Metro West – Alignment Selection Study

Stage 2 Report

Emerging Preferred Route (FINAL)

September 2007

JACOBS

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Contents

1 Executive Summary

1.1 General

Jacobs Engineering (JE) has been appointed by the Railway Procurement Agency (RPA) to undertake an alignment selection study for the proposed Metro West orbital route linking Tallaght and Dublin Airport via Clondalkin, Liffey Valley and Blanchardstown. The study is to be developed from the route selection study undertaken by the consultant, WS Atkins, in 2002 and is to take into account the publication, 'A Platform for Change' and the principles of 'Transport 21' which set out the Government's vision for an integrated passenger transport network in the wider Dublin area.

1.2 Stage 2 Report

The conclusion of Stage 2 of the Employer's Brief is the culmination of the work to inform a recommendation to RPA for an Emerging Preferred Route (EPR) for Metro West.

It is also an opportunity to bring together into a single submission all the previous work undertaken in Stage 2 of the Employers Brief which assisted in arriving at the EPR outlined in the body of this Report.

1.3 Public Consultation

The Minister for Transport announced commencement of Public Consultation for Metro West in November 2006. During the month of January, 2007 a number of Open days were held in various locations along the proposed Metro West routes in both Fingal and South Dublin counties.

A copy of the Public Consultation material can be found in Appendix A.

The Open Days were as follows:

1. Mon 15th Jan Dublin Airport, Great Southern Hotel, 10.00hrs-20.00hrs
2. Wed 17th Jan FCC Offices, Blanchardstown, 10.00hrs-20.00hrs
3. Fri 19th Jan Clarion Hotel, Liffey Valley, 10.00hrs-20.00hrs
4. Mon 22nd Jan SDCC Offices, Clondalkin, 10.00hrs-20.00hrs
5. Thu 25th Jan SDCC Offices, Tallaght, 10.00hrs-20.00hrs

1.4 Options for Study

At Public Consultation, 2No. Route Options were presented to the general public including a number of possible sub-options. Subsequently a number of alternative route options were proposed to RPA by the general public and interest was also expressed in combinations of the 2No. Route Options outlined.

In consultation with RPA it was decided to write a number of Working Papers to deal with all these issues, examining the merits of each alternative option.

Sub Option Route Analysis
This working paper was undertaken to look at the 5No. possible sub-options, which are contained within the 2No. Route Options, presented at Public Consultation and to propose a definite Route Option 1 and Route Option 2 for analysis at EPR stage. This paper assessed

all sub-options and recommended that sub-option B be adopted for preferred route for Route Option 1, thus Route Option 1 now becomes Route 1B.

Review and Analysis of Route Options suggested during Public Consultation
This working paper looked at the alternative route options proposed by the general public during Public Consultation to assess the merits of each. This paper concluded that none of proposed options were stronger that the original route options.

Options South of M50
This working paper looked at the possibility of various route options south of the M50, serving Finglas and its environs and concluded that none were a viable proposition as well as being outwith the requirements of Transport 21.

High Level Assessment of Airport Route Options
This working paper was produced to analyse the routes in and about the airport and the possibility of serving the future Terminal 3. This paper concluded that all route options around the airport be dropped and that Route Option 1 be selected as the preferred route option from Huntstown to Metropark (and on to the airport) following to the north of the M50 corridor.

Following further consultation with RPA and in line with the recommendations of the above working papers it was decided that combinations (hybrids) of Route Options 1 and Route Option 2 should be analysed. This resulted in the 5No. Route Options listed below being used to inform the Emerging Preferred Route, all other sub-options having been discounted;

Route Option 1B - Route 1 following sub-option B
Route Option 2 - Route 2
Route Option 3 - Route 1 to Millennium Park, Route 2 to Abbotstown and Route 1 to Metropark
Route Option 4 - Route 2 to Millennium Park and Route 1 to Metropark
Route Option 5 - Route 2 to Abbotstown and Route 1 to Metropark

1.5 CAPEX

A high level Capital Cost Estimate (CAPEX) estimate was commissioned in Jan 2007 and updated in April 2007 to cater for the 5No. Route Options under consideration. The total costs (excl VAT) of these routes, including risk, are shown in Fig 1.5.1.

Route Option 1	[text deleted]
Route Option 2	[text deleted]
Route Option 3	[text deleted]
Route Option 4	[text deleted]
Route Option 5	[text deleted]

Fig No. 1.5.1

1.6 MAST (Matrix Analysis Summary Table)

Secondary sift criteria were applied to the 5No. Route Options and the MAST table was populated as a joint exercise by both RPA and JE in line with responsibility for generating key inputs. The output was then interrogated for consistency and accuracy; see section 13 of this Report.

A scoring matrix was applied across all of the criteria in line with Department of Transport guidelines;

Legend	
Score	**Assessment**
5	Highly Positive Impact
4	Positive Impact
3	Neutral Impact
2	Negative Impact
1	Highly Negative Impact

Legend	
Relative Assessment	**Color**
Best	
Second Best	
Middle	
Second Worst	
Worst	

The summary scores which each route option obtains from MAST is included and then utilising colour coding each options is coloured from best to worst in line with the above legend, see below, all scores are out of 5.

Appraisal Summary	**OPTION 1B**	**OPTION 2**	**OPTION 3**	**OPTION 4**	**OPTION 5**
Economy	3.92	3.88	3.86	3.78	3.93
Costs/Funding	3.07	2.49	3.06	2.52	2.51
Safety	4.14	4.40	4.13	4.18	4.21
Environment	2.53	2.50	2.48	2.67	2.64
Accessibility & Social Inclusion	4.54	4.13	4.70	4.46	4.62
Integration	4.00	3.58	4.00	3.68	3.63
Constructability/Engineering	3.12	3.37	3.02	3.28	3.37
Public & Stakeholder Support	2.93	2.81	2.72	2.96	2.81
TOTAL SCORE	**3.53**	**3.39**	**3.50**	**3.44**	**3.47**

1.7 Recommendation

All Route Options scored favourably with **Route Option 1B** as the **Emerging Preferred Route.**

1.8 Next Steps

There are a number of “key locations” that require further design development and further public consultation; see section 19 for further details. Mainly, these are areas where the final alignment needs to be considered in further detail as there may be concerns expressed by the general public, however it should be noted that they will not affect the overall decision on EPR. These “key locations” should be progressed during Stage 3.

1. **Castleknock Golf Club**
2. **Blanchardstown Shopping Centre**
3. **Clondalkin**
4. **St Brigid’s Well**
5. **Liffey Valley Underpass**
6. **Liffey Valley Crossing**
7. **Silloge**

2 Format of Stage 2 Report – Emerging Preferred Route

2.1 General

The conclusion of Stage 2 of the Employer's Brief is the culmination of work to inform a recommendation to the Client (Railway Procurement Agency (RPA)) for an Emerging Preferred Route (EPR) for Metro West.

It is also an opportunity to collate into a single submission all the previous work undertaken which assisted in arriving at the EPR outlined in the body of this Report.

The format of the Stage 2 submission to RPA consists of the following;

Vol. 1 – Stage 2 Report – Emerging Preferred Route

Vol. 2 – RPA Papers

(a) Metro West Public Consultation Report Final May 2007
(b) Metro West Demand and CBA Final May 2007
(c) Metro West Catchment Analysis Final May 2007
(d) Metro West O&M Final May 2007
(e) Metro West RAPID Areas Final May 2007
(f) Metro West Runtime and PVR Final May 2007
(g) Metro West Serving Dublin Airport May 2007

Vol. 3 – SIFT Reports

(a) Sift 1 Report
(b) Sift 2 Report

Vol. 4 – Appendices

(a) Project Objectives – Working paper
(b) Design Principles – Working Paper
(c) Route Selection Process

Vol. 5 – Working Papers

(a) High Level Assessment of Clondalkin Route Options
(b) High Level Assessment of Tallaght Route Options
(c) Liffey Valley Working Paper
(d) High Level Assessment of Airport Route Options
(e) Newlands Cross and Fonthill Road Options Study
(f) High Level Assessment of Depot Strategy
(g) Sub-Option Route Analysis
(h) Metro North/Metro West Depot Comparison and Selection Study
(i) Station Catchment Analysis
(j) Review and Analysis of Route Options suggested during Public Consultation
(k) Alignment Options South of M50

Vol. 6 – CAPEX

(a) Capital Cost Estimate
(b) Capital Cost Estimate Supplement

Vol. 7 – Land Acquisition Costs

(a) Property Acquisition Budgets

Vol. 8 – Environmental Assessment Report (EAR)

Vol. 9 – Risk Register

3 Project Background

3.1 Project Background

Jacobs Engineering (JE) has been appointed by the Railway Procurement Agency (RPA) to undertake an alignment selection study for the proposed Metro West orbital route linking Tallaght and Dublin Airport via Clondalkin, Liffey Valley and Blanchardstown. The study is to be developed from the route selection study undertaken by the consultant, WS Atkins, in 2002 and is to take into account the publication, 'A Platform for Change' and the principles of 'Transport 21' which set out the Government's vision for an integrated passenger transport network in the wider Dublin area.

3.1.1 Scope of the Study:

Stage 1 - Review of previous work, familiarisation and development of sifting criteria, alignment option identification and stakeholder engagement.

Stage 2 - Carry out sifting of alignment options, further development of preferred routes and establishment of three alignment options for Public consultation.

Stage 3 - Recommend an Emerging Preferred Route (EPR) from Public Consultation and develop the outline design and capital cost.

3.2 Scope of Stage 2

The scope of works involved in Stage 2 was to carry out 2No. sift workshops and agree, with RPA, two/three alignment options/sub-options to take forward for Public and Stakeholder Consultation with a view to the identification of a single EPR from that process.

3.2.1 Sift 1 Workshop

JE held an initial Sift 1 workshop on 25th July 2006 to review and reduce the number of possible route alignment options (see the Sift 1 Report in Vol. 3). This was carried out using the approved Route Selection Process criteria (see Vol. 4) and in addition to reducing the number of possible route alignment options it also highlighted 4No. critical areas, as listed below, which required further detailed study:

- Tallaght
- Clondalkin
- Liffey Valley Crossing
- Dublin Airport

3.2.2 Working Papers

Following the Sift 1 workshop, JE developed Working Papers for the 4No aforementioned critical areas listed above. The outputs and the conclusions arising from the Working papers fed in to the Sift 2 workshop.

3.2.3 Sift 2 Workshop

The Sift 2 workshop was held on 27th September 2006 in order to finalise the route alignment options to be taken forward to Public Consultation. The Workshop concluded that there should be 2No. main routes options, an Eastern Option which was called Route 1 at Public Consultation and a Central Option which was called Route 2 at Public Consultation

(see appendix A – Dublin Metro West Route Options). Route 1 included a number of sub-options (see the Sift 2 Report in Vol. 3).

This Stage 2 Report should be read in conjunction with the Stage 1 report and both Sift 1 & 2 reports, which include a commentary on the wider context in which this study has been carried out. The discussion of these wider policy issues is not repeated in this report.

3.2.4 Stage 2 Report Objectives

The broad objectives of this report are:

1. To summarise the outputs from the two Sift Workshops.
2. To summarise the outputs from the Working Papers.
3. To recommend an EPR following the Public Consultation Process and the Summary Matrix Analysis recommended in the Route Selection Process criteria.
4. To provide RPA and JE with a transparent audit trail showing why certain options were rejected and why the final Public Consultation options and sub-options were chosen.
5. To develop a solid and robust analysis process, for choosing the EPR, following completion of the Public Consultation. This must ensure that the 5No. critical assessment criteria outlined in the Public Consultation leaflet are assessed as a minimum:
    - Economics/Viability
    - Safety
    - Environment
    - Accessibility
    - Integration
6. To fulfil the criteria laid down in the Project Objectives – Working Paper (issued 18/09/06) and the Design Principles – Working Paper, (issued 18/09/06) which were agreed with RPA (see Vol. 4).

4 Output from Sift 1 and Sift 2 Workshops

4.1 Sifting Methodology

At an early stage it was decided that formal scoring was not appropriate during these high-level assessments of the route alignment options, as it would suggest that there was a significant level of detail behind each relative score. This was not the case, except for some of the engineering issues which were readily quantifiable. The scoring being applied by the team, is based on experience and informed by relative assessment of route alignment options against the qualitative criteria, as set out in the paper "Route Selection Process".

In conclusion it was decided to use the traffic light criteria, a simple three scale relative scoring method that reflects the narrative listed in the Working Papers.

Best	**Green**
Neutral	**Orange**
Worst	**Red**

This criterion was applied for the Tallaght, Liffey Valley and Clondalkin Working Papers. The Airport Working Paper was assessed differently as there were only 2No. main route alignment options and ultimately one was to be discarded. Reference should be made to the Working Papers for more detail.

The following should be noted in relation to the Alignment Matrix Tables shown in the Working Papers:

1. The Sift 1 and 2 Reports do not attempt to identify an EPR, they strive simply to identify those route alignment options worthy to take to Public Consultation and those which it is felt do not deliver the project objectives.
2. That a score of neutral/orange does not mean that the option does not perform adequately against the objectives, but that it would appear to meet the requirements pending further investigation.
3. A green score at this stage suggests that the option at the present best meets the objectives of the specific criteria pending further investigation.
4. Pending further investigation and more detailed appraisal it is felt that the EPR will include some or all of those taken forward to Public Consultation.
5. A route alignment option is removed if it substantially scored poorest and is deemed not to meet some of the key project criteria, as discussed in the body of the report.

4.2 Sift 1 Report – Summary

The initial part of this Stage 2 involved the Sift 1 workshop, which was held on 25th July 2006 This took all the viable routes, listed in the Stage 1 Report, and reduced the possible route alignment options to 2No. emerging route alignment options, with inclusive sub-options.

JE conclusions following the Sift 1 Report were as follows:

- All Eastern route alignment options were still to be considered.
- All Central route alignment options were still to be considered.
- The Western route alignment options were not to be considered further.

- Further work / optioneering was be undertaken in the areas of Tallaght, Clondalkin, Liffey Valley crossing and the Airport (including the interface with Metro North).

4.3 High Level Assessment Working Papers – Summary (See Vol. 5)

4.3.1 High Level Assessment of Airport Route Options

Conclusion

The main output from this report was that the Northern Option and associated sub-options should be discarded from node 94 on the Ballycoolin Road, as shown on fig 1 in Appendix F (of that paper), for the reasons listed in Section 4.10 of the Airport Working Paper

Assuming the above, then there was only one route to serve the airport, which links to Metro North, south of the airport at the delta junction. It is considered that this may cause some operational issues particularly in relation to the potential conflict between Metro West and Metro North services, because of trams running to the Airport or Lissenhall from both lines. This issue will need be reviewed in more detail during Stage 3 when parameters regarding operational timetabling will need to be laid down. Further, following consultation with Fingal County Council (FCC) it was decided to consider an alternative route running parallel to M50 to take to Public Consultation.

The design of the delta (triangular form) junction connection with Metro North, currently emerging as preferred in the vicinity of Metropark, is seen as a critical issue to be resolved and will be dependent on the capacity requirements and the level of interoperability required for the functional network as a whole. These issues are currently being addressed and agreed with RPA and will be finalised during Stage 3.

4.3.2 High Level Assessment of Liffey Valley Options

A separate Working Paper split in to two sections:

- Part 1; A review of possible engineering solutions for crossing the Liffey Valley.
- Part 2; A review to find the best crossing location, taking in to consideration, environmental, structural, architectural, alignment and cost criteria.

Conclusion

Following the review of the engineering solutions and the crossing locations, a set of possible design / Architectural design options, based on ER3 crossing location were developed and are included within the Working Paper.

4.3.3 High level Assessment of Clondalkin Route Options

Conclusion

- Omit the Eastern Route Option from further consideration.
- Retain the Western Route Option for further consideration, as part of the Sift 2 workshop and review.
- Retain the Central Route Options, CR6 and CR8 for further consideration, as part of the Sift 2 workshop and review.
- Omit all the other Central Route Options from further consideration.

4.3.4 High Level Assessment Tallaght Route Options

Conclusion

The analysis carried out in this working paper showed Eastern Route 1 [ER1] to be the preferred choice for the Eastern alignment, while Central Route 1 [CR1] was the preferred choice for the Central alignment.
It was decided to take ER1 and CR1 through to Public Consultation and to show the section along the proposed Embankment Road extension as a sub-option. However this option will depend on the operational constraints imposed by sharing this very busy part of the existing Luas Red Line infrastructure caused by the introduction of the Luas Line A1 operations.

4.4 Sift 2 Report Summary

During the Sift 2 Workshop, held on Wednesday 27th September 2006, the following decisions were confirmed, which informed the development of the final Public Consultation material:

- Accept the output from the Tallaght Working Paper and retain the sub-option along the Embankment Road.
- Accept the output from the Clondalkin Working Paper and annotate CR6 as the main alignment though Clondalkin.
- Accept the engineering output from the Liffey Valley Working Paper, but omit the ER1 and ER2 crossing points due to the effect on traffic congestion and the requirement for extensive third party land take to the north of the River Liffey
- Accept the possible alignments to the south of the airport, but omit all options and sub-options that go north of Huntstown Quarry, serve the proposed western airport terminal 3 and/or join in with Metro North to the north of the airport

In addition to the above outcome, the following decisions were confirmed:

- Assume shared running on the Luas Red Line and future Luas City West (Line A1) extension.
- Assume that a stand alone Depot will be required for Metro West.
- Assume the connection with Metro North will be at Metropark.
- Assume Park & Ride facilities will be provided at the N2, Blanchardstown and Liffey Valley.

4.5 Options for Public Consultation

Following completion of the Sift 2 Workshop, RPA and JE developed a final Public Consultation route alignment drawing that included two main options with a number of sub-options at certain locations. See Appendix A.

This drawing included certain assumptions (see SIFT 2 Report, Vol. 3) in relation to the following, which will have to be developed during the next stage, Stage 3:

- Provisional Metro West depot locations.
- Park & Ride locations.
- Interchanges with bus and rail (heavy rail and Luas).
- Newlands Cross / N7 grade separated proposals by SDCC and NRA.
- St Brigid's Well.
- Metro North connection / delta junction.

4.5.1 Open Days

During the month of January, 2007 a number of Open days were held in various locations along the proposed Metro West routes in both Fingal County and South Dublin counties.

4.5.2 Metro West Public Consultation report

A summary report produced by RPA is contained in Vol. 2.

5 Options for Consideration (5No.)

5.1 Methodology – Stage 2 / EPR Report

Following discussion with RPA, JE suggested that the Stage 2 Report could be utilised to recommend an EPR ahead of Stage 3 and agreed a revised methodology to achieve this goal.

Phase 1

- Produce a single Working Paper to analyse all the sub-options on the 2No. Routes and to recommend which option was to be favoured. This allowed the optimum alignment to be selected for Route 1 and Route 2. All sub-options except for sub-option B were eliminated.

- Produce a Working Paper to analyse the alternative routes proposed at Public Consultation to see if any were viable.

Phase 2

- Because Route 1 and Route 2 share common sections of alignment it was always assumed that the final EPR could be a combination of both lines as opposed to a single choice between either route.
- Because the route alignment section of Route 2, between Huntstown and Metropark, was discounted by the conclusion of the Airport Working Paper there remains 5No. combinations of the 2No. route options remaining for analysis to inform an EPR.

Route Option 1B -	**Route 1 following sub-option B**
Route Option 2 -	**Route 2**
Route Option 3 -	**Route 1 to Millennium Park, Route 2 to Abbotstown and Route 1 to Metropark**
Route Option 4 -	**Route 2 to Millennium Park and Route 1 to Metropark**
Route Option 5 -	**Route 2 to Abbotstown and Route 1 to Metropark**

Phase 3

- Populate the Matrix Analysis Summary Table (MAST) with inputs from both RPA and JE and hold a workshop to interrogate the results. The output from this workshop should inform the EPR. JE will then proceed to finalise the Stage 2 / EPR Report with a recommendation and submit to RPA for approval.

5.2 Route Option 1B Overview

5.2.1 Section A (Tallaght to Porterstown Playing Fields)

Route Option 1B (see Fig No.1) starts in Tallaght on Belgard Road, close to the junction with Blessington Road. It will serve the Tallaght Institute of Technology, The Square Shopping Centre and Tallaght Village. It may be possible to extend the Luas Red Line (Line A) beyond Tallaght stop so that it terminates a short distance from the proposed Metro West terminus. This would allow for greater integration between the services, and a short distance for passengers to walk between services. It would also allow services to run from Red Cow to Tallaght East, potentially eliminating the need for an engineering link at Embankment Road.

From Tallaght the route follows Belgard Road northwards, crosses over the Luas Red Line at the junction of Belgard Rd / Embankment Rd. It crosses the N7 (Naas Road) at Newlands Cross and continues runs northwards along Fonthill Road through the junction with Boot Rd.

As it approaches the Cammock River the route then turns east into Clondalkin Sports Grounds following a route approximately adjacent to the Cammock River before crossing the Old Nangor Rd into what is at present the car park of the Mill Shopping Centre This route allows Metro West to serve Clondalkin Town Centre.

Having crossed Old Nangor Road and New Nangor Road the route turns westward towards Fonthill Road running parallel to Dunawley Avenue. On emerging back on the Fonthill Rd the route then turns northward following Fonthill Road crossing the Grand Canal and the Kildare railway line.

It continues along Fonthill Road and serves Liffey Valley town centre before crossing the N4 (Lucan by-pass), running to the west of Fonthill House and crosses the River Liffey in the vicinity of the Wren's Nest pub. The route winds its way around the perimeter of Castleknock Golf Club and continues northwards towards Porterstown Rd, passing through the local playing fields between Porterstown Church and Rugged Lane.

5.2.2 Section B (Porterstown Playing Fields to Millennium Park)

The route then crosses Porterstown Rd to a reserved corridor running northwards towards Blanchardstown before crossing the Royal Canal and Maynooth railway line at Porterstown Crossing. From there it runs parallel along Blanchardstown Road South passing adjacent to Millennium Park, which is to the east.

5.2.3 Section C (Millennium Park to Abbotstown)

After running parallel to Millennium Park and approximately opposite the junction with Mountview Rd the route turns eastwards into Millennium Park. The route passes to the north of Coolmine Community College and swimming pool crossing Grove Rd into Verona Football Club.

On leaving the football grounds the route cuts through the car park to the east of Blanchardstown Library and runs northwards along the verge of Westend Retail Park thus serving Blanchardstown Town Centre. Following the crossing of both the N3 (Navan Rd) and the Tolka Valley the route emerges on Snugborough Rd and follows this road, serving the National Aquatic Centre (NAC) until Snugborough Rd reaches the junction with Ballycoolin Rd.

5.2.4 Section D (Ballycoolin Rd to Huntstown Power Station)

At the junction of Snugborough Rd and Ballycoolin Rd the route turns eastwards to approximately follow the existing road alignment which according to FCC is due for major upgrade in the near future, until the alignment crosses Cappoge Rd to the south of Cappoge Cottages and from there the route hugs the M50 until it reaches Huntstown Power Station where it diverts to the north of the station at Kildonan.

5.2.5 Section E (Huntstown Power Station to Metropark)

After crossing Huntstown Power Station the route crosses both the old N2 and the new N2 roads (Ashbourne Road) before turning southwards to continue to parallel the M50. The route continues past Meakestown before diverting northeast at Silloge passing through or adjacent to Silloge Golf Club before crossing R108 (Ballymun Rd) to join Metro North at Metropark.

5.3 Route Option 2 Overview

5.3.1 Section F (Tallaght East to Porterstown Playing Fields)

Route Option 2 (see Fig No.2) starts at the Tallaght stop on the existing Luas Red Line. It runs along the Luas line as far as Cookstown stop at which point the Luas Red Line diverts north eastwards behind the bakery heading for Belgard stop. From Cookstown stop Metro West continues northwards for 200m before turning eastwards along the proposed Line A1 (Citywest) Luas extension line as far as Cheeverstown Stop. At Cheeverstown Stop the route turns northwards again following the new proposed road alignment for the Outer Ring Road until it crosses the N7 at Kingswood. The route continues to follow the Outer Ring Road north passing to the east of Grange Castle Golf Club and Wyeth Pharmaceuticals, skirting Clondalkin to the west. North of Grange Castle the route crosses the Grand Canal and the Kildare Railway line at Kishoge.

Continuing north along the Outer Ring Road (ORR) / Ballyowen Road the route heads towards Lucan crossing the N4 (Lucan By-pass) interchange at Woodies before crossing the River Liffey near Astogob at a location between Hermitage Golf Club and the south eastern corner of Luttrellstown Golf Club. The route then continues north passing through the playing fields at Porterstown and joins up with Route Option 1 just south of Porterstown Rd.

5.3.2 Section B (Porterstown Playing Fields to Millennium Park)

This section of the route is common to Route Option 1, Section B, and is outlined above at 6.3.2.

5.3.3 Section G (Millennium Park to Abbotstown)

After Millennium Park the route continues running northward on Blanchardstown Rd South passing to the west of Blanchardstown Shopping Centre. It then cross over the N3 (Navan Road) and Tolka Valley following Blanchardstown Road North and serving the Institute of Technology, Blanchardstown and Ballycoolin Industrial Estate.

At Ballycoolin crossroads the route turns eastwards and follows Ballycoolin Rd to the junction with Snugborough Rd.

5.3.4 Section D (Abbotstown to Huntstown Power Station)

This section of the route is common to Route Option 1, Section D, and is outlined above at 6.3.4.

5.3.5 Section H (Huntstown Power Station to Metropark)

From Huntstown Power Station the route runs in a north easterly direction traversing commercial and agricultural zoned lands until it emerges to the west of Harristown Bus Depot where it turns eastward running to the south of the industrial complexes in the area, As it progress the route runs to the north of Silloge Golf Club, it crosses the R108 before turning south east to join up with Metro North at Metropark.

5.4 Route Option 3 Overview

Route Option 3 (see Fig 3) is a combination of the following sections from above:

- Section A
- Section B
- Section G
- Section D

- Section E

5.5 Route Option 4 Overview

Route Option 4 (see Fig 4) is a combination of the following sections from above:

- Section F
- Section B
- Section C
- Section D
- Section E

5.6 Route Option 5 Overview

Route Option 5 (see Fig 5) is a combination of the following sections from above:

- Section F
- Section B
- Section G
- Section D
- Section E

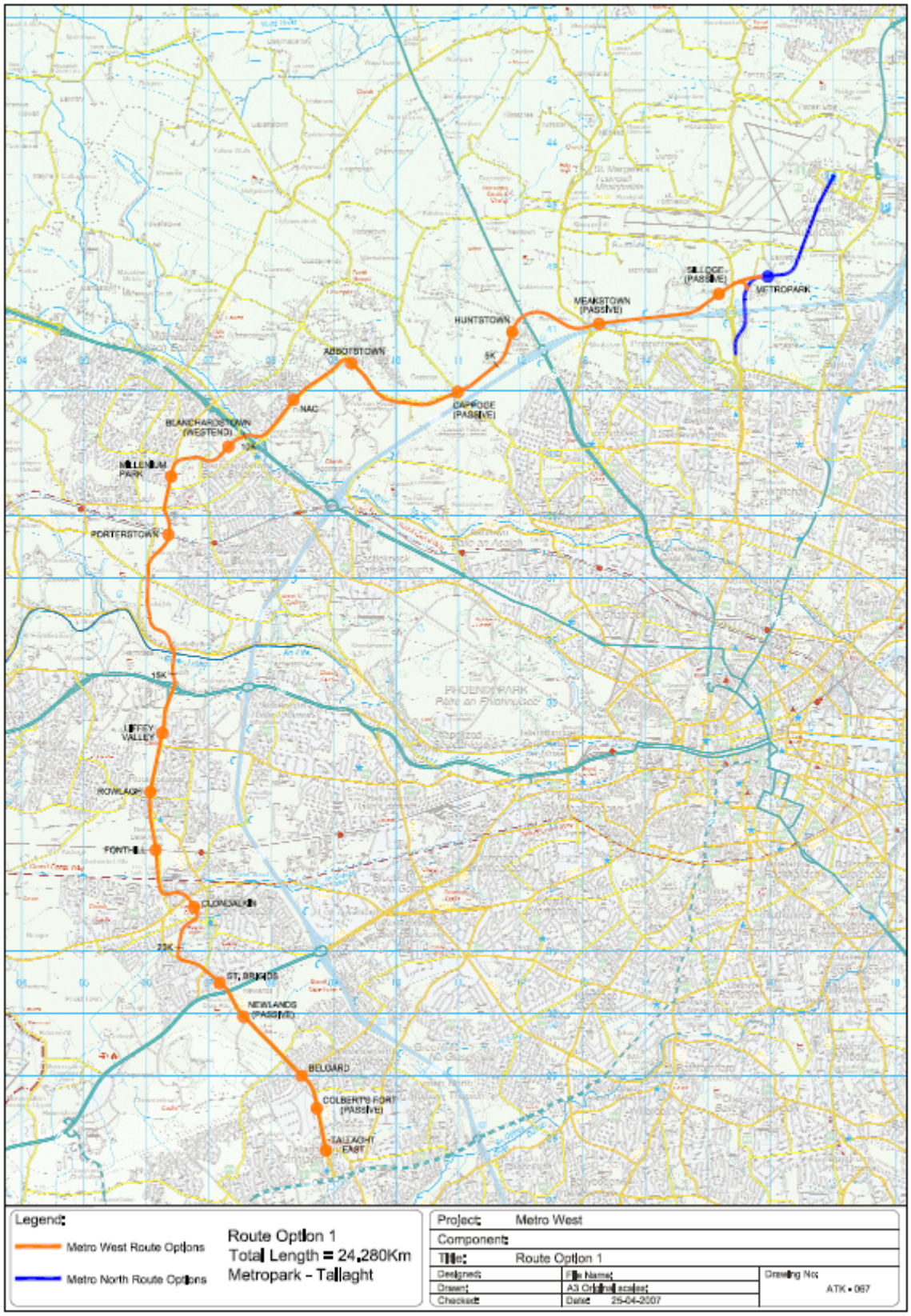


Fig No. 5.1 – Route Option 1B

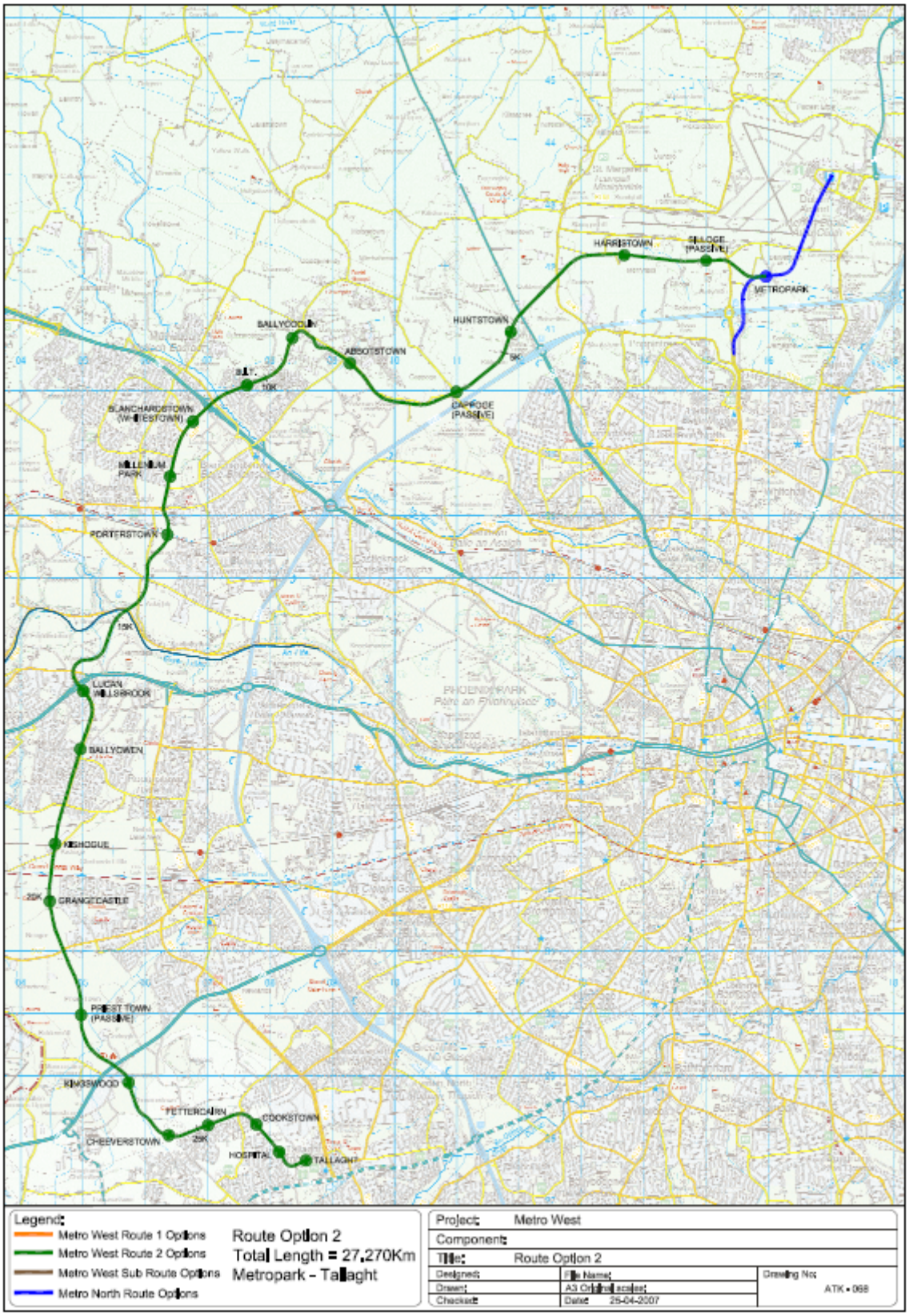


Fig No. 5.2 – Route Option 2

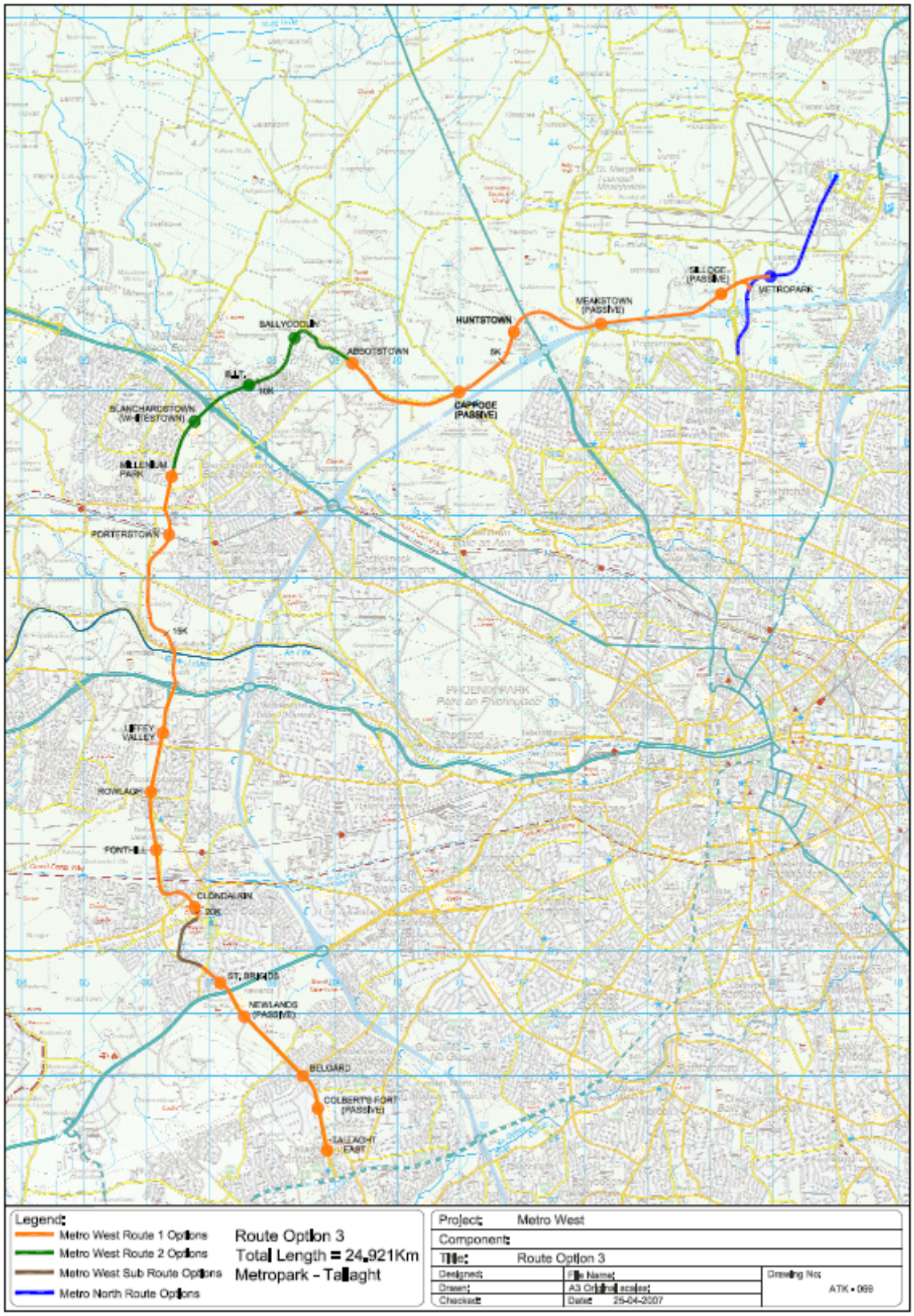


Fig No. 5.3 – Route Option 3

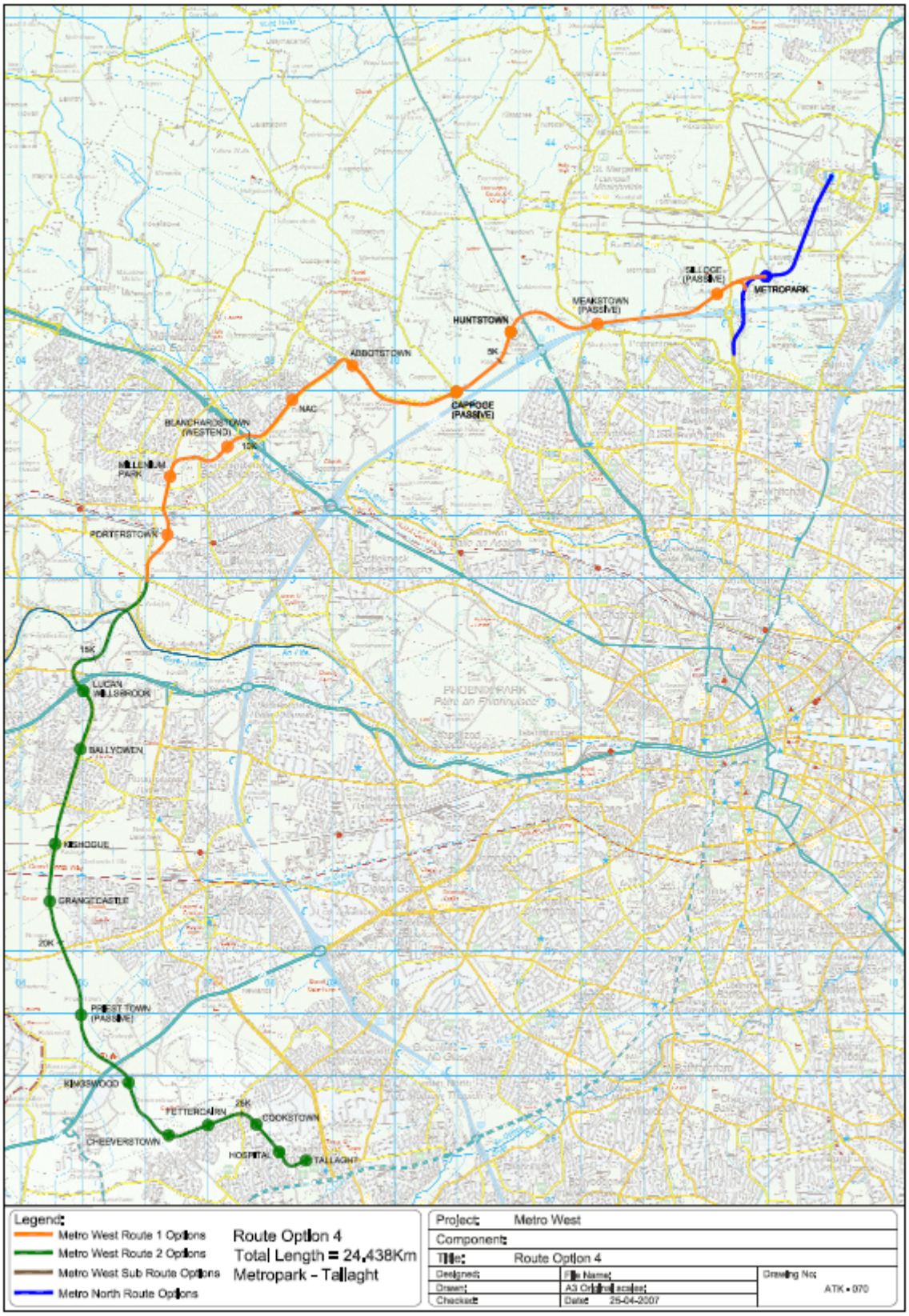


Fig No. 5.4 – Route Option 4

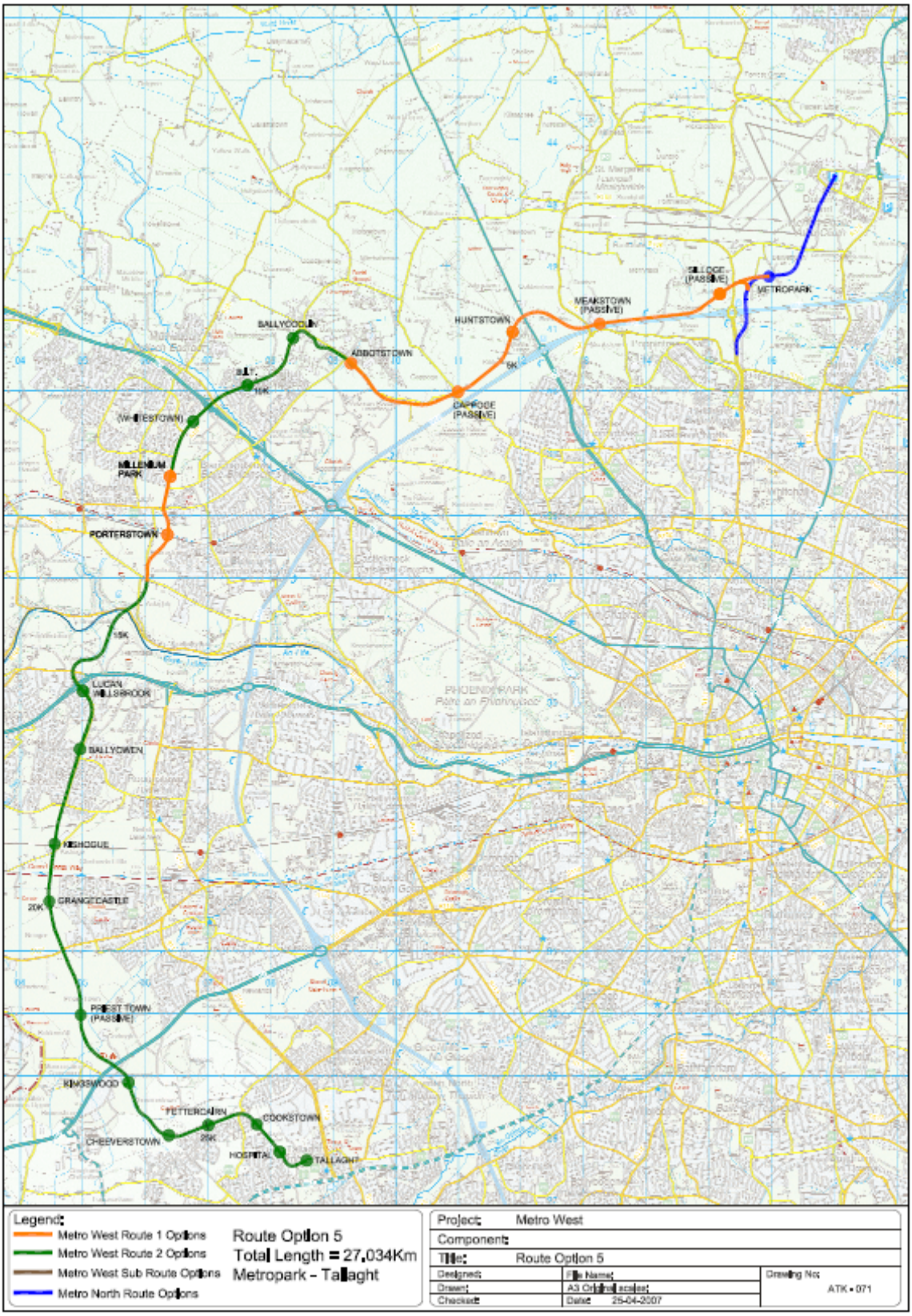


Fig No. 5.5 – Route Option 5

6 Economy

6.1 Introduction

The Economic Assessment has been made on the basis of the technical analysis of Metro West route alignments within the stage 2 study. Specifically;

- Run Time Analysis
- Station Catchment Analysis; and
- Demand forecasts.

Within the Stage 2 study, six eastern and central route options (the output of Stage 1) were assessed in terms of journey time, station catchments and demand forecasts, see JE Paper "Station Catchments Analysis", Sept 2006 contained in Vol. No. 5, Part (i) of Stage 2 submission. Following the Stage 2 sift process 2No. Route Options were selected for public consultation, with a number of sub-options.

As outlined previously all but 1No. of the sub-options were discounted leaving Route Option 1 as consisting of sub-option B. A further 3No.Route Options were then included in the final analysis of the EPR.

Some further journey time assessment and forecast demand has been undertaken on the Public Consultation routes and 3No. additional Route Options but the station catchment analysis has not been updated at this stage. The additional analysis was carried out by RPA in the following papers which can be found in Vol. 2 – RPA Papers;

a) Run Times and Peak Vehicle Requirements – May 2007
b) Metro West Catchment Analysis – May 2007

The original station catchment analysis can be seen in Vol. No. 5 Part (i) – Station Catchment Analysis.

Within the run time analysis a range of figures have been produced for cross comparison of the route options utilising RPA performance model and includes all the original sub-options. Assessments are based on a high level of assumed priority over road traffic and account for track curvature and dwell time at platform stops.

Station catchment analysis was initially undertaken to estimate 2002 and 2016 population, employment and education data for each stop, and to identify poor performing stops for route optimisation. Further station catchment analysis was undertaken by RPA using revised population projections from Fingal and South Dublin County Councils, including analysis of the Stage 1 Western route option and analysing socio-economic factors – education level 3 or less, unemployment, unskilled and retired.

Demand forecasts have been produced by RPA for the 2No. initial Public Consultation Route Options (incl. initial and future stops) as well as the additional 3No. Route Options being analysed for EPR. The demand forecasts were produced from their 2016 multi-modal models for the AM peak and off peak and with AM peak stop flows reported in detail.

6.2 Run Time Analysis

The forecast journey time for Metro West will be critical in terms of the forecast demand and revenue and in terms of the vehicle requirement and operating costs. Throughout the course of Stage 2 run time analysis has been refined through the definition of the stop locations and junction priority. Prior to Public Consultation, and after the 2No. Route Options had been selected, it was decided to define the stop locations to make the Public

Consultation process more informative for the general public by indicating to them the likely location of platform stops. The criterion adopted for stop locations was;

- At termini
- At intersections with railways
- At P&R sites
- On straight sections of track (100m min required)
- At 1km interval approx depending on catchment
- Provision to be made for stops where catchment is 10,000+ per km of track and 5,000+ employed per km of track
- Provision to be made for future stops where above criteria is likely to apply

When applied to the 2No. Route Options the stops which emerged are those shown on the Public Consultation Map, (see Appendix A).

Note;

Initial Stops; these are stops which will be constructed to be operational at the commencement of services on Metro West.

Passive Stops; these are future proposed stops which will be constructed at a later date when demand is sufficiently high.

Using the emerging stops and the 5No. Route Options under consideration for EPR the following run times to the airport are achieved based on an initial service of 4min headway (see RPA Paper, Metro West Runtime and PVR Final May 2007, Vol. 2);

	Dwell (min:sec)	Travel (min:sec)	Cumulative (min:sec)	Distance (metres)	Ave Speed (kph)
Route Option 1B	11:00	42:58	**53:58**	26851	29.85
Route Option 2	12:30	45:58	1:00:28	30239	30.00
Route Option 3	11:30	44:01	55:31	27499	29.72
Route Option 4	12:00	45:50	57:50	28799	29.88
Route Option 5	12:30	46:53	59:23	29447	29.75

Overall it can be seen that the route options vary in time from 54min to 60.5 min with Route Option 1B providing the fastest journey time at 53:58min which is just above a key project objective of 50min runtime from Tallaght to the airport.

The above tables were produced including both initial and passive stops so the times are conservative. Using initial stops only will result in shorter times. At the detailed design stage it is likely that improvements to the efficiency of the system may be achieved to lower runtimes to the project target time.

Conclusion

Ranking the Route Options from best to worst we get;

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Best	4th	2nd	3rd	Worst

6.3 Station Catchments

The original station catchment work was undertaken by JE in Sept 2006 to assess the 0.5km and 1.0km radius catchment population and employment and breakdown in terms of socio-economic factors. The analysis took account of overlapping station catchments to avoid double counting of the results.

The output from this report is contained in Dublin Metro West – Station Catchments Analysis (Sept 2006) and is contained in Vol. No. 5 Part (i).

This early report has now been superseded by Metro West Catchment Analysis (May 2007) produced by RPA and used to inform the EPR.

6.3.1 Population and Employment: Hybrid Options

The population and employment results found using the data provided is outlined below for each of the route options end to end, and also in terms of catchments per kilometre. A 1000m catchment area was assumed for the study (see RPA Paper, Metro West Catchment Analysis Final May 2007, Vol. 2) which is deemed to constitute an "acceptable walking distance" as stated in the IHT's "Guidelines for providing for journeys on foot".

Population & Employment					
Alignment	2002 Pop	2002 Emp	2006 Pop	2016 Pop	2016 Emp
Option 1B	56,168	33,668	74,451	137,189	68,356
Option 2	50,775	37,544	85,191	116,319	68,976
Option 3	56,165	34,132	76,553	140,767	70,482
Option 4	52,685	37,796	85,008	124,517	69,024
Option 5	52,686	38,261	87,116	128,101	71,152

Alignment	Length kms	2016 Pop	2016 Emp	Pop per Km	Emp per Km
Option 1B	23.87	137,189	68,356	5,747	2,864
Option 2	27.38	116,319	68,976	4,248	2,519
Option 3	24.73	140,767	70,482	5,692	2,850
Option 4	26.28	124,517	69,024	4,738	2,626
Option 5	26.87	128,101	71,152	4,767	2,648

Conclusion

Ranking the Route Options from best to worst we get;

Population per km

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Best	Worst	2nd	4th	3rd

Employment per km

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Best	Worst	2nd	4th	3rd

6.4 Forecast Demand and Cost Benefit Analysis

6.4.1 Introduction

Since Public Consultation forecast demand which had been initially modelled in Sept 2006 has now been updated to include all 5No. Route Options under consideration for EPR. This update work has been undertaken by RPA Paper "Demand Forecasting and Cost Benefit Analysis Report" – May 2007 and is contained in Vol. No.2 Part (b) of the Stage 2 submission. A summary of Cost Benefit Analysis which was outside JE Scope of Work has been included here for completeness of the Stage 2 Report.

6.4.2 Annual Demand by Mode

Table 6.4.2.1 shows the forecast changes in public transport demand for all 5No. Route Option compared with the base case which assumes Dublin Metro North in operation. Metro North is allocated as Luas for the analysis. It can be seen that the Route Options generate between 27.5m and 30.1m passengers per year which is substantially up on initial projections of 20m passengers evident during earlier forecast demand analysis. There are a predicted 22m new metro users per year suggesting a significant shift from car however it can been seen from table 6.4.2.1 that there is little difference between the various route options.

Mode	Do Min	Option 1B	Option 2	Option 3	Option 4	Option 5
Rail						
Boardings (millions)	94.6	94.3	94.2	94.6	93.8	94.0
Bus						
Boardings (millions)	241.8	232.0	234.1	231.5	234.8	233.8
Revenue (millions euro)	242.9	232.9	234.4	232.4	235.0	234.2
Revenue per pax (euro)	1.00	1.00	1.00	1.00	1.00	1.00
LRT						
Boardings (millions)	97.6	96.5	94.5	96.8	94.1	94.4
Revenue (millions euro)	112.9	110.8	108.4	111.1	107.9	108.2
Revenue per pax (euro)	1.16	1.15	1.15	1.15	1.15	1.15
Metro						
Boardings (millions)	37.6	71.2	72.6	72.5	72.3	74.0
Revenue (millions euro)	53.8	101.1	104.9	102.7	104.7	106.6
Revenue per pax (euro)	1.43	1.42	1.45	1.42	1.45	1.44
Total PT boardings (millions)	**471.7**	**494.0**	**495.3**	**495.4**	**495.0**	**496.3**

Route Time Metro West (min)		53.96	60.47	55.52	57.83	59.38
Annual demand on Metro West (millions)		27.80	29.95	28.95	29.84	31.69
New Metro users in 2016 (millions)		33.5	34.9	34.9	34.7	36.4
New Metro users coming from private transport (millions)		22.2	22.9	23	22.8	23.8

Fig. No. 6.4.2.1 Metro West Option ER1 Forecast Demand 2016

6.4.3 Line flows

The forecast details line flows for the number of passengers per am peak hour who board and alight the tramway and metro at each stop, and give the respective loading at each stop.

It should be noted that for Route Option1B and Route Option 2 that with the future stops in place the forecast hourly demand decreases and this is a result of the increased runtime on these routes.

The most important stops will be Tallaght, Tallaght East, Blanchardstown, Lucan Willsbrook, and Airport; other heavily used stops are forecast to be Porterstown, Cheeverstown, Metropark, Belgard and Colbert's Fort.

1000+ per hour	Blanchardstown, Airport, Lucan Willsbrook, Tallaght, Tallaght East,
800 + per hour	Porterstown
600 + per hour	Belgard, Colbert's Fort, Metropark, Cheeverstown
400 + per hour	Liffey Valley, Cookstown, Hospital, Huntstown
200 + per hour	Millennium Park, Clondalkin, Fonthill, St Brigids, Abbotstown, Meakestown, Kishoge, Ballycoolin
<200 per hour	The remainder of stops

Fig No. 6.4.3.1 Schedule of stop usage per hour

6.4.4 Cost Benefit Analysis

As outlined in 6.4.1 above RPA undertook to carry out a full cost benefit Analysis (CBA) for the 5No. Route Options under consideration. The findings of this study are contained in RPA Paper "Demand Forecasting and Cost Benefit Analysis Report" – May 2007 and is contained in Vol. No.2 Part (b) of the Stage 2 submission

RPA examined total cost for each of the 5No. options comprising of Capital Cost, Operating Costs and Renewal cost. Against these costs they analysed benefits that would arise to the economy by assigning monetary cost to User Time Savings, Non User Time Savings, Vehicle Operating Cost Savings, Air Emissions Savings and finally savings arising from potential reduction in Accidents. When compared against one another the Cost Benefit Ratio is as per Fig 6.4.4.1 below.

NPV indicates the total contribution to society of each of the route options while Internal Rate of Return (IIR) is the return on investment on the project.

Option	1B	2	3	4	5
Economic Net Present Value (NPV) (€m,2002)	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Benefit to Cost Ratio (BCR)	1.55:1	2.22:1	1.5:1	1.59:1	1.59:1
Internal Rate of Return (IRR)	10.6%	15.3%	10.2%	10.9%	10.69%

Fig No. 6.4.4.1 Economic Results

6.5 Conclusion

The overall conclusion for the Economy section of this Report came out as follows (see MAST in Appendix B);

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
2nd	3rd	4th	Worst	Best

7 Costs & Funding

7.1 Introduction

In Jan 2007 Jacobs undertook to develop a Capital Cost Estimate (see Vol. 6a) for Route Option 1 and Route Option 2.

Excluded from this initial Capital Cost estimates were the following items:

O&M Costs (to be supplied by RPA).
RPA Costs (to be supplied by RPA).
Contingency (included as part of Risk).
Land Acquisition Costs (being undertaken by another party for inclusion at a later date)
Certain Accommodation Works Costs (sewer relining, under pinning etc).

The cost of 45m trams is included and based on a figure of [text deleted] per 40m tram (from RPA). This figure includes for tram fit out in Ireland.

Following the workshops the risks associated with the project were evaluated by adding percentage allowances to each item in the Capital Cost Estimates (See Appendix B of Report). In addition to this, where an opportunity for cost saving was identified this was also included in the estimate. However, due to the current stage of design development the identification of opportunities for saving were kept to a minimum. It is recommended that this be revisited at a later date as part of a Value Engineering exercise when design development has progressed to an appropriate point.

7.2 Supplemental Report

Following Public Consultation and in order to inform the Stage 2 report leading to the EPR. It was decided to examine the 5No. route options previously outlined. This then required a revision of the original cost estimate

The basis of the revised estimate was also an opportunity to amalgamate all known financial information gathered following the publishing of the original CAPEX Report. The additional information that was now available consisted of;

- Land Acquisition Costs (see Vol. 7)
- RPA Costs

The outcome of this exercise is summarised in ECH “Capital Cost Estimates – Supplement Report, May 2007.

The table below summarises the total capital cost of the 5No. Route Options under consideration leading the EPR.

Route Option 1B	[text deleted]
Route Option 2 (as original capital cost estimate).	[text deleted]
Route Option 3	[text deleted]
Route Option 4	[text deleted]
Route Option 5	[text deleted]

Fig No. 7.2.2 Summary of Route Options (including Risk)

The above costs include:

- Construction costs, including site clearance, highway works, track, structures, depot construction, signalling and systems equipment.
- Preliminaries
- Trams (45 nr and 45m long) and trial running costs.
- RPA Costs
- Land Acquisition and CPO Costs

They do not include O&M cost or accommodation works relating to sewer relining and underpinning. O&M costs will be added in a Stage 3 update of CAPEX.

7.3 Commentary on CAPEX Costs

It should be noted from the outset that the CAPEX estimate is a high level estimate at this stage; however it does contain a certain level of opportunity which can be further improved during the evolution of a more detailed design. The level of risk currently equate to +/- 30% of Base Capital Cost. The Basis of Estimate (BOE) is outlined in the CAPEX Report contained in Vol. 6.

It can been see that the costs across the 5No Route Options are broadly similar with Route Option 3 being the most expensive and Route Option 2 being the least expensive.

A more detailed breakdown of cost is outlined in Fig No. 8.3.1

- The median value is [text deleted] and the maximum deviation is ± 2.5%.

- The routes are of varying lengths and the cost/km of each is;

  Route 1B= 24.280km [text deleted]
  Route 2 = 27.270km [text deleted]
  Route 3 = 24.921km [text deleted]
  Route 4 = 24.438km [text deleted]
  Route 5 = 27.034km [text deleted]

- From Fig No. 8.3.1 it can be seen that Route Option 1 is the most expensive per kilometre while Route Option 2 is the least expensive.
  The median cost is [text deleted] and the maximum deviation is 6.2%

- Excluding Land Acquisition and tram costs the cost/km of each is;
  Route 1= 24.280km [text deleted]
  Route 2= 27.270km [text deleted]
  Route 3= 24.921km [text deleted]
  Route 4= 24.438km [text deleted]
  Route 5= 27.034km [text deleted]

	Route Option 1B	Route Option 2	Route Option 3	Route Option 4	Route Option 5
	€'s	€'s	€'s	€'s	€'s
Site Preparation	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Highway Works	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Environmental/Land scaping	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Structures and Bridges	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Trackwork	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Stops	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Traction Power	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Systems Equipment	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Road Junction Signaling	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Utilities	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Ancillary Works	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Nett construction cost	**[text deleted]**	**[text deleted]**	**[text deleted]**	**[text deleted]**	**[text deleted]**
Preliminaries @ [text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
H.O overheads, profit @ [text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Design,Site Supervision@[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Consents, 3rd Party etc [text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Land Acquisition and Compensation	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Capital Cost (Excl. Vehicles)	**[text deleted]**	**[text deleted]**	**[text deleted]**	**[text deleted]**	**[text deleted]**
Trams (45nr)	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Interoperability Allowance [text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Trial Running Costs@[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
Capital Cost (Inc. Vehicles)	**[text deleted]**	**[text deleted]**	**[text deleted]**	**[text deleted]**	**[text deleted]**
RPA Costs @[text deleted]	€69,680,891	€67,247,928	€70,602,231	€67,432,651	€69,905,465
Insurance @ [text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]	[text deleted]
TOTAL CAPITAL COST	**[text deleted]**	**[text deleted]**	**[text deleted]**	**[text deleted]**	**[text deleted]**

Fig No. 7.3.1 Breakdown of CAPEX Costs

- Price aside these figures are broadly in line with expectations, Route Option 1B runs through more mature and developed areas of Dublin while Route Option 2 follows the less developed ORR alignment.

- The average cost of land acquisition based on a 20m corridor through public or private lands and 10m in the highway is [text deleted] per route and this sum can be reduced significantly through value engineering when the alignment is fixed. This equates to an average cost of [text deleted].

- The cost of trams is based on 45No. 45m long units at a total cost of [text deleted].

- It is important to note that the basis of estimate used for the CAPEX is UK and Mainland Europe based, simply for the fact that there is more historical information available given the number of major infrastructure projects built in the UK. The only benchmark available in Ireland is the completed Luas. The high level of Preliminaries portrayed is based on current UK trends which are seeing Contractors moving more cost to this item. Therefore any reduction in the Preliminaries shown here to a more Irish model is not straight forward as it is likely that measured rates would increase in line.

7.4 Spend profile

In order to inform the CAPEX expenditure JE produced a spend profile which is attached in Fig No. 8.4.1. This leads to the establishment of some key dates for the project which must be maintained to ensure delivery of the project in 2014.

The key dates are outlines as follows;

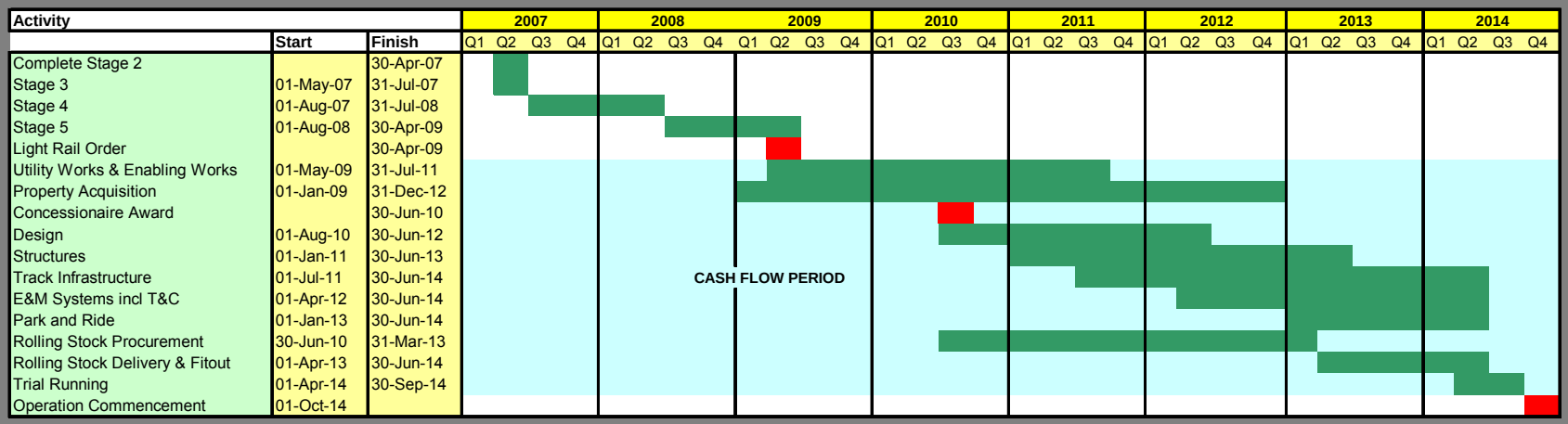
- ✓ Rail Order (RO) by April 2009
- ✓ Concessionaire award by June 2010
- ✓ Infrastructure construction commences by Jan 2011
- ✓ Trail running commences by April 2014
- ✓ Operational services commence by October 2014

7.5 Conclusion

The overall conclusion for the Cost & Funding section of this Report came out as follows (see MAST in Appendix B);

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Best	Worst	2nd	3rd	4th

Spend Profile for Metro West



Activity	Start	Finish
Complete Stage 2		30-Apr-07
Stage 3	01-May-07	31-Jul-07
Stage 4	01-Aug-07	31-Jul-08
Stage 5	01-Aug-08	30-Apr-09
Light Rail Order		30-Apr-09
Utility Works & Enabling Works	01-May-09	31-Jul-11
Property Acquisition	01-Jan-09	31-Dec-12
Concessionaire Award		30-Jun-10
Design	01-Aug-10	30-Jun-12
Structures	01-Jan-11	30-Jun-13
Track Infrastructure	01-Jul-11	30-Jun-14
E&M Systems incl T&C	01-Apr-12	30-Jun-14
Park and Ride	01-Jan-13	30-Jun-14
Rolling Stock Procurement	30-Jun-10	31-Mar-13
Rolling Stock Delivery & Fitout	01-Apr-13	30-Jun-14
Trial Running	01-Apr-14	30-Sep-14
Operation Commencement	01-Oct-14	

Spend Items	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	Total
Client Cost incl PM	10%	15%	25%	20%	20%	10%	100%
Utility Works & Enabling Works	20%	50%	30%	0%	0%	0%	100%
Property Acquisition	10%	20%	30%	20%	10%	10%	100%
Concessionaire Design	0%	15%	70%	15%	0%	0%	100%
Structures	0%	0%	40%	40%	20%	0%	100%
Track Infrastructure	0%	0%	15%	35%	40%	10%	100%
E&M Systems incl T&C	0%	0%	0%	30%	50%	20%	100%
Park & Ride	0%	0%	0%	30%	50%	20%	100%
Rolling Stock Procurement	0%	35%	20%	40%	5%	0%	100%
Rolling Stock Delivery & Fitout	0%	0%	0%	0%	80%	20%	100%
Start Up Costs	0%	0%	0%	20%	50%	30%	100%
Trial Running	0%	0%	0%	0%	0%	100%	100%
Contingency	0%	0%	10%	20%	40%	30%	100%
Risk	0%	0%	10%	20%	30%	40%	100%

Fig 7.4.1 Metro West Spend profile

8 Environment

8.1 Introduction

This report is a summary high level assessment of the 2No Route Options, further detail can be found in the Environmental Assessment Report (EAR), Vol. No. 8

The EAR was produced in tandem with this report, the 2 No. Route Options were considered separately as were the sub options, therefore this consistency is maintained within this report.

As 3 No. hybrid options are then considered in this report we have carried out a “traffic light” analysis across all the options to rank them in terms of score from best to worse.

8.2 Route Option 1B

The environmental constraints assessment indicated that Route Option 1B has a predominately moderate environmental impact overall with approximately 62% of the route alignment scoring a moderate environmental impact and a further 17% of the alignment scoring a low overall environmental impact. A high environmental impact was indicated on 21% of the route alignment notably sections 044 – 077. This section partially crosses the Liffey Valley and therefore affects preserved views, Natural Heritage Area (pNHA), Special Amenity Area Order (SAAO) and a High Amenity Area.

Although Route Option 1B has the lowest impact of the two main route alignment options, the line passes through/within 25 of several features/areas considered to be of both perceived and actually impact/nuisance to human beings. Notably, several open space objectives as designated in the South Dublin and Fingal UDPs, cycle ways, a health centre in Clondalkin, schools, proposed schools, sports grounds and parklands. The route does not directly intersect with any known areas of potential historic contaminated land although it does run within the vicinity of several areas notably an Oil Mill to the west of Clondalkin town centre. It is considered that this will not be a limiting factor.

The route runs through several high amenity areas – in particular the designation in the immediate vicinity of the Liffey Valley, the Liffey Valley itself and the Tolka Valley. Rural amenity objectives designated in the Fingal UDP are directly affected where the route approaches the interchange with Metro North as the area predominately consists of open land.

With respect to visual impact, the route crosses a preserved view looking onto the Liffey Valley at sections 042 – 044 and 044 - 045.

As with all alignment options, the route crosses a number of surface water bodies and watercourses with the major watercourses including Grand Canal, Royal Canal, the River Liffey and the River Tolka. All surface water bodies and watercourses are considered particularly sensitive receptors to the proposed works. There is the potential that pollution of watercourses can have both direct and indirect effects on wider environmental receptors inclusive of ecological value, visual amenity, and recreational enjoyment and also has the potential to affect potable water supplies.

Ecologically, the route passes through/within 25m of three areas of protected trees (notably nodes 006 – 016 and 044 – 045 and 051 – 069). The route passes through three NHAs notably that of Grand Canal, Royal Canal and the Liffey Valley. In addition, the Liffey Valley is also designated as a Special Amenity Area and is consequently protected by a SAAO. As with all three route options, crossing the Liffey Valley has been highlighted as a major environmental constraint and was assessed in the Liffey Valley Working Paper. The

ecological impact is expected to be the loss of broadleaved woodland and semi natural grassland with the potential loss of protected trees and the adverse impact on the SAAO and pNHA.

Archaeology, Cultural and Architectural Heritage

Potential direct impacts have been identified on 38 sites of importance.

Eight sites have been assessed as being of Local importance, while 26 sites have been assessed as being of Regional importance and four of National Importance.

Information on these sites is summarised in the figure below:

Recorded Monument/RPS Number	Site Name	Importance	Designation
DU021-037---	Tallaght Town	Regional	Recorded Monument
DU021-03701-	Tallaght Ecclesiastical remains	Regional	Recorded Monument
DU021-03702-	Tallaght Ecclesiastical Enclosure	Regional	Recorded Monument
DU021-03703-	Tallaght Church	Regional	Recorded Monument
DU021-03704-	Tallaght Graveyard	Regional	Recorded Monument
DU021-03705-	Tallaght Tomb	Regional	Recorded Monument
DU021-03706-	Tallaght Cross	Regional	Recorded Monument
DU021-03707-	Tallaght Millstone	Local	Recorded Monument
DU021-03708-	Tallaght Cross	Regional	Recorded Monument
DU021-03709-	Tallaght Font	Local	Recorded Monument
DU021-03710-	Tallaght Towerhouse	Regional	Recorded Monument
DU021-03711-	Tallaght Gatehouse	Regional	Recorded Monument
DU021-03712-	Tallaght Holy tree	Local	Recorded Monument
DU021-03713-	Tallaght Enclosure	Regional	Recorded Monument
DU021-03714-	Tallaght Market cross	Local	Recorded Monument
DU021-010---	Brideswell Commons Ecclesiastical remains	Regional	Recorded Monument
DU021-01001-	Brideswell Commons Holy Well	Regional	Recorded Monument
DU021-01002-	Brideswell Commons Inscribed stone	Local	Recorded Monument
DU021-01003-	Brideswell Commons Church and graveyard	Regional	Recorded Monument
DU021-01401-	Newlands Demesne Gateway	Local	Recorded Monument
DU021-01402-	Newlands Demesne Date stone	Local	Recorded Monument
DU013-019---	Coolmine (Ca. By.) Ecclesiastical remains	Regional	Recorded Monument
DU013-01901-	Coolmine (Ca. By.) Church	Regional	Recorded Monument
DU013-01902-	Coolmine (Ca. By.) Graveyard	Regional	Recorded Monument
DU014-027---	Cappoge Towerhouse	Regional	Recorded Monument
DU017-041---	Clondalkin Town	Regional	Recorded Monument
DU017-04101-	Clondalkin Ecclesiastical Enclosure	Regional	Recorded Monument
DU017-04102-	Clondalkin Church and graveyard	National	Recorded Monument
DU017-04103-	Clondalkin Cross	National	Recorded Monument

DU017-04104-	Clondalkin Cross	Local	Recorded Monument
DU017-04105-	Clondalkin Round tower	National	Recorded Monument
DU017-04106-	Clondalkin Towerhouse	Regional	Recorded Monument
DU017-04108-	Clondalkin Watermill	Regional	Recorded Monument
DU017-04109-	Clondalkin Ecclesiastical Enclosure	Regional	Recorded Monument
DU017-04110-	Clondalkin Church	Regional	Recorded Monument
DU017-04111-	Brideswell Commons	National	Recorded Monument
DU021-036--*	Brideswell Commons	Regional	Recorded Monument
	Clondalkin Architectural Conservation Area	Regional	Architectural Conservation Area

Fig 8.2.1

This option passes through the Zone of Archaeological Potential associated with Tallaght, which is Recorded Monument (DU021-037), and the Areas of Potential associated with 14 other monuments in this complex. Tallaght was the site of early medieval monastic settlement (DU021-03701 and DU021-03702), a later medieval monastic manor and archbishop's palace (DU021-03710), and was later a significant walled town. At its closest point the route is located over 200m to the west of these sites. It is therefore unlikely that there will be a direct impact on the known elements of these sites. However given the concentration of archaeological sites in this area, there is a high potential for the presence of unknown archaeological remains.

Route Option 1B also passes through the Clondalkin's Zone of Archaeological Potential (DU017-04101), and 10 associated sites in this complex and there is therefore potential for this sub-option to have direct impact on unknown archaeological remains associated with these sites. Clondalkin should be considered to have a high potential for the presence of unknown archaeological remains and there is therefore potential for a direct impact on the unknown archaeological remains.

Located to the south of Clondalkin and west of the R113, Route Option 1B passes through the Zone of Archaeological Potential associated with Brideswell Commons Ecclesiastical Remains (DU021-010, DU021-01001, DU021-01002, and DU021-01003). The core of this complex, including St. Brigid's Well, is located to the west of the present R113, while Route Option 1 is located to the west of this road.

Cappoge Towerhouse (DU014-027) was demolished at some time before 1860. The RMP states that this area was heavily quarried in the past. It is possible, but by no means definite, that archaeological remains associated with this site have been removed.

The Strawberry Beds have been assessed as being of Local cultural heritage importance. This area was the destination of day-trippers from the city of Dublin and has been widely mentioned in songs and books. Depending on the design of the Liffey crossing, it is possible that there may be a direct impact on this area. The Liffey valley should also be considered to be an area of potential for the presence of unknown archaeological remains.

A raised oval mound located in Blanchardstown Millennium Park is believed to be the sites of Coolmine medieval church and graveyard (Recorded Monuments Number DU013-019, DU013-01901, and DU013-01902). The potential for a direct impact on these ecclesiastical remains has been identified.

8.3 Route Option 2

The environmental constraints assessment indicated that Route Option 2 has a predominately moderate environmental impact overall with approximately 68% of the route alignment scoring a moderate environmental impact and 4% of the alignment scoring a low impact. A high environmental impact was indicated on 28% of the route alignment notably sections 005 – 045c, 051 – 069, 051 – 077 and 090 – 092. Once again, as with both route alignments, a high environmental impact is associated with the crossing point over the Liffey Valley.

Route Option 2 runs within 25m/directly intersects several features/areas considered to be both perceived and actually impact/nuisance to human beings. Notably, the route runs within 25m/directly affects Tallaght hospital, intersects with several areas of recreational amenity inclusive of sports grounds and golf courses, several churches and additional facilities such as cycle-ways, parks and areas of designated open space.

As with Route Option 1, the route affects several areas of high amenity inclusive of the Liffey Valley and the Tolka Valley. It also has an adverse effect on the rural amenity objective for the area around the Airport, as it is designated in the Fingal UDP, largely to be attributed to the current rural nature of the area.

Route Option 2 also crosses a designated Protected View point overlooking the Liffey Valley. However, it does directly traverse the sensitive landscape designated to the south of Carpenters Town.

As with all route alignments, Route Option 2 crosses several surface water bodies and water courses in particular Grand Canal, Royal Canal, the River Liffey and the River Tolka. Watercourses are considered to be particularly sensitive receptors to the proposed works. There is the potential that pollution of watercourses can have both direct and indirect effects on wider environmental receptors inclusive of ecological value, visual amenity, and recreational enjoyment and also has the potential to affect potable water supplies. These factors are of particular importance during the construction period and consequently further assessment will be required once the preferred route alignment has been identified.

Ecologically, as with Route Option 1, Route Option 2 intersects three NHAs notably the Grand Canal on section 005-045b, Liffey Valley on section 005 – 045c and Royal Canal on section 051 – 069. As with all routes, the route crosses the Liffey Valley which, in addition to being designated as an NHA, is also a Special Amenity Area and consequently protected by a SAAO. As with both alignment options, crossing the Liffey Valley has been highlighted as a major environmental constraint.

In addition, as with Route Option 1, Route Option runs within 25m/directly intersects 3 areas of a protected trees and woodland, notably nodes 045-051, 051-077 and 005-045c. However, Route Option 2 is the least favourable ecological option due to the major impacts that would result from construction and operation on the woodland that lies within the pNHA to the north of the Liffey at the crossing location.

Crossing the Liffey using Route Option 2 provides the opportunity to implement a bridge design away from the existing M50 crossing, while limiting the ecological impact that would potentially be associated with the crossing. The route would make use of the existing N4 underpass and the elevation will be at low level. This in turn reduces the length of the bridging structure required and the overall construction cost, time and environmental impact.

Archaeology, Cultural and Architectural Heritage

Potential direct impacts on a total of 21 sites of importance have been identified. Information on the sites on which a direct impact has been identified is summarised in the table below:

Recorded Monument/RPS Number	Site Name	Importance	Designation
DU013-019---	Coolmine (Ca. By.) Ecclesiastical remains	Regional	Recorded Monument
DU013-01901-	Coolmine (Ca. By.) Church	Regional	Recorded Monument
DU013-01902-	Coolmine (Ca. By.) Graveyard	Regional	Recorded Monument
DU017-037---	Nangor Castle	Regional	Recorded Monument
DU021-00701*	Deansrath	Regional	Recorded Monument
DU021-00702*	Deansrath	Regional	Recorded Monument
DU021-037---	Tallaght Town	Regional	Recorded Monument
DU021-03701-	Tallaght Ecclesiastical remains	Regional	Recorded Monument
DU021-03702-	Tallaght Ecclesiastical Enclosure	Regional	Recorded Monument
DU021-03703-	Tallaght Church	Regional	Recorded Monument
DU021-03704-	Tallaght Graveyard	Regional	Recorded Monument
DU021-03705-	Tallaght Tomb	Regional	Recorded Monument
DU021-03706-	Tallaght Cross	Regional	Recorded Monument
DU021-03707-	Tallaght Millstone	Local	Recorded Monument
DU021-03708-	Tallaght Cross	Regional	Recorded Monument
DU021-03709-	Tallaght Font	Local	Recorded Monument
DU021-03710-	Tallaght Towerhouse	Regional	Recorded Monument
DU021-03711-	Tallaght Gatehouse	Regional	Recorded Monument
DU021-03712-	Tallaght Holy tree	Local	Recorded Monument
DU021-03713-	Tallaght Enclosure	Regional	Recorded Monument
DU021-03714-	Tallaght Market cross	Local	Recorded Monument

Fig 8.3.1

Seventeen of these sites have been assessed as being of Regional importance, with the remaining four sites assessed as being of Local importance.

The majority of potential direct impact identified relate to Tallaght. Tallaght was the site of early medieval monastic settlement (DU021-03701 and DU021-03702), a later medieval monastic manor and archbishop's palace (DU021-03710), and was later a significant walled town. The route passes through the Zone of Archaeological Potential associated with Tallaght, which is Recorded Monument (DU021-037) and Areas of Potential associated with 14 other monuments in this complex. At its closest point this route is located over 150m to the west of these sites. It is therefore unlikely that there will be a direct impact on the known elements of these sites. However given the concentration of archaeological sites in this area, there is a high potential for the presence of unknown archaeological remains. That Route Option 2 is located almost wholly within the new town and on existing roads should reduce the potential for direct impacts on any such remains.

There is also potential for a direct impact on archaeological remains associated with Nangor Castle (DU017-037). The location of this castle has been identified from early Ordnance Survey mapping as a range of buildings with a formal garden to the west. The castle was incorporated into a 19th century mansion which has also been demolished. Previous archaeological works in the area have identified traces of the castle and medieval settlement and field systems. This area should also be considered to have a high potential for the presence of unknown archaeological remains. DU021-00701 and DU021-00702 are unnamed Record Monuments associated with Nangor Castle.

The Strawberry Beds have been assessed as being of Local importance. This area was the destination for day-trippers from the city of Dublin and has been widely mentioned in songs and books. Depending on the design of the Liffey crossing, it is possible that there will be a direct impact on this site

The discovery of archaeological remains during previous monitoring of construction work in the Liffey Valley does indicate that there is potential for the presence for unknown archaeological remains.

A raised oval mound located in Blanchardstown Millennium Park is believed to be the sites of Coolmine medieval church and graveyard (DU013-019, DU013-01901, and DU013-01902). The potential for a direct impact on these ecclesiastical remains has been identified.

Sub-Option B

Sub Option B crosses Clondalkin Park and an area around the Community Centre designated as Open Space, along with a snooker hall to the west of the Community Centre. In terms of potential contaminated land, Sub Option B crosses the site of a historical Paper Mill to the west of the community centre, identified from historical desk study. This site is not intersected by Route Option 1. With respect to the visual impact, Sub Option B crosses a Preserved View Range of central Clondalkin Park that is not crossed by Route Option 1.

The only natural watercourse in the area is the Cammock River which flows in a north easterly direction. Sub Option B has a direct impact on the Cammock River and may require a bridge crossing. Sub Option B may require the demolition of the Snooker hall to the west of the Community Centre.

Hybrid Options

An environmental constraints assessment was carried out for each of the 5 route options Each of the five route options were analysed using the traffic light system of the Working Papers, assigning each section of the alignment a high, moderate and low environmental impact with colours of red, amber and green respectively. Each of the 5 route options was predominantly of Moderate impact. In order to assess the relative impact of each of the route, a Geographical Information System (GIS) was used to analyse each of the routes and to rank them in terms of environmental impact, based on firstly the individual environmental constraints and secondly the overall environmental constraints.

In order to account for the significance of proximity to the route, the route sub-section options have then been assigned three assessment buffers to reflect specific distances from the proposed alignment options. The three buffers are 0-250m, 250-500m and 500-750m. Each assessment buffer has been given a value to reflect the relative significant impact that is likely to be caused as a result of the proposed development i.e. those sensitive receptors located within 250m of the route section are considered more likely to be significantly affected by the alignment options than the same receptor located between 500 – 750m from the proposed alignment option.

The assessment has also been designed to account for the relative importance of each environmental parameter and their associated sensitive receptors, for example the sensitive receptors associated with the Human Beings parameter includes schools, proposed schools, hospitals, churches and public facilities, where each has been assigned a value allocated in accordance with the criteria outlined in table 2A of the Environmental Assessment Report.

1.0: has been allocated where the sensitive receptor of local value/designation is likely to receive an adverse impact as a result of the proposed route alignment;

1.5: has been allocated where a sensitive receptor of regional designation or that which is safe guarded under local planning requirements e.g. SAAO is likely to receive an adverse impact as a result of the proposed route alignment;

2.0: has been allocated where a parameter of national value such as a SAC, SPA, Hospital etc or that which is afforded legislative protection or a site that would provide a major inhibition for the planned route e.g. conflicting land use is likely to receive an adverse impact as a result of the proposed route alignment.

It is acknowledged that the criteria have been largely derived using expert judgement reflecting a past experience of impact assessment on such projects.

An overall route section score is then calculated as a combination of environmental constraint group scores where each constraint group is considered to have equal importance.

Using the number of 'hits' a score was assigned to each route option, allowing the routes to be assessed ranked In terms of environmental impact relative to each other;

Legend	
Relative Assessment	**Color**
Best	
Second Best	
Middle	
Second Worst	
Worst	

8.4 Individual Constraints

The impact on each of the environmental constraints was ranked across the route options based on the 'hits', for example for constraint Human Beings, Nuisance and Land use, Route Option 3 is the least favourable option and Route Option 4 the Most favourable.

Where more than one Route Option gave the same number of 'hits' for a constraint the same rank was given, e.g. for ecology Route Option 2 and 4 have the same number of hits so are both assigned a relative assessment value of 'second best' and the following assessment value of 'middle' is omitted.

The table below shows the relative assessment of each constraint across each of the Route Option;

Environmental Constraint	Route Option 1	Route Option 2	Route Option 3	Route Option 4	Route Option 5
Human Beings Nuisance and Land Use	4	2	5	1	3
Ecology	5	2	4	2	1
Potentially Contaminated Land	1	5	2	3	4
Surface water and Aquifers	1	5	2	3	4
Landscape and Visual	4	1	4	1	1
Cultural Heritage	4	2	5	1	3
Noise and Vibration	4	2	5	1	3

Fig 10.6.1 – Ranked Environmental Constraints for each Route Option.

8.5 Overall Environmental Impact

Based on the Relative assessment of each environmental constraint, as produced by a GIS based system, each of the five route options were assigned an overall score and from this given an overall Relative Assessment;

Relative Assessment	Route Option
5	3
4	1
3	2
2	5
1	4

Fig 10.7.1 – Overall Environmental Impact

However, once the parameters of Air Quality, Landscape and Traffic volumes were included in the assessment the order of route options 1 and 2 changed slightly to give the following;

Relative Assessment	Route Option
5	3
4	2
3	1
2	5
1	4

Figure 10.7.2 – Overall Environmental Impact including RPA specified parameters

8.6 Conclusion

In summary all 5 route options are of predominantly moderate environmental impact. When ranked using GIS, Route Option 3 is the least favourable option as it has the highest environmental impact of the five Route Options. Route Option 4 is the most favourable option as it has the lowest environmental impact.

9 Accessibility & Social Inclusion

9.1 Introduction

9.1.1 Social Inclusion

Successful inclusion is about creating vibrant communities and linking these communities to offer a diversity of opportunity in employment, social activities and housing. Within South Dublin the areas that are experiencing the greatest social exclusion are north and west Clondalkin and an area in west Tallaght. In Fingal County social exclusion is being experienced in areas such Blanchardstown West, Mulhuddart, Finglas and Ballymun. (See Fig No. 11.1.1.1). Also see RPA Paper "Metro West Analysis – RAPID Areas, May 2007 in Vol. No.2 Part (e)

"While continuing economic growth since 1996 combined with initiatives such as the URBAN initiative, RAPID (Revitalising Areas through Planning, Investment and Development) and the Integrated Area Plan Funds (IAPs) have impacted positively on social exclusion, the scale of the problems faced is such that large scale and continued investment in facilities for these neighborhoods is essential in order to arrive at a situation where sustainable regeneration can take place." (SDCC 2004 Development Plan).

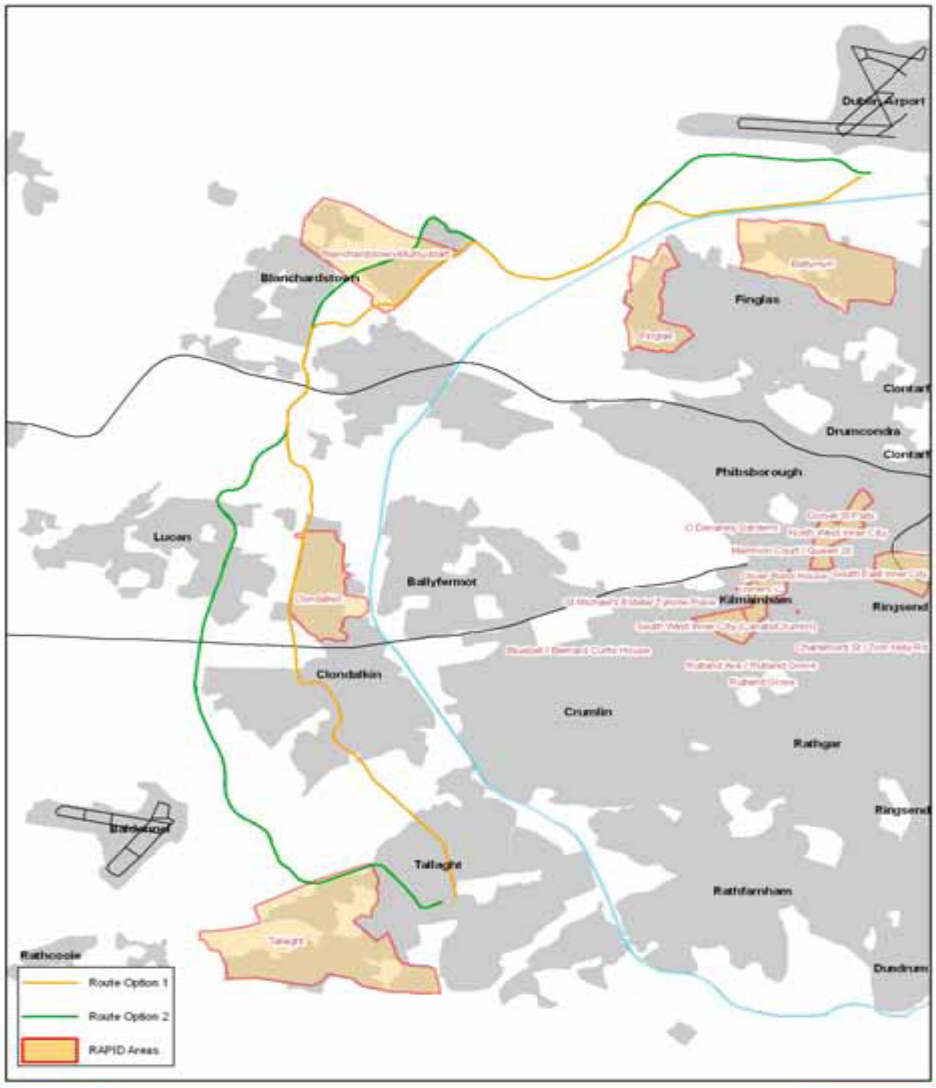


Fig No. 9.1.1.1 RAPID Areas in or about Metro West Route Options

9.1.2 Accessibility

"People with a disability face particular physical barriers to access and movement. For people with mobility impairments, ensuring level / ramped access to buildings, dished kerbs and the provision of appropriate parking and toilet facilities are important. For people with visual impairments, tactile paving that can be felt underfoot and audible signals at pedestrian crossings are necessary.

The Barcelona Declaration aims to encourage local government to make provision for the inclusion of people with disabilities in the community which it represents. The Declaration contains agreed actions to be undertaken by Local Authorities in pursuit of barrier-free design in all environments.

Access requirements for people with a disability must be incorporated into the design of shops and all other buildings, public spaces, facilities and services likely to be used by the general public. The criteria necessary in designing for people with a disability are set out in the Chapter M Building Regulations, 1991, (as amended and including further amendments as may be made from time to time) and the guidelines "Buildings for Everyone", published by the National Disability Authority, August 2002, (and amendments as may be made from time to time)" (SDCC 2004 Development Plan).

RPA has it own Corporate Policy in relation to accessibility which is summarised below;

"RPA is committed to providing access for all and under its corporate policy on Accessibility has given a commitment to lead the field in the development of an accessible light rail system. RPA corporate policy with regard to public transport access:

> *"One of the key objectives of the Railway Procurement Agency is to provide an integrated public transport system that not only serves all members of the public but also enhances the quality of their lives and the quality of the urban environment in the vicinity of the system."*
> *Access for all is central to every scheme design and operation undertaken either directly by RPA or on its behalf by third parties.*
> *RPA will use best international practice in disability design, it will encourage innovative and imaginative solutions and it will seek to lead the field in the provision of an accessible public transport system for Dublin.*
> *RPA is committed to ensuring that its services, premises and information are fully accessible and that its staff receives appropriate awareness training."* (RPA – Architectural Criteria).

9.1.3 General

The following sections consider Route Option 1B and Route Option 2 only as the other 3No. Route Options are derivatives of these two.

9.2 Route 1B

Route Option 1B links existing commercial centres, Tallaght, Clondalkin, Liffey Valley and Blanchardstown by taking an inner orbital route that will consolidate existing development and primarily impact amenity and shopping based car usage. These areas also have areas of higher than normal unemployment.

9.2.1 Employment and Residential Catchment

Route Option 1B achieves the local authorities (FCC and SDCC) Development Plan Objectives of sustained development and improving links between local commercial town centres of Tallaght, Clondalkin, Liffey Valley, Blanchardstown and Dublin Airport.

Employment catchments are highest at the southern end of the route measured from Metropark showing that Tallaght estimated at over 60,000 approx by 2016 (see RPA Report - Metro West Catchment Analysis, May 2007).

Residential catchment of 85-90% approx. by 2016 will be concentrated in the southern two thirds of the route from Blanchardstown to Tallaght. It is likely that will alter due to potential rezoning of lands around M50 after the announcement of Metro West EPR. The large residential areas of Clondalkin, which are currently only serviced by bus routes, will be linked into Metro West, thus linking areas which are economically disadvantaged with centres of high employment.

9.2.2 Severance

The development of the Metro system to serve the Greater Dublin Area based on the existing Luas concept which promotes an open, at grade, non-segregated running of trams will eliminate severance as an issue. This will result in huge benefits for local communities and assist to bring Metro into peoples every day lives.

Details of stations, at-grade intersections and elevated track, bridges etc will require intensive study during detail design to ensure maximum integration into the urban fabric and minimising of severances. Particular attention to all interchanges to ensure minimum walk distances, well lit and attractive waiting areas and routes with step free access will be needed to meet the required RPA accessibility policy.

9.2.3 Access for Socially Excluded

Route Option 1B reinforces the existing social and commercial town centres of Tallaght, Clondalkin, Liffey Valley, and Blanchardstown.

By offering a high quality public transport link between these areas and integrated interchanges with current bus, rail and Luas routes the proposal allows greater access to these areas together with centres of employment by the non car-owning population including teenagers and the elderly.

The orbital nature of the proposed route, linking existing radial public transport paths, is key to delivering a city-wide sustainable public transport system of benefit to all. Pedestrian / cycle routes from low density residential areas will be clear and direct with optimisation of hard/soft landscaping opportunities.

A forecast figure for 2016 of approximately 9,000 unemployed / unskilled / retired will live within a 1.0km radius catchment area of the stations. However it would be anticipated that the availability of Metro West may afford more opportunities to individuals actively seeking employment.

9.3 Route 2

Route Option 2 follows an outer orbital route at the outer limits of current residential and industrial/commercial development in the Greater Dublin Area, linking a number of existing and future areas of employment. There is a larger area of undeveloped land along this route which will increase in value due to potential presence of Metro as well as bringing pressure to increase the density of residential development in the future

A key possible benefit of this route is that it has the chance of transferring a larger quantity of employment based car users onto public transport. It also has the advantage of building necessary infrastructure ahead of major industrial and residential development along the route but conversely the route does bring pressure to extend the development belt which it may be argued does not support sustainable development.

9.3.1 Employment and Residential Catchment

Route Option 2 follows a more westerly route taking in Citywest, Baldonnel, Grangecastle and Lucan before rejoining Route Option 1B after crossing the River Liffey

Employment catchments are highest at the southern end of the line i.e. Tallaght with a forecast value of over 60,000 jobs approx by 2016, as for Route Option 1B (see RPA Report - Metro West Catchment Analysis, May 2007).

The more westerly route taken by Route Option 2 allows the linking of other and future centres of employment at Mulhuddart north of Blanchardstown, Grangecastle Industrial Park west of Clondalkin and Citywest on the N7 Naas Road. The current forecasts for employment catchment along the route show a figure of 134,000 approx – a 14% increase on Route Option 1B.

9.3.2 Severance

See 9.2.2 above.

9.3.3 Access for Socially Excluded

A forecast figure for 2016 of 7,744 approx of unemployed/unskilled / retired will live within a 1.0 km radius catchment area of each station – an 18% reduction on the Route Option1.

By linking future employment areas including Citywest, Grangecastle and Cruiserath/Mulhuddart, with large areas of residential development such as Tallaght, West Clondalkin, Lucan and Blanchardstown; the proposal allows greater employment access by the non car owning population including teenagers, students, the elderly and others.

9.4 Comparison of Options showing Social Inclusion

Location	Route Option 1B	Route Option 2	Route Option 3	Route Option 4	Route Option 5
Tallaght		**Y**		**Y**	**Y**
Clondalkin	**Y**		**Y**		
Mulhuddart	**Y**	**Y**	**Y**	**Y**	**Y**
Finglas	**Y**		**Y**	**Y**	**Y**
Ballymun	**Y**		**Y**	**Y**	**Y**
TOTALS	**4**	**2**	**4**	**4**	**4**

Fig No. 9.4.1 – Comparison of Options showing Social Inclusion

Y – Indicates that area is served by a particular route option

9.5 Conclusion

The overall conclusion for the Accessibility and Social Inclusion section of this Report came out as follows (see MAST in Appendix B);

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
3rd	Worst	Best	4th	2nd

10 Integration

10.1 Introduction

At the announcement of the Route Options and Public Consultation for Metro West on 22nd Nov 2006 the Minister of Transport stated that Metro West ***"will provide integration connectivity between the existing and future transport links into the City Centre. It will link the Tallaght Luas Line, the Kildare and Maynooth rail lines, the proposed Lucan Luas, Metro North and many bus routes. Because of this level of integration, it will open up a great number of additional travel possibilities with minimal interchange for the commuter of West Dublin and for people from many regions of the country to the city and airport.***

It will have park and ride facilities at key points where the route meets major roads such as N2, N3 and N4……"

Based on these parameters the following sections consider the levels of integration offered by the various Route Options.

10.2 Route 1B

10.2.1 Tallaght Town Centre

Tallaght is designated as a Town Centre in the current SDCC County Development Plan and Local Area Plan 2006 (Masterplan) [LAP] and is the subject of considerable on going development which has continued apace both prior to and since the opening of Luas Red Line. It is a vibrant and young community. With the publication of the LAP the town centre is expanded to the North and East thus increasing its catchment area considerably.

"Tallaght is the centre that provides the highest level of retailing in the county along with a broad range of services and other functions in the context of a highly accessible centre with an established catchment population. The synergy of the range of established uses in the Tallaght Town Centre area generates a special status for Tallaght as the primary commercial centre in the county. It is desirable that this status be maintained and enhanced whenever practicable. Tallaght is therefore designated as the County Town of South Dublin County.

Major Centre's serve a sub-regional function, i.e. they have a large population catchment. There are currently five Level 2 centre's in the Greater Dublin Area - Tallaght, Swords, Blanchardstown, Dundrum and Dun Laoghaire. The Retail Planning Guidelines/Greater Dublin Area (RPS/GDA) Strategy proposes an additional Level 2 centre in South Dublin at Liffey Valley, Quarryvale." (SDCC 2004 Development Plan)."

Much of the focus in Tallaght centres on The Square which is a large shopping and retail centre.

To the west of Route Option 1B Tallaght is served by the Luas Red Line which terminates in the vicinity of the Civic Offices. To improve integration with Route Option 1B it is recommended that the existing Luas Red Line stop in Tallaght Square is extended beyond it's current terminus to connect with Metro West on Belgard Road. This would allow Metro services access to Red Cow Depot via the Luas Red Line.

10.2.2 Belgard Road / Embankment Road Junction

Industrial and commercial estates on both sides of Belgard Rd will be well served by Route Option 1B. Provision is being made for a passive stop at Colbert's Fort which can be

commissioned should the demand be available. Further to the north and directly opposite Newlands Cross Golf Club passive provision is also made for a future stop.

The intersection of Embankment Rd and Belgard Rd is a busy junction which is also crossed by Luas Red Line. Embankment Rd is the subject of future road extension running to the west which is currently out to tender from SDCC. This extension will run to Cheeverstown from where it connects to the ORR.

Metro West will cross Embankment road on an elevated structure over the existing Red Line and the highway and is likely to include an elevated stop and cater for disability access. There will also be a requirement to construct an engineering link between the Metro West and Luas Red Line infrastructure, at grade, which will enable the Metro West rolling stock to be stabled in the Red Cow Depot. This provision is vital to allow maximum operational flexibility and helps to reduce fleet size. However, the construction of this engineering link will be complex as it could entail trams running against southbound traffic on Belgard Road. The feasibility of this option must be studied in greater detail during Stage 3.

10.2.3 Clondalkin Town Centre

"While Clondalkin is referred to as a Level 3 District Centre in the Regional Planning Guidelines, Greater Dublin Area (RPG/GDA), this classification refers only to the retailing function of the centre. It is considered that in planning terms Clondalkin should be designated as a Town Centre to adequately reflect its role as a high quality, vibrant service centre, which plays a key role in the urban structure of the County and is sufficient in importance to warrant its designation as a Town Centre."

"It is the policy of the Council to facilitate and encourage the development of Clondalkin as a 'Town Centre' and the expansion of the Town Centre area northwards, and to provide for an integrated cultural and heritage/residential/commercial development of lands at the Round Tower." (SDCC 2004 Development Plan).

Route Option 1B integrates well with the existing town centre and the proposed new development. The location of the new stop is shown within the new development and will need to be agreed with the local developer.

10.2.4 Kildare Railway Line

Route Option 1B crosses the Kildare Railway line at the proposed Fonthill Road station where there will be a major interchange constructed. At present Irish Rail is planning to construct a new station which will have the capability for future expansion allowing for the development and integration of a full vertical interchange between Metro West and mainline railway. Preliminary discussions have been held with Irish Rail and will need to be developed further once the EPR has been announced.

10.2.5 Liffey Valley Area

It is the policy of SDCC to facilitate the development of Liffey Valley Shopping Centre as a Town Centre and to ensure that it is developed in line with a Masterplan.

"The Masterplan shall provide for the upgrading of the urban form of the Town Centre area to provide for the development of new streets and civic spaces, and a range of people intensive uses appropriate to a town centre, (including retail, commercial, residential, recreational, community and cultural activities) based on high quality urban design.

Liffey Valley will act as transport hub and interchange for Metro, LUAS, City and Local Buses and Taxis with services radiating in all directions.

Level 2 Centre designation is applied to Liffey Valley as a newly emerging major retail shopping location. The RPG / GDA strategy identifies a basis for a substantial additional

area of durable goods retail floor space in South Dublin, and recommends Liffey Valley as the location for this floor space. This would significantly expand the existing retail dimension of this centre." (SDCC 2004 Development Plan).

There is also a proposal to construct a Park & Ride facility at Liffey Valley.

Route 1B remains on the Fonthill Road and skirts the shopping centre to the West. However, discussions are on-going with the developers who are looking at the inclusion of a spur to penetrate the town centre, within their proposed scheme. RPA are also developing the Luas Line F, Lucan route options and it may well be that Luas Line F Lucan could be used to penetrate the town centre, with a Metro West interchange along the Fonthill Road.

10.2.6 Maynooth Railway Line

Both Route Option 1B and Route Option 2 (and therefore all 5No. Route Options) cross at Porterstown where there will be a major interchange constructed following agreement with Irish Rail. At present there is no station and Irish Rail is waiting for financial and technical input from a developer to assist with the required works. Also at this stage there are no plans to develop a P&R due to limited space and potential traffic management restrictions. This position may alter in the future.

10.2.7 Blanchardstown Town Centre

As mentioned previously, and in line with Tallaght, Blanchardstown will now develop as a Town Centre and is classified as a Level 2 Town Centre in the RPG / GDA guidelines. Currently Green Properties are in the process of preparing a development Masterplan which is likely to complement and inform the FCC Local Area Plan (LAP) for this future development which will see the current footprint move away from surface car parking to underground parking in order to facilitate commercial and residential development.

Route Option 1B, as currently outlined will serve the area well when the proposed future development of the town centre is complete. In its current location Metro West runs between the main shopping centre and Westend Retail Park. Preliminary discussions are underway with Green Properties and their consultants to look at a proposal to bring Metro West into Market St which is the main area in front of the shopping centre opposite the Civic Centre. The potential realignment of Metro West will offer a greater penetration of the Town Centre and facilitate a modal shift which should serve to refocus the development of the area.

Further discussion with Green Properties, SDCC and other stakeholders to further improve integration is advised.

10.2.8 Park & Ride

Route Option 1B has proposed P&R facilities at Liffey Valley, Blanchardstown and Huntstown on the N2. Both the Liffey Valley and Blanchardstown P&R facilities will depend on the outcome of discussions with the local developers.

The proposed P&R adjacent to the N2 lies on land owned by Cement Roadstone Holdings (CRH). However as it is proposed to possibly amend the route alignment in this area and taking into account the proposed upgrade of the N2 Interchange as part of the M50 Upgrade a potential P&R site to the east of the N2 should be looked at as it would better facilitate southbound commuters.

10.3 Route 2

10.3.1 Tallaght

See 10.2.1 above plus the following.

Route Option 2 utilises the existing Luas Red Line infrastructure and the proposed Luas Line A1 (to City West) infrastructure, therefore access in to the Red Cow depot will not be an issue for stabling the Metro West vehicles, subject to there being no capacity constraints necessary from an operations perspective. Further work to confirm this assessment will be required on this in Stage 3 of the Employer's Brief.

Even though this option provides good integration with the existing infrastructure, no new opportunities are being developed. It should also be noted that there are likely to be capacity issues with 3No. service patterns all utilising the same infrastructure as mentioned above.

10.3.2 Kildare Railway Line

Route Option 2 crosses the Kildare railway line at the proposed Kishoge station, which is to the west of the Clonburris SDZ, where there will be a major interchange constructed if Route Option 2 emerges as the preferred route. At present Irish Rail are developing the concept for a new station which will have the ability for future vertical interchange with Metro West.

10.3.3 Lucan Town Centre

Lucan is classified as a Level 2 Town Centre in the RPG / GDA guidelines.

"It is the policy of the Council (SDCC) to prepare an Urban Design Framework for control of development and for conservation of the central core of Lucan Village having regard to the special historical and architectural character of the area.

In the implementation of this policy it is an objective of the Council to retain the individual identity of Lucan by maintaining its physical separation from Leixlip; continue to give priority to the creation and maintenance of a high standard of local physical environment (having regard to the special historic and architectural character of the area) and to enhance the character of the area." (SDCC 2004 Development Plan).

Route Option 2 does not penetrate Lucan Village; instead it serves the Lucan area through Ballyowen while running along the ORR and passing east of the village at Woodies Interchange before crossing the Liffey Valley.

RPA is currently developing potential route options for Luas Line F (Lucan Line) and in order to better integrate Metro West as it may be possible that the alignments of the both lines will cross. Further work will be required on this at Stage 3 of the Employer's Brief and at a stage when RPA has ascertained possible route options as it is recommend that an interchange facilitate should be developed to facilitate better integration.

10.3.4 Maynooth Railway Line

See 10.2.6 above.

10.3.5 Blanchardstown Town Centre

See 10.2.7 above plus the following.

Route Option 2 passes Blanchardstown Centre to the west remaining on Blanchardstown Road South. Currently retail development in this area has the potential to cause a degree of severance and it is important that discussions continue with Green Properties.

10.3.6 Park & Ride

See 10.2.8 above plus the following.

Route Option 2 has proposed P&R facilities at Blanchardstown and Huntstown on the N2. Provision of the Blanchardstown facilities will depend on the outcome of discussions with the local developers.

10.4 Comparison of Options showing Integration

Fig 10.4.1 summaries how each of the route options integrates with designated town centres and public transport (excl buses) and where there will be future P&R facilities.

Location	Route Option 1B	Route Option 2	Route Option 3	Route Option 4	Route Option 5
Tallaght Town Centre-Level 2	**Y**	**Y**	**Y**	**Y**	**Y**
Clondalkin Level 3	**Y**		**Y**		
Luas Red Line/Line A1	**Y**	**Y**	**Y**	**Y**	**Y**
N7 Motorway P&R					
Kildare Railway Line	**Y**	**Y**	**Y**	**Y**	**Y**
Liffey Valley Shopping Centre - Level 2	**Y**		**Y**		
Lucan		**Y**		**Y**	**Y**
Maynooth Railway Line	**Y**	**Y**	**Y**	**Y**	**Y**
Luas Line F	**Y**	**Y**	**Y**	**Y**	**Y**
N4 Motorway P&R	**Y**		**Y**		
Blanchardstown Town Centre – Level 2	**Y**	**Y**	**Y**	**Y**	**Y**
N3 Motorway P&R	**Y**	**Y**	**Y**	**Y**	**Y**
N2 Motorway P&R	**Y**	**Y**	**Y**	**Y**	**Y**
Metro North	**Y**	**Y**	**Y**	**Y**	**Y**
Total areas of integration excl buses	**12**	**10**	**12**	**10**	**10**

Fig 10.4.1 – Comparison of Options showing Integration

10.5 Conclusion

The overall conclusion for the Integration section of this Report came out as follows (see MAST in Appendix B);

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Best	Worst	Best	3rd	4th

11 Constructability / Engineering

11.1 Introduction

As outlined in Section 6.0 above Route Options 3, 4 & 5 are derivatives of Route Option 1B and Route Option 2. It will simplify an understanding of the alignments if they are looked at as discrete sections of the line as a whole. It is then proposed to list the key issue in each section and to give a high level assessment of constructability in terms of a 3 scale ranking as follows;

Construction Level 1 – difficult
Construction Level 2 – moderate to moderately difficult
Construction Level 3 – easy to moderately easy

11.2 Route Option 1B

11.2.1 Belgard Road Section

Route Option 1B commences at the junction of Belgard Road and Blessington Road just north of the Square Shopping Centre in Tallaght. Metro West will be a segregated alignment located within the existing median of Belgard Road. The Belgard Road cross-section is a dual 2-lane carriageway that is of sufficient width to be reconfigured to allow segregated running of the Metro West within the road reserve while retaining two lanes of traffic in each direction. Existing Bus Corridors (not QBC) may be required to be extinguished to accommodate Metro West running. Pedestrians and cyclists are well provided for with footways on both sides of the carriageway and these facilities will be maintained with the construction of Metro West. A distinguishing feature of Route Option 1B is the high number of local (commercial and retail) accesses that the route crosses.

With the high number of local accesses on both the north and southbound carriageways of Belgard Road, it will be necessary to restrict a lot of these accesses to 'left-in left-out' operation only to retain Metro West segregation. To off-set the removal of right-turns, signalised junctions at Embankment Road and Blessington Road might be an option to cater for all traffic movements. This will be developed during Stage 3 of the Employer's Brief. Consideration should be given to development of one way systems within the many commercial and industrial estates to the east of Belgard road.

The one significant engineering constraint associated with Route Option 1B, within this section, is the crossing of the Luas Red Line at Embankment Road Junction. This crossing will require grade-separation with the preferred option being to take Metro West 'over' the Luas Red Line. It is also expected that the Belgard Stop will be constructed within this grade separated structure. Limited space within the existing road reserve and the requirement for the provision of an engineering link to the Luas Red Line will require careful construction phasing to minimise third-party land impacts and to ensure the safe and efficient operation of all road users, vehicular and pedestrian. Alternatively if the Luas Red Line is extended to Belgard Road a connection with Metro West could be provided negating the requirement for the engineering link at Embankment Road

The working hours for the construction of this elevated structure and associated works, are likely to be restricted due to the proximity of local dwellings. The construction of the remainder of this section will principally be within the existing Belgard Road reserve and therefore there shouldn't be any significant constructability issues due to the road's wide cross-section. This should allow the provision of reasonable traffic management patterns during construction, including for the relocation / protection of existing utility services within the corridor.

Key Issues and Construction Level

- Right hand turns to be banned, requiring junctions to be signalised.
- Access must be maintained to Fire Station on Belgard Road
- Decision required on best location for engineering link
- Detailed surveys required to ascertain property take required along this section of alignment (this applies to both Route Option 1 and Route Option2 so will not be repeated)
- Need to produce a full set utility drawings along this section of alignment (this applies to both Route Option 1 and Route Option2 so will not be repeated)

In terms of constructability this section of works should be considered as;
Construction Level 2 – moderate to moderately difficult
Construction Level 1 – difficult (structure at Embankment Road)

11.2.2 Newlands Cross Junction and St Brigid's Well

Newlands Cross which is a crossroads at the intersection of N7 and Belgard Rd is one of the busiest junctions in the country with high through put of traffic on a daily basis.

Currently South Dublin County Council (SDCC) is developing highway proposals to grade-separate the current at-grade N7 / Belgard Road / Fonthill Road South junction. The impact of Metro West on this scheme is likely to be high given the reduction in lane capacity generated by the imposition of the Metro footprint at this location. To that end JE was commissioned by RPA to carry out an extensive study of feasible engineering solutions to best suit the needs of the Stakeholders, RPA, SDCC and NRA. For the purposes of this study SDCC's consultants, ARUP, were engaged to carry out traffic modelling of each of the schemes.

The results of ARUP traffic modelling study suggested that an "at grade" solution was possible at Newlands Cross.

Following on from this output a preferred route engineering solution was produced by JE showing at grade crossing of Newlands Cross. This solution shows Metro West running in the median through Newlands Cross and moving to the eastside of Fonthill Road South in the section between Newlands Cross and to the north of Boot Rd junction. The implication of "opposite running" is that more stringent safety measures need to be introduced for operational purposes and requires that there is sufficient segregation of the tram and vehicular units on the carriageway to provide sufficient refuge for pedestrians.

Engineering wise there are a number of other possible "at grade" engineering solutions at Newlands Cross and discussions are ongoing with ARUP on this as this Report is produced. The complete body of work is contained in Vol. 5 (e).

A particular challenge that was encountered on this section of the route was how best to deal with an engineering solution in the vicinity of St Brigid's Well (see Fig No. 11.2.2.1) which is on the west side of Fonthill Rd South approx 300m north of Newlands Cross. A number of options were looked at in this particular area. In tandem with a feasible engineering solution a "Cultural Heritage Desk Based Assessment and Landscape Visual Amenity Assessment" was also carried out as part of the Newlands Cross and Fonthill Road Options Study. This report forms part of the report contained in Vol. 5 (e).

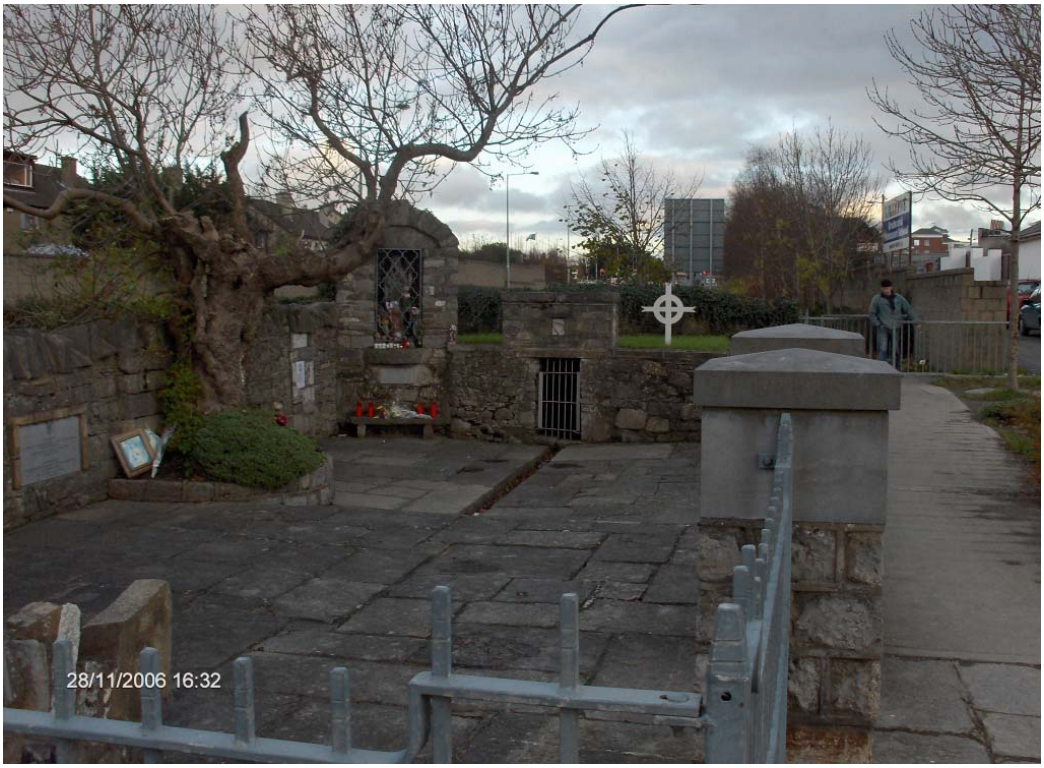


Fig No. 11.2.2.1

Option 3 is the preferred option to resolve the engineering issues at this location. It involves moving St Brigid's Well to the green just west of it but at the same time the study team is cognisant of the potential impacts associated with this solution.

Fig No. 11.2.2.2

The moving of this Well may very well be a sensitive issue for local population due to the desk based study which alludes to the proximity of a Children's Burial Ground ("Killeen"). It is recommended that all stakeholders and the public are consulted on such a proposition. In any event if the work were to proceed it would need to be painstakingly undertaken to minimise impact on the underlying archaeology and for this reason it is also to be recommended that a site archaeology investigation should be undertaken.

An initial meeting has been held with the Dept. of Environment outlining the proposal under consideration and the Dept. has given the approval to carry out a site archaeological survey

at a stage to be decided by RPA and to also begin the process of engagement with stakeholders and locals.

Key Issues and Construction Level

- To mitigate for all road and pedestrian safety issues associated with "opposite running" along this section of Fonthill Road South
- To conclude all discussions with SDCC and NRA to reach final agreement on metro alignment through Newlands Cross
- To commence Public Consultation regarding the requirement to relocate St Brigids Well
- Detailed surveys required to ascertain property take required along this section

In terms of constructability this section of works should be considered as;
Construction Level 1 – difficult

11.2.3 Clondalkin Section

For the Public Consultation Process it was decided to show a number of route options in or about Clondalkin and its town centre (see Appendix A).

There was much opposition to Route Option 1 and Sub-Option B at the Public Consultation Open Days. However it is felt that the case to serve Clondalkin Town Centre is compelling and a stated objective of Metro West. Therefore it is best that a variation of Sub-Option B must be pursued to achieve the optimum solution for Metro West. To this end it suggested that the route alignment of Sub Option B be altered to take it further north of St John Wood, entering the Sports Grounds at a different and more suitable location (also see Sub Option Route Analysis Working Paper Vol. 5).

It is also recommended that once this alignment is fixed, in Stage 3 of the Employer's Brief, that RPA / JE engage in another round of Public Consultation with the residents in this location to strive to reach a mutually acceptable engineering solution at this location thus minimising both visual intrusion and affect on amenity.

Key Issues and Construction Level

- To finalise Route Option 1B through Clondalkin Park to minimise impact on residents, playing fields, tennis courts and Cammock River
- To hold further Public Consultation on Route Option 1B

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy

11.2.4 New Nangor Road and Fonthill Road North Sections

North of the New Nangor Road Route Option 1B runs along the Fonthill Road North crossing over the Grand Canal and the Kildare Railway Line. New structures are required for both these crossings. On this section Metro West is likely to be located offline to the existing carriageway. There are available lands to be purchased on the western side of the road, except for the section between Coldcut Road and St Loman's Road where some road narrowing or realignment is expected due to existing buildings located close to the road.

Normal crossings affected by Route Option 1B are to be replaced with signal controlled junctions. Route Option 1B could run on either side of the road to suit new development opportunities / road layouts, which may require additional sections of road realignment.

Key Issues and Construction Level

- To finalise which side of Fonthill Road is best suited to the construction of Route Option 1B
- To develop an Interchange with Maynooth Line at Fonthill Stop and to agree location and concept design with Irish Rail

- To agree concept design for structure across the Grand canal with Waterways Ireland

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy (New Nangor Rd to south Coldcut Rd)
Construction Level 1 – difficult (Coldcut Rd to St Loman's Rd)

11.2.5 Liffey Valley Shopping Centre

A stated objective of Metro West is to "connect key towns in the West of Dublin serving new and existing communities". Liffey Valley is designated as a Town Centre with residential densities set to increase significantly over the next 10yrs. The current shopping centre has a footprint of 28,000sqm which is expected to double over the next 8yrs subject to planning approval. Estimated footfall to the shopping centre excluding residential development is also expected to double from the current 7 million visitors. The significant expansion of this hub will also generate 8,000 jobs approximately. It is also envisaged that a Bus Interchange will be constructed in the near future.

It may emerge that the Luas Line F may also serve the shopping centre and therefore may be considered as the primary route to serve the Centre given the east – west nature of the line. It is also expected that Luas Line F will be operational prior to Metro West. Therefore an engineering connection should be established with Metro West, most likely in the form of a delta junction to provide a greater potential service pattern and integration with Liffey Valley Shopping Centre.

The construction of a delta junction would most likely be at the junction of Fonthill Rd North and Shancastle Avenue. This work will pose a number of construction difficulties that will have to be overcome and catered for at the design stage. However, it is felt, at this stage that the majority of that construction would best lie within Luas Line F construction timeframe. It is recommended that Stage 3 consider how this future provision would be made so as not the prejudice such a connection in the future.

In the event of Luas Line F not proceeding it may be prudent at some time in the future to investigate the merits of a spur from Metro West serving Liffey Valley Shopping Centre.

Key Issues and Construction Level

- Need to have a stop on Metro West as close as possible to main thoroughfares serving Liffey Valley Shopping Centre.
- Need to consider integration with proposed Line F

In terms of constructability this section of works should be considered as;
N/A at this time

11.2.6 Liffey Valley Crossing

Route Option 1B runs through the existing N4 and Fonthill Road interchange. It is believed that the Metro West track could be accommodated within the road space at the N4 underbridge; otherwise a new bridge over the N4 will be required to be built. Further work will be carried out in stage 3 of the Employer's Brief to establish this fact and to finalise the detail. It is envisaged that there may be significant traffic impacts associated with utilising the underpass and these will need to be assessed during Stage 3 in a traffic assessment report.

To cross the River Liffey along Route Option 1B a new bridge structure, approximately 330m in length, will be constructed as described in the Liffey Valley Working Paper (see Vol. 5).

After crossing the Liffey, Route Option 1B continues north westwards taking a circuitous route around the south western perimeter of Castleknock Golf Club before running through FCC owned playing fields and a playground area behind Porterstown church. This element of the works will impose some speed restrictions on the operational railway.

Generally it is felt that the alignment through the golf club presents conflicts between the operation of the tram and the club itself. This is further complicated by the topography of the area. Engineering solutions to overcome these difficulties will need to be studied in depth to reach an acceptable resolution. It may be necessary that a section of the golf club lands may need to be acquired. Alternatively a land swap deal may lead to a mutually acceptable and viable solution.

Key Issues and Construction Level

- To investigate whether Metro West can be accommodated through the underpass beneath N4
- To carry out a full traffic assessment of local road network during Stage 3
- To understand how Metro West and Luas Lucan Line can be accommodated in vicinity of Liffey Valley Shopping Centre
- To resolve alignment through Castleknock Golf Club
- To resolve alignment through Porterstown playing fields

In terms of constructability this section of works should be considered as;
Construction Level 1 – difficult

11.2.7 Liffey Valley to Porterstown Section

North of Luttrellstown Road, and approximately parallel to Porterstown Rd, Route Option 1B runs along to the east of the road where it utilises the FCC protected corridor. On this section a new structure over the Royal Canal and Maynooth Railway is required. This will be constructed parallel to the existing road bridge which is approximately 180m in length; a similar length is expected for the Metro West structure. Porterstown will then be able to function as an interchange between Metro and the Maynooth Railway Line. P&R facilities are not envisaged at this location at this stage due to a lack suitable land and the increased traffic flows through residential catchments.

Similar to the previous section, all existing road junctions crossed by Route Option 1B are to be replaced with signal controlled junctions to provide priority for Metro West. As with all junctions the level of priority must be agreed with local council.

Key Issues and Construction Level

- To develop an Interchange with Maynooth Line at Porterstown Stop and to agree location and concept design with Irish Rail
- To agree concept design for structure across the Royal canal with Waterways Ireland

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy

11.2.8 Porterstown to Ballycoolin Road Section

Once Route Option 1B has crossed over the Maynooth Railway Line, it continues along Blanchardstown Road South, in the FCC protected corridor, before turning north eastwards through the Millennium Park and Verona FC sports grounds. It then passes through the eastern side of car park adjacent to Blanchardstown Library, which may have a huge impact on the existing car park and access road network around Blanchardstown Town Centre and may require the imposition of alternative traffic management arrangements. Metro West's requirement is to preserve segregation from road vehicles and pedestrians while maintaining the required access to all properties.

It is understood that Green Properties, the owners of Blanchardstown Shopping Centre may close Market St to through traffic as part of the proposed enlargement of the shopping centre. It is envisaged that local access for deliveries, buses and taxis would need to be maintained. Overall this may lead to a revised engineering solution which would mitigate the need to acquire lands which are currently used by Verona FC by bringing Metro West into

the streetscape from the western side of the new Civic Building. Preliminary discussions have been held with Green Properties and their consultants and it is envisaged that a continuing discourse will be necessary to reach a mutually acceptable solution. Generally it is felt that for Metro West to penetrate the Town Centre will offer a more integrated and robust solution to the obvious traffic management complications that are inherent around the shopping centre at this time and will assist a modal shift to an alternative form of transport which at this time is primarily car focused. A detailed traffic assessment report will be required to fully understand the impact on traffic in and around the shopping centre.

The position of the alignment between the main shopping centre and Westend Retail Park is off line to the carriageway. This strip of land is owned by Green Properties and it use helps to facilitate the construction of this element of the work, however it is felt that lane closures and possible single direction traffic flows may be required.

To the north east of the Blanchardstown Centre Metro West crosses the N3 on a new overbridge. It is envisaged that some of the footprint of Westpoint Fitness Centre may need to be acquired due to the curvature of the alignment. Due to the necessary skew crossing over the adjacent Tolka River Valley, a new bridge structure will be required and is expected to be around 200m in length. Work through the Tolka Valley will need to be undertaken in a sensitive manner to minimise impact on the sensitive environment. Route Option 1B then runs along Snugborough Road, utilising green space adjacent to the carriageway on the western side and also serves NAC as it passes until the route reaches the intersection of Snugborough Rd and Ballycoolin Rd.

Key Issues and Construction Level

- To continue to develop route options around Blanchardstown Shopping Centre through continued negotiation with Green Properties and FCC
- Need to carry out detail traffic assessment report during Stage 3
- To minimise impact on Tolka Valley with structure crossing in this location
- To finalise concept design on Snugborough Road and to agree with FCC and Dublin Bus

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy (Porterstown to south of Blanchardstown SC)
Construction Level 1 – difficult (Blanchardstown SC to Ballycoolin Rd)

11.2.9 Ballycoolin Road to N2 Section

From the Ballycoolin crossroads Route Option 1B runs eastwards offline along Ballycoolin Road. Between the Snugborough Road and Cappoge it is understood that Ballycoolin Road is due to be upgraded and realigned, therefore it is recommended that any realignment incorporates an allowance for Metro West. To the west of the proposed Abbotstown Stop there will be a 100m radius horizontal curve which will impose a speed restriction to the vehicle.

Once the route leaves the built-up area it will become segregated and skirt close to the M50 as it approaches Huntstown where it passes to the south of Huntstown quarry which in owned by Cement Roadstone Holdings (CRH).

Key Issues and Construction Level

- To integrate metro alignment with the proposed road upgrade scheme along Ballycoolin Road
- To discuss metro proposal with Developers along this section of route alignment

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy

11.2.10 N2 to Metro North Delta Junction Section

Currently Route Option 1B passes Huntstown Power Station on the north side, where there are also a large number of overhead high voltage wires. It is expected that there will be some major utility issues which need to be understood and resolved prior to the design being agreed and the construction commencing.

There will also be a grade separated crossing of the new N2, and an at grade interface with the old N2 as well as some local road crossings/overbridges, which will be looked at in more detail in Stage 3 of the Employer's Brief. The total length of the structure, or set of structures, and embankment sections may be up to 250m in length.

Once the route crosses the N2 it will be segregated running along northern side of the M50, which should be straightforward to construct. The only issues to be resolved will be crossing of roads which cross under the M50 in respect of constructability, traffic control and driver visibility.

It is understood that the N2 Interchange will be upgraded as part of the M50) Upgrade (see Fig 11.2.10.1), this will involve a considerable reconfiguration of the current interchange layout. JE have also undertaken to investigate possible route realignment in this area to see whether or not the route alignment could fit between Huntstown Power Station and the slip road from the M50 eastbound to the N2. The results of this investigation are not available as at the time this paper is written. Should a solution be possible and bearing in mind the planned upgrade of the junction there may be an opportunity to straighten the alignment along by the M50 which would serve to eliminate unnecessary curves.

Key Issues and Construction Level

- To discuss proposed Metro West crossing of N2 with NRA
- To discuss proposed solution with ESB
- To agree an alignment through the green fields areas with local land owners and Developers

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy

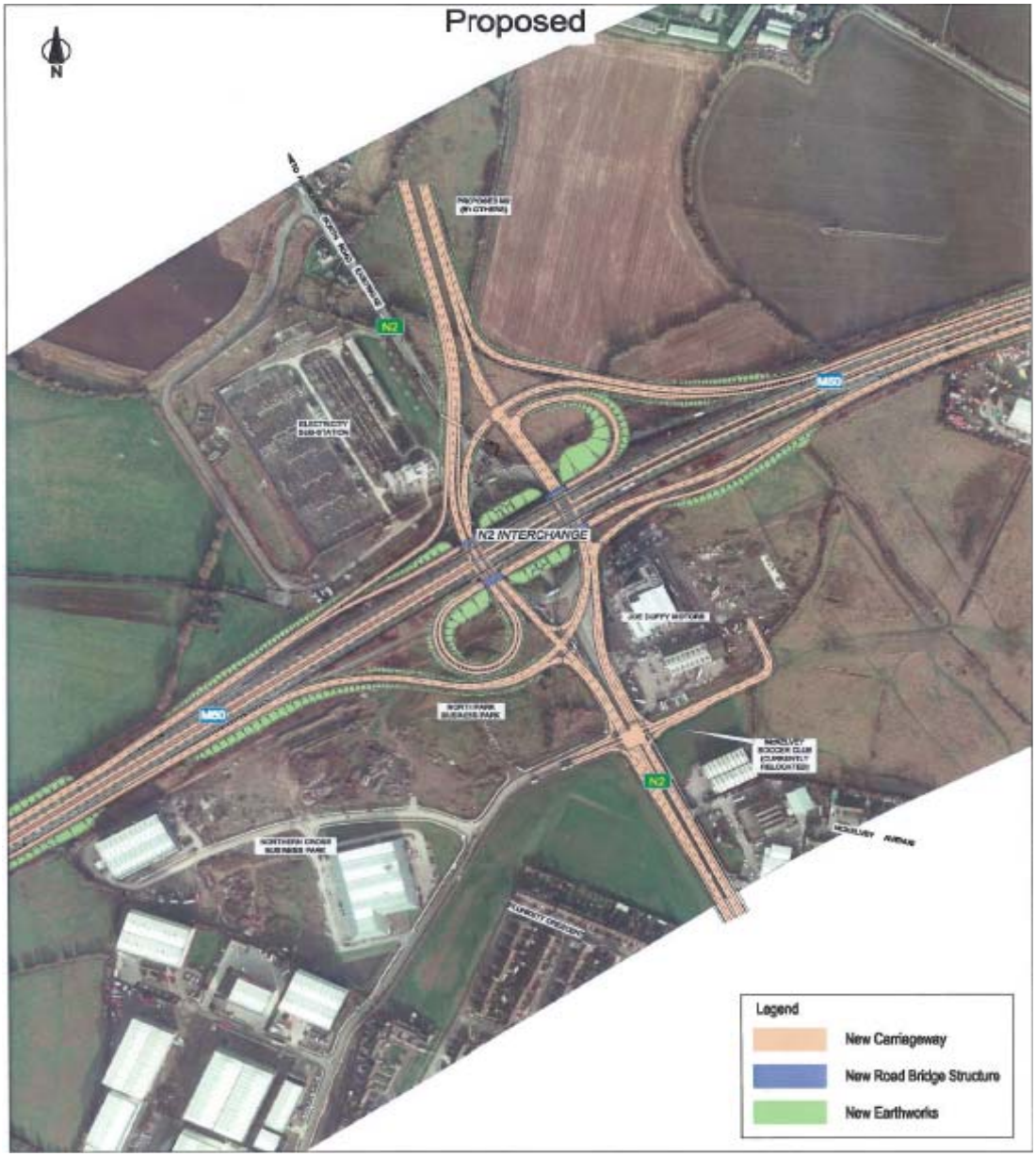


Fig No. 11.2.10.1

11.2.11 Connection with Metro North

The convergence of Metro West and Metro North will occur at Metropark which is to the north east of Ballymun Interchange on the M50. At this stage the service patterns for the overall Metro network have not be finalised. Therefore the design and construction of the delta junction which brings these two lines together must offer the most flexible service pattern for future needs and expandability of the network and timetable. There must be provision for an extension to Howth as is planned at some stage in the future.

The Route 1B alignment has a much more acute angle connection with the leg of the delta junction that goes towards the city centre (see Fig No. 11.2.11.1). This will mean that a chord connection between the Metro West and Metro North leg to the city centre will be a sharper radius and will be constrained by the M50. This will result in a slower speed through the chord.

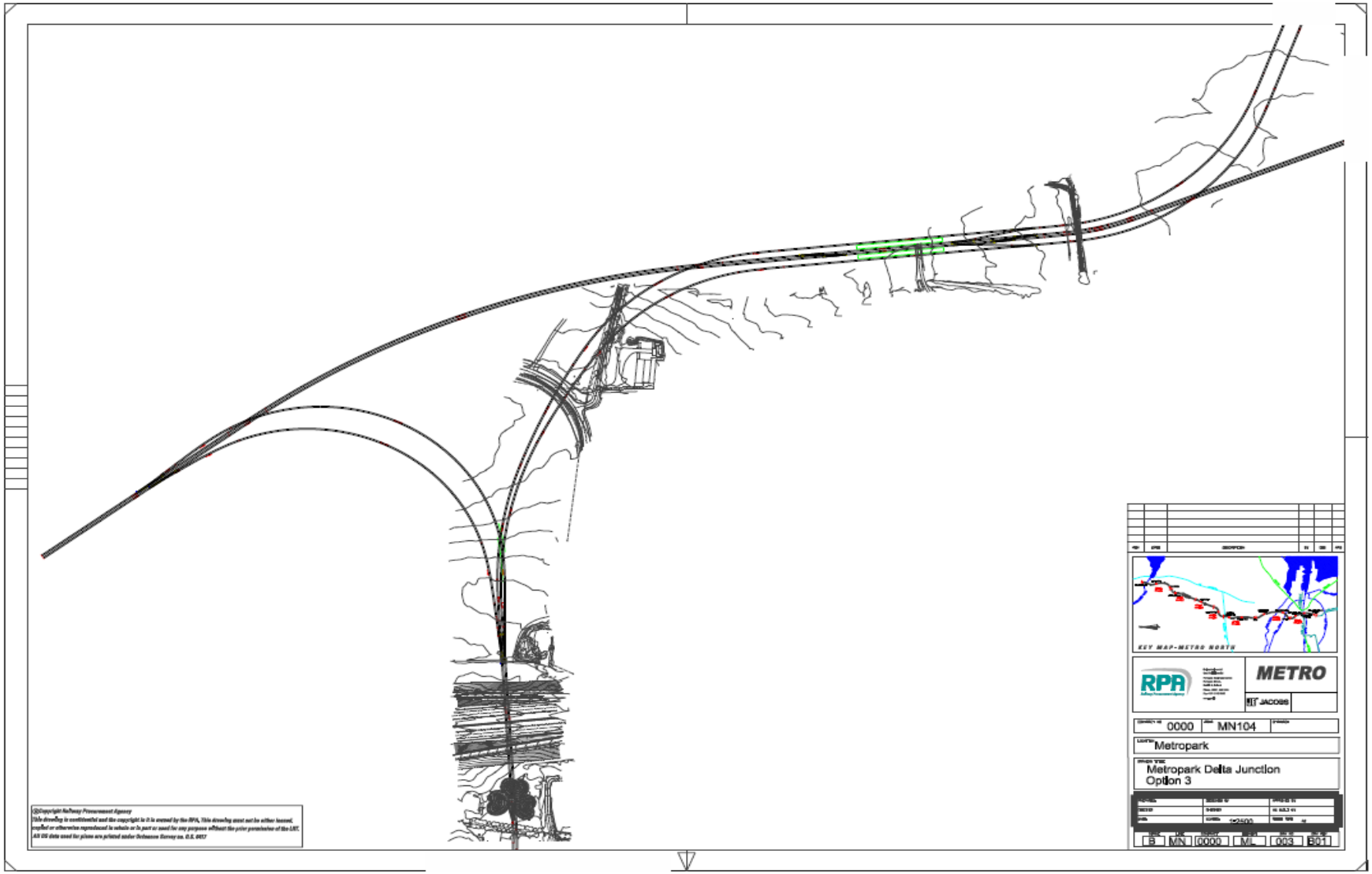


Fig No. 11.2.11.1

The operation of the junction to offer maximum flexibility can incorporate some grade separation on the legs of the chord. The design outlined in Fig No. 11.2.11.1 is provisional at this stage and subject to change but does offer an insight into the possible solutions available.

The design of the delta junction should be predicated on the worst case scenario and be tested accordingly to see that it will facilitate the following service patterns;

All Metro West services terminate at Metropark.
All Metro North services from the airport terminate at Metropark.
All Metro North services from the city terminate at Metropark.

The final alignment of Metro North is required as soon as it is agreed, as it will impact on the next stage of design for Metro West.

Key Issues and Construction Level

- To agree with Metro North Project what infrastructure will be provided under each contract. Engineering hours for connection of Metro West to Metro North should be minimised

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy

11.3 Route Option 2

11.3.1 Metro West shared running with existing Luas Red line Section

Following RPA's decision to use the same width vehicles for Metro West as for the existing Luas line, the section shared with the existing Luas Red line should not require any modification work as the Metro West vehicles will be compatible and interoperable with the Luas infrastructure. There may be some operational issues which should be examined in more detail during Stage 3 if Route Option 2 is chosen.

11.3.2 Cookstown Way to N7 Naas Road Section

The new proposed infrastructure along this section is to run offline and parallel to the Embankment Rd Upgrade Scheme being undertaken by SDCC. The main engineering issue to be solved on this section is the design and installation of a new chord, at Cookstown Way, to join up with the proposed Luas Line A1 (to Citywest) infrastructure. This chord should be designed to a 100m radius if possible but at an ultimate minimum radius of 50m.

To the west of the new chord Metro West will share the proposed Luas Line A1 (Citywest extension) infrastructure. It should be noted that provision should be made during the construction of Line A1 platforms for future expansion to accommodate longer Metro West trams which could be up to 90m in length.

Route Option 2 turns north at the junction of the Outer Ring Road (ORR) and will run along the proposed ORR extension up to the N7. It assumed that Route Option 2 track work will be constructed offline along the ORR, but within the proposed road corridor. There is the likelihood that the alignment will need to traverse the road through one of the proposed junctions which will result in this junction requiring signalisation. In this section, Route Option 2 is in a "green field" area so construction should be relatively straightforward.

Key Issues and Construction Level

- Provision required for longer Metro West platforms which could be up to 90m long
- Line A1 chord from Luas Red Line to be of sufficient design to accommodate Metro West

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy

11.3.3 N7 Naas Road to Griffeen Avenue Section

At Kingswood a new elevated structure will be required to allow Route Option 2 to go over the existing N7 at the interchange with the ORR. The existing N7 overbridge is around 110m in length therefore the Metro West structure is expected to be of similar length. The current assumption is that Metro West will cross the existing side slip roads at grade.

North of the N7 interchange, Route Option 2 runs along the new ORR dual carriageway up to Griffeen Road. The existing road corridor will have to be widened to accommodate Metro West. All at grade road crossings are to be signal controlled with a view to agreeing priority for Metro West vehicles with SDCC. The widening of the existing corridor will require extensive embankment work to maintain the Metro alignment at grade with the existing carriageway.

From the N7 to Grange Castle the route is in a "green field" area or low density development (mostly industrial). The alignment could be located on either side of the road in this area to suit any proposed developments. This will be developed during the next stage. However north of Grange Castle Route Option 2 alignment will pass to the west of the Clonburris SDZ which does offer considerable commercial and residential development potential

Similar to Options 1, Option 2 crosses over the Grand Canal and the Kildare Railway Line. New bridge structures will required for both these crossings. This will also allow the construction of a major interchange with the Kildare Railway Line at Kishoge.

Key Issues and Construction Level

- To agree concept design for structure across N7 with NRA
- To develop an Interchange with Kildare Line at Kishoge Stop and to agree location and concept design with Irish Rail
- To agree concept design for structure across the Grand canal with Waterways Ireland

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy

11.3.4 Ballyowen Road to Lucan Road Section

The Ballyowen Road between Griffeen Avenue and the N4 has been just upgraded to dual carriage as part of ORR project. The existing road corridor in this area would present some engineering challenges along this stretch as the carriageway may not be sufficiently wide to accommodate Metro West, especially at junctions and at the proposed Metro West stops. This could mean that the recently erected boundary walls may need to be relocated to widen the existing road Corridor.

At Woodies Interchange a new elevated structure will be required for Route Option 2 to go over the existing N4 at the interchange with Ballyowen Road. The existing N4 overbridge is round 60m length therefore the new Metro West structure is expected to be of similar length. The current assumption is that Metro West will cross the side slip roads on both sides of the N4 and the Lucan Road at grade.

Another issue highlighted by the utility companies is large number of utilities located within the existing road corridor on this section. Most of the utilities are located under footpaths but some of them are located under bus lanes. This will need to be reviewed during Stage 3 of the Employer's Brief.

While the current road upgrade incorporates bus lanes we would envisage that these would need to be removed and the space made available to the metro alignment. The construction

of the tram stop at Lucan Willsbrook would also present some challenges due to the width of the carriageway.

Key Issues and Construction Level

- Detailed engineering study will be required to ascertain feasibility of construction through this area should this route be chosen
- A detailed traffic assessment report will be required to ascertain possible future impacts on traffic through this section
- It may not be feasible to have segregated metro and bus lanes
- Location of Willsbrook Stop will present difficulties in terms of available road width and length required to accommodate 90m trams in the future

In terms of constructability this section of works should be considered as;
Construction Level 1 – difficult

11.3.5 Liffey Valley crossing

North of the Lucan Road, Metro West runs through the "green fields" on either side of River Liffey. To cross the Liffey Valley along Route Option 2 a new bridge structure approximately 430m in length will be constructed as described in Liffey Valley Working Paper (**see Vol. 5**). This structure would need to be constructed on the skew and would involve some intrusion into both Hermitage Golf Club and Luttrellstown Golf Club. It is feasible that a property will need to be acquired on Rugged Lane to facilitate the alignment as it enters the playing fields at Porterstown. Due to the circuitous nature of the alignment it is envisaged that there will be a speed restriction on the line.

Key Issues and Construction Level

- Reaching agreement with both Hermitage GC and Luttrellstown GC on an alignment through their property

In terms of constructability this section of works should be considered as;
Construction Level 2 – moderate to moderately difficult

11.3.6 Liffey Valley to Blanchardstown Section– shared with Route Option 1

Once Route Option 2 alignment crosses the River Liffey it is assumed that it will skirt Luttrellstown Golf Club and then join up with Route Option 1B, as described in section 11.2.7.

11.3.7 Blanchardstown to Ballycoolin Road Section

To the north of Millennium Park, Route Option 2 continues to run along Blanchardstown Road South and then to the west of Blanchardstown Town Centre but within walking distance. The existing Blanchardstown Road South is a single lane carriageway but there is a plan to widen to a dual carriageway with an additional N3 overbridge. It is believed that plans are ongoing for the construction of a QBC along this corridor. Therefore discussions with the NRA and FCC will be included as part of the stage 3 of the Employer's Brief as it is likely that these lanes may be required for the Metro footprint.

To cross the N3 a new elevated bridge of approximately 60m length is required. The assumption is that slip roads at the N3 and Blanchardstown Road interchange are to be at grade crossings. Then either a culvert or new structure will be required to cross the Tolka River.

North east of the N3, Metro West runs on the eastern side of the Blanchardstown Road North up to Ballycoolin Road where it turns east and runs along the southern side of Ballycoolin Road. The existing road corridors both of Blanchardstown Road North and Ballycoolin Road are not wide enough to accommodate Metro West track but there is available land that could be acquired to widen the road corridor. The final alignment of

Option 2 will depend on the design of the Ballycoolin Road realignment scheme layout, and discussions must be held with FCC to define the proposed route alignment as mentioned previously.

Key Issues and Construction Level

- To develop a concept design for the metro alignment along Blanchardstown South and North for agreement with FCC and in order to demonstrate how buses will be accommodated in the future
- Likewise to develop the metro alignment along Ballycoolin road for agreement with FCC and negotiation with Developers

In terms of constructability this section of works should be considered as;
Construction Level 2 – moderate to moderately difficult (along Blanchardstown North)
Construction Level 3 – easy to moderately easy (along Ballycoolin Road)

11.3.8 Snugborough Road to N2 Section – shared with Route Option 1B

As described in item 11.2.9.

11.3.9 N2 to Metro North Delta Junction Section.

Route Option 2 crossing of the N2 will have the same issues as Route Option 1B, which are as described in 11.2.9. If it is found that the old and new N2's have to be crossed on an elevated structure, the total length of structure or set of structures and embankment section may be approximately 375m in length.

Once the route crosses the N2 it will be segregated and run through the "green field" area to the south of the Airport. A number of road crossings will be required along this stretch of track and to tie up with the future proposed road realignment to the south of the airport. The construction of this section of track will not present any engineering difficulties.

The connection to the delta junction at Metropark has previously been addressed in section 11.2.11.

Key Issues and Construction Level

- To discuss proposed Metro West crossing of N2 with NRA
- To discuss proposal with ESB
- To agree an alignment through the green fields areas with local land owners and Developers

In terms of constructability this section of works should be considered as;
Construction Level 3 – easy to moderately easy

11.3.10 Connection with Metro North

The main issues relating to the delta junction have already been outlined in 11.2.11 above and they also apply here.

The current proposed solution to incorporate a delta junction between Metro West Route Option 2 and Metro West is as per Fig 11.3.10.1. This delta layout is triangular in layout and offers a more acceptable engineering solution than Route Option 1B, which will mean that the junction can be designed to give consistent speeds in all directions.

11.4 Utilities

Due to lack of "as builts" from the various Utility Companies at this stage it is not possible outline in any depth where the large concentrations of utility lie save to say that it can be only expected that a large number of utilities are going to be affected by either Metro West

alignment. Most of the existing utilities are located within road corridors so construction of sections where Metro West runs on existing road corridor will be have to be preceded by utilities diversion works.

With Luas already in operation within the city, substantial experience has been gained by RPA, Utility Companies and Contractors in coping with these large scale projects and the valuable lessons learned will be applied to the construction of Metro West.

It goes without saving that advance planning and liaison are the key ingredients to the successful completion of these works.

It would be prudent at this stage to point out that the ambitious plans for expansion of Luas and the construction of 40+ km of Metro will possibly put a strain on the limited resources of utility companies and strategic decisions need to be made to co-ordinate the critical activities of all of these projects to deliver the much needed infrastructure gains that Dublin will experience.

11.5 Conclusion

The overall conclusion for the Constructability/Engineering section of this Report came out as follows (see MAST in Appendix B);

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
4th	Best	Worst	3rd	Best

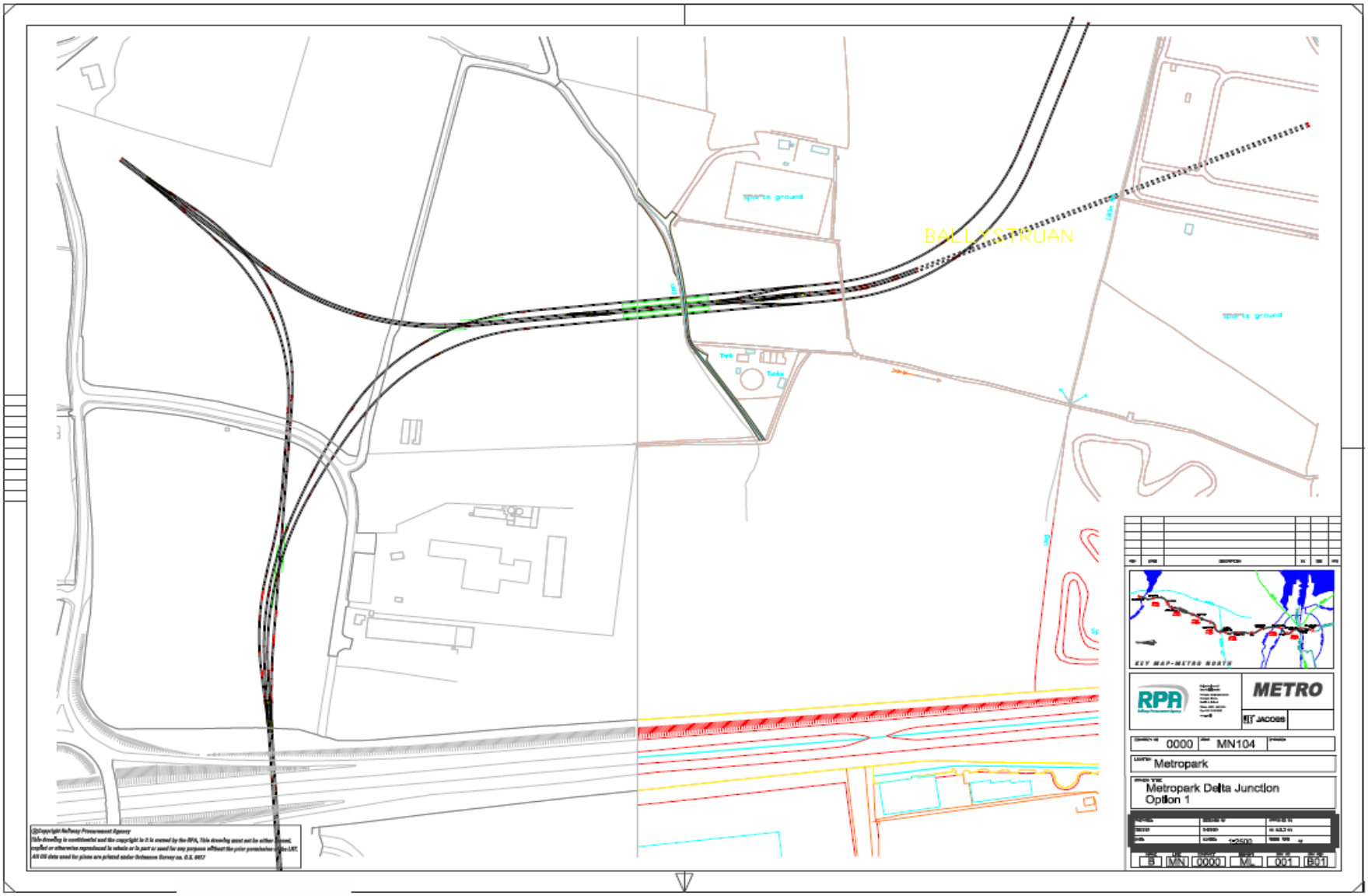


Fig No. 11.3.10.1

12 Public & Stakeholder Support

12.1 Introduction

As outlined in section 5.1 5No. Public Consultation Open Days were held at various locations in Fingal County and South Dublin County inviting the General Public and Statutory Bodies to make submissions on 2No. Route Options, see Fig No. 14.1.1 (also see Appendix A - Public Consultation Material).

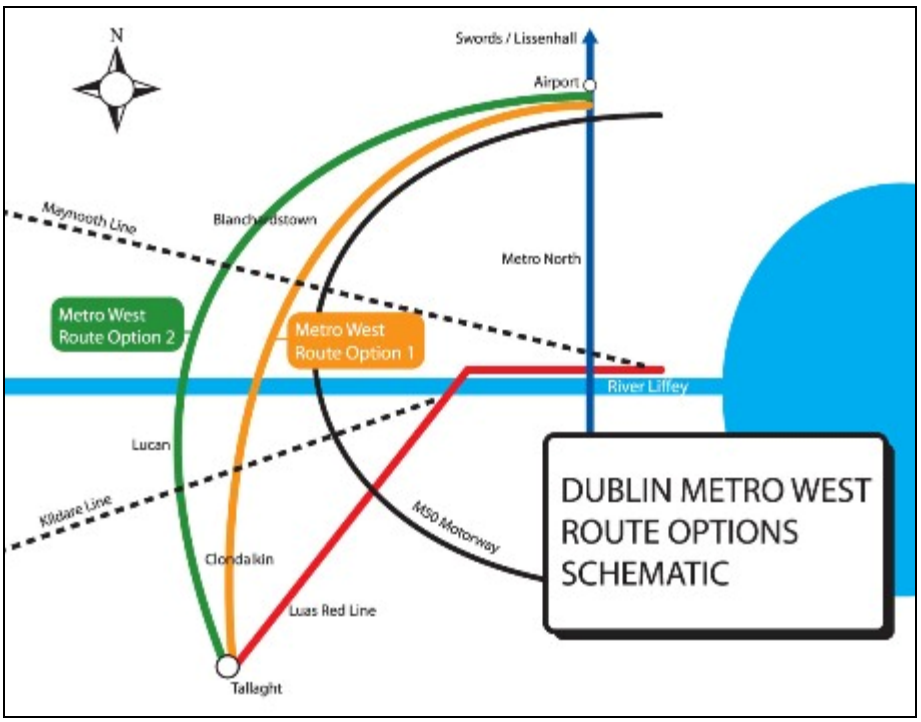


Fig 12.1.1 Route Options Schematic

The closing date for submissions from Statutory Bodies was 16th Feb 2007 and the closing date for submissions from the general Public was 28th Feb 2007.

Generally, the Open Days were well supported by the public and approximately 850No. submissions were received.

Broadly speaking 57% of the public were in favour of Route No. 1 and 43% favoured Route Option 2 (for more details see RPA Paper – Metro West Public Consultation, May 2007 in Vol. 2)

12.2 Key Issues

The key issues that emerged at Public Consultation are listed in Fig No. 12.2.1 and the action to deal with or mitigate that issue is listed alongside. Most of the issues either have been or are being dealt with in some shape or form and in some instances are no longer an issue through progress made and / or decisions taken since close of submissions.

A number of the bigger issues relating to alternative route options are dealt with in a separate Working Paper “Review and Analysis of Route Options suggested during Public Consultation” (see Vol. 5).

No.	Issue	Comment / mitigation	Open / Closed
1	Support for serving Clondalkin Town Centre.	Clondalkin TC will be served by sub-option B. Alignment will need to be finalised.	Closed
2	Support for extending the line to Tyrrelstown.	This has been discounted. See Working Paper "Review and Analysis of Route Options suggested during Public Consultation".	Closed
3	Strong support to serve Institute of Technology Blanchardstown (ITB).	This is on Route Option 2 and will depend on EPR.	Closed
4	Support for Citywest and Grangecastle route.	City west will be served by Luas Line A1. Grangecastle is on Route Option 2. Outcome will depend on EPR.	Closed
5	Proposed alternative through Luttrellstown Demesne.	This has been considered but is unlikely due to the protected status of Luttrellstown Demesne.	Closed
6	Proposed alternative link to serve Liffey Valley Town Centre.	This is being considered and will depend on EPR.	Open
7	Proposed alternative to serve Clondalkin, Lucan and Liffey Valley.	This has been discounted. See Working Paper "Review and Analysis of Route Options suggested during Public Consultation".	Closed
8	Proposed alternative south of the M50, through Finglas.	This has been discounted. See Working Paper "Alignment Options South of M50".	Closed
9	Proposed alternative to serve a possible Terminal 3 at Dublin Airport.	This has been discounted. See Working Paper "High Level Assessment of Airport Route Options".	Closed
10	Proposal to serve Clondalkin via tunnel.	This has been discounted in agreement with SDCC.	Closed
11	Suggested P&R at Kingswood.	This has been discounted as there is a P&R proposed at Cheeverstown.	Closed
12	Alternative from Citywest.	This has been discounted as Citywest will be served by Luas Line A1.	Closed
13	Proposal to start services at Citywest.	This has been discounted as Citywest will be served by Luas Line A1.	Closed
14	Proposal for passive stops to be made initial stops.	This will depend on demand and it is expected that some proposed passive stops will become operational from outset.	Closed
15	Proposal for a stop to be located at Huntstown, Meakestown and Silloge.	A stop is proposed at Huntstown, Meakestown and Silloge. Huntstown is proposed as an initial stop and there is strong demand for other to be initial stop. This will be considered.	Closed
16	Residents of Waterville (Blanchardstown, Dublin 15) have also suggested for a stop on Snugborough Road to be considered.	There is a stop at NAC within 500m.	Closed

Fig 12.2.1 – Key Issues

12.3 Objections

There are three main objections to be considered:

12.3.1 Depot at Porterstown:

"A number of submissions were received from members of the public expressing concern about the impact that a proposed depot may have on the playing fields at Porterstown in Dublin 15 and in the vicinity in general. RPA have been encouraged to look for feasible alternatives for Metro which will avoid entering the lands at Porterstown Park."

At this stage a depot at Porterstown has been discounted. However it must be noted that the alignment for either Route Option 1B or Route Option 2 and associated sub-options must pass through this area to access the reserved corridor adjacent to Porterstown Rd. This matter will need to be dealt with in a sensitive manner with Fingal County Council and the local residents at a later stage.

12.3.2 Route Option 1 via Moyle Park College/ Clondalkin Community Centre:

"A number of submissions were received, including 120 signatures from residents of St. Johns Wood who are opposed to this proposal. Whilst they don't object to the Metro West Route, they feel that an alternative route should be chosen through Clondalkin."

It is felt at this stage that there is a more suitable alignment possible in this area which avoids Moyle Park and crossing of John Rd which is a residential road. This needs to be looked at in more detail in Stage 3 of the Employer's Brief.

12.3.3 Sub-option D through Liffey Valley Town Centre.

"There is also opposition to Sub Option D from the Old Lucan Road (Dead Man's Lane) residents. RPA also noted that the proposal of a new bridge crossing the Liffey Valley is not welcomed by some residents."

At this stage Sub-Option D which served Liffey Valley shopping Centre and crossed the N4 and Dead Man's Lane has been discounted.

12.4 Stakeholders

Prior to and since Public Consultation RPA / JE have continued to meet with various stakeholders in an effort to resolve potential issues and to align each other as to how best to accommodate each others' future development plans and schemes to allow for a seamless integration of Metro West on to the Dublin landscape.

This process is expected to continue after the announcement of EPR right up to issue of the Rail Order.

12.4.1 South Dublin County Council (SDCC)

An extract from SDCC Development Plans 2004 -2010 states clearly outlines current policy in relation to Metro West;

Public Transport

- Completion of LUAS Line A, by 2004, extending from the Square in Tallaght to Middle Abbey Street and its continuation to Connolly Station in Dublin City Centre.

- A new LUAS on-street light rail line between Lucan and Dublin City Centre.

- A new Metro light railway linking Dublin Airport, Blanchardstown, the Liffey Valley Centre, Clondalkin and Tallaght.

- Improved bus priority measures including extension of the existing Lucan Quality Bus Corridor (QBC).

- Upgrading the existing Dublin (Heuston) – Kildare suburban railway including new stations at Adamstown (South Lucan), Kishoge (Outer Ring Road) and Fonthill Road.

From above it can been seen that the transport objectives of SDCC are satisfied by Route Option 1 and SDCC has indicated their preference for this route option.

12.4.2 Fingal County Council (FCC)

A number of policy statements in FCC Developments Plans highlight heavy support for Metro West, namely;

Policy TP13

- To actively seek to utilise Section 49 of the Planning and Development Act 2000 to secure contributions from developers towards the upgrading of public transport infrastructure.

ObjectiveTO7

- To identify and protect a route for the proposed Orbital METRO from the Airport through Blanchardstown towards Clondalkin and Tallaght.

Objective TO15

- To promote and facilitate the development of Public Transport Interchanges at Blanchardstown Centre, Porterstown, Swords, Howth Junction, Baldoyle and Balbriggan, and at other locations which may be identified during the lifetime of the Plan.

Objective TO16

- To facilitate the provision of Park and Ride facilities at suitable interchange points between private and public transport.

From above it can been seen that the transport objectives of FCC are satisfied by the various route options proposed, however FCC has indicated their preference for Route Option 1B.

12.4.3 Dublin City Council (DCC)

Metro West is outside Dublin City Corporation limits but does approach the city limits at the northern section of the route between Cappoge and Metropark on Route Option 1 in particular.

A submission has been received from DCC requesting that consideration be given to an alignment coming south of M50 serving Finglas in some shape or form. This has been discounted in Working Paper “Alignment Options South of M50” primarily because of the restricted road space in which to run a twin track alignment and because Finglas is best served by having its own dedicated transport link to the City Centre in the form of a Luas Line.

12.4.4 NRA

RPA / JE have has numerous meetings with NRA in relation to Metro West and future NRA scheme to see how they may impact one another. Both organisations are supportive of

each other schemes and realise the importance of aligning each other to ones needs, this is especially important where public consultation and public inquiries are concerned.

In particular considerable discussion has centred on Newlands Cross where NRA is looking to commence Public Consultation for the N7 Upgrade which proposes a grade separated solution at the junction itself.

RPA engaged JE to carry out a detailed study at Newlands Cross to look at various options through the junction.

Work has been ongoing for a number of months and it is expected that this work will conclude in the near future, most likely in June 2006. However at this stage it can be stated that an at grade solution is possible for Metro West which will not impede the operation of the junction.

Other areas that will need further study are as follows;

N2 Interchange
N3 crossing
N4 at Liffey Valley underpass

12.4.5 Dublin Bus

Dublin Bus has welcomed Metro West and is broadly in favour of Route Option 1 subject to 2No. exceptions, namely

- Preference for the section of Route Option 2, from Huntstown to Metropark taking in Harristown and Silloge.
- Not in favour of the route Option through Clondalkin Village and would prefer to see Metro West remain on Fonthill Road.

Further to this Dublin Bus would also like to see existing bus lanes improved adjacent to the alignment and for new bus lanes to be constructed where feasible to facilitate improved bus priority.

12.4.6 Dublin Airport Authority (DAA)

A number of meetings have taken place between RPA and DAA. RPA have outlined their position why it does not support Metro West serving the future proposed Terminal (see RPA Paper “Metro West Serving Dublin Airport, May 2007 Paper”. RPA believe that the airport will be best served by the provision of a bus service from airport car park facility in the vicinity of Silloge and that this bus service could run underneath the runway via a tunnel that should be constructed during the runway upgrade. RPA have undertaken to do some modelling and financial costing to further reinforce their case on this matter.

12.5 Conclusion

The overall conclusion for the Public and Stakeholder section of this Report came out as follows (see MAST in Appendix B);

OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
2nd	3rd	Worst	Best	3rd

13 Matrix Appraisal Summary Table (MAST) and Commentary

13.1 Introduction

At the outset of Stage 2 JE outlined a two step sifting criteria for analysing emerging route options for consideration. This sifting criteria is outlined in "Route Selection process Working Paper" (see Vol. No. 5) and consists of a Primary Sift and a Secondary Sift as outlined in the Fig No. 13.1.1 below;

PRIMARY SIFT	SECONDARY SIFT
Economy	Potential patronage CBA Reliability Journey Time Capacity Modal shift Revenue Employment
Costs/Funding	Capital Costs O & M Costs Property Acquisition Developers Funding
Safety	Road Traffic Accidents Security
Environment	Flora & Fauna Air Quality & Climate Material Assets; Archaeological Material Assets; Architectural Material Assets; Cultural Heritage Landscape Noise & vibration Traffic Surface Water Aquifers Potentially Contaminated Land
Accessibility & Social Inclusion	Employment Catchments Residential Catchments Severance Access to transport system for vulnerable groups
Integration	Integration with overall network Phasing possibilities Regeneration (RAPID) Points of Interest Interoperability and operations Landuse Policies Impact on buses Geographical Integration Government policy Other Government Policy
Constructability/Engineering	Construction Safety Buildability Construction disruption Impact on highway network Programme Implementation Material Assets; Utilities interfaces Geotechnical Upgradability Maintainability
Public & Stakeholder Support	Environmental Commercial Impact Access to property Material Assets; Land take Park (Amenity) Golf Clubs Construction impact Public Consultation

Fig 13.1.1 Sift Criteria

At the commence of Stage 2 a “spiders web” of possible route options was developed working on the previous work under taken by WS Atkins and expanded by JE to include other possible route options. Primary Sift criteria was utilised to reduce these route options to the 2No. Route Options which were then taken forward to Public Consultation. This Primary Sift criterion was also used as the basis of analysis for any Working Papers written during Stage 2.

Now that 5No. Route Options are being considered at the final EPR stage, Secondary Sift criteria will need to be utilised to inform the final EPR which will be recommended to RPA.

13.2 Output

The table outlined in Fig No. 13.1.1 has been further developed in conjunction with RPA and in line with their needs to have a robust analysis carried out. Where possible it is advisable to establish quantitative analysis over qualitative analysis as the output is less subjective. Over a number of workshops JE and RPA developed the Matrix Analysis Summary Table to the stage where it was sufficient to perform the task necessary to inform an EPR.

The input to MAST was divided between the parties and substantial work undertaken to provide the backup to inform the inputs.

The MAST was subsequently populated by the parties and interrogated to ensure that both the inputs and outputs were consistent and correct.

No weighting was applied to any of the inputs.

The final populated MAST is attached at Appendix C which also contains the relevant scoring and score summary table.

13.3 Summary Analysis

Appraisal Summary	OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Economy	3.92	3.88	3.86	3.78	3.93
Costs/Funding	3.07	2.49	3.06	2.52	2.51
Safety	4.14	4.40	4.13	4.18	4.21
Environment	2.53	2.50	2.48	2.67	2.64
Accessibility & Social Inclusion	4.54	4.13	4.70	4.46	4.62
Integration	4.00	3.58	4.00	3.68	3.63
Constructability/Engineering	3.12	3.37	3.02	3.28	3.37
Public & Stakeholder Support	2.93	2.81	2.72	2.96	2.81
TOTAL SCORE	**3.53**	**3.39**	**3.50**	**3.44**	**3.46**

Fig. No. 13.3.1 Summary score table from MAST

Fig No. 13.3.1 shows the final scores from MAST. The summary is a roll up of the Secondary Sift Criteria to the Primary Sift headings and as stated previously there is no weighting applied. All scores are measured out of 5.

In order to further distinguish the scores achieved by each of the Route Options the scores are colour coded for clarity, see Fig No. 13.3.2;

Legend	
Score	**Assessment**
5	Highly Positive Impact
4	Positive Impact
3	Neutral Impact
2	Negative Impact
1	Highly Negative Impact

Legend	
Relative Assessment	**Color**
Best	
Second Best	
Middle	
Second Worst	
Worst	

Fig No. 13.3.2

13.4 Commentary

The final standing of the route options from MAST is as follows;

1. Route Option 1B – 3.53 (70.6%)
2. Route Option 3 – 3.50 (70.0%)
3. Route Option 5 – 3.46. (69.2%)
4. Route Option 4 – 3.44 (68.8%)
5. Route Option 2 – 3.39 (67.8%)

The difference between the top and bottom option is only 2.8% which indicates that the initial 2No. Route Options selected for Public Consultation were both strong contenders.

As expected Route Option 3 closely matched Route Option 1B as the variant is the loop from Millennium Park around by Ballycoolin.

None of the routes scored strongly from an environmental perspective and all scores lie between neutral and negative impact on the score matrix.

Route Option 3 scores lowest in 4No. criteria.

From the 2No. Public Consultation Routes, Route Options 1B performs better than Route Option 2.

While finishing in third place Route Option 5 scores favourably with the highest number of greens at 5 whereas Route Option 1B has 4

Route Option 3 also has the highest score in 2No criteria whereas as Route Option 1B scores best in 2 criteria and is marginally lower that Route option 3 in the Economy criteria.

As Route Option 1B scores best and Route Option 2 lowest it should be expected that hybrids of the two roué options would score between the top and bottom scores.

Route Option 1B, while not scoring highest in Public & Stakeholder support from the MAST analysis did have 57% General Public support and also is established as the preferred route of both SDCC and FCC.

14 EPR Recommendation

14.1 Introduction

The work in Stage 2 of the Employer's Brief saw JE recommend 2No Route Options to take to Public Consultation Open Days allowing the General Public, Statutory Bodies and the Private Sector to comment and make submissions supporting, or otherwise, the provision of an orbital metro system for the Greater Dublin Region in line with Transport 21.

The work undertaken by JE, and in tandem with complementary work undertaken by RPA, has resulted in a thorough and analytical approach being adopted for all stages of this work and a visible audit trail is evident in the Stage 2 submission.

Primary and Secondary Sift criteria have been developed and utilised in the development of Working Papers and the EPR.

A detailed Capital Expenditure Report has been commissioned and provided to RPA outlining the budgetary requirements for the development of Metro West proposals which will form the basis of ongoing design development and result in the refinement of these budgets.

Open days were arranged by RPA at various locations in South Dublin and Fingal counties which were supported by JE.

Numerous meeting were held with stakeholders, interested parties and the General Public. Cognisance and consideration has been accorded to all submissions and have helped inform the final decisions and analysis for the Emerging Preferred Route.

The development and population of MAST by both RPA and JE has allowed 12 months of work to be correlated into one matrix thus informing EPR.

14.2 Recommendation

The conclusion of the Stage 2 Report leads to the following recommendations being given to RPA;

1. It is the recommendation of JE that Route Option 1B be taken forward for to Stage 3 of the Employer's Brief, i.e. concept development.

2. In essence Route Option 1B satisfies all the provisions of Transport 21, is the preferred route of both FCC and SDCC and garnered 57% of the General Public's support during the Public Consultation process.

3. Route Option 1B serves to link the communities of Tallaght, Clondalkin, Quarryvale and Blanchardstown while serving the Airport with a runtime of 54min. These areas are also either existing or have been designated as emerging Town Centres and areas of high commercial activity in their respective counties.

4. Route Option 1B will vastly improve integration and social inclusion by serving these communities and enhance the prospects and quality of life for the communities that it serves.

5. Route Option 1B will link with Irish Rail over the Maynooth Line and Kildare Railway Line. It will cross the N2, N3, N4 and N7 and provide ample opportunity to develop Park and Ride facilities at these strategic locations. The route will also have linkage to Luas Line A, Line A1 and Line F (Luas Lucan Line).

6. That on conclusion of the Metro North/Metro West Depot Comparison and Selection Study if Silloge emerges as a preferred location for the construction of a joint depot for the overall network then the routing of the alignment of the EPR in this area, particularly from Meakstown to Silloge should be revisited so as to optimise that alignment and integration with the proposed depot location.

7. By accepting the recommendations of this Report and moving swiftly to Stage 3 of the Employer's Brief, momentum can be maintained to see Metro West commence operations in late 2014.

14.3 Route Option 1B Stops

Route Option 1B (see Appendix D for Map and route description)

1	Airport	
2	Metropark	*(passive)*
3	Silloge	*(passive)*
4	Meakstown	*(park and ride)*
5	Huntstown	*(passive)*
6	Cappoge	
7	Abbotstown	
8	NAC	
9	Blanchardstown West End	
10	Millennium Park	
11	Porterstown	*(Maynooth Interchange)*
12	Liffey Valley	
13	Rowlagh	
14	Fonthill	*(Kildare Interchange)*
15	Clondalkin	
16	St Brigids	
17	Newlands	*(passive)*
18	Belgard	
19	Colbert's Fort	*(passive)*
20	Tallaght East	

15 Next Steps

15.1 Introduction

In order to keep the momentum of the project flowing it is recommended that the following "key locations" on the EPR should be addressed in Stage 3 of the Employer's Brief. It should be noted however that the issues associated with these locations do not affect the decision on the EPR.

15.2 Key Locations

There are a number of "key locations" that require further work and further public consultation;

1. Castleknock Golf Club
The route alignment through this location has the potential to impact two fairways and this alone may render the golf course unusable. A meeting is required with the land owner to discuss various alternative proposals that may work i.e. a land swap to east of his land or lowering the alignment into a cutting. FCC will have to be involved in these discussions.

2. Blanchardstown Shopping Centre
Route Option 1 and Route Option 2 run either to the east or the west of Blanchardstown Shopping Centre. To penetrate the shopping centre along Market Street offers better integration and a huge opportunity for modal shift. While initially reluctant Green Properties, owner of the main precinct, may be more receptive following the outcome of this report. This would mitigate the loss of Verona FC playing fields which could become a major issue.

3. Clondalkin
The proposed alignments presented to the general public at the Open Days met with heavy opposition from locals, particularly those living in St John's Road and St John's Wood. Sub-option A crossed a residential road between both areas and sub-option B runs through the Sports Grounds. Sub-option A has now been discounted while sub-option B is the preferred route.

The proposed alignment through the Sports Grounds, while further away from St John's Wood than originally planned may still encounter opposition. Work on this alignment should be progressed and a further round of consultation held with residents.

4. St Brigid's Well
Following consultation with the Dept of Environment permission has been given to investigate and consult on the feasibility of moving St Brigid's Well to the green adjacent. After the announcement of the EPR an archaeological survey of the area around the Well should be undertaken. Further consultation should be held with residents and stakeholders.

5. Liffey Valley Underpass
Traffic and structural analysis should be conducted to see if Metro West passing beneath the N4 is a viable option.

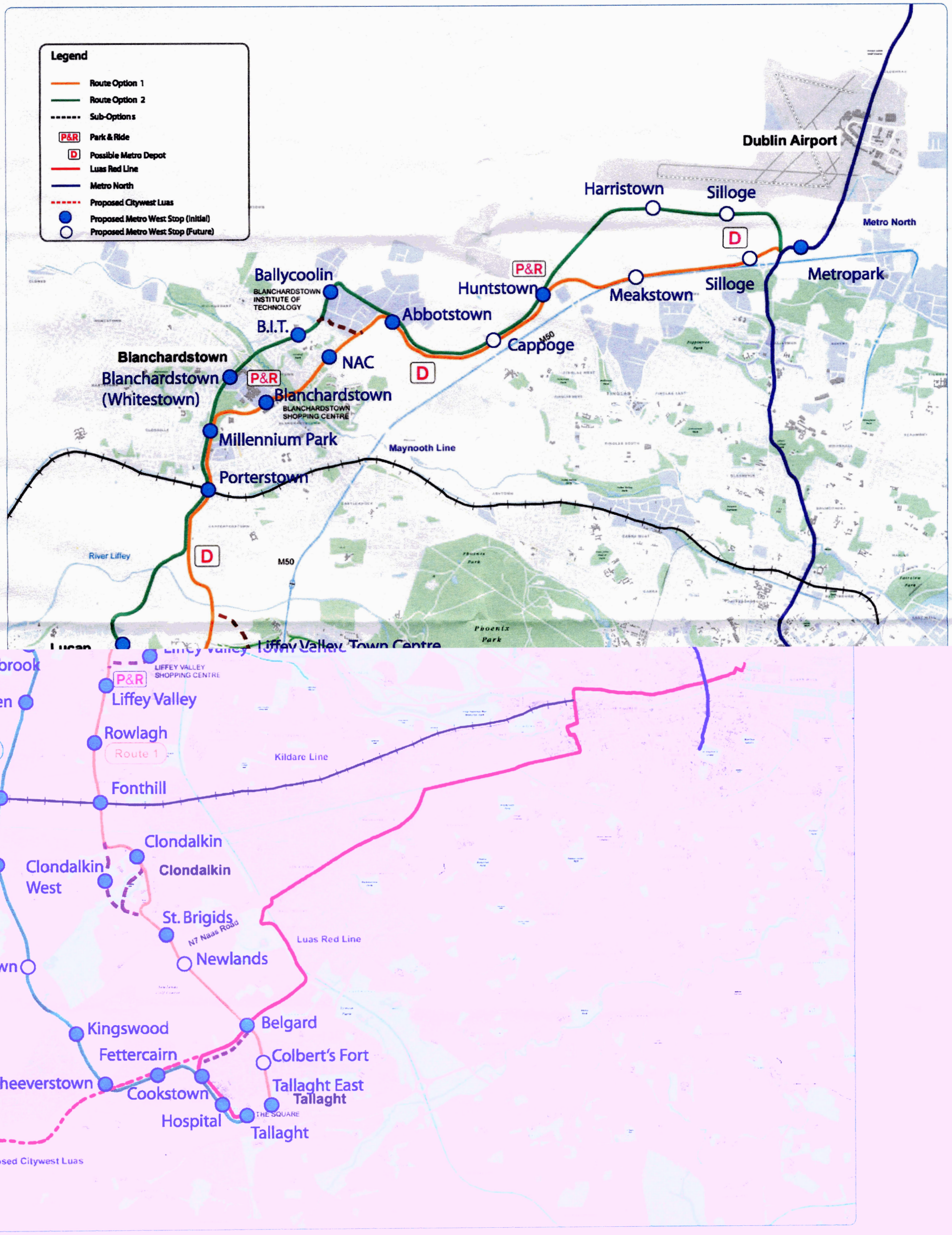
6. Liffey Valley Crossing
Further work should progress on this highly sensitive area by way of consultation with stakeholders. RPA should invite submissions for a landmark structure to enhance the valley.

7. Silloge

Further work should be undertaken to finalise the alignment in the area south of the airport and north of M50. This may be the location of a joint Metro North and Metro West depot which could occupy a footprint of up to 40acres which would have a major impact on the area. The interested developers, residents, and FCC should be contacted to further discuss the options for a landmark Metro statement in this area. Consideration should be given to the option of swapping the proposed location of the depot with Silloge GC to provide a buffer between the depot and future development.

Appendix A - Public Consultation Material

DUBLIN METRO WEST – ROUTE OPTIONS



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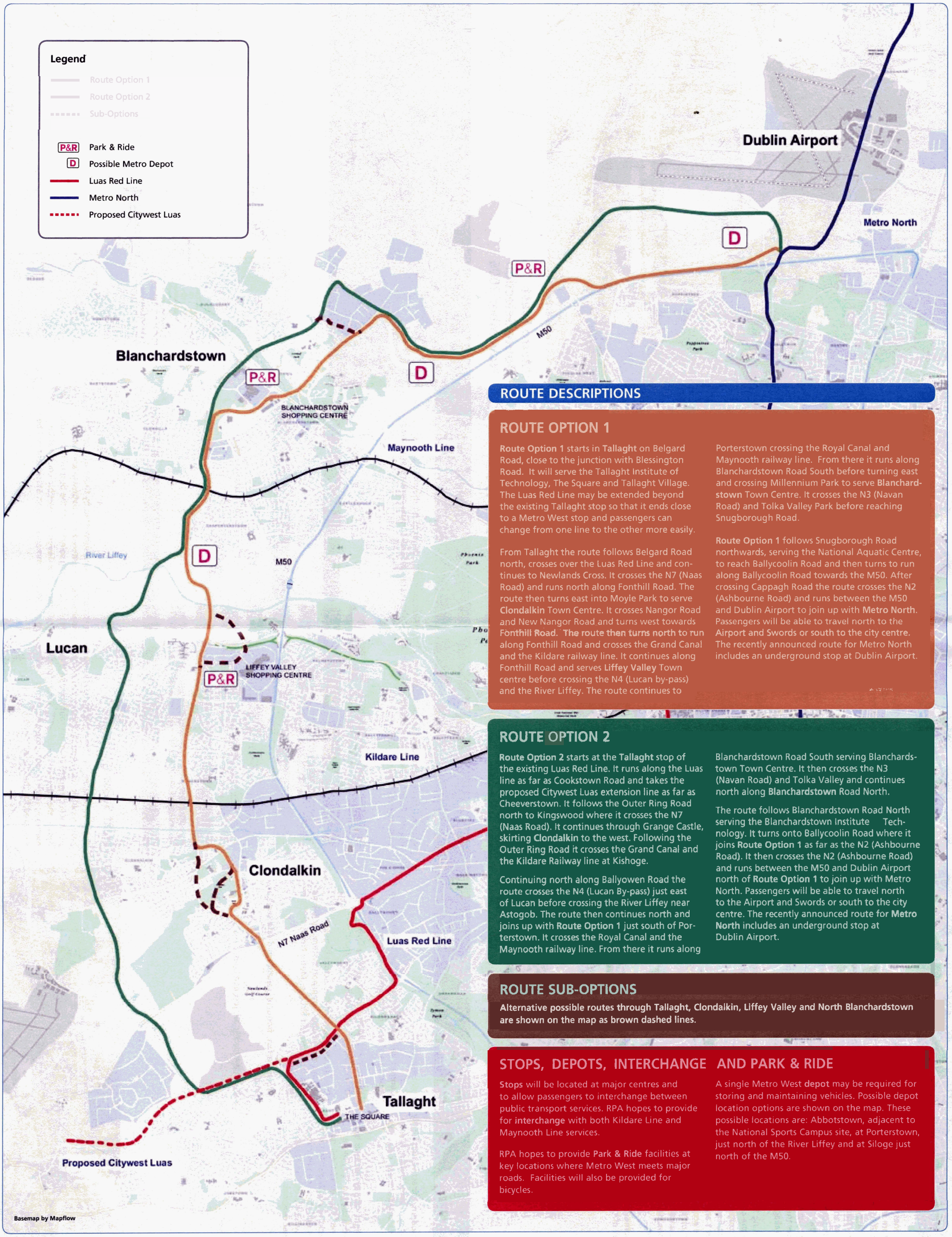
DUBLIN METRO WEST – ROUTE OPTIONS



ROUTE DESCRIPTIONS

ROUTE OPTION 1

Route Option 1 starts in **Tallaght** on Belgard Road, close to the junction with Blessington Road. It will serve the Tallaght Institute of Technology, The Square and Tallaght Village. The Luas Red Line may be extended beyond the existing Tallaght stop so that it ends close to a Metro West stop and passengers can change from one line to the other more easily.

From Tallaght the route follows Belgard Road north, crosses over the Luas Red Line and continues to Newlands Cross. It crosses the N7 (Naas Road) and runs north along Fonthill Road. The route then turns east into Moyle Park to serve **Clondalkin** Town Centre. It crosses Nangor Road and New Nangor Road and turns west towards Fonthill Road. The route then turns north to run along Fonthill Road and crosses the Grand Canal and the Kildare railway line. It continues along Fonthill Road and serves **Liffey Valley** Town centre before crossing the N4 (Lucan by-pass) and the River Liffey. The route continues to Porterstown crossing the Royal Canal and Maynooth railway line. From there it runs along Blanchardstown Road South before turning east and crossing Millennium Park to serve **Blanchardstown** Town Centre. It crosses the N3 (Navan Road) and Tolka Valley Park before reaching Snugborough Road.

Route Option 1 follows Snugborough Road northwards, serving the National Aquatic Centre, to reach Ballycoolin Road and then turns to run along Ballycoolin Road towards the M50. After crossing Cappagh Road the route crosses the N2 (Ashbourne Road) and runs between the M50 and Dublin Airport to join up with **Metro North**. Passengers will be able to travel north to the **Airport and Swords or south to the city centre.** The recently announced route for Metro North includes an underground stop at Dublin Airport.

ROUTE OPTION 2

Route Option 2 starts at the **Tallaght** stop of the existing Luas Red Line. It runs along the Luas line as far as Cookstown Road and takes the proposed Citywest Luas extension line as far as Cheeverstown. It follows the Outer Ring Road north to Kingswood where it crosses the N7 (Naas Road). It continues through Grange Castle, skirting **Clondalkin** to the west. Following the Outer Ring Road it crosses the Grand Canal and the Kildare Railway line at Kishoge.

Continuing north along Ballyowen Road the route crosses the N4 (Lucan By-pass) just east of Lucan before crossing the River Liffey near Astogob. The route then continues north and joins up with **Route Option 1** just south of Porterstown. It crosses the Royal Canal and the Maynooth railway line. From there it runs along Blanchardstown Road South serving Blanchardstown Town Centre. It then crosses the N3 (Navan Road) and Tolka Valley and continues north along **Blanchardstown** Road North.

The route follows Blanchardstown Road North serving the Blanchardstown Institute Technology. It turns onto Ballycoolin Road where it joins **Route Option 1** as far as the N2 (Ashbourne Road). It then crosses the N2 (Ashbourne Road) and runs between the M50 and Dublin Airport north of **Route Option 1** to join up with Metro North. Passengers will be able to travel north to the Airport and Swords or south to the city centre. The recently announced route for **Metro North** includes an underground stop at Dublin Airport.

ROUTE SUB-OPTIONS

Alternative possible routes through Tallaght, Clondalkin, Liffey Valley and North Blanchardstown are shown on the map as brown dashed lines.

STOPS, DEPOTS, INTERCHANGE AND PARK & RIDE

Stops will be located at major centres and to allow passengers to interchange between public transport services. RPA hopes to provide for **interchange** with both Kildare Line and Maynooth Line services.

RPA hopes to provide **Park & Ride** facilities at key locations where Metro West meets major roads. Facilities will also be provided for bicycles.

A single Metro West **depot** may be required for storing and maintaining vehicles. Possible depot location options are shown on the map. These possible locations are: Abbotstown, adjacent to the National Sports Campus site, at Porterstown, just north of the River Liffey and at Siloge just north of the M50.

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INTRODUCTION

Dublin's first two Luas lines have proved to be a tremendous success. More than 22 million passengers were served in 2005 and customer feedback has been very positive. The Government's national transport plan, **Transport 21**, builds on this success and proposes an extensive Luas/Metro network. The Railway Procurement Agency (RPA) has recently published the preferred route for the first phase of the Metro network (Metro North). This newsletter describes the second phase (Metro West), a line between Tallaght and Metro North.

RPA is focused on selecting the best overall route for Metro West within the coming months. Early studies of Metro West routes have been undertaken and this has identified two broad corridor options – **Route Option 1** and **Route Option 2.** These are shown on the accompanying map. Sub-options are also shown on this map. The route finally selected may be a variantion or combination of the route options, or other options identified during consultation.

RPA now welcomes submissions from interested parties in relation to all of the route options being considered.

This newsletter includes:

- A description of the Metro West concept;
- A map showing possible route options identified to date;
- Some of the key considerations in selecting the best overall route option; and
- An outline of the Metro West planning and approval process.

We welcome your views in relation to Metro West. A Freepost card is enclosed for your convenience.

Have your say!

SELECTION OF BEST ROUTE OPTION – KEY CONSIDERATIONS

RPA is assessing possible route options with a view to identify the best overall route for Metro West and this will be finalised. When feedback from public consultation has been reviewed. Key considerations include:

Safety
As with all RPA projects, the safe construction and operation of Metro West will be considered in selecting the route.

Transport and Land-use
Metro West must be compatible with land use and transportation policy.

Contribution to Solving Congestion and Associated Pollution Problems
Attracting motorists out of their cars to a quicker, cleaner and more environmentally friendly form of public transport is at the heart of national policy on sustainable transport.

Environmental Impacts
An Environmental Impact Statement will be completed for Metro West. Construction and operation of transport infrastructure can have impacts, both positive and negative, on the surrounding environment. The likely impacts, both short and long-term, will be assessed and considered.

Social Benefits
High quality public transport is a catalyst for the regeneration of urban areas opening up opportunities for economic growth for the communities served.

Transport System Integration
with all modes of transport, including Luas, Iarnród Éireann, Bus and Park & Ride must be considered.

Affordability and Economics
Value for money and the ability of the project to be funded is critical.

Operations
The route selected must offer potential customers a reliable, speedy and frequent service that fully meets their expectations.

Ease of Construction
Construction of a project of this scale leads to disruption to residents and businesses. This will be considered when selecting a route.

METRO WEST

Front Cover: Oporto Metro

Metro West
Route Selection
November 2006

Transport 21

RPA Railway Procurement Agency

METRO WEST CONCEPT

Metro West will be a modern, attractive and highly accessible urban railway system for Dublin. It will be similar to railways in many European cities the same size as Dublin.

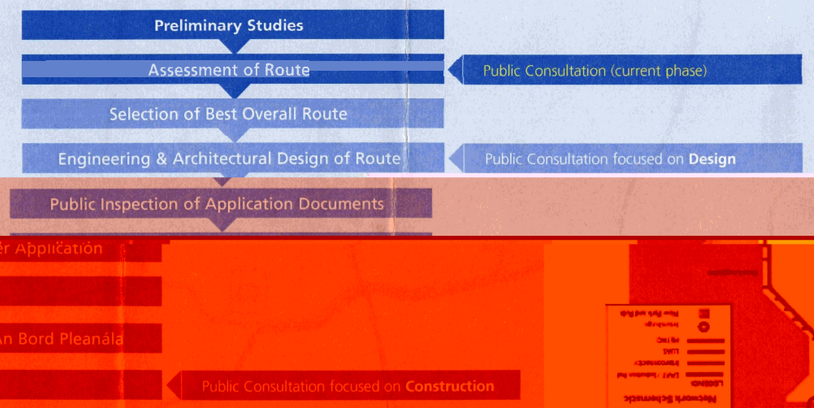
It will run initially as a light railway like Luas but with the ability to be upgraded to carry more passengers when required. Metro West will run on the surface and the tracks will be separate from road traffic. Like Luas it will cross road junctions at street level. Bridges will be provided at major roads, railways and other crossings.

Metro West will:

- Connect key towns in the west of Dublin serving existing and new communities;
- Connect with Metro North, serving Dublin Airport, Swords and Dublin city centre;
- Provide an important connection between current and planned transport systems by linking with Luas, Iarnród Éireann, Metro North and Bus services;
- Provide a fast, frequent, reliable and safe service; and;
- Be accessible for all, just like Luas.

METRO – PLANNING & APPROVAL PROCESS

Approval to proceed with the construction of Metro West ultimately depends on the making of a Railway Order by An Bord Pleanála. The main steps in the overall process may be outlined as follows (current step highlighted):



Next Steps

The RPA will consider the main route options taking account of views submitted by those who participate in public consultation. Contact details of participants may be entered on a database and participants will be notified of the route option finally selected. Following selection of the best overall route option the emphasis will then focus on consultation relating to the design and possible construction methods, track layout, stops, etc. along the chosen route. An Environmental Impact Statement will be prepared for the chosen route.

How to obtain further information and make contact

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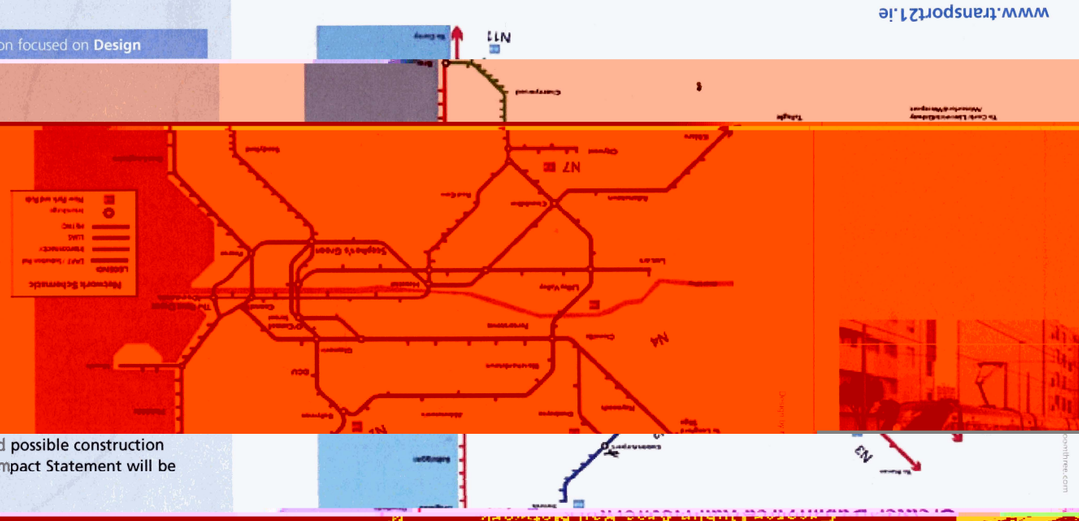
RPA Railway Procurement Agency

Más fearr leat leagan Gaeilge den bhfógra seo, scríobh chugainn nó glaoigh orainn.

www.transport21.ie



Appendix B - MAST

STAGE 2

EMERGING PREFERRED ROUTE

MATRIX APPRAISAL SUMMARY TABLE (MAST)

MAY 2007

STAGE 2

EMERGING PREFERRED ROUTE

MATRIX APPRAISAL SUMMARY TABLE
(MAST)

Appraisal Summary	OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Economy	3.92	3.88	3.86	3.78	3.93
Costs/Funding	3.07	2.49	3.06	2.52	2.51
Safety	4.14	4.40	4.13	4.18	4.21
Environment	2.53	2.50	2.48	2.67	2.64
Accessibility & Social Inclusion	4.54	4.13	4.70	4.46	4.62
Integration	4.00	3.58	4.00	3.68	3.63
Constructability/Engineering	3.12	3.37	3.02	3.28	3.37
Public & Stakeholder Support	2.93	2.81	2.72	2.96	2.81
TOTAL SCORE	3.53	3.39	3.50	3.44	3.46

STAGE 2 REPORT -EMERGING PREFERRED ROUTE - MAST

PRIMARY CRITERIA	SECONDARY CRITERIA	STATEMENT OF ASSESSMENT	OWNER	ANALYSIS	MEASURE	OPTION 1B		OPTION 2		OPTION 3		OPTION 4		OPTION 5		SOURCE
					Unit	Quantity	SCORE	Quantity	SCORE	Quantity	SCORE	Quantity	SCORE	Quantity	SCORE	
Economy	Potential Patronage	Forecast numbers of new Metro users in 2016 as produced by the RPA model in million of passengers per annum (mpa) 40 = Score 5 30 = Score 4 Proportion i.e. 35 = score 4.5	RPA	Quant	mpa	33.5	4.35	34.9	4.49	34.9	4.49	34.7	4.47	36.4	4.64	Demand Forecasting and Cost-Benefit Analysis Report, May 2007
	Cost Benefit Analysis BCR	Benefit to Cost Ratio >2:1 = Score 5 1:1 to 2:1 = Score 4 1:1 = Score 3	RPA	Quant	ratio	1.55:1	4	2.22:1	5	1.5:1	4	1.59:1	4	1.59:1	4	Demand Forecasting and Cost-Benefit Analysis Report, May 2007
	NPV	Economic Net Present Value of Project [text deleted] = Score 5 [text deleted] = Score 4 [text deleted] = Score 3	RPA	Quant	€ million	[text deleted]	4	[text deleted]	5	[text deleted]	4	[text deleted]	4	[text deleted]	4	Demand Forecasting and Cost-Benefit Analysis Report, May 2007
	IRR	Internal Rate of Economic Return >10% = Score 5 5% to 10% = Score 4 5% = Score 3	RPA	Quant	%	10.6	5	15.3	5	10.2	5	10.9	5	10.9	5	Demand Forecasting and Cost-Benefit Analysis Report, May 2007
	Reliability (No. of junctions)	Reliability is affected by the number of at grade road junctions any light rail system has to cross under signal control. Each junction is a potential delay. The more junctions the potentially less reliable the system will be. >40 = Score 1 30 - 40 = Score 2	RPA	Quant	units	36	2	41	1	35	2	41	1	39	2	Metro West Alignment Selection Study, Run Times and Peak Vehicle Requirements, May 2007
	Journey Time	The time taken from terminus to terminus including dwell times >65 = Score 1 60 to 65 = Score 2 55 to 60 = Score 3 50 to 55 = Score 4 <50 = Score 5	RPA	Quant	mins	53.96	4	60.47	2	55.52	3	57.38	3	59.38	3	Metro West Alignment Selection Study, Run Times and Peak Vehicle Requirements, May 2007
	Capacity	The capacity of the route is a product of the headway and the capacity of the vehicles measured in persons per direction per hour 5,000 = Score 3	RPA	Quant	ppdph	5,000	3	5,000	3	5,000	3	5,000	3	5,000	3	45m vehicles operating every 4 minutes (420 passengers per vehicle)
	Modal shift	The number of forecast new Metro users which will come from private transport rather than from other public transport modes in million of passengers per annum (mpa) 25 = Score 5 20 = Score 4 Proportion i.e. 22.5 = score 4.5	RPA	Quant	mpa	22.2	4.44	22.9	4.58	23	4.6	22.8	4.56	23.8	4.76	Demand Forecasting and Cost-Benefit Analysis Report, May 2007
	Revenue	The forecast operating revenue of the route as output from the RPA model in 2002 prices €50 = Score 5 €40 = Score 4 Proportion i.e.€45 = score 4.5	RPA	Quant	€ million	43.8	4.38	47.4	4.74	45.3	4.53	47.2	4.72	49.1	4.91	Forecasting and Cost-Benefit Analysis Report, April 2007. Revenue figures are for forecast year 2016
	Employment (Potential new jobs; excluding construction and operation jobs)	The potential of the route to generate employment over and above that currently forecast in the region Highly Positive = Score 5 Positive = Score 4 Neutral = Score 3 Negative = Score 2 Highly Negative = Score 1	RPA	Qual	n/a	Positive Impact	4	Positive Impact	4	Positive Impact	4	Positive Impact	4	Positive Impact	4	Assumption - Metro West is likely to increase the attractiveness of the region and country to international investment and thus increase employment and jobs in the country (independent of route)
						Sub Total Score	39.17 3.92	Sub Total Score	38.81 3.88	Sub Total Score	38.62 3.86	Sub Total Score	37.75 3.78	Sub Total Score	39.31 3.93	
Costs/Funding	Capital Costs	Capital Cost Estimate in 2007 prices excl Land Acquisition Costs & VAT[text deleted] [text deleted] = Score 1 [text deleted] = Score 2 [text deleted] = Score 3 [text deleted] = Score 4 [text deleted] = Score 5	JE	Quant	€M	[text deleted]	3	[text deleted]	3	[text deleted]	3	[text deleted]	3	[text deleted]	3	ECH CAPEX Report - Apr 2007
	Operation & Maintenance Costs	Annual O&M Costs in 2007 Prices [text deleted] = Score 1 [text deleted] = Score 1 to 2 [text deleted] = Score 2 to 3 [text deleted] = Score 3 to 4 [text deleted] = Score 5 Proportion i.e. [text deleted] = score 2.5	RPA	Quant	€ million	[text deleted]	3.287	[text deleted]	30.39	[text deleted]	27.78	[text deleted]	29.15	[text deleted]	3 .024	Metro West Operating and Maintenance Costs, May 2007
	Property Acquisition	Land Acquisition Costs in 2007 prices [text deleted] = Score 1 [text deleted] = Score 2 [text deleted] = Score 3 [text deleted] = Score 4 [text deleted] = Score 5	JE	Quant	€	[text deleted]	3	[text deleted]	1	[text deleted]	3	[text deleted]	1	[text deleted]	1	Land Acquisition Costs Report (Apr 2007) - K Noble + ECH CAPEX Supplemental Report (Apr 2007)
	Developers Funding	Number of potential development contribution sites including possible S49 areas 1 - 4 Score = 1 5 - 8 Score = 2 9 – 12 Score = 3 13 – 16 Score = 4 17 – 20 Score = 5	JE	Quant	No.	10	3	9	3	10	3	9	3	9	3	High level assessment of County Developments Plans
						Sub Total Score	12.287 3.07	Sub Total Score	9.961 2.49	Sub Total Score	12.222 3.06	Sub Total Score	10.085 2.52	Sub Total Score	10.024 2.51	
Safety	Road Traffic Accidents	The number of road accidents reduced as a result of fewer trips by private vehicle as output from the RPA model (fatalities and injuries) 2016 Annual 2 = Score 5 1 = Score 4 Proportion i.e. 1.5 = score 4.5	RPA	Quant	units	1.28	4.28	1.79	4.79	1.26	4.26	1.36	4.36	1.42	4.42	Demand Forecasting and Cost-Benefit Analysis Report, May 2007
	Security	Assessment of the remoteness, segregation and safety risks Positive Impact Score = 4 Medium Impact Score = 3 Negative Impact Score = 2	JE	Qual	n/a	Positive Impact	4	Positive Impact	4	Positive Impact	4	Positive Impact	4	Positive Impact	4	Option 1 scores well on this category because it runs through areas that will have other activities taking place.
						Sub Total Score	8.28 4.14	Sub Total Score	8.79 4.40	Sub Total Score	8.26 4.13	Sub Total Score	8.36 4.18	Sub Total Score	8.42 4.21	

LEGEND	
Score	Assessment
5	Highly Positive Impact
4	Positive Impact
3	Neutral Impact
2	Negative Impact
1	Highly Negative Impact

STAGE 2 REPORT -EMERGING PREFERRED ROUTE - MAST

Environment	Flora & Fauna	The Number of known sites likely to be impacted 15 to 23 = Score 3 24 to 31 = Score 2 32+ = Score 1	JE	Quant	No.	31	2	17	3	29	2	17	3	15	3	GIS Analysis & Environmental Assessment Report
	Air Quality & Climate	Reduction in tonnes of CO2 emissions as a result of reduced vehicle kilometres on the highway in 2016 0 , Score = 3, 0 to 6,000, Score = 4 6,000 to 12,000, Score = 5 Proportion i.e. 9,000 = score 4.5	RPA	Quant	tonnes	7,544	4.26	10,594	4.77	7,428	4.24	8,040	4.34	8,398	4.40	Demand Forecasting and Cost-Benefit Analysis Report, May 2007
	Material Assets: Archaeological,	The Number of known sites likely to be impacted 0, Score = 5 1-5, Score = 4 6 to 9, Score = 3 10 -12, Score = 2 13+, score = 1	JE	Quant	No.	12	2	11	2	11	2	11	2	10	2	GIS Analysis & Environmental Assessment Report
	Material Assets:Architectural (inc Protected Structures)	The Number of known sites likely to be impacted 37 to 54.66 = Score 3 54.66 to 72.32 = Score 2 72.32 to 90 = Score 1	JE	Quant	No.	70	2	37	3	70	2	37	3	37	3	GIS Analysis & Environmental Assessment Report
	Material Assets: Cultural Heritage	Possible impact Highly Positive, Score = 5 Positive, Score = 4 Neutral, Score = 3 Negative, Score = 2 Highly Negative, Score = 1	JE	Qual	n/a	Neutral Impact	3	Neutral Impact	3	Neutral Impact	3	Neutral Impact	3	Neutral Impact	3	
	Landscape	Little or no impact=6 Slight=5 Slight to moderate=4 Moderate=3 Moderate to substantial=2 Substantial=1	RPA	Qual	n/a	Neutral Impact	3	Neutral Impact	3	Neutral Impact	3	Neutral Impact	3	Neutral Impact	3	Landscape & Visual Impact Impact for MW after SIFT 2 - June 2007
	Noise & vibration	16, score = 3 24, Score = 2 20, Score = 2.5	JE	Quant	No.	21	2.625	18	2.75	24	2	16	3	19	2.625	GIS Analysis
	Traffic	Impact on traffic during operations: Number of junction interactions. The more junctions the greater impact on traffic >40 = Score 1 30 - 40 = Score 2	RPA	Quant	No.	36	2	41	1	35	2	41	1	39	2	Metro West Alignment Selection Study, Run Times and Peak Vehicle Requirements, May 2007
	Surface Water	The number of surface water crossings 9 to 11 = Score 3 11.1 to 13 = Score 2 13.1 to 15 = Score 1	JE	Quant	No.	9	3	12	2	9	3	11	3	11	3	GIS Analysis & Environmental Assessment Report
	Aquifers	The % of route with high environmental impact 0 - 33.3%, Score = 3, Neutral 33.4 - 66.6%, Score = 2, Negative Impact 66.4 - 100%, Score = 1, Highly Negative Impact	JE	Quant	No.	68.66%	1	75.74%	1	70.35%	1	69.79%	1	71.17%	1	GIS Analysis & Environmental Assessment Report
	Potentially Contaminated Land	The Number of known sites likely to be impacted 13 to 18.66 = Score 3 18.66 to 24.32 = Score 2 24.33 to 30 = Score 1	JE	Quant	No.	13	3	19	2	15	3	17	3	19	2	GIS Analysis & Environmental Assessment Report
						Sub Total Score	27.88 2.53	Sub Total Score	27.52 2.50	Sub Total Score	27.24 2.48	Sub Total Score	29.34 2.67	Sub Total Score	29.02 2.64	
Accessibility & Social Inclusion	Employment Catchments	The number of forecast employees within 1km of the proposed stops in 2016 75,000 = Score 5 70,000 = Score 4 65,000 = Score 3 Proportion i.e. 67,500 = score 3.5	RPA	Quant	units	68,356	3.67	68,976	3.80	70,482	4.10	69,024	3.80	71,152	4.23	Metro West Catchment Analysis, April 2007
	Residentail Catchments	The number of forecast residents within 1km of the proposed stops in 2016 150,000 = Score 5 125,000 = Score 4 100,000 = Score 3 Proportion i.e. 112,500 = score 3.5	RPA	Quant	units	137,189	4.49	116,319	3.65	140,767	4.63	124,517	3.98	128,101	4.12	Metro West Catchment Analysis, April 2007
	Severance	Assessment of likely impact of route separating pedestrian movements through built up urban areas 0 Areas Score = 5 1-2 Areas Score = 4 3 – 4 Areas Score = 3 >4 Score = 0	JE	Quant	units	None	5	None	5	None	5	None	5	None	5	See data collection sheet for severance of parks.
	Access to transport system for vunerable groups	The number of those unemployed, unskilled or education level 3 or less. Comments on improved access to jobs and facilities (education, recreation etc) fo these groups 28,000 = Score 5 26,000 = Score 4 Proportion i.e. 27,000 = score 4.5	RPA	Quant/Qual	units	27,132	4.57	26,375	4.19	27,544	4.77	27,044	4.52	27,455	4.73	Metro West Catchment Analysis, April 2007
	Deprived Geographic areas	The number of RAPID and CLAR areas within the catchment of the route 4 = Score 5 2 = Score 4	RPA	Quant	units	4	5	2	4	4	5	4	5	4	5	Metro West RAPID Area Report, April 2007
						Sub Total Score	22.72 4.54	Sub Total Score	20.64 4.13	Sub Total Score	23.50 4.70	Sub Total Score	22.31 4.46	Sub Total Score	23.08 4.62	

STAGE 2 REPORT -EMERGING PREFERRED ROUTE - MAST

Integration	Integration with overall network Bus	The potential Interchange points with the existing or future bus network 7 or Greater Score = 5 6 Score = 4 5 Score = 3 4 Score = 2 3 or less Score = 1	JE	Quant	units	6	4	5	3	6	4	5	3	5	3	See data collection sheet.
	Rail	The potential Interchange points with the existing or future rail network 3 Score = 5 2 Score = 4 1 Score = 3 0 Score = 1	JE	Quant	units	2	4	2	4	2	4	2	4	2	4	See data collection sheet.
	Luas	The potential Interchange points with the existing or future Luas network 3 Score = 5 2 Score = 4 1 Score = 3 0 Score = 1	JE	Quant	units	3	5	3	5	3	5	3	5	3	5	See data collection sheet.
	Metro	The potential Interchange points with the existing or future Metro network 1 Score = 4 2 Score = 5	JE	Quant	units	1	4	1	4	1	4	1	4	1	4	See data collection sheet.
	P & R (Proposed on MW)	The number of new P&R proposed on each route option 5 Score = 5 4 Score = 4 3 Score = 3 etc	JE	Quant	units	3	3	2	2	3	3	2	2	2	2	Public Consultation - Route Options
	P & R Existing or proposed by others	The potential Interchange points with the existing or future P&R sites (non Metro West) 5 Score = 5 4 Score = 4 3 Score = 3 etc	JE	Quant	units	1	1	2	2	2	2	2	2	2	2	See data collection sheet.
	Phasing possibilities	Can the project be feasibly phased (Y/N) Yes, Score = 5 No, Score = 0	JE	Quant	Y/N	Y	5	Y	5	Y	5	Y	5	Y	5	
	Regeneration (RAPID)	The number of areas where regeneration can be accomplished around Metro West 5+, Score = 5 3 - 4, Score = 4 1 to 2, Score = 3 0, Score = 1	JE	Quant	units	4	4	2	3	4	4	4	4	4	4	See RPA Report Rapid Areas, May 07
	Points of Interest Centres Town	Town Centres served as defined in the county development plans 3+, Score = 5 2 to 3, Score = 4 0 to 2, Score = 3	JE	Quant	units	4	5	2	4	4	5	2	4	2	4	See data collection sheet.
	District Centres	District Centres served as defined in the county development plans 3+, Score = 5 2 to 3, Score = 4 0 to 2, Score = 3	JE	Quant	units	0	3	2	4	0	3	2	4	2	4	See data collection sheet.
	Shopping Centres	Main shopping or retail centres served 3+, Score = 5 2 to 3, Score = 4 0 to 2, Score = 3	JE	Quant	units	4	5	2	4	4	5	2	4	2	4	See data collection sheet.
	Hospital	Main hospitals or clinic served 3+, Score = 5 2 to 3, Score = 4 0 to 2, Score = 3	JE	Quant	units	3	5	2	4	3	5	2	4	2	4	See data collection sheet.
	Others	Museums, theatres other points of interest which might attract Metro passengers 10+, Score = 5 6 to 9, Score = 4 0 to 5, Score = 3	JE	Quant	units	11	5	5	3	8	4	7	4	5	3	See data collection sheet.
	Interoperability and operations (Y/N)	Can the MW Route interoperate with Luas and Metro North? Y, Score = 4 N, Score = 3	JE	Qual	Y/N	Y	4	Y	4	Y	4	Y	4	Y	4	
	Land Use Policies	Is the route compliant with county development plans Fully Compliant Score, = 5 Broadly Compliant, Score = 3 Not Compliant, Score 1	JE	Qual	n/a	Broadly Compliant	3	Broadly Compliant	3	Broadly Compliant	3	Broadly Compliant	3	Broadly Compliant	3	Assumption that all route options are broadly compliant with the development plans
	Impact on Buses	Potential loss of bus lanes or stops to accommodate Metro West Loss of 8+, Score = 1 Loss of 6 to 7, Score = 2 Loss of 4 to 5, Score = 3 Loss of 2 to 3, Score = 4 Loss of 0 to 1, Score = 5	JE	Quant	units	3	4	2	4	3	4	2	4	2	4	See data collection sheet.
	Geographical Integration	Improved external links - such as to Gateway towns (as per National Spatial Strategy) and to international ports and airports) Highly Positive = Score 5 Positive = Score 4 Neutral = Score 3 Negative = Score 2 Highly Negative = Score 1	RPA	Qual	n/a	Positive Impact	4	Positive Impact	4	Positive Impact	4	Positive Impact	4	Positive Impact	4	All Options Serve Airport, National Primary Roads and Rail and Luas Connections
	Government Policy	Does the route comply with stated government policy (Transport 21) Yes, Score = 4 No, Score = 2	JE	Qual	Y/N	Y	4	N	2	Y	4	N	2	N	2	Transport 21 states that Metro West will serve Tallaght, Clondalkin, Liffey Valley ar Blanchardstown
	Other (non-transport, non-land use) Goverement policy	Eg - Balanced regional development, sustainablity Highly Positive = Score 5 Positive = Score 4 Neutral = Score 3 Negative = Score 2 Highly Negative = Score 1	RPA	Qual	n/a	Positive Impact	4	Positive Impact	4	Positive Impact	4	Positive Impact	4	Positive Impact	4	Assumption - Metro Wst is likely to positively contribute to other stated government policy as defined in the National Development Plan and other development strategioes (independent of route)
						Sub Total Score	76.00 4.00	Sub Total Score	68.00 3.58	Sub Total Score	76.00 4.00	Sub Total Score	70.00 3.68	Sub Total Score	69.00 3.63	

STAGE 2 REPORT -EMERGING PREFERRED ROUTE - MAST

Constructability/Engineering	Construction Safety	Potential risk due to interfaces with pedestrian, vehicles, rail services and others Low Risk, Score = 5 Low/Medium Risk, Score = 4 Medium Risk, Score = 3 Medium/High, Score = 2 High Risk, Score = 1	JE	Qual	n/a	L/M	4	L/M	4	L/M	4	L/M	4	L/M	4	See Stage2/EPR Report
	Buildability Length of Track	Track Length 24km, Score = 5 30km, Score = 3 proportional i.e. 27km = 4	JE	Quant	km	24.28	4.91	27.27	3.91	24.921	4.69	24.438	4.85	27.034	3.99	See drawings in Stage 2/EPR report.
	No. of Stops	Initial Stops 15, Score = 3 16 to 18, Score = 2 19+, Score = 1	JE	Quant	units	15	3	18	2	16	2	17	2	18	2	See drawings in Stage 2/EPR report.
	No. of Passive Stops	Future Stops 4, Score = 3 5 to 6, Score = 2 7+, Score = 1	JE	Quant	units	5	2	4	3	5	2	4	3	4	3	See drawings in Stage 2/EPR report.
	No. of structures	Bridges, Culverts, underpass etc. 8, Score = 3 9 to 11, Score = 2 12+, Score = 1	JE	Quant	units	11	2	9	2	11	2	9	2	9	2	See data collection sheet.
	Construction disruption	Potential impact on the built environment Low Risk, Score = 5 Low/Medium Risk, Score = 4 Medium Risk, Score = 3 Medium/High, Score = 2 High Risk, Score = 1	JE	Qual	n/a	L/M	4	L/M	4	L/M	4	L/M	4	L/M	4	Assumption that all risks to major roads will be low to medium independent of route
	Impact on highway network	Major Roads requiring lane closures 5, Score = 3 6 to 9, Score = 2 10+, Score = 1	JE	Quant	n/a	9	2	5	3	9	2	5	3	5	3	See Stage2/EPR Report
	Programme Implementation	Duration 3yrs, Score = 5 4yrs, Score = 4 4.5yrs, Score = 4.5	JE	Quant	Years	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	See Stage2/EPR Report
	Material Assets: Utilities interface	Possible interface with major utilities Low, Score = 5 Low/Medium, Score = 4 Medium, Score = 3 Medium/High, Score = 2 High, Score = 1	JE	Qual	n/a	M/H	2	Medium	3	M/H	2	Medium	3	Medium	3	Assume Route 1 will encounter more utility interfaces in Clondalkin, Tallaght and Liffey Valley (Belgard Fonthill) and at Blanchardstown (Snugborough)
	Geotechnical	Potential location of unsuitable ground Low, Score = 5 Low/Medium, Score = 4 Medium, Score = 3 Medium/High, Score = 2 High, Score = 1	JE	Qual	n/a	Neutral	3	Neutral	3	Neutral	3	Neutral	3	Neutral	3	Assume all ground will be similar and suitable
	Upgradability	The ability of the route to at some future stage be upgraded to allow greater segregation, greater capacity and faster speeds. High, Score = 5 Medium, Score = 3 Low, Score = 1	JE	Qual	n/a	Low	1	Medium	3	Low	1	Low	1	Medium	3	Assume that it will be difficult to achieve segregation in Clondalkin, Blanchardstown (West End)
	Maintainability	Available access to track, engineering hours, curvature High, Score = 5 Medium, Score = 3 Low, Score = 1	JE	Qual/Quant	n/a	High	5	High	5	High	5	High	5	High	5	Assume similar and available acces to all routes
						Sub Total Score	37.41 3.12	Sub Total Score	40.41 3.37	Sub Total Score	36.19 3.02	Sub Total Score	39.35 3.28	Sub Total Score	40.49 3.37	

STAGE 2 REPORT -EMERGING PREFERRED ROUTE - MAST

Public & Stakeholder Support	Environmental		Submisisons received on environmental objections during consultation Yes = Score 2 No = Score 4	RPA	Qual	n/a	Y	2	N	4	Y	2	N	4	N	4	Metro West Public Consultation Report, April 2007. Objections raised with respect to Route Option 1 at Liffey Valley crossing
	Commercial Impact (Office/Retail)		Routes Preferred or objections received from retailers during consultation (numbe of preferences) 0 = Score 3 2 = Score 4 4+ = Score 5 Proportion i.e. 1 = score 3.5	RPA	Qual	units	4	5	1	3.5	4	5	2	4	2	4	Green Properties prefer Route Option 2 at Blanchardstown Cosgrave Properties Prefer Route Option 1 at Blanchardstown O' Callaghan Properties prefer Route Option 1 at Liffey Valley Bovale developments wish to Serve Charlestown Shopping Centre (Option 1) Royceton prefer Route Option 1 to Serve Clondalkin New Shopping Centre
	Access to property		Impact on loading, parking and access to residential areas, Positive Impact Score = 4 Neutral Impact Score = 3 Negative Impact Score = 2	JE	Qual	n/a	Neutral	3	Neutral	3	Neutral	3	Neutral	3	Neutral	3	Assume all routes have a neutral impact on residential areas
	Material Assets: Land take	Private	Area of private land required (Acquisition)(excl depot) 50 = Score 3 80 = Score 2	JE	Quant	acres	58.32	2.72	73.64	2.21	54.36	2.85	75.12	2.16	63.75	2.54	as shown on 1:4000 & Land Acquisition Cost Report
		Public	Area of public land required (Acquisition)(excl depot)(incl highway) 25 = Score 3 45 = Score 2	JE	Quant	acres	40.28	2.24	33.11	2.59	44.73	2.01	29.65	2.77	41.51	2.17	as shown on 1:4000 & Land Acquisition Cost Report
		Buildings - Res	Number of buildings or grounds required (Acquisition) 0, Score = 5 1-5, Score = 4 6-10, Score = 3 11-15, Score = 2 16+, Score = 1	JE	Quant	No.	7	3	17	1	17	1	14	2	17	1	as shown on 1:4000 & Land Acquisition Cost Report
		Buildings - Non Res	Number of buildings or grounds required (Acquisition) 0, Score = 5 1-5, Score = 4 6-10, Score = 3	JE	Quant	No.	2	4	0	5	0	5	1	4	0	5	as shown on 1:4000 & Land Acquisition Cost Report
		Car Parks	Number of car parking areas acquired 0, Score = 5 1, Score = 3 2 to 4 , Score = 2 >5, Score = 1	JE	Quant	No.	3	2	2	2	3	2	3	2	3	2	See data collection sheet.
	Park (amenity)		Area of open park land acquired 0, Score = 5 1 to 2, Score = 3 3 to 5 , Score = 2 >6, Score = 1	JE	Quant	units	5	2	4	2	5	2	4	2	4	2	See data collection sheet.
		Golf Clubs	Number of golf clubs impacted 0, Score = 5 1 to 2, Score = 3 3 to 5 , Score = 2 >6, Score = 1	JE	Quant	No.	3	2	3	2	3	2	3	2	3	2	See data collection sheet.
	Construction impact		Populatation catchment affected based on 2006 census population data >55k = Score 2 55k - 50k = Score 2 to 3 50k - 0k = Score 4 Proportion i.e. 52.5k = score 1.5	RPA	Quant	persons	56,168	2	50,775	2.85	56,165	2	52,685	2.46	52,686	2.46	Metro West Catchment Analysis, April 2007
	Public Consultation	Support	Public support for the provision of this route option Yes/No Yes = Score 4 No = Score 2	RPA	Quant	Y/N	Y	4	Y	4	Y	4	Y	4	Y	4	Metro West Public Consultation Report, April 2007
		Objections	Objections to this route option Yes/No Yes = Score 2 No = Score 4	RPA	Quant	Y/N	Y	2	N	4	Y	2	N	4	N	4	Metro West Public Consultation Report, April 2007
		FCC and Other Key	Do Fingal County Council and Other Key stakeholders pefer this route Yes/No Yes = Score 4 No = Score 2	RPA	Quant	Y/N	Y	4	N	2	N	2	Y	4	N	2	FCC Submission
		SDCC and Other Key	Do South Dublin County Council and Other Key stakeholders pefer this route Yes/No Yes = Score 4 No = Score 2	RPA	Quant	Y/N	Y	4	N	2	Y	4	N	2	N	2	SDCC Submission
							Sub Total Score 44.0 2.93		Sub Total Score 42.15 2.81		Sub Total Score 40.87 2.72		Sub Total Score 44.39 2.96		Sub Total Score 42.18 2.81	

Appraisal Summary

	OPTION 1B	OPTION 2	OPTION 3	OPTION 4	OPTION 5
Economy	3.92	3.88	3.86	3.78	3.93
Costs/Funding	3.07	2.49	3.06	2.52	2.51
Safety	4.14	4.40	4.13	4.18	4.21
Environment	2.53	2.50	2.48	2.67	2.64
Accessibility & Social Inclusion	4.54	4.13	4.70	4.46	4.62
Integration	4.00	3.58	4.00	3.68	3.63
Constructability/Engineering	3.12	3.37	3.02	3.28	3.37
Public & Stakeholder Support	2.93	2.81	2.72	2.96	2.81
TOTAL SCORE	3.53	3.39	3.50	3.44	3.46

Legend
RelativeAssessment
Best
Second Best
Middle
Second Worst
Worst

Appendix C - Emerging Preferred Route (EPR)

METRO WEST – *connecting West Dublin!*

Metro West will bring a new travel experience to communities in West Dublin. With park and ride and good quality bus, Luas and rail interchanges, accessing Metro West couldn't be easier. Once aboard, your journey time to the city or the airport will be reduced - helping you to arrive at your destination relaxed and on time.

More than 20 million passengers are expected to use Metro West each year. With Metro West, you can:

- **Travel between Tallaght and Dublin Airport in less than one hour**
- **Travel between Tallaght, Clondalkin, Liffey Valley and Blanchardstown using fast reliable and frequent public transport**
- **Travel onwards to Swords or to the city centre via Metro North**
- **Hop on a Metro train every 4 minutes at peak times**
- **Interchange easily with Kildare and Maynooth rail services, Luas, Metro North and Quality Bus Corridors (QBCs)**

Metro West will have a big impact when it comes to reducing congestion in Dublin West - over 7 million car journeys are expected to be removed from the busy streets.

METRO WEST – *fast, frequent and reliable!*

Metro West is part of Dublin's integrated public transport network, which began with the opening of the Luas Red and Green lines, and will increase substantially under Transport 21.

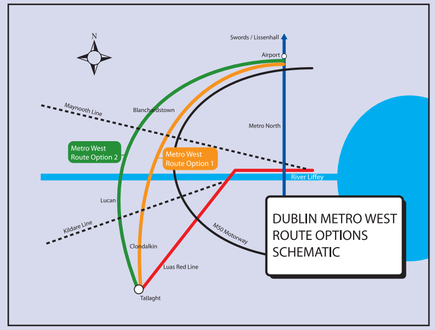
Metro West will generally be separated from road traffic. This will be achieved by running Metro West adjacent to roads or on road medians (rather like Luas on the Naas dual carriageway) and by placing the line on bridges at the busiest roads, railway lines, rivers and canals. This will allow long trains at very frequent intervals and at high speeds to operate on the Metro West line.

Metro West will offer higher capacity than Luas and generally faster journey times, while building on the success of Luas by offering a highly accessible, comfortable and efficient service.

The selected route for Metro West is approximately 24km from Tallaght to the Metropark stop on Metro North and when the system comes into operation it is expected that passengers will be able to travel from Tallaght to Dublin Airport in less than one hour.

ROUTE SELECTION PROCESS

In November 2006 RPA began consultation on route options for Metro West between Tallaght and Dublin Airport outlined below. During the consultation, RPA invited the public and stakeholders to make submissions on the proposed routes including observations, recommendations and proposed alternatives where relevant. In all, RPA received in excess of 800 submissions on the project.



During the consultation RPA also identified the criteria against which a route would be selected. These criteria can be summarised as the following:

- **Delivering a safe and operationally efficient system while minimising risk during construction**
- **Compliance with transport and land-use strategy;**
- **Minimising environmental impacts including congestion and associated pollution problems;**
- **Generating social and economic benefits**
- **Delivering good quality transport integration**
- **Optimising capital and operating costs**
- **Consideration of public and stakeholder submissions.**

KEY ISSUES

The preferred route emerged as best against almost all of the criteria outlined above and the appraisal is summarised in the following table using a color scheme to indicate the relative performance of the options. In the table green represents the best option, red is the worst option and yellow is where the options were neutral.

	Safety & Efficiency	Transport & Land Use	Environmental Impact	Social & Economic Benefits	Transport Integration	Costs	Public Support
Route Option 1	Neutral	Best	Neutral	Best	Best	Best	Best
Route Option 2	Neutral	Worst	Neutral	Worst	Worst	Worst	Worst

Based on the appraisal indicated above Route Option 1 was selected as the Emerging Preferred Route Corridor for Metro West. The Emerging Preferred Route:

- **Has the shortest route and the lowest estimated cost;**
- **Has the quickest journey time and the lowest operating costs;**
- **Is more in keeping with all local & national transport and land use policies and better supports the development plans of Fingal and South Dublin County Councils;**
- **Serves a greater number of key facilities and institutions than the alternative such as hospitals, education centres, sports venues, leisure amenities, shopping districts and employment centres;**
- **Serves existing and established towns and communities on the west side of Dublin thus integrating better with other transport services than the alternative, which in many places would serve areas yet to be developed;**
- **Has a similar environmental impact to the alternative;**
- **Has a similar safety impact to the alternative;**
- **Attracted most support during public consultation.**

The Emerging Preferred Route Corridor is indicated on the map overleaf along with a route description.

NEXT STEPS

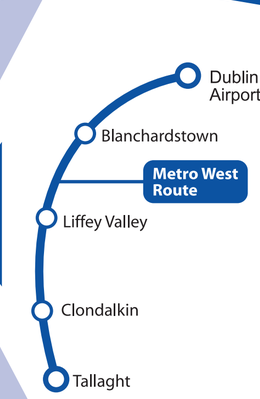
Now that the best overall route has been selected, the emphasis will focus on further consultation relating to the design and possible construction methods of the alignment, track layout and stops along the chosen route.

The design will be developed in phases with an outline design being developed and consulted upon initially. This outline design will demonstrate the system concept, indicate where the track, stops and depot might be located and define the property that may be affected. During this stage there will be locations where slight route variations may be possible and RPA expects to hold further consultation at these locations. This consultation will include public open days where RPA staff will be available to discuss the options, the outline design and system concept.

Following this round of consultation, RPA expects to fix the alignment and proceed to reference design in preparation for a Railway Order application shortly thereafter. An Environmental Impact Statement (EIS) will be prepared for the chosen route.

METRO WEST

emerging preferred route *SEPT 2007*



NDP National Development Plan 2007 - 2013 · European Regional Development Fund · Transport 21 · RPA Railway Procurement Agency

Metro West - Planning & Approval Process

Approval to proceed with the construction of Metro West ultimately depends on the making of a Railway Order by An Bord Pleanála .The main steps in the overall process may be outlined as follows:

- PRELIMINARY STUDIES
- IDENTIFY BEST OVERALL ROUTE OPTION
  - ◀ PUBLIC CONSULTATION FOCUSED ON ROUTE SELECTION
- ENGINEERING & ARCHITECTURAL DESIGN
  - ◀ PUBLIC CONSULTATION FOCUSED ON DESIGN
- PUBLIC INSPECTION OF APPLICATION DOCUMENTS*
- SUBMISSION OF RAILWAY ORDER APPLICATION
- ORAL HEARING
- MAKING OF RAILWAY ORDER
- CONSTRUCTION

Current step

*At this stage the detailed plans, the Environmental Impact Statement (EIS) and other documents which are to accompany the railway order application will be made available for public inspection and/or purchase. Opportunities will be available for anybody who wants to make a submission in relation to the proposed line. Relevant details in relation to inspection locations, deadlines for submissions and so on will be published.

How to obtain further information:

Freephone: 1800 67 64 64

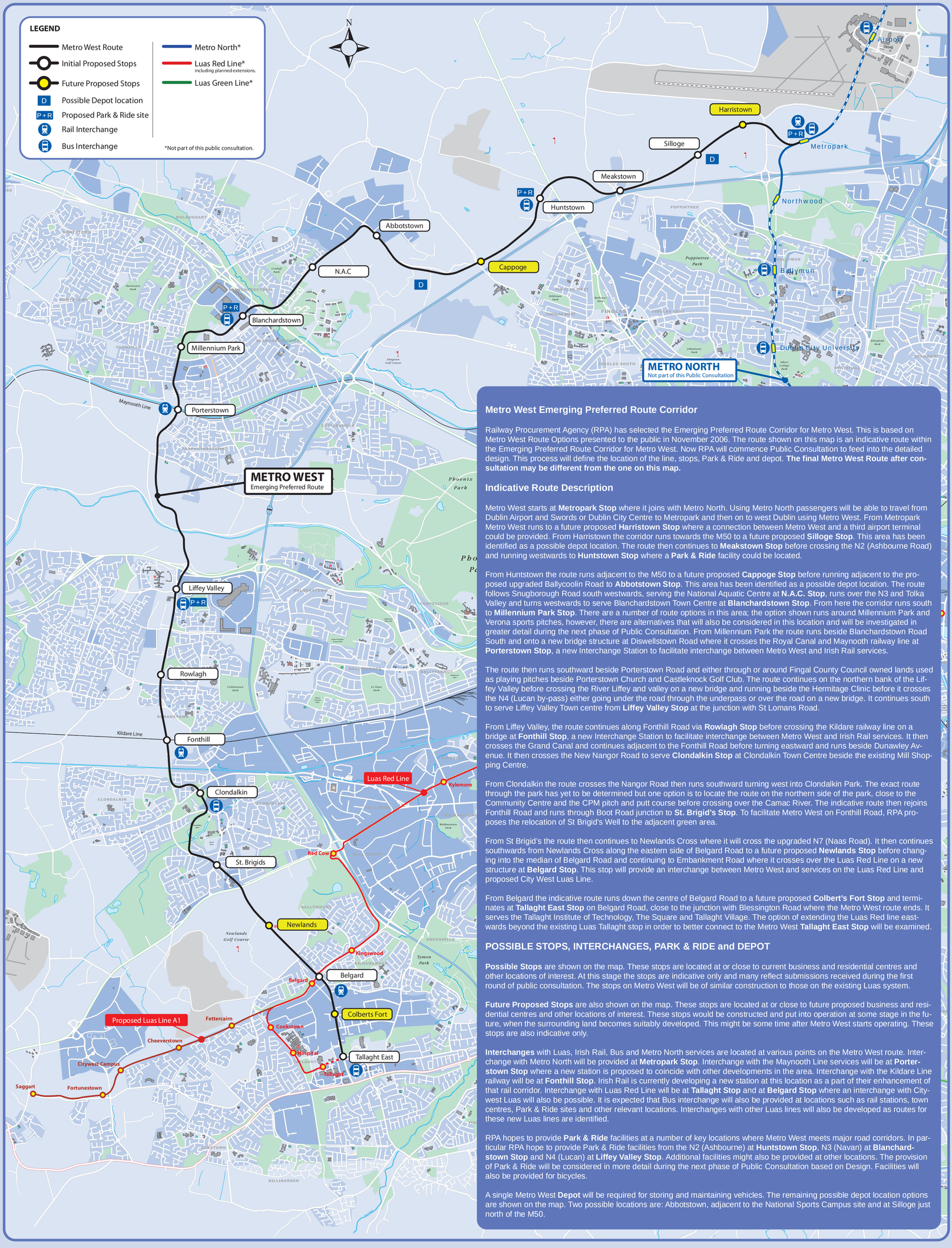
E-mail: info@rpa.ie

Web: www.rpa.ie

Write:
PR Dept.,
RPA,
Parkgate Business Centre,
Parkgate Street,
Dublin 8.

DUBLIN METRO WEST
EMERGING PREFERRED ROUTE

September 2007



Metro West Emerging Preferred Route Corridor

Railway Procurement Agency (RPA) has selected the Emerging Preferred Route Corridor for Metro West. This is based on Metro West Route Options presented to the public in November 2006. The route shown on this map is an indicative route within the Emerging Preferred Route Corridor for Metro West. Now RPA will commence Public Consultation to feed into the detailed design. This process will define the location of the line, stops, Park & Ride and depot. **The final Metro West Route after consultation may be different from the one on this map.**

Indicative Route Description

Metro West starts at **Metropark Stop** where it joins with Metro North. Using Metro North passengers will be able to travel from Dublin Airport and Swords or Dublin City Centre to Metropark and then on to west Dublin using Metro West. From Metropark Metro West runs to a future proposed **Harristown Stop** where a connection between Metro West and a third airport terminal could be provided. From Harristown the corridor runs towards the M50 to a future proposed **Silloge Stop**. This area has been identified as a possible depot location. The route then continues to **Meakstown Stop** before crossing the N2 (Ashbourne Road) and running westwards to **Huntstown Stop** where a **Park & Ride** facility could be located.

From Huntstown the route runs adjacent to the M50 to a future proposed **Cappoge Stop** before running adjacent to the proposed upgraded Ballycoolin Road to **Abbotstown Stop**. This area has been identified as a possible depot location. The route follows Snugborough Road south westwards, serving the National Aquatic Centre at **N.A.C. Stop**, runs over the N3 and Tolka Valley and turns westwards to serve Blanchardstown Town Centre at **Blanchardstown Stop**. From here the corridor runs south to **Millennium Park Stop**. There are a number of route options in this area; the option shown runs around Millennium Park and Verona sports pitches, however, there are alternatives that will also be considered in this location and will be investigated in greater detail during the next phase of Public Consultation. From Millennium Park the route runs beside Blanchardstown Road South and onto a new bridge structure at Diswellstown Road where it crosses the Royal Canal and Maynooth railway line at **Porterstown Stop**, a new Interchange Station to facilitate interchange between Metro West and Irish Rail services.

The route then runs southward beside Porterstown Road and either through or around Fingal County Council owned lands used as playing pitches beside Porterstown Church and Castleknock Golf Club. The route continues on the northern bank of the Liffey Valley before crossing the River Liffey and valley on a new bridge and running beside the Hermitage Clinic before it crosses the N4 (Lucan by-pass) either going under the road through the underpass or over the road on a new bridge. It continues south to serve Liffey Valley Town centre from **Liffey Valley Stop** at the junction with St Lomans Road.

From Liffey Valley, the route continues along Fonthill Road via **Rowlagh Stop** before crossing the Kildare railway line on a bridge at **Fonthill Stop**, a new Interchange Station to facilitate interchange between Metro West and Irish Rail services. It then crosses the Grand Canal and continues adjacent to the Fonthill Road before turning eastward and runs beside Dunawley Avenue. It then crosses the New Nangor Road to serve **Clondalkin Stop** at Clondalkin Town Centre beside the existing Mill Shopping Centre.

From Clondalkin the route crosses the Nangor Road then runs southward turning west into Clondalkin Park. The exact route through the park has yet to be determined but one option is to locate the route on the northern side of the park, close to the Community Centre and the CPM pitch and putt course before crossing over the Camac River. The indicative route then rejoins Fonthill Road and runs through Boot Road junction to **St. Brigid's Stop**. To facilitate Metro West on Fonthill Road, RPA proposes the relocation of St Brigid's Well to the adjacent green area.

From St Brigid's the route then continues to Newlands Cross where it will cross the upgraded N7 (Naas Road). It then continues southwards from Newlands Cross along the eastern side of Belgard Road to a future proposed **Newlands Stop** before changing into the median of Belgard Road and continuing to Embankment Road where it crosses over the Luas Red Line on a new structure at **Belgard Stop**. This stop will provide an interchange between Metro West and services on the Luas Red Line and proposed City West Luas Line.

From Belgard the indicative route runs down the centre of Belgard Road to a future proposed **Colbert's Fort Stop** and terminates at **Tallaght East Stop** on Belgard Road, close to the junction with Blessington Road where the Metro West route ends. It serves the Tallaght Institute of Technology, The Square and Tallaght Village. The option of extending the Luas Red line eastwards beyond the existing Luas Tallaght stop in order to better connect to the Metro West **Tallaght East Stop** will be examined.

POSSIBLE STOPS, INTERCHANGES, PARK & RIDE and DEPOT

Possible Stops are shown on the map. These stops are located at or close to current business and residential centres and other locations of interest. At this stage the stops are indicative only and many reflect submissions received during the first round of public consultation. The stops on Metro West will be of similar construction to those on the existing Luas system.

Future Proposed Stops are also shown on the map. These stops are located at or close to future proposed business and residential centres and other locations of interest. These stops would be constructed and put into operation at some stage in the future, when the surrounding land becomes suitably developed. This might be some time after Metro West starts operating. These stops are also indicative only.

Interchanges with Luas, Irish Rail, Bus and Metro North services are located at various points on the Metro West route. Interchange with Metro North will be provided at **Metropark Stop**. Interchange with the Maynooth Line services will be at **Porterstown Stop** where a new station is proposed to coincide with other developments in the area. Interchange with the Kildare Line railway will be at **Fonthill Stop**. Irish Rail is currently developing a new station at this location as a part of their enhancement of that rail corridor. Interchange with Luas Red Line will be at **Tallaght Stop** and at **Belgard Stop** where an interchange with Citywest Luas will also be possible. It is expected that Bus interchange will also be provided at locations such as rail stations, town centres, Park & Ride sites and other relevant locations. Interchanges with other Luas lines will also be developed as routes for these new Luas lines are identified.

RPA hopes to provide **Park & Ride** facilities at a number of key locations where Metro West meets major road corridors. In particular RPA hope to provide Park & Ride facilities from the N2 (Ashbourne) at **Huntstown Stop**, N3 (Navan) at **Blanchardstown Stop** and N4 (Lucan) at **Liffey Valley Stop**. Additional facilities might also be provided at other locations. The provision of Park & Ride will be considered in more detail during the next phase of Public Consultation based on Design. Facilities will also be provided for bicycles.

A single Metro West **Depot** will be required for storing and maintaining vehicles. The remaining possible depot location options are shown on the map. Two possible locations are: Abbotstown, adjacent to the National Sports Campus site and at Silloge just north of the M50.

NEXT STEPS

RPA is now engaged in Public Consultation to feed into the detailed design; this involves extensive consultation with key stakeholders and Public Consultation. This process will define the exact location of the Metro West route, stops, P&R facilities and depot.

For further information:
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E-mail: info@rpa.ie
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Railway Procurement Agency,
Parkgate Business Centre,
Parkgate Street,
Dublin 8

NDP National Development Plan 2007 - 2013
EUROPEAN REGIONAL DEVELOPMENT FUND
Transport21
RPA Railway Procurement Agency