

EDINBURGH TRAM PROJECT
P80 Risk Allocation Report
 Current Period End 01-Mar-08

Sim Run P80 1A+1B 28598 £k

Risk Mean Sum 21407.38 £k
 Total Allocation Phase 1A 25927.21

WBS Item	Allocated Risks			Impact Assessment 08 Feb 2008				Exposure Period		Sim Run Risk Mean	P80 Risk Allocation	P80 Risk Allocation 1A	QUANTITATIVE RISK CALCULATIONS										
	Risk ID	Cause	Risk Event	Effect	Prob	Current Impact Assessment	Start	End	Risk Distribution				Sim Run Risk Mean	Probability	Reverse Probability	Most Likely	No Impact	Cost @Risk	No Impact		Overall Contingency		
11.1 Construction	894	The design for the lighting has yet to be approved by CEC's Street Lighting section	Additional time or cost could be incurred in relation to the street lighting works	Compliance with their requirements may incur abortive works resulting in additional cost and delay to programme	17.50%	12.5	23-Aug-07	31-Oct-08	3.18	2.92	2.34	DISCRETE	#NAME?	0.175	0.825	12.5	0	#NAME?	0	#NAME?	Design & Consents		
2 PROCUREMENT CONSULTANT	44	SDS contractor does not deliver the required prior approval consents before novation	Late prior approval consents	Delay to programme with additional resource costs and delay to infraco procurement. Impact upon risk balance.	50.00%	900	30-Jun-06	30-Nov-08	902.44	1205.48	1084.94	TRIANG	#NAME?	0.5	0.5	1800	0	#NAME?	0	#NAME?	Design & Consents		
3 DESIGN	336	Adequate scope and extent of noise and vibration prevention measures/requirements are not provided to SDS. Specifications relating to Train noise provided by Tranco are optimistic.	Design assumptions lead to Train noise and vibration measures being inadequate during operation	Train design requires to be re-worked. Post construction elements need to be adjusted or re-constructed or additional noise and vibration measures need to be incorporated.	10.00%	100	01-Jan-07	31-Jan-11	55.94	74.72	59.78	UNIFORM	#NAME?	0.1	0.9	0	0	#NAME?	0	#NAME?	Design & Consents		
5 PARLIAMENTARY PROCESS/ APPROVALS	271	Inadequate quality of submission of approval. Partial submission of package Programme compression Lack of CEC resources.	Failure to process prior approvals applications within 8 weeks	Delay and disruption to infraco programme	80.00%	750	03-Jan-06	29-Aug-08	686.67	880.54	890.54	TRIANG	#NAME?	0.8	0.2	750	0	#NAME?	0	#NAME?	Design & Consents		
5 PARLIAMENTARY PROCESS/ APPROVALS	890	SDS are behind programme with design review certificates and he have decided not to extend programme period to account for this.	CEC carry financial impact of unconfirmed designs provided to infraco	Modifications required to the designs post-contract award resulting in additional costs	50.00%	500	13-Aug-07	31-May-08	376.31	502.88	402.14	TRIANG	#NAME?	0.5	0.5	750	0	#NAME?	0	#NAME?	Design & Consents		
7.3 Infraco	279		Third party consents including Network Rail, CEC Planning, CEC Roads Department, Historic Scotland, Building Firing Owner consent is denied or delayed	Delay to programme. Risk transfer response by holders is to return risk to us, increased out-turn cost if transferred and also as a result of any delay due to inflation.	50.00%	1250	03-Jul-06	31-Dec-08	825.00	834.88	751.39	DISCRETE	#NAME?	0.5	0.5	1250	0	#NAME?	0	#NAME?	Design & Consents		
1 GENERAL/OVERALL	188	Concurrent major projects in Edinburgh	Other major projects in Edinburgh interface with Tram	Delay in sequence in certain areas. Additional interface project management costs	50.00%	100	01-Mar-07	31-Dec-10	149.89	200.36	160.29	TRIANG	#NAME?	0.5	0.5	300	0	#NAME?	0	#NAME?	General Programme Delay		
1.7 Miscellaneous	343	General delay to programme with various causes e.g. failure to obtain approvals on time, parliamentary processes, delays due to lack of prioritisation of BAA agreement with new owners	Delay to completion of project	Inflation at 5% causes increased out-turn cost due to delay plus revenue loss	40.00%	6000	31-Dec-10	31-Dec-11	4821.41	6574.00	5259.22	TRIANG	#NAME?	0.4	0.6	12000	0	#NAME?	0	#NAME?	General Programme Delay		
7.1.3 Depot	874	Inaccurate Topo Survey results	Increase in levels of Spoil Excavation	Increased Cost & Programme extension	25.00%	100	14-May-07	24-Aug-08	74.29	89.22	99.22	TRIANG	#NAME?	0.25	0.75	300	0	#NAME?	0	#NAME?	Infraco Delivery		
7.1.3 Depot	881	Existing Spoil Site Unable to accept future spoil	Increase in the Lothian Valuation Joint Board rateable value of the spoil site.	New Landfill site will have to be found and agreements reached. Possibility of increased costs	80.00%	0	19-Jul-07	31-Mar-08	20.05	26.79	26.79	TRIANG	#NAME?	0.8	0.2	25	0	#NAME?	0	#NAME?	Infraco Delivery		
7.1.3 Depot	876	Agreement with SEPA to use Gravity Drain Proposal	Gravity Drain Proposal	Cost & time saving	79.50%	12.5	12.5	19-Mar-08	09-Jul-08	9.94	13.27	13.27	TRIANG	#NAME?	0.795	0.205	12.5	0	#NAME?	0	#NAME?	Infraco Delivery	
7.3 Infraco	952	Scope of works relating to Wide Area Modelling (WAM) have not been agreed with SDS because they consider this to be out with the scope of their contract.	Uncertainty about extent of construction works required on road network relating to Wide Area Modelling issues	Potential claim from SDS to deal with additional design work; Potential construction costs to deal with WAM issues (difficult to quantify without design) over and above those already included	95.00%	0	3000	03-Jul-06	24-Sep-08	1431.29	1811.92	1911.92	UNIFORM	#NAME?	0.95	0.05	0	0	#NAME?	0	#NAME?	Infraco Delivery	
7.3 Infraco	831	Utilities assets uncovered during construction that were not previously accounted for, unidentified abandoned utilities assets, known redundant utilities, unknown live utilities, unknown redundant utilities	Unknown or abandoned assets impacts scope of Infraco work	Re-design and delay as investigation takes place and solution implemented. Increase in Capex cost as a result of additional works.	90.00%	500	1000	01-Oct-07	31-Jul-10	875.23	801.97	721.58	UNIFORM	#NAME?	0.9	0.1	0	0	#NAME?	0	#NAME?	Infraco Delivery	
7.3 Infraco	172	Area of possible contamination and unstable ground (unlicensed tip) has been highlighted during desk study immediately to east of Gogar Burn. Investigation for CERT project indicates that this consists of building rubble and domestic waste.	Tramway runs through area of possible contamination and special foundation is required to cope with unstable ground	Increase in costs to provide special foundation solution	95.00%	100	200	300	01-Jan-07	31-Jul-08	189.84	253.58	253.58	TRIANG	#NAME?	0.95	0.05	200	0	#NAME?	0	#NAME?	Infraco Delivery
7.3 Infraco	105	Encountering archaeological finds/burials/munitions during construction	Exhumation of archaeological finds/burials	Delay in construction programme	85.00%	0	150	500	20-Sep-07	31-Jul-10	194.53	246.48	221.84	TRIANG	#NAME?	0.85	0.15	150	0	#NAME?	0	#NAME?	Infraco Delivery
7.3 Infraco	318	Failure to make arrangements with Utilities for the phasing of necessary connections, Utility Company operational constraints	Utility connections cannot proceed as planned	Potential delay to start of Infraco works in certain sections	50.00%	100	500	04-Apr-07	31-Jan-08	149.73	200.01	160.01	UNIFORM	#NAME?	0.5	0.5	0	0	#NAME?	0	#NAME?	Infraco Delivery	
7.3 Infraco	173	Uncertainty over extent of contaminated land/hazardous materials on route	Tramway runs through area of previously unidentified contamination/hazardous materials and material requires to be removed and replaced (dig and dump)	Increase in costs to remove material to special and other tip	50.00%	1500	8000	8000	29-Sep-06	31-Jul-10	2895.01	3453.88	3108.48	TRIANG	#NAME?	0.5	0.5	6000	0	#NAME?	0	#NAME?	Infraco Delivery
7.3 Infraco	865	Buildings contain asbestos that was not uncovered during surveys	Asbestos found during demolition works and excavations for construction	Cost and delay during investigation and removal	90.00%	80	150	01-Jan-08	31-Mar-08	94.53	126.28	101.02	UNIFORM	#NAME?	0.9	0.1	0	0	#NAME?	0	#NAME?	Infraco Delivery	
1.1 Land & Property	352	Increase in land values	Higher land compensation claims than anticipated	Additional uplift on compensation claims	30.00%	0	4500	05-Mar-07	31-Dec-10	888.48	919.89	919.89	UNIFORM	#NAME?	0.3	0.7	0	0	#NAME?	0	#NAME?	Land compensation	
1.1 Land & Property	10	Costs of obtaining access rights are unknown	Cost associated with obtaining wayleaves	Increased legal costs relating to obtaining wayleaves	40.00%	50	200	500	02-Apr-07	25-Oct-08	98.80	133.32	133.32	TRIANG	#NAME?	0.4	0.6	200	0	#NAME?	0	#NAME?	Land compensation
7.2 MUDFA/Utilities	184	Utilities assets uncovered during construction that were not previously accounted for, unidentified abandoned utilities assets, asbestos found in excavation for utilities diversion, unknown cellars and basements intrude into works area, other physical job	Unknown or abandoned assets or unforeseen/contaminated ground conditions affect scope of MUDFA work	Re-design and delay as investigation takes place and solution implemented. Increase in Capex cost as a result of additional works.	95.00%	1000	3000	8000	02-Apr-07	31-Dec-08	3163.88	4226.32	4015.00	TRIANG	#NAME?	0.95	0.05	3000	0	#NAME?	0	#NAME?	MUDFA
7.2 MUDFA/Utilities	139	Utilities diversion outline specification only from plans	Uncertainty of Utilities location and consequently required diversion work/ unforeseen utility services within LOD	Increase in MUDFA costs or delays as a result of carrying out more diversions than estimated	90.00%	0	1200	2400	02-Apr-07	31-Dec-08	1082.15	1445.53	1373.26	TRIANG	#NAME?	0.9	0.1	1200	0	#NAME?	0	#NAME?	MUDFA
7.2 MUDFA/Utilities	342	Tram alignment at AB crossing at Gogar co-incident BT data nests/cable (main coms link between Glasgow and Edinburgh) and sewer	AB crossing tunnel requires special design or BT data nests/cables require to be moved or solution to sewer to be engineered	Additional period required for design approval/acceptance turnaround	80.00%	1000	1250	1500	04-Apr-07	30-Sep-08	899.46	1335.07	1335.07	TRIANG	#NAME?	0.8	0.2	1250	0	#NAME?	0	#NAME?	MUDFA
7.2 MUDFA/Utilities	814	Required approval/acceptance turnaround time does not reflect SUC standard practice; SUCs do not have enough resource or process capability to achieve 20 day turnaround	Statutory Utility Companies unable to meet design approval/acceptance turnaround time to meet programme	Additional period required for design approval/acceptance turnaround	95.00%	880	02-Mar-07	31-Dec-08	838.00	1118.73	1060.89	DISCRETE	#NAME?	0.95	0.05	880	0	#NAME?	0	#NAME?	MUDFA		
7.2 MUDFA/Utilities	811	Scottish Power own and maintain a cable tunnel in the vicinity of Leith Walk that may or may not interfere with Tram construction and operation, exact location and depth of tunnel is unknown, condition of tunnel is unknown	Presence of Scottish Power tunnel in Leith Walk requires radical solution	Tunnel may have to be decommissioned and re-laid in a more suitable location, tram alignment may require to be adjusted, special foundation solution e.g. cablelayer may be required, increased capex, potential for tunnel collapse during operation and	80.00%	400	500	800	02-Apr-07	31-Oct-08	400.03	534.95	534.95	TRIANG	#NAME?	0.8	0.2	500	0	#NAME?	0	#NAME?	MUDFA

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WBS Item	Allocated Risks			Impact Assessment 08 Feb 2008	Exposure Period		Sim Run Risk Mean	P80 Risk Allocation	P80 Risk Allocation 1A	QUANTITATIVE RISK CALCULATIONS								Risk Distribution	Overall Contingency					
	Risk ID	Cause	Risk Event		Effect	Prob				Current Impact Assessment			Start	End	Ek	Ek	Ek			Reverse Probability	Most Likely	No Impact	Cost @Risk	No Impact
										Min	Most Likely	Max												
1.3.1 NR Immunsation Project	832	Information handed over in draft format as part of corridor design development. Downstream Tram design change that impacts on requirements. Zone of interference not defined adequately.	SDS gives wrong or insufficient information to Network Rail	Network Rail design their works inappropriately for final Tram requirements. Network Rail are unable to complete their design in time to meet programme. Cost to change design. Delay during redesign. Final works are not suitable and consequently Tram cannot	5.00%	100	300	500	02-Apr-07	30-Oct-09	15.08	20.12	20.12							Network Rail				
7.3 Infraco	134	Network Rail possessions over and above that estimate are required	Compensation paid to Train Operating Companies	Increased compensation paid to Train Operating Companies	5.00%	500	2000	4000	01-Oct-07	31-Jan-09	111.40	148.80	148.80							Network Rail				
7.3 Infraco	116	Network Rail cancels planned possessions	Planned work at interface with Network Rail is delayed	Time delay and resulting cost increase	10.00%	350	750	2000	01-Oct-07	31-Jan-09	102.42	136.81	136.81							Network Rail				
11.1 Construction	893	Due to a terrorism event relating to Edinburgh Airport or due to the mitigation of the risk of such an event occurring traffic restrictions introduced in the vicinity of the airport cause unacceptable delays for vehicles accessing and exiting from the site	Free access cannot be guaranteed to the P&R site	Delays to construction vehicles could have impact on completion date and cost of construction, delays for car park users or buses could detract from usefulness and viability of facility	2.50%		12.5		01-Oct-07	31-Mar-08	0.31	0.42	0.42							Other				
2 PROCUREMENT CONSULTANT	337	Unsuccessful tenderer challenges procurement process (Tramco or Infraco)	OJEU procurement process is challenged	Possible tenderer. Delays, Legals costs to deal with challenge	5.00%	0	100		12-Jan-07	30-Oct-08	2.88	3.56	3.56							Other				
2 PROCUREMENT CONSULTANT	78	Introduction of TEL as client	Change of client during works	Delay and cost during re-negotiation of DPOF contract and additional approvals process	5.00%	12.5	12.5		03-Jul-08	30-Oct-08	0.83	0.83	0.83							Other				
2.1 te Resources	58	Poor performance (quality) by Infraco during construction; poor materials, latent defects	Infraco fails to deliver construction quality, latent defects occur during or after Infraco maintenance period	Rework, stakeholder criticism, negative PR, programme delay if quality issue occurs during construction, operations affected by rework, project management costs to deal with issues	10.00%	25	62.5	100	31-Dec-10	30-Dec-18	6.21	8.30	6.64							Other				
2.2 Transdev	888	Design, construction and/or testing does not meet Transdev requirements and gain approval from the ROGS Competent Person	Transdev refuse to operate system on safety ground or apply overly restrictive procedures that are not directly the responsibility of Infraco (ROGS Competent Person agrees with this)	Delay to commencement of service, additional cost both for delay and rectification of the issue	2.00%	3000	4500	6000	30-Jun-09	31-Dec-10	91.20	121.83	97.46							Other				
2.9 TEL	889	Unsuccessful negotiation. TEL believes costs inflated too much.	Target operating costs for Phase D are not agreed.	TEL Business Case becomes undeliverable. Potential to undertake Dispute Resolution to gain agreement.	1.00%	300	300		04-Jan-10	06-Jan-19	3.00	4.01	3.21							Other				
3 DESIGN	104	Delay in design information release from specialist tram manufacturer	Delay in detailing of stops, trackway, OLE etc for Phase 1B	Time delay and consequent costs	15.00%	0	25	83	01-Jan-07	30-Sep-08	5.32	7.10	0.00							Other				
3 DESIGN	182	Land is not acquired yet	Gaining access to land prior to purchase for advanced works	Increased management costs and delays to design	10.00%	0	30		02-Apr-07	28-Sep-08	1.47	1.86	1.57							Other				
7.1.1 Invasive Species	868	Surveying team unable to obtain access to Network Rail, BAA and other privately owned land because they were not cleared to access this land (including PTS)	Extent of Invasive Species Area Exceeds Estimate from Survey	Underestimating the extent of works, leads to an increase in cost	17.50%	20	20		17-Apr-07	01-Apr-09	3.50	4.88	4.88							Other				
7.1.1 Invasive Species	879	Contractor is unable to get access to worksite due to access route being outside LGD and owned by others	Access to land to eradicate invasive species is not available when required	Programme Delay, contractor refuses to take ownership of risk 869 or includes high contingency in tender to allow for.	10.00%	0	10	20	12-Mar-07	01-Apr-09	1.00	1.34	0.04							Other				
7.1.2 Badger Relocation	884	Ineffective/inappropriate Proposals; new setts must be built before old ones can be closed and licenses will not be issued until nearest time of closure, animals must have settled in new home before closure of old one can take place	Roseburn Badger Proposals for closure of old setts not approved by SNH	Delay in accessing land to construct Tram works and hence in Programme	17.50%	0	12.5	25	01-Oct-08	28-Nov-08	2.18	2.81	0.00							Other				
7.1.2 Badger Relocation	883	Ineffective/inappropriate Proposals; new setts must be built before old ones can be closed and licenses will not be issued until nearest time of closure, animals must have settled in new home before closure of old one can take place	Gogarburn Badger/Other Proposals for closure of old setts not approved by SNH/SEERAD	Delay in accessing land to construct Tram works and hence in Programme	10.00%	0	12.5	25	01-Oct-07	30-Oct-08	1.23	1.64	1.64							Other				
5 PARLIAMENTARY PROCESS/ APPROVALS	977	Legal challenge. Extension of statutory consultation process. Large number of objections. TRO process is subject to a public hearing process.	Delay in achievement of TROs due to a large number of public objections and/or a legal challenge to using a TTRO to construct Infraco.	Requirement to start construction using TTROs	80.00%	750	750		18-Jun-07	31-Dec-09	675.00	901.67	901.67							TROs				

TOTALS

21407.38

25,927

Mean Sum = p50

5415.03
 2628.56
 6481.51
 5071.40
 788.30
 675.00
 228.87
 118.71
 -

6617.71
 3191.13
 8318.58
 5419.51
 1053.01
 901.87
 305.73
 119.88
 -

21,407

25,927

Infraco Delivery
 Design & Consents
 MUDFA
 General Programme Delay
 Land compensation
 TROs
 Network Rail
 Other
 Unspecified Risks (Contingency)