Cost Plan for:-

Infraco Package – Edinburgh Tram Network

21 September 2006

Draft for discussion

contents

Appendices

Cyril Sweett Limited
60 Gray's Inn Road
London
WC1X 8AQ
T. +44 (0)20 7061 9000
F. +44 (0)20 7430 0603
E. info@cyrilsweett.com
www.cyrilsweett.com

1.0 Cost Summary

Section Description	Total
	£
Preliminaries & General Items	118,770,218
Method Related Charges	inc above
Trams	1,127,650
Track and Formation	55,382,920
Tramstops	4,154,289
Depots	18,592,503
Highways	22,868,583
Buildings	1,113,518
Structures	27,695,009
Supervisory and Control System	6,435,870
Communications	5,492,456
Tramstop Equipment	5,756,048
Depot Equipment	751,013
Traction Power	11,959,080
OHLE	19,577,523
Cost Plan Total at Completion	**£299,676,680**

2.0 Notes and Clarifications

2.1 Basis of Costs

Costs are at 3Q 2006 price levels. Allowance for escalation to completion has been included.

Drawings and specifications used for this cost plan are generally dated May 2006. It has been assumed that the Bills of Quantities have been prepared using this same information. An exercise should be undertaken to assess the potential impact of the further design work reflected by the latest design information.

The prices in this cost plan are based on the Infraco works being procured via a competitively bid, lump sum contract, on a Design and Build basis. Price information has been drawn from in-house data, from Switch (tram specialists in Germany) and for certain items, from advice obtained from discussion with market specialist contractors and suppliers.

There are two areas of work in particular that are very specialist:

- Tram detection and positioning system
- Tram management and supervisory system

Cyril Sweett are not experts in this field and, in the timescale available, we have not been able to obtain the benefit of cost advice from companies specialising in these systems. Whilst we have made allowances for these works, we recommend discussions with specialists are convened to ensure these allowances are robust.

Costs assume a domestic sub-contract tender price for Trams of **£75m** for the purposes of Infraco allowances for attendances etc. It has been assumed that the following costs form part of the Tram package tender:

- design fees for the trams
- manufacture, supply to site, unloading, testing and commissioning of the tram vehicles
- all associated escalation
- training drivers
- training vehicle maintainers
- preparation of O&M manuals for the trams
- allowances for contractual obligations that are fully aligned with the Infraco contractor (i.e. on a 'back to back' basis)

Costs are based on the items and quantities in the Bills of Quantities provided. We have not attempted to reconcile the quantities in the Bills with the drawings. However, any discrepancies that have been apparent have been highlighted either:

1. in formal queries to tie or
2. in the Cost Plan itself via alterations and adjustments being made to the Bill items where quantities appear incorrect or additional items have been considered necessary.

The outline design drawings and specifications received have been used for reference purposes in compiling the costs. This information represents design 'work in progress' and is incomplete in a number of areas.

Information used for the Cost Plan is identified in **Appendix B.**

Escalation has been calculated using the methodology set out in the Transport Scotland 'Guide for Adjustment of Prices in Construction Estimates for Inflation and Changes in Market Conditions'. A copy of the calculation has been included in **Appendix C**.

The costs have been apportioned into Phase 1a and Phase 1b in **Appendix D.**

2.2 Project Assumptions

Costs assume an overall programme comprising a start on site of 17.12.2007 running through to completion of 3.11.2010 – an approximately 150 week period, including approvals and commissioning.

Costs assume normal levels of retention (3%), monthly interim payments as work progresses and a industry-standard six month defects period.

Costs assume LADs of £0.5m per week and that these are capped at £10m

It has been assumed that all existing assets (roads, drains, utilities, etc) are in reasonable condition (no allowance has been made for rectifying assets that are currently in poor condition)

Costs assume no significant local resource problems will be encountered

It is assumed that if in order to construct the tram works there is a need for possessions and compensation payments to Network Rail or the Operating companies, such costs as may arise fall outside the Infraco contract.

2.3 Exclusions

This appraisal **excludes** the following:

- Value Added Tax, Stamp Duty, etc.
- Manufacture, supply to site, unloading and testing and commissioning of the tram vehicles including all associated escalation etc (assumed these costs all form part of the Trams package – see page 2/1).
- Training drivers and vehicle maintainers
- Tie project management costs
- Land acquisition costs
- Costs of acquiring sites for temporary establishment areas or for establishing temporary and/or permanent rights of way, rights to suspend structures from third party owned buildings, etc
- Any fees or charges in connection with adjoining properties
- Project insurances effected by the Employer
- Archaeological investigation
- Rights of light/party wall and boundary matters.
- Compensation payments.
- Consequential loss arising from the impact upon third parties (shops, offices, residences, etc) caused by disruption from Tram works. (This includes for e.g. any impact caused by accidental damage to utility supplies, etc)
- Costs associated with stopping up orders.
- Special bonds other than Performance Bonds
- Diversion of unmapped live services
- Network reinforcement of utilities services

- Future enhanced Building Regulations (Part L) requirements and Sustainability requirements
- Operating and maintenance costs beyond the Contract Date for Completion of the Works.

2.4 Opportunities and Risks

The Key opportunities and risks associated with the project are identified below:

Key opportunities:

An examination of key opportunities has not been undertaken at the time of this cost plan.

Key risks and observations on risks:

The methodology adopted to assess the provision for risk included in this cost plan is set out in **Appendix C**.

A. Performance aspects:-

An assessment has been made in this Cost Plan of the potential commercial effect of the risk apportionment for design and performance aspects to Infraco as sought by tie.

It is understood that certain key performance criteria may be incorporated into the Infraco tender documents and that the Contractor will be required to demonstrate that the completed tram system is able to meet these criteria. At the time of this Cost Plan, information on these specific performance targets has not been received. Allowance for performance risk has been included in the costs, but these should be reviewed when the actual performance criteria to be incorporated into the Contract have been defined.

B. Tender Approach & Conditions of Contract

Copies of the Conditions of Contract and other requirements intended to form part of the tender documents and subsequent Contract have not been examined. Costs therefore assume such documentation will not generate commercial and contractual difficulties for the tenderers such that additional risk provisions are incorporated into their tenders.

Costs assume the tender documentation will be prepared in a user-friendly style such that an aggressive, legalistic approach is not conveyed to the tenderers as this is likely, in our view, to create an overly cautious commercial and contractual response from the market, resulting in an otherwise avoidable cost premium being added into the tenders.

C. Programme Risks

As far as the Infraco contractor is concerned, it may be anticipated that the main risk to the achievement of his programme is in respect of the delivery of the tram vehicles. If these are delivered late and the time for testing, commissioning and performance-proving cannot be accelerated, the contract will finish late. Similarly, if there are problems in respect of the performance of the trams, requiring further time for these to be solved, the works will again be completed late.

The Infraco is heavily reliant on the performance of the tram sub-contractor and, and unlike with the civil's work, there may be little he can practically do to mitigate such an emerging risk.

3.0 Scope of Works

3.1 Scope of work

The scope of work included in this cost plan is reflected by the items and costs shown in the Breakdown of Costs in **Appendix A** and as further described by the **Notes and Clarifications in Section 2.0.**

Information used to compile the cost plan is identified in **Appendix B.**

Appendix A

Breakdown of Costs

WBS Code	Item Code	DESCRIPTION	Sub-Totals £	Total £
	TBA	**Preliminaries & General Items**		**118,770,216**
		Supervision	15,818,400	
		Accommodation	2,632,475	
		Plant	760,225	
		Temporary supplies	3,534,000	
		Access equipment	1,000,000	
		Staff Subsistence	3,163,680	
		Design co-ordination & development	960,000	
		Adverse weather etc	2,000,000	
		Miscellaneous	3,494,600	
		OHP on prelims	1,668,169	
		Design fees etc	11,222,311	
		OHP on trams	3,750,000	
		Risk (earlier calculation not adj. - £26.67m is final risk figure – See Appendix C)	26,825,000	
		LADs	4,000,000	
		Insurance & Bonds	652,044	
		Escalation	37,289,312	
	TBA	**Method Related Charges**		
	A1	**Trams**		**1,127,650**
	B1	**Track and Formation**		**55,382,920**
		Route Section 1	13,450,850	
		Route Section 2	3,778,561	
		Route Section 3	12,706,518	
		Route Section 5	14,499,935	
		Route Section 6	6,081,200	
		Route Section 7	4,865,857	
			Total - Page 1	**175,280,786**

B2	**Tramstops**		**4,154,289**
	Newhaven Road	71,823	
	Ocean Terminal	173,668	
	Ocean Drive	143,555	
	Constitution Street	132,890	
	Foot of the Walk	93,894	
	Balfour Street	93,894	
	McDonald Road	93,894	
	Picardy Place	129,668	
	St Andrews Square	117,336	
	Princes Street	97,949	
	Shandwick Place	93,894	
	Haymarket	146,052	
	Roseburn Junction - no BQ provided	133,165	
	Roseburn	133,165	
	Ravelston Dykes	133,165	
	Craigleith	133,165	
	Telford Road	133,165	
	Crewe Toll	132,890	
	West Granton	143,830	
	Caroline Park	132,890	
	Granton Waterfront	132,890	
	Granton Square	143,555	
	Murrayfield	138,831	
	Balgreen Road	137,889	
	Saughton Road North	133,165	
	South Gyle Access	128,332	
	Edinburgh Park Stop	217,508	
	Edinburgh Park	132,890	
	The Gyle	132,890	
	Gogar Burn	131,779	
	Ingliston Park and Ride	149,610	
	Airport	111,003	
		Total - Page 2	**4,154,289**

B3	**Depots**		**18,592,503**
B4	**Highways**		**22,868,583**
	Route Section 1	13,524,331	
	Route Section 2	241,112	
	Route Section 3	4,378,727	
	Route Section 5	2,260,076	
	Route Section 6	1,943,146	
	Route Section 7	521,191	
B5	**Buildings**		
B5(1)	**Substations**		**780,218**
	Leith Sands Substation	47,353	
	Leith Walk Substation	27,083	
	Cathedral Substation	109,027	
	Haymarket Terrace Substation	54,804	
	Russell Road TPH Substation or Roseburn Delta Junction Substation	88,460	
	Craigleith Substation	60,539	
	Granton Mains East Substation	55,292	
	Granton Road Substation	60,964	
	Bankhead Drive Substation	54,885	
	Jenner's Depository Substation	47,645	
	Gogar Depot Substation	103,744	
	Ingliston Park & Ride Substation	40,423	
	Allowance for enhancement to external appearance of substations in architecturally sensitive areas of the city	30,000	
B5(3)	**Travel Centre**		**333,300**
		Total - Page 3	**42,574,604**

B6	**Structures**		
B6(1)	**BRIDGES**		**14,586,048**
S1	Roseburn Terrace Bridge	277,616	
S2	Colt Bridge Viaduct	567,680	
S3	St Georges School Access Bridge	125,796	
S4	St. Georges School Footbridge	12,055	
S5	Ravelston Dykes Bridge	34,769	
S6	Craigleith Drive Bridge	55,595	
S8	Queensferry Road Bridge	90,485	
S9	Groathill Road South Bridge	58,113	
S10	Telford Road Bridge	65,064	
S11	Drylaw Drive Bridge	18,448	
S12	Crewe Road Gardens Bridge	1,393,965	
S16	Victoria Dock Entrance Bridge	4,777	
S17	Tower Place Bridge	207,795	
S19	Haymarket Station Viaduct	314,439	
S20	Russell Road Underbridge	532,037	
S21A	Roseburn Street Viaduct	2,238,028	
S22	Balgreen Road Bridge	9,611	
S23	Carrick Knowe Underbridge	861,289	
S26	South Gyle Access Road Bridge	704,802	
S27	Edinburgh Park Station Bridge	3,169,593	
S29	Gogar Burn Bridge	481,723	
S32	Depot Access Road Bridge	1,410,039	
S33	Earl Bridge	540,256	
S21E	Water of Leith Underbridge	1,412,072	
		Total - Page 4	**14,586,048**

B6(2)	**CULVERTS**		**3,134,356**
S28	A8 Underpass	2,983,986	
S30	Gogar Culvert	43,923	
S31	Gogar Culvert	43,923	
S34	Gogar Culvert	62,524	
B6(3)	**Earthworks**		
	Not Used		
B6(4)	**RETAINING WALLS**		**9,974,605**
S21B	Structures at Murrayfield	1,810,386	
S21C	Structures at Murrayfield	120,780	
S21D	Structures at Murrayfield	822,378	
W1	Linsay Road Retaining Walls	717,489	
W2	Ferry Road Retaining Wall	214,858	
W3 & W4	Russell Road Retaining Walls	1,002,631	
W8	Baird Drive Retaining Wall	971,024	
W9	Balgreen Road Retaining Wall	74,171	
W11	Bankhead Drive Retaining wall	98,165	
W16	A8 Retaining Wall	2,149,439	
****	Roseburn Corridor Retaining Walls	1,993,284	
		Total - Page 5	**13,108,961**

C1	**SUPERVISORY AND CONTROL SYSTEM**		
	SYSTEM WIDE		**6,435,870**
C1(2)	SCADA	420,000	
C2(1)	Operational Radio System	105,000	
C2(2)	Operational Data Network	4,741,275	
C2(3)	Telephone Network	147,420	
C3(1)	Closed Circuit TV	966,525	
C3(2)	Passenger Help Point	10,500	
C3(3)	Public Address System	24,150	
C3(4)	Passenger Information Display System	21,000	
C1(1)	**TRAM POSITIONING AND DETECTION SYSTEM**		**3,388,518**
	Route Section 1A		
	Route Section 1B		
	Route Section 1C		
	Route Section 1D		
	Route Section 2A		
	Route Section 3A		
	Route Section 3B		
	Route Section 3C		
	Route Section 5A		
	Route Section 5B		
	Route Section 5C		
	Route Section 6		
	Route Section 7A		
		Total - Page 6	**9,824,388**

C1(2)	**SCADA**		**2,068,500**
	Route Section 1A		
	Route Section 1B		
	Route Section 1C		
	Route Section 1D		
	Route Section 2A		
	Route Section 3A		
	Route Section 3B		
	Route Section 3C		
	Route Section 5A		
	Route Section 5B		
	Route Section 5C		
	Route Section 6		
	Route Section 7A		
C1(3)	**Not Used**		
C1(4)	**Condition Monitoring**		**35,438**
		Total - Page 7	**2,103,938**

C3	**Tramstop Equipment**		**5,756,048**
	Newhaven Road	134,243	
	Ocean Terminal	170,993	
	Ocean Drive	196,665	
	Constitution Street	196,665	
	Foot of the Walk	134,243	
	Balfour Street	134,243	
	McDonald Road	134,243	
	Picardy Place	134,243	
	St Andrews Square	196,665	
	Princes Street	196,665	
	Shandwick Place	134,243	
	Haymarket	233,415	
	Roseburn	196,665	
	Ravelston Dykes	196,665	
	Craigleith	196,665	
	Telford Road	196,665	
	Crewe Toll	196,665	
	West Granton	201,705	
	Caroline Park	196,665	
	Granton Waterfront	196,665	
	Granton Square	201,705	
	Murrayfield	196,665	
	Balgreen Road	196,665	
	Saughton Road North	196,665	
	South Gyle Access	196,665	
	Edinburgh Park Stop	196,665	
	Edinburgh Park	196,665	
	The Gyle	196,665	
	Gogar Burn	196,665	
	Ingliston Park and Ride	235,148	
	Airport	170,993	
		Total - Page 8	**5,756,048**

C4	**Depot Equipment**		**751,013**
D1	**Traction Power**		
D1	**Traction Power - Substations**		**8,421,000**
	Leith Sands Substation	666,750	
	Leith Walk Substation	666,750	
	Cathedral Substation	483,000	
	Haymarket Terrace Substation	483,000	
	Craigleith Substation	666,750	
	Granton Mains East Substation	666,750	
	Granton Road Substation	666,750	
	Russell Road TPH Substation	666,750	
	Bankhead Drive Substation	666,750	
	Jenner's Depository Substation	666,750	
	Gogar Depot Substation	1,454,250	
	Ingliston Park & Ride Substation	666,750	
D1(4)	**Traction Power Parallel Feeder Cable**		**3,538,080**
	Route Section 1A	360,360	
	Route Section 1B	170,100	
	Route Section 1C	260,820	
	Route Section 1D	165,060	
	Route Section 2A	260,820	
	Route Section 3A	403,200	
	Route Section 3B	177,660	
	Route Section 3C	156,240	
	Route Section 5A	196,560	
	Route Section 5B	603,540	
	Route Section 5C	249,480	
	Route Section 6	189,000	
	Route Section 7A	345,240	
		Total - Page 9	**12,710,093**

D2	**OHLE**		
D2(1)	**CONTACT SYSTEMS – OVERHEAD LINE ELECTRIFICATION (OHLE)**		**19,237,323**
	Route Section 1A	2,623,967	
	Route Section 1B	796,005	
	Route Section 1C	1,529,762	
	Route Section 1D	703,357	
	Route Section 2A	1,147,944	
	Route Section 3A	1,762,438	
	Route Section 3B	922,110	
	Route Section 3C	957,428	
	Route Section 5A	865,868	
	Route Section 5B	2,430,834	
	Route Section 5C	1,408,134	
	Route Section 6	2,512,457	
	Route Section 7A	1,577,020	
D2(2)	**Pantograph**		**340,200**
		Total - Page 10	**19,577,523**

Appendix B

List of information used to compile cost plan

Below listed drawings and information of technical nature were generally considered for the BQs:

Series 40-10

40-10-DWG-000822
40-10-DWG-000823
40-10-DWG-000824
40-10-DWG-000850
40-10-DWG-000851
40-10-DWG-000852
40-10-DWG-000853
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Series 40-20

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Series 40-30

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Series 40-50

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40-95-SPE-000202

Appendix C

Risk Report

Recommendation

It is recommended that a risk contingency of £26,678,000.00 (or 9.54% of the INFRACO project cost) be incorporated into the INFRACO Cost Plan. This is based on an 80% level of confidence (P80) of the potential risk exposure of the 16 risk items analysed and 14 cost items (refer page 7 & 8 of this appendix). The INFRACO risk is incorporated into 'Preliminaries & General Items', section 1.0 Cost Summary.

It is recommended that further analysis of the INFRACO risks is carried out after the submission of contractor's tender packages.

Introduction

This report describes the findings of a quantified risk analysis (QRA) undertaken on 20th September 2006 to review the INFRACO risks on the Edinburgh Tram Network project. The analysis used a Monte Carlo technique to model 16 INFRACO risks of the 149 total project risks (including opportunities) detailed in the Turner and Townsend Capex Risk Register 18th August 2006.

The INFRACO risks were reviewed in a Cyril Sweett Risk Workshop held on the 13th September 2006. The aim of the review was to provide support for the assessment of an appropriate allowance for risk for the INFRACO cost plan. This report includes details of the methodology, analysis and findings of the cost risk analysis.

Modelling Assumptions

The risk analysis used a Monte Carlo analysis technique to provide a more robust method for modelling the potential risk exposure. The analysis was undertaken using @Risk software to provide an estimate of the potential risk exposure at various levels of confidence.

The key steps in the process were:

- Review of the 149 total project risks detailed in the Turner and Townsend Capex Risk Register 18th August 2006. The total risk allocation in this risk register was approximately £65M
- 40 risk items were removed from the total project risks for further analysis, these items contained a total risk allocation of £55M (85% of total project risks)
- A Cyril Sweett Risk Workshop held on the 13th September 2006 with the members of the Cyril Sweett cost plan team. This provided an opportunity to review the impact and probability of the 40 risk items. The workshop highlighted 15 INFRACO risks for the QRA analysis
- 1st QRA analysis was undertaken modelling both the 15 risk items and variance on the 14 cost items
- 2nd QRA analysis: An additional risk item was included to account for risks not included in the analysis but identified in the Turner and Townsend Capex Risk Register. (To account for the 109 risk and opportunity elements not included in the analysis)

Trigen distributions were used for all the risks where minimum, maximum and most likely data was available. The cost risk data and the variance used on the costs are detailed page 7 & 8 of this appendix.

Results of Analysis

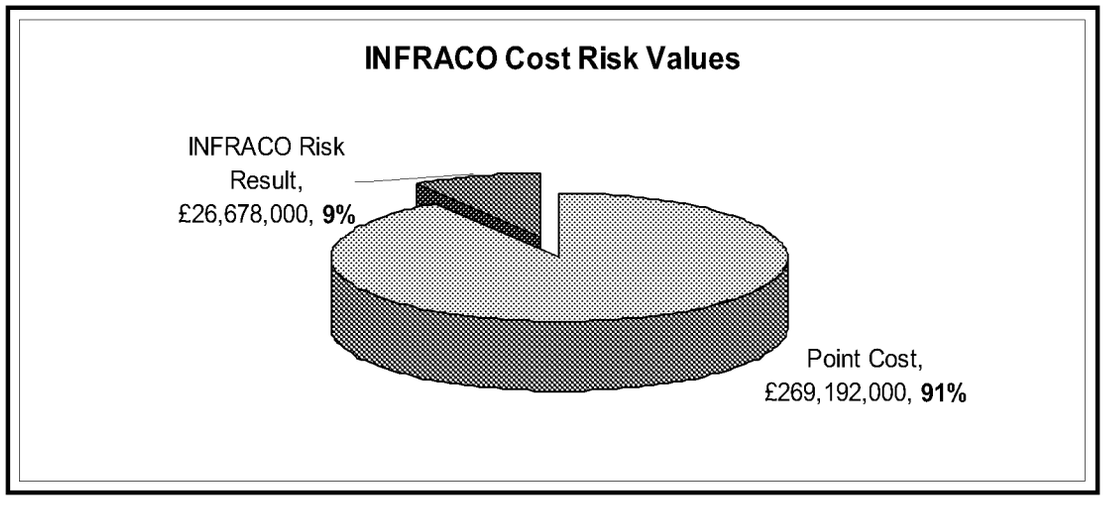
The 'Risk Calculation Summary' uses figures from the @Risk summary 'Key Output data for Cost plan', page 5 of this appendix.

Risk Calculation Summary	
Cost to P-80	£291,868,000
Point Estimate	£269,192,000
Risk to P-80	£22,676,000
Uplift factor 65/55	1.18%
INFRACO Risk Result	**£26,678,000**

The uplift factor of 1.18 (£65M/£55M) is used to account for the difference between risks modelled and risks detailed in the Turner and Townsend Capex Risk Register. The analysis detailed £55M of the £65M identified in the Total Project Risk register.

The confidence levels are defined in terms of probability such that an 80% confidence (or P-80) implies a probability of 80% that the risk will be less than the indicated value. The cumulative probability values and cumulative probability curve is shown on pages 5 and 6 of this appendix.

The 'Risk to P-80' value for the project is 9.0% of the project cost. The graph below shows the weightings of the INFRACO Point Cost and the INFRACO Risk result.



Cost Variance

The INFRACO Risk value is a combination of Cost Variance (values shown on page 7 of this appendix) and Risk Items (values shown on page 8 of this appendix). The table below shows the weighting of the risk items and cost variance in determining the INFRACO Risk.

INFRACO Risk	
Cost Variance (Estimating Uncertainty)	£12,994,000
Risk Items – 16 Risks Items	£13,684,000
INFRACO Risk Result	**£26,678,000**

Regression Sensitivity

The regression sensitivity graph below is a graphical representation of the correlation between the individual risk items and the total INFRACO risk exposure. It can be interpreted as showing which uncertainties drive the overall risk and provides a useful guide for prioritising risk mitigation measures.

The following six items have the greatest affect on the INFRACO risk, by reducing either the probability their occurrence and / or the impact it will be possible to reduce the risk cost (sorted in decreasing magnitude of influence):

- Failure to meet performance requirements
- Preliminaries & General items (cost variance)
- Delay to start of INFRACO programme
- Track and Formation (cost variance)
- Procurement process does not lead to price certainty
- Late consents (Planning, TTROs, TROs, Network Rail Possessions etc)

TIE Quantitative Risk Analysis

INFRACO risk model excluding inflation, revision 3 on cost sensitivitiest and including an unidentified risk item.

Analysis Summary Statistics	
Workbook Name	TIE QRA Model 180906 D8a.xls
Number of Simulations	1
Number of Iterations	3000
Number of Inputs	350
Number of Outputs	3
Sampling Type	Latin Hypercube
Simulation Start Time	10:56:23
Simulation Stop Time	10:56:29
Simulation Duration	00:00:06
Random Seed	590379555

Key Model Output Data	
Minimum	262,546
Maximum	347,174
Mean	285,630
P 80	291,868
St Deviation	12,555

All Values in £,000

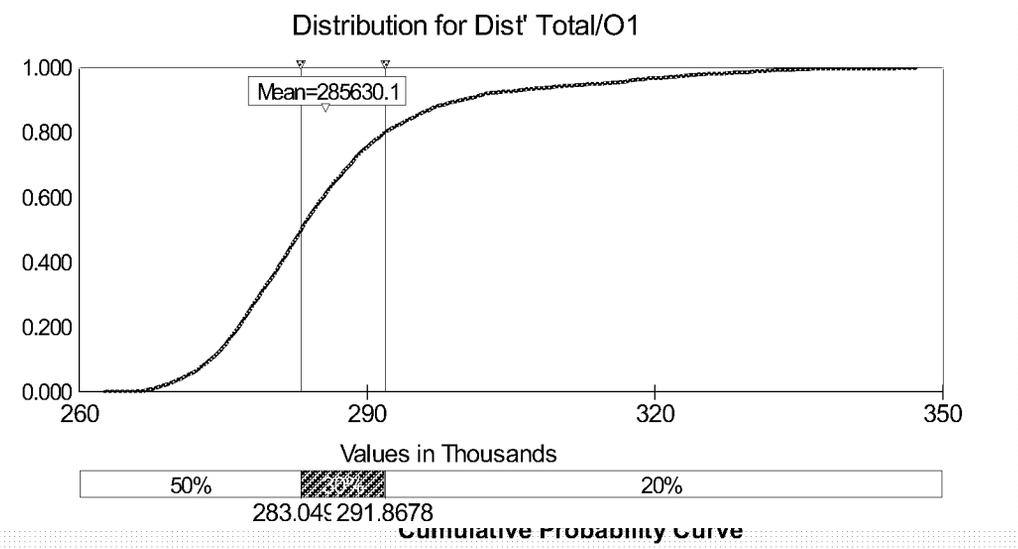
Split Results Pmean	
Cost Pmn	276,460
Risk Pmn	9,170
Cost Uplift	7,268
Risk Uplift	9,170
Risk to Pm	16,438

Key Outup Data For Cost Plan				
Point Estimate	**Cost to P mean**	**Pmean**	**Cost to P80**	**P80**
269,192	16,438	285,630	6,238	291,868

Point Est	% to Pmean	Pmean	% to P80	P80
269,192	6%	285,630	2%	291,868

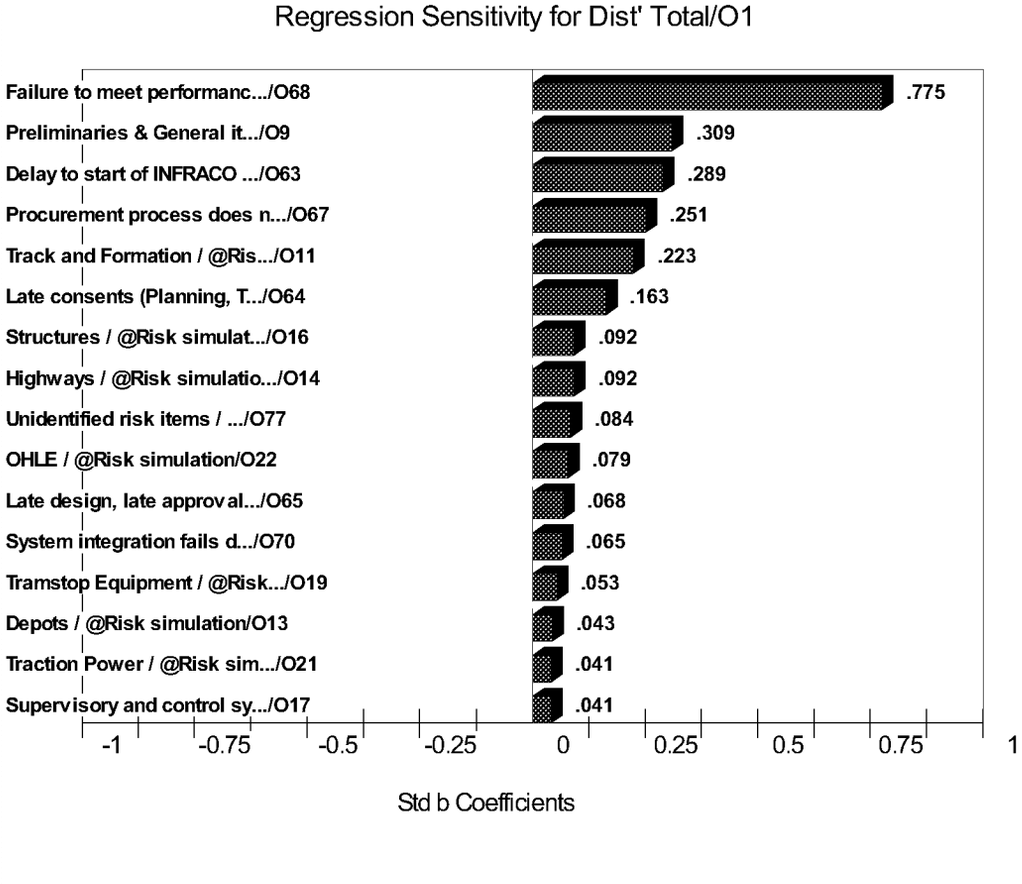
Sensitivities				Cumul' Probabilities	
Description	**Rank**	**Regression**	**Correlation**		
Failure to meet performance requiren	1	0.775	0.482	0%	262,546
Preliminaries & General items / @Ris	2	0.309	0.443	5%	270,995
Delay to start of INFRACO programm	3	0.289	0.388	10%	273,666
Procurement process does not lead t	4	0.251	0.313	15%	275,278
Track and Formation / @Risk simulat	5	0.223	0.322	20%	276,561
Late consents (Planning, TTROs, TR	6	0.163	0.225	25%	277,656
Structures / @Risk simulation	7	0.092	0.141	30%	278,822
Highways / @Risk simulation	8	0.092	0.159	35%	279,980
Unidentified risk items / @Risk simul	9	0.084	0.126	40%	281,010
OHLE / @Risk simulation	10	0.079	0.104	45%	282,047
Late design, late approvals and other	11	0.068	0.092	50%	283,049
System integration fails during testing	12	0.065	0.079	55%	284,127
Tramstop Equipment / @Risk simulat	13	0.053	0.047	60%	285,389
Depots / @Risk simulation	14	0.043	0.026	65%	286,634
Traction Power / @Risk simulation	15	0.041	0.080	70%	288,150
Supervisory and control system / @R	16	0.041	0.050	75%	289,713
Compensation paid to Train Operatin	17	0.037	0.035	80%	291,868
Uncertainty of Utilities location and co	18	0.037	0.058	85%	294,869
Environmental Statement requiremer	19	0.034	0.065	90%	299,653
Comms / @Risk simulation	20	0.025	0.037	95%	314,156
				100%	347,174

TIE Quantitative Risk Analysis



Cumulative Probability Curve

(Values are thousands of the base unit £,000. i.e. Millions)



Appendix D

Escalation Calculation

Escalation- Calculation Summary

	At 3Q 06 price levels	Escalation prior to start of construction	Cost at price levels at start of construction	Escalation through construction	Total Out-turn costs at end of day
Civils	122,638,687	7,013,742	129,652,428	12,045,590	141,698,018
Building	22,786,608	1,303,173	24,089,781	1,515,973	25,605,753
Signalling	14,542,744	1,054,330	15,597,074	1,266,109	16,863,183
Electrical and Traction Power, et	41,539,405	2,905,361	44,444,766	3,064,128	47,508,894
Organisation Management	60,879,923	3,006,859	63,886,782	4,114,048	68,000,830
	262,387,366	**15,283,465**	**277,670,831**	**22,005,847**	**299,676,678**

	£
	262,387,366
15,283,465	
22,005,847	
	37,289,312
	299,676,678

Edinburgh Trams, Escalation – to: Construction

COST	2006 start 4Q	2006 3m	2007 12m	2007 end 4Q
Civils	122,638,687	1,395,015	5,618,727	129,652,428
Building	22,786,608	259,198	1,043,975	24,089,781
Signalling	14,542,744	209,052	845,278	15,597,074
Electrical and Traction Power, etc	41,539,405	576,359	2,329,002	44,444,766
Organisation Management	60,879,923	608,799	2,398,060	63,886,782
TOTALS	262,387,366	3,048,423	12,235,041	277,670,831

Indexation %	2003	2004	2005	2006	2007
Civils %	3.15	4.83	4.30	4.55	4.53
Building %	3.15	4.83	4.30	4.55	4.53
Signalling %	4.35	6.03	5.50	5.75	5.73
Electrical and Traction Power, etc %	4.15	5.83	5.30	5.55	5.53
Organisation Management %	4.40	4.50	4.30	4.00	3.90

	estimate	inflation %	period	inflation £	uplift £
2006	Civils				
1st year	122,638,687	4.550	3m	1,395,015	124,033,702
2007	Civils				
2nd year	124,033,702	4.530	12m	5,618,727	129,652,428
2006	Building				
1st year	22,786,608	4.550	3m	259,198	23,045,806
2007	Building				
2nd year	23,045,806	4.530	12m	1,043,975	24,089,781
2006	Signalling				
1st Year	14,542,744	5.750	3m	209,052	14,751,796
2007	Signalling				
2nd year	14,751,796	5.730	12m	845,278	15,597,074
2006	Electrical, Traction Power & Telecomms				
1st Year	41,539,405	5.550	3m	576,359	42,115,764
2007	Electrical, Traction Power & Telecomms				
2nd year	42,115,764	5.530	12m	2,329,002	44,444,766
2006	Organisation Management				
1st Year	60,879,923	4.000	3m	608,799	61,488,722
2007	Organisation Management				
2nd year	61,488,722	3.900	12m	2,398,060	63,886,782

Edinburgh Trams Escalation during Construction & End of Day Cost

	1st year	2nd year	3rd year
Refer to indexation % sheet	2008	2009	2010
Period (months) inflation applies	12	12	10
Civils %	5.57	5.55	5.55
Building %	3.80	3.80	3.80
Signalling %	4.88	4.87	4.87
Electrical and Traction Power, etc %	4.16	4.15	4.15
Organisation Management %	4.00	4.10	4.10

Construction period details - months & monthly spend	from "... to Construction"	Construction period/months	Constr. period monthly spend
Civils %	129,652,428	32	4,051,638
Building %	24,089,781	32	752,806
Signalling %	15,597,074	32	487,409
Electrical and Traction Power, etc %	44,444,766	32	1,388,899
Organisation Management %	63,886,782	34	1,879,023

Escalation & End of Day Cost	2008	2009	2010			End of Day TOTAL
Civils	1,354,058	4,132,461	6,559,071			141,698,018
Building	171,640	521,441	822,891			25,605,753
Signalling	142,713	434,797	688,598			16,863,183
Electrical and Traction Power, etc	346,669	1,053,561	1,663,898			47,508,894
Organisation Management	450,966	1,382,660	2,280,422			68,000,830
TOTALS	2,466,045	7,524,921	12,014,881			299,676,678

Civils - 1st Year =>	monthly spend	Y1 period spend	over ? months	mid point	% p.a.	months x %	£
	4,051,638	48,619,661	12	Y	5.570	2.785	1,354,058
						1st year escalation	**1,354,058**
						1st year escalated spend	**49,973,718**

Civils - 2nd Year =>	monthly spend	Y2 period spend	over ? months	mid point	% p.a.	% x months	£
	4,051,638	48,619,661	12	N	5.570	5.570	2,708,115
		51,327,776	12	Y	5.550	2.775	1,424,346
						2nd year escalation	**4,132,461**
						2nd year escalated spend	**52,752,121**

Civils - 3rd Year =>	monthly spend	Y3 period spend	over ? months	mid point	% p.a.	% x months	£
	4,051,638	48,619,661	12.0	N	5.570	5.570	2,708,115
		51,327,776	12.0	N	5.550	5.550	2,848,692
		54,176,467	8.0	Y	5.550	1.850	1,002,265
						3rd year escalation	**6,559,071**
						3rd year escalated c-flow	**55,178,732**

Building - 1st Year =>	monthly spend	Y1 period spend	over ? months	mid point	% p.a.	months x %	£
	752,806	9,033,668	12	Y	3.800	1.900	171,640
						1st year escalation	**171,640**
						1st year escalated spend	**9,205,307**

Building - 2nd Year =>	monthly spend	Y2 period spend	over ? months	mid point	% p.a.	% x months	£
	752,806	9,033,668	12	N	3.800	3.800	343,279
		9,376,947	12	Y	3.800	1.900	178,162
						2nd year escalation	**521,441**
						2nd year escalated spend	**9,555,109**

Building - 3rd Year =>	monthly spend	Y3 period spend	over ? months	mid point	% p.a.	% x months	£
	752,806	9,033,668	12.0	N	3.800	3.800	343,279
		9,376,947	12.0	N	3.800	3.800	356,324
		9,733,271	8.0	Y	3.800	1.267	123,288
						3rd year escalation	**822,891**
						3rd year escalated cash-flow	**9,856,559**

Signalling - 1st Year =>	monthly spend	Y1 period spend	over ? months	mid point	% p.a.	months x %	£
	487,409	5,848,903	12	Y	4.880	2.440	142,713
						1st year escalation	**142,713**
						1st year escalated spend	**5,991,616**

Signalling - 2nd Year =>	monthly spend	Y2 period spend	over ? months	mid point	% p.a.	% x months	£
	487,409	5,848,903	12	N	4.880	4.880	285,426
		6,134,329	12	Y	4.870	2.435	149,371
						2nd year escalation	**434,797**
						2nd year escalated spend	**6,283,700**

Signalling - 3rd Year =>	monthly spend	Y3 period spend	over ? months	mid point	% p.a.	% x months	£
	487,409	5,848,903	12.0	N	4.880	4.880	285,426
		6,134,329	12.0	N	4.870	4.870	298,742
		6,433,071	8.0	Y	4.870	1.623	104,430
						3rd year escalation	**688,598**
						3rd year escalated cash -flow	**6,537,501**

Electrical & Traction - 1st Year =>	monthly spend	Y1 period spend	over ? months	mid point	% p.a.	months x %	£
	1,388,899	16,666,787	12	Y	4.160	2.080	346,669
						1st year escalation	**346,669**
						1st year escalated spend	**17,013,456**

Electrical & Traction - 2nd Year =>	monthly spend	Y2 period spend	over ? months	mid point	% p.a.	% x months	£
	1,388,899	16,666,787	12	N	4.160	4.160	693,338
		17,360,126	12	Y	4.150	2.075	360,223
						2nd year escalation	**1,053,561**
						2nd year escalated spend	**17,720,348**

Electrical & Traction - 3rd Year =>	monthly spend	Y3 period spend	over ? months	mid point	% p.a.	% x months	£
	1,388,899	16,666,787	12.0	N	4.160	4.160	693,338
		17,360,126	12.0	N	4.150	4.150	720,445
		18,080,571	8.0	Y	4.150	1.383	250,115
						3rd year escalation	**1,663,898**
						3rd year escalated cash -flow	**18,330,685**

Org Management - 1st Year =>	monthly spend	Y1 period spend	over ? months	mid point	% p.a.	months x %	£
	1,879,023	22,548,276	12	Y	4.000	2.000	450,966
						1st year escalation	**450,966**
						1st year escalated spend	**22,999,242**

Org Management - 2nd Year =>	monthly spend	Y2 period spend	over ? months	mid point	% p.a.	% x months	£
	1,879,023	22,548,276	12	N	4.000	4.000	901,931
		23,450,207	12	Y	4.100	2.050	480,729
						2nd year escalation	**1,382,660**
						2nd year escalated spend	**23,930,936**

Org Management - 3rd Year =>	monthly spend	Y3 period spend	over ? months	mid point	% p.a.	% x months	£
	1,879,023	22,548,276	12.0	N	4.000	4.000	901,931
		23,450,207	12.0	N	4.100	4.100	961,458
		24,411,666	10.0	Y	4.100	1.708	417,033
						3rd year escalation	**2,280,422**
						3rd year escalated cash-flow	**24,828,698**

Appendix E

Apportionment of cost into Phase 1a and Phase 1b

WBS Code	Item Code	DESCRIPTION	Phase 1a £	Phase 1b £
	TBA	Preliminaries & General Items	95,016,173	23,754,043
	TBA	Method Related Charges	inc above	inc above
	A1	Trams	902,120	225,530
	B1	Track and Formation	42,676,402	12,706,518
	B2	Tramstops	2,935,575	1,218,713
	B3	Depots	18,592,503	n/a
	B4	Highways	18,489,856	4,378,727
	B5	Buildings	936,723	176,795
	B6	Structures	25,273,039	2,421,970
	C1	Supervisory and Control System	5,148,696	1,287,174
	C2	Comms	4,393,964	1,098,491
	C3	Tramstop Equipment	3,975,983	1,780,065
	C4	Depot Equipment	751,013	n/a
	D1	Traction Power	9,221,730	2,737,350
	D2	OHLE	15,867,508	3,710,015
		TOTAL PHASES 1a & 1b	244,181,284	55,495,392