

# **Coleraine to Londonderry Track Renewals Project**

**Addendum to 2010 Appraisal**

**September 2011**

## 1. Background

The Coleraine and Derry Line is a predominantly single track line with a passing loop at Castlerock Station. There is one other intermediate stop at Bellarena, located north east of Limavady. The line is 33.5 miles long with track that dates to approximately 1978.

In 2010 KPMG prepared an economic appraisal for NIR for the Coleraine to Derry Track Renewals Project which sought to identify the least cost option for delivering the Minister's decision to provide a rail service to Derry. The preferred option was Option 3a which was a full relay of the existing track with the addition of a new passing loop and a new signalling system to be operated from Coleraine. The capital cost of this option, including optimism bias was budgeted at £75m. The project was approved by NITHC / Translink's executive group, the NITHC Board and DRD and DFP for implementation between April 2012 and March 2013. However, funding constraints have meant that the project could not go ahead as planned and a decision was made to defer a full line relay until a later date.

In the interim, and in order to keep the line open, a project was set up to deal specifically with safety related works on the line. The economic appraisal, *Coleraine – Londonderry Track Safety Improvements Works* was approved by the Executive Group in April 2011, the NITHC Board in May 2011 and DFP in June 2011. Translink received a letter of offer from DRD to proceed with the project in June 2011. This project recommended safety works to the "middle section" of the line between Castlerock and Eglinton. This involves putting in new rail to replace the 56% of the old rail to provide a length of continuously welded rail (CWR) which requires the least ancillary works. The ballast will be topped up where required. This section was chosen as it is the most accessible and would deliver the best value given the limited funds available. Procurement for this project has commenced with the project timetabled to be completed in 2012/13. While this option allows the line to remain open, speed restrictions on the line mean that in the absence of further work, service on the line would have to be reduced by 40%.. This reduced level of service will continue until the necessary work is completed on the 2 end sections of the line, i.e. between Coleraine and Castlerock and Eglinton and Derry.

Given that Derry has been chosen to be the UK's inaugural City of Culture in 2013, it is important that the track is able to maintain the current level of service in order to help transport the expected influx of tourists to the North West. There is growing public opinion against any move to reduce service during this period. This is on top of adverse press reaction to the fact that, in the absence of the investment, the new trains bought to run on the line will remain idle. Extra funding is therefore being sought, in addition to the funding for the track safety improvement works and the Bann Bridge<sup>1</sup>, to improve the infrastructure of the Coleraine to Derry line. The aim of this addendum is to identify the option that, in the short-term, ensures that current services are maintained and in the medium/long term delivers the enhanced service provided under the preferred option (3a) in the original appraisal. In effect, the addendum assesses the cost/benefit implications of phasing the works needed to deliver option 3a taking into account the planned safety works and also current budget constraints.

## **2. Strategic Context**

The 2010 KPMG appraisal looked at the following underlying strategies:

### **Department for Regional Development (DRD):**

- Regional Development Strategy for Northern Ireland 2025 – the project should improve the track to such a level that it can accommodate the services envisaged by the New Trains Two (NTT) programme. Therefore, it will have a beneficial impact on rail services provided over this part of the rail network.
- Regional Transportation Strategy for Northern Ireland 2002-2012 – this project has the potential to contribute towards this strategy in terms of improvements to rail services and the opportunity to increase passenger numbers.
- Regional Strategic Transport Network Transport Plan 2015 this project has the potential to assist towards increasing rail passenger numbers by improving the

---

<sup>1</sup> The refurbishment of the Bann Bridge is a further project to be carried out on this section of track. The Bann Bridge was constructed in the 1920's and has 11 spans, one of which is a lifting bascule type to allow the passage of shipping to Coleraine Port. Translink are under obligation to provide ships with access to and egress from the port as required. This is a standalone project and is not dependent on the relay project; however it also requires a line blockade and, to minimise passenger disruption, it should be done at the same time as the relay project. This has been a lesson learned from previous projects undertaken by Translink.

service supplied between Coleraine and Derry through the redevelopment of the line.

- Accessible Transport Strategy 2015 – through modernisation of the rail network, this project will contribute to the accessibility to services for those with disabilities.

#### **Translink:**

- Review of the Future of Railway in Northern Ireland – Report by the Railways Taskforce – Translink has managed lesser used lines over a 10 year period of Safety Improvement Programme as envisaged by the Consolidation Option under the Railways Task Force Interim Report. Translink has also achieved the 60% growth target set within the Regional Transportation Strategy confirming the viability of the existing railway network. This project provides the next step in the strategic development of the railways by providing the long term integrity of the Coleraine to Derry track and the facility to deliver an enhanced timetable linked to the completion of the NTT programme.
- Translink Corporate Plan 2009/2010 – 2011/2012.
- Translink Passenger Charter.

#### **Office of the First Minister and Deputy First Minister (OFMDFM):**

- Lifetime Opportunities – this project will assist Translink in achieving improved rail services across the rail network by providing passengers with an increased frequency in service, improvements in the safety of the line and ultimately the provision of train sets which have increased capacity (through the implementation of the NTT programme). In particular, due to the rural location of this track, the project will help towards eliminating poverty from rural areas.
- Statutory Equality Obligations (Section 75 of the Northern Ireland Act 1988) – Translink provides services for all sections of society. Improvements to services are particularly beneficial to those with disabilities.
- Sustainable Development Strategy for Northern Ireland – improvements to rail services will attract people to public transport from the private car thereby reducing Northern Ireland's carbon footprint.

## **Safety Decision Making (Health and Safety Executive)**

**Ilex Regeneration Plan** – this project has the potential to increase passenger numbers on the Coleraine to Derry section thereby increasing the number of people who visit the City of Derry for business and leisure activities.

**Derry City Council: Annual Report and Improvement Plan 2009/2010** : this project will potentially attract visitors to the North West.

**Coleraine Borough Council: Corporate Plan 2009 – 2011**: the project will help the accessibility to Coleraine through a high quality rail service.

### **3. Identification of Need**

In the KPMG report, the need for the project was determined in terms of the following:

- The current Coleraine to Derry Track Infrastructure;
- Passenger Demand; and
- NIR's future design timetable for the Belfast to Derry route for operation following the NTT Programme.

#### Coleraine to Derry track infrastructure

The Coleraine to Derry line section is 33.5 miles long and is constructed as jointed track, on concrete sleepers. The rails are flat bottom type 50kg/m, and they are of vintage 1971-1978 and therefore have endured between 33 and 40 years of service. The rail ends (of almost every rail without exception) are now crippled (dipped) and these dipped joints are the locations where a safety incident, through a train derailment, is most likely to occur due to the development of twist faults. Between Coleraine and Derry there are approximately 5,900 individual rail joints (Up cess and Down cess rails). Each rail joint is a potential derailment point.

The physical items that must now be addressed by the Permanent Way Department to reduce risk and preserve the Coleraine to Derry Line can be summarised as follows:-

- Crippled rail ends
- Rail end breakages
- Failed junction plates
- Potential twist faults
- Poor ride quality
- Increased wear and tear on trains
- Increased impact loading on formation

During March 2011, the last track geometry recording run of 2010/11 took place using the track geometry recording equipment. It identified 8 level 4 twist faults (the most severe twist faults), 65 level 3 twists, about 400 level 2 twist faults and about 800 level 1 twist faults. Severe twist faults can cause derailment.

The Coleraine to Derry Track Renewals Project appraisal discussed the condition of the signalling and the bridges. The signalling system dates from the 1970's and 1980's with the exception of Castlerock station which dates from the 1930's.

A token block system is used to control the single line between Coleraine and Castlerock and between Castlerock and Derry. This technology allows only one train to operate on each section of line at a time and has a significant impact on line capacity, especially where the block length is considerable, such as between Castlerock and Derry.

The design of the existing signalling layout and interlocking at Castlerock does not comply with current industry best practice and parts of the operating mechanisms are obsolete, making spares harder to source. In addition, the current installation does not support the introduction of Automatic Warning System (AWS) or Train Protection and Warning System (TPWS) equipment at this location, as currently required by legislation.

The condition of the bridge structures along this route has been analysed. As a result concrete repairs and waterproofing have been identified as being required on some

bridges. The condition survey has shown that two bridges, (Pottagh and Ballykelly) will need to be replaced within the next 5 to 10 years whilst a third near Myroe (Broharris) needs significant work in the same time frame.

The railway line from Coleraine to Derry currently operates under a Permanent Speed Restriction (PSR) of 60MPH with some lower permanent and temporary speed restrictions enforced at specific locations. The condition of the permanent way has now degraded to such an extent that the Head of Permanent Way is currently considering a reduction in the PSR to 50MPH everywhere along this route.

The line section between Castlerock and Eglinton is due to be re-railed over the next 12 to 15 months (under the Track Safety Improvement Work) which will eliminate the jointed track over that section. This is a medium term safety measure as much of the ballast is in a poor condition and will be life expired in the next 10 years. The section will be re-railed with new rail and this is expected to have a service life of at least 30 years. Therefore, a full relay of the Castlerock to Eglinton section, in about 10 years' time, is expected to use the then existing rail.

### Passenger Demand

The Coleraine to Derry section is part of the Londonderry Line which is part of the Cork – Dublin – Belfast – Derry Trans European Network. Passenger numbers on the whole Derry Line have been rising significantly over the last number of years. In 2001/02 there were 631,029 passenger journeys between Belfast and Derry. By 2010/11 this had increased by 134% to 1,476,929. This significant growth is mirrored in the section between Coleraine and Derry where, in 2010/11 there were 402,125 journeys compared with approximately 240,000 in 2006/07.

In February 2007, Booz Allen Hamilton carried out a passenger demand forecast showing future passenger number predictions out to 2034/35. The Booz Allen Hamilton report had overall expected growth on the Derry line of about 25%, particularly given the introduction of the Class 4000 fleet and improved signalling on the line allowing for increased train frequencies.

## NIR's future design timetable for the Belfast to Derry route for operation post the NTT Programme

Under the NTT project, Translink identified a requirement to provide an hourly service between Coleraine and Derry in 2012, with the first service from Belfast arriving before 9am. In addition, it was assumed that an enhanced timetable would be provided from 2018 providing a half-hourly shuttle service between the two cities as a stand-alone option from the Belfast to Derry services.

Booz Allen Hamilton (BAH) were commissioned by Translink to review the future timetable requirements of the whole Derry Line from Belfast and identify the future infrastructure and line speed improvements required to achieve an hourly service between the two cities, as well as an optional half-hourly shuttle service between Coleraine and Derry. Their study concluded that two new passing loops would be required to meet the hourly and half-hourly service requirement as well as a complete upgrade of the signalling system to current standards. This would also permit the rationalisation of signal cabins by consolidating signal control from Castlerock and Derry to Coleraine. The preferred option in the appraisal has one passing loop and this is deemed appropriate at this time.

## UK City of Culture

Since the 2010 appraisal an additional need for change has arisen. Derry has been chosen to be the UK's inaugural City of Culture in 2013. Derry can expect a large influx of tourists for that year leading to much needed investment and employment and regeneration. It is essential, therefore, that there is adequate transport infrastructure in the North West.



## 4. Objectives, Targets and Constraints

At this time, the main objectives of the project are:

- To deliver the infrastructure capacity for 8 return journeys per day by 2013 ;
- By 2015, deliver the necessary infrastructure to facilitate the timetable identified under the New Trains Two (NTT) project.

### Constraints

- Allocated budget – the project can only proceed if the appropriate financing is secured. The PE implications are set out later in the addendum.
- Time constraint – the Coleraine to Derry line needs to be open for as much of 2013 as possible as this is the year that Derry is the UK City of Culture.
- Availability of land (if applicable) – there may be a requirement to acquire additional land in order to construct the passing loop.
- Regulatory and Planning constraints – the proposed work to be carried out must comply with relevant legislation and regulations, including Health and Safety legislation

## 5. Consideration of Options

The 2010 Economic Appraisal concluded that, in order to achieve the objectives of the New Trains Two Programme, it was necessary to carry out a full renewal of the line along with the provision of a passing loop and necessary signalling works i.e. option 3a. Work was due to commence in 2011 and be completed by March 2013. As outlined earlier, budget constraints meant that this option was no longer considered affordable and the decision was made to defer investment until a later date. In the interim, and in order to keep the line open, safety improvement works on the middle section of the track at a cost of just over £7.6million were approved. These works are due to commence in 2011/12 and completed in 2012/13.

This section considers a number of alternative options to deliver the objectives set out in section 4. Although a full relay (option 3a) is no longer a viable option (due to affordability and also it would mean closure of the line throughout 2013), it is included for comparison purposes. Under each option (other than 3a) it is assumed that the safety improvement works will go ahead. The cost of these works has therefore been included for each option. It is also assumed that full signal upgrade is required for each option<sup>2</sup>.

### **Option A: Full Relay, Signalling and Passing Loop**

Under this option, a relay of the full track would commence in 2012 and be completed in late 2013 with signalling and the passing loop to be carried during 2012 and 2013.

Other than timing, this option is the same as the original preferred option (option 3a). While this is no longer a feasible option for the reasons set out above, it has been included as a comparator.

### **Option B: Re-rail middle section, relay end sections of rail by 2013, upgrade signalling and provide passing loop by 2014 and relay middle section by 2021.**

Option B delivers the same ultimate solution as Option A, but over three phases. The proposed phasing is as follows:

- Phase 1 is the full relay of the permanent way from Coleraine to Castlerock and from Eglinton to Derry. This includes all bridge work in these sections but excludes any signalling work. All track will be re-laid as CWR. This will be completed by the end of March 2013.
- Phase 2 is the full re-signalling of the Coleraine to Derry line section and the addition of the passing loop. This will be completed in 2014/15.

---

<sup>2</sup> The signalling system on the Coleraine to Derry line section is a token block system that dates from the 1930's, though it was upgraded in the 1980's with minor works done to it in 2009 due to the interface with Derry airport. The system is completely unreliable and prone to frequent breakdown. Parts of the operating mechanism are obsolete making spares increasingly hard to source. If the system were to fail completely a like for like replacement could not be sourced. The design of the existing signalling layout and interlocking at Castlerock does not comply with current industry best practice. Under all scenarios, the signalling on the Coleraine to Derry line needs to be replaced

- Phase 3 is the full relay of the track between Castlerock and Eglinton which is being re-railed under the *Coleraine – Londonderry Track Safety Improvements Works* project. Phase 3 is expected to replace sleepers and ballast as well as refurbish bridges within this line section; however much of the new material (e.g. the new rail) being used in the safety improvement works will be reusable. This will take place in 2021.

**Option C: Do nothing other than re-rail middle section in the short term. Defer the relay of the end sections of rail until 2014/2115 and upgrade signalling in 2015/16. Relay middle section by 2021. The passing loop required to provide an hourly service has been excluded.**

Option C is to do nothing in the short term except normal maintenance of the line, with the completion of Phases 1 and 2 (excluding the passing loop) listed above between April 2013 and March 2016, and Phase 3 in 2021. The exclusion of the passing loop will mean that the hourly service, as envisaged by the New Trains Two programme, will not be delivered. This option is, therefore, a relaying of the existing track only. It should be noted that, under this option, with regard to the two end sections, there is probably a 50/50 chance that within the next 4 years the track condition could fall to a level where passenger services are no longer attractive enough to remain viable. This option also will result in a significant reduction in service to five trains each way per day.

**Option D: Re-rail whole line in 2011/12 with signalling upgrade and passing loop. Relay whole line in 2021.**

In addition to the proposed re-railing of the middle section, this option involves re-railing the two ends of the Coleraine to Derry Line between Coleraine and Castlerock and Eglinton and Derry. NIR's Infrastructure Department has concluded that this does not present a viable solution for these two sections of the line for the following reasons:

- Both of these sections are in need of renewal. In both areas the formation below the sleepers has failed or is failing and should be dug out and removed. A new

formation material comprised of geotextile and fresh, clean quality ballast should be installed.

- The drainage on the two sections is not working and a new drainage system needs to be constructed to collect rainwater and divert and drain it from the track formation.
- The track is currently jointed and formation failure is most severe at the dipped joint ends. Removal of jointed track and replacement with continuously welded track on the existing formation material will give rise to “ghost joints”.
- The existing ballast shoulders are insufficient to resist the thermal expansion forces experienced on welded track. Therefore new ballast shoulders need to be constructed. In-order to construct these, retention measures need to be built first. This can be by construction of retaining walls or widening embankment tops through civil engineering methods.
- The track itself is single track and it is generally narrow with steep ground on its down side boundary and often a drop into sea water on the up side along the Bann Estuary and along Lough Foyle. Access is difficult in both sections and is largely restricted to a linear route along the railway line.

When the condition of the existing asset, the works required and the physical site constraints are considered together, it is clear that these two sections of railway line need to be renewed and that neither section is suitable for Track Safety Improvement Works.

Option D is therefore rejected for further analysis.

## 6. Assessment of Costs

### Capital Costs

Detailed capital costs (2011/12 prices) associated with each of the options are set out in annex 1 and summarised in table 1 below.

**Table 1: Summary of Capital Costs**

<b>Cost Description</b>	<b>Option A £</b>	<b>Option B £</b>	<b>Option C £</b>
<b>Capital Costs of relay &amp; Signalling Works(includes Optimism Bias)</b>	75,019,634	77,743,178	74,181,925
<b>Safety improvement works</b>	0	7,652,017	7,652,017
<b>Total Cost</b>	<b>75,019,634</b>	<b>85,395,195</b>	<b>81,833,142</b>

Notes

- All costs are in 2011/12 prices
- For A & B Signalling costs includes cost of passing loop

### Maintenance Costs

Maintenance costs (2011/12 prices) for all options are set out below:

**Option A** (full relay): Annual rail maintenance costs would reduce from £776,468 per annum to £473,267 per annum from 2014 onwards.

**Option B** (3 phased approach): Following the completion of phase 1 in 2013 (re-rail of middle section and relay of end sections), rail maintenance costs will fall from £776,468 to £643,060. Following completion of phase 3 in 2021 (relay of middle section), maintenance costs will fall to £473,267. Around £115 k has been included for maintaining the current signalling system.

**Option C** (Do Nothing in short-term): Maintenance costs will remain at £776,468 and then fall to £643,060 in 2016 after completion of phase 1 and 2 (re-rail of middle section and relay of end sections). Following completion of phase 3 in 2021 (relay of middle section), maintenance costs will fall to £473,267. Around £115 k has been included for maintaining the current signalling system.

### **Net Present Cost**

The Net Present Cost for each option is set out in table 2 – details of the calculations are set out in attached spreadsheets.

**Table 2; Net Present Costs**

Option A	£79,841,093
Option B	£79,996,741
Option C	£73,474,441

### **Work Duration**

#### **Option A**

The duration of this option will be 78 weeks as per original EA. A works duration optimism bias has been calculated at 5.8% which gives an additional time of 32 days.

#### **Option B**

The duration of the first phase will be 52 weeks, the second phase will last 108 weeks and the third phase 36 weeks. A works duration optimism bias has been calculated at 5.8% which gives an additional time of 22 days, 44 days and 15 days respectively.

#### **Option C**

The duration of the first phase will be 52 weeks, the second phase will last 106 weeks and the third phase 36 weeks. A works duration optimism bias has been calculated at 5.8% which gives an additional time of 22 days, 44 days and 15 days respectively.

These works duration results are considered immaterial with regard to delivering the benefits and achieving objectives.

## 7. Assessment of Non-Monetary Costs and Benefits

As with the original appraisal, a weighting and scoring approach has been used to assess non-monetary costs and benefits. The criteria, along with weights allocated, are outlined in table 3 below. Criteria have been added to reflect the need to provide an adequate rail service to Derry during the 2013 City of Culture. In addition, further criterion has been added to reflect the differing journey times/speed between the various options.

**Table 3: Benefit Criterion and Weights**

<b>Criteria</b>	<b>Weighting</b>
1. Provision of an adequate rail service during Derry's year as UK City of Culture	30
2. Ability to meet NTT and Translink objective with regards to the future timetable requirements (hourly service and arrive in Derry before 9am)	25
3. Ability to utilise new trains purchased under NTT	15
4. Ability to reduce passenger journey time	10
5. Impact on passenger demand/revenues	10
6. Avoid disruption/closure on Coleraine to Derry Section (public perceptions)	10
Total	100

The weighted scores for each option are set out in table 4.

**Table 4: Weighted Scores**

<b>Criterion</b>	<b>Weighting</b>	<b>Option A</b>		<b>Option B</b>		<b>Option C</b>	
		<b>Score</b>	<b>WS</b>	<b>Score</b>	<b>WS</b>	<b>Score</b>	<b>WS</b>
1	30	0	0	8	240	5	150

2	25	10	250	8	200	0	0
3	15	10	150	8	120	0	0
4	10	10	100	6	60	4	40
5	10	10	100	8	80	0	0
6	10	8	80	0	0	0	0
Total	100		680		700		190
Rank		2 <sup>nd</sup>		1 <sup>st</sup>		3 <sup>rd</sup>	

An explanation for the scores allocated to each option has been outlined below. While care has been taken to avoid double counting, it is inevitable that there is some overlap between the criteria.

**Criteria 1: Provision of an adequate rail service during Derry’s year as UK City of Culture**

As outlined earlier, Derry has been chosen to be the UK’s inaugural City of Culture in 2013. A need has therefore arisen to ensure that the track is able to deliver an adequate rail service during 2013. Option A would see the work being carried out during 2013 resulting in a blockade with no services going to Derry. Therefore option A scores zero. The line would be open under Option C; however, the condition of the line would result in service capacity being reduced to 5 trains each way per day. Option C therefore scores 5. Option B only scores 8 because, whilst the line would have the capacity for 8 services each way per day, it would not be reopened until March 2013 – 3 months into the City of Culture year.

**Criteria 2: Ability to meet New Trains Two and Translink objective with regards to the future timetable requirements (hourly service and arrive in Derry before 9am)**

Option C scores zero because, without the passing loop, the Coleraine to Derry line section will not have the capacity to deliver the New Trains Two timetable. Option A and B will both deliver the NTT timetable. However, it will be delivered quicker under option A (2014 as opposed to 2015 under option B). Option A scores 10 and B scores 8.



### **Criteria 3: Ability to utilise new trains purchased under New Trains Two**

Currently there are five 3-car sets on the Belfast-Coleraine-Derry and Belfast-Coleraine-Portrush lines. Under New Trains Two the plan would be to have six 3 car sets and two 6 car sets on these lines. These trains have already been bought and therefore without the proposed improvements on the line, they will not be able to be utilised. Option C scores zero because without immediate investment, service is planned to reduce to 5 trains each way per day and even when the relay takes place, service can only resume to normal levels in the absence of a passing loop. Option A and option B will both require new trains but option A scores higher as these can be used from April 2014 as opposed to April 2015 in option B. Therefore, option A scores 10 and option B scores 8.

### **Criteria 4: Ability to reduce passenger journey times**

Journey time along the route is currently between 45-47 minutes. Under option A, a full journey time saving of approximately 9/10 minutes will be achieved on completion of the full relay in 2014. Option A therefore scores 10. While Option B delivers an element of time savings on the two end sections in the short term, the full benefit will not be realised until the relay of the middle section in 2021. Option B, therefore scores only scores 6. Under Option C, journey times will increase in the short-term with the imposition of further TSR to 50mph. As with option B an element of time savings will be captured on completion of the relay of the end section (albeit later). However, as with option B, the full time savings will only be captured in 2021. Therefore, option C does not deliver any time savings until after 2016 and the full benefits by 2021. Option C scores 4.

### **Criteria 5: Impact on Passenger Demand/Revenues**

It is anticipated that the hourly frequency on the Derry line will lead to an increase in passenger demand and therefore revenue. Passenger demand will also be influenced by journey times. Therefore, under option A, which will result in a reduced journey time and hourly frequency, the passenger demand/revenue would be the highest so scores 10. Increased demand/revenue will also be delivered under option B as an hourly

frequency can be introduced by 2015, but full journey time savings cannot be delivered until 2021, so option B scores less than option A, i.e. 8. As an hourly frequency cannot be delivered without the passing loop, passenger demand is not anticipated to increase under option C. In addition, the reduced service as well as additional speed restrictions will likely result in a fall in passenger demand. Translink's view is that there is probably a 50/50 chance that within the next 4 years the track condition could fall to a level where passenger services are no longer attractive enough to remain viable. Option C, therefore, scores 0.

## Criteria 6: Avoid disruption/closure on Coleraine to Derry Section

All options will involve some degree of blockade/closure of the line. However, because the phased options (B & C) require more than one blockade they score zero for Criterion 6. Option A scores 8 as only one blockade is required to carry out the full relay.

## 8. Identification of Preferred Option

The results of the monetary and non-monetary analysis are set out in Table 5.

**Table 5: Summary**

	Capital Costs (2011/12 prices)	NPC	Non-Quantifiable Score
Option A	75,019,634	£79,841,093	680
Option B	85,395,195	£79,996,741	700
Option C	81,833,142	£73,474,441	190

### Notes

The capital costs and NPCs for options B and C include the £7.6 million already secured for the rail safety programme.

As outlined earlier, the aim of the addendum is to identify the least cost option of delivering the project objectives which are:

- To deliver the infrastructure capacity for 8 return journeys per day by 2013;
- By 2015, deliver the necessary infrastructure to facilitate the timetable identified under the New Trains Two (NTT) project.

Option C has the lowest NPC. However, it should be noted that this does not include any heavy maintenance in the first three years thereby increasing the risk that the track condition could fall to a level where passenger services are no longer attractive enough to remain viable. In addition, option C fails to meet the objectives outlined in section 4 and this is reflected within the scores awarded in the non-monetary assessment.

In NPC terms, option A and B are broadly similar. While option A, clearly delivers more non-quantifiable benefits in criteria 2-6, it can not deliver objective 1 which is to provide an adequate rail service by 2013. .

On the basis of the monetary and non-monetary analysis, **Option B is the preferred option**. Subject to funding being available, Option B will ensure the on-going safety of the Coleraine to Derry line section, it will ensure that the connection is maintained with the second city and it will ensure that the level of rail service is largely maintained on delivery of the benefits is over a longer timescale. It is therefore recommended to proceed with Phase 1 of Option B.

## 9. Project Financing/Affordability

The PE implications for the preferred option B for the current budget period are set out in table 6.

	2011/12	2012/13	2013/14	2014/15
<b>Capital DEL Requirements</b>				
Rail Safety Project	£3,000,000	£4,745,057		
Relay – phase 1		£27,239,014		
Signalling – phase 2				£21,269,292
<b>Funding Secured</b>	<b>£3,000,000</b>	<b>4,745,057</b>		<b>£20,000,000</b>
<b>Funding Gap</b>	<b>0</b>	<b>27,239,014</b>		<b>£1,2269,292</b>

### Notes

Costs which were provided in 2011/12 prices have been uplifted to nominal prices using the projected GDP deflator (source HMT). It should be noted that if the cost of some materials (such as steel) increase at a greater rate then then nominal costs will be higher.

DRD are currently considering a range of funding options. These will be outlined in a paper which will go before the Executive in early October.

## 10: Project Management/Post-Project-Evaluation

The project management structure is as follows:

- The Internal Translink Project Manager will be Ruairi Savage;
- The External Project Manager will be Chris Caves from ARUP;
- The project will follow Translink's Construction Division Project Management procedures and Office of Government and Commerce Gateway Reviews which implement the process of gateway reviews throughout the duration of the project;
- The Programme SRO will be Clive Bradberry (Infrastructure Executive);
- The Project Sponsor will be Eugene O'Brien (Head of Permanent Way);
- The overall project control manager will be Brendan Harkin; and
- The Internal Translink Project Board consists of Clive Bradberry (Chair), Eugene O'Brien, Mark Atkinson, Jim Moore (Head of Signalling and Telecoms), a DRD representative, Mal McGreevy (General Manager of Railways), Brendan Harkin and Gwen McKee (Project Accountant). The Project Board meet monthly.

### Project timetable

	<b>Date</b>
Commence Phase 1	May 2012
Complete Phase 1	March 2013
Commence Phase 2	April 2013
Complete Phase 2	June 2015
Commence Phase 3	April 2021
Complete Phase 3	December 2021

### Post Project Evaluation

A project management evaluation will be undertaken within 3 months of the completion of each phase. The criteria will be:

- Was the phase completed within budget?
- Was the phase delivered in time?
- Was the phase completed in line with Translink's Construction Division Project Management procedures and OGC Gateway guidelines?

The Financial Planning Department will carry out the project management evaluation.

A project benefit evaluation will be undertaken within 3 months of the completion of each phase. The criteria will be:

- Did the phase achieve its objectives?
- Has the phase delivered its benefits?

The Financial Planning Department will carry out the project benefit evaluation. The evaluation will monitor and evaluate the extent to which the following targets have been met.

### Short term Targets

The following are the short term targets of the project:

- Completion of first phase by the end of March 2013;
- Elimination of the risk of rail end breaks on the Coleraine to Derry line section;
- Elimination of junction plate failures on the Coleraine to Derry line section;
- Elimination in risk of sleeper failure at joints (where they are most heavily laden) on the Coleraine to Derry line section;
- Elimination of the risk of derailment caused by twist faults at the joints on the Coleraine to Derry line section measured by a reduction in the number and severity of twist faults from the March 2011 recorded levels;
- Removal of the weakest point of the track which is the rail on the Coleraine to Derry line section;
- Replacement of joints with a continuous rail leading to much lower stress concentrations being transmitted to the underlying formation in comparison with

jointed track and therefore less damage to the formation on the Coleraine to Derry line section;

- Reduction in risk of the imposition of Temporary Speed Restrictions below 60mph on the Coleraine to Derry line section; and
- Provide infrastructure capacity for 8 return journeys per day.

### Medium term Targets

The following are the medium term targets of the project

- Completion of second phase by the end of June 2015;
- Upgrade signalling to modern standards on the Coleraine to Derry line section;
- Relocate signal cabins at Derry and Castlerock to Coleraine;
- Ensure signalling compatibility on the Coleraine to Derry line section with future ERTMS (European Rail Traffic Management System); and
- Provide infrastructure capacity for an hourly service.

### Long term Targets

The following are the long term targets of the project

- Completion of third phase by the end of December 2021
- Renew Coleraine to Derry track to ensure a minimum 30 year operational life
- Upgrade the line speed where possible on the Coleraine to Derry line section to maximum of 90mph
- Facilitate future installation of a half hourly service with a first arrival in Derry before 9am.





Annex 1: Details of Capital Cost (Excludes Rail Safety Project)

	Option A	Option B			Option C				
Cost Description	Budget per KPMG appraisal £	Phase 1 £	Phase 2 £	Phase 3 £	Total of the phases £	Phases 1 and 2 £	Phase 3 £	Total £	Notes
<b>Infrastructure Costs</b>									
P Way	<b>28,981,674</b>	11,114,610	1,365,695	15,292,215	<b>27,772,520</b>	12,080,305	15,292,215	<b>27,772,520</b>	1
Civil Works	<b>9,348,314</b>	4,292,474	1,738,538	3,413,504	<b>9,444,516</b>	5,831,012	3,413,504	<b>9,444,516</b>	
Property	<b>119,591</b>	0	87,549	32,042	<b>119,591</b>	87,549	32,042	<b>119,591</b>	
Preliminaries	<b>7,168,173</b>	3,359,147	1,044,822	3,981,749	<b>8,385,718</b>	4,403,969	3,981,749	<b>8,385,718</b>	2
Signalling	<b>9,906,047</b>	979,000	8,984,688	550,000	<b>10,513,688</b>	7,984,688	550,000	<b>10,184,688</b>	3
Electrification and Plant and Telecoms	<b>2,078,988</b>	0	2,078,988	0	<b>2,078,988</b>	2,078,988	0	<b>2,078,988</b>	
<b>Subtotal</b>	<b>57,602,787</b>	<b>19,745,231</b>	<b>15,300,280</b>	<b>23,269,510</b>	<b>58,315,021</b>	<b>32,466,511</b>	<b>23,269,510</b>	<b>57,986,021</b>	
<b>Other Capital Costs</b>									
Preparation (at 6%)	<b>3,456,167</b>	1,184,714	918,017	1,396,171	<b>3,498,902</b>	1,982,991	1,396,171	<b>3,479,162</b>	2
Supervision (at 2%)	<b>1,152,056</b>	592,357	306,006	698,085	<b>1,596,448</b>	654,330	698,085	<b>1,392,415</b>	2
Provision of	<b>926,355</b>	694,766	20,000	553,048	<b>1,267,814</b>	694,766	553,048	<b>1,247,814</b>	4

temporary bus service									
<b>Subtotal</b>	<b>5,534,578</b>	<b>2,471,837</b>	<b>1,244,023</b>	<b>2,647,304</b>	<b>6,363,164</b>	<b>3,332,087</b>	<b>2,647,304</b>	<b>6,119,391</b>	
<b>Capital Costs Total</b>	<b>63,137,365</b>	<b>22,217,068</b>	<b>16,544,303</b>	<b>25,916,814</b>	<b>64,678,185</b>	<b>35,798.598</b>	<b>25,916,814</b>	<b>64,105,412</b>	
Exclude Sunk Costs	<b>(725,021)</b>	0	0	0	0	0	0	0	
<b>Future Cost</b>	<b>62,412,344</b>	<b>22,217,068</b>	<b>16,544,303</b>	<b>25,916,814</b>	<b>64,678,185</b>	<b>35,798.598</b>	<b>25,916,814</b>	<b>64,105,412</b>	
Optimism Bias @ 20.2%	<b>12,607,293</b>	4,487,848	3,341,949	5,235,196	<b>13,064,993</b>	7,231,317	5,235,196	<b>12,949,293</b>	
<b>Total Cost</b>	<b>75,019,637</b>	<b>26,704,916</b>	<b>19,886,252</b>	<b>31,152,010</b>	<b>77,743,178</b>	<b>43,029,915</b>	<b>31,152,010</b>	<b>77,181,925</b>	

Notes

1. The phased costs do not included the cost of the rail being used in the *Coleraine – Londonderry Track Safety Improvements Works project* as it is expected that all of this rail would be reusable. The cost of this rail is £1,856k.
2. Because the work would be done over three distinct phases, there is an increase in Preliminaries, Preparation and Supervision because these need to be done three times as opposed to just once.
3. The increase in signalling costs is because the relay of the middle section in Phase 3 will involve the disconnecting and reconnecting of the signalling in that section.
4. This work will involve two major blockades in Phases 1 and 3 as well as smaller blockades in Phase 2. In the original appraisal it was assumed that one blockade would do for the whole works