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## **Appendix D**

### **COST ESTIMATE**

**GRIP 2 Estimate Report issued under separate cover.**

**For a high level cost summary table refer to Section 11.**

**Please refer to the Preliminary Business Case for high level scheme costs.**

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# Appendix E

## RISK REGISTER

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# **MetroWest Phase 2**

## **Qualitative Risk Analysis**

Project Name: Metrowest Phase 2  
OP Reference:139797  
Project Manager: Rachel Leighfield-Finch  
Sponsor:

Prepared By: Lorna Buckland  
Job Title: Risk and Value Analyst  
Date: 23<sup>rd</sup> December 2014

Approved By: Michael Alldis  
Job Title: Risk and Value Assistant  
Date: 23<sup>rd</sup> December 2014

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## GRIP Context

Current GRIP Stage:	2
GRIP Stage(s) to which this report relates:	2-8
Estimated start of significant physical works:	Unknown

## 1. Executive Summary

The concept of MetroWest Phase 2 is to build on the work to be undertaken by MetroWest Phase 1 to deliver an enhanced local rail service to support economic growth within the greater Bristol area. Phase 2 comprises of the following:

- Half hourly services to Weston Milton, Yate.
- Hourly passenger services on a re opened Henbury line as either a Loop or a Spur (capacity for two new stations) with additional station(s) on the Filton Bank.
- Services starting operation on May 2021 (or sooner if viable).

A Qualitative Cost Risk Analysis (QCRA) workshop was held at URS Offices, Swindon on Monday 8th December 2014 with the objective of reviewing the risks for the MetroWest phase 2 project. Representatives of Network Rail, URS, South Gloucestershire Council and West of England LEP were present. All participated in the deliberations.

Key assumptions the risks were based on are,

- The operational performance of a loop service is an issue in its entirety whereas the spur service option offers relatively better performance
- The project can mitigate adverse impact of Henbury loop on main entrance to Bristol Port.
- Funding regime will continue regardless of result of General Election

The analysis identified the top risks by criticality as,

- More infrastructure improvements required for the loop service.
- Henbury loop adversely impacts entrance to Bristol Port.
- Possession availability.
- Opposition to proposed location of stations.
- Unable to close Concorde Way.

## 2. Background

The West of England Local Enterprise Partnership together with the Executive members for Transport of the four councils who comprise of the West of England Joint Transport Board, has determined that MetroWest Phase 1 and 2 are it's highest priorities for DfT funding.

The concept of MetroWest Phase 2 is to build on the work to be undertaken by MetroWest Phase 1 to deliver an enhanced local rail service to support economic growth within the greater Bristol area. Phase 2 comprises of the following:

- Half hourly services at Weston Milton, Yate.
- Hourly passenger services on a re opened Henbury line as either a Loop or a Spur (capacity for two new stations) with additional station(s) on the Filton Bank.
- Services starting operation on May 2021 (or sooner if viable).

The primary objectives of the project are:

- Support economic growth, through enhancing transport links to major employment centres across the West of England.
- Deliver a more resilient transport service, with more attractive & reliable journey times.
- Improve accessibility to the rail network with new and re-opened rail stations
- To make a positive contribution to social well being, life opportunities and improving quality of life along the affected corridors in particular.

The following engineering works have been proposed as part of Phase 2:

- New station(s) on Filton Bank
- A station at Henbury
- A station at Filton North
- Upgrade existing freight line to passenger status
- Turnback facility at Yate.



Network Rail have been tasked with developing the options for the MetroWest project at GRIP stage 2 and building up the construction cost estimate to be presented as part of the Feasibility Study.

### 3. Methodology

A Qualitative Cost Risk Analysis (QCRA) workshop was held at URS Offices, Swindon on Monday 8th December 2014 with the objective of reviewing the risks for the MetroWest phase 2 project. Representatives of Network Rail, URS, South Gloucestershire Council and West of England LEP were present. All participated in the deliberations.

The objectives of the meeting were to:

- Identify significant risks to the achievement of the project objectives
- Establish a project risk register in Active Risk Manager (ARM)
- Identify actions to be undertaken to increase the probability of project success
- Conduct an assumption analysis and identify any constraints

The risks to the project were identified in a brainstormed session. The contractors risk register was also reviewed. Each risk was then analysed to understand the probability of occurrence and impact of the risks on the project outcome. A risk owner was allocated and a treatment strategy decided upon.

## 4. Assumptions Analysis

A number of assumptions were identified and an assumption analysis exercise was undertaken, details are shown in the table below. It should be noted that these assumptions are potentially risks that could occur and actions should be taken to reduce their likelihood of occurrence or impact. Where scored as 'CC' or worse they must be included as a risk in the analysis.

**Table 4.1 Assumptions Analysis Key**

Stability	Sensitivity
A B C D	A B C D
A – Very Confident	A – Minor Impact
B – Fairly Confident	B – Manageable Impact
C – Uncomfortable	C – Significant Impact
D – Very Uncomfortable	D – Critical Impact
Will the assumption turn out to be correct?	How much does it matter if the assumption turns out to be true?

Assumption	Stability	Sensitivity	Justification
1 Can build within existing permitted development rights	B	B	Operational railway and stations below threshold for DCO. Time in the programme to allow acquiring 3rd party land.
2 Bristol East junction improvements will be delivered	A	C	Timetable based on Bristol East having happened. Due to be delivered 2017. Would mean couldn't deliver Henbury line.
3 Filton Bank will have 4 tracks reinstated prior to inauguration of Henbury line services	A	C	Filton is in detailed design phase. Would mean couldn't deliver Henbury line.
4 BASRE - changes to signalling panel will be delivered by 2016	B	B	Would lead to design alterations, additional cost and delay to programme.
5 Existing signalling power system will accommodate MetroWest (St Andrews have enough capacity to accommodate changes)	B	B	Should be spare capacity. Lead to design work to strengthen up the supplies. Few months delay and design / material costs
6 Funding regime will continue regardless of result of General Election	B	C	Significant funding currently from DFT. Source of funding could change - different processes to acquire.
7 Scheme will deliver a benefit cost ratio of greater than 2	B	B	Phase 1 had a BCR of 2.28 - 5.99. If not higher than 2 would try and evaluate components of schemes that did deliver value and explore options of using funding not tied to BCR.
8 Pace of wider economic development is as anticipated in ongoing technical work.	B	B	Lead to risk of revenue decline, therefore higher level of subsidy would be required than anticipated. Given current economic conditions - fairly confident. Could impact the funding of the scheme - could fluctuate over the course of next 5 years.

9 4th Platform at Bristol Parkway (platform 1) will be delivered to allow increased service to Yate.	A	C	Being delivered as a stand alone scheme. Would have to operationally revisit timetable and may have impact on performance (PPI). A: Identify delivery project for 4 <sup>th</sup> platform at Bristol Parkway subject to securing planning consent for any redevelopment.
10 Proposed alterations to Filton West Curve will not impact on this scheme.	B	C	Will sell Filton West curve, and build closer to AFR. New line would be built before old line decommissioned.
11 The operational performance of a loop service is an issue in its entirety whereas the spur service option offers relatively better performance	C	C	A: More performance modelling and comparing scenarios to understand the performance of the loop service. A: Identify what further infrastructure requirements would be required to mitigate.
12 Hallen Marsh Junction - signalling and Permanent Way options will fit together	B	C	Currently on option 8. Would lead to significant additional cost. Only relates to the loop service, option for phase 1 is to alter signalling. Need to look at 2 projects together at that location. It is a constrained area, would constrain when freight services could enter / exit.
13 Project will manage steep longitudinal gradients at new stations by risk assessed applications to the ORR.	B	C	4 potential new station sites (Ashley Down, Constable Road, North Filton, and Henbury loop option) have elements that current design does not accord with Railway Group Standards - steep longitudinal gradients, to be managed by risk assessed application to ORR. Assumed risk assessment route rather than alter gradients. Mitigation is that trains are not terminating at the above stations. Precedence exists for construction of platforms on steep longitudinal gradients. Significant in terms of cost and and has the potential to disrupt existing freight services. – During construction freight services may need to be diverted in some cases. Henbury for the spur operating option - it is possible to provide a single bay platform that is both straight and level and therefore accords with railway group standards.
14 DNO supplies are available at the new station	A	C	Cost impact. DNO may have to strengthen their network.
15 There will be a platform 0 at Temple Meads	B	C	To be delivered as part of Crossrail iteration 5. Sufficient platforms for trains at Temple Meads.
16 MetroWest phase 1 option 6B is implemented (applicable to Henbury loop service)	B	C	Implementing 6B. Could lead to increased risk to performance.
17 Signalling Testers will be available	B	B	National shortage of Signalling Testers. Need to understand whether volume of resource is adequate.
18 Suitable rolling stock will be available	B	D	Couldn't run the services if this assumption was incorrect

19 The project can mitigate adverse impact of Henbury loop on main entrance to Bristol Port.	C	C	St Andrews Road - increase down time of crossing barrier – this is a risk to the loop service only, and delivery of project.
20 Capable (capacity) of making changes to St Andrews panel and associated interlocking.	B	B	Wouldn't be able to re-signal if assumption was incorrect.
21 BSSR is on schedule	B	C	BSSR enabling platform 0 at Bristol Temple Meads. Integration with other projects.
22 3rd party land can be procured at stations	B	C	Local Authority have CPO powers, therefore could secure land through this. Time allowed in the programme.
23 Operations can find somewhere to stable coal train.	B	C	If assumption was incorrect additional infrastructure may be required.
24 Henbury line will not be electrified.	B	C	Aspiration to electrify to Ports. Designing with electrification in mind. ARUPs undertaking a study looking into electrification beyond GW Mainline – delivery would be outside of Phase 2 time frame.
25 West of England Joint Transport Body will accept the business case.	B	B	If assumption was incorrect would need to rework.

## 5. Results

The risk profile of the project is illustrated in the below heat map,

		Impact			
		2: Low	3: Medium	4: High	5: Very High
Probability	5: Very High	1	2		
	4: High	3	2	3	
	3: Medium	1	2	3	
	2: Low	2		3	1
	1: Very Low				

The table below displays the top five cost risks by criticality;

**Table 5.1 Top 5 Threats**

Risk			Current Qualitative Impact		Current Score	
Risk ID	Risk Title	Risk Owner	Probability	Cost		
346158	More infrastructure improvements required for the loop service	Leighfield Finch, Rachel	4: High	4: High	8.	Critical
346160	Henbury loop adversely impacts entrance to Bristol port	Leighfield Finch, Rachel	4: High	4: High	8.	Critical
346179	Possession availability	Leighfield Finch, Rachel	4: High	4: High	8.	Critical
346173	Opposition to proposed location of stations	Leighfield Finch, Rachel	5: Very High	3: Medium	8.	Critical
346176	Unable to close Concorde Way	Leighfield Finch, Rachel	5: Very High	3: Medium	8.	Critical

## 6. Actions

The following actions were recorded in the workshop. Owners were assigned from people within the room. These actions should be entered in to the project plan where capital expenditure or time is taken to complete the action.

**Table 6.1 Action Table**

Action	Owner
1 Identify delivery project for 4 <sup>th</sup> Platform at Bristol Parkway	Rachel Leighfield-Finch
2 More performance modelling and comparing scenarios to understand the performance of the loop service.	Rachel Leighfield-Finch
3 Identify what further infrastructure requirements would be required to mitigate.	Rachel Leighfield-Finch

## 7. Appendix A – Attendees

**Table 7.1 Attendees List**

Name	Role	Company
Rachel Leighfield-Finch	Project Development Manager	Network Rail
Laura Hemsley	Project Manager	URS
Pete Hillier	PWay CRE	URS
Alistair Rice	Project Manager MetroWest Phase 2	South Gloucestershire Council
Steve Turner	CEM	URS
Steve Baker	PE (Civils)	Network Rail
Lyn Townsend	Asset Engineer (Signalling)	Network Rail
James White	Programme Manager Metro West	West of England LEP
Geoff Kearney	Asset Engineer Track	Network Rail
Chris Spellman	E&P Engineer	URS
John Skinner	Environment and Consents	URS
Lorna Buckland	Risk and Value Analyst	Network Rail



## 8. Revision History

**Table 8.1 Document History**

Version	Date	Author	Comments
0.1	22 <sup>nd</sup> Dec 2014	L Buckland	Draft
0.2	23 <sup>rd</sup> Dec 2014	L Buckland	Draft – to be sent for QA
1.0	23 <sup>rd</sup> Dec 2014	M Aldis	Final following QA
2.0	20 <sup>th</sup> Jan 2015	L Buckland	Minor changes following comments