

Sim Run P90 1A+1B 50761 £k

Risk Mean Sum
 38413.43 £k

Total Allocation
 Phase 1A 44083.03
 Phase 1B 8375.78

WBS Item	Allocated Risks			23-Jan-07	Impact Assessment 7 June 2007			Sim Run Risk Mean	P90 Risk Allocation	Proportion allocated to 1A	Parameter used to Split 1A/1B	P90 Risk Allocation 1A	P90 Risk Allocation 1B	80:20 Sum Cumulative	80:20 %age Cumulative		
	Risk ID	Cause	Risk Event		Effect	Prob	Current Impact Assessment £k									Max	
				%	%	Min	Most Likely	Max	£k	£k				£k (P90)	% (P90)		
7.2 MUDFA/Utilities	164	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 obstructions; other contaminated land	PROJECT PRIMARY 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.	80	90	2000	5000	8500	4644.78	6137.79	0.81	Surface Area Affected (from Highways element of Infraco estimate)	4971.61	1166.18	6137.79	12%
1 GENERAL/OVERALL	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	Inflation at 5% causes increased out-turn cost due to delay	20	20	5900	15200	22600	2902.19	3835.06	0.82	MUDFA + Infraco + Tramco Estimate	3144.75	690.31	9972.86	20%
1 GENERAL/OVERALL	352	Some properties may result in higher land compensation claims than anticipated	PROJECT PRIMARY Land compensation for high risk properties	Additional uplift on compensation claims	80	80	0		5750	2309.41	3051.75	0.85	Land and Property Estimate	2593.99	457.76	13024.61	26%
1 GENERAL/OVERALL	884	Landowner disagrees with District Valuer's Assessment of land value and submits a Certificate of Appropriate Alternative Development - Plots 150, 162, 322 and 327	SUMMARY: Submission of CAAD Claims (Plots 150, 162, 322 and 327)	Increase in land value for plot > impact on budget	Risk added Post Jan-07	50		4145		2072.50	2738.68	1.00	Geographic	2738.68	0.00	15763.29	31%
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.	PROJECT PRIMARY 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	90	90	1000	1500	2000	1349.54	1783.33	1.00	Geographic	1783.33	0.00	17546.62	35%
7.3 Infraco	48	Two stage tender pricing does not achieve price certainty for works at first stage.	Price certainty is not achieved	Price creep post tender (during pre-construction period). Tender evaluation period exceeds 2 months currently planned. Bidder may attempt to price low at first stage.	50	30	1000	2000	10000	1303.04	1721.89	0.78	Infraco Estimate	1343.07	378.82	19268.51	38%
7.3 Infraco	47	Poor design and review processes; cumbersome approvals process; reiterative design/approvals process.	Completion of MUDFA works is delayed (due to late design/approvals) - late utility diversions in advance of Infraco works.	Increase in price and time delay in the Infraco contract; Infraco could end up delay to commencement or with utility diversion and would have to price for or have to carry out unplanned re-sequencing; Claims from MUDFA as a result of being unable to proceed with works.	50	50	400	2400	4800	1269.29	1677.29	0.78	Infraco Prelims	1308.29	369.00	20945.80	41%
7.3 Infraco	178	Procurement Strategy novates SDS to Infraco after Detailed Design; Limited input on buildability from Infraco.	Infraco due diligence process reveals that design rework will be required after novation of SDS.	Bids will be higher than envisaged in base estimate as Infraco will price for re-work.	50	50	0	2500	5000	1250.34	1652.24	0.78	Infraco Prelims	1288.75	363.49	22598.04	45%
7.2 MUDFA/Utilities	139	Utilities diversion outline specification only from plans	PROJECT PRIMARY 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	60	0		4000	1195.95	1580.38	0.94	MUDFA Price	1485.55	94.82	24178.42	48%
7.3 Infraco	952	Scope of works relating to Wide Area Modelling (WAM) has not been agreed with SDS; Design relating to the outputs of WAM has not yet been undertaken; Boundaries of Tram Project responsibility and details of what constitutes betterment for WAM is not finalised.	PROJECT PRIMARY 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.	Risk added Post Jan-07	95	0		2500	1191.16	1574.05	0.81	Highways Element of Infraco Estimate	1274.98	299.07	25752.47	51%

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	Risk ID	Cause	Risk Event		Prob %	Prob %	Current Impact Assessment £k	Min								
4 FINANCIAL ISSUES/ FUNDING/ PROCUREMENT STRATEGY	270	Source of funding and scope of works relating to Wide Area Modelling issues not agreed with CEC.	PROJECT PRIMARY Uncertainty about requirements for Wide Area Modelling and need and extent of construction works required on road network.	Increased construction cost; Delay while additional funding is found.	Impact added Post Jan-07	95		1250			0.81	Highways Element of Infraco Estimate	1271.06	298.15	27321.68	54%
7.3 Infraco	279		PROJECT PRIMARY Third party consents including Network Rail, CEC Planning, CEC Roads Department, Historic Scotland, Building Fixing Owner consent is denied or delayed	Delay to programme; Risk transfer response by bidders is to return risk to tie; Increased out-turn cost if transferred an also as a result of any delay due to inflation.	Impact added Post Jan-07	95		1250			1.00	Geographic - items in risk generally apply to 1A therefore 100% allocation	1560.95	0.00	28882.63	57%
2 PROCUREMENT CONSULTANT	348	Project not completed to programme due to employee controlled issues.	Project end date extended.	Project Management and overhead costs to cover delay.		20	20	2700	5400	8100	1.00	Costs applicable whether or not 1B is done	1425.08	1425.08	30307.70	60%
7.3 Infraco	70	SDS does not provide its defined deliverables (technical specs) in accordance with the SDS contract	Poor definition in Infraco tender documents	Creates impact on the Infraco ability to develop its tender - pricing and supply chain. Increase in time for BAFO and increase in costs. Increase in bidder queries.		50	50	900	1800	2700	0.90	PM Cost Estimate	1070.43	118.94	31497.07	62%
1 GENERAL/OVERALL	354	Land and property values experience a net reduction in value as a result of the introduction of the Tram	Part 1 Claims for land and property	Possible successful claims resulting in increased costs to project with impact after construction		50	50	0		3300	0.85	Land and Property Estimate	925.89	163.39	32586.36	64%
7.3 Infraco	81	Insufficient time given to designers to develop and complete tender designs	Inadequate design development for tender stage.	Infraco may price for additional reworking of design for compliant or variant proposals.		95	95	500		1000	0.78	Infraco Estimate	734.74	207.23	33528.33	66%
7.3 Infraco	66	Contracts not integrated and/or systems not compatible	Inadequate system integration	Time delay and interface problems between specialist contractors sub systems		50	50	0	1000	3000	0.78	Infraco Estimate	683.94	192.91	34405.18	68%
7.2 MUDFA/Utilities	342	Tram alignment at A8 crossing at Gogar co-incides BT data nests/cable (main coms link between Glasgow and Edinburgh)	A8 crossing tunnel requires special design or BT data nest/cables require to be moved	Capex cost to cover BT data nest/cable move; additional design costs; delay while works to undertake move are carried out; additional tunnelling costs.		70	50	1000		1500	1.00	Geographic	826.13	0.00	35231.31	69%
3 DESIGN	102	Change in Design Kinematic Envelope requirements	Detail design leads to kinematic envelope impact on vertical and horizontal alignment	Realignment of track to accommodate an increased 3 dimensional safe zone around the preferred route		50	50	0	500	3250	1.00	Geographic	822.02	0.00	36053.33	71%
1 GENERAL/OVERALL	938	Transport Scotland do not have resources available in the required magnitude to project manage works; Transport Scotland do not have technical or contractual project management expertise available; Transport Scotland do not have capability to effectively manage a construction contract and works.	STAKEHOLDER PRIMARY Immunisation Project not adequately managed or controlled by Client i.e. Transport Scotland	Project objectives and requirements not clear to Network Rail; Drop dead date of October 2009 not achieved; Costs increase beyond budget.	Impact added Post Jan-07	80		500		1000	1.00	Geographic	792.89	0.00	36846.22	73%
7.3 Infraco	78	Inadequate scope of surveys and site investigations - SDS does not scope surveys and investigations adequately	Contractor claims that ground information is not sufficient or encounters unforeseen ground conditions.	Delay and cost due to scope increase, design, rework etc during construction or pricing of additional surveys by Bidders.		80	80	200	500	1000	0.78	Infraco Estimate	467.29	131.80	37445.31	74%
7.3 Infraco	22	Base estimate does not account for presence of hazardous materials on land	Hazardous materials encountered during construction	Additional treatment costs and protective measures		50	50	100	400	2000	0.73	Track Estimate	403.97	149.42	37998.70	75%
7.2 MUDFA/Utilities	911	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.	PROJECT PRIMARY 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. cantilever may be required; increased capex; potential for tunnel collapse during operation and consequent disruption for tram.	Added Post Jan 07	80		400	500	600	1.00	Geographic	528.28	0.00	38526.98	76%

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					%	%	Min	Most Likely	Max	£k	£k						
7.3 Infraco	11	Contractors methodology not adequately assessed	Land required for access to workfront not acquired	Additional management and acquisition costs relating to acquiring land to gain access	80	80	0		1000	400.33	529.01	0.81	Highways Element of Infraco Estimate	428.50	100.51	39055.99	77%
7.3 Infraco	68	Interface with Transdev	Supply of commissioning services from Transdev to Infraco.	Delay and costs incurred by Infraco.	30	30	0	1000	3000	402.87	532.36	0.87	Transdev Estimate	463.16	69.21	39588.35	78%
7.4 Tramco	351	Depot not completed on time	Trams are manufactured but Depot unavailable to take delivery	Trams need to be stored resulting in storage costs	80	80	200	500	750	385.34	509.21	0.87	No of Trams	443.01	66.20	40097.56	79%
7.1 Advanced Works	875	Scottish Gas Networks are carrying out HP gas main diversion at depot, Turnhouse PRS not constructed on time (Risk 349 effect); Tram has limited control over SGN activities.	Delay to completion of SGN HP Gas Main Works	Critical delay to programme works including removal of spoil, Infraco removal of SGN pipeline	Risk added Post Jan-07	50	500		1000	374.81	495.29	1.00	Geographic	495.29	0.00	40592.85	80%
7.1 Advanced Works	897	Mass excavation in vicinity/close proximity to water mains	Excavation equipment causing damage to water mains	Loss of water supply in the Edinburgh area, site flooding, damaged reputation	Risk added Post Jan-07	50	500		1000	374.61	495.03	1.00	Geographic	495.03	0.00	41087.88	81%
7.3 Infraco	182	Unusually adverse weather conditions	Delay in Infraco construction programme as a result of exceptional weather conditions	Contractor claims for delay in construction programme	50	50	500		1000	374.74	495.19	0.78	Infraco Prelims	386.25	108.94	41583.07	82%
1 GENERAL/OVERALL	942	Decision making process, relating to funding and works, not undertaken during purdah period	Network Rail do not commence works at required time	Acceleration of works required to reduce duration; Additional costs; Works not completed by drop dead date of October 2009	Risk added Post Jan-07	50	500		1000	375.78	496.58	1.00	Geographic	496.58	0.00	42079.64	83%
7.3 Infraco	931	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 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.	Risk added Post Jan-07	50	500		1000	374.73	495.18	0.81	Highways Element of Infraco Estimate	401.10	94.08	42574.82	84%
1 GENERAL/OVERALL	936	Communication protocol not set up or is unclear; Nature of contract between Transport Scotland and Network Rail restricts direct communication; tie/Network Rail communication channels are not defined, are restricted or mis-used.	STAKEHOLDER PRIMARY Information not accurately and/or timeously passed between tie and Network Rail for Immunisation Works	Incorrect or lack of information received by Network Rail/tie; Development of poor relationships; Cumbersome resolution; Delay with works being delayed beyond October 2009; Project Management costs of dispute resolution; Increased cost of work; tie not adequately able to monitor progress of work.	Risk added Post Jan-07	50	500		1000	375.54	496.25	1.00	Geographic	496.25	0.00	43071.07	85%
7.3 Infraco	100	3rd party agreements impact on works not accounted for in estimate/ become apparent during construction	Increase in fencing, walls, screen requirements	Additional construction costs	50	50	200	400	1200	300.91	397.63	0.00	Geographic	0.00	397.63	43468.70	86%
7.3 Infraco	302	Steel shortage due to global demand and ongoing Corus transfer of rail production facility	Steel shortage	Long lead times, additional cost due to inflation, programme delay.	Impact added Post Jan-07	40	500		1000	300.22	396.72	0.73	Track Estimate	289.60	107.11	43865.42	86%
7.4 Tramco	905	Not controlled by Project	Tramco Insolvency	Trams are not delivered; legal costs; delay	Risk added Post Jan-07	1		25000		250.00	330.36	0.87	No of Trams	287.41	42.95	44195.78	87%
7.1 Advanced Works	877	Delayed approvals from Scottish Water and/or SEPA	Delay to water and waste water design completion in depot area	Delay to start of utility diversion works, programme & increased cost	Risk added Post Jan-07	80		300		238.50	315.16	1.00	Geographic	315.16	0.00	44510.95	88%
1 GENERAL/OVERALL	6	CEC fails to manage existing assets or changes	CEC management of assets	Increased legal and management costs to deal with change. Delay to construction programme.	50	50	200	400	800	233.86	309.03	0.68	CEC Owned Land Value	210.14	98.89	44819.98	88%
7.2 MUDFA/Utilities	21	Design constraints e.g. presence of other utilities, proximity of LoD boundary, diversion technical requirements etc.	Design requires that Utilities are diverted outside of LoD	Additional design; additional land purchase required and consequent contact with landowners; design may result in increased work quantities due to extent of diversions; potential increased duration of works.	80	80	100	250	500	226.31	299.06	0.95	Utilities Estimate	284.11	14.95	45119.04	89%
7.3 Infraco	303	Proximity in time and space to other works within Edinburgh	Third party works in Edinburgh impact on Tram infrastructure	CEC may limit the number of workfronts allowed; programme re-	Impact added Post Jan-07	70	100		500	209.86	277.32	0.81	Highways Element of Infraco Estimate	224.63	52.69	45396.36	89%
2 PROCUREMENT CONSULTANT	138	Business claims for loss of profits during construction are not	Business claims for loss of profits during construction	Compensation and legal costs	50	50	0	250	1000	208.10	274.99	1.00	Business Claims Compensation	274.99	0.00	45671.35	90%

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7.3 Infraco	132	Realignment of existing road geometry required	Increase in off-route junction improvements, certain junctions requiring realignment of kerbs etc	Increase in construction cost	30	80	0	250	500	200.19	264.54	1.00	Geographic	264.54	0.00	45935.89	90%
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	50	10	900	1800	2700	182.04	240.56	0.90	PM Cost Estimate	216.50	24.06	46176.45	91%
7.3 Infraco	99	Resurfacing of side streets required	Increase in off-route junction improvements	Increase in construction cost	50	50	135	270	540	157.62	208.28	1.00	Geographic	208.28	0.00	46384.73	91%
7.4 Tramco	906	Currency fluctuation Euro/Sterling	Tramco pricing risk	price may go up/down	Risk added Post Jan-07	5	0	3000	6000	144.62	191.11	0.87	No of Trams	166.27	24.84	46575.85	92%
7.1 Advanced Works	898	Plant Failure / Damage	Breakdown / Failure of Site Plant during Mass Excavation	Delay to Programme / Cost / Lorries unable to leave site	Risk added Post Jan-07	50	100		500	150.21	198.49	1.00	Geographic	198.49	0.00	46774.34	92%
4 FINANCIAL ISSUES/ FUNDING/ PROCUREMENT STRATEGY	294	Traffic model identifies areas where design is not compatible with efficient transport network operations.	Final Design impacts negatively on Final Business Case	Could be negative implications on Tram final business case. Potential to negatively impact BCR	Impact added Post Jan-07	50	100		500	149.76	197.90	1.00	Costs applicable whether or not 1B is done	197.90	197.90	46972.24	93%
7.1 Advanced Works	873	Late receipt SDS Depot Design for Utilities Diversions	Delay to start of Mass Earth Works	Critical delay to programme	Risk added Post Jan-07	50		300		150.00	198.22	1.00	Geographic	198.22	0.00	47170.45	93%
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	50	100		500	150.26	198.57	0.95	Utilities Estimate	188.64	9.93	47369.02	93%
7.1 Advanced Works	896	Diversion of HV and LV power supplies at Gogar Depot	Damage to HV, LV Power & Comms cables by excavation works, hitting unidentified cables	Loss of Supply to both private & business Users, delay to programme, impact on reputation	Risk added Post Jan-07	50	100		500	150.35	198.67	1.00	Geographic	198.67	0.00	47567.69	94%
2 PROCUREMENT CONSULTANT	888	Design, construction and/or testing does not meet Transdev requirements	Transdev refuse to operate system on safety ground or apply overly restrictive procedures that are not directly the responsibility of Infraco	Delay to commencement of service, additional cost both for delay and rectification of the issue	Risk added Post Jan-07	18	500		1000	129.77	171.49	0.78	Infraco Estimate	133.76	37.73	47739.18	94%
2 PROCUREMENT CONSULTANT	887	Transdev do not resource up sufficiently in Edinburgh or key resources are lost	Resource to operate Tram is insufficient with DPOFA obligations not achieved in time or to sufficient quality	Delay to tram service commencement. Delay costs for Infraco as Testing and Commissioning cannot commence. Overall project management costs as a result of delays.	Risk added Post Jan-07	18	500		1000	131.29	173.49	0.87	No of Trams	150.93	22.55	47912.66	94%
7.4 Tramco	142	Base estimate allows only for minimum on-board supervisory and comms equipment.	Specification for on-board and supervisory equipment has not been established for Trams on Phase 1A.	A high specification is required for on-board supervisory and comms equipment.	50	50	0	75	675	125.67	166.07	1.00	Geographic	166.07	0.00	48078.73	95%
7.3 Infraco	173	Area of possible contamination (unlicensed tip) has been highlighted during desk study immediately to west of Gogar Burn - investigation for CERT project indicates that this consists of building rubble and domestic waste. However, there is a risk that some of this material is contaminated and poorly compacted and requires to be removed and replaced.	Tramway runs through area of possible contamination and material requires to be removed and replaced (dig and dump).	Increase in costs to remove material to special and other tip.	5	3	1368		8208	123.89	163.71	1.00	Geographic	163.71	0.00	48242.44	95%
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	5	500	2000	4000	105.67	139.64	1.00	Geographic	139.64	0.00	48382.08	95%
7.3 Infraco	115	Network Rail cancels planned possessions	Planned work at interface with Network Rail is delayed	Time delay and resulting cost increase	10	10	350	750	2000	101.18	133.71	1.00	Geographic	133.71	0.00	48515.79	96%
1 GENERAL/OVERALL	10	Costs of obtaining access rights are unknown	Cost associated with obtaining wayleaves	Increased legal costs relating to obtaining wayleaves	40	40	50	200	500	100.56	132.89	0.85	Land and Property Estimate	112.95	19.93	48648.68	96%
1 GENERAL/OVERALL	9	Reclassification of land	Land reclassification changes value	Reclassification of land increases value/ cost of land.	20	20	0		1000	100.38	132.64	0.85	Land and Property Estimate	112.75	19.90	48781.32	96%
7.3 Infraco	103	Delay in design information release from specialist tram manufacturer	Delay in detailing of stops, trackway, OLE etc for Phase 1A	Time delay and consequent costs	30	30	0	225	750	95.63	126.37	1.00	Geographic	126.37	0.00	48907.69	96%
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	Risk added Post Jan-07	90	60		150	94.49	124.86	1.00	Geographic	124.86	0.00	49032.55	97%

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7.1 Advanced Works	284	Acceleration of programme. (Current programme has no contingency and shows depot works commencement November 2007.)	PROJECT PRIMARY Requirement for early commencement of depot works is not able to be met.	Potential delay and increased cost	Impact added Post Jan-07	10		500		1000	75.99	100.41	1.00	Geographic	100.41	0.00	49132.97	97%
7.4 Tramco	71	Inadequate definition of availability, reliability and maintainability requirements	Unclear scope of desired performance levels.	Increased capex investment is necessary.		30	30	0	250	500	74.76	98.79	0.87	No of Trams	85.95	12.84	49231.76	97%
7.4 Tramco	155	Increase in specification over and above assumptions in base estimate regarding equipment and quality specification for tram vehicles	Business case runtime and CEC requirements (change in equipment and quality specification)	Increased cost of tramsets		20	20	160	270	600	68.74	90.84	0.87	No of Trams	79.03	11.81	49322.60	97%
1 GENERAL/OVERALL	356	Challenge to Tram Parliamentary powers	Litigation as a result of challenge to parliamentary powers	Costs of defending challenge		80	80	0	50	200	66.45	87.81	1.00	Costs applicable whether or not 1B is done	87.81	87.81	49410.41	97%
1 GENERAL/OVERALL	935	Immisation project not prioritised by Network Rail; Network Rail resources diverted to other projects or emergencies; Multiple iterations of design development; Tram requirements change as a result of Tram design development; Network Rail standards changes; Tram programme not able to be achieved in the first place.	STAKEHOLDER PRIMARY Network Rail do not deliver the immisation works before the drop dead date of October 2009.	Tram cannot be commissioned to programme; Critical delay.	Risk added Post Jan-07	20		100		500	59.26	78.31	1.00	Geographic	78.31	0.00	49488.72	97%
7.4 Tramco	97	Problems with tram supplier (industrial relations, financial problems etc)	Delay in supply of vehicles	Time delay to operations, costs relating procurement of replacement manufacturer		25	25	0	260	450	59.45	78.56	0.87	No of Trams	68.34	10.21	49567.27	98%
7.4 Tramco	907	Tramco bids valid till October 07 but procurement process goes on beyond that	Tram tender validities exceeded	Price escalation	Risk added Post Jan-07	2		0	3000	6000	58.18	76.88	0.87	No of Trams	66.89	9.99	49644.15	98%
7.3 Infraco	67	Interface with CEC as roads authority	Roads maintenance is not carried out	CEC is in breach of its statutory duties		20	20	100	250	500	56.09	74.11	0.81	Highways Element of Infraco Estimate	60.03	14.08	49718.27	98%
7.4 Tramco	98	Problems with tram supplier (industrial relations, financial problems etc)	Delay in supply of vehicles	Time delay to operations, costs relating procurement of replacement manufacturer		25	25	0	240	400	53.72	70.99	0.87	No of Trams	61.76	9.23	49789.26	98%
7.3 Infraco	179	Risk of adverse effects of construction not adequately passed to contractor; liability not adequately covered by insurers; construction impacts cause distress to surrounding buildings.	Adverse Infrastructure construction impacts cause damage to or result in a claim from a 3rd party	Costs of repair or claim; unaccounted for legal costs.		10	10	0	500	1000	49.14	64.93	1.00	Geographic	64.93	0.00	49854.19	98%
7.4 Tramco	899	Stakeholder indecision/unclarified role	Inability to determine and sign off aesthetic requirements for Tram	Programme delay in finalising design; potential cost impacts	Risk added Post Jan-07	20		0	250	500	49.87	65.90	0.87	No of Trams	57.33	8.57	49920.09	98%
7.3 Infraco	167	Long/ inaccurate lead times on various materials especially steel and copper.	Contractor specialist materials procurement problems	Programme delay and assumed output not possible		50	50	0		200	49.75	65.75	0.78	Infraco Estimate	51.28	14.46	49985.84	98%
7.2 MUDFA/Utilities	183	Unusually adverse weather conditions	Delay in Utilities Diversion programme as a result of exceptional weather conditions	Contractor claims for delay in construction programme		50	15	100		500	45.10	59.60	0.94	MUDFA Estimate	56.02	3.58	50045.44	99%
7.3 Infraco	105	Encountering archaeological finds/burials/munitions during construction	Exhumation of archaeological finds/burials	Delay in construction programme		90	70	0	60	120	41.83	55.28	1.00	Geographic	55.28	0.00	50100.72	99%
7.4 Tramco	900	SDS & Infraco procurement not familiar with chosen tram reqts	Depot design is not compatible with tram	Programme delay whilst Infraco modify Depot; Performance risk on Tramco TMA	Risk added Post Jan-07	15		10	250	500	38.29	50.59	1.00	Geographic	50.59	0.00	50151.31	99%
7.1 Advanced Works	869	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	Risk added Post Jan-07	50		25		100	31.25	41.29	1.00	Geographic	41.29	0.00	50192.60	99%

Sim Run P90 1A+1B 50761 £k

Risk Mean Sum
 38413.43 £k

Total Allocation
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 Phase 1B 8375.78

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	Risk ID	Cause	Risk Event		Prob %	Prob %	Current Impact Assessment £k									
						Min	Most Likely	Max								
7.1 Advanced Works	879	Contractor is 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 869 or includes high contingency in tender to allow for.	Risk added Post Jan-07	50	25	100	31.28	41.34	0.78	Infraco Estimate	32.24	9.09	50233.93	99%
5 PALIAMENTARY PROCESS/ APPROVALS	310	MUDFA fail to use best endeavours to minimise disruption to city centre	Congestion and disruption in City of Edinburgh	Additional traffic management costs		50	50	0	25.15	33.24	1.00	Geographic	33.24	0.00	50267.17	99%
7.2 MUDFA/Utilities	315	Contractors do not understand 3rd party obligations; construction methodology cause adverse impact and cost to 3rd parties; 3rd parties were not expecting construction to have an impact on them; Code of Construction Practice found to be inadequate; vibration and noise claims; claims as a result of proximity to buildings; physical damage from plant.	Significant number/magnitude of claims from 3rd parties received as a result of Utility Diversion activity	tie Project Management costs to deal with claims; negative PR		30	50	0	25.04	33.08	1.00	Costs applicable whether or not 1B is done	33.08	33.08	50300.26	99%
2 PROCUREMENT CONSULTANT	76	Introduction of TEL as client	Change of client during works	Delay and cost during re-negotiation of DPOF contract and additional approvals process		50	50	0	25.11	33.19	1.00	Costs applicable whether or not 1B is done	33.19	33.19	50333.44	99%
2 PROCUREMENT CONSULTANT	920	Contractors have not been given information on or do not understand 3rd party obligations; tie has not recognised implications of 3rd Party agreements; construction methodology cause adverse impact and cost to 3rd parties; 3rd parties were not expecting construction to have an impact on them.	Significant number/magnitude of claims from 3rd parties received as a result of Infrastructure construction activity	tie Project Management costs to deal with claims; negative PR	Risk added Post Jan-07	50	50	0	24.93	32.94	0.82	MUDFA + Infraco + Tramco Estimate	27.01	5.93	50366.39	99%
1 GENERAL/OVERALL	169	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	50	0	24.90	32.90	0.81	Highways Element of Infraco Estimate	26.65	6.25	50399.29	99%
7.4 Tramco	143	Base estimate allows only for minimum on-board supervisory and comms equipment.	Specification for on-board and supervisory equipment has not been established for Trams on Phase 1B.	A high specification is required for on-board supervisory and comms equipment.		50	50	0	20.61	27.23	0.00	Geographic	0.00	27.23	50426.52	99%
7.3 Infraco	156	Key interface issue is Eastfield Avenue Bridge requires new bridge construction, re-grading, move utilities etc	Interface issues with EARL	Delay in design interface development and additional construction costs. Additionally, if EARL does not go ahead budget requires to be found to pay for unnecessary works.		10	10	0	19.81	26.17	1.00	Geographic	26.17	0.00	50452.70	99%
7.3 Infraco	205	Network Rail issue new Group and Company Standards during construction. Design and construction is aligned to current Network Rail Group and Company Standards.	Network Rail emerging Group and Company Standards are different at time of construction	New standards require to be adopted resulting in re-design, delay and increased construction cost.		30	20	0	15.09	19.94	1.00	Geographic	19.94	0.00	50472.64	99%
1 GENERAL/OVERALL	12	Failure to identify accommodation works to land	Overestimation of land value	Over payment for land and opportunity to conduct advance works lost		60	60	5	15.03	19.86	0.85	Land and Property Estimate	16.88	2.98	50492.50	99%
1 GENERAL/OVERALL	932	Information handed over in draft format as part of continual 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 be commissioned to programme.	Risk added Post Jan-07	5	100	500	14.96	19.77	1.00	Geographic	19.77	0.00	50512.27	100%

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7.3 Infraco	323	Background information supplied by tie is incorrect	Information supplied by tie proves incorrect and Infraco's design solution prejudiced as a result	Delay during re-design, poor relations develop with Infraco, negative PR, costs over and above base estimate because bidder has included for complete re-design in his bid	Impact added Post Jan-07	50	0	50	12.43	16.43	0.78	Infraco Estimate	12.81	3.61	50528.70	100%
7.3 Infraco	192	OLE pole location requirements	OLE pole location requirements result in special foundation requirements	Foundation requirements cause increase in construction costs		30	10	250	12.53	16.56	0.74	Track Estimate	12.26	4.31	50545.27	100%
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		30	30	83	10.80	14.27	0.00	Geographic	0.00	14.27	50559.54	100%
3 DESIGN	162	Land is not acquired yet	Gaining access to land prior to purchase for advanced works	Increased management costs and delays to design		50	30	70	10.37	13.70	0.85	Land and Property Estimate	11.64	2.05	50573.23	100%
7.1 Advanced Works	876	Agreement with SEPA to use Gravity Drain Proposal	Gravity Drain Proposal	Cost & time saving	Risk added Post Jan-07	80		12.5	9.94	13.13	1.00	Geographic	13.13	0.00	50586.37	100%
7.3 Infraco	177	Unforeseen external events impact on Construction	Infraco seeks compensation as a result of external events having an impact on Construction	Legal costs and compensation costs for events not agreed in contract		30	30	50	7.50	9.91	1.00	Costs applicable whether or not 1B is done	9.91	9.91	50596.27	100%
2 PROCUREMENT CONSULTANT	890	DPOFA amendment is not fully negotiated	Key performance indicators for DPOFA are not agreed	In absence of KPIs, would have to refer to Dispute Resolution to resolve issues.	Risk added Post Jan-07	3		300	7.50	9.91	1.00	Costs applicable whether or not 1B is done	9.91	9.91	50606.18	100%
2 PROCUREMENT CONSULTANT	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	Impact added Post Jan-07	10	25	100	6.26	8.27	0.78	Infraco Estimate	6.45	1.82	50614.45	100%
1 GENERAL/OVERALL	18	Site specific legal requirements (possession, property, Section 75)	extended need for legal aid - increasing in legal costs	Legal costs and delay caused by conflict		10	10	100	4.97	6.56	0.85	Land and Property Estimate	5.58	0.98	50621.01	100%
7.2 MUDFA/Utilities	313	BT requirement for 10 year warranty is unusual	BT 10 year warranty on jointing chambers and ducts is not provided	Warranty requirements not met, additional costs to provide required quality, possible additional costs to repair during warranty period		5	5	150	3.76	4.96	1.00	Geographic	4.96	0.00	50625.98	100%
1 GENERAL/OVERALL	25	Omission/ error/ mis-alignment in main contract relating to land and property	Infraco fails to comply with conditions due to inadequate wording of main contract	Legal costs to update contract and defending an error. Delay to access.		10	10	60	2.99	3.95	0.78	Infraco Estimate	3.08	0.87	50629.93	100%
2 PROCUREMENT CONSULTANT	337	Unsuccessful tendered challenges procurement process (Tramco or Infraco)	OJEU procurement process is challenged	Possible retender; Delays; Legals costs to deal with challenge		5	5	100	2.48	3.27	1.00	Costs applicable whether or not 1B is done	3.27	3.27	50633.20	100%
7.4 Tramco	319	Trams are not compatible and interoperable with each other and other parts of the system	Trams found to be incompatible during commissioning	Delay to commissioning, costs to deal with issue		10	10	50	2.57	3.39	1.00	Costs applicable whether or not 1B is done	3.39	3.39	50636.60	100%
7.3 Infraco	150	Blackspots for radio/mobile communications	Geographic areas where radio/mobile communications cannot obtain signal	Additional remedial equipment required e.g. repeater masts, booster packs etc		50	50	10	2.50	3.30	1.00	Geographic	3.30	0.00	50639.90	100%
7.3 Infraco	304	Infrastructure design development e.g. building fixing approvals not achieved as designed	Utilities (diverted by MUDFA or left in place) are found to be in the path of infrastructure works at time of construction	Additional utilities diversions are required to be undertaken by Infraco with additional cost and programme impacts	Impact added Post Jan-07	20	0	25	2.54	3.35	0.81	Highways Element of Infraco Estimate	2.71	0.64	50643.25	100%
7.3 Infraco	244	Inadequate provision for people with disabilities	People with disabilities are unable to access Tram Service	Breach of DDA legislation, costs to rectify and negative PR	Impact added Post Jan-07	18	0	25	2.19	2.89	0.78	Infraco Estimate	2.26	0.64	50646.14	100%
7.1 Advanced Works	894	Ineffective/Inappropriate Proposals; new setts must be built before old ones can be closed and licenses will not be issued until nearer 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	Risk added Post Jan-07	18	0	25	2.18	2.88	0.00	Geographic	0.00	2.88	50649.02	100%

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	Risk ID	Cause	Risk Event		Prob %	Prob %	Current Impact Assessment £k	Min									Most Likely
7.1 Advanced Works	883	Ineffective/inappropriate Proposals; new setts must be built before old ones can be closed and licenses will not be issued until nearer time of closure; animals must have settled in new home before closure of old one can take place	Gogarburn Badger/Otter Proposals for closure of old setts not approved by SNH/SEERAD	Delay in accessing land to construct Tram works and hence in Programme	Risk added Post Jan-07	18	0		25	2.19	2.89	1.00	Geographic	2.89	0.00	50651.92	100%
1 GENERAL/OVERALL	15	Market conditions reduce value of acquired land	Value of acquired land	Ultimate land disposal values are reduced		15	0		20	1.53	2.02	0.85	Land and Property Estimate	1.72	0.30	50653.94	100%
1 GENERAL/OVERALL	26	Protracted negotiation, additional claims, late acquisitions or late claims in relation to land and property	Long term legal/ advisor involvement	Legal/ advisor budget may be exceeded		10	0		20	1.01	1.33	0.85	Land and Property Estimate	1.13	0.20	50655.28	100%
7.2 MUDFA/Utilities	955	Combined Storm Overflow at Caroline Park impinges on works.	Caroline Park Combined Storm Overflow require new roof slab.	Increase capex due to cost of solution construction.	Risk added Post Jan-07	60	50	75	100	45.03		0.00	Geographic	0.00	0.00	50655.28	100%
7.2 MUDFA/Utilities	958	AMIS engaged to undertake work relating to EARL.	AMIS experiences resourcing issues; MUDFA project experiences co-ordination/sequencing issues and disruption over and above originally envisaged.	Additional disruption and delay which may not be recoverable by Tram.	Risk added Post Jan-07	70	40	50	60	34.98		1.00	Geographic	0.00	0.00	50655.28	100%