

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

Contingency has been applied to all installation elements as noted below with no specified contingency on land values as this is already included within the forecasts by Colliers CRE, **tie**'s Property & Land Adviser.

The degree of risk in each element of the scheme is reflected in the allowance made. The narrative below describes the levels of contingency attached to each element of the project.

Civils - Contingency for Civils is 10-12.5% of the base cost. The scope of work is more generic in nature than other tram projects costs and may be impacted by restrictions on existing ground conditions together with site operations e.g. possession times, restricted sites and traffic flow. The rates used in the build up to the Civils element should be considered as reasonably secure with the allowance for unforeseen works and site restrictions.

Utilities - Costs for Utility Diversions are considered less certain than other cost heads due to the relatively unforeseen nature of the work. Notwithstanding mitigation measures proposed by **tie**, contingency of 12.5-15% has been allowed for Utilities, depending on scope and location.

Electrical - This element of the work has a contingency level of 10-12.5% to reflect the scope of work and risk as being reasonably secure.

Network Rail - A contingency of 18.5% has been allowed for Network Rail due to the complex negotiating process to be undertaken regarding possessions, land purchase and working alongside Network Rail property.

Stops - As the scope of work of this element is less likely to change and the costs are considered to be reasonably secure a contingency level of 10-12.5% has been allocated to this element.

Track - This is the single largest value element and has been allocated a contingency of 11% which is considered appropriate at this stage of the estimating process. The procurement methodology and strategy e.g. advanced utilities work is considered as reasonable mitigation against cost risk to this element.

Trams - The procurement methodology will allow direct control of contract negotiations with **tie** to assist in quality control and promote competition and, as such, a specified tram contingency of 15% is considered appropriate.

It is concluded that the levels of risk allowances described together with the proposed risk and procurement strategy are considered appropriate to manage the risk challenges of the scheme.

6.4.2 Cost and Programme Management

tie espouse stringent cost and programme control processes. Each of the planned work packages are linked to the critical path of the Infraco programme. The SDS/Infraco Provider is required to produce and report on a cost loaded programme to facilitate control, management of progress and direction towards critical activities. The visibility of Service Provider budgets and resource loaded programme will be used to monitor earned value.

The 'concept' design of the scheme has been prepared in developing submissions for Parliament. The SDS Provider will further develop the scheme design over three distinct stages, namely, outline requirements, preliminary design and detailed design. At each of these stages **tie** will have 'hold and review' points. In addition, the procurement strategy allows 'stop and start' of design, if required, without the major contractual risk to a conventional procurement.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

The SDS Provider shall design within the agreed general parameters instructed by **tie** in accordance with the Design Manual and Detailed Specification and early agreement with the Planning Department. The cost reporting of potential changes is required prior to acceptance of variations and design alterations.

The overall procurement and implementation strategy has been developed taking cognisance of the potential for delay to the project programme, as discussed in Section 5.3.2. To mitigate this **tie** have identified a number of critical activities such as design, approvals and consents. These activities have been scheduled at an early stage of the programme and the early appointments of the SDS and TSS will further assist in this mitigation.

The current programme has an element of float related to key activities. This degree of flexibility will allow the rescheduling of activities to ensure that resources are deployed to maintain the critical path.

To assist in managing this process **tie** has identified a number of Project Management systems and procedures which will provide us with real time analysis of Programme activities, as follows.

- **Primavera P3e** to manage the programme and provide progress and slippage analysis, based on actual resource scheduling;
- **Primavision** will provide summaries across all critical work streams, automatically flagging any delays and slippage to planned progress; and
- **Progress Reporter** will allow up real time updating from remote site, and allows remote access to Programme information allowing timely decisions and resolution of conflict.

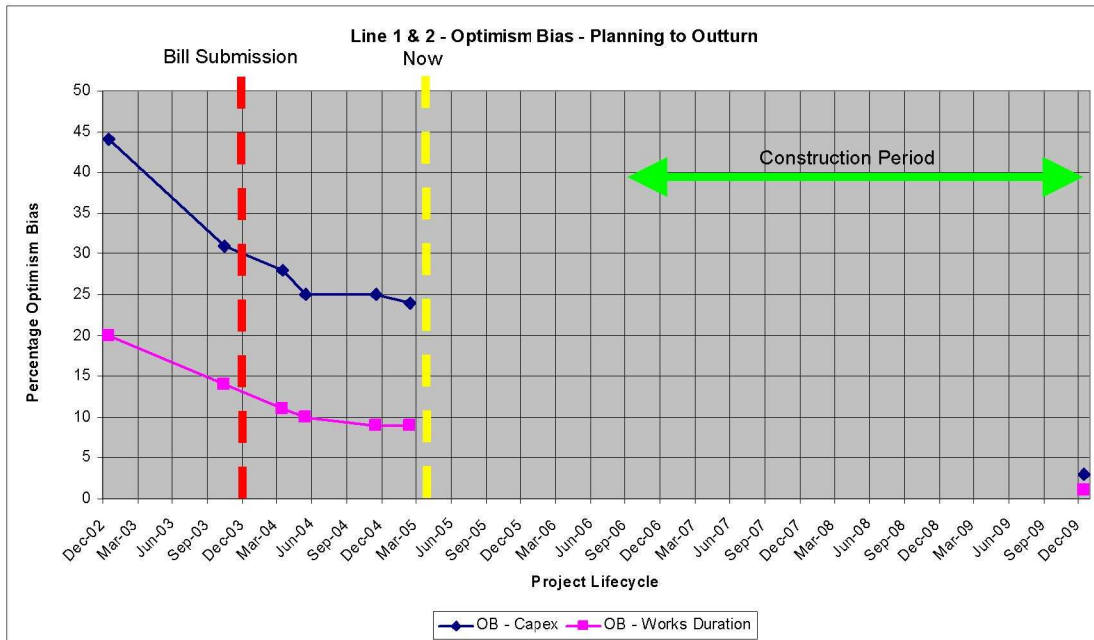
The Master Programme shall incorporate all work streams and shall identify, monitor and analyse the critical path and inherent float across all of the sub programmes.

6.4.3 Optimism Bias Contingencies

An initial step to select the 'starting values', for Optimism Bias, from the published guidance is the classification of the 'project type'. **tie** have sought the advice, regarding the project classification, from the authors of Mott MacDonald's guidance on Optimism Bias who have confirmed **tie**'s view, that it is appropriate to classify the project as a 'Standard Civil Engineering Project'. This is primarily due to the 20-year history of delivery of tram schemes in the UK with over twelve operational schemes (totalling £2.29bn of investment costs at the time) and number of other schemes in development. **tie** considers that it would be inappropriate to classify the project as 'non-standard' due to the unique nature of the sample projects that include the Thames Barrier and Coulport Explosive Handling Jetty projects. Transport projects categorised as 'non-standard' include Jubilee Line Extension due to their complexity.

As described earlier in this section, risk management is being actively measured on the tram system for each risk and has been demonstrated through the reduction of the overall Optimism Bias level. HM Treasury recommended "starting values" of **44%** increase in Capital Expenditure and **20%** in Works Duration, in accordance with published guidance, as shown below.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE



Reduction in Optimism Bias has been recorded in the progress to manage each of the individual the following risks in accordance with reported 'mitigation factors' on each of the 'percentage contribution' for risk areas to Optimism Bias in accordance with HM Treasury guidance. This has not been due to the mitigation of an individual risk but rather progress to varying degrees in the management of all of the 237 identified project risks.

As can be seen from the above graph, **tie** has shown the starting values commencing in December 2002, when the scheme technical advisers were appointed, and tracking the movement over the following 28-month period. It should be noted that the risk management process started with the publication of the Feasibility Study in 2001, as outlined in Section [Reference to PD Section].

The 'current' estimated values as adopted in this IOBC for Lines 1, 2 and potential Network configurations are as follows.

Optimism Bias	February 2005
Capital Expenditure	24%
Works Duration	9%

This compares to the specified contingency to capital expenditure estimates of the full tram system of approximately 11% (specified contingencies result in an increase of approximately £24m (2Q2003) above base cost estimates for Phase 1) that have been recommended by **tie**'s advisers. The following table summarises the potential overall influence of Optimism Bias on the various system configurations.

Scheme	Optimism Bias (2Q2003)	Percentage Increase in Base Costs
Phase 1 - Line 1 Standalone	£52.64m	24%
Line 2 Standalone	£61.62m	24%
Investment Enhanced Network	£105.62m	24%
Investment Enhanced Network excluding Newbridge	£95.81m	24%

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

The approach to phasing is discussed in Section 8.5, with proposals for Phase 1 to proceed in the form of Line 1 only, with potential outturn costs (2Q2003) and committed grant availability as follows.

Scheme	Base Cost Plus Full Optimism Bias (2Q2003)	Base Cost Plus Estimated Optimism Bias (2Q2003)	Base Cost Plus Specified Contingency (2Q2003)	Base Cost (2Q2003)
Phase 1	£315.82m	£271.96m	£243.05m	£219.32m
Grant Reserve	£59.18m	£103.04m	£131.95m	£155.68m

It is concluded that including current estimates of Optimism Bias would increase the base costs of £219m (2Q2003) for Phase 1 to £272m (effective headroom of a further £29m above base and contingent costs recommended by **tie**'s advisers) and can be delivered within the committed £375m public sector grant for all of the above scenarios.

tie's technical advisors have carried out an initial QRA validation of the potential maximum increased capital cost for Phase 1 for the project risk register to confirm the potential extent of Optimism Bias. The results of this exercise support the reduction in Optimism Bias as estimated with a 'very high' certainty (95% percentile) that the potential risk exposure is approximately £50m that equates to an increase of approximately 22% above 2Q2003 base costs. **tie** propose to develop this exercise further in conjunction with SDS and TSS upon their appointments.

The comfort to funders is that the proposed £375m grant would provide a total 'headroom' of 70% above base costs or 54% above base costs allowing for specified contingencies for 2Q2003 prices. The 'headroom' is further examined in 'nominal' prices in Section 8.6.5.

This allowance is clearly greater than the starting values proposed by HM Treasury guidance (44%) and provides a 'high' degree of certainty to the Scottish Executive and CEC that the overall committed grant will not be exceeded. Further, when reviewed in conjunction with Optimism Bias studies conducted on behalf of the Department for Transport that these allowances within the overall grant lies at the upper percentiles of probability (between 80-90% percentile). This confidence can be further enhanced when other funding sources are included as discussed in Section 8.2.5.

It is further concluded that Optimism Bias of 9% exists on the proposed 30-month construction programme and could result in delays of up to 3-months. If the full extent of optimism bias were applied of (assuming no mitigation to 20% optimism bias to programme starting values) this would equate to a potential overall delay of approximately 6-months.

6.5 Risk Allocation

The selected procurement route will be realised in a series of contracts which will effectively retain, transfer or share the project risks with the private sector. It is therefore noted that the selection of an appropriate procurement route will be one of the key elements of risk mitigation for the tram system. Risk has been quantified following a detailed assessment process performed by **tie** and the **tie**'s advisers in accordance with industry best practice and **tie**'s, and their advisers, experience.

Although the intended risk allocation is not determined by funding or financing, it is recognised that PFI projects have been shown to have a more attractive long-term risk management approach (reflected in less Optimism Bias) than traditional schemes, due to the following key features as reported in HM Treasury Guidance.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

- Negotiated transfer of project risks;
- Risk transfer to the best party capable of managing risk consistent with VFM and quality;
- High level of due diligence demanded by PFI procurement;
- Clearer definition of project requirements; and
- Longer-term relationships are developed with contractors and service providers encouraging early resolution of problems.

The Risk Allocation Matrix for the proposed Infrastructure & Integrator Consortium Option for the tram infrastructure has been analysed by **tie** and their legal advisers DLA Piper. This risk allocation has been shown to demonstrate clear benefits of risk transfer of key development and construction risks and will require to be tested with the market (as discussed in **Section 5.14.1**).

An opportunity will be sought through the preferred procurement option to transfer the risk of project management during construction to the private sector, holding the successful bidder responsible for the overall management of a sequence of interrelated construction projects on the critical path to implementation.

There is no standard contract for use in tram schemes which embodies a settled approach to responsibility for risk and its financial implications. However, there are standard forms utilised on PFI schemes that can be customised to meet tram requirements and the proposed risk allocation. **tie** and their advisers will use experience from previous tram schemes and the proposed risk allocation as a basis for settling contractual provisions where appropriate and thereafter negotiations with the private sector.

In the development of proposed contracts, **tie** and their advisers have designed risk allocation matrices to reflect the allocation of risks to private sector, public sector and those that are effectively shared in order to construct contracts with clarity of those risks which the private sector will require to price and those risks which the public sector will need to manage. The Risk Allocation Matrices for SDS and TSS Contractors are shown in **Appendix G**.

The following sections review the optimal risk allocation during the key project phases for 'conventional' and 'PFI' options including comment on plausibility of private sector borne risks. It should be borne in mind that a decision is yet to be taken on proceeding with a PFI funded scheme. It is anticipated that this will require further dialogue with the Scottish Executive over the coming months to allow conclusion in the February 2006 OBC.

6.5.1 Allocation during the Development Period

This section deals with the most relevant risks that **tie** will be managing or transferring to other contractors prior to entering into a contract that will deliver a completed tram system.

Set out below are the key risks that **tie** will be responsible for managing during this period.

- Parliamentary Process;
- Planning Process and Permission;
- Model development, ticketing and fare strategy;
- Tram priority in highway;
- Land Acquisition and Compensation;
- Detailed Design development;
- Agreements with heavy rail parties;
- Public Utility diversions; and
- Programme and Cost Management.

During this period, **tie** will actively manage these risks both directly and through a number of key contracts. These contracts include the following as discussed in **Section [6.6.1]**.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

- Technical Support Services (TSS) Contract;
- System Design Services (SDS) Contract;
- Joint Revenue Committee (JRC) Contract;
- Advance Survey Works (ASW) Contract; and
- Utility Single Framework Agreement for advance diversion of utilities (USFA).

In addition, **tie** will be advised by the Operator (who has already been appointed), and **tie**'s legal team (comprising Dundas & Wilson, DLA Piper Rudnick Gray Cary and Bircham Dyson Bell), financial adviser (PricewaterhouseCoopers), procurement specialists (Partnerships UK) and insurance and risk advisers (Heath Lambert Group) on issues affecting risk.

The table below sets out the general allocation of risk during this period, and this is discussed further below. Where the table indicates risk allocated to the public sector, the risk is under the management of **tie**, but with consequences of risks being experienced by a number of participants.

Risk Allocation During the Development Period				
Risk	Public Sector	USFA Contractor	SDS Designer	Utilities
Land acquisition	✓			
Parliamentary process delays	✓			
Parliamentary process changes	✓			
Planning	✓		✓	
Design Risks	✓		✓	
Major Utility diversion quantity	✓			✓
Major Utility diversion cost	✓	✓		✓
Major Utility diversion delay	✓	✓		
Delays to Utilities Agreement	✓			✓
Network rail related delays	✓			
Required approvals from HMRI	✓			
Incorrect cost estimate	✓			
Incorrect timetable assumptions	✓			

Of the above, land acquisition and progression of the parliamentary process are clearly driven by **tie** and CEC. The latter stages of the parliamentary process will benefit from the support of the SDS Contractor, but they will have no contractual responsibility for anything other than advice. **tie** has and will continue to manage these risks through the experienced in-house team that it has assembled.

The initial steps towards placing planning applications will be made on behalf of **tie** and then Infracore by the SDS Contractor. Ultimately, the SDS Contractor will have responsibility for the planning application being appropriate for the scheme, and there will be sanctions under the SDS Contract for poor performance. However, the fundamentals of the success of the planning application will be determined by **tie**'s (and CEC's) preferences for the specification of the system, and therefore the risk of the success of the planning application must remain at least partially with the public sector, albeit with the majority of financial risk of increased costs passed to SDS/Infracore.

Design risk covers risks of failures in the design affecting the ongoing scheme. During the development period this could manifest itself as a problem with a planning matter, a utility diversion design or the instructions to bidders for the Infrastructure Contract. This risk is partially transferred to the SDS Contractor through their contract, although it is likely that some of the consequences of a significant problem with the design failure would be borne by the public sector. **tie** will manage and mitigate this directly and through the TSS Provider.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

Risk for the execution of utilities diversions will be transferred under the USFA. The scope of work that these contracts will cover will be specified by the Utilities and designed by SDS and the risk that these are significantly greater than anticipated will be covered by the public sector. **tie** proposes to carry out detailed survey works during the period July to November 2005 to get a firmer view of the quantity of works to be required, with the support of SDS and TSS Providers. This will provide the additional benefit of information to allow greater certainty to USFA bidders.

Should USFA fail to complete in time to allow the Infrastructure Contractor on to the site, then the public sector will be responsible for delay to Infraco works. **tie** plan to mitigate this risk with incentivisation of the USFA Contractor to complete on time. This risk will be minimised by the early scheduling of utilities diversion works which are anticipated to be significantly advanced, by the time that the Infraco Contract is signed, and released to Infraco as staged handovers of completed sections.

Network Rail and HMRI will be consulted by the SDS Contractor during this period.

Cost estimates and timetable estimates will be developed further by the SDS Contractor up to the date of signing the Infraco Contract. The responsibility for the consequences of increases in cost and programme will be borne by the public sector. **tie** will use the TSS Contractor, the Operator and its internal resource to challenge assumptions and potential cost creep throughout this process.

In summary, the public sector is exposed to significant but manageable risks during the period of scheme development. The introduction of the SDS Contractor and USFA Contractor in the proposed procurement strategy reduces risk to an extent, but, as in all projects of this type, the major responsibility for identifying and managing potential risks during this period will remain with the project team and their advisers. **tie** has assembled a team with significant experience in the tram industry and, together with the TSS Contractor, the Operator, and its other advisers, believes that it has the necessary skills to manage risk during this period.

6.5.2 Allocation during the Construction Period

Risk allocation and management during the construction period will differ depending upon the selection of the specific procurement option for the Infraco Contract, that is, conventionally funded or privately funded.

It is worth considering how general risk transfer differs under these two different approaches.

Under a conventionally funded project, the financial risk that the Infraco Contractor is exposed to is limited to the amount of money that it has expended, less the amount it has been paid, along with any bonding requirements. Payment for construction contracts is broadly on the basis of progress against programme, and therefore there will not normally be a large exposure for the contractor based on the difference between income and expenditure on the contract.

By comparison, on a privately financed project, the risk that the Infraco Contractor is exposed to is greater, because the privately financed element of the funding for the contract does not start to be repaid until the construction is complete, and the facility/system becomes available for use. With private financing there will be therefore no payment made to the Infraco until the scheme is commissioned and presented for operational use.

Therefore, while it is possible to contractually transfer similar risks under both types of contract, a privately financed contract will be more able to absorb the cost of a major risk arising than under the conventional approach. Therefore, it is more likely under a privately

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

financed contract that risks will be effectively transferred than under a conventional approach, and that risk will not rebound on the public sector through non-delivery. In addition, it is worth observing that, because of the significant risk being taken by funders under a privately financed option, the funders carry out significant due diligence on the project, which itself builds a further layer of risk management.

This difference in effective risk transfer applies to all risks that affect the contract, but we have picked out in the risk allocation matrix below the key areas where effective risk transfer varies between the two types of funding options.

In order to illustrate this, the 'shaded' boxes in the risk allocation matrix below sets out where the public sector would retain risk under an Infraco Contract which is wholly funded by direct payments, and would not under a longer term contract that includes an element of privately raised finance.

Risk Allocation During the Construction Period				
Category	Risk	Public Sector	Infrastructure Contractor	USFA Contractor
Design	Changes in Design Requirements	✓		
	Failure of design	✓	✓	
Utilities	Major Utility diversion quantity	✓		
	Major Utility diversion cost	✓		✓
	Major Utility diversion delay	✓		✓
	Minor Utility diversion quantity		✓	
	Minor Utility diversion cost		✓	
	Minor Utility diversion delay		✓	
Construction	Force Majeure	✓	✓	
	3rd party claims		✓	
	Ground condition		✓	
	Archaeology	✓	✓	
	Site safety		✓	
	Technology risk		✓	
	Compliance with street possessions		✓	
Commissioning	System integration failure	✓	✓	
	Failure to meet standards	✓	✓	
	Inappropriate vehicle	✓	✓	
	Required approvals from HMRI	✓	✓	
Contractual/ Financial	Weaknesses in contractual interfaces	✓		
	Incorrect cost estimate	✓	✓	
	Incorrect timetable assumptions	✓	✓	

The key issues for risk management are as follows.

Design – Changes in design which are required by the public sector after the signing of the Infraco Contract will be at the risk of the public sector, under both conventional procurement and privately financed options. However, a significant failure in the design would be more effectively transferred to the Infraco Contractor under a privately financed option, because it may only become an issue during the commissioning process, when the effective risk transfer would be greater under a privately financed option (see Commissioning below).

Utilities Diversion - As discussed above, significant utilities diversion, that is, 'Major' utilities under the swept path of the tramway will remain with the public sector. To the extent that these are unfinished at the time of the signing of the Infraco Contract (and it is expected that

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

they will be complete in key areas), the risks on these works will be carried by the public sector. 'Minor' utilities diversion under footways for installation of poles etc. will be wholly the responsibility of the Infrastructure Contractor.

Construction risks – The proposed approach will transfer all of the typical risks transferred under a construction contract. We have not distinguished between the two financing approaches in the above matrix, although should a significant cost arise under construction, the public sector would be more likely to be involved financially under a conventional project than under a privately financed project (where there has been shown to be no or limited increases in capital costs with public sector fully transferring risk to the private sector consortia).

Commissioning risks – These risks represent the situation whereby once all of the assets have been delivered, they do not work properly together and need to be changed. It is at this stage that the difference in amounts that the Infraco Contractor has at stake under the two funding approaches is most telling. Under a conventionally funded approach, if a commissioning issue emerged, the negotiating position of the public sector in any dispute would be significantly weaker than if private finance was involved.

Contractual risks – Under either approach it is imperative that **tie** ensures that the risk of problems arising at the interfaces between contracts is minimised. This risk has been significantly reduced by **tie**'s decision to novate design and vehicle contracts to the Infraco Contractor.

Financial risks - If significant supply cost increases emerge these will be for the Infrastructure Contractor to absorb (although a privately financed Infraco Contractor's capacity to accept cost increases will be greater than one which is conventionally funded). If construction is delayed, a privately financed Infraco Contractor would receive no recompense of availability payment lost because of the period of delay unless the concession period were extended. It may also be possible to structure a conventionally funded contract to give the Infraco Contractor a similar financial incentive to deliver on time, and it is intended that this is an issue which will be raised in the Market Consultation exercise.

6.5.3 Allocation during the Operating Period

As is the case during the construction period, the effective allocation of risk will be different depending on the choice of conventional or private finance for the Infraco Contract.

At the core of this distinction is the difference between entering into a contract with an Infraco Contractor which is a special purpose vehicle that needs to earn its annual availability payment to service its debts and entering into a contract with an Infraco Contractor which is a construction company, that will be seeking to cap its ongoing liabilities for the construction project both in financial terms and in respect of warranty period.

If a conventionally funded contract was to be the procurement option, **tie** would seek to manage the infrastructure risks during the operating period based on contractual obligations. However, it is unlikely that these will fully transfer the risks that a privately financed contract would.

Therefore the table below shows in the 'shaded' areas the risks that would be effectively transferred to the Infraco Contractor under a privately financed option, but not under a conventionally funded option.

Risk Allocation During the Operating Period			
Risk	Public Sector	Infrastructure Contractor	Tram Operator

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

Risk Allocation During the Operating Period			
Risk	Public Sector	Infrastructure Contractor	Tram Operator
Revenue	✓		✓
Operating costs	✓		✓
Maintenance unit cost	✓	✓	
Maintenance quantity	✓	✓	
Latent defects	✓	✓	
Failure of warranties on subcontracts	✓	✓	
Supply chain failures	✓	✓	
Operation provision	✓	✓	✓
Failure to meet standards	✓	✓	✓
Operational safety	✓	✓	✓
Inflation risk	✓		
Service running times	✓	✓	✓
Failure to provide promised tram priorities	✓		

Revenue and operating risks will be shared with the Operator under the terms of the operating contract. This will be done under the terms of the pain/gain mechanism described in **Section 5.6.2** of the Procurement Strategy.

Maintenance and latent defect risks are the key risks which will be fully and effectively transferred under a privately financed Infraco Contract. Allied to these are risks associated with the supply chain and failures in warranty provision (e.g. due to bankruptcy of original subcontractors).

It is also worth bearing in mind that the Infraco Contractor (if privately financed) will bear not only the costs of correcting defects but also loss of income during the period during which the system is unavailable. (This issue is highlighted above under Operational Provision, Failure to meet standards and Operational Safety.)

A key driver for the eventual success of the system will be the delivery of the required service run-times. The DPOFA shares this risk between public and private sector. However, all other risks associated with running times would be transferred to the Infraco Contractor, to the extent that it has a long term commitment to the project.

6.5.4 Risks Retained by Public Sector

The extent of public sector retained and shared risks has been assessed by **tie** and DLA Piper, **tie**'s procurement legal advisers. This has identified the risks that will be retained through the proposed contractual arrangements and will therefore require to be vigorously managed by the public sector. The **retained risks** are associated with the acquisition of land to allow construction to commence; the design development and advance utility diversion works; the completion of all necessary advance works prior to commencement of main construction works; the procedures and acceptability of potential **tie** or CEC instructed changes during design development; the care in the selection of tram vehicle supplier in achieving compatibility with infrastructure (albeit integration risk to be taken by Infraco); and potential future VAT, tax and legislative changes that could influence the scheme.

In addition to the above 'development' and 'construction' related risks it is noted that the public sector will need to consider the loss of **project momentum** and additional costs that may be incurred through delays to the consideration and approval of the Outline Business Case; the potential cost exposure if adviser costs are exceeded or revenues underestimated; management costs associated with the scheme; obtaining Royal Assent; the financial

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

governance arrangements to ensure timely and appropriate release of funds; potential delays incurred through indecision on the funding route; and procurement delays.

A summary of public sector risks, their potential consequences and the proposed mitigation is shown in **Appendix H**. It is recommended that the Scottish Executive and CEC agree the split of public sector risk allocation in order that this may be reflected in the February 2006 OBC.

6.6 Risk Management Strategy

The following section briefly summarises the risk management strategy in the 'short', 'medium' and 'long term' including planning engagement, co-ordination of risks, seeking market commitments for deliverable packages of work and reaching financial close to commence main construction activities.

6.6.1 Key Milestones for Risk Management

The key material risk to **tie** post contract signing relates to **tie** requesting changes to the scheme that result in cost increases that the PFI provider has to pass back to **tie**. However, **tie** has significantly mitigated the risk of Operator requested change through the early involvement of Transdev through the DPOFA, which has been described in more detail in Section 5.6.

As discussed above, four potential risk areas remain with CEC relating to Land, Major Utilities Diversions, Highways Work, Planning and Service Integration.

tie is confident that the scheme development work undertaken to date on tram system and the procedures it intends to adopt on design sign-off will capture design innovation and cost reduction but will minimise the potential for any change which will exceed planned overall expenditure.

tie will continue to ensure that the appropriate **governance controls** are applied to the remaining stages of the development of the tram system. **tie** have identified the principles of and commercial implications of an emerging procurement strategy for a deliverable phase of the Network with details of the consequential elements of management, design, procurement and construction activities that will effectively **de-risk** the main infrastructure contract.

On tram projects procured under a Full Consortium Option, the key date for transfer of risk to the private sector is the date when the single contract for the procurement of the system is signed. However, the Procurement Strategy adopted involves a staged process of risk transfer. The key project needs for risk management and the solutions proposed are summarised below.

Project Needs	Proposed Solutions
Continued Technical Support	TSS – technical reviewer, management and support to tie
Early System Design	SDS – infrastructure and system designer novated to Infracore
Refine Revenue Projections	JRC – assessor and estimator of revenue generation from the operating tram network
Control of Infrastructure Cost Risk	ASW - Advance survey works
Reach agreement with key 3 rd parties	Ongoing objector and stakeholder management and Agreements e.g. Network Rail, BAA
De-risk the main infrastructure works	SDS/USFA Diversions - Advance design and

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

Project Needs	Proposed Solutions
	utility single framework diversions
Select an appropriate Tram vehicle	Vehicle manufacture, design and maintenance contract novated to Infraco.
Ensure system integration	Infraco – implementation company, responsible for construction, integration and maintenance of the tram system

A number of other potential supporting contracts and agreements will be required including Planning Supervisor, Property & Land Acquisition, Roads Authority, Network Rail, Independent Validation & Verification, Power, Insurance and Policing. The risk profile of the project changes significantly when the commissioning of the system is complete and the operations commence.

Because the procurement strategy for this project includes a number of contracts, there will be a number of dates at which elements of risk will be transferred, as shown below.

Service Provision	Indicative Appointment Date
Technical Support (TSS)	June 2005
System Design (SDS)	June 2005
Revenue Setting Committee (JRC)	July 2005
Advance Surveys Works (ASW)	July 2005
Advance PU Diversion (USFA)	April 2006
Vehicle Supply (VEHCO)	June 2007
Infraco Construction & Commissioning (INFRACO)	June 2007

Of these, the most important will be the date of signing of the Infrastructure Contract. The Infrastructure Contractor's role as integrator for the system means that significant elements of the project risk will transfer to it. However, it must be recognised that this date may be jeopardised if a timetable to include PFI funding cannot be accommodated.

6.6.2 Key Risk Mitigation Underway

tie will continue to apply significant efforts to identify, analyse, categorise and implement the planned mitigation for each identified and emerging risk including management of market commitment to clearly defined workpackages.

All of the risks identified have been discussed in detail between **tie** and their advisers, and are each subject to a risk mitigation strategy to minimise, where possible, their likelihood and severity of impact on project delivery and operation.

tie is seeking to substantially further mitigate risk through the ongoing involvement of Transdev (involvement commenced June 2004) and planned early involvement of the scheme designer through all the planned phases of project development.

In the 'short' term, **tie's** immediate focus will be to mitigate the risks associated with the development of the Outline Business Case to ensure funding issues do not delay scheme delivery; working to resolve issues raised by the objectors to the scheme; preparation of evidence to support the detailed considerations of Parliament; the procurement of designers to commence detailed design of the system; engaging with Network Rail and Public Utility providers; and development of integrated fare strategy with TEL, which is described in more detail in Section 8.2.2.

In the 'medium' term, **tie's** focus will be the mitigation of risks associated with the potential market interest for the construction of the tram system. **tie** will be undertaking market sounding with potential Infraco consortia members; revenue model development;

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

development of an integrated service plan with bus operators; commencing early design of critical areas of the system to achieve greater price certainty; engagement with the Planning Department; procuring advance survey works; and development of contract documentation for Utilities Single Framework Agreement.

In the 'long' term, **tie**'s focus will be related to the commencement of Public Utility diversions; preparation of Tram Supply and Infracore contract documentation; effecting a Contract with the Infrastructure and Integrator Consortium; challenging the constructability of the scheme; and implementation of integration of services with bus operators.

6.7 Conclusions

The project timetable continues to be driven toward an operational system by the end of 2009, in line with CEC's published programme. The risk management approach involves expenditure prior to the date for Royal Assent to this Bill (anticipated end December 2005) for example in respect of detailed design work and Utilities diversions where synergies are available from co-ordinating work with the Utilities own works. This is necessary in order to achieve the 2009 entry into public service date but as shown above would be necessary regardless of timetable and is not intended to imply any presumption about Parliament's wishes. In the event that such expenditure is facilitated, the risk of abortive cost will be fully appraised before actual spending is committed; in the event that no, or only limited, such expenditure may be financed prior to Royal Assent, the implications for project risks and programme will require to be evaluated.

7 VfM Assessment

7.1 Introduction

tie have proposed to the Executive a process to carry out a preliminary VfM assessment making use of the Scottish Executive's own recently produced draft Application Note on the use of the Treasury VfM Guidance in Scotland. This section records the results of that preliminary assessment as the basis for further discussions with the Scottish Executive.

The agreed structure of assessment is as follows:

- Assessment of project against the eight key circumstances that if met would provide a prima facie case for PFI; and
- Assessment of project against key Stage 2 qualitative factors.

7.2 Assessment of Prima Facie Case for PFI

PPP procurement should be considered when the Procuring Council, Agency or Department considers that the evidence of the benefits that PPP can deliver gives a strong case for considering PPP. Appendix 1 of the Scottish Executive's Application Note sets out the eight key characteristics that if met would provide such a prima facie case for PFI. Each is listed below, together with an assessment of their application to the Edinburgh tram system:

- A major capital investment programme, requiring effective management of risks associated with construction and delivery; **The Edinburgh tram system is not a programme of investment, but it does represent a major capital investment, requiring effective management of the risks associated with construction and delivery.**
- The private sector has the expertise to deliver and there is good reason to think it will offer value for money; **The expertise to deliver the project is certainly within the private sector, and with an appropriate competition, there is reason to believe that it will offer VfM (subject to the other assessments below).**
- The structure of the service is appropriate, allowing the public sector to define its needs as service outputs; **The proposed tram system involves the construction and long term maintenance of a major capital asset, that would be capable of definition through a series of required service outputs.**
- The nature of the assets and services identified as part of the PPP scheme are capable of being costed on a whole-of-life, long term basis; **The tram system is capable of being costed on a whole-of-life, long term basis.**
- The value of the project is sufficiently large to ensure that procurement costs are not disproportionate; **The current estimated value of the total project (£438m (2003 prices) Lines 1 + 2, excluding Newbridge Shuttle) is sufficiently large to ensure that procurement costs are not disproportionate.**
- The technology and other aspects of the sector are stable, and not susceptible to fast paced change; **The key aspects of light rail technology are stable and not subject to fast paced change.**

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

- Planning horizons are long term, with assets intended to be used over long periods into the future; **The planning horizons for the tram system are long term, with the system likely to be used for well over 30 years.**
- There are robust incentives on the private sector to perform. **An availability payment mechanism to cover a significant proportion of the private sector's construction and maintenance costs would be capable of providing robust incentives on the private sector to perform.**

Overall, there would appear to be a clear prima facie case for considering a PPP procurement.

7.3 Assessment of project against key Stage 2 qualitative factors

The Application Note helpfully provides a proforma table against which the project can be tested against the three key qualitative criteria. These tests can be applied at both a *programme* (Stage 1) and *project* (Stage 2) level. In line with the agreed structure for this preliminary assessment, the tables below have been completed in accordance with Stage 2 (i.e. project level) and where questions are not applicable (i.e. programme level) this is indicated.

VIABILITY Investment objectives and outcomes need to be translatable into outputs which can be contracted for, measured and agreed. Many service areas can be contracted for, but some areas will inherently be non-contractable.		
Issue	Questions	Response
Programme level objectives and outputs	Is the Procuring Council, Agency or Department satisfied that operable contracts could be constructed for projects falling in this area?	Not applicable at project level. Operable contracts based on DBFM model capable of being constructed for project.
	Could the contracts describe service requirements in clear, objective, output-based terms?	DBFM model contract capable of describing service requirements in clear, objective, output-based terms (likely to be based on system availability and selected KPI's).
	Could they support assessments of whether the service has been delivered to an agreed standard?	Contracts as above would support assessment of service delivery (based on system availability)
	Is the fit between needs and outcome sufficient to proceed?	Yes

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

Operational flexibility	Is the Procuring Council, Agency or Department satisfied that operational flexibility is likely to be maintained over the lifetime of the contract, at an acceptable cost?	Key parameters of tram system availability will need to be finalised ahead of procurement, but contracts will be capable of including a degree of flexibility. To the extent that any such required flexibility can be specified in the contract, cost should be acceptable.
Equity, efficiency and accountability	Are there public equity, efficiency or accountability reasons for providing the service directly rather than thorough a PPP contract?	No public equity, efficiency or accountability reasons to provide service directly (and no public sector capability to provide infrastructure on this scale without private sector involvement).
	Are there regulatory or legal restrictions that require services to be provided directly?	No.
OVERALL VIABILITY	Is the accounting officer satisfied that an operable contract with built in flexibility can be constructed, and that strategic and regulatory issues can be overcome?	Operable contract with degree of built in flexibility capable of construction (see above – key parameters of tram system availability will need to be finalised ahead of procurement). No particular strategic/regulatory issues, although HMRI, safety, and RTOS Regulation will need consideration.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE**DESIRABILITY**

An increasing body of evidence has shown that better risk management in PPP results in a greater proportion of assets being delivered on time and to budget. By integrating the life-cycle and operation costs with design and construction, PPP can provide better risk management and incentives to develop innovative approaches to output delivery. Consistent high quality services can be achieved through performance and payment mechanisms. However, risk transfer is priced into the contract. The purpose of this question is to consider whether the benefits of PPP are likely to outweigh this additional cost.

Issues	Question	Response
Risk management	Does the project involve the purchase of a significant capital asset, where the risks of cost and time over-runs are likely to be significant?	Yes. Tram system infrastructure is significant (£438m at 2003 prices) and complex capital asset, with significant risks of cost and time over-runs. (see Section 6)
	Does the programme or project involve operational aspects where the risk of cost and time overrun are likely to be significant?	Tram operation subject of separate contract, but this will in turn depend on timely system availability, any failures of which will have significant cost implications. (see section 6)
Innovation	Does a preliminary assessment indicate that there is likely scope for innovation? To what extent are the project's scope, specification and operation pre-set or open to negotiation with the private sector?	There will be some scope for innovation. Sensitive nature of World Heritage site planning and available input from system operator (Transdev) means that design likely to be well-developed ahead of contract tender with design team available to infrastructure contract partner.
Service provision	Are there good strategic reasons to retain soft service provision in-house? Refer STUC Staffing Protocol	Relevant services do not include "Tram Operator Function" (Soft FM (cleaning, routine maintenance) – Operator) but rather "planned, reactive maintenance and lifecycle replacement" (Hard FM – InfraCo)
	Is soft service transfer essential for achieving the overall benefits of improved standards of service delivery? Refer STUC Staffing protocol	Not being proposed here.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

Incentive and monitoring	Can the outcomes or outputs of the investment programme be described in contractual terms which would be unambiguous and measurable?	Yes. DBFM model contract capable of describing service requirements in clear, objective, output-based terms (likely to be based on system availability). (See above).
	Can the service be assessed against an agreed standard?	Yes – see above.
	Would incentives on service levels be enhanced through a PPP payment mechanism?	Payment mechanism based on deductions for non-availability likely to provide strong incentives in conjunction with selected KPI's.
Lifecycle costs / residual value	Is it possible to integrate the design, build and operation of the project?	Design, build and maintenance (including lifecycle) can be integrated. Operations could also be integrated, but based on lessons learned from other systems, and market sentiment, current intention is that operations will remain under separate contract (DPOFA).
	Is a lengthy contract envisaged? Will a long-term contractual relationship be suitable (or advantageous) for the service?	Contract anticipated to be 20 years or longer, to allow for whole-of-life approach to design and construction.
	Are there significant ongoing operating costs and maintenance requirements? Are these likely to be sensitive to the type of construction?	Ongoing operation likely to be separate contract (see above) but ongoing maintenance and system lifecycle will be sensitive and potentially sensitive to type of construction.
OVERALL DESIRABILITY	Overall, is the accounting officer satisfied that PPP would bring sufficient benefits that would outweigh the expected higher cost of capital?	On a qualitative basis, preliminary overall assessment suggests that PPP could bring sufficient benefits. Such benefits may also however be captured through hybrid PFI (combination of private capital at risk and milestone conventional funding)

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

ACHIEVABILITY		
<p>Significant transaction costs are involved in a PPP project. In particular, the procurement process can be complex and significant resources, including senior management time, may be required for project development and ongoing monitoring. Client capability will have direct consequences for procurement time. Perceptions of this capability will also affect the level and quality of market interest. PPP and other contract-based approaches should maximise the benefits of a competitive process – but the structure of proposals and the choice of procurement route should be informed by an assessment of the likely market appetite.</p>		
Issue	Question	Response
Transaction costs and client capacity	Is there sufficient client-side capability to manage the procurement process and appraise the ongoing performance against agreed outputs?	tie is specialist procurement vehicle., TEL will provide such client-side capability for proposed integrated public transport system.
	Can appropriately skilled procurement teams be assembled in good time?	tie's Implementation Team is established and this will grow to suit planning and management of planned procurements
Competition	Is there evidence that the private sector is capable of delivering the required outcome?	Informal market testing has revealed strong interest from a number of potential consortia with strong delivery track records. Formal market test of procurement strategy planned in the near future.
	Is there likely to be sufficient market interest for the project?	See above. Edinburgh structure reflects lessons learned from previous tram procurements.
OVERALL ACHIEVABILITY	Overall is the accounting officer satisfied that a PPP procurement programme is achievable, given client side capability and the attractiveness of the proposals to the market?	Preliminary overall assessment is that PPP procurement will be achievable given client side capability and attractiveness to market. Market reaction also due to be tested more formally in the near future

The overall conclusion of the above assessment indicates that PFI is a potential option for the ETN and merits further consideration.

7.4 Quantitative assessment of the project

As described in the procurement section, the IOBC identifies three options for the ETN, two of which incorporate an element of PFI. A quantitative assessment of each of these options is presented in Section 8. Following discussion with the Scottish Executive PFU a Stage 2 quantitative assessment has not been completed as part of this IOBC, although this will form part of the Completed OBC document.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

8 Funding, Financing & Affordability

8.1 Introduction

This section addresses the key funding and affordability issues with respect to the funding of the Project in the context of a fixed Executive grant of £375m and the financial risks which must be borne by either **tie**/CEC or SE.

tie has conducted a detailed analysis of the main financing options available. To confirm the deliverability of the various available options **tie** has:

- Considered at this stage four options for system configuration (see below);
- Considered different funding strategies, to evaluate the benefits and risks of the potential private and public available sources of financing; and
- Assessed in relation to each configuration the funding required, the risks associated with the various cash flow streams and the robustness of the assumptions utilised.

Four possible configurations have been modelled as follows:

1. Tram Line 1 only
2. Tram Line 2 only
3. Tram Line 1 and 2
4. Tram Line 1 and 2 less Newbridge Shuttle

At this point in time these configurations align with the Bills being progressed through Parliament and with the estimates for costs and revenues which have been developed by **tie** and its advisors. A review of these financial inputs to the model is given at section 8.2 below.

Each of the four configurations presented has been modelled under two alternative funding scenarios, Conventional Funding and a Hybrid PFI structure both of which are explained at section 8.3 below.

The results of the financial model are summarised at section 8.4 and in the detailed cash flow forecasts included in Appendix E.

Finally section 8.5 concludes that constraints on visible funding and significant uncertainties which still exist, particularly in respect of forecast revenues, dictate that a phased approach to implementing the project is one where such risks can be carefully managed to meet the objectives of both CEC and SE.

8.2 Review of financial inputs to the modelling process

The following is a review of each of the principal financial inputs to the financial model being Capital Expenditure, Lifecycle Costs (long term maintenance), Operating Costs, Farebox Revenues and Other Income for each of the four project configurations presented.

8.2.1 Capital Expenditure

Table 8.2 below indicates the construction costs in each of the four alternative configurations. These estimates are stated in Q2 2003 prices and include a specified contingency.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE**Table 8.2 – Capital Expenditure for Configuration Options**

City of Edinburgh Council Integrated Transport Initiative (ITI) - Inception	<i>Tram Line 1</i>	<i>Tram Line 2</i>	<i>Tram Line 1&2</i>	<i>Tram Line 1&2 less Newbridge</i>
Civils	33,000	38,182	62,673	59,278
Utilities	33,750	34,735	60,047	52,572
Electrical	26,082	22,400	42,437	37,549
Network Rail	1,755	9,555	9,555	9,555
Stops	6,978	7,307	12,838	11,433
Depot	11,537	20,355	30,320	30,320
Track	37,375	45,854	76,337	64,480
Land	23,330	30,263	48,950	46,450
Vehicles	24,955	23,173	55,258	49,910
Project Costs	10,500	9,848	20,438	18,479
Preliminaries	23,355	25,191	43,231	39,314
Design	9,034	8,817	15,991	14,620
Coordination/Consent	1,399	3,626	4,728	4,072
Total (2003 Prices)	243,050	279,306	482,802	438,031
Nominal Base Cost	263,783	308,441	529,606	480,495
Specified Contingency	28,639	27,535	51,605	46,926
Total (Nominal)	292,422	335,976	581,211	527,421

The above Capital Expenditure estimates were indexed within the financial model using an index which increases at 1.5 times RPI to give the nominal estimates of Capital Expenditure included in the tables in section 8.4 below.

Base Capital Expenditure Assumptions

The work in developing cost estimates can be split into two distinct phases, the first being a qualitative assessment of costs. The qualitative assessment defined a series of scheme parameters and assumptions that would form the basis of the estimation process in later work and defined the elements that would comprise the options. These assumptions have been refined to reflect developments to the proposals for the two lines and to ensure a general consistency of approach between the two tram line teams.

The second phase of the cost estimation process was the development of quantitative cost estimates. These estimates went through several iterations, being updated on completion of each phase of the design development – initial, consultation and final - to reflect changes to the route or to the design assumptions.

The approach to preparing capital cost estimates has been to use a combination of benchmarking, previous experience and engineering judgement. The rates used for the various capital cost elements have been developed and refined and reflect the experience in a wide variety of LRT and highways projects throughout the UK and Europe. All rates quoted are based on Q2 2003 prices, and are exclusive of VAT with no offset allowances in respect of revenue, contributions or concession work.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE

The rationale behind the estimation process for capital costs has been to ensure that the accuracy of the estimates is appropriate to the level of detail available at each design stage. Thus, the initial estimate relied on broad brush per metre rates, for which conservative assumptions and larger contingencies were used to reflect the level of confidence in the estimates at that stage. As the scheme has developed towards a single preferred route, and individual elements have been identified and quantified, it has been possible to estimate the costs for individual items, which has allowed contingencies to be reduced and estimates to be tightened. Inevitably, the development of the scheme proposals has resulted in inconsistent bases for each iteration of the capex estimate, so each iteration has been reconciled to previous estimates in order to carry out a like-for-like comparison.

The following table summarises the assumptions used in deriving the estimates for each line in the table above:

Category	Sub-category	Assumption
Civil	Structures	Individually assessed to determine cost and size requirements.
	Bulk Earthworks	Includes rates for excavation and disposal of material, an allowance for contaminated land, and placing/compacting of capping.
	Landscaping	Costs of £150k per kilometre (assuming 10m wide corridor) plus £15k per stop.
	Drainage/Ducting	Included within track costs for track drainage, and highway costs for new highway works.
Utilities		Combined services drawings issued to utilities companies cost estimates received from all PU companies.
Electrical	Substations	Construction of buildings and installation of plant and equipment for substations
		SCADA included throughout.
Preliminaries		20% preliminaries, 7% design, 3.35% coordination.
Stops		All stops assumed to have 2 side platforms (except Airport and Ingliston park and ride with 1 platform), 2 ticket machines, 2 CCTV cameras, 2 emergency help points and a PA system.
Depot		Costs allow for the provision of the main depot. Location of the depot requires significant earthworks and retaining structures so costs have been increased.
Track	Ballasted	Ballasted track used where practical.
	Slab track	Assumed on structures, to minimise construction depth.
	Paved(embedded) slab track	Used where road vehicles are permitted to share road spaces with trams, at level crossings and in areas of dedicated running.
Land		Colliers CRE commissioned for separate specialist report.
Vehicles		Trams assumed values at £1.55m each.
Contingency		HM Treasury guidelines were applied at STAG 2
Project Costs		To cover promoters costs, insurances and pre-operational costs.

Review of Capital Expenditure Assumptions

tie has conducted a further review of these capital cost assumptions to gain further re-assurance on the robustness of estimates at this stage of the development process. This review included the following elements:

- (a) Review of the ongoing cost management process; and
- (b) Benchmarking against other completed and proposed projects.