

**EDINBURGH TRAM PROJECT**

**P80 Risk Allocation Report**

Current Period End: 01-Mar-08

Sim Run P80 1A+1B 30965.44 £k

Risk Mean Sum: 2236.45 £k  
 Total Allocation Phase 1A: 26637.90

WBS Item	Allocated Risks			Impact Assessment 08 Feb 2008				Exposure Period		Sim Run Risk Mean	P80 Risk Allocation	P80 Risk Allocation 1A		
	Risk ID	Cause	Risk Event	Effect	Prob	Current Impact Assessment			Start					End
						%	Min	Most Likely						
11.1 Construction	994	The design for the lighting has yet to be approved by CE'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			29-Aug-07	31-Oct-08	2.19	3.03	2.43	Design & Consents
2 PROCUREMENT CONSU/TANT	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 delays to InfraCo procurement	50.00%	800			26-Jul-08	30-Nov-08	897.11	1243.88	1119.32	Design & Consents
3 DESIGN	338	Adequacy of noise and extent of noise and vibration prevention measures/requirements are not provided to SDS. Specifications relating to Tram noise provided by Tramcare optimistic	Design assumptions lead to Tram noise and vibration measures being inadequate during operation	Tram 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	33.28	73.79	59.03	Design & Consents
4 PARLIAMENTARY PROCESS/ APPROVALS	811	Inadequate quality of submission of approval. Poor submission of package. Programme compression. Lack of CE's resources	Failure to progress prior approvals applications within 8 weeks	Delay and disruption to InfraCo programme	80.00%	730	750	1000	03-Jan-06	28-Aug-08	641.00	924.95	924.95	Design & Consents
5 PARLIAMENTARY PROCESS/ APPROVALS	466	SDS are behind programme with design review certificates and have decided not to award programme period to account for this	CEC carry financial impact of uncertified designs provided to InfraCo	Modifications required to the designs post certified award resulting in additional costs	10.00%	300	300	400	13-Aug-07	31-May-08	174.50	520.58	416.47	Design & Consents
6 INFRACO	279		Third party consents including Network Rail, CE's Planning, CE's Roads Department, Historic Scotland, Building Firing Owner consent is denied or delayed	Delay to programme. Risk transfer response by others is to return risk to be. Increased outturn cost if transferred and also as a result of any delay to core inflation.	50.00%	400			03-Jul-08	31-Dec-09	645.00	886.45	779.80	Design & Consents
1 GENERAL OVERALL		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	150.08	208.05	166.44	General Programme Delay
1.7 Miscellaneous	343	General delay to programme with various causes. Failure to obtain approvals on time, parliamentary processes delays due to lack of prioritisation of BAA agreements with new owners	Delay to completion of project	Inflation at 5% causing increased outturn cost due to delay plus revenue loss	50.00%	8000	12000	8500	31-Dec-10	31-Dec-11	4789.10	6361.58	5187.27	General Programme Delay
1.3.4 Depot	974	Inaccurate Topo Survey results	Increase in levels of Spoil Excavation	Increased Cost of programme extension	25.00%	100	100	100	14-May-07	24-Aug-08	75.04	104.03	104.03	InfraCo Delivery
1.3.4 Depot	981	Existing Spoil Site Unable to accept future spoil	Increase in the Leithair Valuation Joint Board rate of value of the spoil site	New landfill site will have to be found and agreement reached. Possibility of increased costs	25.00%	50	50	50	19-Jul-07	31-Mar-08	78.85	27.66	27.66	InfraCo Delivery
1.3.3 Depot	985	Agreement with SE PA to use Gravity Drain Proposal	Gravity Drain Proposal	Cost & time saving	75.00%	12.5	12.5	12.5	19-Mar-08	08-Jul-08	9.94	14.12	13.78	InfraCo Delivery
1.3.3 Depot	987	Scope of works relating to Wide Area Modelling (WAM) have not been agreed with SDS because they consider this to be outwith the scope of their contract.	Uncertainty about extent of construction works required on rail network relating to Wide Area Modelling issues.	Potential claim from SDS to deal with additional design work. Potential claim against costs to deal with WAM issues (difficult to quantify without design) over and above those already included.	85.00%	0			03-Jul-06	24-Sep-08	1467.00	1671.00	1971.05	InfraCo Delivery
1.3.3 Depot	991	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 costs as a result of additional works.	90.00%	500			01-Dec-07	31-Jul-08	673.50	939.00	747.78	InfraCo Delivery
7.3 InfraCo	118	Area of possible contamination and unstable ground (unincised tip) has been identified during geotechnical investigation to assist Capital Burn - investigation for CERT project. Investigation 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	85.00%	100			31-Dec-07	31-Jul-08	190.18	283.65	283.65	InfraCo Delivery
1.3 InfraCo	100	Encountering archaeological finds/burials during	Excavation of archaeological finds/burials	Delay in construction programme	85.00%	0			28-Sep-07	31-Jul-10	194.74	256.11	230.50	InfraCo Delivery
7.3 InfraCo	108	Failure to make arrangements with Utility for the phasing of necessary connections. Utility Company operational constraints	Utility connections cannot proceed as planned	Potential delays to start of InfraCo works in certain sections	50.00%	100			04-Apr-07	31-Jan-08	144.00	207.69	166.15	InfraCo Delivery
1.3 InfraCo	110	Uncertainty over extent of contaminated land and 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	28-Sep-08	31-Jul-10	2659.25	3803.38	3243.05	InfraCo Delivery

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WBS Item	Risk ID	Cause	Risk Event	Effect	Impact Assessment 08 Feb 2008				Exposure Period		Sim Run Risk Mean	P80 Risk Allocation	P80 Risk Allocation 1A	
					Prob	Current Impact Assessment			Start	End				
						%	Min	Most Likely						
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%	60		150	01-Jan-08	31-Mar-09	94.39	130.85	104.68	Infraco Delivery
1.1 Land & Property	352	Higher level compensation claims than anticipated	Additional uplift on compensation claims		30.00%	0			05-Mar-07	31-Dec-10	884.89	949.15	949.15	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	280		02-Apr-07	25-Oct-08	99.84	138.41	138.41	Land compensation
2 MUDFA/Utilities	864	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 within scope of MUDFA work.	Re-design and delay as investigation takes place and solution implemented. Increase in Costs costs as a result of additional works.	95.00%	1000	3003		02-Apr-07	31-Dec-08	8171.30	4386.43	4176.61	MUDFA
7.2 MUDFA/Utilities	866	Utilities diversion outlines specification only from plans	Uncertainty of Utilities location and consequently required diversion works unforeseen utility services within LOD	Increase in MUDFA costs or delays as a result of carrying out more diversions than estimated	90.00%	0			02-Apr-07	31-Dec-08	1081.92	1499.89	1424.90	MUDFA
7.2 MUDFA/Utilities	867	Tram alignment at AB crossing at Gogar co include BT data nests/cable main cross link between Glasgow and Edinburgh end sewer	AB crossing tunnel requires special design or BT data nests/cable require to be moved or solution to sewer to be engineered		80.00%	1000	1250		04-Apr-07	30-Sep-08	1000.85	1387.22	1387.22	MUDFA
2 MUDFA/Utilities	868	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 DBI by Companies unable to meet design approval/acceptance turnaround time to meet programme	Additional period required for design approval/acceptance turnaround	95.80%				02-Mar-07	31-Dec-08	836.80	1158.96	1101.01	MUDFA
7.2 MUDFA/Utilities	869	Scottish Power own and maintain a cable tunnel in the vicinity of Leth 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 Leth 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 solutions e.g. cantilever may be required, increased capacity, potential for tunnel collapse during operation and	80.00%	400		880	02-Apr-07	31-Dec-08	400.00	104.00	554.53	MUDFA
1.3.1 NR Immunisation Project	870	Information handed over in draft format at time of design design requirements. Zone of interference not defined adequately	SUCs give wrong or insufficient information to Network Rail	Network Rail design the 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 design. Final works are not carried out consequently, Tram	5.00%				02-Apr-07	30-Dec-08		21.53	21.53	Network Rail
7.3 Infraco	869	Network Rail possessions over and above that assumed are required	Compensation paid to Train Operating Companies	Increased compensation paid to Train Operating Companies	5.00%	580	2000	4000	01-Oct-07	31-Jan-09	108.67	158.69	150.66	Network Rail
1.3.1 NR Immunisation Project	870	Network Rail carries planned possessions	Planned works to coincide with Network Rail possession	Timidity and cost of long cost increase	10.00%	350			02-Apr-07	30-Dec-08	100.00	145.88	145.88	Network Rail
11.1 Construction	868	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 completion date and cost of construction, delays for airport users or buses could detract from user fitness and viability of facility	2.50%				01-Oct-07	31-Mar-09	0.31	0.36	0.43	Other
PROCUREMENT CONSULTANT	867	Unsuccessful tender challenges procurement process (Trafico or Infraco)	CEU procurement process is challenged	Possible tenderer, Delays, Legals costs to deal with challenge	5.00%				30-Mar-07	30-Sep-08	3.47	3.48	3.43	Other
PROCUREMENT CONSULTANT	868	Introduction of TEL as client	Change of client during work	Delay and cost during re-negotiation of DPOF contract and additional approval process	5.00%	12.5			03-Jul-06	30-Oct-08	6.53	6.67	0.69	Other
11.1 Infraco	869	Poor performance (quality) by Infraco during construction, poor materials later defects	Infraco fails to deliver construction quality, late start/stop occurring or after Infraco maintenance period	Re-work, extra, broader than, impact on PR, or programme delay / quality, results of reducing construction, operations affected by rework, project management costs to deal with issues	10.00%	25	80	100	31-Dec-10	30-Dec-16	6.68	6.68	6.83	Other
11.1 Infraco	868	Design, construction and/or testing does not meet Train Operator requirements and gain approval from the RCTS Competent Person	Train Operator refuse to operate system on safety grounds by applying quality test the procedures that are not entirely the responsibility of Infraco (RCTS Competent Person agrees with this)	Delay to commencement of service, additional cost both for delay and resolution of the issue	2.00%	3000	1000	1000	30-Jun-09	31-Dec-10	81.28	128.54	101.23	Other

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 Total Allocation Phase 1A: 26537.90

WBS Item	Allocated Risks		Impact Assessment 08 Feb 2008	Exposure Period	Sim Run Risk Mean	P80 Risk Allocation	P80 Risk Allocation 1A	Other				
	Risk ID	Cause							Risk Event	Effect	Prob	Current Impact Assessment
2.9 TEL	889	Unsuccessful negotiation. TEL believes costs inflated too much.	Target operating costs for Phase 0 are not agreed.	TEL Business Case becomes undeliverable. Potential to undertake Dispute Resolution to gain agreement.	1.00%	300	04-Jan-10	08-Jan-19	3.00	4.16	3.33	Other
3 DESIGN	890	Delay in design information release from specialist manufacturer and is not acquired yet.	Delay in detailing of stops, trackway, GLE etc for Phase 1B.	Time delay and consequent costs	15.00%	0	01-Jan-07	30-Sep-08	2.46	2.30	0.00	Other
7.1.1 Invasive Species	891	Surveying team unable to gain access to Network Rail, B&S or other privately owned land because they were not allowed to access this land (including PIS).	Gaining access to land prior to purchase for advanced works	Increased management costs and delays to design	10.00%	0	02-Apr-07	28-Sep-08	2.46	2.83	1.62	Other
7.1.1 Invasive Species	892	Extent of Invasive Species Area Estimated from Survey	Extent of Invasive Species Area Estimated from Survey	Underestimating the extent of work, leads to an increase in cost	19.50%	0	17-Apr-07	01-Apr-09	3.05	4.99	4.85	Other
7.1.1 Invasive Species	893	Contractor unable to get access to worksite due to access route being outside LOD 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 B&S or uncovers high contingency in tender to allow for.	10.00%	0	12-Mar-07	01-Apr-08	0.85	1.40	0.04	Other
7.1.2 Badger Relocation	894	Ineffective/inappropriate Processes: new sets must be built before old ones can be closed (eg) (dense will not be released until near time of closure, animals must have settled in new home before closure of old one can take place)	Rosaburn Badger: Proposals for closure of old sets not approved by SNH	Delay in assessing land to construct Tram works and hence in Programme	17.50%	0	01-Oct-08	28-Nov-08	2.46	3.83	0.00	Other
7.1.2 Badger Relocation	895	Ineffective/inappropriate Processes: new sets must be built before old ones can be closed (eg) (dense will not be released until near time of closure, animals must have settled in new home before closure of old one can take place)	Cogaburn Badger: Other Proposals for closure of old sets not approved by SNH/SEERAD	Delay in assessing land to construct Tram works and hence in Programme	10.00%	0	01-Oct-08	30-Nov-08	1.00	1.14	1.76	Other
5 PARLIAMENTARY PROCESS/ APPROVALS	896	Legal challenge. Extension of consultation process. Large number of objections. TRO process is subject to a public hearing process.	Delay in agreement of TROs due to a large number of public objections for a legal challenge to using a TRO to construct Infraco.	Requirements to take construction using TROs	90.00%	750	18-Jun-07	31-Dec-09	875.00	935.76	935.76	TROs

22336.45	27.938	
Mean Sum = p50		
5419.33	6872.31	Infraco Delivery
2620.24	3301.99	Design & Consents
6459.88	8644.25	MUDFA
5999.40	6653.66	General Programme Delay
784.50	1087.56	Land compensation
675.00	935.76	TROs
229.43	318.06	Network Rail
118.68	124.22	Other
-	-	Unspecified Risks (Contingency)
22.336	27.938	