transport21
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RPA
Railway Procurement Agency

Metro West

OUTLINE BUSINESS CASE

December 2008

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ANNEX 1: PPP ASSESSMENT REPORT (JULY 2008)

Important Notice

This Metro West Outline Business Case (OBC) and Public Private Partnership Assessment (PPPA) report has been prepared by RPA for the confidential consideration and use of Government.

Because of the sensitive nature of the information contained in the OBC, the OBC should not be disclosed outside RPA or Government departments. RPA considers the OBC to be an exempt record and therefore not able to be released under the Freedom of Information Act 1997. Premature release of the OBC would, in the opinion of RPA, be contrary to the public interest. It contains:

- Commercially sensitive information
- Information that was provided in confidence
- Advice for consideration by government
- Information relating to the deliberative processes of a public body, and
- Information relating to the financial and economic interests of the State.

RPA must be notified upon a request being made for access to the OBC under the Freedom of Information Act 1997, or any other legislation.

Executive Summary

Introduction

Metro West Outline Business Case has been prepared in accordance with the 'Guidelines on the Appraisal and Management of Capital Expenditure Proposals in the Public Sector', Department of Finance, February 2005.

Metro West is a key element of the government's proposed integrated public transport system T21. Its orbital nature will provide integration with many of the existing and proposed radial transport corridors around the city. Metro West along with Metro North project represents the first phases of what is expected to become an extensive Metro network for Dublin.

Metro West was first identified as part of the orbital metro proposed in Dublin Transportation Office's (DTO) transport and planning strategy, 'A Platform for Change (2001)'. The subsequent announcement of Transport 21 in November 2005 identified Metro West as a potential Public Private Partnership (PPP) project to be delivered between Tallaght and a connection with Metro North south of Dublin Airport area.

RPA have developed a PPP procurement assessment (PPPA) report which is a high level statutory document required under the Department of Finance Guidelines for Provision of Infrastructure and Capital Investments through Public Private Partnerships. The PPPA report explores the potential to provide value for money by PPP and to address questions such as: suitability, affordability, initial contract structure and risk transfer, initial output terms and key aspects of the overall procurement process. The PPP Assessment report is appended to the Outline Business Case, and the two reports should be considered in unison.

This report concludes that there is a strong case for Metro West, and RPA should proceed to develop the project further in line with the Government's decision for it to be delivered as Public Private Partnership.

The key findings contained in the OBC are summarised under the relevant sections as outlined below. The issues surrounding the Metro West project are complex and this summary should be read in conjunction with the full report.

Work Carried Out on Metro West to date

The preparation of the OBC and PPPA report succeeds preliminary assessment studies undertaken for RPA in 2001 and 2007 that have concluded that the Metro West project is technically, environmentally, financially and economically viable.

The Vision

To provide a high quality orbital Light Rail service by 2015, delivered as an affordable / bankable PPP, connecting Tallaght, Clondalkin, Liffey Valley and Blanchardstown and linking the radial network to provide connection to the Airport and the City Centre.

Route Selection

RPA has concluded an extensive exercise of consideration of route options where alternatives were appraised over a broad set of criteria including, economy, environmental impact, integration, social inclusion, safety and public and stakeholder support. RPA selected the preferred route corridor for Metro West in 2007. Extensive consultations, through various stages of the scheme evolution, have demonstrated strong public and stakeholder support for the scheme.

Capturing Land Value

South Dublin County Council (SDCC) and Fingal County Council (FCC) are fully supportive of Metro West and seek to promote the scheme in partnership with RPA. To this end both local authorities intend to implement a Special Development Contribution Scheme under Section 49 of the Planning and Development Act 2000, to contribute towards the funding of the Metro West project.

In addition, RPA is negotiating with landowners and developers to contribute to the cost and delivery of Metro West in the form of capital contributions, delivery of infrastructure or the provision of lands. Sections of the route of Metro West traverses large land holdings in single ownership, many of which are owned by developers.

This has been proven, in particular with Luas lines A1 and B1, to be an innovative and successful approach to project financing and in particular reducing the capital requirement for the project.

Option Appraisal

RPA have considered the partial delivery of Metro West and has concluded that a phased implementation is not preferred and, in particular, that the phasing as proposed in Transport 21 is not feasible.

Partial or phased delivery may be a requirement under the following circumstances:

- Where full project funding is not available and the scope of the project is reduced to funding availability;
- Where Metro North is not delivered in advance of Metro West.

Emerging from the above, there are two possible partial delivery strategies which have emerged as feasible for implementation. These are:

1. Porterstown to Metro North
2. Tallaght to Blanchardstown

Studies have concluded that the opportunity exists to now proceed with a single Railway Order for the complete project without having an impact on the delivery. This also ensures that the delivery of the complete scheme is secured, at least through the planning process. It is therefore a strong conclusion of the analysis that, independent of the delivery decision, the project proceeds in its entirety to Railway Order.

Any decision to proceed on the basis of one of the options for phased or partial delivery should be taken in advance of the commencement of the procurement process to insure that any subsequent change of position does not require the termination of the initiated tender process and the advertisement of a new tender process.

The Transport Need

There is an ever increasing demand for the Metro West project. Dublin has experienced large scale unsustainable urban sprawl in last decades which has lead to increased traffic congestion, reduced economic productivity and reduced quality of life. West Dublin in particular has suffered from this urban sprawl with large new communities emerging outside the M50.

Large new towns have emerged in the Tallaght, Blanchardstown and Swords areas in particular, which are of regional and national economic importance and of a scale similar to many of the regional cities in Ireland. These new areas are generally unconnected and isolated from each other whilst there is a substantial demand for travel between them. This demand is presently only served by limited infrastructure with strong reliance on the M50 which, as a result, suffers from severe traffic congestion.

There is an existing transport deficit between these town centres that must be redressed to reduce the pressure on the existing infrastructure and to allow the future consolidation of new development in a sustainable manner. The provision of high quality public transport in the form of Metro West has been identified by the Government as performing a key role in fulfilling this transport need.

Project Definition

The route and system concept for Metro West have been developed based on a defined set of project objectives some of which have been derived from stated government policy and others which are driven by engineering, integration and operational requirements.

The chosen route for Metro West is approximately 25.5km long and serves Tallaght, Clondalkin, Liffey Valley and Blanchardstown and connects to Metro North in the Dardistown area. The line runs through FCC and SDCC administrative areas.
There are a total of 22 stops being considered along the route including the Dardistown stop which is shared with Metro North. Of the 22 stops, 18 are likely to be provided initially with passive provision being made for the remaining 4, to be delivered at some future stage subject to surrounding development taking place.

A depot is currently proposed to be located at Silloge, south of Dublin Airport and north of the M50. Additional stabling for trams at Red Cow, near the southern end of the route is also being considered.

Metro West system is being designed for initial capacity of 5,000 passengers per direction per hour (ppdph), using 47m vehicles at 4 minute headways. The system will be capable to be incrementally upgraded to at least twice that capacity as and if demand increases.

The infrastructure is being designed to allow operation of up to 94m long vehicles so that the initial capacity can be easily increased to 10,000 ppdph as demand increases, whilst maintaining the peak headway of 4 minutes.

Ultimately the capacity of Metro West may be increased to 20,000 ppdph by reducing the headway to 2 minutes. It is envisioned that an increase in capacity to longer vehicles at 2 minute headways will require additional infrastructure, generally related to the power supply requirements, additional trams and possibly depot enhancements. However this capacity requirement is unlikely to emerge in the medium term. Capacity of greater than 10,000ppdph is unlikely that would be required during the life of the PPP concession, thus any required additional investment would not be necessary until post the concession period.

The Metro West concept allows interoperability with Metro North, allowing passengers to travel from Tallaght to destinations on Metro North without the need for interchange. In addition the concept will allow Metro West vehicles to operate on the Luas Red Line via a connection at Tallaght. This will facilitate Metro West access to the possible stabling area at Red Cow. The longer Metro West vehicles will not however be able to operate passenger services on the Luas network due to platform restrictions.

Transport and Planning

The provision of Metro West should be considered of strategic national importance as it will connect towns on the western edge of Dublin City equivalent, or greater, in

size to many of the regional cities in Ireland. These, already large towns are forecast to grow over the coming years, and through planning frameworks it is intended to consolidate development in the areas around planned sustainable town centres.

The realisation of these planning objectives will be contingent on the provision of new transport and other infrastructure. Given the nature and extent of the existing development and the projected new development around the Metro West route, it is clear that there is a large existing and expected future transport demand that must be accommodated.

Metro West in addition to, and in combination with, other transport projects identified in Transport 21 seeks to satisfy this existing transport deficit and make provision for future transport needs.

Population & employment figures for all areas surrounding the proposed Metro West have been supplied to RPA by FCC and SDCC. The projections show major growth of both employment and household demand in the catchment area up to 2016.

The immediate catchment area will contain a total population of over 137,000 by 2016 compared to 74,000 in 2006. This is based on a reasonable walking distance of 1km.

This indicates a growth in excess of 70,000 by 2016. The total employment is projected to be over 68,000 in 2016 compared to nearly 34,000 in 2002. From 2002 there is a forecast doubling in employment in the catchment by 2016.

Within SDCC and FCC there are a number of Local Area Plans (LAP) and Strategic Development Zones (SDZ) being progressed adjacent to the Metro West route. Each of these planning frameworks propose significant new development or redevelopment in areas that will be served by Metro West which, when realised, will deliver substantial catchments of population and employment to Metro West beyond the 2016 forecasts outlined. Greatly improved access to transport is essential to the delivery of much of this proposed development.

Metro West through interchange with existing and proposed new radial transport systems will have an important integration role and interchange with Luas, rail, bus, Metro North and Park and Ride (P&R) facilities. This will result in the widening of the catchment of Metro West beyond its immediate corridor. The provision of the Metro West will for the first time in Dublin offer public transport users the opportunity to travel between locations on the western edge of the city without the need to first enter the city centre.

Passenger forecasts of Metro West suggest that the project will attract in the order of 30 - 36 million new passengers to the Metro Network in 2016. This is additional to the 45.6 million passengers forecast for Metro North. This will contribute significantly to the reduction of traffic congestion along the corridor.

Cost-Benefit Analysis

The Cost Benefit Analysis of the Metro West has demonstrated a strong economic case, with an estimated Benefit to Cost Ratio (BCR) of 2.21:1 in the base case.

Sensitivity testing of service pattern, alternative transport network assumptions and phasing options produced BCRs of 1.60:1 suggesting a robust scheme.

The BCR is strongest when the project is implemented in full and an integrated service pattern between Metro West and Metro North is achieved.

Additional economic benefits are likely to be generated by Metro West and a qualitative assessment suggests that some of these benefits could be substantial. These include reduction in commuting time, reduction in road accidents, increased quality of life, easier accessibility, reduced carbon emissions and other environmental impacts, etc.

Metro West will generate a large amount of employment during the lifecycle of the project. It is expected that up to 1,000 jobs will be directly created at the peak of the construction programme. Many more jobs will be created as an indirect consequence of the project to support the construction process.

It is also expected that, once operational, the project will create in the order of 300 direct jobs related to the operation of the service and maintenance of the infrastructure. Many more indirect jobs will be created to support and complement the ongoing service operations.

It is expected that Metro West would recapture some of its investment through job and economic generation based on evidence from other schemes, for example the London Docklands Light Railway. (Note UITP report 'Financing Light Rail'of July 2008, suggested 50% of the capital cost of DLR was recaptured through overall office development and job creation).

Capital Costing

The capital cost estimates reflect the Metro West Route and the current stage of project definition and development.

The estimates were prepared using cost information from international consultants and historical and current cost data for Luas projects reflecting the anticipated demand, capacity and works required for Metro West.

The total direct capital cost of Metro West is estimated to be **[text deleted],** including risk/contingency allowance of **[text deleted],** million, in 2008 prices.

The estimated total Exchequer capital contribution is **[text deleted],** in 2008 prices. These costs relate to selective advance works, RPA project management, and planning services that are required in advance of the PPP contract or are related to risks best managed by RPA.

Property and Development Contributions

The main objective of the property and development contributions is to minimise the amount of Exchequer funding required for the procurement of the project. It is hoped that when these negotiations are complete the outcome relating to direct contributions, will be divided into two categories namely:

1. The transfer of land interests under their ownership which is required for the project to RPA at a reduced rate. The transfer of other land interests, at no cost to the RPA, such as rights of way, temporary access for construction, and the right to run the line over certain structures which will be provided by developers.

2. Provision of some parts of the infrastructure by developers.

Negotiations are being held with various developers with a view to developing legal agreements under which they would make further contributions, over the statutory levy contribution, to the Metro West project. Negotiations to achieve contributions will be undertaken with all property owners along the route and have already commenced.

In addition there are a number of state or semi-state bodies which hold significant lands which have been identified as required for Metro West. RPA expects that agreements will be made with such bodies to secure these lands at reasonable cost to the project.

In many instances contributions, either in terms of land, infrastructure or direct capital will be offset against potential levy contribution. This however is a desirable mechanism as it offers certainty of funding up-front, reduces the initial burden on the Exchequer and insulates the project from potential land value escalation.

As no agreements are currently in place, the OBC assumes the full cost of lands will be incurred and no adjustment to the Exchequer funding requirement or levy contribution forecast is assumed.

An opportunity now exists to capture significant contributions to the project that may not exist at some future stage, due to changing market appetite and loss of potential levies linked to large proposed short term developments.

In light of the current and forecasted economic climate it is reasonable to assume that a number of developments will be delayed. As a result, a number of planning

applications of large developments within the levy scheme catchment area have not been successful. On the other hand, recent APB decisions cited several developments as being 'premature' without Metro West and has increased the opportunity for RPA to negotiate favourable agreements with property developers. However, capturing contributions to the project from the private sector is also very much dependant on the demonstration of a real project delivery programme.

Risk Assessment

RPA has prepared a preliminary risk register and has considered the major risks that the project faces. An outline risk allocation has been undertaken which suggests the risk transfer envisaged for the project, in accordance with best practice and other similar projects in the PPP sector.

The PPPA considered the appropriate apportionment and allocation of risk between the public and private sector. The PPPA suggests the following key cost and risk elements are best managed and delivered by the public sector (RPA):

- Planning and Railway Order;
- Land Acquisition;
- Advance Works; and
- RPA Project Management of the PPP and advance works.

The PPPA also suggests that other project risks are either shared or transferred to the private sector under the contract.

The risk assessment during the procurement stage of the project will reflect the negotiated procedure, which allows scope for negotiating the allocation and quantification of risk throughout the bidding process. It is envisaged that risks management will follow a well defined and prescribed process, part of the enterprise risk management approach adopted by RPA.

A risk allocation matrix table for the PPP contractual scope is proposed. Further details regarding the contractual scope, the PPP Arrangement and Contractual

Structure are detailed out in the PPP Assessment Report, which is annexed to this report.

Project Finance and Cashflows

The analysis contained within this OBC represents RPA's preliminary financial forecast of the project through PPP procurement.

It is envisaged that the contract structure for the Metro West PPP will separate the Infrastructure Contract and the Operating Contract. The PPP Concessionaire will enter into the Infrastructure Contract for the Design, Build, Finance and Maintenance (DBFM) of Metro West.

Following the input of all known costs, the cash flow model has been optimised to create a profile of Availability Payments that will provide a blended equity return to the PPP Concessionaire of [text deleted]. Based on preliminary projections, the Availability Payment is [text deleted]. per annum in 2008 prices, over a 30 year period.

Procurement Strategy

The PPPA undertaken by RPA has suggested that the project would be appropriately procured as a PPP and is likely to present value for money to the Exchequer. The assessment suggests that the majority of the project scope should be delivered by the private sector but that some elements are best delivered by the Exchequer through the RPA.

In addition the PPPA suggest the most appropriate form of PPP would be DBFM contract, with separate Operating contract for operating the service. This is similar to the structure being pursued for Metro North.

RPA will complete the EIS, property referencing, and public consultation and apply for Railway Order (RO). On receipt of the RO, RPA will award contracts under a traditional procurement method for advance works such as utility diversions.

The procurement process in the Metro West PPP transaction will be conducted under the negotiated procedure. RPA will also commence these negotiations on receipt of

the RO. It is anticipated that at the outcome of the Metro West PPP procurement process, one DBFM contract will be awarded to a successful bidder.

RPA has retained an option to award the Metro West Operating Contract to the Metro North Operator. It is anticipated that in case the Metro North operator does not become the Metro West operator, there will be a separate operator for Metro West.

Any decision to deliver part only of Metro West (rather than full project implementation) could have significant impacts on the procurement process for the project, should that decision be made subsequent to the initiation of the process. This is because having commenced the procurement process, a subsequent change of position would most likely require the termination of the initiated tender process and the advertisement of a new tender process. Thus it is desirable that any decision to proceed on the basis of one of the options for phased or partial delivery should be taken in advance of the commencement of the procurement process.

Programme and Way Forward

There are a number of key critical activities that drive the Metro West schedule. These are primarily the Railway Order (RO) process and the Procurement processes which are currently envisaged to run in parallel. The project cannot advance in the absence of each of these key processes being completed.

There are also key dependencies between the RO and procurement processes which mean that the procurement process cannot run in isolation of RO. For example, the commencement of contract negotiations cannot commence in advance of successful conclusion of the RO process. However, the RO could proceed in the absence of procurement proceeding or commencing.

The earliest possible delivery of Metro West is late 2015 and is also contingent on a number of key external factors, particularly the successful conclusion of the Metro North Railway Order process. Other factors that affect the Metro West project are the signing of agreements with developers along the route, acceptance of the detailed design by the relevant local authorities, confirmation of Exchequer funding, timely

approval from the Department of Transport to proceed with the planning and procurement stages of the project etc.

Following approval of the OBC and the PPPA, RPA will finalise the contracting structure for the project and initiate a procurement process by publishing a call for competition in the Official Journal of the European Union (OJEU Notice). This is scheduled to be published in early 2009.

This will be followed by pre-qualification and selection of successful candidates shortlisted to proceed further with the tender process. It is anticipated that an invitation to negotiate will commence in parallel to the Railway Order application which is scheduled for autumn 2009.

Following Railway Order approval, scheduled for mid 2010, RPA will award contracts for some enabling works (e.g. utility diversions) and commence a Best and Final Offer (BAFO) period for the PPP contract. The conclusion of the BAFO process will result in the selection of one preferred bidder and one reserve bidder. Final negotiations with the preferred bidder will take place before financial close and award of contract, scheduled for Autumn 2011.

The PPP will then commence detailed design, construction testing and commissioning of the scheme with passenger operations expected to commence in late 2015.

The delivery of Metro West to the programme outlined is contingent on key milestones being achieved to target. In particular, the achievement of passenger services is reliant on the Railway Order and PPP procurement processes running in parallel. Any delay to the procurement milestones will have equivalent knock on delays to the successful completion of works and subsequent commencement of passenger services.

Conclusion

Studies undertaken by RPA in 2001 and 2007 have suggested a strong case for the Metro West project. The assessment undertaken by RPA in this OBC and PPPA

reinforces these previous conclusions and demonstrates a robust transport, economic and financial case for the project.

Metro West will serve large towns and centres of development on the western edge of Dublin which are currently experiencing considerable traffic congestion problems with little public transport options. Trips between these key economic and residential zones is generally satisfied by use of the M50 which, even with the current upgrade work, is expected to remain severely congested.

These areas of Dublin particularly Tallaght, Clondalkin and Banchardstown have the potential to enhance the economic development of the region but this potential is currently restricted by poor accessibility to the rest of the city area and Dublin Airport. Metro West will release much of this potential and allow these key economic areas to develop in a sustainable manner.

Metro West will be a key generator of employment in the corridor and region, offering direct employment to those involved in its construction and subsequent operation but, more importantly, indirectly leading to development and regeneration along the corridor as a result of greater opportunity and connectivity.

RPA have developed cost estimates and a cost benefit analysis. it is apparent that Metro West has strong economic value, as economic benefits outweigh the estimated cost of the project.

The PPPA undertaken by RPA suggests that the project would be appropriately procured as a PPP and is likely to present value for money to the Exchequer. The assessment suggests that the majority of the project scope should be delivered by the private sector but that some elements are best delivered by the Exchequer through the RPA.

To minimise the Exchequer funding requirement to the project, and to capture some of the likely benefits to the private sector, RPA is seeking to maximise all opportunities to obtain contributions from the private sector. A supplementary development contribution scheme under Section 49 of the Planning & Development

Act 2000 is being implemented by SDCC and FCC to support Metro West. RPA is also negotiating with land owners along the route for financial contributions and land to the project where development benefits can be captured. This will reduce the initial financial burden on the Exchequer.

A certain momentum has been established with the relevant stakeholders and market consultations indicated strong interest in the financing and delivery of the Metro West project. Similarly the public is supportive of the project and has continually expressed that support at all stages of the project development.

In order to deliver the project to programme it will be critical that decisions are made in a timely fashion to allow subsequent phases of delivery to advance, this is particularly the case with respect to the funding and procurement decisions.

In the first instance the following key decisions are required to advance the scheme:

- Approval of the project as a PPP (acceptance of the PPPA);
- Approval of the scope and instruction to proceed to Railway Order;
- Approval for the commencement of PPP planning;
- Approval to commence procurement.

RPA is confident that the level of detail to which it and its advisers have developed the material on which this OBC is based will fully support the Government's decision making.

1 Background

Chapter Summary

- The development of an integrated public transport network throughout Dublin has been Government policy for more almost two decades.
- Transport 21, supported by the Regional Planning Guidelines, proposes developing a Metro network comprised in the first instance of two metro routes, Metro North and Metro West.
- The delivery of Transport 21 is reinforced in the National Development Plan 2007 – 2013 and the delivery of public transport has been identified as a priority.
- Urban sprawl and development in west Dublin have lead to the degradation of economic performance and quality of life in the area as a result of unsustainable traffic growth.
- Fingal and South Dublin County Councils are seeking to redress this urban sprawl by identifying areas for consolidated development in town centre type settings.
- There is an existing transport deficit between these town centres that must be redressed to reduce the pressure on the existing infrastructure and to allow the future consolidation of new development in a sustainable manner.
- The provision of high quality public transport in the form of Metro West has been identified as performing a key role in fulfilling this transport need.
- South Dublin County Council and Fingal County Council support the delivery of Metro West and as a policy seek to achieve its delivery.
- Studies undertaken for RPA in 2001 and 2007 have concluded that the Metro West project is technically, environmentally, financially and economically viable.
- Extensive consultation by RPA on route options and the emerging route have indicated strong support for the project.
- Previous studies of phasing options have concluded that Metro West should be delivered as a single project. Phasing may be viable if either Metro North is not delivered or funding of the complete project becomes constrained.

1.1 Dublin's Transport Policy

In November 2001 the Dublin Transportation Office (DTO) published strategy, 'A Platform for Change – Outline of an Integrated Transportation Strategy for the Greater Dublin Area – 2000 to 2016', which was an update of the DTI report of 1994 and developed as a consequence of the unprecedented economic growth experienced in Dublin in the late 1990s; and the associated traffic congestion. The DTO recognised that the DTI strategy of 1994 had significantly underestimated the growth in population and employment in the city and thus the transport and land use strategy of the DTI would not now achieve its original objectives.

The DTO strategy recognised the large reliance on private car transport in Dublin and developed a strategy to deliver a viable public transport alternative with the objective of reducing car transport and associated congestion back to levels of the early 1990's. The DTO strategy identified the need for an enhanced public transport network building on the existing Luas system, at that stage under construction, and more extensive than that proposed in the DTI report, and enhanced to include a higher capacity Metro network.

In November 2005 the government published its national ten year transport investment strategy for the period 2006 to 2015 known as 'Transport 21'. The strategy identified the delivery of an extensive rail based public transport network for Dublin consisting Luas, Metro and Heavy Rail. The Transport 21 strategy is broadly consistent with the longer term vision set out by the DTO and identified the delivery of seven new Luas projects and two Metro projects in the period.

'Transport 21' identified the delivery of Metro West from a connection with the existing Luas Red Line to connect with the proposed Metro North at a location close to Dublin Airport. Metro West was identified as a PPP project to be delivered in four phases broadly defined as:

Phases	Route
Phase 1	Luas Red Line to Clondalkin

Phase 2	Clondalkin to Liffey Valley
Phase 3	Liffey Valley to Blanchardstown
Phase 4	Blanchardstown to Metro North

The total scope of the project was identified as being approximately 23.5km in length, running from a connection point with the Luas Red Line, in the area around the Red Cow depot, to a connection point with Metro North somewhere south of Dublin Airport.

The 'National Development Plan' 2007-2013, further reinforces Governments commitment to the delivery of the transport infrastructure set out in Transport 21. Chapter 1 of the NDP states that a key output under investment priorities will be:
"*To deliver a radically upgraded public transport system in line with the timetable in Transport 21 especially in the Greater Dublin Area (GDA), but with significant impacts in other areas".*

In order to address the increasing traffic congestion and associated environmental degradation, the plan states that a complete transformation in the public transport network in the Greater Dublin Area (GDA) is required. Accordingly, over the period of the Plan 2007-2013, it states that the phased development of the Metro West line will be advanced in line with the timetable in Transport 21 along with other public transport projects.

1.2 Land Use and Transport Policy

The National Spatial Strategy (NSS) for Ireland 2002–2020 sets out a national strategic policy on land use, settlement, economic development and sustainability for a 20 year period. This plan sets out the greater Dublin region as a driver of national development. The NSS also recognises the role of transport, and in particular effective urban transport, in strengthening the role of areas identified for balanced, sustainable development.

The Regional Planning Guidelines Greater Dublin Area 2004 – 2016 (RPGs) develops the national policy and strategy outlined in the NSS onto a regional and

area specific level. The RPGs identify the critical relationship between land use development and infrastructure provision with a key infrastructure element being public transport. The RPGs have identified the marrying of development with high quality public transport provision and has taken the principle of the transportation strategy for the Dublin metropolitan region set out by the DTO in 2001 as the basis for regional development and consolidation of the metropolitan region:

"…Development within the Metropolitan Area will be consolidated, with a much-enhanced multi-modal transport system…"

The document also states that:

"…In the Metropolitan Area, public transportation and other sustainable modes should be given precedence over the requirements of the private car in all relevant policy and decision-making…"

West Dublin, like much of the GDA, has become susceptible to urban sprawl, unsustainable development, environmental degradation and traffic congestion in recent years. Its location on the western edge of a developing city, outside the M50 ring road and served by the major national roads, makes it a desirable residential and commercial area.

West Dublin falls within the administrative areas of two local authorities, SDCC and FCC.

Against this background, the South Dublin County Development Plan 2004 - 2010 and the Fingal County Development Plan 2005 – 2011, in broad terms, aim to provide for an enhanced quality of life for all in the counties by:

- promoting the growth of enterprise and employment opportunities;
- promoting and providing high quality residential environments;
- protecting and improving the quality of the built and natural environments; and
- ensuring the provision of necessary infrastructural and community facilities.

Section 1.5.7 of the South Dublin County Council plan states that it is the aim of the county to promote ease of movement within and access to South Dublin by integrating land use planning with a high quality, sustainable and integrated transport system for people and goods within the County.

Section 7.6.4 of the South Dublin County development plan states a specific objective of the county in relation to Metro.

Policy T 7:
"It is the policy of the Council to support and facilitate the provision of a new Metro Railway System in the Dublin area and to reserve final lines for Metro when they have been agreed. It is also the policy of the Council to investigate the extension of Metro to the Rathfarnham, Terenure, Knocklyon, Ballycullen and Oldcourt areas in conjunction with the appropriate agencies".

Policy TP7 of the Fingal County Development plan states, it is policy:
"*To prioritise public transport by safeguarding future METRO, other rail and bus routes; promoting and facilitating the provision of new METRO and other rail facilities, rail and bus routes".*

Objective TO7 of the Fingal County Development plan states, it is an objective:
"To identify and protect a route for the proposed Orbital Metro from the Airport through Blanchardstown towards Clondalkin and Tallaght".

1.3 The Transport Need

The national, regional and local transport strategies and policies have been developed to address the unsustainable development patterns that have emerged in the city region over recent decades. This development has seen large tracts of lands on the western periphery of Dublin, and indeed in adjacent counties, transformed to low density sprawling residential areas with little or few identifiable district or town centres cores and with an unsustainable reliance on the car for mobility.

Indeed the pace of the low density sprawl has meant that the provision of infrastructure to support these large new communities is often lagging behind the delivery of the housing and in some cases large communities are left remote from basic facilities such as schools, shopping and recreational facilities. This has increased the demand for long distance travel for activities that in more established areas are a short walk away.

The low density nature of the urban sprawl has meant that this increasing demand for transport is difficult to meet viably by public transport, as routes and services cannot serve the large geographic areas in a cost effective and attractive manner, Population densities typically do not support high capacity systems and the bus struggles to connect these population centres to the relevant centres in a time efficient manner. Thus the communities in such areas rely, in the majority, on private transport, typically the car.

This large car reliance has a compounding effect on the transport problem as it increases traffic congestion, reduces the reliability of the already sub-optimal public transport services thus leading to reductions in public transport usage. The overall effect of this cycle is a reduction in economic efficiency, a reduction in the quality of life and increases in carbon gas and other polluting emissions.

Unfortunately west Dublin has suffered most from the effect of this urban sprawl which has been driven over recent years by the increases in housing demand and the availability of lands outside the M50. What were once rural or suburban villages along the western edge of the city have emerged as key employment centres and towns like Tallaght, Clondalkin, Blanchardstown and Swords are now of similar scale in population and employment terms to many of the regional cities in the country.

These large new towns have changed the pattern of travel in Dublin and the employment, retail and social opportunities that they provide has resulted in a large, and ever increasing, proportion of trips being made in Dublin occurring outside and away from the city centre.

The availability of transport infrastructure between these towns is limited and there is a large reliance on infrastructure such as the M50. The massive congestion currently experienced and the expected ongoing congestion forecast even with the upgrade of the road are a result of the lack of transport alternatives. The M50 typifies, on a regional level, the congestion that is experienced on a daily basis in these western towns which in some cases are becoming choked by traffic.

There are few public transport services between these large towns and those that do exist are typically unreliable and infrequent as a result of having to negotiate the traffic congestion in the area. In addition the higher capacity public transport infrastructure is historically focused on connecting outlying areas to the city centre rather than catering for trips between the peripheral town centres.

The effect of the urban sprawl, the infrastructure deficit and the impact of traffic congestion on the quality of life for these communities is now understood and documented. SDCC and FCC have implemented policies to redress the urban sprawl through the identification of key town and economic centres in the region to promote consolidated development into the future and prevent future and further sprawl of the suburban area. Metro West has been identified as performing a key role in fulfilling this transport need.

1.4 Delivering in Partnership

RPA has delivered the first phase of the Luas system, comprising two light rail lines known as the Luas Red Line and the Luas Green Line. The existing Luas lines began passenger carrying operations in 2004 and the system has proven extremely successful in the short period since operations commenced.

RPA is charged with the development of Light Rail and Metro systems in partnership with other government agencies and the private sector. Since the commencement of Luas services RPA has successfully obtained Railway Orders for the extension of the Luas Green Line to Cherrywood and the Luas Red Line to The Point and to Saggart, respectively. Construction has commenced on the extensions to Cherrywood and The Point. Construction is due to commence on the extension to Saggart in Autumn

2008. Passenger operations are due to commence on the extensions to The Point in 2009 and Cherrywood in 2010 and, with operations commencing on the extension to Saggart in 2011.

In addition to the above Luas extensions, RPA is progressing the delivery of a further four Luas projects and two Metro projects, Metro North and Metro West. The Metro projects have been proposed to be delivered as Public Private Partnerships (PPP).

Metro West route traverses lands zoned as residential, commercial, and industrial, green belt, amenity etc. The servicing of these lands by public transport facilitates sustainable development at densities which may not otherwise be possible in appropriately zoned lands, and in other areas offers the potential for rezoning of otherwise remote lands along the corridor. The facilitation of development at higher densities than might otherwise be achieved reduces the potential for further urban sprawl and consolidates development in a sustainable manner.

SDCC and FCC are fully supportive of Metro West and seek to promote the scheme in partnership with RPA. To this end both local authorities intend to implement a Special Development Contribution Scheme under Section 49 of the Planning and Development Act 2000, to support the funding of the Metro West project.

The delivery of a high quality transport mode into the development lands of both local authorities is also of key importance to the landowners and property developers in the area. There is also a realisation of the benefits Metro can bring to any development in terms of increased attractiveness and value. Land owners along the route of Metro West are also supportive of the project.

RPA is negotiating with land owners and developers to contribute to the cost and delivery of the Metro West project in the form of capital contributions, delivery of infrastructure or the provision of lands. Sections of the route of Metro West traverses large land holdings in single ownership, many of which are owned by developers. There is therefore significant potential to enter into agreements to secure funding for the project.

1.5 Consideration of Alternatives

In 2001, RPA (then the Light Rail Project Office of CIE) initiated a detailed route feasibility study for Metro West. The purpose of the study was to identify the feasibility of an orbital Metro system and identify potential routes for a route between N2/M50 and Tallaght. The study concluded that the route was technically feasible and identified a number of potential route corridors.

The results of the study were published in January and April 2002 in the reports "*Dublin Metro Western Route Phase 1 Alignment Study, Final Report*" and 'Dublin Metro Western Route Phase 2 Alignment Study, Final Report' respectively, produced by WS Atkins. These reports are attached as Appendices 1 and 2.

Due to an instruction from Government to concentrate on the Metro North corridor, the identified potential corridors were not pursued to consultation and a final preferred route was not identified. The 2001 study suggested the cost of the Metro orbital route would be between [text deleted] - [text deleted] in 2001 prices including VAT, depending on the route and the design solutions adopted.

In 2006, following announcement of Transport 21, RPA engaged Jacobs Engineering to undertake the Metro West route selection study. The purpose of this commission was to progress the Metro West project from the WS Atkins work through to the selection of an emerging preferred route, to develop an outline design of the route selected, to consider the phasing and construction programme and to develop a high level cost estimate of the emerging route, to develop an outline design of the route selected.

The study was undertaken in three stages:

- Stage 1 – Review of previous work, familiarisation and development of sifting criteria, route option identification and stakeholder engagement.
- Stage 2 – Carry out sifting of route options, further development of preferred routes and establishment of three route options for Public consultation.

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

During Stage 2, the appraisal of route options and variants was carried out by a multi-disciplinary team which included staff from Jacobs Engineering and RPA. The appraisal process assessed each option against a wide range of criteria centring on the public interest.

The criteria considered were:

- Economy;
- Costs and Funding;
- Environment;
- Safety;
- Accessibility & Social Inclusion;
- Integration;
- Constructability / Engineering; and
- Public & Stakeholder Support.

The results of the study were published in September 2007 in the report 'Metro West – Alignment Selection Study, Stage 2 Report, Emerging Preferred Route (FINAL)', produced by Jacobs Engineering. This report is attached as Appendix 3.

In July 2007, RPA selected the emerging preferred route corridor for Metro West, based on the recommendation of the Jacobs study. The route selected and emerging concept is further outlined in section 'Description of the Chosen Route' in Chapter 2 of this document. A multi criteria analysis was undertaken of all route options to inform the final route selection, which included environmental, financial and economic appraisal. This appraisal concluded that the project would have a positive economic and financial case. The study suggested the cost of the Metro West route would be in the order of [text deleted] in 2007 prices excluding VAT.

It should be noted that the scope of the project that emerged from the route selection process was extended by approximately 2km over that envisaged in Transport 21,

which was as a result of a more defined route but also a conclusion that it would not be feasible to share a large portion of the Luas Red Line from Tallaght to Red Cow in normal operations. Thus a separate Metro West route from Tallaght to Clondalkin with no shared running with Luas emerged.

The Metro West route is described in detail under the heading 'Description of Chosen Route' in Chapter 2 of this report. The description also includes a commentary of some of the critical factors that determine the route in any particular area.

1.6 Consultation

During the 2001 and 2006 studies, RPA engaged extensively with identified stakeholders including local authorities, state agencies, interest groups, and the general public. Throughout the consultation process support for the Metro West project has been strong and RPA has had considerable engagement in the consultation process.

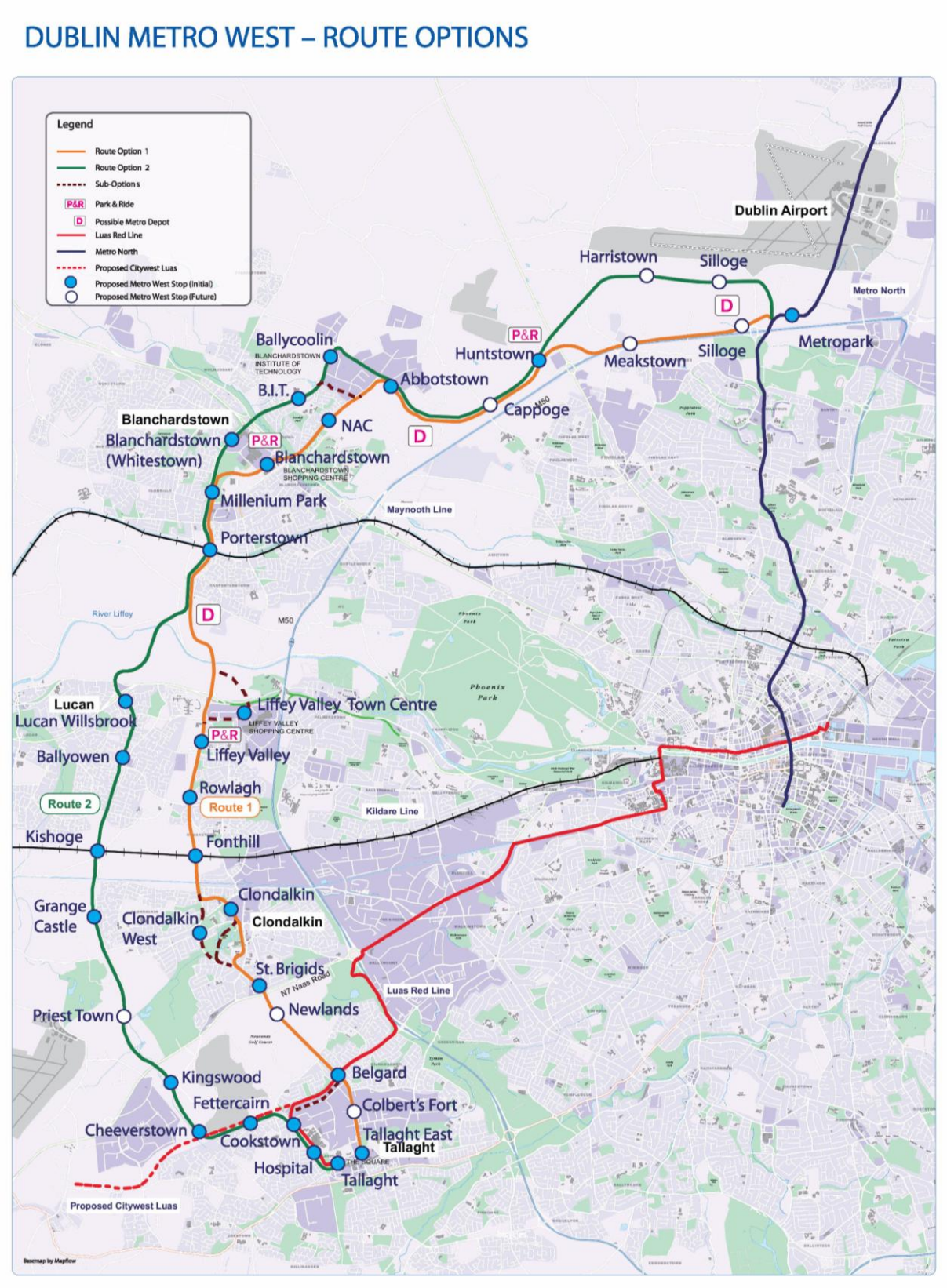
Initial consultation on the multiple of identified routes was restricted to the design team and other major stakeholders such as the local authorities. Workshops were undertaken to refine the route options to only those that were deemed deliverable and feasible as Metro West routes. In November 2006 the RPA commenced a wider public consultation process on two main route options and a number of sub options. The route options presented are outlined in figure 1.1. below. Consultation included advertisement in local and national media, publishing of information on the RPA website and public open days, where the public were invited to put questions to project staff with respect to the options, their impacts and their benefits.

The result of the initial consultation suggested support for either route option but with a slight preference for route option 1 overall and in particular through the South Dublin County Council area. Few objections were received except at two locations, Moyle Park in Clondalkin and Old Lucan Road, Palmerstown. The Emerging Preferred Route Corridor selected avoids both these locations as alternative routes had already also formed part of the consultation process and emerged as preferred.

Following selection of the route RPA commenced a further round of stakeholder and public consultation, this time focused on an emerging design concept within the corridor selected. The results of this consultation were again positive and focused on specific issues. Concerns with elements of the concept were raised and options to address them developed. No significant objection to the route was raised which could not be addressed through design revision. The Emerging Preferred Route is described in detail in chapter 2 of this document.

During 2008 RPA have been consulting on the scope for the Environmental Impact Assessment with all statutory consultees and the general public. This process has highlighted areas of specific environmental concern and has allowed the project team to commence consideration of mitigation measures.

Figure 1.1 – November 2006 Metro West Consultation Route Options



1.7 Consideration of Phasing

As indicated in Section 1.1, Transport 21 suggested the delivery of Metro West from Tallaght to Dardistown in four phases. On completion of the route selection process, RPA commenced a study of possible phasing options. The study was completed in late 2007 and concluded the following:

- The phased delivery of Metro West as proposed in Transport 21 is not feasible due to construction timelines, depot requirements, expected profile of patronage and the PPP procurement process.
- It is likely that separate phases could require separate PPP mechanisms to be put in place. In order to achieve the target completion date for the entire route, these processes would have to run in parallel.
- A single Railway Order could allow the project to be delivered in phases but may result in a reduction of the programme benefits of a phased delivery as a result of parallel procurements[1].
- If delivered as four separate back-to-back phases delivery of Metro West from Tallaght to Dardistown would take almost 12 years to complete with four separate procurement processes and Railway Orders.
- The patronage and revenue benefit of the project is most when it is delivered in full.
- The implementation of Metro West as a single project is preferred with no element of project phasing.

Having considered the phasing as proposed by Transport 21 it was apparent that the delivery of Metro West was critically linked to the delivery of Metro North. In the absence of Metro North, Metro West would terminate at an illogical location south of Dublin Airport.

RPA also considered in what other context delivery options might be proposed. There are two circumstances where the partial delivery of Metro West may be either required or desirable. These are:

[1] The link between Railway Order and the procurement process would restrict all phases proceeding to BAFO stage until the Railway Order for the entire route is secured.

- Where full project funding is not available and the scope of the project is reduced to funding availability;
- Where Metro North is not completed in advance of Metro West.

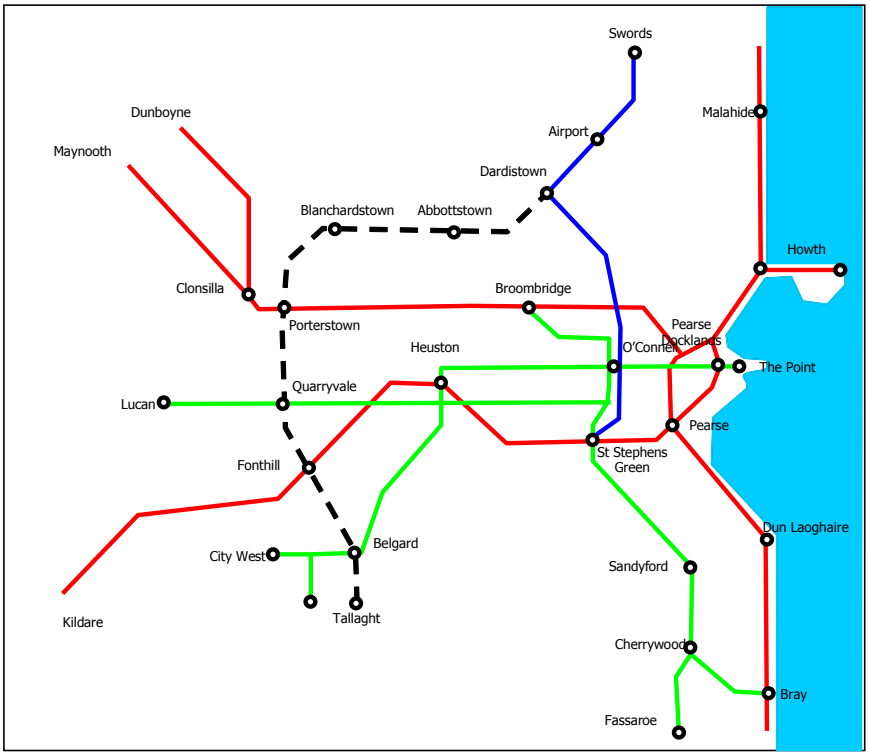
Emerging from the above, there are two possible partial delivery options feasible for implementation. These are:

1. Option 1 - Porterstown to Metro North
2. Option 2 - Tallaght to Blanchardstown

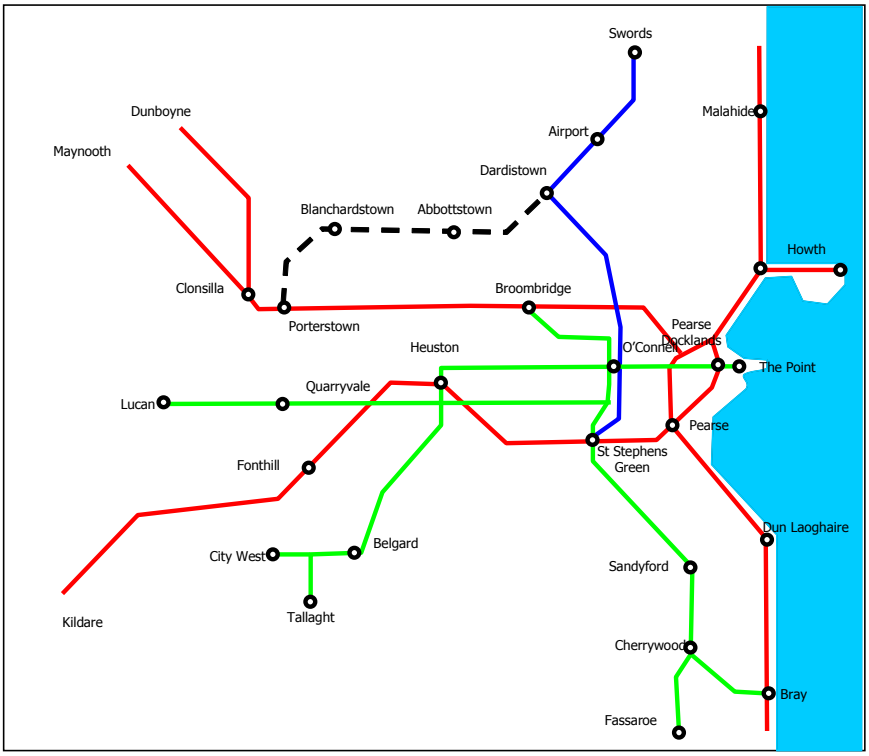
Option 1 is approximately 12.5km in length and Option 2 is approximately 14 km in length. As the location of the proposed Metro West depot is Silloge, Option 2 would have to be operated from the proposed Red Cow stabling area with an agreement required with the Luas maintainer to carry out maintenance from the existing Luas depot.

This Outline Business Case should therefore consider the following delivery strategies for Metro West:

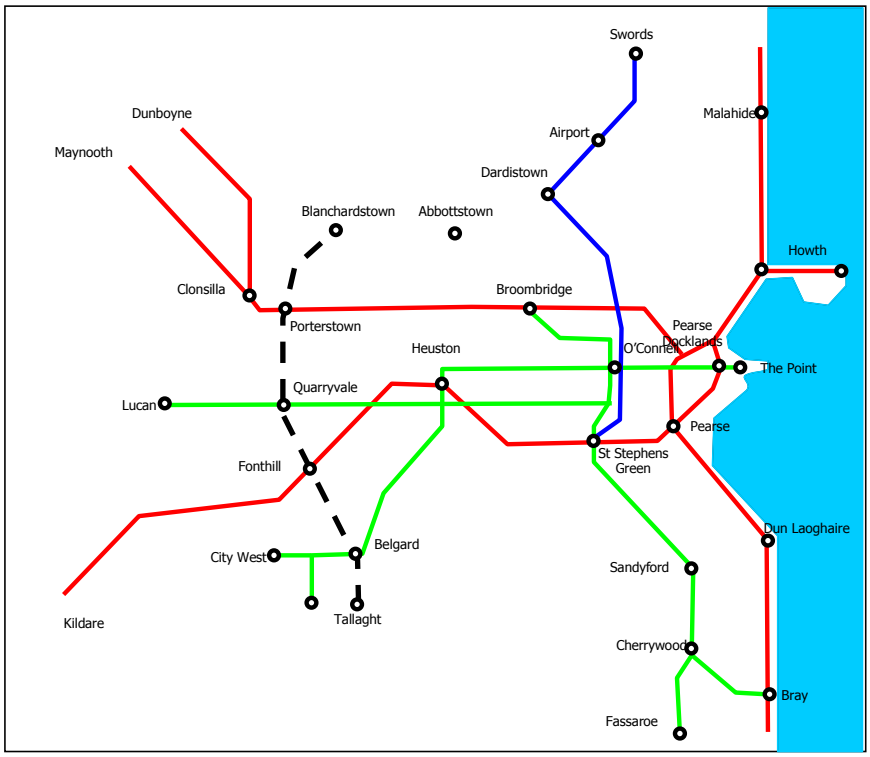
1. Base Case – Full project implementation



2. Partial Delivery Option 1 – Limited Funding - Porterstown to Metro North



3. Partial Delivery Option 2 – No Metro North – Tallaght to Blanchardstown



It should be noted that the partial delivery options outlined above could also be considered as phased delivery options with the remaining element of the project in either scenario delivered as a later phase. For the purpose of this OBC the options have only been considered as partial delivery with no further phase delivered during the appraisal period.

The impact of partial or phased delivery of the project on procurement is considered in more detail in Chapter 9. Any decision to proceed on the basis of one of the options for partial or phased delivery should be taken in advance of the commencement of the procurement process to insure that any subsequent change of position does not require the termination of the initiated tender process and the advertisement of a new tender process.

1.8 Conclusion

Dublin has experienced large scale urban sprawl in last decades which has lead to unsustainable development, increased traffic congestion, reduced economic productivity and reduced quality of life. West Dublin in particular has suffered from this urban sprawl with large new communities emerging outside the M50.

Large new towns such as Tallaght, Blanchardstown and Swords in particular, have emerged in the area, which are of regional and national economic importance and of a scale similar to many of the regional cities in Ireland. These new areas are generally unconnected and isolated from each other whilst there is a substantial demand for travel between them. This demand is presently only served by limited infrastructure with strong reliance on the M50 which, as a result, suffers from severe traffic congestion.

The areas are also poorly served by public transport which suffers as a result of traffic congestion and for historic reasons is predominantly focused on connecting these outer towns with the city centre. The local authorities now seek to redress the sprawling city and have identified key areas for consolidated development.

There is an existing transport deficit between these town centres that must be redressed to reduce the pressure on the existing infrastructure and to allow the future consolidation of new development in a sustainable manner. The provision of high quality public transport in the form of Metro West has been identified as performing a key role in fulfilling this transport need.

The first phase of an integrated Luas and Metro network for Dublin has been completed by RPA and the expansion of the Luas network throughout the region is now under way as per Government policy. 'Transport 21' builds on the delivery of the first phase of Luas and seeks to develop a transportation network over the next 10 years comprising Luas, Metro, Heavy Rail and Bus.

There is now an understanding of the many benefits mass transit systems such as Luas and Metro brings. Local authorities, land owners and developers are seeking to

deliver Luas and Metro to their areas. The delivery of this type of transit is seen as a catalyst for consolidated sustainable development in the area and offers developers increased attractiveness and value.

It is a policy of South Dublin and Fingal County Councils to support and facilitate the provision of Metro West and both administrative areas are committed to implementing a levy scheme to contribute to the financing of the project.

Studies undertaken on behalf of RPA in 2001 and 2007 have concluded that the Metro West route is technically, environmentally, financially and economically viable. RPA has concluded an extensive exercise of consideration of route options where alternatives were appraised over a broad set of criteria including, economy, environmental impact, integration, social inclusion, safety and public and stakeholder support. Extensive consultation of the project through various stages of the scheme evolution, have demonstrated strong public and stakeholder support for the scheme.

RPA have considered the phased delivery of Metro West, initially as set out in Transport 21 and also other phasing options. This consideration has concluded that a phased implementation is not preferred and that the phasing as proposed in Transport 21 is not feasible. If phasing of the project is necessary then a two stage phasing strategy seems to be most reasonable.

2 Project Definition

Chapter Summary

- The route and system concept for Metro West has been developed based on a defined set of project objectives.
- Metro West is being designed to initially operate with capacities, vehicles and headways similar to Luas but with the capability to be upgraded to larger capacities.
- Metro West will be fully interoperable with Metro North allowing passengers to travel between the two lines without the need for interchange.
- Metro West will be capable of operating on the Luas Red Line to facilitate access to a stabling area at Red Cow. Long Metro West vehicles will not however be able to provide passenger services on the Luas Line due to the shorter Luas stops.
- The Metro West connection with Metro North is being designed to allow Metro West vehicles to run to the city centre and to the Airport/Swords via the Metro North system.
- Metro West serves Tallaght, Clondalkin, Liffey Valley and Blanchardstown and connects to Metro North in the Dardistown area.
- The line crosses the Liffey Valley and Strawberry Beds. The crossing location has emerged as the preferred location from an environmental and technical assessment of the area.

2.1 Background

As noted in the previous chapter, the route of Metro West was chosen following a detailed multi-criteria analysis, and consideration of views expressed by interested parties during the public consultation process. The route options considered and finally presented for consultation emerged from a consideration of feasible routes against a set of key project objectives which are summarised as:

- To connect Tallaght to Metro North in an orbital route;

- To provide a high quality transport system and service;
- To provide Value for Money;
- To complement the latest County Council Development Plans;
- To integrate with proposed developments and to allow for the possibility of a Supplementary Development Contribution Scheme under Section 49 of the Planning and Development Act 2000;
- To provide an upgradeable and flexible service to allow for the probable future increases in demand;
- To provide a fast, efficient and reliable service with a journey time of 50 minutes from Tallaght to the Airport, and 45 minutes from Blanchardstown to the City Centre as well as consistency of speed along the route;
- To provide a frequent and reliable service;
- To encourage model shift from unsustainable transport modes and help provide an alternative to congestion;
- To integrate with all other modes of transport, where possible (Multi Modal);
- To provide a system design that is fully interoperable with Luas and Metro North;
- To provide a safe system with full accessibility;
- To minimise the negative environmental impact of the scheme and maximise overall sustainability;
- To consider the views of all stakeholders, including the public, in the design and achieve a consensus where possible;
- To take account of the following documents; “A Platform for Change” and “Transport 21” throughout the project lifecycle;
- To implement government policy; and
- To maximise the commercial viability of the project.

Based on the above objectives the Metro West system concept and preferred route has emerged.

2.2 System concept

Metro West will be designed to operate initially as system of similar capacity to the Luas Red and Green Lines but with the capability to substantially enhance the capacity to typical Metro levels. The initial length of the vehicle is likely to be in the order of 47m and the system will be designed to allow headways of 4 minutes in the peak periods. It is envisioned that an increase in capacity to longer vehicles at 2 minute headways will require an increase in infrastructure, generally related to the power supply requirements, additional trams and possibly depot enhancements.

As demand increases on the line, the capacity of the system can be increased by increasing the length of the vehicle to approximately twice its initial length. Keeping the headway constant would result in a doubling of capacity in such a scenario but the system will also be capable of accommodating incremental increases in service frequency as required. Whilst initial headways of 4 minutes will be the basis of the design, the system could be capable of accommodating headways of approximately 2 minutes.

Importantly Metro West is being designed to allow vehicles to operate on both the Luas and Metro North networks. This means that a vehicle on Metro West could successfully run on either the Luas track or the Metro North track. Similarly it may be possible for either Luas or Metro North vehicles to run on Metro West track.

The length of the Luas platforms means that the longer Metro West vehicles will not be able to offer passenger services on the Red Line but will use the Red Line to access the proposed stabling area at Red Cow. Metro West will however be able to offer full passenger services on Metro North track allowing passengers to travel between the two lines without the need for interchange.

Some of the critical design considerations for Metro West are:

- The structures gauge accommodates vehicles of 2.4 metres wide.
- The lateral clearances to the poles and other fixed obstacles are consistent with that shown on the Railway Safety Commissions document, ‘Guidelines for the

design of Railway Infrastructure and Rolling Stock'. Also, allowance is made for the provision of service pathways at the side of the line.

- The use of low-floor vehicles is assumed. This is the same as the design of the Luas Red and Green Lines and the proposed Metro North.
- A desirable minimum radius of 100 metres was specified with an absolute minimum radius of 50m considered acceptable where considerable design constraints exist.
- All the platforms are designed to cater for 94 metre long vehicles. This allows full length Metro North vehicles to operate on the route.
- The traction system is designed around using an overhead contact system of 750 V DC using a tram wire arrangement. Provision can be made in the detailed design to cater for extra wires if required for a higher power output in the future.
- The substations are sized to cater for equipment allowing for a nominal power output of 4 MVa.
- Protected running is provided for along the entire length of the route. This means that the tramway has its own right of way and road traffic only crosses it laterally at junctions.
- The system is designed as an open one. It has a number of at-grade crossings and it is generally not fenced. This is in line with Light Rail principles and it facilitates the integration the design into the local environment.
- Provision is made for ticket vending machines at the stops.
- The structures are designed to cater for line loads of 25kN/metre and for an axle load of 120kN.

In addition provision will be made for control systems, including:

- An automatic vehicle location system. This will automatically monitor the location of vehicles in service and display their location in a control centre. This can be used as an input into other systems such as a passenger information system.
- A passenger information display system. Such a system is designed to display relevant information for passengers in the trams and at stop locations
- A SCADA (Supervisory Control and Data Acquisition) to monitor the power supply system and some of the fixed equipment.

- A radio system. This is to provide communication between the control centre and operational staff.
- A video monitoring system and an emergency telephone system at stops. This is to improve passenger security and reduce vandalism.
- Metro West vehicles will also be fitted with additional equipment to allow the vehicles to communicate with the Luas and Metro North systems during interoperability. This will include functionality such as on-board Automatic Train Protection (ATP) to allow operation on the signalised areas of Metro North.

In order to achieve the objective of a 50 minute journey time from Tallaght to Dublin Airport, the system concept and design is such that high levels of segregation from other road traffic is being delivered and highest priority for Metro West at any signal controlled traffic junctions is a key design requirement. This requirement for priority and segregation has meant that the system design has more structures or underpasses of road and other crossings than would typically be the case on a Luas type of system. In addition the route generally runs adjacent to roads, rather than on the public road itself which often means running through lands not in public ownership.

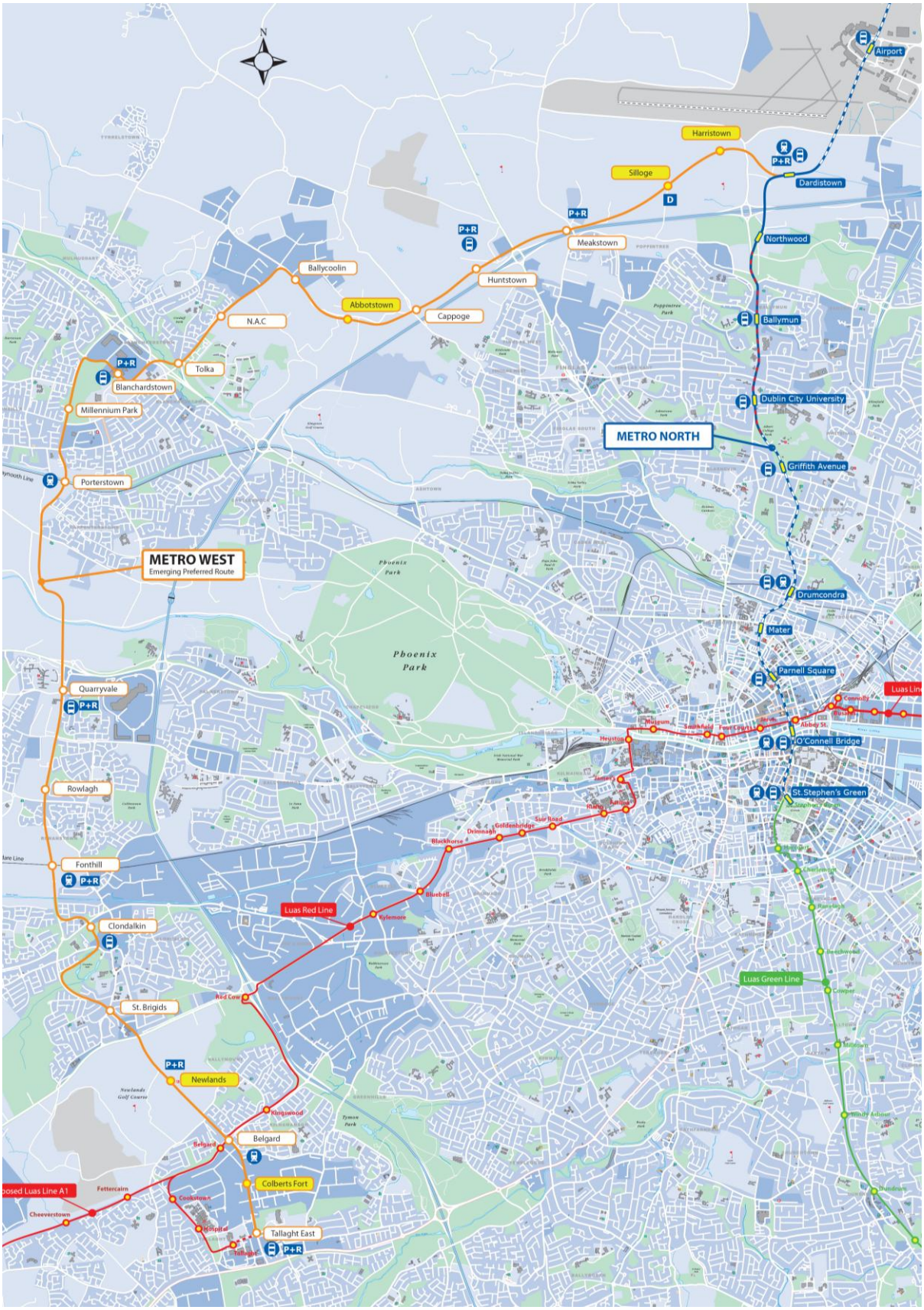
2.3 Description of the Chosen Route

The emerging preferred route for Metro West runs from Tallaght to Metro North at Dardistown, via Clondalkin, Liffey Valley and Blanchardstown. The preferred route is approximately 25.5km long. Figure 2.1 outlines the emerging preferred route for Metro West.

The existing concept makes provision for initial and future stops. Initial stops are defined as those that will be provided and operational on opening of the service. The future stops are defined as stops that may not be opened initially but would be implemented at some future stage in parallel to surrounding land development. Future stops are shown as yellow on the map above. Land and other essential works to facilitate future stops will be delivered as part of the initial scope of works.

The description of the selected route is also outlined below:

Figure 2.1 – Metro West Emerging Preferred Route



Metro West starts in **Tallaght East** (all stops identified in bold) on Belgard Road, close to the junction with Old Blessington Road. It will serve the Tallaght Institute of Technology, The Square Shopping Centre and Tallaght Village. A service or engineering link will be provided to link Metro West with the Luas Red Line which will allow trams to switch between the Luas and Metro West routes. There will be a crossover in advance of the Tallaght East Stop.

From Tallaght the route follows Belgard Road northward, to a potential future stop at **Colbert's Fort**. Following this, the line crosses over the Luas Red Line on a new structure at Embankment Road where an interchange stop at **Belgard** will be provided between Metro West and Luas services on the Red Line and its Citywest branch. The route then continues northward towards Newlands Cross.

Prior to the line reaching Newlands Cross, there is the possibility of providing a future stop to be called **Newlands**. This is currently a green belt area with little surrounding development. A P&R could be provided adjacent to this Newlands stop which would seek to serve traffic coming from the N7, N8 and N9 corridor. Continuing to Newlands Cross, the route will run at grade under the upgraded N7 (Naas Road) flyover and northwards towards St. Brigid's Well. A stop, **St Brigid's**, will be provided to serve the surrounding area.

The route then runs northward from Boot Road junction before turning east into Clondalkin Park before crossing the Nangor Road to serve **Clondalkin** Town Centre beside the existing Mill Shopping Centre. It then crosses the New Nangor Road and turns west towards Fonthill Road beside Dunawley Avenue. From here the route again turns northward to run adjacent to the Fonthill Road crossing the Grand Canal and the Kildare railway line at **Fonthill**. A new Interchange Stop / Station will be constructed where Metro West crosses over the Iarnród Éireann, Kildare line. Turnback facilities will be provided at either Fonthill or Clondalkin. It is intended that the rail P&R at Fonthill will be shared with Metro West.

The route continues to serve **Rowlagh** and then Liffey Valley Town Centre the latter, from a stop, **Quarryvale**, at the junction with St Loman's Road. At this location an

interchange and link between Metro West and the proposed Lucan Luas Line will be provided. P&R is being considered in this area.

The route then crosses the N4 and runs between Hermitage Clinic and Fonthill House before crossing the River Liffey and Liffey Valley on a new bridge structure. The route continues on the northern bank of the Liffey Valley to Porterstown through lands at Castleknock Golf Club and Porterstown Park. The route then runs beside Porterstown Road and onto a new bridge structure at Diswellstown Road where it crosses the Royal Canal and the Maynooth Railway Line. A new stop will also be developed at **Porterstown** to facilitate interchange between Metro West and Iarnród Éireann Maynooth and Dunboyne services.

From the interchange stop at Porterstown the route continues to a stop at **Millennium Park** before turning eastwards to serve **Blanchardstown** Town Centre. It is intended that P&R will be provided as part of a redevelopment of adjacent lands at Blanchardstown. From the Blanchardstown Town Centre the route runs over the N3 to a stop at **Tolka**, serving Blanchardstown Village and James Connolly Memorial Hospital before continuing northwards to run adjacent to Snugborough Road.

The route then serves the National Aquatic Centre (**NAC**), before reaching the junction with Ballycoolin Road from where it then turns to run eastward adjacent to the proposed upgraded road, to **Ballycoolin** stop. This stop will serve the Ballycollin Industrial estate and Blanchardstown Corporate Park.

The route then continues east adjacent to the Ballycoolin Road to a potential future stop at **Abbottstown**. From Abbottstown the route heads towards the M50 before crossing Cappagh Road to a new **Cappoge** stop provided to serve the industrial lands to the north of the M50, Cappagh Hospital, and residential lands to the south of the M50.

Continuing north to a possible future stop at **Huntstown**, the route then crosses the N2 (Ashbourne Road) and runs to **Meakstown**. P&R is proposed at both the Huntstown and Meakstown Stops with access to and from the N2 corridor via the Cherryhound Interchange. The line then runs between the M50 and Dublin Airport

with additional future stops at **Silloge** where a Metro West depot is proposed. The stop will be used to provide for the changeover of drivers rather than passengers but it may become a full stop subject to development in the surrounding area.

From Silloge the route continues to a possible future stop at **Harristown** close to one of the existing Airport long term car parks. Finally the route will link with Metro North at **Dardistown**. From here passengers will be able to travel northwards to the Airport and Swords, or southwards to the city centre.

Bus interchange with Metro West stops and suitable facilities will form part of the of the Metro West stop design. Car lay-by (Kiss and Ride) facilities will also form part of each stop design along with appropriate cycle parking provision.

There will be many structures on the Metro West route at rivers, canals, railway lines, Luas crossings and major road crossings. A signature structure is proposed to cross the River Liffey and Liffey Valley which is the subject of an international architectural design competition. The design of all structures will be sensitive to the amenity of the area they seek to cross.

2.4 Conclusion

The route and system concept for Metro West has been developed based on a defined set of project objectives some which have been derived from stated government policy and others which are driven by engineering and operational requirements to insure interoperability with other Luas and Metro lines.

Metro West is being designed to initially operate with capacities greater to existing Luas but with the capability to be incrementally upgraded up to at least twice that capacity as demand increases.

Metro West will be interoperable with Metro North, the Metro West connection with Metro North at Dardistown is being designed to allow Metro West vehicles to run to the city centre and the Airport/Swords via the Metro North system. Thus the system

will also act as an access to the city centre in addition to serving areas on the western periphery of Dublin.

The chosen route for Metro West is approximately 25.5km long and serves Tallaght, Clondalkin, Liffey Valley and Blanchardstown and connects to Metro North in the Dardistown area. The line crosses the Liffey Valley and Strawberry Beds.

3 Transport and Planning

Chapter Summary

- Major towns on the western edge of Dublin are similar or greater in population to many of the existing regional cities in Ireland.
- These new towns are forecast to grown considerably in the coming years as a result of planning objectives and a desire by the local authorities to consolidate development around sustainable town centres.
- The realisation of these planning objectives will be contingent on the provision of new transport infrastructure such as Metro West.
- The delivery of Metro West is thus of strategic national importance.
- The catchment of Metro West will be greatly expanded through integration with other transport infrastructure either existing or proposed under Transport 21.
- The introduction of Metro West is forecast to add up to 36.1 million trips to the entire Metro Network. This is based on running Metro West services to Belinstown[2] and the City Centre. If Metro West services terminate at Dardistown, the scenario forecast adds 32.5 million to the entire Metro Network.
- The initial capacity provided on Metro West will be in the order of 5,000 passengers per direction per hour based on 47m long vehicles running at 4 minute headways. The ultimate capacity could be increased to at least 20,000 passengers per direction per hour by a combination of doubling the length of the vehicle and reducing the headway between vehicles.
- The maximum line flow past any point on the Metro West route in 2016 is forecast to 3,658 passengers per direction per hour, well within the proposed capacity provision.

3.1 Population and Employment Projections

As discussed in chapter 1, areas outside the M50 on the western edge of Dublin have experienced considerable change over recent decades. What were once rural villages outside Dublin City, have initially been transformed to suburbs of Dublin and

[2] Belinstown is the terminus of Metro North.

in recent years to major town centres of regional and economic importance. In particular towns like Tallaght, Clondalkin, Blanchardstown and Swords are now of a scale similar to some of the regional cities in Ireland.

For example, the population of Tallaght and Blanchardstown and their immediate environs are reported to be in excess of 100,000 and 90,000 respectively. Similarly Swords and Clondalkin have populations of approximately 35,000 and 40,000 respectively.

By way of comparison these 2006 Census populations are set against some of the regional cities in Ireland in table 3.1 below:

Table 3.1 2006 Population Statistics

Location	2006 Population
Kilkenny City	25,000
Swords	35,000
Clondalkin	40,000
Waterford City	50,000
Galway City	75,000
Blanchardstown	90,000
Limerick City & Suburbs	90,000
Tallaght & Surrounds	100,000
Cork City & Suburbs	190,000
Dublin City (Inside M50)	500,000

As can be seen from table 3.1, the combined population of the Dublin western towns of Dublin is in excess of combined populations of Galway, Waterford, Limerick and Kilkenny.

Land use data for the catchment area of Metro West is required by the RPA in order to develop an understanding of the likely demand for light rail in that area. The serving of the lands with mass transit provides the potential for higher density development that may not otherwise be achieved. Land use forecasts have been supplied to the RPA by the DTO, SDCC and FCC. In addition property developers

adjacent to the Metro West route have also supplied land use forecasts around the route.

The immediate catchment area of Metro West is taken as being the area that falls within reasonable walking distance of the route. Based on experience, surveys from Luas and international experience the typical catchment of a high capacity rail based system is in the order of 1km.

Table 3.2 below gives the summarised forecast for both population and employment in the 1km catchment area of Metro West in 2016 compared to historical data from 2002 and 2006.

Table 3.2 Population and Employment Projections for Metro West Catchment Area

Metro West 1km Catchment				
2002 Population	2002 Employment	2006 Population	2016 Population	2016 Employment
56,168	33,668	74,451	137,189	68,356

The projections show major growth of both employment and household demand in the catchment area of Metro West up to 2016. Table 3.2 indicates a total population of over 137,000 by 2016 compared to 74,000 in 2006, within the immediate catchment of the line. It should also be noted that the immediate catchment in 2006 outlined in table 3.2 represents less than 33% of the wider area which would form part of the overall Metro West catchment via integration with other modes.

Table 3.2 also indicates a total employment projection of over 68,000 in 2016 compared to nearly 34,000 in 2002. High residential densities and greatly improved access to transport are essential to consolidating development in the area. Some of the areas adjacent to the Metro West route are on the verge of a major transformation, providing this growth can be facilitated. It should be noted however that any projections are preliminary and are based on work in progress by SDCC and FCC.

A number of Local Area Plans (LAP) and Strategic Development Zones (SDZ) are being progressed adjacent to Metro West. Major plans in the FCC area include:

- Tallaght Town Centre Masterplan
- Clonburris SDZ
- Liffey Valley Town Centre LAP
- Naas Road Gateway Masterplan

Major plans in the SDCC area include:

- Airport LAP
- North Ballymun LAP
- Cappagh Road LAP
- Diswellstown LAP
- Meakstown LAP

Through these plans SDCC and FCC are seeking to implement a planning framework to consolidate development around existing and new services in a sustainable manner. It should be noted that the last development plans identified Tallaght, Clondalkin, Liffey Valley and Blanchardstown as town centres with the intention that each become sustainable towns in terms of employment, population and supporting services.

Given the nature and extent of the existing development and the projected new development around the Metro West route, it is clear that there is a large existing and expected future transport demand that must be accommodated. The provision of infrastructure to serve these towns on scale equivalent to serving many of the largest cities in the country and is thus of strategic national importance.

3.2 Transport Provision

Another key contributing factor to the demand for any individual public transport service in this area is the availability of other transport infrastructure. As mentioned in chapter 1, there is a chronic transport infrastructure deficit in the area. Traffic congestion is a daily feature of this part of the city. Times and days that are typically considered off-peak often experience the most severe congestion. ‘Transport 21’

proposes an integrated transport network to reduce traffic congestion on a national level and Metro West is a key element of that strategy on this corridor.

There are currently a number of other transport projects, as identified in 'Transport 21', in various planning and implementation phases, which through integration will have a direct impact on the patronage of Metro West. The key transport projects in this regard are:

- Luas Line A1 (Citywest);
- Luas Line F (Lucan);
- Metro North;
- Iarnród Éireann Interconnector;
- Kildare Route Upgrade Project;
- Maynooth Line spur to Dunboyne;
- M50 Upgrade;
- Outer Ring Road; and
- Quality Bus Corridors;

Metro West will enable interchange with Kildare and Maynooth rail services, Luas red line, Luas line F, Metro North and Quality Bus Corridors (QBCs).

In addition to those transport schemes outlined above, SDCC and FCC also proposed some additional local transport schemes such as bus services through the area. These have not been included in this appraisal. The provision of complementary bus services to Metro West is likely to have a positive impact on the overall case particularly where bus services increase the Metro catchment.

3.3 Forecast Demand

Inputs and Assumptions

The land use data have been utilised by RPA to develop passenger forecast demand in both the morning peak and off-peak periods using a multi-modal transport model.

In order to assess the effect of Metro West, the transport model is run with two different scenarios. The first scenario is called 'Do-Minimum'. This scenario assumes that the projected land use forecasts are met without Metro West included. A second scenario is then run where Metro West is included. This is called 'Do-Something' scenario and this scenario includes all the assumptions of the 'Do-Minimum' scenario plus Metro West. The difference between one scenario and the other gives us an indication of the effect of the Metro West scheme. Only projects that are committed or highly likely to proceed are included in the assumptions for the base case.

In order to give a full appraisal of Metro West a number of different scenarios and sensitivities were tested. Table 3.3 shows the assumptions used for the base case.

Table 3.3 – Transport Assumptions Base Case for "Do Minimum" and "Do Something"

Assumption	"Do Minimum"	"Do Something"
Luas Tallaght to Connolly (Red Line)	Yes	Yes
Luas St Stephen's Green to Sandyford (Green Line)	Yes	Yes
Luas Connolly to The Point (Line C1)	Yes	Yes
Luas Sandyford to Bride's Glen (Line B1)	Yes	Yes
Luas Belgard to Saggart (Line A1)	Yes	Yes
Metro North	Yes	Yes
Metro West	**No**	**Yes**
Luas City-centre to Lucan (Line F)	No	No
Luas Stephen's Green to Broombridge (Line BX/D)	No	No
Luas Bride's Glen to Bray/Fassaroe (Line B2)	No	No
Iarnród Éireann Interconnector	No	No
Dublin Port Tunnel	Yes	Yes
Outer Ring Road*	Yes	Yes
Luas P&R	Yes	Yes
DTO Quality Bus Network	Yes	Yes
Integrated Ticketing	Yes	Yes
Demand management	No	No

* Note: the Outer Ring Road is the 'Dublin Outer Orbital Road' which has been built by SDCC to link from Tallaght via Kingswood to the N4 and Ballydowd Interchange.

Only projects that are committed or highly likely to proceed prior to Metro West are included in the assumptions for the base case. Metro North has lodged it's Railway Order application and is thus considered highly likely to proceed. Interconnector, Luas Line F and Luas Line B2 are not included. The project such as the Interconnector and the above mentioned are included in the T21 scenario where the assumption is that Metro West is the last project that is introduced.

Base Case Service Patterns

Within the base case there was two service patterns compared against each other and the 'Do Minimum' scenario. These are service pattern 1 and service pattern 2. Service pattern 1 has three different services to and from Tallaght. One third of the services go between Tallaght and Belinstown, another third go between Tallaght and the city centre and the final third goes between Tallaght and Dardistown. Service pattern 2 has all Metro West services running between Tallaght and Dardistown only, thus, all passengers must interchange if they want to travel onwards to the Airport, Swords or the City Centre. Table 3.4 highlights the different service patterns used in the Base Case.

Table 3.4 – Service Patterns Base Case

	Headway (minutes)	
Service Pattern 1 and 2	**Peak**	**Off peak**
Luas: Bride's Glen - St Stephens Green	4	**7.5**
Luas: Tallaght - The Point	8	**15**
Luas: Saggart - The Point	8	**15**
Metro North: Belinstown - St Stephens Green	4	**7.5**
Metro West - Service Pattern 1		
Metro West: Tallaght - Belinstown	12	**24**
Metro West: Tallaght - Dardistown	12	**24**
Metro West: Tallaght - City Centre	12	**24**

Metro West - Service Pattern 2		
Metro West: Tallaght - Dardistown	**4**	**8**

Model Results

The forecast result for both service patterns are presented in table 3.5. The results show a significant increase in trips made on the Metro Network when Metro West is introduced. Service pattern 1 achieves 36.1 million trips to the Metro network compared to 32.5 million trips with service pattern 2. In addition, both service patterns are expected to add over 26 million new public transport trips to the network in 2016.

A considerable proportion of the new trips on the system come from the highway network. This will have a positive effect in terms of traffic decongestion, i.e. taking cars off from the highway. The data also demonstrates a considerable number of new Metro trips would come from bus services.

Some of these bus routes parallel the Metro West proposal and it would seem reasonable that such services would be rearranged with the introduction of Metro West. In that event, it is likely that patronage on Metro West would increase.

Table 3.5 – Model Results Base Case 2016 (per annum)

	Do Min Without Metro West	Service Pattern 1	Change From Do Min	Service Pattern 2	Change From Do Min
Heavy Rail					
Boardings millions	81.7	83	1.3	83.2	1.5
Bus					
Boardings millions	271.2	259.6	-11.6	263.2	-8
Luas					
Boardings millions	81.9	82.4	0.5	82.2	0.3
Metro					
Boardings millions	45.6	81.6	36.1	78.1	32.5
Total Public Transport Boardings	**480.4**	**506.6**	**26.2**	**506.7**	**26.3**

As would be expected, there is higher demand forecast on the Metro network with service pattern 1 (integrated services between Metro West and Metro North) as compared to service pattern 2 (all Metro West services terminate at Dardistown). However overall public transport demand remains broadly constant in both service scenarios.

The output of the RPA model also forecasts revenues from fares for the Metro West route. Table 3.6 shows the additional likely revenue generated on the Metro network as a result of the introduction of the Metro West scheme.

Table 3.6 – 2016 Forecast Revenue per annum Base Case (2002 prices)

	Service Pattern 1	Service Pattern 2
Revenue (2002 prices)	€48.8m	€37.8m

The additional revenue is based on an average yield per customer of €1.34 in 2002 prices. This is higher than what is currently achieved on the existing Luas system.

It should be noted however that the forecast higher yield on Metro West is due to forecast longer distance trips than Luas and the assumption that a distance based fare system (similar to Luas) is used on Metro West. This means the longer the trip the higher the fare. The maximum length of trip possible on Luas is currently 15km; the maximum length of trip possible on Metro West with service pattern 1 is in the order of 35km (25km on Metro West plus 10km on Metro North).

The forecast presented for demand and revenue in 2016 have not been adjusted in tables 3.5 to 3.9 by a demand ramp up. Demand ramp up for the purpose of financial modelling, has been included in chapter 8.

3.4 Capacity of Metro West

Metro West will be designed and constructed so that it can provide adequate capacity in a cost effective manner for the projected levels of initial demand and also

be capable of being expanded to provide additional capacity as demand increases over time.

Increased demand can be met by increasing the capacity in two ways: by either lengthening or combining vehicles in multiple units, or reducing the headway. The system concept makes it more feasible to increase tram lengths initially rather than reducing headways and tram lengths could be increased in increments from 47m initially up to a maximum length of 94m or by coupling two 47m vehicles. This will be compatible with Metro North maximum platform length of 94m.

The estimated initial capacity of Metro West is 5,000 persons per direction per hour (ppdph). This initial capacity will be provided by running 47m vehicles every 4 minutes in the peak period. The system is being designed to be easily upgraded to at least 10,000 ppdph by increasing the length of the vehicle to 94m and maintaining the peak headway at 4 minutes. It is not expected that a further capacity increase will be required within the 30 year appraisal period.

In the longer term, as demand further grows, the service headway may be reduced to 2 minute intervals (30tph) if capacity at the at-grade traffic crossings permits. This would provide capacity for 20,000 ppdph – more than twice the forecast required in the 30 year appraisal period.

It is envisioned that an increase in capacity to longer vehicles at 2 minute headways will require an increase in infrastructure as above. As it is not envisioned that capacity of greater than 10,000ppdph would be required during the life of the PPP concession, it is likely that if such an increase is required then an investment would be necessary.

Appendix 4 to this document shows the expected 2016 lineflows on Metro West as output by the RPA transport model during this scheme appraisal. The base case is based on the assumptions outlined above in tables 3.3 and 3.4.

In service pattern 1 the maximum expected carryings past any point is 3,658ppdph at St Brigid’s Stop. The system must therefore be capable of carrying this load with

room for future growth. In service pattern 2 where the service is only from Tallaght to Dardistown (no interoperation on Metro North) the maximum expected carryings past any point is 3,538ppdph which also occurs at St. Brigid's stop.

The forecast maximum lineflows in both service scenarios fall well within the initial proposed capacity provision of 5,000ppdph and allows for considerable future growth in demand. RPA expects that the initial capacity provision will be sufficient to meet demand for 10 to 15 years after opening.

3.5 Sensitivity Testing

In order to test the robustness of the transport case for Metro West different sensitivities were tested. The first sensitivity test examines the impact of Metro West when all of the public transport projects in the GDA as part of the 'Transport 21' programme have been implemented. This is called the 'Transport 21' scenario. In this scenario the addition of Metro West in the 'Do-something' adds 29.8 million passengers with service pattern 1, and 29.5 million passengers with service pattern 2. The comparison of service pattern 1 and service pattern 2 with the Transport 21 'Do Minimum' scenario 1 is shown in Table 3.7. This highlights that with the Transport 21 projects in place there is still a strong demand for Metro West.

Table 3.7 – Model Results Transport 21 Scenario 2016

	Do Min Without Metro West	Service Pattern 1	Change From Do Min	Service Pattern 2	Change From Do Min
Rail					
Boardings millions	97.8	98.6	0.8	99.4	1.6
Bus					
Boardings millions	229.0	221.2	-7.8	222.8	-6.2
Luas					
Boardings millions	135.4	134.3	-1.2	134.5	-0.90
Metro					
Boardings millions	44.9	74.4	29.8	74.3	29.4

Total PT Boardings	**507.1**	**528.7**	**21.6**	**531.0**	**23.9**

Two further sensitivities were tested to illustrate the impact that a partial delivery of Metro West would have on patronage based on the delivery options discussed in chapter 1:

- Delivery Option 1 – Limited Funding - Porterstown to Metro North
- Delivery Option 2 – No Metro North – Tallaght to Blanchardstown

Option 1 allows the integrated service with Metro North to be implemented, whilst Option 2 would operate as a stand alone system between Tallaght and Blanchardstown.

The results of the demand forecasts for both delivery options are shown in tables 3.8. and 3.9. It should be noted the results are compared to different "Do Minimum" scenarios, Option 2 assumes that Metro North is not in place in both the "Do Minimum" and "Do Something" whereas Option 1 includes Metro North.

Table 3.8 – Model Results Delivery Option 1 (Porterstown to Metro North) 2016

	Do Min Without Metro West	Option 1	Change From Do Min
Rail			
Boardings millions	81.7	80.5	-1.2
Bus			
Boardings millions	271.2	266.6	-4.6
Luas			
Boardings millions	81.9	83.1	1.2
Metro			
Boardings millions	45.6	60.6	15
Total PT Boardings	**480.4**	**490.8**	**10.4**

Table 3.9 – Model Results Delivery Option 2 (Tallaght to Blanchardstown) 2016

	Do Min Without Metro West	Option 2	Change From Do Min
Rail			
Boardings	82.7	85	2.5
Bus			
Boardings	285.2	281	-4.2
Luas			
Boardings	68.2	69.3	1.1
Metro			
Boardings	0.0	17.7	17.7
Total PT Boardings	**436.1**	**453**	**16.9**

Option 1 is forecast to add 15 million trips to the Metro Network and 10 million trips to the overall public transport network. This is on the basis of Metro North being in place. Option 2 is forecast to add 17.7 million trips to the Metro Network and almost 17 million trips to the overall public transport network. Forecasting suggest a strong transport demand for either delivery option.

3.6 Conclusion

The provision of Metro West should be considered of strategic national importance as it will connect towns on the western edge of Dublin City equivalent, or greater, in size. These new towns are also forecast to substantially grow over the coming years. Through planning frameworks it is intended to consolidate development in the area around planned sustainable town centres.

The realisation of these planning objectives will be contingent on the provision of new transport and other infrastructure. Given the nature and extent of the existing development and the projected new development around the Metro West route, it is clear that there is a large existing and expected future transport demand that must be accommodated.

Metro West in addition to, and in combination with, other transport projects identified in Transport 21 seeks to satisfy this existing transport deficit and make provision for future transport needs.

The demand forecasts indicate that the introduction of Metro West will add 36.1 million trips to the Metro network when there are through-services to the city-centre and Belinstown (interoperable with Metro North). The demand is 32.5 million when Metro West services terminate at Dardistown. The per annum revenue in 2002 prices is forecast to be €48.8 million and €31.8 million for both service patterns, respectively.

Metro West's initial capacity, using 47m vehicles at 4 minute headways, will be in the order of 5,000 ppdph. The maximum forecast lineflow past any point is 3,658 ppdph, which is well below the initial capacity provision and allows for considerable future growth in demand.

The infrastructure is being constructed to allow for 94m vehicles so that the initial capacity can be easily increased to 10,000 ppdph as, and if, demand requires whilst maintaining the peak headway at 4 minutes. It is forecast that demand for greater than this capacity will not arise during the 30 year from opening appraisal period
Ultimately the capacity of Metro West may be increased to 20,000 ppdph by reducing the headway to 2 minutes. However this capacity requirement is unlikely to emerge until the much longer term.

With the full build-out of Transport 21 there remains very strong demand for Metro West with in the order of 36.1 million new Metro passengers forecast.
The phased delivery of Metro West also seems viable with forecasts of between 15 and 17.7 million new Metro passengers depending on the phasing option.

4 Cost-benefit Analysis

Chapter Summary

- The delivery of Metro West will act as an economic driver for west Dublin and help to consolidate the area on the western edge of the city as a key employer and economic generator.
- Metro West will itself act as an employer, generating jobs, both directly and indirectly, during the construction and operational phases of the project.
- The Cost Benefit Analysis of Metro West has demonstrated a strong economic case for the project with benefit to cost ratios (BCRs) of between 1.67:1 and 2.21:1 depending on the service pattern and other transport assumptions.
- The economic return of the project is strongest when it is implemented in full and an interoperable and integrated service pattern between Metro West and Metro North is achieved.
- The economic return of Metro West when the complete public transport element of Transport 21 is implemented remains strong with BCRs of 1.89:1 forecast.
- Analysis of the partial delivery of Metro West suggests that a phasing of the project would be economically viable however it would not deliver as much economic return as the full scheme.
- Additional economic benefits, not captured in traditional cost benefit analysis are likely to be generated by Metro West and a qualitative assessment suggests that some of these benefits could be substantial.
- The analysis undertaken by RPA could be considered conservative and has demonstrated a strong and robust economic case for Metro West.

4.1 Methodology

The RPA transport model has been applied to estimate the benefits resulting from Metro West in 2016. The outputs were monetised and discounted in the economic appraisal. They are then compared with the full discounted costs of the scheme over a thirty year appraisal period to give an indication of the economic worth of the project.

The 2016 forecasts of additional patronage and revenue are outlined in Chapter 3. The transport assumptions and service patterns are also outlined in Chapter 3. The service patterns, other than the inclusion of Metro West, are the same in the 'Do-Minimum' and in the 'Do-Something'. Two service patterns for Metro West have been tested in the cost benefit appraisal:

- Service Pattern 1 - Mixed integrated service with Metro North;
- Service Pattern 2 - Tallaght to Dardistown only.

These service patterns are as described in more detail in Chapter 3.

4.2 Economic Appraisal

The parameters and methodology used in the CBA are consistent with the guidance issued by the Department of Transport for appraisal of transport projects. All costs and benefits have been discounted to 2002 for analysis purposes, in accordance with the same guidelines.

A cost-benefit analysis of Metro West was carried out based on the results of the transport model scenarios and the estimates of capital, renewal, operating and maintenance costs of the scheme.

For the economic appraisal it was assumed that:

- The scheme opens in the last quarter of 2015;
- The appraisal period is 30 years from opening;
- The discount rate is 4%.

A conservative approach was taken when extrapolating the results from the forecast year,2016. It is assumed the benefits are constant in each year, that is, they do not grow from year to year. No residual values have been assumed at the end of the thirty year operation period. This is also a conservative approach.

The parameters and assumptions used to develop the economic appraisal are presented in Appendix 5.

As table 4.1 demonstrates, there is a good economic case for the project. The integrated service pattern (Service Pattern 1) gives more benefits despite having increased operating, maintenance cost and renewal costs.

Table 4.1 - Results of Cost-benefit analysis for Base Case

	Discounted to 2002 (€m)	
	Service Pattern 1	**Service Pattern 2**
User Time Savings	**[text deleted]**	**[text deleted]**
Non User Time Savings	**[text deleted]**	**[text deleted]**
Vehicle Operating Cost Savings	**[text deleted]**	**[text deleted]**
Accident Savings	**[text deleted]**	**[text deleted]**
Air emissions Savings	**[text deleted]**	**[text deleted]**
Total Benefits	**[text deleted]**	**[text deleted]**
Operating and Maintenance Costs	**[text deleted]**	**[text deleted]**
Renewals Costs	**[text deleted]**	**[text deleted]**
Capital Costs	**[text deleted]**	**[text deleted]**
Total Costs	**[text deleted]**	**[text deleted]**
Economic Net Present Value (NPV)	**[text deleted]**	**[text deleted]**
Benefit to Cost Ratio (BCR)	**2.21:1**	**1.81:1**
Internal Rate of Return (IRR)	**14.1%**	**10.9%**

4.3 Scenario Testing

In order to test the robustness of the results of the economic appraisal sensitivity analysis has been undertaken by changing the assumptions made.

4.3.1 Transport 21 Network

In this scenario it was assumed that all the public transport elements of the 'Transport 21' programme, for the GDA, was in place in the 'Do-Minimum', and then Metro West services were added for the 'Do-Something'. This reduces the benefits of the project, but it still indicates a good economic case for Metro West as is shown in table 4.2.

Table 4.2 - Results of Cost-benefit analysis – With 'Transport 21' Network

	Discounted to 2002 (€m)	
	Service Pattern 1	**Service Pattern 2**
User Time Savings	**[text deleted]**	**[text deleted]**
Non User Time Savings	**[text deleted]**	**[text deleted]**
Vehicle Operating Cost Savings	**[text deleted]**	**[text deleted]**
Accident Savings	**[text deleted]**	**[text deleted]**
Air emissions Savings	**[text deleted]**	**[text deleted]**
Total Benefits	**[text deleted]**	**[text deleted]**
Operating and Maintenance Costs	**[text deleted]**	**[text deleted]**
Renewals Costs	**[text deleted]**	**[text deleted]**
Capital Costs	**[text deleted]**	**[text deleted]**
Total Costs	**[text deleted]**	**[text deleted]**
Economic Net Present Value (NPV)	**[text deleted]**	**[text deleted]**
Benefit to Cost Ratio (BCR)	**1.89:1**	**1.67:1**
Internal Rate of Return (IRR)	**12.1%**	**10.0%**

The benefits of the project are forecast to reduce in this scenario as some of the transport need is being provided by alternative schemes. For example with the introduction of the Iarnród Éireann Interconnector it may be more attractive for some passengers to make journeys from say Hazelhatch to DCU via interchange with Metro North at St Stephens Green rather than via interchange with Metro West at Fonthill. Similarly other trips may become more attractive via the Lucan Luas line etc.

4.3.2 Delivery Options

Another set of scenarios were tested to examine the impact of the partial delivery of Metro West. The phasing options are as described in chapter 1:

- Delivery Option 1 – Limited Funding – Porterstown to Metro North
- Delivery Option 2 – No Metro North – Tallaght to Blanchardstown

The results of the economic appraisal of these phasing options are illustrated in table 4.3.

Table 4.3 - Results of Cost-benefit analysis – Partial Delivery Options

	Discounted to 2002 (€m)	
	Option 1	Option 2
User Time Savings	[text deleted]	[text deleted]
Non User Time Savings	[text deleted]	[text deleted]
Vehicle Operating Cost Savings	[text deleted]	[text deleted]
Accident Savings	[text deleted]	[text deleted]
Air emissions Savings	[text deleted]	[text deleted]
Total Benefits	[text deleted]	[text deleted]
Operating and Maintenance Costs	[text deleted]	[text deleted]
Renewals Costs	[text deleted]	[text deleted]
Capital Costs	[text deleted]	[text deleted]
Total Costs	[text deleted]	[text deleted]
Economic Net Present Value (NPV)	[text deleted]	[text deleted]
Benefit to Cost Ratio (BCR)	1.60:1	1.87:1
Internal Rate of Return (IRR)	9.7%	10.5%

It should be noted that the service pattern assumed for Option 1 includes integrated services on Metro North (Service Pattern 1). In addition the costs utilised for this high level appraisal are based on a prorated estimate from the base case using relative route distances.

The results of the appraisal indicate that the partial delivery options considered would be economically viable and deliver a strong social return. As with the demand and revenue assessment Option 2 appears to be the strongest. It is also worth noting that neither delivery option offers as much economic benefit as the full scheme (base case) which returns more than twice the value of Option 2 in NPV terms.

4.3.3 Other Scenarios

The scenarios tested above in relation to full Transport 21 delivery and partial delivery tend to reduce the economic benefits associated with the scheme. This should be considered a conservative approach to appraisal but has been undertaken to demonstrate the robustness of the scheme.

There are also however alternative input transport assumptions which are likely to increase the benefit of Metro West but have not been included in this analysis. Examples are:

- No parallel QBC on the corridor (none exists but QBC is assumed in the base case as per DTO strategy);
- Complementary and integrated bus services;
- Improved Metro West journey time by removal of future stops;
- Increased tolling on the M50 as per DTO strategy and M50 EIS;
- Transport demand management including parking charging as per DTO strategy; and
- Continued development beyond local authority projections.

Although none of these scenarios have been assumed in the base case for the project it is likely that during the 30 year appraisal period, some or many of these scenarios may be realised, increasing the patronage and revenue forecasts and increasing the economic benefits of the scheme.

4.4 Other Economic Impacts

A recognised failing of traditional cost-benefit analysis is its inability to include certain economic impacts that are known to exist as a result of transport projects. Some of these benefits are not easily quantified and monetised but are worthy of identification and consideration in project appraisal.

Some of the additional benefits that Metro West will bring which are not generally captured in traditional CBA are:

- Increased employment and commercial opportunity in the area served;
- Improved quality of life;
- Increased integration through transport interchange;
- Greater access for people with mobility impairment;
- Improved social inclusion by serving disadvantaged areas;
- Improved local, regional and national attractiveness;
- Greater opportunity for consolidation of development and reduction of urban sprawl;
- Reduced dependency on car and depleting natural resources; and
- For every euro of investment in Metro West, there will be a multiplication of income generation from the local economy.

Anecdotal evidence from commercial groups and businesses suggest the Luas Red and Green Lines have increased property prices, improved footfall in commercial areas and improved business productivity through improved mobility in the area through which it runs.

4.4.1 Multi-Criteria Analysis

A summary multi-criteria analysis is presented in the 'Project Appraisal Balance Sheet' in table 4.5. Any of the results that require model outputs take the results from the CBA model of the Base Case with service pattern 1. Some of the other results are taken from the 'Metro West – Alignment Selection Study, Stage 2 Report,

Emerging Preferred Route (FINAL'",, which is attached as Appendix 3 to this document.

Under the five criteria of Economy, Safety, Environment, Accessibility and Social Inclusion, and Integration, a five point scaling system has been applied to distinguish between impacts. The impacts are rated under this system as follows:

Table 4.4 - MCA Rating Table

Impact	Rating
Highly positive	**5**
Moderately positive	**4**
Neutral	**3**
Moderately negative	**2**
Highly negative	**1**

Table 4.5 – Project Appraisal Balance Sheet

Criteria	Qualitative Statement	Quantitative Statement	Score
Economy			
Transport Efficiency and Effectiveness	Metro West has a strong economic case, with a positive NPV over the lifetime of the project.	NPV = [text deleted] over thirty years (discounted to 2002) Benefit-cost ratio = 2.21 Internal rate of return = 14.1%	**4**
Other Economic Impacts	Metro West will contribute to wider economic benefits such employment creation, regeneration, and will encourage modal shift	Luas passenger surveys indicate that a third of Luas users previously travelled by car.	**4**
Safety			
	Metro West will contribute to safety objectives by reducing road accident casualties and fatalities due to decreased kilometres on the highway network.		**4**
Environment			
Air quality	Reduced vehicle kilometres will reduce emissions from cars, improving air quality and reducing greenhouse gas emissions.	NPV of value of emissions avoided Population affected by change in PM10 and NO_2 levels The reduction in road kilometres for service pattern 1 is 22.8 million per annum.	**4**
Noise and vibration	Metro West construction and operation will have some impact on noise and vibration. It is however anticipated that negative impacts can be mitigated through design giving a neutral impact.	No monetised information available. Sensitive receptors have been identified along the route.	**3**
Landscape and visual quality	Metro West will generally have a broadly neutral impact.		**3**
Flora and fauna	There will be some negative impacts on known sites. It is however anticipated that negative impacts can be mitigated through design giving a neutral impact.	GIS analysis has indicated that 21 known sites may be affected	**3**
Cultural heritage	Neutral impact		**3**

Criteria	Qualitative Statement	Quantitative Statement	Score
Land Use	Due to the segregated nature of the Metro West's system concept there will be some land severance in places along the route length. However in the context of the overall scheme the negative impacts will be outweighed by the substantial benefits of redevelopment and regeneration that can be gained by its introduction.		**4**
Water resources	There are several surface water crossings; also, there may be some impact on aquifers. It is however anticipated that negative impacts can be mitigated through design giving a neutral impact.	Surface water crossings = 9 Percentage of route with impact on aquifers = 69%	**3**
Accessibility and Social Inclusion			
Vulnerable groups	Metro West will improve accessibility for vulnerable groups. The infrastructure will be fully accessible for those with mobility and sensory impairments.	Using 2006 Census results approximately 27,000 people that are classified as unemployed, unskilled, or with an education level of 3 or less are within 1km of the route.	**5**
Deprived geographic areas	Metro West serves a number of areas designated as disadvantaged.	Metro West serves 4 RAPID areas.	**5**
Integration			
Transport Integration	Metro West provides a number of transport interchange points – in particular with bus services at Tallaght, Clondalkin, and Blanchardstown. There will be interchange points with the Citywest Luas Line, the Red Line, the Lucan Luas Line and Metro North. Metro West will also provide with Iarnród Éireann Maynooth and Kildare routes at Porterstown and Fonthill. Metro West is quite segregated and will be constructed in a large number of Greenfield areas - this will reduce the impact on the operation and development of other transport services and infrastructure.		**5**

Criteria	Qualitative Statement	Quantitative Statement	Score
Land Use Integration	Metro West is compatible with the Development Plans in Fingal and South Dublin County Councils, and the Regional Planning Guidelines. Because it will run through many undeveloped areas it will allow local authorities to have higher density developments, allowing consolidation of development and reducing urban sprawl and associated car dependency.		**5**
Geographical integration And Other Government Policy Integration	Metro West is also part of the National Development Plan. Metro West allows easier access to the airport and serves several national primary routes, and rail and Luas/Metro lines. As such, supports the objectives of the national spatial strategy.		**5**

4.4.2 Economic Generation

In addition to serving major areas of population, Metro West will serve some of the largest employment and other centres of economic activity in the region. Metro West will serve directly many of the largest retail centres such as 'The Square', Tallaght, Liffey Valley Shopping Centre, and Blanchardstown Shopping Centre. It will also serve 'The Pavilions' in Swords and core retail areas in the city centre through interoperability with Metro North. The linking of these retail centres with the population centres and the city centre with high quality public transport will contribute to increasing the corridor as a retail destination and lead to increased footfall.

Metro West will also connect many of the largest employers in the region such as CRH, Bristol-Myers Squibb, IBM, eBay, PayPal and other major employers such as Intel, Wyeth and Pfizer through interchange with radial transport systems. Many of these companies are major international investors in the Irish economy and serving their campus with quality transport infrastructure will help to secure their continued investment in the state.

Metro West will facilitate greater movement of people between these facilitates and other indigenous businesses along the corridor and importantly will also provide these businesses with direct access to Dublin Airport and the city centre. The effect of this increased mobility will have a positive effect in the area as an attractive place to either locate or invest and help strengthen the region as an international hub through linkage with Dublin Airport.

Metro West will provide connections between many of the regions third level institutes, Tallaght Institute of Technology, Blanchardstown Institute of Technology, Dublin City University, Trinity College Dublin and via interchange connects NUI Maynooth, National College of Ireland etc. Students traditionally rely on public transport and providing direct links between these institutes will increase the possibilities for exchange and cooperation. Providing direct transport links to these institutions along the corridor will also increase the opportunity for access to education for more disadvantaged groups and Metro West will link these educational

centres to businesses in the region, increasing the opportunity for cooperation in research and development areas which are critical in maintaining competitive advantage in an ever increasing global economy. This is particularly the case in the IT and Pharmaceutical, sectors which have a large presence along the route of Metro West.

Metro West will also generate a large amount of new employment during the lifecycle of the project and will become a major employer in the region. It is expected that up to 1,000 jobs will be created directly at the peak of the construction programme. Many more jobs will be created as an indirect consequence of the project to support the construction process.

It is also expected that, once operational, the project will create in the order of 300 direct jobs related to the operation of the service and maintenance of the infrastructure. Many more indirect jobs will be created to support and compliment the ongoing service operations.

It is difficult to quantify many of these employment and economic benefits that will accrue as a result of the project and it is a failing of traditional cost benefit analysis that such benefits are not captured. It is however expected that Metro West will be a significant contributor to the regions economy both directly and indirectly.

4.5 Conclusion

The Metro West scheme displays a strong economic cost-benefit ratio of 2.21:1. The economic return of the scheme is strongest when a mixed service pattern with Metro North is assumed however the case remains strong when there is a simple service pattern assumed with a benefit-cost ratio of 1.81:1.

The project also produces a strong economic return when, and if, the entire transport infrastructure proposed under 'Transport 21' is assumed and cost-benefit ratios of greater than 1.67:1 emerge.

Analysis of the partial delivery of Metro West suggest that a phasing of the project would be economically viable however it would not deliver the substantial economic return of the full scheme.

The appraisal undertaken by RPA could be considered conservative in approach as beneficial transport scenarios have been excluded from the base case and sensitivity tests. The analysis however indicates a strong and robust economic case for the project.

Traditional cost-benefit analysis fails to include many of the additional benefits that are known to exist as a result of investment in transport projects. Additional economic benefits are likely to be generated by Metro West and a qualitative assessment suggests that some of these benefits could be substantial.

It is expected that Metro West would recapture some of its investment through job and economic generation based on evidence from other schemes, for example the London Docklands Light Railway. (Note UITP report 'Financing Light Rail'of July 2008, suggested 50% of the capital cost of DLR was recaptured through overall office development and job creation).

5 Capital Cost

Chapter Summary

- The capital cost estimates reflect the emerging preferred route and current system concept of project definition and development.
- The estimates were prepared using cost information from international consultants and historical and current cost data for Luas projects reflecting the anticipated demand, capacity and works required for Metro West.
- The total direct capital cost of Metro West is estimated to be [text deleted] including risk/contingency allowance of [text deleted] in 2008 prices.
- The Proposed total Exchequer Funding of Metro West is estimated to be [text deleted] including risk/contingency, in 2008 prices and covers funding of advance works, land acquisition, RPA Project management and planning costs.
- Current cost estimates for Metro West are in excess of the allocation originally identified in 'Transport 21' which is due to increase in project scope and escalation effects.

5.1 Methodology

The capital cost estimates prepared for the purposes of the OBC reflect the current stage of project definition and development and the specific design objectives and criteria available and appropriate for the development of the design for Metro West. The current design reflects the following tasks:

- The emerging preferred route and current system concept;
- Preliminary vertical and horizontal alignments; and
- Preliminary identification of proposed Structures, Stops, interfaces with Irish - Rail, potential Depot locations and configurations, Park & Ride sites, and Metro North / Luas interfaces.

In the preparation of capital cost estimates the following factors have been considered:

- International market conditions;
- Irish economic growth and labour rates;
- Industry norms and requirements; and
- Historical cost data based on Luas constructed and tendered projects.

Metro West unit costs for the major cost categories in the attached tables are comparable to outturn costs of comparable schemes encountered in Ireland and the UK.

5.1.1 Overview

The stage 1 preliminary assessment of capital cost estimates were prepared initially by external consultants engaged in the preparation of the preliminary design and choice of the emerging preferred route. In the preparation of these estimates external consultants did not have access to existing RPA's database of historical cost information. This provided an initial level of benchmarking of RPA costs.

The stage 2 preliminary cost estimate was developed from the historical costs database retained by RPA, and estimates were prepared by external consultants and reviewed in accordance with RPA data and adjusted to reflect the current state where deemed appropriate.

5.1.2 Basis of Capital Cost Estimate

The general assumptions and parameters are summarised below:

- Cost estimates have been prepared in January 2008 prices;
- The construction cost estimates have been presented in both net values and also adjusted for risk/contingency, based on qualitative assessment and professional judgement;
- The estimate is based on the emerging preferred route, stop locations, major and minor structures, depot size and location, interfaces with Luas / Metro North and Iarnród Éireann, and the system concept;

- Generally accepted cost measures have been applied from both international and Irish sources and project experience, including selective major structure prices, pre-tender unit prices, industry standards, comparable unit costs and Irish rates and norms to principal quantities where possible; and
- The capital costs estimates reflect the current level of project design. It is anticipated that as the project develops, estimates will be refined to reflect both the output specification, and the evolving design leading into the Railway Order application. The cost estimates will be developed through a series of estimate reviews and risk, value engineering and value management workshops.

The estimates presented in this chapter include allowances for the following capital cost items:

- Design of Metro West infrastructure;
- Construction of Metro West infrastructure;
- Design, manufacture, shipping to site and installation of all equipment;
- Relocation of existing equipment and services;
- Testing, commissioning and warranty of all new equipment;
- Staged delivery of works;
- Rolling stock; and
- Property and land acquisition;

The current estimating tolerance is approximately +/- 25% based on the level of design information and the knowledge of costs for projects of a similar nature. This level of tolerance is to be expected at this stage of project design and reflects best international practice, and also the potential changes arising from the development of the reference design that may affect the forecast capital cost. As the project evolves over its life cycle it is anticipated that the levels of uncertainty will reduce to +/- 15% when the reference design is completed and the RO Application is ready to lodge.

5.2 Total Net Direct Capital Costs

The net direct capital costs are cost exclusive of risk/contingencies, and are presented in 2008 prices.

The net direct capital cost estimates presented in Table 5.1 are based on the current project design and reflect the calculation methodology as presented above. The unit costs of construction have been derived from local and International experience of similar works.

Table 5.1 - Net Direct Capital Cost Estimates (€ millions, 2008 prices)

Cost Categories	Cost € millions
Utility Diversions	[text deleted]
Bridges and Structures	[text deleted]
Selective Enabling Works	(text deleted)
Infrastructure – Civil & Track work	(text deleted)
Infrastructure - Mechanical / Electrical	[text deleted]
Rolling Stock (incl. Trial Running)	[text deleted]
Depot	[text deleted]
Park & Ride	[text deleted]
Land & Property Acquisition	[text deleted]
Total Net Direct Capital Cost	[text deleted]

5.2.1 Utility Diversions

Currently, there is insufficient design to support an accurate level of costing for utility diversions/enabling works. Consequently, each portion of the emerging preferred route was divided into three classifications representing anticipated densities of required utility diversions. The overall length of each classification High, Medium and Low were priced at unit rates per kilometre reflecting current projects under construction.

5.2.2 Selective Enabling Works

Selective enabling works are likely to be reasonably small in scope and cost and will be identified as the design of the project advances and scope of the entire works becomes more defined. Typically such works will be utilising opportunities which will allow savings to the Metro West project in terms of cost, duration or risk transfer. For example an opportunity may exist to implement part of the Metro West scope as part of a separate NRA or other works contract in an area where Metro West is planned to interface in the future such as at Newlands Cross.

5.2.3 Bridges and Structures

There are 13 structures along the Metro West route. Structures range from the signature Liffey Valley Bridge with a span of 365m to minor structures over the Cammock River of 5m span. In addition to bridge structures, significant retaining walls and embankments form part of the scope.

5.2.4 Ticketing

Allowances have been included for an average of three ticketing machines including validators and software controllers at each stop.

5.2.5 Infrastructure – Civil

Allowances have been included for all civil works necessary to complement the construction of the trackworks. Such works include site works, road works including Drainage, Stops, and interfaces with Iarnród Éireann, Metro North and Luas Lines, remodelling of road junctions, road and traffic signalling, and miscellaneous minor civil works.

5.2.6 Infrastructure – Mechanical & Electrical

The scope of Mechanical & Electrical works include the provision of the Overhead Line Equipment (OHLE), Ducting, Power, Communications and SCADA systems, Substation Structures including Fit-Out and a signal control centre.

5.2.7 Infrastructure – Trackworks and Track Equipment

It has been assumed at this time that all of Track work will be Dual Running Embedded Track. It is possible that some savings may be realised should it be

decided that ballast or alternative cheaper track types are used. Allowances have also been included for crossovers, turn-outs and connections to existing and future Metro and Luas Lines.

5.2.8 Rolling Stock

Allowances for 40 vehicles have been included in the estimate. Costs per vehicles have been extrapolated from recent contracts for the supply of 53m vehicles and spares.

5.2.9 Depot

The location, size and dimensions of the Metro West Depot have not been finalised at this stage. Provision has been made in the estimates for a Depot capable of servicing, maintaining and stabling forty 47m vehicles. Workshop, administration, car parking, staff and control facilities have also been included.

It should be noted that the RPA is in the process of concluding a deal with the land owner at the depot site that will allow the provision of a depot sized to accommodate forty (40) 94m long vehicles. The land area is approximately 12 hectares and the deal emerging would allow this land to be secured within the budget allocation set out in the OBC.

5.2.10 Park & Ride

The location, type and number of car parking spaces have not been finalised at this stage. Provision has been made in the estimates for at-grade park and ride facilities for 1,050 car parking spaces.

5.2.11 Land & Property Acquisition

The evaluation of Land & Property acquisition has been undertaken by property consultants. Land take areas have been calculated by assuming a line wide corridor of 12m. Costs have been calculated using average rates per acre, appropriate for location and other factors. In addition, allowances for the acquisition of individual properties and land, for example the Depot site, have been included.

It is anticipated that negotiations with individual land and property owners may alter the costs going forward. However, it is also envisaged that bi-lateral agreements with developers may offset any inflation of the capital costs estimates related to land and property acquisition. It is assumed in this estimate that the full market price of land will be paid by RPA and no adjustment has been made to reflect any emerging agreements.

5.3 Total Capital Costs

The total capital cost account for the net direct capital cost as presented above, and in addition includes:

- Fees incurred by RPA to design, manage and implement the project;
- Inflation rate escalation over the project implementation period based on annual percentages applied to each of the multiple cost items.
- The risk/contingency developed for this preliminary capital costs estimate have been developed by the allocation of risk and opportunity allowances to each cost category in the estimate. This method of calculating risk/opportunity will be replaced by full quantitative cost and time risk analyses;

5.3.1 Risk/Contingency

A preliminary assessment of risks associated with each cost category has been made. The overall risk/contingency allowance amounts to [text deleted] of the Direct Capital Costs. While the risk allowance may appear to be low, there are a number of factors that provide higher confidence in the cost estimates, namely:

- Metro West is at-grade for the entirely with the exception of elevated structures. It does not have any tunnelling, underground structures or other highly specialised methods of construction and will be similar in nature to the Luas line B1 currently under construction.

It should be noted that the risk allocation in this preliminary estimate is high level and does not reflect any emerging procurement strategy. A refined risk allocation and

valuation will emerge as part of the consideration of the PPP strategy and in particular in the preparation of the Public Sector Benchmark (PSB) as required under the relevant guidelines.

5.3.2 Fees

Allowances have been included in the estimates for an appropriate level of fees to be incurred by RPA who will prepare the reference transaction documentation, undertake the tender and award process and administer the PPP Contract up to the commencement of operations.

5.3.3 Inflation Escalation

Allowances for inflation have been included to take into account the impact of inflation on construction and other costs over the construction period. Inflation rate for Rolling Stock is 2.5% and 5% for all other asset categories.

The assumed period for Advance & Utility works is Aug 2010 - Mar 2012 inclusive. The PPP Contract, excluding design covers period Jul 2011 - Dec 2014. Above dates exclude rolling stock procurement, commissioning and trial running.

5.3.4 VAT

All cost estimates are exclusive of VAT.

Table 5.2 - Total Capital Cost Estimates

Cost Categories (€ 000's)	Net Cost Excl Risk	Risk	Total Cost 2008	Inflation[3]	TOTAL Nominal Value
	A	B	C = A + B	D	E = C + D
Client Cost incl PM	(text deleted)	(text deleted)	62,234	12,118	74,352
Property Acquisition	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Utility Diversions	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Selective Enabling Works	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Subtotal Exchequer	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)

[3] Estimated value of inflation of the project life.

Bridges and Structures	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Infrastructure – Civils & Trackwork	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Infrastructure - Mechanical / Electrical	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Rolling Stock (incl Trial Running)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Depot	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Park & Ride	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Total Direct Capital Cost	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)

5.4 Comparison with Transport 21 Allocation

Transport 21 as announced by the Minister for Transport in November 2005 proposed a delivery profile for Metro West based on an assumed project scope. Transport 21 assumed the route would run from the Luas Red Line (at Red Cow) to a connection point with Metro North, south of Dublin Airport. The project would be delivered in phases as outlined in chapter 1 of this document. The scope of the project was estimated at 23.5km.

A preliminary allocation of [text deleted] including VAT, in nominal terms which was based on an estimate that Metro West would cost approximately [text deleted] in 2004 prices and an additional blended VAT allocation of 14%.

Removing the VAT from the Transport 21 allocation suggests a Total Capital Costs for Metro West of [text deleted]. This when compared to the total capital cost estimate presented in table 5.2 shows a variance of approximately [text deleted] in nominal terms.

There are a number of key critical reasons why the cost estimates are now different which can be broken down into two key cost headings:

5.4.1 Scope

The Transport 21 cost estimate was based on a project route of approximately 23.5km (from Red Line to Metro North). The current route length is approximately 25.5km.

The estimate for Metro West was based on Luas outturn costs and no allowance was made for the additional cost of a Metro system. Such costs include by way of example:

- additional lands for stops for longer vehicles;
- additional systems for interoperability with Metro North;
- larger depot area (longer vehicles);
- greater segregation from other road users (more bridges and structures).

5.4.2 Escalation

The transport 21 programme envisioned the route would be delivered in four phases with the first phase open in 2010 and the final phase delivered in 2014. This means that a substantial amount of expenditure would occur in the early years up to 2012.

The current programme envisages the project to be delivered as a single phase (full route) and completion of the project in 2015. Thus inflation of considerable costs due to later years of expenditure results in a greater variation of estimate in year of spend terms than when compared to the common price base.

5.4.3 Variance

Based on an assessment of the current project scope, the spend profile of the project and target delivery dates in comparison to that of the Transport 21 allocation , the analysis suggests that approximately [text deleted] (52%) of the variance in nominal terms is accounted for by escalation and the remainder is due to the change of scope.

5.5 Exchequer Element of Project Costs

The PPPA sets out the contractual structure and the scope of the PPP arrangements. Additionally, further rationale for scoping of the Exchequer funding is presented in section 9.2 of this document. The element of the project to be funded by the Exchequer is presented below. The Cost Estimates for this Exchequer funding include risk contingency are presented below in both 2008 prices and nominal values.

Table 5.3 - Cost Estimates funded by the Exchequer

Cost Item	Exchequer Cost € million	Contractual Risk associated
Utility Diversions	[text deleted][4]	Advance Works
Selective Enabling Works	[text deleted]	
Land & Property Acquisition	[text deleted]	Land Acquisition
Fees	62.234	RPA Project Management & Planning Process
Subtotal Exchequer Funding (Jan 2008 prices)	**[text deleted]**	
Inflation Escalation	[text deleted]	
Subtotal Exchequer Funding (Nominal)	**[text deleted]**	

The current total Exchequer contribution is estimated to be approximately 28% of the total project capital cost. These costs relate to both works and services that are required in advance of the PPP contract or are related to risks best managed by the RPA.

The current total Exchequer contribution reflects the proposed risk allocation of the project, which were agreed in principle by the NDFA and are based on best practice in PPP procurement.

[4] The utility diversion works estimate is based on a high, medium and low impact assessment of utility density in each section of the route. Risk assessment suggests a high cost in high density areas and a cost saving in low density areas. The net effect is a balancing out of costs/risks.

5.6 Conclusion

Capital Costs are preliminary and consistent with design and project definition at this stage of project development.

The total direct capital cost of Metro West is estimated to be [text deleted], including risk/contingency allowance of [text deleted], in 2008 prices.

The estimated cost of the Metro West project is in excess of the original allocation as defined in Transport 21. This variance is due to a change in scope, primarily an additional 2km of route and a change in the implementation programme resulting in cost escalation.

The Proposed total Exchequer Funding of Metro West is estimated to be [text deleted] , including risk/contingency, in 2008 prices. This is approximately 28% of the total project cost and covers funding of advance works, land acquisition and RPA Project management and planning costs.

It is anticipated that Value Engineering studies and further design development may result in cost savings which at this point in time can not be quantified.

6 Property and Development Contributions

Chapter Summary

- Metro West will cause local development potential and property values to increase significantly along the corridor.
- To reduce the Exchequer funding requirement to the project, and to capture some of the likely benefits to the private sector, RPA is seeking to maximise all opportunities to obtain contributions from the private sector.
- A supplementary development contribution scheme under Section49 of the Planning & Development Act 2000 is being implemented by SDCC and FCC to support Metro West.
- The levy contribution will be an important source of funding for this project and a preliminary estimate on funding potential from development levies ranges from €198 to 298 million.
- RPA is pursuing agreements with land owners along the route to seek to transfer land interests to the RPA at no cost or at a cost below market price. This will reduce the initial financial burden on the Exchequer.
- Initial estimates suggest that RPA may reduce the cost of property on the project by approximately €50 million subject to agreements.
- In addition to the provision of lands RPA is pursuing the provision of Metro West infrastructure to the project by adjacent developers. Initial negotiations suggest there is scope for such provision except for Park and Ride and some stop locations.
- RPA is also negotiating direct financial contributions to the project from adjacent land owners where equitable benefits can be identified.
- Failure to advance the project may result in the loss of this substantial opportunity to reduce the financial burden on the Exchequer.

6.1 Potential Levy contribution

Section 49, Planning and Development Act 2000, permits local authorities to make Supplementary Development Contribution Schemes (SDCS) to support public transport infrastructure. Metro West will increase local development potential and

promote property value increases along its corridor. A Section 49 Levy Scheme will allow the project to capture some of this increased value, thereby becoming an important source of funding. Section 49 Levy Schemes are already in place for the Metro North and Luas Line B1. Luas Line C1 has a similar scheme which is enacted under Section 25 of the Dublin Docklands Development Authority Act 1997.

South Dublin County Council and Fingal County Council are both in the process of implementing a SDCS to support Metro West based on the selected route. It is expected that the schemes will be in place by the end of 2008 and that levy contribution will commence during 2009, as planning applications are processed. In addition to implementing the SDCS, both local authorities intend to protect the route of Metro West through variation of the respective county development plans.

At this stage a broad assessment of the potential development contributions has been made. When the local authorities have defined the scheme and it has been ratified by the relevant elected members, a more detailed forecast of levy contribution can be made.

The critical factor in determining the levy yield is the area that is likely to be developed within the SDCS boundary and the category of development. Assuming the proposed schemes are similar to previous SDCS's the scheme will cover a catchment area of approximately 1km either side of the route. Portions of this catchment are already developed and other portions are likely to remain, or will be designated as, open/amenity space over the life of the levy scheme.

It is estimated that 70% of the catchment area is likely to yield contributions under a SDCS and using rates that are based on other similar levy schemes that have been adopted by the relevant councils allows a preliminary forecast to be made. Table 6.1 outlines minimum levy rates which would be expected to be applied to developments in respect of the Metro West project.

Table 6.1 - Proposed Levy Rates

Possible Levy Rates (2008 prices)	
Dublin City Council (Metro North)	
Residential (per unit)	€2,573
Commercial (per metre sqd)	€23.47
Retail (per metre sqd)	€33.81
Fingal County Council (Metro North)	
Residential (per hectare)	€319,725
Commercial (per hectare)	€727,650
Retail (per hectare)	€992,250
South Dublin County Council (Kildare Route Upgrade)	
Residential (per unit)	€1,995
Commercial (per metre sqd)	€23.47
Retail (per metre sqd)	€30.45

Applying the potential rates indentified in table 6.1 and a typical indexation rate of 5% per annum generates a preliminary forecast of contributions with the assumed catchment. This inflation rate is a reasonable estimate, when compared to average cost of borrowing of circa 7% to private developers. Table 6.2 illustrates the forecast levy contribution for Metro West over a 30 year period, discounted to present value (2008) at a rate of 4%. Thirty years is a typical period for which similar levy schemes apply. Forecasts have been undertaken in 3 scenarios:

- Mid Scenario – 20% build out of residential, commercial and retail in FCC and SDCC with 0% in DCC
- Low Scenario – 16% build out of residential, commercial and retail in FCC and SDCC with 0% in DCC
- High Scenario – 24% build out of residential, commercial and retail in FCC and SDCC with 0% in DCC

It will be a requirement of the levy schemes that RPA confirms within a defined period if funding is available from the public sector to pursue the project. It is

unreasonable to continue collecting the levy if there is not a commitment to proceed with the project.

Table 6.2 - Estimated Development Levies

Estimated Potential Levy contribution (PV € millions)*	
Low Scenario	€198
Mid Scenario	€248
High Scenario	€298

*Note: *The estimated development levies were calculated in the second half of 2008 and reflect the economic forecasts at that time.*

The forecast provided makes the assumption that granted planning permissions can be levied in respect of two separate contribution schemes. Approximately 20% of the levy scheme area has potential to overlap with other proposed projects. This may have an impact if it is deemed inequitable to impose two supplementary contribution scheme levies on the same development.

It should be noted that the basis of the levy calculation is conservative and assumes a low level of build out in the catchment area over the duration of the scheme and that no existing developed land is redeveloped. A revised forecast of levy contribution will be derived once the local authorities have finalised the proposed schemes.

A substantial portion of the Metro West catchment has been zoned for development and it is expected that significant development will take place on these lands in the medium term. Failure to proceed with the Metro West project will result in a loss of opportunity to gain funding for the project as this development occurs. Once development has taken place no levy can be accrued.

6.2 Direct Contributions from Developers

Negotiations are being held with various developers with a view to concluding legal agreements under which they would make further contributions, over the levy contribution, to the Metro West project. The main objective is to minimise the amount of Exchequer funding required for the procurement of the project. It is hoped that when these negotiations are complete the outcome relating to direct contributions, will be divided into two categories namely:

1. The transfer of land interests under their ownership which is required for the project to RPA at a reduced rate. The transfer of other land interests, at no cost to the RPA, such as rights of way, temporary access for construction, and the right to run the line over certain structures which will be provided by developers.

2. Provision of some parts of the infrastructure by developers.

6.2.1 Transfer of land interests

The estimated value of land required to deliver Metro West is [text deleted]. This figure is included in the cost estimate shown in chapter 5, 'Capital Estimates'. The area of the land is based on a permanent land take of approximately 12m in width over the length of the route and a further allowance for approximately 30 acres for a depot site. This allowance is generous but makes provision for additional costs which may emerge due to temporary land take, substation requirements and design changes.

In relation to the transfer of land interests, the overall value of the contributions which RPA expects the private sector to make to the Metro West scheme has been estimated at €50 million. This is based on the current status of negotiations with land owners and developers. Such agreement to transfer lands would also reduce risk of capital cost increases associated with the acquisition of these lands through the compulsory purchase process.

Negotiations to achieve contributions will be undertaken with all property owners along the route and have already commenced with many of the main property owners and developers along the route. In addition there are number of state bodies which hold significant lands which have been identified as required for Metro West. RPA expects that agreements will be made with such bodies to secure these lands at reasonable cost to the project.

6.2.2 Provision of infrastructure by Developers

As with previous projects RPA will seek the provision of infrastructure from developers. This may be the delivery of the track system, the stops, structures, park

and ride or other facilities or parts there of. Agreements of this nature, where elements of the project are constructed by a developer form a net contribution to the project. RPA anticipate at this stage that a limited number of stops will be funded by developers and that some Park and Ride may be delivered through integration with adjacent development at little or no cost to the project.

In many instances contributions, either in terms of land, infrastructure or direct capital will be offset against potential levy contribution. This however is a desirable mechanism as it offers certainty of funding up front reduces the initial burden on the Exchequer and insulates the project from land value escalation.

6.2.3 Other Elements of the Agreements with Developers

It is intended that any proposed agreements will also provide for the following:

1. The developers support the Metro West project and agree any conditions prior to Railway Order. This will greatly reduce the risk of a protracted oral hearing and increases the chance of a successful outcome. The local authorities, most of the landowners in the catchment area and RPA have cooperated in arriving at the optimum solution in relation to the essential elements of the scheme.
2. The agreements will be contingent on obtaining a Railway Order for the project as the project cannot proceed without the necessary statutory powers.
3. RPA is to actively pursue the project and in particular prepare the necessary documentation for a Railway Order.

6.3 Conclusion

Initial discussions and negotiations suggest that an opportunity exists to obtain a significant contribution from the private sector towards financing the delivery of the Metro West project.

Private contributions can be achieved through levy contribution under Supplementary Development Contribution Schemes (SDCS) and through bi-lateral agreements with developers and landowners along the route.

Preliminary estimates indicate that a SDCS could generate a levy income of between €198 and €298 million towards the cost of Metro West project. South Dublin and Fingal County Council intend to ratify a SDCS for Metro West before the end to the year.

RPA will also seek direct contributions from developers. Initial estimates indicate that a saving of circa €50million could be achieved against the value of land by transfer of lands at reduced or no cost to RPA. It is expected that such contributions would generally be offset against levy payments.

It may be a requirement of the agreements with the developers that RPA confirms if funding is available from the public sector to pursue the project and that RPA commits to securing planning powers for its delivery.

Agreements with the owners of the land which is required for the scheme will reduce the risk of cost escalation associated with items such as objections resulting in difficult conditions attached to the order, difficulties in finalising details associated with property acquisition etc.

Failure to advance the project may result in the loss of the substantial opportunity, afforded by the proposed levy schemes and the agreements with other parties, to reduce the financial burden on the Exchequer.

7 Risk Assessment

Chapter Summary

- Optimal allocation of all project risks between the public and the private sector is the underpinning principle for achieving cost efficiencies and value for money.
- RPA has started a rigorous analysis of project risk management on Metro West which is captured in a project risk register.
- This process is part of an enterprise risk management approach in RPA.
- Risks have been identified through the project lifecycle and defined as having impact on either programme or cost or both.
- The PPPA considered the appropriate apportionment and allocation of risk between the public and private sector and suggests the cost and risk elements of Planning and Railway Order, Land Acquisition, Advance Works and RPA Project Management are best managed and delivered by RPA.
- The PPPA also suggests that other project risks are either shared or transferred to the private sector under the contract.
- The final risk allocation will only emerge on conclusion of the contract negotiations under the procurement process.
- Further details regarding the contractual scope, the PPP Arrangement and Contractual Structure are detailed out in the PPP Assessment Report, which is annexed to this report.

7.1 Introduction

Risk assessment is an important aspect of project appraisal, and appears in a number of different contexts. This chapter predominantly deals with the Metro West risk process and establishment of the risk register.

The PPP transaction risk register will form part of the overall Metro West risk register, and indeed the RPA Enterprise risk management approach. The PPP risk allocation

and broad outline is further detailed in the in the PPP Assessment Report, which is annexed to this report.

The objective for risk allocations between the public and private sector for PPP projects is to ensure optimal risk transfer between the parties, so that the risks reside with the party best able to manage and control those risks. This is the underpinning principle in achieving cost efficiencies and value for money.

As project design and consultation with the market proceeds, RPA and its advisors will have a better understanding of these risks and will be able to quantify their impact on project cashflow with greater confidence. The risk management process and work to date is discussed in this chapter.

7.2 Objectives

The overriding objective of the PPP structure is to have clear lines of responsibility for the ownership and management of risk to achieve effective risk transfer to the best party to manage it and to obtain value for money from the investment to the Exchequer.

7.3 Methodology

The Metro West Risk register is the primary source of information and record for all risks on the project. Risks include all uncertainty related to technical, legal, commercial, financial and health and safety issues and opportunities.

RPA have developed a formal risk management process for Metro West. Risk assessment is a cyclical process which commences at the beginning of each project and it continues throughout the life of the project.

Infrastructure projects that are procured using Public Private Partnerships will commit Contracting Authorities to significant investment throughout the duration of the Project Agreement. It is therefore important that RPA establish appropriate plans to manage the risks that they retain.

For those risks that are transferred to the Contractor or PPP company, the risk management plan will demonstrate how the contract facilitates the transfer of such risks, and set out the plans of the Contractor to manage those risks that have been allocated to it.

The Metro West project is at an early stage of planning and engineering. This means that capital costs have been estimated through the application of standard unit costs to a number of asset classes. There is consequently some uncertainty over both the nature of the project and the prices which will be charged for its components. It should be noted the costs estimates include in this outline business case have separate allowances for risk and contingency in acknowledgement of this uncertainty.

Under a PPP, the private sector will typically bear a larger proportion of the cost and programme risks than would typically be the case under a traditional procurement. The PPP Company would typically finance a large portion of the capital investment and the majority of the operations, maintenance and lifecycle costs. The PPP is not normally paid until the project service is delivered and available for use.

7.4 Work Completed to Date

7.4.1 Early-Stage risk workshops

RPA and its advisory team have conducted a series of workshops to identify project specific risks. The goal of these workshops was to develop a project risk register. Major project-specific risks were also identified, as were process risks, procurement risks, and other risks defined as those that could cause delay at various stages in the planning and procurement process prior to financial close.

7.4.2 Risk register

At this early stage of design and project definition broad categories of risks within each heading have been addressed. The risks will be further expanded and detailed out as the project develops. In considering risks, both the effect on cost and the effect on programme will be considered. These headings are:

- *Land Acquisition Risk* – includes the risk that the land initially required may not be available on time or may cost more than budgeted;
- *Planning and Railway Order Risk*– includes the risk that the Railway Order for the construction and operation of the project may be refused, the risk that unacceptable conditions may be applied to any permission granted, and the risk that the planning process may take longer than anticipated and cost more than expected;
- *Utilities Risk* – includes risks around the diversion or protection of gas, electricity and other utility equipment on the route;
- *Project Procurement & PPP Contract Management Risk* - includes risk of a poorly selected or managed contractual relationship, various interfaces with other parties, contractual obligations, implementation of the procurement process and principles, etc.;
- *Design Risk* - includes the risk that the design solution or output specification adopted may not work satisfactorily and may fail to meet the requirements of the project, the risk that new technical standards may be introduced during the design phase, and the risk that the design process itself may take longer than anticipated and cost more than intended;
- *Construction Risk* – includes the risk that factors such as changes in labour and materials costs, inadequate cost management, poor estimation of quantities, work not done to standard, adverse site and weather conditions, protester action, and the failure of contractors to perform may lead to construction time and cost overruns;
- *Commissioning Risk* – includes risks around system integration and trial operations including approvals and certification by local authorities and other relevant bodies, which could delay the opening date;
- *Maintenance Risk* – includes risks that operating and maintenance costs and performance may be poorer than anticipated;
- *Demand Risk* – includes the risk that usage of the service varies from the level forecast, and the risk that revenues generated from passengers are lower than expected;

- *Regulatory / Legislative Risk* – includes the risk that a regulatory or legislative change may be made that significantly effects the ability of the Contractor to continue to meet its contractual obligations;
- *Environmental Risk* - includes the risk related to the EIS process and the risk that significant adverse environmental impacts from the project emerge which were not anticipated and must be mitigated;
- *Financial Risk* – includes the risk that factors such as changes in financial market conditions, fluctuations in exchange rates, variations in financing costs and changes in indexation assumptions may lead to operating or capital losses;
- *Safety Risk* – relating to safe design, construction, operation and the protection of the health and wellbeing of all project stakeholders;
- *Technology & Obsolescence Risk* – over the life of the project the risk that equipment may need replacing earlier than expected, or may be more expensive to replace;
- *Interface with Metro North Risk* – It is the risk associated with the necessary cooperation and information share to ensure compatibility of all project elements. This is valued as high by the market, as a result of ensuring the need for proper compatibility of all project elements including information sharing of relevant documents and design;
- *Interoperability & Interface with Other Transport Risk* – risk related to failing to integrate elements of the Metro West project into the current design or works of other transport infrastructure;
- *Levy Risk* – risk related to raising finance from levy contributions; and
- *Other Risk* – Risk in relation to land and infrastructure provision by developers and risks to be specified further as the project progresses.

7.5 Treatment of Risk under PPP

The optimal allocation of project risks lies at the heart of the rationale for Public Private Partnerships. When projects are procured traditionally, risks are not explicitly priced into infrastructure procurement contracts and responsibilities and incentives are not placed appropriately. As a result project budget may be readjusted to incorporate the additional risks occurring during the project implementation.

On the other hand, the PPP process seeks to overcome these issues through the following means:

- *Whole of life costing* - The public sector has a mixed record in the managing the costs of assets over their useful lives, with a consequence that essential maintenance expenditure is deferred. Under PPP, minimum whole of life costing can be achieved, as this risk and pricing is capped with the payment mechanism:
- *Performance related payments* - The PPP payment mechanism links Government payments to the level of performance specified in the contract;
- *Innovation* - The PPP procurement model specifies outputs, rather than inputs. This allows the maximum scope for private sector innovation to benefit the project; and
- *Transfer of risk* - The Government can make an assessment of the optimal level of risk transfer, weighing the advantages against the risk premium sought be the private sector to achieve overall best value for money for the project (i.e. minimise risk-adjusted whole of life cost to Government).

The risk assessment during the procurement stage of the project will reflect the negotiated procedure, which allows scope for negotiating the allocation and quantification of risk throughout the bidding process.

7.5.1 Initial Risk Allocation

Section 3.1 of the PPP Assessment suggests a risk allocation between the public and private sector. The PPPA suggests the following key cost and risk elements are best managed and delivered by the public sector (RPA):

• Planning and Railway Order;
• Land Acquisition;
• Advance Works; and
• RPA Project Management of the PPP and advance works.

Please refer to the PPPA report for further clarification on this risk allocation.

An initial proposal for risk allocation for Metro West is illustrated in Table 7.1. The table suggests those risks that are best borne by the public sector, the private sector or shared. It should be noted that this initial risk allocation will form the initial basis of contract consideration. The final allocation of risk will only be determined at the conclusion of contract negotiations and it is also expected that the risk allocation will form a large part of these negotiations.

Table 7.1: Initial Risk Allocation

RISK CATEGORY	RPA	Private Sector	Shared
Land Acquisition	√		
Planning / Railway Order	√		
Advance Works (Utility & Enabling works)	√		
Project Procurement & PPP Contract Management	√		
Design, Construction, Commissioning & Supply		√	
Maintenance		√	
Demand	√		
Regulatory and Legislative			√
Environment		√	
Financial		√	
Safety		√	
Technology and Obsolescence		√	
Interface Risk with Metro North		√	
Interface Risk with other Transport Infrastructure		√	

This table is based on preliminary discussions between RPA and National Development and Finance Agency (NDFA) and subject to review by the NDFA. NDFA has agreed in principle on the risk transfer to the private sector. NDFA also concluded that the allocation of certain elements to RPA as described above should facilitate a “cleaner” project for the private sector to price.

7.6 Conclusion

The project risk management process forms part of an enterprise wide risk management approach that is led by RPA. The treatment of project risk will continue to be developed throughout the Railway Order and procurement stages to ensure:

- Best value risk transfer;
- A commercial structure that maximises competitive interest; and
- Proper treatment of whole life costs.

RPA has prepared a preliminary risk register and has considered the major risks that the project faces. Additionally, risks have been taken into account based on professional judgement in each area of the project during this initial assessment.

The PPPA considered the appropriate apportionment and allocation of risk between the public and private sector in the PPP. The PPPA suggests the following key cost and risk elements are best managed and delivered by the public sector (RPA):

• Planning and Railway Order;
• Land Acquisition;
• Advance Works; and
• RPA Project Management of the PPP and advance works.

The PPPA also suggests that other project risks are either shared or transferred to the private sector under the contract. The outline risk allocation table shows the risk transfer envisaged for the project, in accordance with best practice and other similar projects the PPP sector.

The PPP transaction risk register will form part of the overall Metro West risk register, and indeed the RPA Enterprise risk management approach. The processes will be streamlined and integrated in accordance with the scope of works for each of the contracts and will enable a robust project risk management process and output.

8 Project Finance and Cashflows

Chapter Summary

- The total projected cost of the Metro West project is c.[text deleted] in 2008 prices. Approximately [text deleted] of the total capital cost is envisaged to be funded by the Exchequer. The remaining c. [text deleted] will be funded privately through PPP procurement.
- It is envisaged that the Exchequer funding for non-PPP works will be repaid from a stream of levy contributions receivable by the Local Authorities under a project Section 49 Levy Scheme. The levy income projected for the Metro West project in present value is c.€214m.
- The cash flow model assumes that the PPP Concessionaire is entitled to receive Availability Payments from RPA following the commencement of operations until the end of the concession. It is envisaged that this stream of income will be sufficient to meet the expenditure profile of the PPP Concessionaire and also provide an adequate return for successfully delivering the project.
- The PPP Operating contact has been modelled separately to determine the projected revenues receivable on behalf of RPA by the Operator throughout the operating period.
- The operating revenues are expected to fund the operating contract and produce a substantial annual surplus, which could be used to part fund the Availability Payments to the PPP Concessionaire.
- Following the input of all known costs, the cash flow model has been optimised to create a profile of Availability Payments that will provide a blended equity return to the PPP Concessionaire of c. [text deleted] Based on preliminary projections, the Availability Payment is c. [text deleted] per annum in 2008 prices over the assumed 30 year operating period.
- Financial modelling suggests inclusion of utility and other advance works would not produce value for money and increase the Annual Availability Payment by at least (text deleted) in 2008 prices.

8.1 Overview

The analysis contained within this Outline Business Case represents the RPA's preliminary financial forecast of the project through PPP procurement. At this stage, analysis is based on project cashflow modelled on the underlying demand and revenue projections, and capital, operational and life cycle expenditure estimates contained in this OBC.

It is important to note that this analysis does not represent either a shadow bid model or a public sector benchmark for the project. The shadow bid model and the public sector benchmark will be developed later following the detailed definition of the project and contract. This analysis has projected cashflow based on currently available information which is preliminary. As such, the calculations within the financial model are preliminary and the results should therefore be considered as indicative.

8.2 Contract Structure Overview

It is currently envisaged that the contract structure for the Metro West PPP will separate the Infrastructure Contract and the Operating Contract. The PPP Concessionaire will enter into the Infrastructure Contract for the design, build, finance and maintenance of Metro West. Please refer to Section IV of the PPPA appended to this document for explanation of the emerging structure.

The Operator will enter into the Operating Contract for the operation of passenger services of the project. The Operator will be remunerated for the delivery of the passenger operations on a performance basis, similar to that employed between RPA and the Luas operator.

The PPP Concessionaire will be remunerated for the availability of the services through annual Availability Payments payable by RPA following construction completion until the end of the concession.

The Operator will collect fare-box and park & ride revenues on behalf of the RPA.

The operating revenues will be dealt in practice similarly to the current Luas contracts. Like the Luas contract, there will be a dynamic payment mechanism that will calculate the variation between the bid/contacted operating price and the fare box revenue.

The Operator will be entitled to retain from these collected revenues a "service charge" which is price agreed between RPA and contractor, as part of the tender process i.e. contract award.

In the event that revenues are less than the annual service charge the Operator would receive a balancing payment ("operating subvention") from RPA. Any surplus of revenues collected by the Operator above the service charge will be returned to RPA (as an "operating surplus"). Any payments made to either the PPP Concessionaire or the Operator will be subject to performance deductions in accordance with the payment mechanism.

The Operating surplus would be available to offset a proportion of the availability payments for the infrastructure. This is outlined in Section 8.2. Propose to reword section for clarity.

Further details regarding the PPP arrangement and Metro West contract structure can be found in Section III and IV of the PPP Assessment report.

8.3 Financial Model Assumptions

8.3.1 Project Timing

Financial close and commencement of construction are projected to occur in October 2010. The model assumes a construction period of approximately 5 years, with operations commencing in October 2015.

8.3.2 Concession Length

For the purpose of this preliminary analysis, a concession term of the construction period plus 30 years has been assumed. Therefore, the operating period is estimated to be 30 years, resulting in a projected total concession period of 35 years.

The length of the concession will be subject to further review through the tendering process.

8.3.3 Interest Rates

An interest rate of [text deleted] has been assumed for the senior commercial debt and the equity loan bridge. A coupon rate of [text deleted] has been assumed for the shareholder "equity" loan.

8.3.4 Discount Rate

Cashflows have been discounted at a rate of 4.80%. This is an estimate and will be refined by the NDFA with reference to market rates later in the project.

8.3.5 VAT and Taxation

All VAT has been excluded from this cashflow model. It is currently uncertain whether or not the PPP Concessionaire will be entitled to recover any VAT cost under a PPP contract. However, any VAT paid on Availability Payments from RPA can be considered neutral from an Exchequer perspective.

Corporation Tax has been applied to the net profits of the PPP Concessionaire at a rate of 12.5%. The taxation does not include any adjustments for losses brought forward or capital allowances.

Inflation

3A general inflation assumption of 2.5% has been applied to operating and maintenance costs and lifecycle costs. Revenue is inflated at 2%. Capital cost inflation during construction is escalated separately by asset type and is detailed in the Table 8.3 below.

8.3.6 Base Year

Operating costs and revenues are provided from the Transport Forecasting Model and are quoted in 2002 prices; these cost items have been adjusted for inflation and brought forward to 2008 prices. All construction cost estimates have a base year of 2008.

The financial model is treating 2008 as a Base year.

8.3.7 Presentation of Values

Real (2008) Price is any price or value expressed in terms of the base year, in this case, base year is 2008, which means values have not been adjusted for inflation.

Nominal Value figures refer to any price or value expressed in monetary terms of the year of occurrence, which means it is adjusted for inflation.

Present Value is any price or value expressed in terms of the base year (2008), adjusted for inflation and discounted at a certain discount factor to account for today's value of the future euro. A discount factor of 4.8% has been applied as advised by NDFA, for calculation of the present values.

Net Present Value is the single calculated present value of the project's future net cashflow minus the initial investment, adjusted for certain advised discount factor.

8.3.8 Capital Cost

Certain costs items have been excluded from the main PPP contract. The works associated with these costs will either be delivered by RPA or procured under separate works contracts. Table 8.1 below outlines these non-PPP costs:

Table 8.1 – Non-PPP Costs (€m)

	2008	2009	2010	2011	2012	2013	2014	2015	Total
Property Acquisitions	0.0	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Client Cost incl PM	7.3	11.9	9.0	6.3	6.6	6.9	12.6	13.8	74.4
Advance Works (Utility Works / Enabling Works)	0.0	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Advance Works (Enabling Works / Structure)	0.0	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Total - Nominal	**7.3**	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Total - Real (2008)	**7.3**	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
PV discounted @ 4.8%	**7.3**	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)

The remainder of the capital costs outlined in Chapter 5 will form part of the main PPP contract. The total capital cost used in the financial model is set out below in

Table 8.2. These costs will be financed by the PPP Concessionaire under the main PPP contract:

Table 8.2 – Total PPP Capital Cost (€m)

	2011	2012	2013	2014	2015	Total
Capital Cost - Q1 2008 prices	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Capital Cost - Nominal	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)
Present Value	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)	(text deleted)

Chapter 5 provides a full breakdown of the various capital cost items. Cost escalation has been applied to each asset category during construction as shown in Table 8.3 below:

Table 8.3 – Inflation rates applied to asset categories

Asset Category	%
Concessionaire Design	5.0%
Structures	5.0%
Track Infrastructure	5.0%
E&M Systems incl T&C	5.0%
Depot	5.0%
Park & Ride	5.0%
Start Up Costs	5.0%
Trial Running	5.0%
Contingency	5.0%
Risk	5.0%
Rolling Stock Procurement	2.5%
Rolling Stock Delivery & Fit out	2.5%

8.3.9 Revenues and Demand

Demand is assumed to ramp up over the first three years of operations as shown in Table 8.5 below:

Table 8.5 – Demand Ramp Up

	Year 1	Year 2	Year 3	Year 4 onwards

Demand (as a percentage of steady state)	80%	85%	90%	100%

Fare increases equivalent to the inflation rate of 2% a year are assumed over the term of the concession. The table below shows the projected operating revenues in nominal terms over the term of the concession. In accordance with the contract structure overview outlined in section 8.2 above, the operating revenues outlined below are assumed to be collected by the Operating Contractor. As such, revenues flow outside of the Infrastructure contract and therefore do not reduce the quantum of Availability Payments payable by RPA throughout the concession period.

Table 8.6 – Projected Operation Revenues (Nominal €m)

	Years 1 - 5	Years 6 - 10	Years 11 - 15	Years 16 - 20	Years 21 - 25	Years 26 - 30	**Total**
Revenues	**326.7**	**421.7**	**514.0**	**626.6**	**763.8**	**930.6**	**3,583.3**

8.3.10 Operating Costs

The operating costs are estimated to be approximately [text deleted] per annum. These costs are expressed in 2002 prices. During the forecast period, these costs are escalated at 2.5% per annum in line with projected levels of inflation. The additional operating costs are related to interoperability, i.e. Metro West trams running on Metro North infrastructure. Table 8.7 below outlines the resulting projected operating costs in nominal terms over the term of the concession:

Table 8.7 – Projected Operating Costs (Nominal €m)

	Years 1 - 5	**Years 6 - 10**	**Years 11 - 15**	**Years 16 - 20**	**Years 21 - 25**	**Years 26 - 30**	**Total**
Operating Cost	**(text deleted)**	**(text deleted)**	**(text deleted)**	**(text deleted)**	**(text deleted)**	**(text deleted)**	**(text deleted)**

Table 8.8 – Operating Cost Breakdown (2002 Prices per annum)

Operating Cost Category	**€000s**
Operations	
Staff	[text deleted]
Insurance	[text deleted]
Other	[text deleted]

MN Additional Operating Cost*	[text deleted]
Total	[text deleted]

*Note: The additional operating costs for interoperating Metro West services on Metro North infrastructure can be summarised as follows:

Operators Costs - additional cost to the operator of running more services, running services into the City Centre and to Swords requires more vehicles and thus more drivers.
Infrastructure Company costs - the additional services running on the Metro North infrastructure will increase the use of the track, stops and other systems and thus increase the maintenance requirements. The Metro North contract will allow additional services to be implemented with a cost based on the increase in Vehicle Kilometres on the route. There will also be additional electricity supply costs, ticket costs etc.

8.3.11 Lifecycle Costs

Life cycle costs are comprised of maintenance and renewal cost, are an important component of the overall cost of the project. The profile of life cycle costs reflects the year on year maintenance costs increasing in line with inflation. In addition, approximately every five years, there is a significant renewals programme resulting in significant renewal cost in the lifecycle expenditure profile.

Table 8.9 below outlines the resulting projected lifecycle costs in nominal terms:

Table 8.9 – Projected Life Cycle Costs (Nominal €m)

	Years 1 - 5	Years 6 - 10	Years 11 - 15	Years 16 - 20	Years 21 - 25	Years 26 - 30	Total
Lifecycle Costs	**(text deleted)**	**(text deleted)**	**(text deleted)**	**(text deleted)**	**(text deleted)**	**(text deleted)**	**(text deleted)**

For the purposes of this preliminary analysis, the cashflow model has assumed a "flat" lifecycle cost profile in which the total lifecycle cost for the concession period is spread evenly over the 30 years. In practice, it is envisaged that the PPP

Concessionaire will provide for a lifecycle reserve account or a “sinking fund” to smooth lifecycle payments over the concession period.

8.4 PPP Financing Structure

8.4.1 General

The financial model assumes that funding during construction is by way of a senior debt facility supported by an equity loan bridge and upfront pinpoint equity. The funding requirement for each period is the amount of the construction capital expenditure. Interest during construction is rolled up into the principal of both the senior debt facility and the equity loan bridge facility. The model assumes a debt equity split of [text deleted] of the total funding requirement for infrastructure.

8.4.2 Debt

Debt facilities are drawn down as required during the construction period and interest on these amounts is capitalised. The senior debt facility is assumed to mature [text deleted] years following drawdown. The debt repayment profile is assumed to be fully amortising with level debt service over the term of the debt. An interest rate of [text deleted] has been assumed for the senior debt.

8.4.3 Equity

An upfront pure equity contributio of [text deleted] flows into the PPP Concessionaire at construction commencement, with the shareholder loan being drawn down at construction completion to replace the equity loan bridge which was drawn down as required during construction similar to senior debt.

Return on ordinary equity is sourced from the excess of PPP Concessionaire income over expenses. Ordinary equity is paid in the form of dividends and out of accounting profits. As such, in any year where the PPP Concessionaire may be in an accounting loss position, no dividends are paid. The shareholder “equity” loan is fully amortised over [text deleted] years, and a coupon of [text deleted] has been assumed.

An optimisation exercise has been undertaken in the model to deliver an overall nominal equity return of c.[text deleted] to the equity investors. This return is the blended rate

between the coupon on the shareholder loan and the Internal Rate of Return on ordinary equity.

8.5 Analysis and Results

8.5.1 Funding of Non-PPP Works

The financing structure outlined relates to the main Metro West PPP contract. However, as detailed in Section 8.2, it is currently envisaged that certain advance works and property acquisitions will be procured separately to the main PPP project. Table 5.3 shows the cost of these "non-PPP" works to be c. [text deleted] in nominal terms. It is currently envisaged that the cost of these works will be funded the Exchequer.

A stream of levy contributions receivable by the local authorities in accordance with the Supplementary Development Contribution Scheme Levy Scheme for the project will be accrued over the life of the project with a primary aim to reduce the exchequer funding requirement.

The following table outlines the projected levy contributions receivable for the Metro West project. It is important to note that these levy projections are preliminary and should be considered as indicative for the purposes of this analysis. Further work is required to further refine the levy estimates over the life of the Levy Scheme.

Table 8.10 - Projected Levy Income (€m)

	Years 1 - 5	Years 6 - 10	Years 11 - 15	Years 16 - 20	Years 21 - 25	Years 26 - 30	Total
Levy Income (Nominal)	41.29	52.70	67.26	85.84	109.55	139.82	496.46

Figure 8.1 –Proposed Exchequer Funding and Projected Levy Income (Nominal - €m)

8.5.2 Project Sources and Uses of Funds (PPP)

The funding requirement for the Metro West PPP project is the maximum amount of PPP Concessionaire expenditure incurred up to the time at which cash flow is generated from the successful operation of the Metro West service. This means that in addition to the direct cash costs of the project during start up and construction, the PPP Concessionaire will incur debt interest rolled up. This therefore needs to be included in the financing requirements. The following table summarises the funding requirement and capital structure that has been modelled for the project.

Table 8.11 – Funding Requirement and Capital Structure (Nominal €m)

Initial Funding Summary	Nominal			
	€'m			€'m
Uses of Funds			Sources of Funds	
Construction Costs and Interest			Equity and Debt funding	
Construction Costs	**(text deleted)**		Pure Equity	**(text deleted)**
Rolling Stock	**(text deleted)**		Equity Loan Bridge	**(text deleted)**
Senior Debt Rolled Up	**(text deleted)**		Senior Debt	**(text deleted)**
Equity Bridge Loan Rolled Up	**(text deleted)**			
Total Uses of Funds	**(text deleted)**		**Total Sources of Funds**	**(text deleted)**

It has been assumed that no Exchequer contributions are available to fund capital costs for the Metro West project. It is however envisaged that certain works excluded from the main PPP contract as detailed in Section 8.5.1 above will be Exchequer funded. As such, no element of capital subvention has been included in the PPP cashflow model.

Senior debt and equity are drawn down during the construction period to meet the funding requirements of capital expenditure. As no 'Availability Payments' are payable to the PPP Concessionaire until the commencement of operations in the last quarter of 2015, there are no funds available to finance the capital repayments and interest charges on the senior debt and equity loan bridge. As a result, interest is "rolled-up" and capitalised during the construction period and later amortised over the loan term following the commencement of operations.

In return for undertaking the capital expenditure and delivering and maintaining the infrastructure to meet the identified output specifications, following construction completion and certification the PPP Concessionaire is entitled to receive Availability Payments from RPA following the commencement of operations until the end of the concession. It is envisaged that this stream of Availability Payments will be sufficient to meet the expenditure profile of the PPP Concessionaire and also provide an adequate return for successfully delivering the project.

Following the input of all known costs and revenues, the cashflow model has been optimised to create a profile of 'Availability Payments' that will provide a blended equity return to the PPP Concessionaire of c. [text deleted]. Based on current projections, the real Availability Payment (i.e. 2008 price) per annum is c. [text deleted]. A portion of this

Availability Payment is then escalated in line with inflation, as it reflects payment for life cycle and other escalated costs. The escalated portion of the Availability Payment is determined by reference to an 'x-factor', which reflects the percentage of 'Availability Payment' to be escalated. The 'x-factor' is usually bid by the bidders as part of their tender submission. For the purposes of this preliminary analysis, an indicative 'x-factor' of [text deleted] has been assumed. Based on these assumptions, the estimated net present value of the proposed stream of 'Availability Payments' payable by RPA over the term of the concession is c. [text deleted].

8.5.3 Scenario testing

A second scenario and financial analysis has been carried out to assess the impact on the Exchequer from inclusion of advance works (selective enabling and utility works) into the PPP contract.

The results from the analysis showed that the inclusion of advance works does not provide value for money and make the project financially less viable.

A sensitivity analysis showed that the availability payments increase c. [text deleted] per annum in 2008 prices, to pay for the advance works over the contract term. The financial modelling did not account for the financial implications stemming from the project programme, which will drastically change, i.e. the project implementation and operational service start will be delayed approximately two years.

The two year estimated delay could be explained as follows: If the selective advance works are placed in the main PPP contract, which would be a significant departure from the agreed procurement strategy for Metro North, as project precedent, than those works will not be able to start until the PPP contractor has been appointed, which currently is programmed for Q4 2011. Currently, the financial model assumes that design for advance works would commence in advance of the Railway Order, in Q3 2009. This allows works to start immediately after receiving a Railway Order in Q3 2010 and be completed in Q3 2012.

If the PPP company were to commence in Q4 2011 it is expected that design would not be completed until late 2012 with works commencing immediately there after and

lasting for an equivalent 2 year duration. Thus not concluding until Q4 2013. Hence the 2 year difference between the advance works start in Q3 2009 by RPA and advance works start in Q4 2011 if done by PPP.

8.6 Conclusions

The results of the financial modelling of the project cash flows indicate a total funding requirement of c.[text deleted] excluding VAT, in nominal, i.e. year of expenditure values. A portion of this total cost relates to property acquisitions and advance works (c. [text deleted] - nominal). It is currently envisaged that these works will be kept separate from the main PPP contract and will be funded by the Exchequer.

The remaining works (c. [text deleted]– nominal) will be procured through a PPP contract. The model calculates an annual 'Availability Payment' by RPA of c. [text deleted] based on a target blended equity return of c. [text deleted] A portion (i.e. the x-factor) of this annual 'Availability Payment' is then escalated in line with inflation throughout the concession period.

It is forecast that considerable revenues will be generated by the project which will generate an operating surplus. This surplus could part fund the annual Availability Payments to the PPP Concessionaire.

It is important to note that the financial model used for the purposes of this analysis has projected cash flows based on currently available information which is preliminary. As such, the calculations within the financial model are preliminary and the results should therefore be considered as indicative. This analysis does not reflect a shadow bid model for the project. The shadow bid model and the public sector benchmark will be developed later following the detailed definition of the project and contract.

9 Procurement Strategy

Chapter Summary

- Procurement process in a PPP transaction will be conducted under the negotiated procedure.
- RPA will complete the EIS, property referencing, and public consultation and apply for RO. The RO application will coincide with the issue of the tender documents to potential bidders.
- It is anticipated that at the outcome of the Metro West procurement process, a number of advance works contracts and one PPP DBFM contract will be awarded.
- RPA has retained an option to award the Metro West Operating Contract to the Metro North Operator. It is anticipated that, even if the Metro North operator does not become the Metro West operator, there will be a separate operator for Metro West.
- Any decision to deliver part only of Metro West (rather than full project implementation) would have significant impacts on the procurement process for the Project.

9.1 Introduction

This procurement strategy chapter sets out the following:

- Summary of the Procurement Procedure (Section 9.2);
- Preliminary considerations in the establishment of the procurement strategy / process (Section 9.3);
- Strategic Procurement Issues Requiring Determination (Section 9.4); and
- Conclusion (Section 9.5).

As previously mentioned, further detail on the proposed PPP arrangement scope and other considerations relating to the PPP transaction are detailed out in the PPP Assessment report, which is annexed to this Outline Business Case.

9.2 Summary of the Procurement Procedure

The Metro Wets PPP Assessment (PPPA) report appended to this OBC suggests that the project would be appropriately procured as a PPP. The PPPA also suggests that the allocation of risk and cost be shared between the public and private sector with the majority of the project scope to be delivered by the PPP Concessionaire

The proposed project contractual structure and finance structure (Section IV of the PPP Assessment), based on the initial risk transfer and the scope of the PPP contract, emphasises the need for Exchequer funding towards the items described below:

- Planning and Railway Order;
- Land Acquisition;
- Advance Works; and
- RPA Project Management.

Please refer to the PPPA for further clarification on the Exchequer funding and emerging contract structure.

The PPPA suggests the most appropriate form of PPP would be DBFM contract, with separate Operating contract for operating the service. This is similar to the structure being pursued for Metro North.

RPA will complete the EIS, property referencing, and public consultation and apply for Railway Order.

On receipt of the Railway Order RPA will award contracts under a traditional procurement method for advance works such as utility diversions.

The procurement process in the Metro West PPP transaction will be conducted under the negotiated procedure.

The procurement process in a PPP transaction conducted under the negotiated procedure typically involves the following stages:

- Project definition;
- Expression of Interest and Pre-qualification;
- Invitation to Negotiate;
- Short listing;
- Best and Final Offers;
- Negotiations; and
- Financial Close

All these stages have to be done within a regulatory framework imposed by Irish and European law on procurement. In the case of infrastructure projects additional requirements are imposed *inter alia*, by environmental and social regulations and in the case of railway infrastructure in particular, the Railway Order process. Within the parameters set out by these regulations, RPA has the flexibility to structure the process and its broader procurement strategy, to suit its own commercial and/or policy objectives.

9.2.1 Statutory Process

A Railway Order (RO) operates in place of planning permission for new railway infrastructure. More specifically, it provides authorisation to construct, operate and maintain the infrastructure subject to certain conditions deemed appropriate by An Bord Pleanála (ABP).

A Railway Order identifies the land which may be acquired on a permanent or temporary basis for the purposes of carrying out the railway works, the proposed alignment and the limits of deviation within which it must be constructed. The Metro West Infrastructure Contractor and the Metro Operator will be obliged to act in accordance with the terms and conditions of the Railway Order at all times.

It is RPA's experience that the preparation of a RO application takes approximately 2 years with the formal post-application processes taking up to an additional 12 months.

RPA has the statutory power to apply to ABP for a Railway Order under Section 37 of the Transport (Railway Infrastructure) Act, 2001 (the '2001 Act') as amended by the Planning and Development (Strategic Infrastructure) Act, 2006 (the '2006 Act'). RPA may also consent to a third party making the application.

One of the primary purposes of the '2006' Act was to improve the efficiency of the development consent process for specific types of strategic infrastructure, including major transport projects of the type provided for in Transport 21 such as Metro West. The 2006 Act restructured ABP creating a special division to deal exclusively with strategic infrastructure projects.

9.2.2 Preparation for RO application

A considerable amount of preparatory work needs to be completed prior to the submission of an RO application. This work is summarised below. The list is derived from RPA's experience as well as the specific statutory requirements.

- Public interest – the application must demonstrate a clear public interest in the project going ahead;
- Public consultation – consultation of all stakeholders, in phases, is necessary;
- Route alignment study – the RO application, or draft RO will put forward one route for approval and the choice of route needs to be justified;
- Design – the design submitted as part of the RO needs to be detailed enough to allow the public to assess the impact of the project on their property and environment;
- Property referencing – because the RO confers powers to acquire land which is needed for the project compulsorily, all such land needs to be referenced in the application;

- Environmental Impact Statement – the document needs to address environmental issues thoroughly to avoid problems at the oral hearing or during assessment of the application. A written opinion from the Board can be obtained on the information to be contained in the EIS;
- Pre-Application Consultation - mandatory consultation with ABP before making the application and ABP may give advice in particular regarding the application procedures and what considerations may have a bearing on its decision. ABP must conduct the consultations expeditiously and take steps to ensure that there are no avoidable delays;
- Public Notification – before an application is made, the applicant must deposit and publish a public notification of the draft order and documents that will accompany the application and additional information; and
- Mandatory 6 week display period – this follows notification; interested parties may make submissions up to the end of the display period.

9.2.3 Procedures following submission of the RO application

The post-submission procedures are set out in the 2001 Transport Act as amended and are broadly as follows:

- ABP may require further information regarding the EIS, which will also be required to be published, deposited and served on relevant persons where the information provided contains significant data in relation to the likely effects on the environment;
- Oral hearing - ABP may, at its absolute discretion, hold an oral hearing in relation to an application. An inspector appointed by ABP conducts the oral hearing and has a broad discretion to determine the manner in which the hearing is conducted, subject to ABP giving particular directions. ABP informs relevant persons and any person or body it considers appropriate of the time and place of the oral hearing. Persons interested in attending may be required to submit points or summary of the arguments they intent to make at the hearing;
- Report of oral hearing - the inspector prepares a report of the oral hearing which includes his recommendations. ABP is obliged to consider the report but is not

obliged to follow any of the recommendations included in it. The inspector shall conduct the hearing expeditiously and without undue formality;

- Additional requests/meetings – ABP may at its absolute discretion;
- Require further submissions and/or observations from the applicant, persons who previously submitted such information or other persons;
- Make information available for inspection and notify and member of the public thereof;
- Hold meetings with applicant or such other persons where it appears to be necessary or expedient for the purposes of determining the application or resolving any issue, disagreement between applicant and any other party, including in advance of an oral hearing;
- RO Decision by ABP – the objective is to make a decision within a period of 18 weeks from the last day for submissions or observations. The decision is followed by an eight-week stand still period during which an application for judicial review of the order may be made, which period may be extended by the High Court in certain circumstances; and
- RO becomes operative – this occurs either at the end of the eight-week period (as extended) or at the final determination of the judicial review.

9.2.4 Working the RO into the Procurement Process

The OBC for Metro West considered a number of options in relation to:

- At what stage of the procurement process should the RO application be made;
- The impact of all of the above on the overall Programme;
- Metro North Railway Order process; and
- The impact of the above on bid costs of the private sector.

Following this consideration, it is envisaged that the reference design will be carried out by RPA and consultants. RPA will complete the EIS, property referencing, and public consultation and apply for RO. The RO application will coincide with the issue

of the Invitation to Negotiate (ITN) to the successful candidates. The two bidders submitting the highest-scoring tenders would be invited to submit BAFOs.

The RO should be granted before BAFO stage of the PPP element of the project commences, and before contracts are awarded for any works external to the PPP such as utility diversion works. This affords the RPA to incorporate any changes required by An Bord Pleanála or the Minister to be incorporated in the relevant scopes.

9.3 Preliminary Considerations of the Procurement Strategy

This Section sets out certain important considerations which must be taken into account in the establishment of any procurement strategy and process for Metro West. It should be noted that none of these factors can be considered on their own. They fall to be considered collectively, with the "best" procurement strategy seeking to achieve a balance between them.

- ***An acceptable strategy and process -*** The strategy and process must be acceptable to the market of potential bidders [text deleted]. The market's confidence in and appetite for Metro West is likely to be heightened in the event that RPA's procurement strategy for the two Projects is seen as being cohesive. Indeed as pointed out elsewhere in this document, many of the decisions taken in establishing the procurement strategy for Metro North, impact on and in some cases determine aspects of the procurement strategy and process for Metro West.

- ***Speed -*** A short but realistic procurement programme will be attractive to the market and help to engender confidence in the Project. It will give an encouraging message to potential bidders in terms of the likely costs of participation, and the prospect of early revenue flows. However, speed cannot take priority over thoroughness and process. Procurement law, the Railway Order process and inevitable complexity of the PPP process, require RPA to follow certain time consuming procedures. Procurement law also requires

RPA to give bidders a realistic amount of time to prepare for the various stages of the procurement process. Failure to comply with the regulatory processes in full could lead to legal challenges and the possibility that the processes will have to be re-run or at the very least, interrupted.

- ***Competitive tension -*** Experience shows that maintaining competitive tension between bidders for as long as possible leads to the best outcome, in terms of the quality and cost of the solutions tendered. Processes whereby a preferred bidder is selected early on tend to result in more expensive solutions and/or an adverse degree of risk transfer to the procuring body. However, at a certain point in the procurement process, the benefits of maintaining competitive tension are outweighed by the cost to bidders and the procuring body of keeping the competition going. "Good" bidders can decide to pull out (or not to participate at all in the first place), where they consider that the chances of them being successful as against the cost of participating, are simply too low.

- ***Innovation*** - A stagnant procurement strategy in an evolving market is one to be avoided. Innovation should not only be permitted as part of the procurement strategy for Metro West, it should be actively encouraged, because of its potentially positive effects on the quality of solutions tendered and the price of those solutions. However, encouraging innovation raises important issues in relation to the structure and speed of the process, the cost of participation and the numbers of bidders involved at the various stages. In addition, the regulatory processes oblige RPA to establish certain fairly detailed parameters regarding the Project, and then abide by them. Failure to comply with these parameters could lead to legal challenges and the possibility that the processes will have to be re-run, or at the very least, interrupted.

- ***Price*** - The procurement process and in particular the tender evaluation strategy, should be such to enable RPA to select the tender offering the best value for money to RPA, over the life of the Project.

Strategic Procurement Issues Requiring Determination

The Metro West project is currently in the detailed appraisal stage. There are a number of important decisions that have to be taken in the coming months regarding the broader procurement strategy and the structure of the Metro West procurement process. Such issues include:

- The scope and structure of the competitive process for Metro West;
- Phasing of Metro West and the implications of same for the procurement strategy;
- Interoperability with Metro North.

It should be noted that this list is not exhaustive.

In some cases, the optimum procurement strategy, process and commercial structure are suggested by key strategic decisions which have already been taken for the wider Dublin network. In reaching a recommended procurement strategy for Metro West, RPA has to consider:

- The technical, commercial and contractual interfaces with each of the infrastructure designer, contractor and maintainer and the operator for Metro North
- Interoperability of Metro West with Metro North, LUAS and other elements of the wider Dublin Network; and
- How best to introduce an element of flexibility into the procurement to give some robustness to the procurement strategy in the event that Metro North is delayed or does not proceed.

The issues identified in this introduction are now considered in further detail below.

9.4.1 Scope of PPP Contract

A preliminary issue requiring determination is which contracts are being procured under the Metro West procurement process, and the actual scope of those contracts. Some of the factors leading into this decision have already been determined in the

context of Metro North. In particular, RPA has retained an option to award the Metro West Operating Contract to the Metro North Operator.

Broadly, it is anticipated that at the outcome of the Metro West procurement process, one DBFM contract will be awarded to the successful bidder. More specifically, it is anticipated that this contract will cover:

- Civil engineering and associated design and construction services, including: construction of embankments, elevated sections, track-bed and track laying; signalling, control and communications systems and other mechanical and electrical works; construction of stations and associated structures; construction of related service facilities, including depots, maintenance facilities and control rooms; and construction of car-parks;
- Procuring the design, manufacture and supply of rolling stock for Metro West through a qualified list of Rolling Stock Suppliers established by RPA. RPA proposes to pre-qualify rolling stock suppliers in the same way as was done for Metro North. Following pre-qualification, shortlisted rolling stock suppliers and shortlisted infrastructure concessionaires would be invited to form consortia to bid together for the Metro West infrastructure concession. This structure would be similar to Metro North's, but simpler, because it would not invoke the third element of operations;
- Commissioning and testing of Metro West and its parts. If the Metro North Operator is also to operate Metro West, the arrangements for that operator's involvement in the commissioning of Metro West will require close attention;
- Maintenance and renewal of infrastructure and rolling stock;
- Procuring project finance in relation to all of the above.

A detailed analysis of options will be required to be undertaken in order to establish the optimum timing for the commencement of the involvement of that operator in Metro West.

9.4.2 Partial or Phased Delivery

As described in chapter 2 of this OBC, two scenarios were considered by RPA where the partial or phased delivery of Metro West may be considered. These are:

- Where full project funding is not available, in which case that part of the Metro West route going from Porterstown to Metro North, could be completed;
- Where Metro North is not delivered before Metro West in which case that part of the Metro West route, going from Tallaght to Blanchardstown, could be completed.

Any decision to deliver part only of Metro West (rather than full project implementation) would have significant impacts on the procurement process for the Project.

Procurement law requires the scope of a contract to be fully set out in the OJEU contract notice. This scope should be based on the procuring body's best estimate of scope at the time of despatch of the contract notice to the OJEU for publication. This implies that if full implementation of Metro West is envisaged at the time of despatch, then this should be stated in the OJEU contract notice, and the competition proceed on that basis. On the other hand if it appears more likely that the award will be based on one or other of the options for phased implementation, then this should be stated in the contract notice and the competition proceed on that basis.

The mere fact that the OJEU contract notice states that the contract will involve full implementation of Metro West, does not mean that RPA could not subsequently reduce the scope of the Project to one or other of the options for phased implementation. Procurement law allows procuring bodies a certain degree of flexibility to change the scope of their contracts, even after those contracts have been advertised.

The frequently applied test in this regard is to ask whether the change is ‘significant’. The change would be deemed ‘significant’ if the altered contract would attract interest from a different bidders than those who replied to the original contract notice. It is possible that a reduction in the scope of the Metro West Contract from full Project

implementation to one or other of the options for phased delivery would be considered a 'significant' change. Even if the change was not considered 'significant', application of the equal treatment principle could require certain parts of the procurement process to be re-run, e.g., where changing the scope impacted on the process predating the change.

If there was a change from full Project implementation to one of the options for partial or phased delivery, and this change was considered 'significant' in the manner outlined above, then it is most likely that the ongoing procurement process may need to be terminated and re-advertised on the basis of the relevant option.

9.4.3 Interoperability with Metro North

Interoperability between Metro North and Metro West requires that interface issues will need to be addressed early in the system definition phase for Metro West, and indeed some provision has already been made for this in the Metro North procurement. Metro North makes both passive and active provision for certain elements of the Metro West design. For example it is likely that the Metro North Infrastructure Contactor will develop the combined Central Control Room at Belinstown, and space provision to accommodate Metro West control facilities has been included in the Metro North specification.

A question has arisen as to the extent to which RPA might minimise interface and interoperability risk for the systems element of the Infrastructure Contract (signalling, control and communication systems and other mechanical and electrical works), by procuring that the systems provider to the Metro North Infrastructure Contractor, be responsible for these elements for Metro West.

On this specific issue a view was taken that the most sensible strategy taking account of regulatory, commercial and technical concerns, was simply to include a requirement in the output specification for Metro West that both systems had to be compatible. It is considered that contractual provision can be made in the Metro North project documentation to require incumbent Metro North systems providers to co-operate and share such information as is essential to enable the Metro West

Infrastructure provider to meet system interface and interoperability requirements and ensure and technical compatibility between the two lines.

9.5 Conclusion

It is clear that there are a considerable number of issues that need to be considered in detail, and this document endeavours to set out the current solution that is proposed in relation to each of these options. However, the procurement strategy will evolve as further consideration is given to these matters.

RPA should take a view shortly prior to the despatch of the Metro West contract notice to the OJEU, regarding the scope of the Project and make their best-estimate of that scope, the basis of the description of the Project in the OJEU and the subsequent tender process.

The scope of the Project should be reviewed at frequent intervals throughout the procurement process. Any decision to change the scope – including any decision to proceed on the basis of one of the options for phased delivery – should be informed, *inter alia*, by advice on whether the change could be accommodated within the on-going procurement process or alternatively whether the change required the termination of that process and the advertisement of a new one.

10 Programme and Way Forward

Chapter Summary

- Under the current programme Metro West will commence operations in late 2015. This is based on an ambitious but achievable programme.
- The delivery of Metro West is contingent on the successful completion of other activities external to the project, particularly the successful granting of Railway Order for Metro North.
- There are a number of key activities that must be progressed following approval of the OBC for the project to remain on target.
- Some of the Metro West activities are dependant on factors outside the immediate control of project such as third party approvals and agreements.
- Two core activities to be progressed are Railway Order and completion of the Procurement process.
- In order to deliver the project to programme it will be critical that decisions are made in a timely fashion to allow subsequent phases of delivery to advance.
- There is an immediate requirement to approve this OBC and PPPA, the commencement of the Railway Order Process and the commencement of the procurement process.

10.1 Timescales

'Transport 21' identified the delivery of Metro West in phases between 2010 and 2014. Having considered the phasing proposed in Transport 21, the RPA concluded that the construction of Metro West in its entirety is likely to take in the order of four and a half years. This is in addition to a contract award and design period of approximately nine months following receipt of planning approval to proceed.

In addition it is acknowledged that the delivery of Metro West as currently proposed is contingent on Metro North being in place and it is therefore unlikely that An Bord Pleanála would consider the Metro West Railway Order in advance of a decision on the Metro North scheme. It is expected that the Metro North Railway Order

application would be made in quarter three of 2008 and that a Railway order will be granted, subject to consideration by An Bord Pleanála, in the later part of the second quarter of 2009.

The earliest the Metro West Railway Order could be lodged would be the third quarter of 2009 with approval likely to be some nine months later, in the second quarter of 2010. The delivery programme of five and a quarter years would therefore mean that Metro West cannot now be delivered by the end of 2014 as suggested in 'Transport 21' and will not now be in place until some time mid 2015 at the earliest. This however assumes that there is no delay to Metro North Railway Order and that RPA and An Bord Pleanála resource is available to meet the programme.

10.2 Activities

In order to deliver Metro West to this programme there are a number of key activities which RPA must complete. The following table provides a brief overview of the critical activities required of RPA following approval of the Metro West Outline Business Case.

Table 10.1 - Activities required to deliver Metro West.

Activity	Overview
Design	In order to accurately define the scope of the project for tendering and Railway Order, the design of the project must be progressed to a reasonable level of detail. Typically, RPA complete what is referred to as a reference design which seeks to accurately reflect the property take, and critical elements of the proposed scheme. This continued design work will also allow further development of, amongst other things, the project cost plan, EIS and risk register. Design will be led by RPA and carried out partly in-house and partly by engineering consultants. Prior to issuing any Invitation to Negotiate a design sufficient to allow the bidders to frame their bids in a manner consistent with the anticipated

	requirements of the Railway Order will be required.
Environmental Impact Study	An Environmental Impact Statement (EIS) will have to be prepared in accordance with S.39 of the Transport (Railway Infrastructure) Act, 2001. The EIS will be based on the reference design and RPA has engaged a range of environmental experts to undertake the EIS for inclusion in the Railway Order application.
Railway Order application	RPA will lodge a Railway Order application in accordance with the Transport (Railway Infrastructure) Act 2001 and manage the process through Oral Hearing.
Procurement	Following approval of the Outline Business Case and the PPP assessment, RPA will finalise the contracting structure for the project and initiate a procurement process by publishing a call for competition in the Official Journal of the European Union (OJEU Notice). This will be followed by pre-qualification and selection of successful candidates shortlisted to proceed further with the tender process. It is anticipated that an invitation to negotiate will commence in parallel to the Railway Order application with bidders in place to proceed to BAFO stage on approval of the Railway order. Following Railway Order approval RPA will award contracts for some enabling works (e.g. utility diversions) and commence a Best and Final Offer (BAFO) period for the PPP contract that will result with selection of one preferred bidder and one reserve bidder. Final negotiations with the preferred bidder will take place before financial close and award of contract.
Risk	Risk assessment and allocation will form an essential part of framing the project. RPA continue the risk work discussed in Chapter 7 *Risk Assessment,* in particular completing a full quantitative risk analysis, and further refine its strategy as the project risks become clearer.
Finance structures	RPA has commenced discussions with the NDFA who are the financial advisors to the project. The NDFA and RPA are considering the financial structure best suited to the requirements of the project. This will be completed following approval of the Outline Business Case and the PPP assessment.

10.3 Programme

A detailed Metro West programme has been prepared to indicate the activities required to deliver the project as close as possible to the target completion date set out in Transport 21. Table 10.2 indicates some of the key project milestones in the programme.

Table 10.2 - The key programme dates

Activity	Target Completion Date
Approval of OBC	September 2008
Fixed Alignment	September 2008
Publish OJEU	February 2009
Prequalify Tenderers	July 2009
Complete Reference Design	July 2009
Complete PSB	September 2009
Lodge RO Application	October 2009
Release PPP ITN Docs	November 2009
Enforceable RO	June 2010
Enabling Construction Start	October 2010
BAFO	November 2010
PPP Financial Close	September 2011
PPP Construction Starts	October 2011
Construction End	July 2015
Passenger Operations	October 2015

The dates set out in the above table are indicative and present the current status of the project based on knowledge of key dependencies and assumptions on external factors.

The current programme is based on a optimistic but achievable, schedule with little room for delay. Thus any delay to critical activities will have a knock on and equivalent impact on the final completion date for the project. The programme is also

based on running the procurement and planning processes in parallel in order to minimise any delay in award of contract s post the granting of the Railway Order.
The link between Railway Order and the procurement process is critical as the completion of the procurement process cannot commence prior to the granting of the RO. This link insures any changes to the reference design as a result of the statutory planning process are incorporated in the bids.

The BAFO and contract negotiations period result in the contract award occurring approximately 15 months post RO. The initial tendering process must however have been completed in advance of the RO in order to achieve this milestone.

The current programme marries the completion of this initial tendering stage with the granting of the RO. The start of this process is the publishing of an OJEU notice. Due to the scale of the job and the requirements for durations of prequalification and tendering, it is required that the OJEU is published in early 2009 to achieve completion of the tendering to programme. This means that a decision to proceed with the procurement of the project must be taken early in the last quarter of 2008. This is to allow an advance notice of intention to publish the OJEU to be published, hold a market open day and prepare the relevant documentation for the prequalification stage, as would be typical and expected on a project of this scale.

The decision to proceed with the procurement process is contingent on the approval of the PPPA and an instruction to proceed from the Department of Transport (DoT) and is thus outside the control of RPA. Other activities are also dependant on factors outside the immediate control of RPA including the signing of agreements with developers along the route, acceptance of the design by the relevant local authorities, confirmation of funding and the approval of the Metro North project.

The target dates set out above are subject to change as the project evolves, scope changes and greater knowledge of dependencies emerge.

10.4 Next Steps and Key Decisions

In order to deliver the project to programme the RPA must now commence a number of key activities these are:

Proceed with Railway Order

The Railway Order (RO) process must now start in order to facilitate the lodging of the order in October of 2009. The development of the Railway Order will involve a range of activities which can be summarised as:

- Reference Design;
- EIS;
- Property referencing;
- Agreements with land owners; and
- Legal documentation.

The RO process could be completed in isolation of the delivery strategy (partial or phased delivery) or the procurement process. The RO does not suggest a definite commitment to deliver the project, it simply acquires the powers to do so if and when required.

Proceeding now with the RO will however give certainty to the scope and project design, protect the corridor in planning terms, insure levies are secured, allow all property to be identified and referenced and, if appropriate, allow the output specification and tender information to be compiled.

The RO process must be completed in advance of the final stage of the procurement process, independent of when the procurement stage commences.

Commence Procurement Process

If the project is to be delivered to the current programme it is critical that the procurement process now commences for the DBFM element. This procurement process will involve a range of activities that can be summarised as:

- Despatch PIN and Market Open Day;
- Issue OJEU Notice;
- Prequalify Bidders;

- Issue ITN to Prequalified Bidders;
- Tender Evaluation and Preferred Bidder/s;
- BAFO;
- Final negotiations;
- Contract Award.

In parallel RPA must also award contract for enabling works such as utility diversions etc. This will be run in parallel with a traditional procurement model.

As noted above there is a strong link between the RO process and the procurement process. RPA anticipates that the ITN for the DBFM will be issued in parallel to the lodging of the RO and that BAFO will not commence until the enforceable order is on place.

Initiating the procurement process will generate an expectation in the market place that the project is proceed indeed an expectation already exists on the basis of the Transport 21 announcement of 2005 and subsequent statements of commitment.

For a project of this scale and to be delivered as a PPP a considerable effort and resource is required by the private sector to ready themselves for procurement and indeed to participate in the procurement process. Once the procurement process commences any subsequent decision to delay or halt the project could irrevocably damage the process and eliminate all confidence in the process by the private sector. It is likely that companies that would have expended large resource in the first instance would not remobilise at a later stage. It is also the case that the scale and nature of the project would suggest that there would be only a limited number of companies who could mobilise to deliver the scheme.

Decisions Required

Based on the above it is therefore critical that timely decisions are made to allow the project to proceed to implementation. In the first instance the following key decisions are required:

- to proceed to Railway Order for the full project scope;
- to agree the scope of the project for procurement (partial or phased delivery);
- to approve the OBC and PPPA; and
- to approve the commencement of the procurement process and when to do so.

It should be noted that procurement process for any PPP must follow guidelines set out by the Department of Finance. These guidelines require approvals to be made at particular stages in the procurement process which act as gateways to the commencement of subsequent phases. The first approval required in this process is to approve the PPPA and OBC. It will be critical that at each gateway, decisions are made in a timely fashion to allow RPA to proceed to next stage to programme.

10.5 Conclusion

The target completion date of the Metro West project of 2014, as identified in Transport 21 is not feasible. Based on the current programme Metro West will be completed in 2015.

The delivery of the project to this programme is contingent on a number of key external factors, particularly the successful conclusion of the Metro North Railway Order process.

There are a number of key critical activities that drive the rest of the Metro West schedule, these are primarily the Railway Order process and the Procurement process. The project cannot advance in the absence of each of these key activities being completed.

Some of the Metro West activities are dependant on factors outside the immediate control of project including the signing of agreements with developers along the route, acceptance of the design by the relevant local authorities, confirmation of

Exchequer funding, approval from the Department of Transport to proceed with the project etc.

In order to deliver the project to programme it will be critical that decisions are made in a timely fashion to allow subsequent phases of delivery to advance, this is particularly the case with respect to the funding and procurement decisions.

In the first instance the following key decisions are required:

- Approval of the project as a PPP (acceptance of the PPPA);
- Approval of the scope and instruction to proceed to Railway Order;
- Approval for the commencement of PPP planning;
- Approval to commence procurement.

The target dates set out in this OBC are subject to change as the project evolves, scope changes and greater knowledge of dependencies emerge.