

Croxley Rail Link

Review of Risk Register

30th September 2009

Produced for
Hertfordshire County Council

Prepared by
Mouchel

209-215 Blackfriars Road
London
SE1 8NL
UK

T 0207 803 2600
F 0207 803 2601
E tom.duckmanton@mouchel.com
M 07976 344278

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Organisation	Contact	Copies
Hertfordshire County Council	Mike Younghusband	1
Mouchel	Tom Duckmanton	Master

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1 Introduction

1.1 Purpose of this Report

The following paper presents the findings of the risk register review for the above scheme.

1.2 Background

Hertfordshire County Council is the lead partner for the Croxley Rail Link project, which aims to extend London Underground's Metropolitan Line from Croxley Green into Watford Junction. It has commissioned a number of studies to assist in its preparation of a Major Schemes Business Case.

In April 2007, Mouchel carried out a review of the cost estimates and highlighted risks to produce a consolidated out turn cost estimate for the scheme.

The methodology for establishing a 'robust' cost estimate for the scheme was as follows:

- To identify the full scope of the Construction Works as far as possible, by consolidating previous studies, technical surveys and assessments to produce a 'Design Specification' for the scheme.
- To procure the 'expertise' of competent contractors to provide contemporary cost estimates, which could be compared with each other and those prepared on behalf of London Underground.
- Review the outputs from the above exercises to produce a consolidated cost estimate for the scheme.

1.3 Approach

In preparing the Updated Major Scheme Business Case, Hertfordshire County Council have commissioned two new studies to review the validity of the consolidated cost estimate.

In May 2009, VolkerRail were commissioned to carry out an independent review of the consolidated cost estimate. They concluded that the approach adopted was sound, whilst recommending minor additions for inclusion in the cost estimate.

In July 2009, Mouchel were commissioned to facilitate a review of the risk register. The findings of this exercise are contained in Section 2 below.

2 Risk Review

2.1 Summary of Risk Review

A workshop was held with Hertfordshire County Council, London Underground and the project team on the 30th July 2009.

The purpose of this exercise was to review the validity and value of each risk item and to assign a risk owner. Where appropriate new risks have been added and redundant risks deleted from the register. The output from this exercise is summarised below:

Risk Register

Risk Owner	Ref	Risk Description	Probability High / Medium / Low	Impact High / Medium / Low	Maximum Financial Impact	Assessed Financial Impact	Mitigation / Notes	Risk Register Reviewed July 2009
	1	<u>EMPLOYER'S RISKS</u>						
HCC	1.1	Scope Change in high level Project Requirements	-	-	-	-	Cost estimate reflects current project needs – all future changes to be financially assessed and signed off by stakeholders.	No major change to scope since cost estimate was undertaken.
HCC	1.2	Contract Strategy / Programme Onerous commercial conditions may lead to contractors building additional risk allowance into price.	-	-	2980 2400	1570 1200	Civil works costs based upon standard form of contract. Onerous conditions may affect civil estimate. Assessed financial impact is 2.5% of current estimate	No Change
HCC		Delay in starting the Project results in additional inflation to project costs.			420	210	Programme delays will lead to higher inflation costs.	
HCC		Programme delays leads to additional project management costs. Maximum delay assumed to be 4 months.	-	-	160	160	Fully detailed programme to be developed to include appropriate levels of float; and programme to be managed to schedule.	New Item
LU	1.3	LUL / Train Ops / Interfaces Need to check impact of aspiration of 10 trains per hour (peak) Vs planned 6	-	-	-	-	Qualify estimate. Evaluated and dealt with outside this estimate	No Change

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	1.4	Rolling Stock	-	-	-	-		
	Ref	Risk Description	Probability High / Medium / Low	Impact High / Medium / Low	Maximum Financial Impact	Assessed Financial Impact	Mitigation / Notes	Risk Register Reviewed July 2009
	1.5	Additional Regulatory requirements	M	M	2370	1940		
HCC		Existing overline road bridges - provision of steps up & down cutting to cross the road above and provision of lockable gates			100	60	HMRI may request additional works. Cost allowance included in risk register	No further scheme development, potential risks still valid
HCC		Existing 3 No. underline bridge decks - steps down embankments to cross the road below			75	45	HMRI may request additional works. Cost allowance included in risk register	No further scheme development, potential risks still valid
HCC		Watford Junction Station - Buffers			240	240	HMRI SPG 2B section 7 requires appropriate energy absorbing buffers on terminated tracks for new works. Sliding buffer cost allowance included in risk register.	No further scheme development, potential risks still valid
HCC		Watford Junction Station - Increased platform length			140	105	Platform lengths may need to be increased by 20m in order to accommodate sliding buffers and 10m to match Ascot Road platform length of 144m	No further scheme development, potential risks still valid
HCC		Watford Junction Station - Station – Increased Platform Lengths -Changes to track and signalling			600	450	If platform lengths are increased by 30m, this will effect the track and the signalling arrangements	No further scheme development, potential risks still valid
HCC		Watford Junction Station – Increased Platform Lengths - revisions to track connections			850	850	Additional requirement for 1 cross over and 1 turnout at Watford Junction Station	No further scheme development, still valid
HCC		Provision of remotely controlled DC track isolating switches in lieu of hook switches			75	50	It is anticipated that HMRI will not accept hook switches on this section of line. Remotely controlled DC track isolating switch are likely to be preferred	No further scheme development, potential risks still valid

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HCC		Other HMRI requirements			290	140	Other HMRI requirements not identified at this stage	No further scheme development, potential risks still valid
	1.6	Inflation (Start - April 08, Handover April 10) Estimating error in assumption about future inflation rate leads to addition project costs.	M	M	- 420	- 210	Central case assumes inflation is 4.5% i.e. base of 2.5% plus real construction cost of 2.0% pa.	New item
	Ref	Risk Description	Probability High / Medium / Low	Impact High / Medium / Low	Maximum Financial Impact	Assessed Financial Impact	Mitigation / Notes	Risk Register Reviewed July 2009
HCC	1.7	Technology / Standards change during project	L	L	-	-	Low probability. No costs effect.	No change
	2	<u>SITE RISKS</u>						
	2.1	Ground Conditions / Ground Water	M	M	1080	610		
HCC		Additional dewatering works due to higher than anticipated water tables / permeability of underlying soils.			100	50	Carry out site investigation to determine level of dewatering at structure locations	No further scheme development, potential risks still valid
HCC		Potential of finding significant obstructions during earthworks leading to additional site investigation and an alternative works.			175	100	Carry out site investigation	No further scheme development, potential risks still valid
HCC		Uncertainty relating to the condition of embankments and cuttings and infrastructure owner's requirements			100	50	Carry out investigations	No further scheme development, potential risks still valid
HCC		Greater than anticipated settlement of new embankment leads to additional secondary ground works.			150	75	Carry out site investigation. Design ground improvement as required and construct early in the programme	No further scheme development, potential risks still valid
HCC		Viaduct - Ground conditions are less competent than expected leading to change in pile type			100	60	The strength of the chalk may preclude the practicality of using CFA piles. Additional cost of using alternative piling solution	No further scheme development, potential risks still valid

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HCC		2 New Stations - Ground conditions are less competent than expected resulting in piles required			50	25	Risk of new station being piled. Carry out detailed site investigation	No further scheme development, potential risks still valid
HCC		Other unforeseen ground conditions leading to additional SI and or site earth works. Potential of finding munitions or archaeological find leads to protracted extension of the works and additional costs.			175	125	Undertake thorough site investigation and feed interpretative report into design.	No change
HCC					230	125	Undertake thorough desk top investigation	New item.
	Ref	Risk Description	Probability High / Medium / Low	Impact High / Medium / Low	Maximum Financial Impact	Assessed Financial Impact	Mitigation / Notes	Risk Register Reviewed July 2009
HCC	2.2	Contaminated Ground Extra over for the disposal of contaminated material from existing earthworks operations	M	M	175	75	Carry out site investigation to determine level of contamination. Disposal of hazardous material where necessary	No further scheme development, potential risks still valid
HCC	2.3	Asset Conditions Discovery and hence disposal of asbestos in demolished station (Watford West)	M	M	1860	1755	Additional costs associated with disposal of asbestos. Carry out asbestos survey	No further scheme development, still valid
	2.4	Access	L	L	30	15		
HCC	2.4.1	Rail	-	-	-	-	Included in cost estimate	No change
HCC	2.4.2	Civils Health Campus Site is found not to be available for site compound and access – alternative facility required incurring additional cost	M	H	20	10	Included in cost estimate Seek formal agreement for land use at earliest opportunity and explore suitable alternatives.	No change New item.
HCC		Access to viaduct foundation work zone is more contracted and results in higher costs being incurred.	L	M	10	5	Seek formal agreement for land use at earliest opportunity and explore suitable alternatives.	New item.
	2.5	Environmental	L	L	400	225		

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HCC		Additional vegetation clearance required due to length of delay in commencing works.			50	25	Carry out survey	No further scheme development, still valid
HCC		Extra over for dealing with Japanese Knotweed	M	L	200	100	Carry out survey and commence treatment at earliest opportunity.	New Item
HCC		Environmental constraints associated with vegetation removal including SSSI risks			150	100	Carry out survey and consultation with relevant bodies	No further scheme development, still valid
	Ref	Risk Description	Probability High / Medium / Low	Impact High / Medium / Low	Maximum Financial Impact	Assessed Financial Impact	Mitigation / Notes	Risk Register Reviewed July 2009
	2.6	Land Costs	-	-	-	-	Land costs excluded from estimate	No change
HCC	2.7	Restricted Working Hours Additional restrictions on working hours due to close proximity of live rail and other rail projects being implemented during the same period.	M M	M M	1070 1070	550 550	Included in cost estimate Communicate planned works adjacent to NR / LU live rails at the earliest opportunity and adjust programme accordingly.	No change New Item – additional 5% of labour costs on rail related work.
HCC	2.8	Building over live roads, rails etc Traffic management – extra over for additional traffic management requirements to reflect timing or complexity of final design solution	L M	L M	290 145	150 75	Resolve plans at the earliest opportunity and prepare programme accordingly.	New Item – Additional 1% of prelim costs
HCC		Restricted site access - extra over for additional traffic management requirements to reflect timing or complexity of final design solution	M	M	145	75	Resolve plans at the earliest opportunity and prepare programme accordingly.	New Item – Additional 1% of prelim costs
HCC	2.9	Unforeseen services <i>Extra Over for determining Way leave issues</i>	M	M	430 155	290 90	Early consultation with landowners.	No further scheme development
HCC		<i>Extra Over for diversion of existing services</i>			175	125	Cost of diverting existing services not shown on drawings	No further scheme development
HCC		<i>Extra Over for repairs to existing services</i>			100	75	Carry out condition survey of existing services	No further scheme development
	2.10	Interfaces to existing roads /	M	M	100	50		

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		paths / drains / services						
	3	<u>DESIGN RISKS</u>						
	3.1	Design development	H	H	7160	2985		
HCC		Tolpits Lane Overbridge - 65mm departure from absolute minimum may not be granted - cut back abutment faces by 33mm each side, otherwise rebuild bridge			700	90	Mitigation is to cut back abutment faces. Maximum risk is to rebuild the bridge if 65mm departure from absolute minimum is not granted	No further scheme development, potential risks still valid
HCC		Tolpits Lane Overbridge - Provision of metal safety fences on road approaches and over bridge decks if cutting back the abutment faces, or 65mm departure, are accepted			300	30	If P6 parapets are not required metal safety fences will be constructed on road approaches and over bridge. If P6 parapets are required the bridge deck will need to be reconstructed. These costs are included in the rebuild costs	No further scheme development, potential risks still valid.
HCC		Unknown buried services on overline bridge decks to be replaced			200	100	Carry out services survey	No further scheme development, potential risks still valid.
HCC		Vicarage Road Overbridge - Provision of metal safety fences on road approaches and over bridge decks			300	30	If P6 parapets are not required metal safety fences will be constructed on road approaches and over bridge. If P6 parapets are required the bridge deck will need to be reconstructed.	No further scheme development, potential risks still valid.
HCC		Wiggenhall Road Overbridge - Departure from absolute minimum by 206mm may not be granted - risk of having to rebuild the entire bridge			400	200	Early consultation to establish if departure from absolute minimum by 206mm may not be granted. Likely rebuild	No further scheme development, potential risks still valid.
HCC		Wiggenhall Road Overbridge - Provision of metal safety fences on road approaches and over bridge decks if the 206mm departure is accepted			300	30	If P6 parapets are not required metal safety fences will be constructed on road approaches and over bridge. If P6 parapets are required the bridge deck will need to be reconstructed. These costs are included in the rebuild costs	No further scheme development, potential risks still valid.
HCC		Ascot Road Station - Provision of pedestrian controlled crossing to car park and pedestrian guard rails both side of road			50	50	Provide safe access to new car park with the provision of a pedestrian controlled crossing and guard rails	No further scheme development, potential risks still valid.

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HCC		Extra Over for complying with additional DDA requirements such as Platform and Train Access			260	130	Increase corridor widths, door openings, disabled toilets etc to comply with DDA	No further scheme development, potential risks still valid.
HCC		General design development			4650	2325	General changes to design through the design development process. Assessed financial impact represents 5% of the base estimate	No further scheme development, potential risks still valid.
	3.2	Adequate Power	H	H	600	500		
		Power supply to new substation from Croxley hall substation	-	-	600	500	Investigate location of power supply to feed the new sub-station. Cost associated with new sub-station being fed by Croxley Hall sub-station	No further scheme development, potential risks still valid.
LU	3.3	Signalling	H	H	795	400		
		Risk of programme being out of alignment with the LU signalling upgrade works leading to separate package of work having to be initiated for this project.			795	400	Presently in Metronet commitment and therefore these costs are excluded from this estimate	No further scheme development, potential risks still valid.
HCC	3.4	Safety / other requirements for rail operators	M	M	1445	1445		
		Additional work / cost associated with decommissioning existing 1.3km of LU track.			1445	1445	Define scope and responsibilities at the earliest opportunity and adjust costings and programme accordingly.	New Item
	4	<u>THIRD PARTY RISKS</u>						
HCC	4.1	Planning / public enquiries	H	H	-	-	Estimate assumes a start date of 1 st Quarter 2011	
					Total	21205	12770	

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