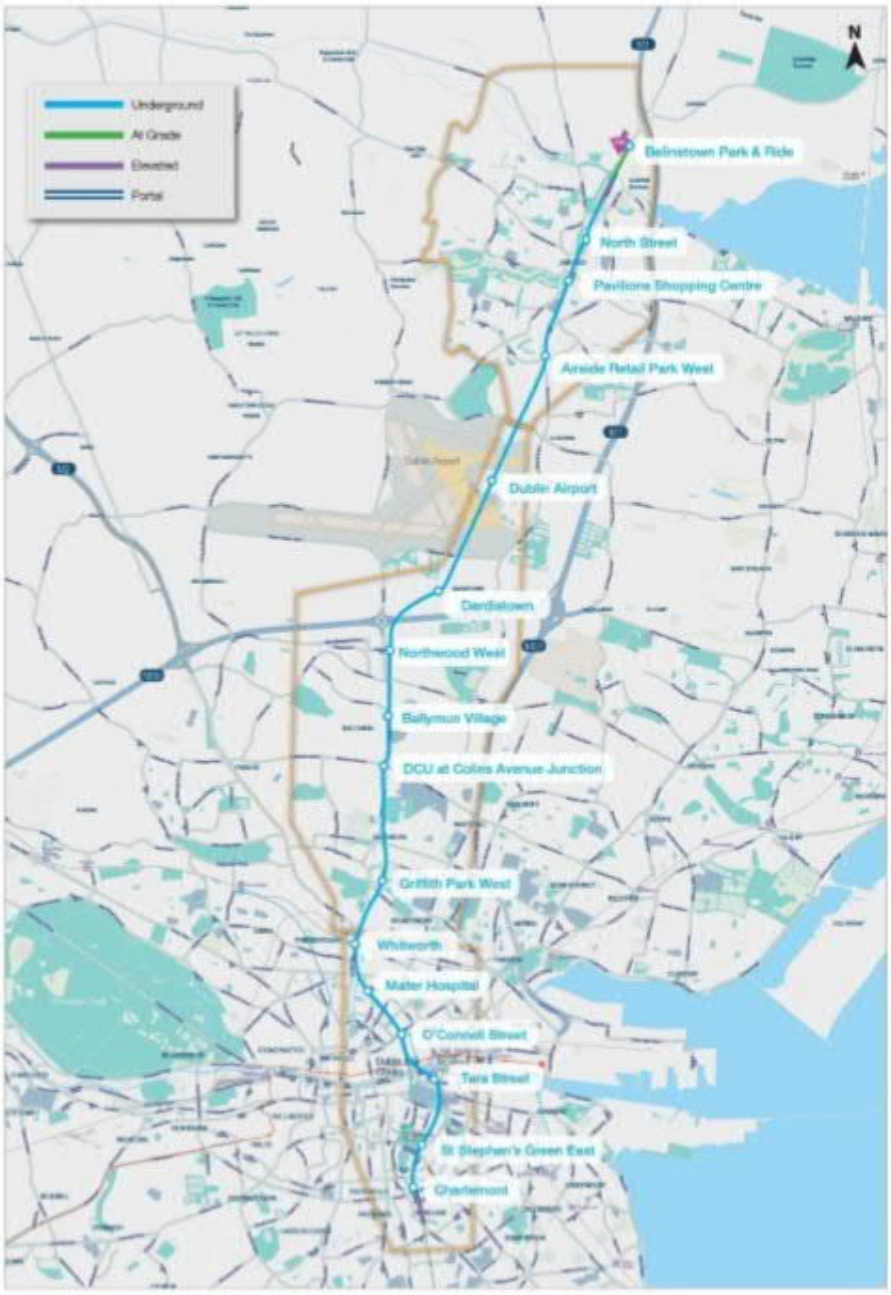

Figure 0-3 - Map of Route Option 10 (New Metro North Alignment Options Report (2018))

Stage 2 MCA

The outcome of the assessment of Option 9 and Option 10 against the scheme objectives is shown below:

	Objective	Option 9	Option 10
Economy	Cater for the growing travel demand along the corridor		
	Support Economic Development		
	Reduction of urban congestion		
	Segregated from urban congestion		
Safety	Reduction of cars		
Integration	Provision of interchanges and 'Park and Ride' improving transport integration		
Environment	Reduced CO2 emissions		
	Air quality improvement		
	Noise reduction		
Accessibility and social inclusion	Facilitate connection to attractor nodes		
	Attractive and accessible to all users		
TOTAL			

Table 0-1 - Outcome of comparative MCA assessment of Option 9 and 10

Based on this assessment, Option 9 emerges as a preferred route for MetroLink. Both options fully address the objectives to support economic development, reduce and be segregated from urban congestion, reduce the number of cars, and facilitate connections to attractor nodes. Both options address environmental objectives of the project, but not fully, and these can be mitigated through design.

However, the key difference between the two options lies in the Integration criterion. Option 9 integrates better with the wider transport network with better potential for seamless interchange with other modes, particularly heavy rail in the city centre and buses in Swords.

It also integrates better with current Land Use Policy particularly in Ballymun and Swords than Option 10. The Fingal County Development Plan Swords town and its environs is planned to grow significantly in population of and as such will have a significantly increased transport travel demand. In order to accommodate this demand, public transport systems will have to be fully integrated with each other, and with the surrounding land-use. Additionally, Option 10 is significantly more expensive than Option 9, therefore also giving Option 9 an economic advantage.