Railway Procurement Agency

METRO NORTH

ST. STEPHEN'S GREEN, AIRPORT, ESTUARY

ADDENDUM TO UPDATED DETAILED BUSINESS CASE

DECEMBER 2010

Contents

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1. Executive Summary

1.1 Introduction

The Metro North Detailed Business Case (DBC) which was submitted to the National Transport Authority (NTA) on 19 July 2010 was approved by NTA on 5 October 2010. In approving the DBC, NTA requested that following a decision by An Bord Pleanála (ABP) on the Railway Order (RO) application that RPA conduct an analysis of any significant conditions attached to the RO which would have a material impact on the Government approved capital envelope for the project or on the economic and financial analysis as detailed in Chapters 7 and 8 of the DBC.

On 27 October 2010 RPA was granted a Railway Order (RO) for Metro North by An Bord Pleanála (ABP). However ABP decided not to approve certain elements of the RO application in the area north of Swords namely the depot and ancillary facilities at Belinstown including the strategic park and ride and proposed line (2.3km) and stops north of Estuary. The proposed stop at Seatown was also omitted from the RO. ABP imposed 20 conditions on the RO including the changes noted above.

This addendum to the DBC has been prepared to summarise the material impacts of the approved RO and conditions on the DBC. This paper sets out on a chapter by chapter basis the material changes from the DBC arising out of the railway order conditions.

This addendum to the DBC demonstrates that there is still a strong economic case for Metro North, taking account of the railway order conditions, with benefit to cost ratio of 1.89:1 when taking account of wider economic benefits and in excess of 1.46:1 using traditional economic appraisal methods. The scheme is therefore of substantial societal worth, with benefits well in excess of costs.

1.2 Approval Required

RPA is now seeking approval to award certain priority enabling works contracts in January 2011 following the RO becoming operational on 23 December 2010. This approval requires a commitment by Government of approximately €43 million during 2011. This is a reduction of approximately €33 million from the requirement set out in the DBC due to a revision to the phasing of enabling works.

1.3 Project Definition

The route for Metro North is now 16.5 km long and runs between Estuary, to the north of Swords, and St. Stephen's Green in the city centre. There are now 14 stops along the route, 9 underground (below grade) and 5 at ground level (at grade). The at grade stops at Belinstown, Lissenhall, and Seatown have been deleted from the project in accordance with the RO conditions. The end to end journey time is now forecast to be 29 minutes.

RPA is undertaking a public consultation process in order to inform the revised depot location which will either be in the vicinity of Dardistown or Fostertown.

FCC has agreed in principle to develop proposals and seek planning permission for an appropriately sized strategic public transport 'park and ride' in the vicinity of Estuary stop.

1.4 Transport Planning

Metro North is forecast to carry approximately 33.3 million passengers annually in the base case scenario. This is a modest reduction compared to the DBC which forecast 36.3 million per annum. The reduction in demand is directly attributable to the shortened route length and consequently the reduced catchment area.

As expected, and as was the case with the DBC, a considerable proportion of the new boardings on the system come from the highway network. This will have a positive effect in terms of traffic decongestion in the city centre, i.e. taking cars off from the highway. The implementation of Metro North is forecast to reduce the number of car trips by 10.9 million per annum.

In the very pessimistic No Growth test scenario Metro North is forecast to carry 23.5 million passengers annually. Using the Local Authority projected growth forecasts Metro North is forecast to carry 43.5 million passengers annually.

1.5 Risk

The requirement for a separate new railway order for the revised depot location and the resultant revised spoil disposal strategy increases the risk of further delays to the project as there is no certainty as to when the application will be determined by An Bord Pleanála.

1.6 Economic Appraisal

The changes in the scope of Metro North arising out of the conditions imposed by ABP result in a modest reduction in the Benefit to Cost Ratio (BCR) from that presented in the DBC. However, there remains a strong economic case for the implementation of Metro North under a range of different scenarios. The benefit to cost ratio of the project is 1.89:1 when taking account of wider economic benefits and is 1.46:1 using traditional economic appraisal methods. The scheme is therefore of substantial societal worth, with benefits exceeding costs by more than €1 billion.

Table 1.1 Economic Appraisal Results

	Base Case	Wider Economic Benefits
Benefit to Cost Ratio (BCR)	**1.46:1**	**1.89:1**
Internal Rate of Return (IRR)	**8.4%**	**12.34%**

1.7 Project Finance and Cash-flows, Affordability and Value for Money

In summary there is a marginal reduction in the overall exchequer funding requirement for Metro North, primarily due to a reduction in land take due to the shortened alignment. The estimated net Exchequer funding requirement (in nominal terms) for Metro North over the construction period is reduced by €15 million from the DBC to [1]€1,572 million. There is a small reduction in the overall capital cost of Metro North taking account of the changes to both the exchequer and PPP funded elements of the scheme and the project can still be accommodated within the existing total capital envelope of €3,798 million.

The phasing of enabling works has been reviewed as a result of the delay arising out of the RO conditions. As a result the net exchequer funding requirement in 2011 has been reduced by €33 million to €43 million.

Since the DBC was prepared the financial and economic crisis facing Ireland has escalated significantly. There has been a loss of international financial creditability. It is not considered feasible that in these circumstances international debt funding markets would lend funds to project finance transactions (such as Metro North) in Ireland, the repayment of which is ultimately dependent on the Irish state.

In its agreement with the EU and the IMF Ireland has committed to taking decisive steps both in financial sector reform and in restoring fiscal stability. A critical issue is to return the Irish banks to viability so that they can operate without further state support in a reasonable period of time. Significant steps, such as recapitalisation of the banks and

[1] This is inclusive of the €143 million expenditure on the project to the end of November 2010.

stress testing of capital adequacy and liquidity are planned through 2011, together with the publication of detailed methodologies and results to restore international financial credibility.

The current programme for Metro North (as shown in Chapter 10) envisages Metro North reaching financial close in late 2012 or early 2013. On that basis engagement with debt funders is required in late 2011 or early 2012. Subject to the measures, which Ireland as agreed with the IMF and EU, having achieved the desired result of restoring financial credibility it is considered feasible that Metro North could achieve financial close in those timescales.

Market research (conducted by the European PPP Expertise Centre – a body established by European Investment Bank) indicates that conditions in the European and international PPP market continue to improve. Overall, debt tenors are lengthening and margins are slowly moderating and the market appears to be returning to large PPPs.

It is therefore considered that subject to international confidence in Ireland returning and no further deterioration in financial markets, the required debt funding should be available to achieve financial close for Metro North in the timescales now envisaged for the project.

1.8 Programme and Way Forward

At the time the DBC was submitted in July 2010 ABP had indicated that it would be making a decision on the RO application by mid August 2010. Subsequent to that, RPA were notified of a delay and ABP made a decision on the Railway Order at the end of October 2010. That delay together with the delay arising out of the requirement for a further railway order application for the revised depot location will result in a delay to the project reaching financial close of 12-18 months from the dates shown in the DBC. That delay has a direct knock on impact on construction completion and operational service commencement.

2. Background

- There are no material changes to the Background chapter of the updated DBC arising out of the RO conditions.

3. Project Definition

3.1 Summary of Changes to the Project Definition chapter from the DBC

- The route for Metro North is now 16.5 km long and runs between Estuary, to the north of Swords, and St. Stephen's Green in the city centre. There are now 14 stops along the route, 9 underground (below grade) and 5 at ground level (at grade).
- RPA is undertaking a public consultation process in order to inform the revised depot location which either will be in the vicinity of Dardistown or to the south of Fosterstown.
- An appropriately sized strategic public transport 'park and ride' in the vicinity of Estuary stop has been agreed in principle with Fingal County Council.
- The end to end journey time is now forecast to be 29 minutes and an initial fleet of 34 vehicles is required to accommodate services running at 5 minute headways at peak times.

3.2 Summary of Railway Order Conditions that impact on the Project Definition

On 27 October 2010 RPA was granted a Railway Order (RO) for Metro North by An Bord Pleanála (ABP). However ABP decided not to approve certain elements of the RO application in the area north of Swords namely the depot and ancillary facilities at Belinstown including the strategic park and ride and the proposed line (2.3km) and stops north of Estuary. The proposed stop at Seatown was also omitted from the RO. Overall ABP imposed 20 conditions on the RO. A number of these conditions give rise to changes in the project definition as set out in the DBC. The following sections set out the material changes.

3.3 Description of the Amended Route

The Metro North route is now 16.5 km long and runs between Estuary, to the north of Swords, and St. Stephen's Green in the city centre. There are 14 stops along the route, 9 underground (below grade) and 5 at ground level (at grade).

In accordance with the ABP conditions the following 3 stops have been removed from the project:

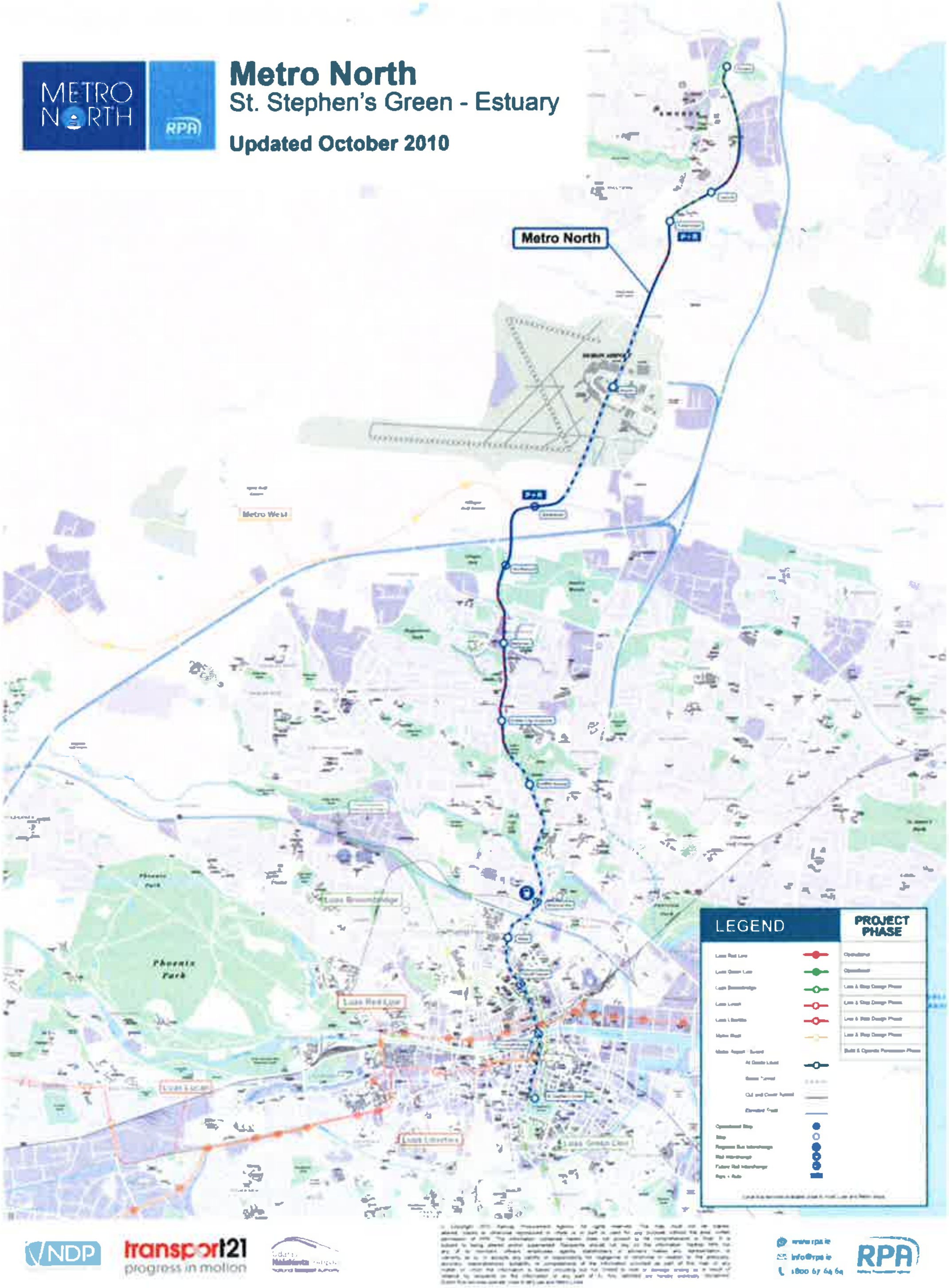
- Belinstown;
- Lissenhall; and
- Seatown.

The northern terminus is now at Estuary stop and a crossover facility will be provided to the south of the stop to allow turn-back of vehicles.

The route is still designed so as to safeguard the future possible extensions of the metro network to the south, towards the Luas Green line and to the north beyond Estuary towards Donabate. None of the RO conditions constrain the future extension of the line and provision will still be made for an operating link with the proposed Metro West project at Dardistown.

The route map included at Figure 3.1 illustrates the geographical location of the route.

Figure 3.1 Amended Metro North Route



3.4 Depot

ABP has required RPA to relocate the maintenance depot from its proposed location at Belinstown, north of Swords. RPA has considered a range of alternatives for relocating the depot. These have now been narrowed down to three locations as described below.

3.4.1 Depot location Option 1: Dardistown North

The Dardistown North depot site is located to the north of the proposed Dardistown metro stop, and south of the Dublin Airport boundary road, between the R108 and the R132. The site is currently good quality arable agricultural land, with some playing fields. There are residential properties and other playing fields to the north of the site, fronting onto the airport boundary road. The entrance to the depot will be from the airport perimeter road.

3.4.2 Depot location Option 2: Dardistown South

The Dardistown South depot site is located to the south of the proposed Dardistown metro stop, and just north of the M50 motorway, and east of its junction with the R108. A meat packing plant is located on the western boundary of the site accessed from the R108. The area is currently used as arable land. Closer to the motorway is a reclamation site for building materials and a number of industrial units. The entrance to the depot will be from the R108.

3.4.3 Depot location Option 3: Fosterstown South

The Fosterstown South depot site is located to the north of Dublin Airport in an area bound by the metro alignment, Naul Road and the R132. The area is currently arable land and is zoned green belt. The entrance to the depot will be from the R132.

3.4.4 Selecting the preferred location

A public consultation exercise is currently being undertaken on the options and the selection of the best location will be finalised when feedback from this public consultation has been reviewed. As well as taking account of the views submitted by those who participate in public consultation, the following factors will be considered in choosing the best location for the maintenance depot:

- Environmental impacts
- Existing and planned land-uses of the area
- Efficiency of operational arrangements, including operation of the proposed Metro West line
- Technical or construction risk
- Construction and operating costs

Following selection of the preferred option detailed design and environmental impact assessment will take place. It is envisaged that the railway order application for the revised depot will be submitted to ABP at the end of April 2011.

The facilities being provided at the depot are broadly unchanged from the DBC. The DBC had envisaged that the main power supply would be connected to three high voltage electricity supply points at Belinstown Depot, Dardistown and St Stephen's Green. Due to the depot being relocated from Belinstown the electricity supply unit which had been envisaged would be at Belinstown will now be located at the new depot location. There are no technical impediments to this proposal at any of the three possible options for location of the depot although the Electricity Supply Board (ESB) will need to sign off on the final proposal.

The light metro vehicles (LMV) maintenance facilities shall provide capacity for the stabling and maintenance for the ultimate fleet size which has reduced to 74 vehicles (see 3.7

below). Stabling will initially be provided for 38 vehicles, the fleet required to accommodate a four minute service pattern. This allows some spare stabling capacity at opening. Space will be set aside to increase the stabling capacity if required in the future to accommodate the ultimate fleet size.

3.5 Park & Ride

The proposed stop at Belinstown had been planned to incorporate an adjacent 2,000 space multi-storey strategic 'park and ride' to extend the effective catchment of Metro North and to attract commuters from along the M1 motorway and the old Belfast Road, the R132 and surrounding areas. In accordance with the RO conditions this has now been removed from the scheme.

In its advisory notes to the RO (which do not form part of the RO conditions) ABP noted that an application may be made for approval/permission for a strategic 'park and ride' facility at the northern terminus, generally adjacent to the Estuary Stop.

Since the RO was granted RPA have been in discussions with Fingal County Council (FCC), who own some of the lands adjacent to the Estuary Stop. FCC has agreed in principle to develop proposals and seek planning permission for a public transport 'park and ride' in the vicinity of the Estuary terminus. Detailed proposals for the 'park and ride' will now need to be developed but it is now envisaged that based on demand forecasting, the adjacent road network, the need to accommodate some spare capacity for the future and the amount of suitable land available, that 1000 spaces is an appropriate size for a 'park and ride' at Estuary and this forms the basis of the cost estimates contained in Chapter 8 Project Finance.

3.6 Swords Stop Access

The DBC had envisaged that initially access to the Swords stop would be by pedestrian ground level crossings of the R132. ABP imposed a condition that access to the Swords stop at ground level across the carriageways of the R132 shall not be permitted and that the stop shall be served by pedestrian bridges linking to each side of the dual carriageway, subject to an application for an amendment to the granted RO. An options analysis is currently being carried out and initial discussions have taken place with FCC as to the location and design of a pedestrian footbridge spanning the R132 dual carriageway which is now included within the project scope.

3.7 Light Metro Vehicles

In the DBC it had been estimated that a fleet of 84 LMVs would be required to accommodate the ultimate peak service running at two minute headways. Based on the shortened alignment it is how estimated that a fleet of 74 LMVs will be required to accommodate the ultimate peak headway and the vehicle maintenance depot facilities will be sized on that basis. A fleet of 34 vehicles will be required initially for the peak opening service running at 5 minute headways.

3.8 Journey Time

The estimated journey time from the terminus at Estuary to St. Stephen's Green is approximately 29 minutes.

4. Transport Planning

4.1 Summary of Changes to the Transport Planning chapter of the DBC

- In the Base Case (current infrastructure and moderate growth land use) scenario, Metro North is forecast to add approximately 33.3 million passengers annually. This is a modest reduction compared to the DBC which forecast 36.3 million per annum. The reduction in demand is directly attributable to the shortened route length and consequently the reduced catchment area. The omission of Seatown stop had little effect on forecast demand as these passengers have redistributed to either Estuary or Swords.

- As expected and as was the case with the DBC a considerable proportion of the new boardings on the system come from the highway network. This will have a positive effect in terms of traffic decongestion in the city centre, i.e. taking cars off from the highway. The implementation of Metro North is forecast to reduce the number of car trips by 10.9 million per annum.

- Metro North is forecast to add 23.5 million passengers annually in the very pessimistic No Growth test scenario and 43.5 million passengers annually using the Local Authority Growth test scenario.

- The 'Transport 21' sensitivity test indicates that Metro North will add 39.7 million passengers annually to the Metro Network.

- Including Luas Broombridge (Line BXD) in the Base Case scenario reduces Metro North annual boardings from 33.3 million to 32.2 million.

4.2 Summary of Railway Order Conditions that impact on Transport Planning

The Metro North route is now 2.3km shorter (now 16.5 km) and runs between Estuary, to the north of Swords, and St. Stephen's Green. Three stops, Belinstown, Lissenhall and Seatown have been removed from the project and the strategic 'park and ride' which was to be located in Belinstown is now likely to be located at Estuary. An investigation into this location for a 'park and ride' is ongoing. These changes reduce the catchment area of Metro North and will result in a modest overall reduction in forecast demand for the scheme.

4.3 Population and Employment Projections

Figure 4.1 illustrates the 1km and 2km catchment area of Metro North which is reduced due to the shortened alignment.

Figure 4.1 Catchment area of Metro North

Table 4.1 illustrates the revised population and employment numbers for the 1km catchment of Metro North for 2006[2] and for two future year forecasts called Moderate Growth and Local Authority growth.

Table 4.1 1Km Revised Catchment area of Metro North

Alignment	2006 Pop*	2006 Emp*	Moderate Growth Pop**	Moderate Growth Emp**	LA Growth Pop**	LA Growth Emp**
Current Metro North	122,346	180,189	129,572	208,505	140,840	264,271
DBC	123,548	182,662	133,991	212,864	150,284	272,993

*Census figure

** Projected figure

Table 4.1 illustrates that in 2006 the revised proposed Metro North alignment has a catchment of approximately 180,000 jobs and approximately 122,000 people. The future year projections still show significant growth in the Metro North catchment, with employment increasing to nearly 265,000 in the Local Authority scenario.

However, as set out in the DBC the local authority projections are unlikely to be fully realised within the modelling timeframe due to the current economic climate and therefore as its base case RPA has produced additional demand forecasts, which assume that employment and population growth will not exceed levels forecast in the CSO's M0F1 scenario.

Under these assumptions, the total number of jobs in the Metro North catchment is forecast to be approximately 208,500.

4.4 Forecast Demand

4.4.1 Model Results

The demand forecasts for the Base Case service pattern described in the DBC are presented in Table 4.2.

Table 4.2 Model Results Base Case Moderate Growth (per annum)

	Moderate Growth		
	Do Min	Do Something	Change from Do Min
Heavy Rail			
Boardings millions	93.2	96.2	2.98
Bus			
Boardings millions	232.5	219.5	-13.0
Luas			

[2] The most recent available census data

Boardings millions	50.6	54.0	3.33
Metro			
Boardings millions	-	33.3	**33.3**
Total PT boardings (millions)	**376.3**	**402.9**	**26.6**

The demand forecasts indicate that the introduction of Metro North will add 33.3 million passenger boardings to the Metro network. This is a reduction of approximately 3 million passenger boardings from the DBC.

As was the case with the DBC a considerable proportion of the new boardings on the system come from the highway network. This will have a positive effect in terms of traffic decongestion in the city centre, i.e. taking cars off from the highway. The implementation of Metro North is forecast to reduce the number of car trips by 10.9 million per annum.

4.4.2 Land Use Sensitivity Test

Two further land use scenarios are tested. The first assumes that future year population and employment levels will be the same as 2006. This is referred to as the No Growth Scenario. The second scenario uses Local Authorities' population and employment growth projections without restricting this growth to conform with CSO forecasts. This is known as the Local Authority or LA Growth scenario. The results for these two scenarios are presented in Table 4.3 below.

Table 4.3 Model Results Base Case No Growth and LA Growth (per annum)

	No Growth			LA Growth		
	Do Min	Do Something	Change from Do Min	Do Min	Do Something	Change from Do Min
Heavy Rail						
Boardings millions	77.2	7.90	1.7	106.1	109.6	3.6
Bus						
Boardings millions	199.7	190.2	-9.5	259.5	242.8	-16.7
Luas						
Boardings millions	37.5	39.4	1.9	69.6	74.9	5.3
Metro						
Boardings millions	-	23.5	23.5	-	43.5	43.5
Total PT boardings (millions)	**314.4**	**332.0**	**17.6**	**435.1**	**470.8**	**35.7**

Demand for Metro North in the No Growth and LA growth scenarios is 23.5 million and 43.5 million respectively.

4.4.3 Comparison with existing Luas Patronage

The results of the modelling analysis show that Metro North is still expected to perform extremely well in attracting passenger numbers that are in excess of those currently experienced on the existing Luas lines (Table 4.4 below).

Table 4.4 Metro North Patronage Comparison per annum with Current Luas

	Patronage (millions)	Length (km)	Patronage (millions/km)
Red Line (2009)	13.6	15.1	0.90
Green Line (2009)	11.8	8.9	1.33
Metro North Patronage (No Growth)	23.5	16.5	1.42
Metro North Patronage (Moderate Growth)	33.3	16.5	2.02
Metro North Patronage (LA Growth)	43.5	16.5	2.64

On a per kilometre basis Metro North is forecast to be more heavily used than either the existing Red or Green lines in the No Growth, Moderate and LA growth scenarios. As was noted in the DBC, this is to be expected as metro provides higher average speeds than can be achieved on light rail and this, coupled with the reliability and frequency of service, makes metro more attractive over other modes including private car and bus.

4.4.4 Revenue

The output of the RPA model also forecasts revenues from fares for the proposed scheme. Table 4.5 shows the likely revenue generated as a result of Metro North implementation in the future year (2026).

Table 4.5 2026 Forecast Revenue per annum Base Case (2009 prices)

	Do Something
Revenue (2009 prices) No Growth	€50.26m
Revenue (2009 prices) Moderate Growth	€72.57m
Revenue (2009 prices) LA Growth	€95.84m

The revenue is based on an average fare per customer of approximately [3]€2.18 in 2009 prices for the Moderate Growth scenario. The incremental revenue is higher than what is currently being achieved on the existing Luas system.

The forecasts presented above for demand and revenue have not been adjusted in Table 4.5 by a demand ramp up. A demand ramp up in the early years for the purpose of financial and economic modelling has been included in chapters 7 and 8.

4.5 Further Sensitivity Testing

The main sensitivity tests carried out in the DBC have been re-forecast to test the robustness of the transport case for the revised Metro North scheme. As was the case with the DBC the sensitivity tests involve changes to the transport network and service patterns of various Transport 21 schemes. All sensitivity tests are based on the Moderate Growth land use scenario.

The first sensitivity test examines the impact of Metro North when it is introduced after all of the public transport projects in the GDA in Transport 21 have been implemented. This is called the 'Transport 21' scenario. The transport inputs and service patterns for this test are detailed in Table 4.8 and Table 4.9 of the DBC respectively. The results are set out in Table 4.6.

[3] This is marginally lower than the average fare per customer shown in the DBC. On the assumption that a distance based fare system (similar to Luas) is used on Metro North the average fare has fallen from the DBC as a result of the shortened alignment.

The addition of Metro North in the 'Do Something' scenario adds 39.7 million passenger boardings to the Metro network. This highlights the fact that as the public transport network expands the importance of Metro North will continue to grow.

Table 4.6 Model Results 2026 – Full Transport 21 Sensitivity Test (per annum)

	Do Min	Do Something	Change from Do Min
Heavy Rail			
Boardings millions	100.3	102.4	2.0
Bus			
Boardings millions	212.5	198.1	-14.4
Luas			
Boardings millions	91.4	94.2	2.8
Metro			
Boardings millions	22.1	61.8	39.7
Total Public Transport Boardings	**426.3**	**456.5**	**30.2**

The second sensitivity test is based on the same public transport network and service patterns as the Base Case scenario but with the addition of Luas line BXD (see Table 4.7).

Table 4.7 Model Results – Base Case with BxD Sensitivity Test (per annum)

	Do Min	Do Something	Change from Do Min
Heavy Rail			
Boardings millions	91.8	95.0	3.16
Bus			
Boardings millions	230.2	217.4	-12.7
Luas			
Boardings millions	56.8	61.5	2.65
Metro			
Boardings millions	-	32.2	32.2
Total Public Transport Boardings	**380.8**	**406.0**	**25.3**

The results shown in Table 4.7 demonstrate that there would still be strong demand for Metro North in this scenario with boardings on Metro North at 32.2 million. As expected, this is lower than the base case forecast of 33.3 million. The primary reason is that, with the introduction of BXD, individuals travelling to Dublin City Centre on the Green Line can now access areas further north than St. Stephen's Green without the need to transfer to Metro North to complete their journey.

5. Capital Costing for Exchequer Funded Elements

5.1 Summary of Changes to the Exchequer Funded Capital Costs

The capital cost of the exchequer funded elements of Metro North excluding PPP Capital Contributions is estimated to be €579.9 million (excluding VAT). This represents a reduction of €15.7 million from the DBC which arises from the reduction in property required for the project offset by a slight increase in RPA costs arising from additional costs due to the requirement for a new railway order application for the depot and spoil disposal strategy and because of the delay to financial close.

5.2 Summary of Railway Order Conditions that impact on the Exchequer Funded Capital Cost

The primary impact of the RO conditions on the exchequer funded element of the capital cost is the cost savings arising out of the reduction in property required due to the shortened alignment.

5.2.1 Advance Enabling Works

The cost allowance for advance enabling works is unchanged from the DBC. Whilst some of the RO conditions have impacted on enabling works it is envisaged that these can be accommodated with the existing risk allowances. Some of the enabling works packages have however been re-phased to take account of the fact that financial close will now be later and therefore some enabling works packages can start later as set out in Chapter 9. The overall cost allowance is unchanged from the DBC.

5.2.2 Property Acquisition

Due to the shortened alignment less property is now required for the project resulting in a reduction in the property cost. The value of land at any of the three options for the revised depot is higher than at the original depot location which slightly offsets the savings from the reduced land take elsewhere. An allowance has been made for the property protection scheme should this be required to be exchequer funded (which may be a consequence of condition 8 to the RO). Overall these changes result in a reduction in the property budget of €18.5 million from €145.7 million the DBC to €127.2 million. It should be noted that no allowance has been made for any property costs which may be associated with the revised strategic park and ride location.

5.2.3 RPA Project Management

The requirement for a further railway order application for the revised depot location and spoil disposal strategy will result in increased costs for design and environmental impact assessment. It will also result in a delay in the project reaching financial close and will result in the project team being mobilised for a longer period. For costing purposes it has been assumed that financial close will be in Q3 2012. That delay together with the additional railway order application costs results in an increase in pre-financial close costs of €3.4 million from €86.8 million in the DBC to €90.2 million. Post financial close project management costs are unchanged from the DBC.

5.3 Revised Exchequer Funded Capital Costs

The exchequer funded capital cost estimate for Metro North (excluding PPP Capital Contributions) is €579.9m (excl. VAT) and is presented in Table 5.1 below. This is a reduction of €15.7 million from the DBC.

Table 5.1 Exchequer Funded Capital Cost Estimates (€ million nominal)

Cost Categories	Cost € million Nominal
Advance Enabling Works	€256.7
Land and Property Acquisition	€127.2
RPA Project Management Pre-Financial Close	€90.2
RPA Project Management Post-Financial Close	€80.8
[4]RPA - Retained Risks	€25.0
Total Capital Cost (Excluding VAT)	**€579.9**

5.4 Expenditure to Date

The accrued expenditure to the end of November 2010 is €142.7 million (excl. VAT) and is presented in Table 5.2 below.

Table 5.2 Expenditure to end November 2010

Cost Categories	Cost (€ million)
Advance Enabling Works	45.5
Land and Property Acquisition	25.7
RPA Project Management Pre-Financial Close	71.5
Total Capital Cost (Excluding VAT)	**142.7**

[4] See section 8.8 on pages 109 and 110 of the DBC

6. Risk

6.1 Chapter Summary

- There are no material changes to the Risk chapter of the Updated Detailed Business Case arising out of the railway order conditions. The requirement for a separate new railway order for the revised depot location and the resultant revised spoil disposal strategy does increase the risk of further delays to the project as there is not certainty as to when such an application will be determined by An Bord Pleanála.
- Other significant railway order conditions which may alter the risk profile of the project and may be subject to negotiation over the risk allocation position between RPA and InfraCo are:
  - Condition 6 which requires the written agreement for surface and underground stop detailed design with the relevant planning authority. This has the potential to introduce delays to the design process and to introduce additional costs due to changes to the agreed planning authority requirements being introduced through this process. RPA will endeavour to mitigate this risk by agreeing protocols for this process with the relevant planning authorities;
  - Condition 9 which requires works to cease in the event of damage to property of a certain level being identified. This potentially creates an unbankable risk for InfraCo and will require further careful consideration as to how best this can be managed; and
  - Condition 15 which imposes very onerous noise limits in certain locations at certain times. However, this risk may be mitigated as the condition permits these limits to be relaxed in agreement with the local authorities.

7. Economic Appraisal

7.1 Summary of Changes to the Economic Appraisal

The changes in the scope of Metro North arising out of the conditions imposed by ABP result in a reduction in the BCR from that presented in the DBC. However, there remains a strong economic case for the implementation of Metro North under a range of different scenarios. The benefit to cost ratio of the project is 1.89:1 when taking account of wider economic benefits and is 1.46:1 using traditional economic appraisal methods. The scheme is therefore of substantial societal worth, with benefits well in excess of costs.

7.2 Summary of Railway Order Conditions that impact on Economic Appraisal

As set out in Chapter 4 the shortened alignment results in a reduction in demand of approximately 3m trips per annum in the base case. This is an 8.3% reduction from the DBC.

The cost changes, arising out of the scope changes, which are described in Chapter 8 also impact on the economic appraisal. Overall there is a slight reduction in the overall capital cost of the project and there are also reduced lifecycle and maintenance costs arising out of the reduced alignment in particular in relation to vehicle maintenance costs and traction power costs.

7.3 Economic Appraisal

The combined impact of the change in costs and benefits is that the BCR in the Base Case reduces from 1.55:1 in the DBC to 1.46:1, and the IRR reduces from 9.1% to 8.65%. The inclusion of Wider Impacts in the BCR delivers a BCR of 1.89:1.

[5]Table 7.1 Metro North Economic Appraisal Results Base Case

Benefit to Cost Ratio (BCR)	**1.46**
Internal Rate of Return (IRR)	**8.65%**

The scope changes have similar impacts on the sensitivity tests in the DBC. The two land-use sensitivity tests that were presented in the DBC have been updated. The No Growth scenario now delivers a BCR of 1.04:1, and an IRR of 4.45%, while the Local Authority delivers a BCR of 1.98:1 and an IRR of 12.6%.

Table 7.2 Metro North Economic Appraisal Results No Growth and LA Growth Scenarios

	No Growth	LA Growth
Benefit to Cost Ratio (BCR)	**1.04**	**1.98**
Internal Rate of Return (IRR)	**4.45%**	**12.6%**

Two infrastructure sensitivity tests were also presented in the DBC. The Transport 21 test now delivers a BCR of 1:455:1 and an IRR of 9.41%, while the Current Infrastructure with BXD test delivers a BCR of 1.43:1 and a BCR of 8.56%.

5 Benefit information not disclosed as the BCR is presented and that would permit the calculation of the cost information which is commercially sensitive for the reasons outlined in Chapter 8 of the DBC.

Table 7.3 Metro North Economic Appraisal Results – T21 Network

Benefit to Cost Ratio (BCR)	**1.55:1**
Internal Rate of Return (IRR)	**9.41%**

Table 7.4 Metro North Economic Appraisal Results – Current Infrastructure with Luas BXD

Benefit to Cost Ratio (BCR)	**1.43:1**
Internal Rate of Return (IRR)	**8.56%**

7.4 Wider Economic Benefits

The wider impacts described in DBC are largely unchanged by the scope changes arising out of the RO condition. The assessment of wider impacts associated with Metro North increase the BCR of the scheme to 1.89:1 in the base case. The wider impacts BCR in the DBC was 2.0:1.

8. Project Finance

8.1 Summary of Changes to the Project Finance Chapter

- The estimated net Exchequer funding requirement (in nominal terms) for Metro North over the construction period is reduced by €15 million from the DBC to €1,572 million.
- There is a small reduction in the overall capital cost of Metro North taking account of the changes to the PPP elements of the scheme and the project can still be accommodated within the existing total capital envelope of €3,798 million.
- As discussed in Chapter 9 the phasing of enabling works has been reviewed as a result of the delay arising out of the RO conditions. As a result the net exchequer funding requirement in 2011 has been reduced by €33 million to €43 million.
- The timing of drawdown of capital contributions to the PPP contractor has also been reviewed in light of delay to financial close (as a result of RO conditions) and the changed economic circumstances. There is therefore significantly reduced exchequer requirement in the years 2012 to 2014 from the numbers presented in the DBC.
- There will be a decrease in the lifecycle, maintenance, traction power and operating costs arising from the shortened alignment. These costs reductions offset the reduction in forecast operating revenue arising from lower patronage forecasts.

8.2 Summary of Railway Order Conditions that impact on Project Finance and Cash-flows

The following conditions imposed in the Railway Order have had an impact on the capital cost element of the scheme to be funded by PPP Co. The key elements which will result in changes to the PPP capital costs are as follows:

- Revised Spoil disposal strategy - the original spoil disposal strategy had assumed that a significant amount of the excavated material could be reused at the original depot site at Belinstown. At any of the new depot location sites there is less opportunity for reuse and that material will now probably need to be transported further for disposal at landfill sites incurring disposal costs as well as the additional transportation costs.
- The outline plan for the depot at the three possible locations allows some optimisation from the layout of the depot at Belinstown. This will result in some marginal reductions in cost of the depot facilities themselves. However, the access for Metro North vehicles to the depot at any of the revised locations will require a more complex delta junction arrangement which will increase the cost.
- The requirement for a footbridge at Sword also results in increased costs.
- The overall length of the line has been reduced by 2.3km and now terminates at Estuary rather than Belinstown. In addition to the shortening the line the stops at Belinstown, Lissenhall and Seatown have been removed resulting in a further reduction in cost. The shortened alignment also reduces the number of vehicles required resulting in further costs savings.
- As set out in Chapter 3 it is now envisaged that the strategic park and ride will accommodate 1000 spaces rather than the 2000 space park and ride at Belinstown that was included in the DBC. This results in further capital cost savings.

These changes together with other scope changes since the PPP bids were submitted result in an overall capital cost increase in the order of € 2 million nominal.

This is offset by a reduction in the exchequer funded capital cost elements of €15m as set out in Chapter 5. There is therefore an overall reduction in the order of €13 million in the total capital cost. The revised project can therefore be accommodated within the existing capital envelope which is €3.8 billion exclusive of VAT as set out in the DBC.

In terms of operating and maintenance costs the shortened alignment and shortened journey time results in reduced vehicle and infrastructure maintenance costs as well as reduced traction power costs power costs and reduced operating costs. These changes will reduce the following payments:

- Availability payments to the PPP contractor over the 25 year term of the project once passenger services have commenced;
- Energy costs to be paid to the PPP contractor for running the system; and
- Operating fee to be paid to the Operator.

There is also a reduction in operating revenue due to the reduced patronage forecasts as set out in Chapter 4. RPA is confident that the level of operating revenue will still be sufficient to cover the operating fee and power costs.

8.3 Exchequer Funded Capital Contribution

As set out in section 9.5 of Chapter 9 of the DBC annual limits had been imposed on the maximum level of capital contributions that could be bid by the PPP bidders. The DBC had assumed that the €150 million limit originally set for 2010 would apply in 2012. Annual limits of €300 million had applied thereafter. As a result of the RO conditions there is now a further delay to when PPP financial close can be achieved. It is now assumed that financial close will be achieved in 2012 but substantial construction works will not start until 2013. It is therefore now proposed that the €150 million limit should apply in 2013. In light of the economic circumstances and the budgetary constraints it is considered that the annual limits should be reduced to €250 million for 2014 and €275 million thereafter. The maximum total exchequer funded capital contribution remains at €1,050 million. The maximum possible exchequer funding requirement in respect of capital contributions is shown in Table 8.1 below. Depending on the construction programme of the successful PPP bidder it is possible that some capital contribution may not be drawn down until 2018.

Table 8.1 Maximum Exchequer Funded Capital Contribution (€ million nominal)

	€ million nominal excluding VAT						
	Total	2012	2013	2014	2015	2016	2017
Total Adjusted	<=1,050	0	<=150	<=250	<=275	<=275	<=275

<= less than or equal to

8.4 Other Exchequer Funded Capital Costs

The changes to the other exchequer funded capital arising out of the RO conditions are set out in Chapter 5. The associated exchequer cash flows are shown in Table 8.2 below including an allowance of €25 million for RPA retained risks under the PPP arrangement as described in paragraph 8.8 of the DBC.

Table 8.2 Exchequer Funded Property, Enabling Works & RPA Costs & Retained Risks (€ million nominal)

€ million nominal excluding VAT								
Total	2006 To 2010	2011	2012	2013	2014	2015	2016	2017
580	143	59	128	105	51	50	24	20

8.5 Development Levies

FCC has confirmed to RPA that the area of the Section 49 Supplementary Development Contribution Scheme for Metro North is not materially affected by the shortened alignment. The forecasts used in the DBC are therefore unaltered.

The levies collected to the end of October 2010 for both of the local authorities are set out in Table 8.3 below.

Table 8.3 – Metro North Levies Collected to End October 2010 (€ million)

€ million nominal	Total	2007	2008	2009	2010 to 31 October
Fingal County Council	12.9	0.1	3.8	0.5	8.6
Dublin City Council	2.2	0.1	0.4	0.8	0.9
Total	**15.1**	**0.2**	**4.2**	**1.3**	**9.5**

Based on these projections the forecast levy yield in nominal terms over the period of the construction is set out in Table 8.4 below. In overall terms this is unchanged from the DBC although the numbers for 2007 to 2010 and 2011 have been slightly amended.

Table 8.4 – Levy Forecast Construction Period (€ million nominal)

€ million nominal								
Total	2007 to 2010	2011	2012	2013	2014	2015	2016	2017
58.3	15.1	1.3	2.1	2.1	4.3	10.9	11.1	11.4

8.6 Summary of Construction Period Exchequer Cash Flows

The estimated Exchequer funding requirement is set out in Table 8.5 below in nominal terms. The projected development levies based on RPA's adjusted estimates as set out in Table 8.4 above are netted against the gross Exchequer funding estimate to provide the net Exchequer funding requirement. The net Exchequer funding requirement in nominal terms is €1,572 million which is within the approved Exchequer funding of €1,628 million which is set out in Table 8.16 of the DBC.

Table 8.5 – Net Exchequer Funding Requirement to end of Construction Period (€ million nominal)

	Metro North - Exchequer Cash-flows to Completion of Construction € million Nominal												
	Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
RPA Costs - Pre Financial Close	90.2	8.1	26.3	20.3	10.9	6.3	9.2	9.1	-	-	-	-	-
RPA Costs - Post Financial Close	80.8	-	-	-	-	-	-	7.3	14.7	14.7	14.7	14.7	14.7
Property Costs	127.2	-	-	21.4	2.6	1.7	-	15.2	30.4	30.4	25.4	-	-
Enabling Works	256.7	-	-	23.8	16.4	5.7	50.0	95.9	54.7	0.9	5.1	4.0	-
RPA - Retained Risks	25.0	-	-	-	-	-	-	-	5.0	5.0	5.0	5.0	5.0
Sub-Total	**579.9**	**8.1**	**26.3**	**65.6**	**29.9**	**13.7**	**59.2**	**127.6**	**104.9**	**51.0**	**50.2**	**23.7**	**19.7**
PPP Capital Contribution	1,050.0	-	-	-	-	-	-	-	150.0	250.0	275.0	275.0	100.0
Gross Exchequer Requirement	**1,629.9**	**8.1**	**26.3**	**65.6**	**29.9**	**13.7**	**59.2**	**127.6**	**254.9**	**301.0**	**325.2**	**298.7**	**119.7**
Less S 49 Development levies	58.3	-	-	-	-	-	16.4	2.1	2.1	4.3	10.9	11.1	11.4
Net Exchequer Requirement	**1,571.6**	**8.1**	**26.3**	**65.6**	**29.9**	**13.7**	**42.8**	**125.5**	**252.7**	**296.7**	**314.3**	**287.6**	**108.3**

8.7 Operational Period Revenues and Costs

Demand and revenue forecasts for Metro North are based on RPA's transport model and average yield per boarding assumptions. The demand assumptions have changed from the DBC as set out in Chapter 4 and therefore the revenue projections have also changed.

Table 8.6 below sets out the gross anticipated revenues for the first five years of operations.

Table 8.6 Projected Operations Revenue – First Five Year of Operations (€ millions, Nominal)

	Metro North - Operational Revenue - 2018 to 2022 € million Nominal				
	2018	2019	2020	2021	2022
Gross Revenue	55	60	66	76	79

Operating revenue projections have reduced from the DBC but RPA also estimates a reduction in operating, maintenance and power costs. Based on RPA's own analysis RPA remains confident that the level of operating revenue will be sufficient to cover the operating fee and power costs.

8.8 Impact of Irish Economic and Financial Crisis on Project Financing

Since the DBC was prepared in July 2010 the scale of the Irish economic and financial crisis has crystallised somewhat culminating in a programme of financial support for Ireland being agreed with the EU and the International Monetary Fund (IMF). The agreed programme is intended to bring about a sustainable stabilisation of the Irish economy and is intended to address in a decisive manner the economic and financial causes underlying current market concerns and will thereby contribute to restoring confidence in Ireland and safeguarding financial stability in the euro area as a whole. Clearly it will be some time before it becomes apparent whether the planned measures are sufficient to restore confidence in the financial stability of Ireland and the eurozone. It will be therefore be some time before market access, on a sustainable basis, for Irish sovereign debt is restored and there will also probably be a continued lack of access to interbank markets for Irish banks. It is not considered feasible that in these circumstances international debt funding markets would lend funds to project finance transactions (such as Metro North) in Ireland, the repayment of which is ultimately dependent on the Irish state.

In its agreement with the EU and the IMF Ireland has committed to taking decisive steps to return the Irish banks to viability so that they can operate without further state support in a reasonable period of time. Significant steps, such as recapitalisation of the banks and stress testing of capital adequacy and liquidity are planned through 2011, together with the publication of detailed methodologies and results to restore international financial credibility.

The current programme for Metro North (as shown in Chapter 10) envisages Metro North reaching financial close in late 2012 or early 2013. On that basis engagement with debt funders is required in late 2011 or early 2012. Subject to the measures, which Ireland as agreed with the IMF and EU, having achieved the desired result of restoring financial credibility it is considered feasible that Metro North could achieve financial close in those timescales.

Market research (conducted by the European PPP Expertise Centre – a body established by European Investment Bank) indicates that conditions in the European and international PPP market continue to improve. Overall, debt tenors are lengthening and margins are slowly moderating and the market appears to be returning to large PPPs. It is therefore considered that subject to international confidence in Ireland returning and no further deterioration in financial markets, the required debt funding should be available to achieve financial close for Metro North in the timescales now envisaged for the project.

9. Commercial Structure & Procurement Strategy

9.1 Summary of Changes to the Commercial Structure and Procurement Strategy

- **There are no material changes to the commercial structure and procurement strategy set out in the DBC arising out of conditions imposed by the Railway Order.**
- **RPA has carried out further analysis of the phasing of enabling works in light of the delay to financial close. It will be necessary to proceed with the advance works at Mater if Metro North is not to adversely impact on the opening date of the new adult hospital. The planned utility diversion works in the vicinity of O'Connell Bridge, associated heritage works and the utility diversion works in Ballymun need to progress in 2011. The other enabling works packages have been reprogrammed to start in late 2011/early 2012.**

9.2 Enabling Works Phasing

RPA has carried out further analysis of the phasing of enabling works in light of the delay to financial close arising out of the requirement for a new railway order application for the relocation of the depot and resultant revised spoil disposal strategy.

It continues to be the case if RPA cannot commence the Mater Stop Box Diaphragm Wall works in June 2011 there will be a direct knock on impact on the opening date for the new adult hospital which is scheduled for January 2012. This is due to the environmental impacts caused when constructing the stop box in relation to noise and vibration. In summary, the operational hospital would not be able to withstand the environmental impacts from the stop box diaphragm wall construction. It is currently scheduled that this enabling works contract is awarded in May 2011 with works commencing on site in June 2011.

The commencement dates for the other enabling works packages are driven by the requirement to hand over sites to InfacCo on dates specified in the bidders construction programme(s). Wherever possible enabling works are scheduled so as to allow for potential programme slippage and thus reduce the risk of late handover to InfraCo. The programme for enabling works envisages the staggered commencement of various packages of work starting with contract award in January 2011. After contract award a period of time is required for contractors to mobilise and apply for and put in place all the necessary consents and permits to be in a position to commence works on site. The current dates for award of the significant enabling works packages are as follows:

Table 9.1

Enabling Works Package	Contract Award	Works Commence
Heritage Works	January 2011	
O'Connell Street – Removal of Gray, Larkin,O'Brien		April 2011
O'Connell Street – O'Connell Monument		July 2012
St.Stephen's Green		July 2012
O'Connell Bridge Utilities & Sub-Station Works	January 2011	April 2011
Mater Stop Box Diaphragm Wall	May 2011	June 2011
Ballymun Utility Diversions	May 2011	August 2011
St Stephen's Green Utility Diversions	October 2011	January 2012

Parnell Square Utility Diversions	October 2011	January 2012
Temporary Liffey Bridge	Q 2/3 2012	Q3/Q4 2012

The enabling works at O'Connell Bridge and Ballymun are the most complex and have the greatest risk of overrun and therefore risk of late handover to InfraCo. The works at St. Stephens Green and Parnell Square can commence later. This revised phasing has been reflected in the exchequer cash flow analysis shown in Table 8.5 above.

10. Programme and Way Forward

10.1 Chapter Summary

RPA estimates that the delay to the project arising out of the delayed decision on the RO and the requirement for a further railway order application will result in a delay to the project reaching financial close of 12 to 18 months from the dates shown in the DBC. That delay has a direct knock on impact on construction completion and operational service commencement.

10.2 Summary of Railway Order Conditions that impact on Programme

At the time the DBC was submitted in July 2010 ABP had indicated that it would be making a decision on the RO application by mid August 2010. Subsequent to that, RPA was notified of a delay and ABP made a decision on the RO at the end of October 2010. That delay together with the delay arising out of the requirement for a further railway order application for the revised depot location will result in a delay to the project reaching financial close of 12-18 months from the dates shown in the DBC. That delay has a direct knock on impact on construction completion and operational service commencement.

10.3 Programme

The National Transport Authority (NTA) has expressed a preference that the next step in the PPP procurement process, which is the mark up of contracts by the BAFO Tenderers leading to contractual negotiations, does not take place until after the depot railway order is granted. However, NTA also recognises that there may be some benefit in maintaining momentum on the PPP procurement. In advance of making a decision on the appropriate process and the timing of PPP procurement activities RPA will meet with both BAFO Tenderers. A meeting of the Metro North Project Board will take place subsequent to those meetings in order to make a decision on the approach to be adopted. The master programme will be updated once this decision is taken. The key programme dates programme set out in Table 10.2 below show a range of dates for PPP procurement milestones based on either commencing engagement with the BAFO Tenderers after the depot railway order application is submitted in April 2011 or after the railway order is granted which is assumed to be in October 2011.

Table 10.2 Key Milestone Dates in Metro North Programme

Milestone/Activity	
Railway Order Operational	23 December 2010
Approval of Enabling Works funding	December 2010
Award first Enabling Works contracts	January 2011
Commence Heritage and Utility Works on site	April 2011
Depot Railway Order Application lodged	April 2011
Depot Railway Order Granted	October 2011
Depot Railway Order Operational	December 2011
Receipt of PPP BAFO Tenders	Q4 2011 to Q2 2012
Preferred PPP Bidder Selection	Q1 2012 to Q3 2012
Government Approval of Final Business Case	Q2 2012 to Q4 2012
PPP Contract Award	Q3 2012 to Q1 2013
Operational Service Commencement	Q4 2017 to Q4 2018

The dates set out in the above table are dependent on a number of factors external to RPA including:

- It is anticipated that the Railway Order shall come into operation on 23 December 2010 on the assumption that an application for leave to apply for judicial review of the order will not be made;
- RPA is given approval in December 2010 to award enabling works contracts;
- ABP make a decision on the depot railway order application within 18 weeks of the conclusion of the 6 week public display period following lodgement of the application;
- Timely approval of the Final Business Case by Government once a preferred PPP bidder is appointed;
- Continued stability of financial markets so that financial close can be achieved quickly once a preferred bidder is appointed; and
- The two bidders have different construction programmes (including testing and commissioning). These programmes will be updated as part of the bidders BAFO submission. The final programme will be dependent on the programme of the preferred bidder. Any delay in awarding enabling works contracts will also have a knock on impact on PPP bidders programmes as their access to the site could be delayed at critical locations.