

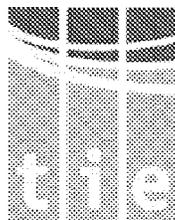
Edinburgh Tram Network

Outline Business Case, March 2006

Draft for Discussion

March 2006

**NB – Development Draft
Not for Wider Distribution**



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Executive Summary

Purpose

The purpose of this OBC is to provide an update on progress in a number of key areas:

- Clarity which has arisen with respect to the sources of funding for the capital costs of the project and how they will be applied.
- The development of a plan to phase the construction of the project due to affordability constraints.
- The strategy that **tie** is following to produce a robust Final Business Case, the delivery of which is a condition precedent to release of the major funding for the project, approval of the scope and phasing and approval to commence construction of the project
- The detailed procurement programme developed to incorporate the continuing procurement of the project in parallel with development of the Business Case and funding requirements to meet that programme.
- The emergence of Transport Edinburgh Limited as a key player in the service integration planning activities which are crucial to success
- The progress and further development of **tie**'s 'enhanced' conventional procurement strategy being deployed by **tie** to manage risks and reduce the capital cost of the project including the commencement of detailed design and market consultation.

Funding

During 2005 the key funding and affordability issues were addressed in the context of a fixed SE grant of £375m, a substantial contribution from CEC and the financial risks which will have to be borne by either CEC or SE. The conclusion reached was that although Tram Line 1 only or Tram Line 2 only had a high degree of deliverability within the constraint of a fixed SE grant of £375m, a network of Lines 1 and 2, with or without the Newbridge Shuttle, was unlikely to be affordable in one phase of construction and that a phased approach to procurement and delivery would be implemented.

Discussions between CEC and SE have focused on the capital funding available and which sections of the tram network can realistically be afforded as a first phase of the network. SE has made an in-principle commitment to indexation of the original £375m grant provided that a substantial capital contribution is made by the Council and submission of a robust Final Business Case. The indexed grant will amount to approximately £450m to £500m depending upon the actual level of cost inflation in the construction industry.

CEC has committed to contribute £45m towards the capital cost of the project, to be structured in a manner which minimises financial risk. Again the commitment is subject to the presentation of a satisfactory Final Business Case. CEC must balance its desire to support the project with its fiduciary responsibility and limited resources. CEC's contribution, therefore, comprises only such amounts as could reasonably be expected to be funded from future tram related development income and receipts, rather than from general funds or from Council Tax. CEC will now work with **tie** and in consultation with SE to further analyse the likely timing of tram related receipts and to determine the appropriate borrowing or other mechanism to deliver its contribution in a timely manner but also in a way which minimises the financial risks it is exposed to.

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Both SE and CEC have also stipulated that approval will not be given for the commencement of physical utility diversion until the Final Business Case in its draft form provides them with sufficient comfort as to the robustness of the capital cost estimates (and therefore the affordability of the project) and confirmation of the viability of the project.

Certain other aspects of the funding structure remain to be agreed between CEC and SE in the period up to issue of tender documents for the Vehicle and Infrastructure contracts, most importantly:

- An agreed value for money payment mechanism for the Vehicle and Infraco contracts which transfers a sensible amount of risk to the contractors as an incentive to them to deliver in terms of time and quality whilst keeping **tie**'s enhanced conventional procurement strategy intact and minimising the funding cost, management costs and risk premia associated with the procurement strategy. **tie** will now facilitate discussion and agreement of these mechanisms by all parties.
- The mechanisms by which emerging increases in capital costs would be managed or funded in the event that the forecast outturn costs of the phase 1 Tram at any time exceeded the funding approved.

Phasing

Concurrent with development of the in-principle revised funding contribution from SE and CEC above, the analysis of the phasing options has progressed. The assumed first phase of (at least) Leith waterfront to Edinburgh Airport (phase 1a) has been adopted by all parties. The total cost of this phase is currently estimated at £430m (£484m including incremental optimism bias) compared to the total in principle funding package of between £495m and £545m depending upon the final scope of indexation. There is therefore a high degree of probability that it will be deliverable within the funding available. CEC remains committed to the delivery of the section from Roseburn to Granton Square (phase 1b) at an additional cost of £75.2m (£84.7m including incremental optimism bias). Preparatory work for this section will be performed and affordability will be re-evaluated once the outcome of the tenders for the Infrastructure and Vehicle contracts is known.

The adoption of the assumed first phase followed an examination by **tie**, CEC, TEL, Lothian Buses and Transdev (validated by the SE) to determine through reasoned argument and professional judgement which phases within the totality of lines 1 and 2 would be the best to progress assuming Royal Assent is given to both Bills. This work concluded that the above phasing gives the best balance of costs and benefits and presents a high probability of being financially viable when integrated with bus services. Extensive validation work continues.

This proposed phase 1a would provide the core support for the city economy and would directly link the major growth centres at the Airport/Gogarburn/West Edinburgh and Leith Waterfront with the city centre. It would provide access to the major housing and commercial developments under construction and planned and would underpin the role of these developments in sustaining Edinburgh's role as a growing successful capital city.

This work has been carried out under the umbrella of the Council's new transport company, Transport Edinburgh Limited (TEL). It has always been a critical element of the planning for the tram system that the operations of bus and tram (and other modes) should be as fully integrated as possible and significant progress has already been made towards such an integrated system by TEL.

Economic viability of phase 1a

A series of qualitative checks have been carried out on the BCR ratio that might be expected to be delivered by phase 1a of the Tram operating in an integrated service environment with,

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at least, Lothian Buses. The results of this examination indicate that the BCR for phase 1a can be expected to be of the same order of magnitude as the results presented to Parliament for Line 1 (1.21) and Line 2 (1.4).

Financial viability of phase 1a

A full appraisal of the revenue, operating costs and lifecycle costs for the Tram was modelled to support the Parliamentary process. This work has consistently concluded that in each of the scenarios of Line 1 only, Line 2 only and a network of Line 1 and 2 operating together, the Tram would be financially viable i.e. revenues generated by the Tram will cover the operating costs and ongoing lifecycle maintenance of the system such that no subsidy is required.

TEL, with the assistance of tie and Transdev, has conducted a review of the financial and operating viability of the phase 1a Leith waterfront to Airport tram line, integrated with bus services. The objective was to assess the financial performance of the TEL bus and tram business in the first full year of tram operations, based upon current demand, costs and revenues, with projected future growth and resource requirements. The review has concluded that the integrated bus and tram business can sustain at least the level of dividend currently payable by Lothian Buses to CEC, without subsidy. In addition, a number of action plans have been identified, whereby the risks of an operating loss could be mitigated and potential additional revenues realised. This initial and prudent analysis demonstrates the benefits of the Tram and Lothian Buses working as a single economic entity and will inform the preparation the more detailed TEL Business Plan from which the Final Business case for Tram will be derived. Integration with third party operators will be an additional key feature of this analysis.

Impact of EARL

An assessment of the impact of EARL on the patronage and revenues of the Tram was completed and presented to the Parliament in late 2005. In terms of a qualitative analysis, EARL would provide direct routing from the Airport to the national railway network. EARL would therefore provide links on a regional and national basis, whilst Tram would provide the local connections. Both EARL and the tram would provide links to Haymarket and Waverley. However EARL does have the potential to capture a significant proportion of passenger trips between the airport and the City Centre. Fare policy will be a key decider of the relative attractiveness for users. There is good reason to believe that Tram and EARL can serve different market demands, Tram serving the local price sensitive and time insensitive market and EARL the national, price non-sensitive and time sensitive market.

The modelling of the demand for travel to/from Edinburgh Airport prepared for the purposes of promoting EARL is more sophisticated and used more up to date information than the Line 2 modelling reported in STAG. As well as modelling airport demand in a more detailed manner, the EARL modelling uses the latest airport passenger forecasts, which predict a much faster rate in growth than those available in mid-2003 and reflects capacity restraints at the airport causing a significant shift towards public transport.

The results reflect that when EARL is operating, Tram will lose market share to EARL particularly in respect of those travelling between the Airport and the City Centre. However, there remain a large number of airport passengers who continue to use tram to access the airport from addresses between The Gyle and Murrayfield. While the revenue and economic benefits are reduced by the presence of EARL, they are both significantly higher than the tram only scenario presented in the more conservative STAG estimates originally presented to Parliament. In the absence of EARL, the increase in airport passengers may actually put a strain on the capacity of Tram in the longer term.

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Bus and Tram Integration

CEC is following a strategy to establish TEL as the single economic entity under which both the Tram and Lothian Buses would operate in an actively planned and managed integrated transport network. TEL will take full advantage of the continuing engagement of Transdev as the intended operator of the Tram network who bring to bear their experience and expertise in the design and operation of tram and other public transport system systems.

TEL has now developed its presence with the appointment of its Board of Directors including two independent non-executives. The Chief Executive of Lothian Buses has been appointed as Chief Executive of TEL. The governance structure of the Tram project has now been amended such that TEL has clear accountability for planning and implementing the integrated transport business with **tie** (advised by Transdev) charged with delivery of the tram project. This structure has been implemented such that clear and full accountability to the Council as Promoter of the Tram project and majority owner of Lothian Buses is sustained and that the interests and influence of SE as the principal provider of funding for the project are preserved.

TEL has played a leading role in the work carried out to date, as described above, in assessing the economic and financial viability of the phase 1a tram integrated with bus services and in assisting the Joint Revenue Committee contractor to define the parameters and inputs to the patronage and revenue modelling process as described under Procurement Strategy below. TEL has also been engaging in consultation with third party bus operators.

TEL is committed to the implementation of integrated ticketing as between the Tram and Lothian Buses with fare parity between the two services.

Final Business Case and Procurement Programme

The key aspects of affordability, financial viability and economic viability of the first phase of the tram are now being analysed and confirmed as part of the preparation of the Final Business Case. The Final Business Case is now explicitly conceived as being an integral part of the delivery of a TEL Business Plan which will seek to demonstrate that Tram and Lothian Buses, operating in a fully integrated manner, with interlocking and complementary services, efficient interchange and integrated ticketing, will be financial viable.

The workstreams to deliver the TEL Business Plan include a complete reappraisal of the patronage, revenues and costs associated with the operation of each of the Tram and Lothian Buses operating in an integrated manner and the strengths weakness, opportunities and threats facing that combined business. The plan will incorporate a benchmarking of the selected phase 1a Tram against other possible phasing options to confirm the phasing plan selected and a testing the sensitivity of economic and financial outcomes to the adoption of different Tram and Lothian Bus service patterns.

The development of the TEL Business plan will run in parallel with the continuing design of the Tram system and the interaction thereof with the wider road network (including park and ride facilities) and other forms of transport including heavy rail and the airport. Both **tie** and TEL believe that both these closely interdependent processes will be better informed and enhanced as a result.

The economic benefits and costs of the proposed phase 1a are now being analysed as part of a refreshment of transport modelling and patronage and revenue projections under the Joint Revenue Committee (JRC) contract procured by **tie**. The scope of the JRC analysis includes testing of a number of alternative operating frequencies and service configuration for both Tram and Lothian Buses the objective being to arrive at a solution which is capable of delivering the best combination of economic costs and benefits whilst preserving the objective of delivering financially viable Tram and Lothian Bus operations.

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In turn the commencement of utility diversions and land acquisitions by Jan 2007 has been assessed by **tie** as the latest possible date to maintain the programme for award of the Vehicles and Infrastructure contracts at the end of June 2007 and consequently to the commencement of tram operations in July 2010.

The delivery of the Final Business Case which demonstrates affordability, economic viability and financial viability is in turn dependant upon the prior completion of the following procurement activities:

- Completion of the JRC modelling to provide patronage and revenue projections for the phase 1 tram and Lothian Buses operating as an integrated public transport service and an analysis and quantification (Benefit Cost Ratio) of the economic benefits and costs arising from the implementation of the phase 1 tram.
- Analysis of 1st stage tender returns for the Vehicles and Infrastructure contracts to the extent that the Final Business Case can conclude, with a high degree of confidence, that the capital cost estimates for the assumed phase 1 of the tram are robust and affordable from the agreed CEC/SE funding package.

The above constraints and dependencies necessitate the delivery of the Final Business Case in two stages: a 'Draft Final Business Case' in complete form by the end of October 2006 to reflect the outputs from JRC and the 1st stage tender returns and a 'Final Business Case' in early June 07 reflecting the final negotiated tender prices and any consequential development of the phasing of the project or refinement of other elements of the Business Case with the express endorsement of TEL, CEC and SE.

The following is an extraction of milestone dates from the current design and construction programme insofar as they mesh with Business Case submission.

<u>Activity / milestone</u>	<u>Dates</u>
- Royal Assent Required prior to issue of tenders for Infraco and Tramco	Assumed by end Mar 06
- Delivery of this OBC - Review and endorsement of OBC by CEC / SE	8 Mar 06 to 30 Mar 06
- Approval to issue tenders for Infrastructure (Infraco) and Vehicles contracts - Approval of funding for period April 06 to Dec 06 Approval of the OBC is the milestone by which approval of funding for continuing implementation activities is sought for implementation activities for the period up to commencement of utility diversion under MUDFA and land acquisitions in Jan 07	3 Apr 06
- Issue of tenders for Vehicles - Issue of tenders for Infraco - Award of MUDFA Initial 6 months of MUDFA for design development - Completion of JRC modelling (patronage, revenues and economic viability) - 1st Stage return of tenders for: Vehicles Infraco	3 Apr 06 25 Apr 06 1 Jun 06 28 Aug 06 21 Jul 06 30 Sep 06

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Activity / milestone	Dates
- Delivery of Draft Final Business Case (FBC) Incorporating the output from JRC, excluding analysis of 1 st stage tenders	18 Sep 06
- Update Draft FBC for analysis of 1st Stage Tramco and Infraco tenders Such analysis to be sufficient to conclude on overall affordability of phase 1 subject to clarification (CARP) and negotiation (BAFO) process, allowing adequate contingency	By end Oct 06
- Review and endorsement of Draft FBC by CEC / SE	19 Sep to 31 Oct 06
- CEC approval of Draft FBC and CEC/SE approval to fund and commence utility diversion and land acquisitions	30 Nov 06
- Utility diversions commence following mobilisation	Jan 07
- Vehicles and Infraco CARP and BAFO	Sep 06 to June 07
- Deliver updated FBC to reflect final negotiated tender prices	1 May 07 to
- CEC/SE approval of FBC and to award Vehicles and Infraco contracts	7 Jun 07
- Award of Vehicles and Infrastructure contract	7 Jun 07 29 Jun 07

Funding Requirements – April 2006 to June 2007

The forecast outturn for year to March 06 and the planned expenditure and funding requirements for April 06 to June 07 is set out in detail in Appendix III. The total for the current (05/06) year is £16.3m, including £4.1m for the parliamentary process and £12.2m for project implementation.

In 2006-07 through to Financial Close in mid-2007, the total planned spend on project implementation will be **£107.2m**. This includes **£32.7m** during the period to December 2006 (during which no physical utility diversions or land acquisitions will take place) and **£74.5m** during the period from January 2007 to the end of June 2007 (the programmed date for award of the Vehicle and Infraco contracts).

By approval of this OBC **tie** is also seeking approval of funding totalling **£32.7m** to cover the continuation of implementation activities as described in this document (and as reflected in the procurement programme included Appendix 1) up to the commencement of physical utility diversions in January 2007. These costs primarily comprise system design under SDS ; technical support and tie resources ; legal work ; and utility diversion planning under MUDFA. It is anticipated that approval of the Draft Final Business case is the 'Stagegate' by which the funding for the period January to June 2007 would be released. Expenditure in the first half of 2007 will be dominated by the physical utility works (£24.1m) and land & property acquisition (£32.6m). The balance is a continuation of design, legal and management services.

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Procurement Strategy

The Procurement Strategy that **tie** is following for this project has been developed to address the common challenges faced by all light rail procurements and the specific issues associated with Edinburgh. The main elements of the approach and progress to date are set out below.

Introduction of Operator at Early Stage

A key strand of the Procurement Strategy was the decision to select the operator for the system in advance of completing the Parliamentary process which is a pre-requisite to the letting of contracts for the fabric of the system. The principal reasons for introducing early involvement of the operator were that it allows **tie** to use the operator's knowledge and experience during the Parliamentary process, business case development, planning, design, and commissioning phases, to ensure that the system will be capable of being operated effectively, facilitates input from an experienced operator on issues such as fares and ticketing policy, facilitates proper planning of an integrated service network including the Lothian Bus operations and other operators.

Transdev were appointed as operators under the Development Partnering and Operating Franchise Agreement (DPOFA) in 2004.

Separation of Operations and System Delivery

The separation of the day to day operation of the tram network from the initial construction of the tram system is a further characteristic or consequence of early operator involvement. It allows those parties responsible for providing vehicles and infrastructure to concentrate on their strengths, which ought to be reflected in more competitive contract pricing from those parties as they will not need to think about procedures and risks that they do not necessarily understand.

Establishment of Joint Revenue Committee

Edinburgh is in an almost unique position, in that the main bus operator in the city is majority owned by the public sector. Recognising the unique opportunity this presented, the City of Edinburgh Council decided to establish Transport Edinburgh Limited ("TEL"), to take on the responsibility for coordinating the services of Lothian Buses and the tram.

As part of the process of coordination and integration of buses and tram, a Joint Revenue Committee (JRC) was established with the objective of the development, testing and successful commissioning of a Modelling Suite to support the viability of the Tram Business Case and ongoing revenue forecasting for TEL. The JRC contract was awarded to a joint team of Steer Davies Gleave and Sir Colin Buchanan & Partners and is due to provide the Modelling Suite to **tie** in August 2006.

A Modelling Revenue Stakeholder Group ("MRSG") has been established to assist JRC to define the parameters and inputs which allows them to deliver the scope of services under their contract. The members of this group will be required to source any information which their organisation has and which is required to inform the model building process to ensure it is robust. This group will report back to their respective organisations on progress and ultimately on the output from the modelling, although **tie** remains the contractual client for JRC.

Procurement of Technical Support Services provider

The resources provided under the Technical Support Services (TSS) contract facilitate design and project management and allow for continuity post novation of SDS to the Infracore. These resources will also be critical for testing, quality, safety and environmental management.

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Early Involvement of Designer

Another key strand of the Procurement strategy was the early involvement of the design contractor. The design contract or System Design Services (SDS) contract was awarded in September 2005 to Parsons Brinkerhoff. This contract allows **tie** to advance design work for sensitive sections of the tram route, thereby reducing the planning and estimating risks to which bidders for the infrastructure contract are exposed. It also facilitates the opportunity to procure advanced works on utility diversions and identify at an earlier stage the land requirements and traffic regulation requirements, both temporary and permanent, of the identified network scope.

Utilities Diversions Undertaken as Advanced Works

A significant benefit arising from having undertaken early design work is that **tie** is able to procure the necessary utility diversions prior to commencement of the system construction. This provides very significant construction programme benefits and therefore cost benefits, due to reduced risk exposure of the infrastructure provider, creating the best opportunity to minimise disruption and maximise construction productivity.

Tie is procuring the utility diversions under the Multi Utilities Diversion Framework Agreement (MUDFA). The award of the MUDFA is scheduled for early June 2006. On award, the MUDFA Contractor will undertake a series of pre-construction activities including working with the SDS Provider to optimise the design of the utilities, minimise disruption to the city of Edinburgh and maximise construction productivity.

Separate Selection of Infrastructure and Vehicle Providers

There are a relatively small number of vehicle providers in the light rail market, compared to the number of infrastructure contractors. Had **tie** adopted the conventional approach and asked the infrastructure providers and vehicle providers to team up and present a single proposal covering both, this would have restricted the range of choice available to **tie**. Therefore, **tie's** approach of having separate competitions for infrastructure and vehicle provision means that it will be able to select its preferred option for each from all possible combinations.

During the market sounding exercise conducted by **tie** in Autumn 2005, it became clear that the infrastructure providers would prefer to know in advance who the vehicle manufacturer would be in order that they could account for this in their infrastructure proposals. Consequently, **tie** intends to identify the "preferred vehicle supplier" prior to the submission of the infrastructure bidders' best and final offers to give them the opportunity to take account of the characteristics of the chosen vehicle in their final infrastructure proposals and costings.

The tender process for the Vehicle Supply and Vehicle Maintenance Contracts commenced in January 2006, with the issue of a Memorandum of Information and Pre-qualification Questionnaire. Seven bidders submitted returns and from that list of seven a shortlist of four has been selected: Alstom, Bombardier, CAF and Siemens. The ITT process is scheduled to commence in April 2006 with Tender returns due in late July 2006. By August a shortlist of two bidders will have been identified and a CARP/BAFO process commenced with the aim of identifying the preferred bidder before the end of December 2006.

The competition for the Infraco was launched on 27 January 2006 by the issue of an OJEU Notice. It is intended to prequalify from 3 to 5 candidates for the main tender, with those tender documents being issued towards the end of April 2006.

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The bidders for the Infraco Contract will have access to the design as developed by SDS up to the launch of the tender, and will be given a schedule of delivery of further updates on design. They will also be supplied with the specification for vehicles which will be the basis of the vehicle tender, currently expected to be launched at the same time.

Receipt of initial bids is planned for 30 September 2006 and following evaluation of those bids a shortlist of 2 tenderers will be selected. These will be asked to further refine their proposals, and to assist with this **tie** will provide updated design details and vehicle technical information sourced from the preferred vehicle tenders.

On selection of a preferred bidder, the selected bidder will be required to close the contract by the end of June 2007 and to have novated to it the SDS contract and the Vehicle supply and Vehicle Maintenance contracts.

Reaggregation of procurement structure under Infraco

tie believes that the Procurement Strategy is the one most likely to deliver a value for money project to CEC and the SE. A key element in achieving this is the disaggregation of the procurement of the separate contracts required to achieve a tram service. However, **tie** also recognises the benefits delivered by a consortium structure which would normally be achieved through a single integrated procurement process and aims to retain as many of these benefits as possible by reaggregating the structure within the Infraco contract. **tie's** intention is to achieve this by novating the design and vehicle supply and maintenance contracts to the Infraco.

The structure transfers all of the systems integration and interface risk to the Infraco (with the exception of those contracts which remain held by **tie**, being the MUDFA, the JRC and the DPOFA).

Land Acquisition Process and Third Party Interface Agreements

Using the powers under the Parliamentary Bills, if enacted, **tie** will project manage the acquisition of all land and rights in land, temporary and permanent, required to construct, operate and maintain the tram system. **tie** and its advisers will identify all parties with an interest in each parcel of land, identify the compensation payable, consult with interested parties as part of an overall communications strategy and give appropriate notification to enable CEC to take title in the land prior to the appointment of Infraco.

A number of agreements have been put in place, or are in the process of being put in place, with key third parties such as Network Rail, BAA, Forth Ports and all the major utilities to facilitate the design process both from an access to land viewpoint in terms of the actual siting of the tram network and in terms of agreeing the responsibility for and management of utilities diversions works.

Risk management and Governance

tie continues to apply a rigorous risk management regime to the project. This incorporates regular risk assessment and re-assessment; reporting and management of risks at appropriate levels within the governance structure; application of risk management to design of contract structures and terms; relationship to optimism bias; and insurance arrangements.

The overall project governance structure has been revised in recent months to reflect the pivotal role of TEL and to streamline reporting lines.

These areas are explained in detail in the appropriate sections of this OBC.

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1. Introduction**1.1 Background**

1.1.1 The delivery of an Edinburgh Tram Network is regarded by the City of Edinburgh Council ("CEC") as a key element of its overall Transport Strategy for the city. The project has been in development for over five years, with the aim of having trams operational by the middle of 2010.

1.1.2 Key to the delivery of the project, and to secure the required funding from the Scottish Executive ("the Executive") is the development of a robust Business Case. This Outline Business Case ("OBC") reflects the progress made since the Preliminary Financial Case documents were submitted to the Scottish Executive and to Parliament in September 2004.

1.2 The proposed ETN

1.2.1 The system proposed comprises two lines as follows:

- Line 1 which provides a circular connection around the North Edinburgh development area, Leith Walk, Princes Street and around the Roseburn to Granton loop. The overall route length is 15.6km with stops at 22 locations. Stop spacing varies along the route with an average spacing of around 700m outside the City Centre; and
- Line 2 which extends from St Andrew Square to Haymarket and through the Edinburgh Park business park and out to the Airport with a shuttle extension from the Airport to Newbridge. In total the line covers 17.8km and has stops situated at 18 locations. The section of tramway between St Andrew Square and Roseburn is common to both Line 1 and Line 2.

1.2.2 An extensive programme of work resulted in the submission of a Private Bill for each of Line 1 and Line 2 to Parliament in December 2003. Both the Line 1 and 2 Private Bill Committees have now delivered their reports. Royal Assent is anticipated by 31st March 2006, subject to the will of Parliament.

1.3 The Outline Business Case

1.3.1 The purpose of this OBC is to provide an update on progress in a number of key areas :

- Clarity which has arisen with respect to the sources of funding for the capital costs of the project and how they will be applied.
- The development of a plan to phase the construction of the project due to affordability constraints.
- The progress and further development of an 'enhanced' conventional procurement strategy being deployed by **tie** to manage risks and reduce the capital cost of the project including the commencement of detailed design and market consultation.
- The strategy that **tie** is following to produce a robust Final Business Case, the delivery of which is a condition precedent on which the funding for the project will be released, the scope of the phasing approved and approval to commence construction of the project
- The detailed procurement programme developed to incorporate the continuing procurement of the project in parallel with development of the Business Case.

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- 1.3.2 This OBC also identifies project management and risk management structures to deliver the project and implement subsequent contracts and provides details of the funding required to continue the procurement and Business Case development from April 2006.
- 1.3.3 The OBC has been prepared by **tie** limited on behalf of CEC. The overall process has been led and directed by a project team representing expertise in Finance, Risk, Technical Analysis, Operations and Programme Management, supported by **tie**'s technical, legal and financial advisers.
- 1.3.4 This OBC forms a part of the formal Governance structure for the procurement, following Scottish Executive and Office of Government Commerce ("OGC") best practice as adapted by **tie** for the circumstances of the Edinburgh Tram Project. Approval of the OBC will be by:
- The Board of Transport Edinburgh Limited (TEL) who have responsibility for development of the full integrated tram and bus system.
 - CEC as Promoter and part funder of the project
 - The Scottish Executive (SE) as providers of the majority of the funding for the project

1.4 Structure of the document

- 1.4.1 The remainder of this document is structured as follows:

Section 2: Strategic Context – Summarises the key policy developments and public transport issues driving the procurement

Section 3: Project Objectives, benefits and constraints – Sets out high level objectives and expected benefits for this procurement and goes on to summarise the key issues and constraints facing the procurement that may impact on benefit realisation.

Section 4: STAG Appraisal – Summarises the assessment of Tram Lines 1 and 2 undertaken to meet the requirements of the Scottish Executive Transport Appraisal Guidance. This section also outlines **tie**'s proposals to update the STAG appraisal to reflect the phased approach to construction now adopted.

Section 5: Funding, Affordability and Phasing – Describes the costs of the project in comparison to the in principle agreements on funding now reached by CEC and SE, the phasing of the project adopted to address continuing affordability constraints and the integrated programme of procurement and Business case delivery which is being followed by **tie** through to commitment to the main Vehicle and Infrastructure contracts.

Section 6: Procurement Strategy and Programme – Describes in detail the 'enhanced' conventional procurement strategy being followed by **tie** including an appraisal of risk allocation between the various parties and the contractual and other methods being deployed by **tie** to manage the delivery risk retained in the Public Sector.

Section 7: Value for Money (VfM) assessment – Identifies and assesses the main factors impacting the VfM review which concluded that **tie**'s 'enhanced' conventional procurement approach is likely to deliver better VfM for the Public Sector than a PPP/PFI approach.

Section 8: Risk Management – Describes the overarching framework for the management of risk with particular reference to the Tram project and the procurement strategy adopted.

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Section 9: Management Arrangements and Governance – Provides details of the overall governance structure and the roles and responsibilities of the parties involved.

Appendices – Supporting briefing papers that provide additional detail to the material presented in the main body of this document.

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE**2. Strategic context****2.1 Overall transport strategy****2.1.1 Background**

- 2.1.1.1 The genesis of the tram project can be traced back to a White Paper issued in July 1998, a few months before the Scotland Act 1998 came into force. It was produced by the Scottish Office and entitled 'Travel Choices for Scotland: The Scottish Integrated Transport White Paper'. This invited each local Council to produce a Local Transport Strategy, and advocated the setting up of a Scottish Public Transport Fund to fund key projects.

1998	White Paper – "Scotland's Transport Future" City of Edinburgh Council Local Transport Strategy (LTS) - Inception
1999	City of Edinburgh Council Integrated Transport Initiative (ITI) - Inception
2000	City of Edinburgh Council LTS 2000 – Published Waterfront Edinburgh Limited (a Joint venture between City of Edinburgh Council, Scottish Enterprise Edinburgh and Lothian) commissions the Feasibility Study for a North Edinburgh Transit Solution (Anderson, Steer Davies Gleave and Mott MacDonald are appointed as advisors)
2001	Feasibility Study for a North Edinburgh Transit Solution – Published City of Edinburgh Council commissions the Edinburgh LRT Masterplan Feasibility Study (Ove Arup & Partners are appointed as advisors)
2002	Transport Edinburgh Limited (now tie) Incorporated Scottish Executive 'Approval in Principle' of the City of Edinburgh Council's ITI Scottish Executive funding grant awarded to support the introduction two Bills into Parliament - Tram Line 1 and Tram Line2
2003	Edinburgh LRT Masterplan Feasibility Study - Published Transport Minister announces £375 Million 'available in principle' for the Edinburgh Tram'.
2004	Tram Line 1 and Tram Line 2 Bill submitted to Parliament City of Edinburgh Council LTS 2004 – Published

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2.1.1.2 Accordingly, The City of Edinburgh Council resolved in October 1998 to prepare its Local Transport Strategy (LTS), and this was drawn up over the following two years. This has been updated and approved in January 2004 by the City of Edinburgh Council. It sets out a vision for transport in Edinburgh as follows:

“Edinburgh should be a city with a transport system which is accessible to all and serves all. Edinburgh’s transport system should contribute to better health, safety and quality of life, with particular consideration for vulnerable people such as children, the elderly and disabled people; it should be a true Citizen’s Network. The transport system should support a strong, sustainable local economy.”

“People should be able to meet their day to day needs within short distances that can easily be undertaken on foot, by bicycle, or by public transport. Choice should be available for all journeys within the city. The city should develop and grow in a compact form that minimises the need for travel, especially by car.”

2.1.1.3 The aims of the LTS are set out as follows:

- To improve safety for all road and transport users;
- To reduce the environmental impacts of travel;
- To support the local economy;
- To promote better health and fitness;
- To reduce social exclusion; and
- To maximise the role of streets as places to meet and play.

LTS also sets out that, schemes to be pursued in the longer term, dependent on funding, including “a *light rapid transit system for the city*”.

2.1.1.4 The strategy included identifying and implementing a series of measures (the ‘New Transport Initiative’, and subsequently the ‘Integrated Transport Initiative’ (“ITI”)), which was presented to CEC’s Transportation Committee in May 1999. The Committee authorised implementation of Phase 1 of the strategy, which was to identify major improvements needed to the city’s transport system. The measures that were identified were a congestion charging scheme, together with a package of improvements to public and private transport.

2.1.1.5 In May 2000, CEC considered the results of Phase 1 of the ITI and agreed to embark on Phase 2, an examination of the ways of achieving the measures that had been identified. The CEC Executive considered Phase 2 in September 2001. The package of suggested improvements to public and private transport was divided into five areas: rail, tram and guided bus; integrated transport including park and ride; bus improvements; road maintenance; and quality of life and environmental improvements.

2.1.1.6 The report concluded that the best way to deliver the improvements was to set up a wholly-owned subsidiary to implement such elements of the ITI. CEC established **tie** as a wholly-owned company with the role of project management, procurement and implementation. **tie** was set up in 2002 with its own staff, a majority of private sector board members and the remit to develop the ITI and to take forward the development of three tram line projects. CEC retains the transport strategy function and once agreed projects move to the detailed development and procurement stage, **tie** takes responsibility for these.

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2.1.2 White Paper – “Scotland's Transport Future”

- 2.1.2.1 National planning policy is shaped by the National Planning Framework. This document supports the integrated planning of land-use and transport as exemplified by the Edinburgh and the Lothians Structure Plan.
- 2.1.2.2 National transport policy is set out in the **White Paper “Scotland's Transport Future.”** This sets out the overall aim of promoting economic growth, social inclusion, health and protection of our environment through a safe, integrated, effective and efficient transport system. It sees the principal challenges in achieving this being changing attitudes to transport choices, stabilising road traffic volumes at 2001 levels by 2021, facilitating the development of new transport links and delivering value for money. Linked to this is maximising opportunities presented by the rapid pace of technological change and ensuring the right governance arrangements are in place to deliver.
- 2.1.2.3 In terms of delivering the vision, the White Paper specifically states *“We [SE] are supporting City of Edinburgh Council's proposals to introduce a modern tram network to Edinburgh, to tackle congestion and link communities with areas of economic growth. Trams will provide fast, efficient, mass transport and provide a real alternative to travel by private car.”*

2.1.3 Regional and Local Transport Strategy

- 2.1.3.1 SESTRAN, a body of the 10 local authorities covering the south east of Scotland have produced and agreed a **Regional Transport Strategy**. One of the aspirations of this Regional Transport Strategy is *“a desire to see high quality, reasonably-priced bus, and rail and tram links from the region into Edinburgh and within the City itself.”*
- 2.1.3.2 The vision of CEC's **Local Transport Strategy** is as follows:

“Edinburgh aspires to be a City with a transport system that is accessible to all and serves all. Edinburgh's transport system should contribute to better health, safety and quality of life.... The transport system should support a strong, sustainable local economy.”

The document includes the following policy: - *“The Council will work with partners and external agencies to introduce a tram system to serve the City of Edinburgh.”*

2.2 Feasibility Study for a North Edinburgh Rapid Transit Solution – July 2001

- 2.2.1 In support of the development of the City of Edinburgh LTS a potential Rapid Transit Solution (RTS) for linking the Waterfront development in the North of Edinburgh to the city centre was commissioned. This work was performed by a partnership of Andersen, Steer Davies Gleave and Mott MacDonald and published in July 2001.
- 2.2.2 The ‘Waterfront Report’ as it came to be known, examined potential technical solutions for a RTS, the options considered were initially:
- Bus Based - Quality Bus, Alternative Fuel;
 - Guided Bus Based - Kerb Guided and Electronic Guided;
 - Light Rapid Transit - Light Rail; and
 - Automated Guideway - Monorail, People Mover and Maglev.

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2.2.3 After initial assessment of the relative merits and demerits of each transport mode they were judged against 4 key questions:

- 1) Will the technology work in the available corridor?
- 2) Does it achieve the overall quality desired of the system?
- 3) Does the technology match the scale and form of network proposed, including future developments?
- 4) Will the technology attract the anticipated patronage or have adequate capacity?

2.2.4 Leading on from the above assessment the following options, as discussed in the 'Waterfront Report', were discounted:

- Transitional Bus;
- Monorail;
- Guideways;
- Magnetic Levitation; and
- People movers.

2.2.5 Two remaining options - Guided Bus and Light Rail, were taken forward for detailed assessment against the criteria in the table below:

Criterion	Guided Bus	Light Rail Transit
Alignment	If segregated similar issues to LRT, otherwise easier to design.	Dedicated alignment design required whether segregated or not.
Public Utilities Impacts	If segregated similar issues to LRT, otherwise no relocation required.	All longitudinal services beneath swept path must be relocated.
Traffic Impact	Will need to contend with existing bus service on street.	Greater priority afforded thus reduced impact if properly policed.
Modal Interchange	No major benefit over existing bus services.	Benefit of incorporating new mode of transport at interchange.
Journey Time	Guided bus will not receive any greater priority than normal buses if un-segregated.	Greater priority afforded to LRT on un-segregated sections thus reducing journey times.
Patronage	Not perceived as significantly different from conventional bus thus reduced patronage.	Reduced journey times, improved reliability and comfort will result in increased patronage.
Carrying capacity	Would require additional vehicles for the same peak capacity.	Increased carrying capacity with peak capacity of 2500 persons per hour.
Depot Site	No dedicated infrastructure required.	Dedicated infrastructure required.
Capital Cost	Reduced capital costs.	Increased capital costs.
Operating costs	Comparable to LRT but increased lifecycle replacement costs.	Comparable to guided bus but lower lifecycle replacement costs.
Revenue	Less revenue.	More revenue.
Construction Programme	Programme contracted due to works extent being significantly reduced.	Programme lengthened due to works extent being significantly increased.

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Accessibility	More difficult access for disabled persons, push chairs etc.	Greater accessibility for all including disabled persons with level access.
Comfort/Ride Quality	Inferior comfort levels due to irregularity of road surface.	Superior comfort levels with LRV's fitted with resilient wheels and high spec. suspension on rails.
Frequency/Reliability	More frequent but not as reliable due to reduced priority traffic impacts.	
Image	Perceived by public as normal bus.	Improved public image over buses.
Safety	Reactionary operation therefore path not as easily perceived.	Improved safety due to fixed path easily perceived (pedestrian/driver).
Air Quality/Noise Impacts	Increased air quality and noise impacts due to the bus vehicles generally being diesel powered. These impacts can be reduced by adopting dual powered busses.	being electronically powered do not discharge noxious emissions and equipped with resilient wheels and skirting, as well as, using continuously welded rail, means noise is minimised.

* Highlighted cells denote which option is better against each criteria.

2.2.6 Following this detailed analysis Tram was selected as the preferred transport solution. Three route options were derived from a long list of twenty six configurations. Following the detailed assessment and consultation the preferred solution of a Light Rail system was identified and the route configuration now known as the North Edinburgh Loop was proposed. This proposal was submitted to full City of Edinburgh Council and has been incorporated in the LTS 2000 and 2004.

2.3 Edinburgh LRT Masterplan Feasibility Study – January 2003

2.3.1 This report was commissioned (December 2001) by the City of Edinburgh Council to build on the initial work proposed under the 'Waterfront Report'. The main conclusions of this report are summarised below.

2.3.2 The specific remit for Ove Arup and Partners was to develop:

- A “viable network” of LRT routes which, in conjunction with other modes, will best meet LTS and other project specific objectives;
- An outline of Capital costs, Revenue and Operating costs for the LRT lines;
- Sufficient data on LRT routes for use in overall assessment and prioritisation of scheme with the ITI; and
- Inputs to the development of the road user charging scheme business case and to support applications to the government for approval and funding of the ITI.

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2.3.3 The approach taken was two phase.

Phase 1 comprised a comparison of the nine identified transport corridors and their appraisal against preliminary criteria based on the Scottish Transport Appraisal Guidance (STAG) 1. This comparison led to recommended seven schemes (see table below) for a more detailed assessment at **Phase 2**, which formed the basis of the recommendation on priorities for LRT implementation.

Corridor	Scores	Ranking
Queensferry	+9	4
North Edinburgh Loop	+22	2
West Edinburgh	+24	1
South Edinburgh	+6	5
South East Edinburgh	+17	3
South Suburban	+4	7
South Orbital	+5	6

2.3.4 Following the detailed appraisal it was recommended the top Three were taken forward for further detailed consideration. This further analysis resulted in the conclusion that the North Edinburgh Loop (Line 1) be accorded the highest priority among the corridors tested and that the Masterplan should include both the West (Line 2) and South East (Line 3) lines as high priority schemes. This proposal was submitted to full City of Edinburgh Council and has been incorporated in the LTS 2000 and 2004.

2.4 Parliamentary Submission

2.4.1 The recommendations in the 'Feasibility Study for a North Edinburgh Rapid Transit Solution', 'Edinburgh LRT Masterplan Feasibility Study', City of Edinburgh LTS and the City of Edinburgh ITI culminated in funding support in June 2002 from the Scottish Executive to develop the North Edinburgh Loop (Line 1) and the Western Route (Line 2) for Parliamentary submission. The Bills and supporting documents were lodged in Parliament in January 2004.

2.4.2 Scottish Transport Appraisal Guidance (STAG)

2.4.2.1 As part of the supporting documentation submitted to Parliament **tie** has compiled a STAG and completed further extensive work and consultation on tram Line 1 and tram Line 2. This detailed work assessed the projects against the key STAG criteria and have confirmed that both lines meet or exceed the Scottish Executive criteria. In addition to the wider economic aspects of the tram lines the estimated revenues and costs were examined and which confirmed that there is a robust economic and financial case for tram Line 1 and tram Line 2. The STAG documents were submitted to the City of Edinburgh Council for CEC Executive approval and thereafter submitted to the Parliament in January 2004. The documents have subsequently been updated and re-submitted to Parliament in September 2004. A summary of the conclusions of these reports is provided in Section 4.

2.4.2.2 Throughout the project development **tie** has reviewed the key documents that have been submitted to Parliament. These reviews are ongoing and were last formally reported in September 2004 when the Updates to STAG and PFC were issued to Parliament. Since this submission **tie** has continued to review the key drivers of the economic and financial Case and have ascertained that there has been no material change since this time.

2.4.3 Preliminary Financial Case

2.4.3.1 In addition to the STAG work **tie** examined and submitted to Parliament a Preliminary Financial Case (PFC) for each of tram Line 1 and tram Line 2.

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2.4.3.2 The PFC assessed the financial aspects of the proposals and examined how much each tram line could be procured for, the options for effecting such procurements and the risks inherent in these procurement options. The PFC documents were submitted to the City of Edinburgh Council for CEC Executive approval and thereafter submitted to the Parliament in January 2004. The documents have subsequently been updated and re-submitted to Parliament in September 2004.

2.4.4 Environmental Statement

2.4.4.1 The Environmental Statement was submitted along with the Bills to Parliament and examines the assessment of the following:

- The environmental character of the area likely to be affected by the development through baseline studies;
- Predict the possible effects, both beneficial and adverse, of the development on the environment;
- Introduce design and operational modifications or other measures to avoid, reduce or offset adverse effect, and where possible, enhance positive effects; and
- Summarise the results of the Environmental Impact Assessment in the Environmental Statement.

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3. Project objectives, benefits and constraints**3.1 Project objectives**

3.1.1. The projects support the National, Regional and Local Transport Strategies. More specifically the tram is designed to address the five areas outlined below:

- **Local economy and accessibility** – To achieve an integrated, efficient, accessible and high quality public transport system that promotes economic growth to the local community, improving its performance and competitiveness. This is fundamental to achieving both the social inclusion and economic development elements of the transport vision, through:
 - Increased number of people with access to the public transport network; and
 - Increased number of people with access to employment opportunities at Granton, Leith, Muirhouse, Pilton and Newhaven.
- **Sustainability and environment** – To encourage more sustainable travel and comply with the targets set by the Air Quality Amendment Regulations. This is fundamental to achieving the environmental, sustainability, health & fitness and traffic aspirations:
 - Increased share of travel on public transport and non-motorised modes; and
 - Reduced global emissions and control local air quality in order to comply with air quality standards.
- **Traffic congestion** – To enable cars to be used efficiently, reducing congestion and delays on key routes. This is fundamental to the achievement of economic development and environmental aims of the vision:
 - Reduce the number of trips made by car; and
 - Reduce road traffic volume on key urban routes.
- **Safety** – To aim at less deaths by road traffic accident, by reducing vehicle volumes, speeds and making roads safer for both users and non-users. This is fundamental to achieving the safety elements of the vision:
 - Reduce the number of road traffic accidents and casualties in Edinburgh.
- **Social benefits** – To take the new system as an opportunity to promote social and community benefits, which are fundamental to the respective elements of the vision:
 - Improve liveability of streets; and
 - Improve access to transport system by people with low incomes, no access to car, the elderly or mobility impairments.

3.2 Benefits of the system

Although Edinburgh's economic success brings many benefits to both the City and the wider region, it also creates problems, such as traffic congestion. There are a range of objectives of the tram that should either support the benefits or address the problems. These are detailed below.

3.2.1 Integration of land use and transport planning

By providing a tram system to serve and connect Core Development Areas (CDA) across the City, the need for car dependence to access employment, residential and retail areas should be minimised. A tram system will ensure that there is effective, high quality public transport

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linking the City's strategic development and regeneration sites. Without a tram system, it is likely that major developments will be less likely to succeed and where they do, will contribute significantly more to City wide congestion as a direct result of the failure to integrate land use and transport policies. Such developments will also be likely to be diverted to less sustainable locations in the greenbelt and elsewhere with less potential for effective transport integration. Areas in the Line 1 catchment that will benefit include the City Centre, the Granton Waterfront and Leith Docks development areas, whilst for the full Line 2 Newbridge/Ratho/Kirkliston CDA, South Gyle and Edinburgh Park will be the main beneficiaries.

3.2.2 Traffic congestion

Tram, rather than directly reducing existing congestion, will operate primarily to permit further development without aggravating additional congestion. The tram system has the potential to reduce traffic congestion by encouraging drivers to use the tram instead of their car. As other tram schemes in the UK have shown, there is greater potential for modal shift from car to tram than to buses, or guided buses, particularly if the tram is in operation before the development comes online and travel patterns have already been established. Modal shift from car is a key objective of the Local and Regional Transport Strategies because it will help to relieve the problems of traffic congestion that are experienced in the City and the wider region. The analysis carried out following standard STAG methodology showed that the system would provide a relatively high level of benefit for non users of the tram, more so than for users. An explanation for this is that the modelling work predicts severe congestion by 2026 and any reduction in congestion caused by modal shift, however small, could result in a small benefit to a large number of people travelling. In reality this means that as some car users switch to tram, capacity is released on the road network which cuts journey times for remaining car drivers. In addition, faster journeys for remaining bus users, as well as for those switching from slower bus to faster tram provide overall benefits. Thus the de-congestion benefits are predicted to be cumulatively significant.

3.2.3 Environment

CEC has a statutory responsibility under the Environment Act 1995 to work to comply with the national air quality objectives. Air quality monitoring is carried out periodically and, for the seven pollutants CEC is required to monitor, one was found to be unlikely to meet its objective. Consequently, CEC declared an Air Quality Management Area in December 2000 covering parts of the City centre area on the basis that the nitrogen dioxides objectives are likely to be exceeded in 2005. Vehicles within the City have been shown to account for up to 88% of emissions of nitrogen oxides. CEC is currently implementing its Air Quality Action Plan (AQAP) in relation to nitrogen dioxide pollution. Trams will contribute to the objectives of the AQAP by providing a large number of journeys through the City centre so improving mobility and accessibility but without adding to current levels of nitrogen dioxide as trams have zero emissions at point of use. Trams can also be much quieter than buses providing a higher quality environment for those living, working and travelling in the area.

3.2.4 Social inclusion

This can be facilitated by better public transport, which allows improved access to jobs and services for those without access to a car. Although neither line will serve anywhere not currently served by bus, and will have greater spacing between stops than bus has, it will reduce public transport journey times and, particularly if Line 1 is taken into account, greatly enhance the reliability of trips to employment centres (Sighthill, The Gyle, Edinburgh Park, Gogarburn, the Airport and Newbridge) in the West, as well as journeys from there to the northern parts of the City. For those living close to a stop, this will provide a significant benefit although for those living between stops walk time will be increased compared to the bus. This will be partially offset by the level of frequency and reliability tram offers compared to the bus. In terms of journey time savings, (comparing scheduled bus journey times with those

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scheduled for the tram, and taking into account waiting times) these will be improved by between five and fifteen minutes for destinations on the tram corridor. This improvement does not take into account the greater reliability of trams compared with bus, which will lead to reduced waiting times on the new mode. As congestion increases these time savings will increase particularly where segregated running is a feature of the route. The tram therefore improves accessibility for many in travelling to employment, education and leisure opportunities.

3.2.5 Integration

The introduction of tram will provide an opportunity to significantly improve integration between transport modes. The major advantage here is that integration can be planned before the start of services; this is much more effective than trying to achieve integration between already established services. Detailed dialogue on this area has been underway since the tram operator designate was appointed in 2004. The interchange at Haymarket and close proximity to Waverley Station and Edinburgh Park Station mean integration with heavy rail will be good. These interlinking services, along with the proposed frequency of the service, means tram will afford easier access to employment and service areas. Tram will also facilitate enhanced integration between public transport and travel by air through serving Edinburgh Airport. The integration of the bus, rail, air and tram network will mean considerable improvement for the travelling public. This could lead to demand for additional feeder services to the main network thus further benefits in terms of both integration and inclusion.

3.2.6 Accessibility

Trams are accessible to people with mobility impairments as access to vehicles and at stops will be fully accessible. In comparison, a little more than half of the LB fleet has low floor access at present although LB are required under the Disability Discrimination Act to have all their vehicles as fully compliant low floor vehicles by 2014. If current levels of LB fleet replacement are maintained, all their vehicles will be fully accessible within six years. Even on low floor buses however, access for people with mobility impairments cannot be guaranteed due to inconsiderate or illegal parking of other vehicles at bus stops, and/or poor driver discipline, such that the bus does not reach the kerb. Trams will always have access to stops and every tram will have level boarding. For people with mobility impairments who live close to tram stops, the tram will therefore represent a major improvement in the provision of accessible public transport. The greater distance between stops will reduce accessibility for some although the guaranteed level access once at the stop will provide a benefit over the current situation of accessing buses.

3.2.7 Economic regeneration

In the parts of Edinburgh served by Tram such as Leith Docks, Granton Waterfront and Sighthill, regeneration is a key priority. Tram enables the development of brownfield sites by providing sustainable transport connections to areas either currently poorly served by public transport or experiencing congestion, particularly at peak times. This therefore can significantly contribute to City regeneration. For example, without Line 1 it is unlikely the large scale redevelopment of Leith Docks could go ahead bringing with it high quality living, leisure and employment opportunities. In addition to opening up brownfield land for redevelopment and despite the difficulty in quantification, it is probable that the tram will have a positive impact on the image of the area and hence help to stimulate further inward investment. For certain employers whose workforces may be more than usually reliant on public transport access, the Tram may act as a catalyst to encourage them to locate in areas that they would have previously discounted. In addition, by contributing to reducing growth in congestion, Tram will be assisting with maintaining the economic viability of North and West Edinburgh.

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3.2.8 Streetscape

Linked to economic regeneration is the image of a City conveyed by its streetscape. In spite of its historical importance, parts of Edinburgh's urban environment are of much poorer quality than is desirable. Experience in France has shown that investment in trams has been used as a mechanism to improve streetscape and environmental amenity in general, bringing both economic and social benefits. In recognition of this important role of tram, a Tram Urban Design Manual has been, and is continuing to be developed by CEC.

3.2.9 Reliability

Trams are more reliable than buses for two main reasons: firstly, they tend to benefit from greater segregation from general traffic and are thus protected from the vagaries of traffic congestion; and, secondly, they generally utilise off-vehicle ticket sales with multi-door boarding, rather than only the driver selling tickets, which reduces dwell time and the variability of dwell time at stops compared with bus. It is theoretically possible that bus operation could be modified to produce the same level of reliability.

3.2.10 The Edinburgh Tram (from CEC report)

3.2.10.1 The following is an extract from the report on funding and phasing of the Tram considered and approved by City of Edinburgh Council in January 2006:

Tram Lines 1 and 2 represent key infrastructure for the centre of the city region. The Edinburgh city region is at the centre of the Scottish economy and is key to attracting of population, investment and development. Core to the continued strength of the city region is the ability to move freely within the city itself and between key employment and development areas.

The Edinburgh Tram can deliver the quality transport system which an expanding and prosperous Edinburgh needs. It provides an opportunity to cope with the increasing demand for movement and an alternative to the private car beyond that which can be provided by buses. The current proposals can also be extended in the medium and longer term, both within the city and beyond. A tram can eventually link East Lothian, West Lothian and Midlothian with each other and with Edinburgh. The linkages with longer distance transport, especially an improving and extended rail network, provide opportunities to increase access to employment across the wider area which is so important to the city economy.

This link with the economy and to employment is a key benefit. Surveys of and engagement with major business sectors repeatedly state their main concerns as being access to a skilled workforce and ease of movement. This is recognised both for existing business and for development of key areas of growth.

Edinburgh Waterfront is the largest brownfield development in Scotland, equivalent to a new town in scale and would be served by Line 1. Lines 1 and 2 together would connect the Waterfront, city centre, West Edinburgh and the Airport. The city centre and West Edinburgh represent the second and fourth largest concentrations of employment in Scotland and West Edinburgh in particular is forecast to grow considerably. At the core of this growth is the West Edinburgh Planning Framework area, south of the Airport and identified by the Scottish Executive as a national growth point. Tram Line 2 will be core infrastructure for this development area; without the new transport investment it is unlikely that this major national opportunity can be realised. It will be particularly vital in combating the expected growth in travel demand arising from the development. Without this development, major greenfield and greenbelt releases would be required. This not only has planning implications but would result in a settlement pattern that would be more difficult to serve by public transport.

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The tram will provide a step change in transport which will greatly improve the choice of public over private transport, increasingly important in the context of the demands of a growing city. Experience elsewhere shows the potential for trams to draw patronage from private cars, especially where they are serving new development areas where travel habits can be formed from the start.

Trams are an attractive option for motorists. In the UK, 20% of peak hour and 50% of weekend tram passengers traditionally travelled by car. Trams allow more people to travel to city centres and retail areas. For example, Dublin has seen an increase of 35% in footfall at an end of line mall and a general increase in city centre pedestrian traffic since the recent introduction of its trams.

It has been demonstrated that property values and rental prices increase along tram lines. Dublin reports an increase of up to 15%, while in Strasbourg real estate agents report that 50% of enquirers seek access to the tram.

Trams can also improve accessibility and mobility for people with disabilities. Croydon reports that its tram is more popular with those with impaired mobility than its "dial a ride" service, because of its wheel chair accessible vehicles running reliably to schedules.

3.3 Project constraints

- 3.3.1 The system will need to address the effect on the World Heritage Status of Edinburgh and **tie** is seeking to minimise or eliminate any adverse impact the tram system may have, by working closely with CEC Planning Committee to develop complementary solutions. The initial design work proposed as part of the recommended procurement option is targeted on the most sensitive sections of the route, with the aim of facilitating planning solutions in these areas. The topography, layout, numerous ancient monuments and Sites of Special Scientific Interest, have all been evaluated and have shaped the routing of the tram system, **tie** is committed to minimising any adverse impact on these areas.
- 3.3.2 During the construction phase there will be periods where 'restricted' or 'no construction' can be achieved in certain areas, primarily during the Edinburgh Festival and the run up to Christmas. **tie** will need to ensure that the scheduling of construction takes into account when areas will be curtailed, and minimise any potential down time by pragmatic targeting of resources.
- 3.3.3 **tie** is also aware that there are a limited number of tram manufacturers that can meet the system requirements. As part of the recommended procurement option, **tie** is therefore seeking to complete the vehicle element and transfer the successful bidder to the infrastructure provider separately. This will enable better competition on both elements and avoid the possibility that preferred tram vehicle provider may be commercially restricted to a sub-optimal infrastructure provider.

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4. STAG Appraisal**4.1 Line 1 and Line 2 STAG Appraisals for Parliamentary Submission**

This section summarises the key conclusions arising from the STAG 2 analysis undertaken by Mott MacDonald in respect of Line 1 in July 2004 and Faber Maunsell in respect of Line 2 in July 2004. The following is drawn from the executive summaries of these STAG 2 documents:

4.1.1 STAG 2 inputs

CEC is examining ways of providing the City with the transport infrastructure necessary to promote and support a growing local economy and create a healthy, safe and sustainable environment. As a key component of the strategy of public transport investment in Edinburgh, CEC is proposing to develop a network of modern light rapid transit rail systems, or trams. The tram system is being developed in stages and will focus on the major City transport corridors.

Scheme descriptions - Line One consists of a Northern Loop, linking the City Centre with Granton, Newhaven and Leith, passing through the Waterfront development area and then along the line of the former Roseburn railway corridor to Haymarket. Line Two of the Edinburgh Tram Network links the City Centre to Murrayfield, Edinburgh Park, the Gyle, airport and the Newbridge park and ride at the western extremity. Both lines are expected to provide a number of positive benefits including economic regeneration and improved accessibility as described in Section 2.

Tram Specification - It is assumed that the trams will be semi-low floor or total low floor vehicles. This implies a floor height of between 300 and 400mm. This type of vehicle has been adopted in order to ensure that the alignment characteristics will cater for most currently available rolling stock.

Construction - One of the early activities required for construction is the diversion of Public Utilities from beneath the tramway. This has, historically been undertaken, either as an advanced works contract or as part of the main works contract. Generally the inclusion of this phase within the main contract provides a reduction in programme due to the ability to coordinate efficiently within the main contract. The 30-month construction period is based upon the utilities diversions being undertaken as advance works ahead of the main infrastructure contract.

Costs - The costs developed for the STAG 2 include capital costs, operating costs and life cycle costs, and have been prepared using a combination of benchmarking, previous experience and engineering judgement. Costs were derived from a comprehensive database compiled from analyses of costs for the infrastructure works of completed and proposed LRT schemes throughout the UK, currently advised prices from vehicle manufacturers and preliminary diversionary works estimates obtained from utilities companies. The resulting estimates take account of the prevailing factors influencing this particular scheme including location, relative complexity, environment and anticipated programme.

Operations - The single overarching objective from the operational viewpoint is to minimise journey times, so as to maximise the attractiveness of the service and minimise operating costs and rolling stock resources. The key is to achieve free flow wherever possible so that the running speed is the maximum safe speed for any particular type of environment.

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4.1.2 STAG 2 Appraisals

STAG2 appraisal of both Lines 1 and 2 examining the key issues of:

- Environment;
- Safety;
- Economy;
- Integration; and
- Accessibility and Social Inclusion.

The matters arising from this analysis is set out in detail in the STAG 2 reports which have previously been submitted to the Executive. The appraisal has identified that Tram Lines 1 and 2 would:

- Enhance the accessibility of key areas within the City thereby improving access to employment and social opportunities, especially for those without private transport;
- Result in expected Improvements in air quality as a result of the reduction in number of cars. This is a fundamental requirement of the environmental/sustainability aspiration of the City;
- Reduced traffic congestion as illustrated by the economic benefits arising from the introduction of the scheme; and
- Provide a safe and secure environment both on board and at the stops. There will be no increase in the number of accidents in 2009 as a result of the introduction of the tram.

It is therefore concluded that the introduction of the Tram Lines 1 and 2 are consistent with the objectives of CEC and will contribute well to the realisation of the Vision for Edinburgh.

4.1.3 Benefits and Costs to Government

As required by STAG, the report includes consideration of the economic welfare impacts of the proposal as part of the Transport Economic Efficiency (TEE) assessment. The appraisal provides a review of what users are willing to pay in order to use the tram line; the financial impact on private sector transport providers; and impacts arising from land use or other impacts of the tram line.

The benefits and costs of both projects have been calculated over a 30-year period and are summarised below. The Benefit Cost Ratio was calculated as 1.21 for Line 1 and 1.40 for Line 2, which both represent good value for money in economic terms.

	Line 1	Line 2
Present Value of Benefits (PVB)	£236 million	£288 million
Present Value of Costs (PVC)	£196 million	£206 million
Net Present Value (NPV)	£40 million	£82 million
Benefit Cost Ratio (BCR)	1.21	1.40

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4.2 Assessment of Benefits and Costs to Government from Alternative Phasing Options

- 4.2.1 An assessment of the economic benefits and costs (BCR) arising from a number of phasing options for delivery of Lines 1 and 2 is included within the work of the Joint Revenue Committee (JRC). The analysis will also incorporate the testing of a number of alternative operating frequencies and service configurations for both Tram and Lothian Buses, the objective being to arrive at a solution which is capable of delivering the best combination of economic costs and benefits whilst preserving the objective of delivering financially viable Tram and Lothian Bus operations and achieving the objectives of CEC's Local Transport Strategy.
- 4.2.2 The JRC is scheduled to complete its work in August 2006.

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5. Funding, Affordability and Phasing

5.1 Introduction

5.1.1 During 2005 the key funding and affordability issues were addressed with respect to the funding of the Project in the context of a fixed SE grant of £375m and the financial risks which will have to be borne by either CEC or SE. Four possible configurations of the Tram system were addressed as follows:

- a) Tram Line 1 only
- b) Tram Line 2 only
- c) Tram Line 1 and 2
- d) Tram Line 1 and 2 less Newbridge Shuttle

5.1.2 The conclusion reached was that although Tram Line 1 only or Tram Line 2 only had a high degree of deliverability within the constraint of a fixed SE grant of £375m, a network of Lines 1 and 2, with or without the Newbridge Shuttle, was unlikely to be affordable in one phase of construction and that a phased approach to procurement and delivery would be implemented.

5.1.3 Discussions have continued with officials of CEC and senior civil servants in the SE, on behalf of the Transport Minister. These discussions have focused on the capital funding available and which sections of the tram network can realistically be afforded as a first phase of the network. CEC's identification of a phased approach was welcomed and the Minister has made an in principle commitment to indexation of the original £375m grant provided that a substantial capital contribution is made by the Council and submission of a robust Final Business Case as described at section 5.4 below.

5.2 Summary of Phased Procurement Approach

5.2.1 **tie** has carried out a great deal of work to ensure that the current capital cost estimates are the most accurate available and are benchmarked against outturn costs on completed tram projects. However on a project of the scale and complexity of the tram project there is still a significant degree of uncertainty (including that relating to construction market prices generally) which will exist up to and beyond the point where tender prices are known. It is therefore important to achieve as much certainty as possible on the likely price for the different elements of the network before awarding the major contracts for the tram infrastructure and vehicles.

5.2.2 **tie** is implementing a phased approach which would be applied to the procurement of Lines 1 and 2. The aim of the phased approach is to:

- Ensure maximum clarity around the likely costs of sections of the network.
- Allow for the option of retaining the same contractor for each of the two initial phases.
- Ensure that each completed phase is completely sustainable in financial and operating terms as a tram service in its own right.

5.2.3 The desirable consequence of the phased approach is that CEC and SE will take the final decisions about what sections of the network to build, and in which order, after the initial tender prices have been received for the Infrastructure and Vehicles contracts.

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5.2.4 **tie's** 'enhanced' conventional procurement strategy is entirely compatible with a phased approach because:

- Both the Infrastructure and Vehicle contracts will be tendered as a series of 'options' such that transparent pricing will be available for each significant section of the network. This will enable the selection of the optimum phasing and the confirmation of the value for money that each incremental section of the network represents in the context of net revenues as well as meeting wider social and economic objectives.
- The scope of design, utility diversions and other implementation activities programmed for the period up to award of the main Infrastructure and Vehicle contracts focuses on de-risking the procurement of the 'core' of the network being the section from Ocean Terminal to Haymarket via Princes Street.

5.3 Capital Costs of the Tram

5.3.1 The estimates of capital costs for Line 1, Line 2 and for the full network of Lines 1 and 2 were prepared by **tie's** technical advisors in 2003. Extensive work has been done to support the robustness of the underlying cost estimates which are predicated on the execution of the 'enhanced' conventional procurement strategy being followed by **tie** which is fully analysed at Section 6 below.

5.3.2 The capital cost estimates have not changed since the Bills for Lines 1 and 2 were submitted to Parliament. In common with the presentation of costs on other capital projects these cost estimates were base dated to a particular point in time, in this case the second quarter of 2003, and did not include inflation.

5.3.3 Table 5.1 below presents these cost estimates both in 2003 prices and with **tie's** current estimate of the effect of inflation at an average of 6% per annum. The inflated cost estimate is the estimated actual cash which will be spent on the project. The table also includes the capital costs associated with two of the alternatives which were examined as being potentially affordable and viable first phases of the Tram:

- Phase 1a - Leith waterfront to Edinburgh Airport (AIR) – Column D
- Phase 1a plus 1b - Leith waterfront to AIR plus Roseburn to Granton Square (GRS) – Column E

Table 5.1 – Capital Cost Estimates

£m	Line 1	Line 2	Lines	Leith	Leith-
	A	B	1+2	- AIR	AIR plus GRS
			C	D	E
Total Base Cost in Q2 2003 Prices	219.3	253.2	440.0	298.0	350.2
Specified Contingency	23.7	25.3	44.0	29.8	35.0
Total Cost Estimate in Q2 2003 Prices	243.0	278.5	484.0	327.8	385.2
Estimated Inflation	75.3	86.3	150.0	101.6	119.4
Inflated Cost Estimate	318.3	364.8	634.0	429.4	504.6
Incremental Optimism Bias (Inflated)	40.2	46.4	80.7	54.7	64.2
Inflated Cost Estimate including Optimism Bias	358.5	411.2	714.7	484.1	568.8

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- 5.3.4 Lines 1+2 costs do not total the costs of Line 1 and Line 2 in aggregate due to the elimination of the costs of the common running section from the Line 2 costs and to minor additional costs in relation to the effective operation of the two lines as a network.
- 5.3.5 The Specified Contingency, which is approximately 10% of base costs, is that which **tie** and its advisors believe to be sufficient to deliver the project as described in terms of scope, quality and programme in the original submissions to Parliament in 2004.
- 5.3.6 Under HM Treasury guidelines, SE must consider the impact of 'Optimism Bias' on required funding. This requirement has arisen from a historical trend of underestimating the cost of public works in the UK. Calculated in accordance with the HM Treasury guidelines optimism bias would be 24% on the Tram project and so the incremental optimism bias (i.e. in addition to **tie**'s specified contingency) is 14% of the base costs excluding specified contingency. **tie** considers that the extent to which this contingency proves to be necessary will, inter-alia, be dependant upon the number and value of changes to both scope and programme which are proposed by the stakeholders in the project during design and construction. CEC and SE determined that there should be visible funding in respect of the incremental optimism bias when assessing the affordability of the phase 1 of the project as described at section 5.6 below.

5.4 Funding to pay for Capital Costs

- 5.4.1 There have been three recent and concurrent developments with regards to the funding available to pay for capital cost of the project and the development of the phasing proposals.
- 5.4.2 Scottish Ministers have approved an increase, in line with indexation, of the grant originally offered in March 2003 from £375m to approximately £450m to £500m. Indexation is the step that the SE has taken with other transport capital projects. The final level of the grant will depend upon the actual level of cost inflation in the construction industry. The commitment is at this stage an in principle commitment and is subject to the presentation of a satisfactory Final Business Case.
- 5.4.3 Underpinning SE's position is a commitment by CEC, as Promoter, to contribute £45m towards the capital cost of the project, to be structured in a manner which minimises financial risk. Again the commitment is subject to the presentation of a satisfactory Final Business Case.
- 5.4.4 Both SE and CEC have also stipulated that approval will not be given for the commencement of physical utility diversion until the Final Business Case in its draft form provides them with sufficient comfort as to the robustness of the capital cost estimates (and therefore the affordability of the project) and confirmation of the economic and financial viability of the project.
- 5.4.5 Concurrent with development of the in-principle revised funding contribution from SE and CEC above, the analysis of the phasing options has progressed. The assumed first phase of at least Leith waterfront to Edinburgh Airport (phase 1a) has been adopted by all parties. The total cost of this phase is £430m (£484m including incremental optimism bias) compared to the total in principle funding package of between £495m and £545m depending upon the final outcome of the SE's indexation proposals. Subject to the results of the tender process for the main Vehicle and Infrastructure contracts, the selection of this option as the initial phase of the project presents a high degree of probability that it will be deliverable within the funding available.

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- 5.4.6 CEC remains committed to the delivery of the section from Roseburn to Granton Square (phase 1b) at an additional cost of £75.2m (£84.7m including incremental optimism bias). This will be re-evaluated once the outcome of the tenders for the Infrastructure and Vehicle contracts is known.

5.5 Structure of CEC Contribution and Financial Risk Sharing with SE

- 5.5.1 CEC, as Promoter, has made an in-principle commitment to make a contribution of £45m towards the capital cost of its tram project, to be structured in a manner which minimises financial risk. CEC has already incurred £1m in the current financial year as a contribution towards development and implementation from its Capital Investment Programme and could allocate a further £1.5m, although no provision has yet been made in its Capital Investment Programme for the period 2006-9
- 5.5.2 CEC must, however, balance its desire to support the project with its fiduciary responsibility and limited resources. CEC's contribution, therefore, comprises only such amounts as could reasonably be expected to be funded from future tram related development income and receipts, rather than from general funds or from Council Tax. The anticipated sources of such receipts include:
- Land contributions by the Council
 - Anticipated development gains accruing to the Council on Council owned sites
 - Section 75 planning agreements already negotiated and anticipated future agreements
 - Third party developments around the tram routes
 - Anticipated capital receipts from tram related Council owned sites.
- 5.5.3 To enable the capital funding of the project to be delivered in a timely manner to make payments for capital expenditure, it is assumed that the elements of CEC's contribution which are to be made in cash would be borrowed, where necessary, against the anticipated sources of receipt described above. During the period up to delivery of the Final Business Case, CEC will work with **tie** and in consultation with SE to further analyse the likely timing of these receipts and to determine the appropriate borrowing or other mechanism to deliver its contribution in a timely manner but also in a way which minimises the financial risks it is exposed to.
- 5.5.4 Certain other aspects of the funding structure remain to be agreed between CEC and SE in the period up to issue of tender documents for the Vehicle and Infrastructure contracts, most importantly:
- Details of a value for money payment mechanism which transfers a sensible amount of risk to the contractors as an incentive to them to deliver in terms of time and quality whilst keeping **tie**'s enhanced conventional procurement strategy intact and minimising the funding cost, management costs and risk premia associated with the procurement strategy.
 - The mechanisms by which emerging increases in capital costs would be managed, funded, or shared in the event that the forecast outturn costs of the phase 1 Tram at any time exceeded the funding available.

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5.6 Development of Phase 1

- 5.6.1 Taking a prudent view on capital cost estimates and funding sources, an examination has been undertaken by a number of parties — **tie**, CEC, TEL, Lothian Buses, Transdev — to assess optimum construction phasing. This work was validated by the SE. The parties determined through reasoned argument and professional judgement which phases within the totality of lines 1 and 2 would be the best to proceed with, assuming that Royal Assent is granted for both Bills.
- 5.6.2 This work has been carried out under the umbrella of the Council's new transport company, Transport Edinburgh Limited (TEL). It has always been a critical element of the planning for the tram system that the operations of bus and tram (and other modes) should be as fully integrated as possible and significant progress has already been made towards such an integrated system by TEL. The early involvement of Transdev, who also operate the successful Nottingham tram system, is an important innovation by **tie**. The combined planning work by **tie**, Lothian Buses and Transdev has provided a unique opportunity to establish an effective integrated public transport system. This has proved successful in Nottingham where already revenue is above planning estimates and demonstrates the absolute importance of this linkage.
- 5.6.3 Consideration has been given to a range of options for first phase network construction and to the pattern of construction of subsequent phases. This work indicates that the line from Leith Waterfront to Edinburgh Airport (phase 1a), via Haymarket and Princes Street, gives the best balance of costs and benefits and presents a high probability of being financially viable when integrated with Lothian Buses services. This first phase of the tram development could be extended to include the section of Line 1 from Roseburn to Granton Square (phase 1b).
- 5.6.4 This proposed phase 1a would provide the core support for the city economy and would directly link the major growth centres at the Airport/Gogarburn/West Edinburgh and Leith Waterfront with the city centre. It would provide access to the major housing and commercial developments under construction and planned and would underpin the role of these developments in sustaining the Edinburgh's role as a growing successful capital city.
- 5.6.5 The link to Leith will serve two thirds of the waterfront development contained in the area that runs across the Leith waterfront between Newhaven and the eastern end of the Victoria dock in Leith. Two thirds of the totality—approaching 20,000 houses plus shops and offices—is within that arc. The tram will serve that area extremely well. Figures have changed during the consideration of the Bill and Forth Ports has made revised proposals for Leith docks. Under the latest proposals, a community the size of Bathgate will be built in Leith docks.
- 5.6.6 The advantages to the Council in achieving its vision for the city and in securing transport infrastructure stemming from this proposed first phase of the tram are:
- The tram would be a world class gateway to the city for visitors arriving at the Airport, providing access to all modes of transport
 - Direct access to the major shopping destinations of the Gyle, Ocean Terminal and the city centre and to the Royal Bank of Scotland's new international headquarters at Gogarburn
 - Access for existing communities to employment, leisure, shopping and other opportunities
 - The line would link with existing transport hubs at Edinburgh Park, Haymarket and Waverley Railway Stations and at the Bus Station in St Andrew Square to give first class interchange for local and long distance trips
 - The line would serve an expanded 'Park and Ride' at Ingliston increasing the catchment area of the tram and further reducing the demand for car travel in the city

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- The Roseburn Street tram stop would serve Murrayfield and Tynecastle stadia, giving access to international and national sporting and other events
 - This first phase would provide the core infrastructure on which expansion of the network would be built and could include in the future the proposed Line 3 linking the city centre with the new Royal Infirmary and the key development areas in South Edinburgh.
- 5.6.7 The development of this core section of Lines 1 and 2, as a first phase, is fully supported by TEL and Transdev, the proposed tram operator.
- 5.6.8 The resulting first phase (phase 1a) therefore is a good fit with the Structure and Local Plans and reflects long-term objectives. This is also the case with phase 1b, which the council wishes to construct at the same time as phase 1a. Here the key 'driver' is the need to link the Granton Waterfront with the rest of the network and the rest of the city-region. Granton is linked to the network at Haymarket via the Roseburn corridor, which also serves the new Telford College, the Western General Hospital, Craighleith retail park and other key destinations. This section remains an important priority in social inclusion and economic development terms and will be constructed as part of phase 1, if prudent levels of contingency prove not to be required and subject to an acceptable Final Business Case.

5.7 Further Phases

- 5.7.1 The Council remains committed to seeking the funding for subsequent phases. These can be summarised as:
- Roseburn to Granton section, which provides much needed access to North Edinburgh and the Waterfront area (if this cannot be accommodated within phase 1)
 - Granton to Leith section along the waterfront, enabling through running of trams past Ocean Terminal and onto central Leith
 - Ingliston to Newbridge section which opens development opportunities in west Edinburgh under the West Edinburgh Planning Framework. Future funding will be closely linked with the continued expansion of the city and the associated opportunities for private sector contributions.

5.8 Economic Viability

- 5.8.1 The principal measure of economic viability of the project, as required by STAG, is the Benefit Cost Ratio (BCR) prepared as part of the Economic Efficiency (TEE) assessment. As explained in section 4 above, the BCR's for Line 1 and Line 2 have previously been reported to Parliament as 1.21 and 1.4 respectively. In addition, during the Consideration stage of the Bills an appraisal was prepared of the economic benefits and costs arising from the operation of Lines 1 and 2 together as a network. The output of this appraisal was a BCR of 1.5. The higher BCR for a network reflects economies of scale in terms of costs and significant additional patronage and wider travel time benefits when compared to the scenario where each line operates independently.
- 5.8.2 A series of qualitative checks have been carried out on the BCR ratio that might be expected to be delivered by the phase 1a of the Tram that is now proposed operating in an integrated service environment with, at least, Lothian Buses. The results of this examination indicate that the BCR for phase 1a can be expected to be of the same order of magnitude as the results presented for Line 1 and Line 2 above.
- 5.8.3 The economic benefits and costs of the proposed phase 1a are now being analysed as part of a refreshment of transport modelling and patronage and revenue projections under the Joint Revenue Committee (JRC) contract procured by **tie**. The analysis includes an appraisal of the remaining elements of Line 1 and 2 not included within the scope of phase 1a. The scope of

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the JRC analysis includes testing of a number of alternative operating frequencies and service configuration for both Tram and Lothian Buses the objective being to arrive at a solution which is capable of delivering the best combination of economic costs and benefits whilst preserving the objective of delivering financially viable Tram and Lothian Bus operations.

- 5.8.4 The output from the Joint Revenue Committee, programmed for completion in early autumn 2006, is a primary input to the Final Business Case as described at sections 5.9 and 5.10 below.

5.9 Financial Viability and the TEL Business Plan

- 5.9.1 The principal measure of financial viability of the project is that the Tram system is that year on year and in aggregate over its useful life, the revenues generated by the Tram will cover the operating costs and ongoing lifecycle maintenance of the system such that no subsidy is required.
- 5.9.2 A full appraisal of the revenue, operating costs and lifecycle costs for the Tram was modelled to support the Parliamentary process. The patronage, revenue and cost projections have been consistent with the information submitted in the STAG appraisals for Line 1 and Line 2 supplemented with a robust appraisal of the revenue and costs which would be delivered by a network of Lines 1 and 2 operating together. This work has consistently concluded that in each of the scenarios of Line 1 only, Line 2 only and a network of Line 1 and 2 operating together, the Tram would be financially viable.
- 5.9.3 The patronage and revenue projections were subjected to extensive benchmarking and found to compare favourably with other LRT projects. In addition the underlying modelling was subjected to expert review and found to be of industry standard and fit for purpose. However it was also recognised that there remained a significant level of inherent risk with regard to the patronage and revenue projections as exists on all projects of this complexity and noted that projections had not been prepared for any phase of Tram construction other than the individual Lines 1 and 2 and for the network as a whole.
- 5.9.4 The strategy being followed by CEC to address these uncertainties has the following main elements:
- Establishment of TEL as the single economic entity under which both the Tram and Lothian Buses would operate in an actively planned and managed integrated transport network
 - The continuing engagement of Transdev as the intended operator of the Tram network who bring to bear their experience and expertise in the design and operation of tram and other public transport system systems
 - Commissioning of a further stage of transport modelling via the Joint Revenue Committee (JRC) contract which is closely aligned with the detailed design of the Tram and which is the overarching tool by which TEL can develop service integration plans for phase 1 Tram and Lothian Buses (and future phases of the Tram)
- 5.9.4 TEL has now developed its presence with the appointment of its Board of Directors including two independent non-executives. The Chief Executive of Lothian Buses has been appointed as Chief Executive of TEL. The governance structure of the Tram project has now been amended such that TEL has clear accountability for planning and implementing the integrated transport business with **tie** (advised by Transdev) charged with delivery of the tram project. This structure has been implemented such that clear and full accountability to the Council as Promoter of the Tram project and majority owner of Lothian Buses is sustained and that the interests and influence of SE as the principal provider of funding for the project are preserved.

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- 5.9.5 TEL, with the assistance of **tie** and Transdev, has conducted a review of the financial and operating viability of the phase 1a Leith waterfront to Airport tram line, integrated with bus services. The objective was to assess the financial performance of the TEL bus and tram business in the first full year of tram operations, based upon current demand, costs and revenues, with projected future growth and resource requirements. The review has concluded that the integrated bus and tram business can sustain at least the level of dividend currently payable by Lothian Buses to CEC, without subsidy. In addition, a number of action plans have been identified, whereby the risks of an operating loss could be mitigated and potential additional revenues realised.
- 5.9.6 This initial and prudent analysis demonstrates the benefits of the Tram and Lothian Buses working as a single economic entity and will inform the preparation a more detailed TEL Business Plan in the period between now and the end of October 2006 as described in section 5.11 below.
- 5.9.7 The objectives of the TEL Business Plan are now explicitly conceived as demonstrating that Tram and Lothian Buses, operating in a fully integrated manner, with interlocking and complementary services, efficient interchange and integrated ticketing, will be financial viable.
- 5.9.8 The workstreams to deliver the TEL Business Plan include a complete reappraisal of the patronage, revenues and costs associated with the operation of each of the Tram and Lothian Buses operating in an integrated manner and the strengths weakness, opportunities and threats facing that combined business. The plan will incorporate a benchmarking of the selected phase 1a Tram against other possible phasing options to confirm the phasing plan selected and a testing the sensitivity of economic and financial outcomes to the adoption of different Tram and Lothian Bus service patterns. To support this planning process the modelling work of the JRC will explicitly model the forecast patronage and revenues delivered by Tram and Lothian Buses.
- 5.9.9 The development of the TEL Business plan will run in parallel with the continuing design of the Tram system and the interaction thereof with the wider road network (including park and ride facilities) and other forms of transport including heavy rail and the airport. Both **tie** and TEL believe that both these closely interdependent processes will be better informed and enhanced as a result.
- 5.9.10 The preparation of the Final Business Case will consider the residual value of the tram operation at the end of the assumed 30-year project period. The end-value will comprise the following:
- Assets with a long and enduring life ("the enduring assets"): Civil works; Land and Property; and Utilities diversions.
 - Assets with a greater need for major repair and refurbishment ("the depreciating assets"): Track; Electrical; Stops; Depot; and Vehicles.

A significant proportion of the system would have a life materially longer than 30 years. Land will have alternative use value which could be realised if the tram system were terminated. The problem is that the assets are only worth what they can realise and it is therefore necessary to evaluate future cash flows, assuming best use is as a tram system. This also ignores any restitution costs since the system will continue as a going concern. The residual value of the tram system will be further evaluated to ensure that this significant consideration in the preparation of the TEL Business Plan is given full visibility.

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5.10 Impact of EARL

- 5.10.1 An assessment of the impact of EARL on the patronage and revenues of the the Tram was completed and presented to the Parliament in late 2005 and is summarised here.
- 5.10.2 In terms of a qualitative analysis, EARL would provide direct routing from the Airport to the national railway network. EARL would therefore provide links on a regional and national basis, whilst Tram would provide the local connections. Both EARL and the tram would provide links to Haymarket and Waverley. The Tram has the advantage of providing links to intermediate locations as well as more transfer connections to bus services. However EARL does have the potential to capture a significant proportion of passenger trips between the airport and the City Centre. Fare policy will be a key decider of the relative attractiveness for users. There is good reason to believe that Tram and EARL can serve different market demands, Tram serving the local price sensitive and time insensitive market and EARL the national, price non-sensitive and time sensitive market.
- 5.10.3 In quantitative terms the Line 2 STAG considered the impacts of EARL on Line 2 as a sensitivity test. The impacts of EARL on Line 2 have been reappraised in light of recent modelling work undertaken as part of the promotion of the EARL scheme.
- 5.10.4 The EARL modelling of the demand for travel to/from Edinburgh Airport across all modes is more sophisticated and used more up to date information than the Line 2 modelling reported in STAG. As well as modelling airport demand in a more detailed manner, the three most important changes introduced to the Line 2 model are:
- Use of the latest airport passenger forecasts, which predict a much faster rate in growth than those available in mid-2003
 - More recent airport employee forecasts
 - Airport car park charges and capacity restraints cause a significant shift towards public transport.
- 5.10.5 The findings of this updated modelling process are summarised as follows:
- Based upon more recent information, the demand for travel across all modes to/from Edinburgh Airport is higher than was previously forecast.
 - Using these updated airport forecasts and taking into account the availability of and the charge for car parking at the airport in future years, leads to a much higher usage of tram than the original STAG work predicted. This increases tram patronage, revenue and economic benefits.
- 5.10.6 In economic terms, this higher airport related demand translates to an increase in the Benefit Cost Ratio (BCR) for Line 2 from 1.40 to 1.53 even allowing for the introduction of EARL. The total benefits have increased as more passengers benefit from tram. The cost to the Government decreases, because the increased revenue helps to off set the capital costs of the scheme. Both these changes lead to increasing the Benefit to Cost Ratio.
- 5.10.7 In terms of forecast patronage and revenue for Tram, the results reflect that when EARL is operating, Tram will lose market share to EARL particularly in respect of those travelling between the Airport and the City Centre. However, there remain a large number of airport passengers who continue to use tram to access the airport from addresses between The Gyle and Murrayfield. While the revenue and economic benefits are reduced by the presence of EARL, they are both significantly higher than the tram only scenario presented in the more conservative STAG estimates. In the absence of EARL, the increase in airport passengers may actually put a strain on the capacity of Tram in the longer term.

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- 5.10.8 This analysis ignores the potential for interchange trips at the airport, between rail and tram, which would boost demand for both systems by providing inter-urban links via rail with local Edinburgh access via Tram. The attractiveness of interchanges will very much depend on fare schemes. If premium fares are charged for both tram and Rail, for movements through the airport, this will deter much of the demand. As part of the overall strategy for ticketing **tie** sees the inclusion of multi modal through ticketing as a key element of adding to the flexibility and usability of the public transport systems. The models currently available, do not handle through fares and therefore it is difficult to quantify the revenue and economic benefits of airport interchanges. By effectively eliminating all airport interchanges from the modelling, the financial and economic assessments are conservative.
- 5.10.9 The quantitative analysis above is anchored on the impact on BCR, patronage and revenues for Line 2 only by comparison to the previous STAG figures. **tie** considers that the impact on BCR, patronage and revenues for the phase 1a from the Airport to Leith Waterfront would be proportionately of the same order of magnitude. The next phase of transport modelling being undertaken by the Joint Revenue Committee is as sophisticated as the updated modelling for EARL used in the above analysis and will explicitly take account of the latest airport passenger forecasts, new surveys and increase in demand for travel to and from Edinburgh Airport.

5.11 Final Business Case Integration with Procurement Programme

- 5.11.1 The development of a TEL Business Plan as described in section 5.9 above is considered by **tie** and TEL to be the same process under which the Tram Final Business Case will be delivered, the two being essentially the same document but edited to meet the tailored needs of different audiences.
- 5.11.2 In the case of both the TEL Business Plan and Tram Final Business Case the three essential conclusions that the documents must help the stakeholders reach are:
- a) Phase 1 of the Tram will be affordable from the in principle agreed funding package between CEC and SE
 - b) Phase 1 of the Tram will be economically viable – i.e. the investment in the tram will represent value for money in terms of the economic benefits it generates (measured in terms of a BCR)
 - c) The TEL Business will be financially viable i.e. there is a high probability that revenues will be sufficient to cover its operating and maintenance costs on an ongoing basis. The test of financial viability will also apply to the Tram and Lothian Bus operations separately although the derivation of this analysis will require judgement.
- 5.11.3 The development of a Final Business Case to meet the above objectives takes place against the continuing programme of design and procurement of the tram during 2006 and the development of a Final Business Case meshes with the design and procurement programme and the key decision points in that programme for the primary stakeholders (TEL, CEC and SE).
- 5.11.4 A key constraint on the procurement programme is the requirement of CEC and SE to have received and approved a Final Business Case which is sufficient to demonstrate the key affordability, economic viability and financial viability parameters outlined above prior to endorsing or funding the commencement of utility diversions under the MUDFA. In turn the commencement of utility diversions and land acquisitions by Jan 07 has been assessed by **tie** as the latest possible date to maintain the programme for award of the Vehicles and Infrastructure contracts at the end of June 07 and consequently to the commencement of tram operations in July 10.

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- 5.11.5 The delivery of the Final Business Case is in turn dependant upon the prior completion of the following procurement activities:

Completion of JRC modelling in Aug 06. The key outputs from the JRC work which feed into the Final Business Case are patronage and revenue projections for the phase 1 tram and Lothian Buses operating as an integrated public transport service and an analysis and quantification (Benefit Cost Ratio) of the economic benefits and costs arising from the implementation of the phase 1 tram. The objective is for the TEL Business Plan to present an integrated service proposal which supports the assertion of economic and financial viability of the tram and the combined TEL Business.

Analysis of 1st Stage tender returns for Tramco and Infraco in July 06 and Infraco Sep 06. An assessment of the tenders received must be completed to the extent that the Final Business Case can conclude, with a high degree of confidence, that the capital cost estimates for the assumed phase 1 of the tram are robust and that it is affordable from the in principle agreed CEC/SE funding package.

- 5.11.6 The above constraints and dependencies necessitate the delivery of the Final Business Case in two stages:

A 'Draft Final Business Case' in complete form by the end of October 2006. This document will be draft insofar as it will not reflect the final negotiated tender prices for the Tramco and Infrastructure contracts.

The 'Final Business Case' in early June 07 reflecting the final negotiated tender prices and any consequential development of the phasing of the project or refinement of other elements of the Business Case with the express endorsement of TEL, CEC and SE.

- 5.11.7 The following is an extraction of milestone dates from the current design and construction programme insofar as they mesh with Business Case submission. **NB - Nothing in the table that follows overrides any parallel approval processes or gateways (e.g. review of tender documents) which are required by TEL, CEC or SE and are an integral part of the procurement programme.**

<u>Activity / milestone</u>	<u>Dates</u>
- Royal Assent Required prior to issue of tenders for Infraco and Tramco	Assumed by end Mar 06
- Delivery of this OBC - Review and endorsement of OBC by CEC / SE	8 Mar 06 to 30 Mar 06
- Approval to issue tenders for Infrastructure (Infraco) and Vehicles contracts - Approval of funding for period April 06 to Dec 06 Approval of the OBC is the milestone by which approval of funding for continuing implementation activities is sought for implementation activities for the period up to commencement of utility diversion under MUDFA and land acquisitions in Jan 07	3 Apr 06

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Activity / milestone	Dates
<ul style="list-style-type: none"> - Issue of tenders for Vehicles - Issue of tenders for Infraco - Award of MUDFA <p>Initial 6 months of MUDFA for design development</p> <ul style="list-style-type: none"> - Completion of JRC modelling (patronage, revenues and economic viability) - 1st Stage return of tenders for: <ul style="list-style-type: none"> Vehicles Infraco 	<p>3 Apr 06 25 Apr 06 1 Jun 06</p> <p>28 Aug 06</p> <p>21 Jul 06 30 Sep 06</p>
<ul style="list-style-type: none"> - Delivery of Draft Final Business Case (FBC) <p>Incorporating the output from JRC, excluding analysis of 1st stage tenders</p> <ul style="list-style-type: none"> - Update Draft FBC for analysis of 1st Stage Tramco and Infraco tenders <p>Such analysis to be sufficient to conclude on overall affordability of phase 1 subject to clarification (CARP) and negotiation (BAFO) process, allowing adequate contingency</p> <ul style="list-style-type: none"> - Review and endorsement of Draft FBC by CEC / SE <p>- CEC approval of Draft FBC and CEC/SE approval to fund and commence utility diversion and land acquisitions</p> <ul style="list-style-type: none"> - Utility diversions commence following mobilisation 	<p>18 Sep 06</p> <p>By end Oct 06</p> <p>19 Sep to 31 Oct 06</p> <p>30 Nov 06</p> <p>Jan 07</p>
<ul style="list-style-type: none"> - Vehicles and Infraco CARP and BAFO - Deliver updated FBC to reflect final negotiated tender prices - CEC/SE approval of FBC and to award Vehicles and Infraco contracts - Award of Vehicles and Infrastructure contract 	<p>Sep 06 to June 07</p> <p>1 May 07 to 7 Jun 07</p> <p>7 Jun 07 29 Jun 07</p>

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6. Procurement Strategy and Programme

6.1 Introduction

tie has developed an 'Enhanced' Conventional Procurement Strategy (Procurement Strategy) that addresses both the issues experienced on other light rail procurements in the UK and the specific circumstances affecting Edinburgh.

The resultant structure is a series of contracts which, managed as a group, will transfer risk effectively to the private sector, advance the scheme as quickly as possible and provide strong value for money.

This section of the OBC includes:

- The background to how **tie** arrived at the Procurement Strategy including the results of the market sounding exercise;
- The key differentiators between this and other approaches to procurement in the light rail sector;
- A description of the process by which **tie** will implement its procurement strategy;
- A detailed description of the key contracts that **tie** have already entered into or will enter into;

6.2 Background to Procurement Strategy

6.2.1 The Light Rail Market Environment

The UK Light Rail sector has encountered difficulties in the last six years. These have affected both existing projects and those in procurement. .

On the earliest schemes, it appears that the private sector showed over-confidence in respect of the risks it faced, and in some cases, the public sector showed a lack of foresight. This may have been related to a lack of understanding of the flexibility which is required to run a public transport system under a long term contract, and the risks in forecasting public transport revenues for a specific service over the long term.

The result is that on many of the projects that have been completed, neither the public nor private sectors are happy with the outcome. Contractors have lost significant amounts on the underlying construction projects due to changes in scope over which they have little control. The tram operators are facing escalating costs, competition from buses and revenues which fall short of what is required to cover fixed costs. Meanwhile the public sector has realised that it has little ability to control the behaviour of the tram operators due to the lack of suitable sanctions available under their project agreements.

This outcome has made the private sector extremely wary of light rail projects. This is documented in the National Audit Office report of 2004 commenting on the effectiveness of light rail schemes. Unfortunately, this industry feedback arrived too late to inform the development of a number of procurements in England, which have encountered significant affordability problems, with costs increasing due to bidders factoring in significant margins to deal with the risks that they have difficulty pricing accurately. These affordability issues have led to significant delays and in several cases the cancellation of the projects affected.

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However, schemes which are not yet in procurement have the opportunity to learn from the issues which have arisen on both existing schemes and the stalled/cancelled procurements. This is exactly what **tie** has set out to do in developing the Procurement Strategy set out in this OBC.

In order to do this, **tie** has sought to harness first hand experience from key individuals involved in those schemes. **tie** has successfully achieved this by:

- recruiting individuals into the project team with breadth and depth of experience of other light rail projects;
- appointing an operator, Transdev, with experience of procuring and operating light rail schemes in the UK and overseas;
- selecting advisers with a broad experience of light rail and other public/private procurements; and
- engaging with the bidder market in a consultation exercise.

tie's proposed solution has resulted in it taking a greater degree of control over the process during the early 'development' phase compared to what the public sector has done on other projects. This has resulted in **tie** progressing the overall project sufficiently in advance of seeking bids from Infraco bidders, that it will be able to offer the private sector a better defined basis on which to bid and a less onerous risk allocation, such that the private sector will be able to price their bids with a greater degree of accuracy and certainty than has been achieved on other projects.

In this way, **tie** believes it will significantly reduce the cost of the overall project having significantly de-risked that element of the project that falls to the private sector to deliver.

6.2.2 Market consultation process

6.2.2.1 Introduction

In October 2005, **tie** placed two Prior Information Notices (PINs) in the Official Journal of European Union (OJEU). The PINs invited responses from interested parties for both the planned Vehicle and Infraco contracts, together with a brief summary of relevant experience.

A total of 11 parties responded to the PINs: 5 for Vehicles and 6 for Infraco. Taken together, the responses represented a significant cross section of the key players in the light rail vehicle and construction sectors. From the total responses, **tie** selected a shortlist of six potential Infraco bidders, and five potential vehicle suppliers who were then invited to Edinburgh for discussions.

In advance of the discussions, the invited parties were sent a Project Information Memorandum, setting out the background to the project and **tie's** current thinking on the Procurement Strategy, together with a list of specific questions (separate lists for potential Vehicle suppliers and Infracos). The questions were compiled by the project team and advisors, in consultation with the SE.

6.2.2.2 The PIN meetings

The meetings were held in Edinburgh over the course of 2nd and 3rd November 2005. **tie's** Tram Project Director, Ian Kendall, led the sessions, supported by members of the **tie** project team as well as representatives from DLA Piper, PUK, Parsons Brinckerhoff, Transdev and PwC. Julian Ware (KPMG) attended on behalf of the SE.

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Discussions with potential Infraco bidders focussed initially on a core group of questions from the list which had been circulated with other issues explored as time allowed. Discussions with potential vehicle suppliers generally covered the full list of questions. Individual interviewees were also invited (although put under no obligation) to provide a subsequent written response to the PIN questions. The key points from the discussions are summarised below.

6.2.2.3 Infraco

The six potential bidders invited for discussion were Amec, Mowlem, Carillion, Balfour Beatty, Robert McAlpine and Ansaldo.

The general discussion focused on **tie's** overall Procurement Strategy, the novation of the systems design services (SDS) provider and design integration, Vehicle integration, maintenance, finance and the procurement process.

Key issues

- All interviewees appreciated the opportunity to discuss the procurement with **tie**, prior to the formal bid process;
- They generally welcomed the overall approach that **tie** had taken in developing the Procurement Strategy, and recognised the rationale for adopting this approach;
- In particular, the de-coupling of tram operations and revenue risk from the Infraco contract was seen as attractive and an important driver to achieving good VfM bids;
- Interviewees also generally understood and supported the rationale for early utilities diversion work, although a number did point out this would result in some roads being dug up twice (by MUDFA and Infraco);
- All saw the benefits of achieving early planning consent on the core network through the SDS provider, although those with the major in-house design capability (Balfour Beatty and AMEC) were slightly disappointed that significant elements of design would be undertaken prior to Infraco award. However, it was pointed out that not all design would be carried out prior to Infraco award and that there would be an opportunity to vary the scope of the design services at Infraco award if agreed between **tie** and the Infraco. Carillion stated that they did have in-house design (although not for OLE) but would be happy to use the SDS provider;
- The planned novation of the SDS contract was not seen as problematic: arrangements along these lines were common practice with other work and Parsons Brinckerhoff are well known and respected;
- Concern regarding confidentiality of bidder innovation during the negotiation period was expressed by a number of participants, with the potential impact this could have on Infraco's willingness/ability to innovate pre contract close highlighted. However, it was explained that a bid protocol process would be in place and that this would cover these issues. Also, **tie's** technical adviser, Scott Wilson Railways (TSS), would be asked to monitor the interaction between the Infraco bidders and the SDS provider;
- The general rationale for separation of vehicles and infrastructure was widely accepted. However, Mowlem and Carillion both indicated reluctance to accept the risks associated with vehicles and vehicle integration. Both explained that they would have issues at Board level (based on past experience in the light rail sector). The implication was that

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since Board approval could not be guaranteed, this may prevent them bidding on the current structure.

- Generally potential bidders were concerned about the choice of vehicle manufacturer and their reputation and quality (including balance sheet strength affecting the value of manufacturers' warranties). These concerns might be reflected in the price, but could be addressed through an appropriate due diligence period with the Vehicle contract once the manufacturer was known (see below);
- Balfour Beatty, Robert McAlpine, Amec and Ansaldo indicated that they would be prepared to bid on the basis of the proposed structure;
- Additional comments in relation to the strategy for the Vehicles contract included:
 - Detailed review of the Vehicles contract by Infraco would be required early in the process to establish the obligations being novated; as would detailed understanding of both SDS and MUDFA;
 - Differential pricing for each proposed Vehicle provider may be necessary; a variant option in which Infraco did not take Vehicle risk was also suggested by some;
 - Whilst the rationale of driving the best commercial deal through extended competition for both contracts was understood, a bid process for the Vehicles contract and Infraco run in parallel to financial close has the potential to be complex and expensive for bidders. As a result, the view was expressed that **tie** will need to be certain that running both in parallel will provide best value;
 - Amec and Mowlem stated that a firm statement on the identity of the tram would be important in order to evaluate the work of the SDS Provider while preparing their bids;
 - Financial robustness of potential vehicle providers presented a significant concern for some, particularly if a 30 year maintenance agreement were to be the preferred approach;
 - Whilst the risks associated with a 6 year maintenance regime would be easier to price than 30 years (and a shorter period would therefore be likely to prove cheaper), there was still an interest and willingness to price a 30 year maintenance period if that was required;
 - Generally, earlier certainty on the preferred vehicle provider was likely to be welcomed by potential Infracos as a means of reducing uncertainty regarding integration risks and simplifying the procurement process. Infracos did accept however **tie's** interest in maximising competition for the Vehicles contract.
- The requirement (or not) for finance was not regarded as an issue by most bidders; prolonged uncertainty on the issue was however a concern. Potential bidders were comforted by the indication from **tie** that this clarification would be provided prior to procurement in 2006.
- Some did indicate a preference for inclusion of some form of finance in terms of the increased value that they could bring to the overall bid.
- All were interested in the availability and commitment of public sector funds for the project (in the light of recent experience on schemes in England).

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6.2.2.4 Vehicles (Tramco)

The potential bidders invited for discussion were Siemens, Mitsubishi, Alstom, Bombardier and Ansaldo.

The discussions were slightly different in emphasis from the Infraco and focused on the ability of potential vehicles to meet the requirements of the system. There was also, however, discussion of issues surrounding maintenance and the novation of the vehicle contract to Infraco.

Key issues

- All interviewees again appreciated the opportunity to discuss the procurement with **tie**, prior to the formal bid process;
- They generally welcomed the overall approach that **tie** had taken in developing the Procurement Strategy, and understood the rationale;
- Potential vehicle providers in particular welcomed the requirement for them to concentrate on the delivery of tram vehicles outside of the complications and risks of a consortium structure
- All were content with the proposed novation of the Vehicle contract to Infraco
- The main suppliers *can* all deliver across the range of **tie's** specified requirements in terms of length and floor. Caveats relate to:
 - Siemens' production of a long vehicle (more than 30m);
 - Alstom's production of a 75% low floor vehicle;
 - Mitsubishi's statement that they had not yet delivered trams longer than 30m.
- Lead times ranged from 14 to 24 months, which could present a constraint, but are broadly in line with requirements
- A flexible maintenance regime could be provided across each of the potential vehicle providers. There was generally no particular preference expressed around supply only or supply & maintain contracts, although Siemens were very interested in providing long term maintenance services.
- Confirmed that the trams could be maintained/altered in an appropriately adapted depot.

6.2.2.5 Overall conclusions

- Positive reaction from market to opportunity for consultation;
- General understanding of rationale behind proposed approach and welcome for **tie** approach to:
 - Revenue risk;
 - Utilities (MUDFA);
 - Planning risk (through SDS)
 - Network Rail

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- Flexibility as to duration of maintenance obligations (subject to pricing);
- However, there were certain areas that merited further consideration in refining the Procurement Strategy. In particular:
 - The proposed parallel procurement of Vehicles and Infraco: whilst maximising competitive tension, increased complication during procurement and potentially problematic uncertainty for Infracos in assessing and pricing vehicle integration risk (which is closely linked to the identity of vehicle manufacturers);
 - Vehicles contract novation: particular issue for two potential Infraco bidders who indicated problems in terms of Board level approval for acceptance of vehicle integration risk (with possible impact on the overall strength of competition);
 - Bidder protocol: need to ensure that the intended protocol would provide reassurance on issues of confidentiality and provide opportunity for Infracos' due diligence on contracts to be novated (vehicles – as above, SDS);
 - Requirement for private finance: whilst likely to be available, early decisions necessary.

6.3 Key Distinguishing Features of Procurement Strategy

The Procurement Strategy that **tie** is following for this project has been developed to address the common challenges faced by all light rail procurements and the specific issues associated with Edinburgh. It is a unique approach and this section sets out the main ways in which the Procurement Strategy differs from market norms. However, it is also important to understand that most of the differences relate to the process of procurement and not the outcome of the procurement.

The outcome of the Procurement Strategy will be two contracts with different private sector entities: an operating contract, the Development Partnering and Operating Franchise Agreement (“DPOFA”) and an infrastructure (Infraco) contract. The Infraco contract will act as a “holding contract” with the design, initial construction and ongoing maintenance, vehicle provision and vehicle maintenance contracts all novated to the infrastructure provider at financial close. This outcome is not dissimilar to the approach adopted on, amongst others, Docklands Light Railway.

Whilst the light rail market does not have a fixed template for how transactions should be undertaken, there has been a general approach on projects to date whereby a single contract has been let for all key activities in providing the tram service. **tie's** approach clearly differs from this, in the ways set out below.

6.3.1 Introduction of Operator at Early Stage

A key strand of the Procurement Strategy was the decision to select the operator for the system in advance of completing the Parliamentary process which is a pre-requisite to the letting of contracts for the fabric of the system.

The principal reasons for introducing early involvement of the operator were that it:

- allows **tie** to use the operator's knowledge and experience during the Parliamentary process, business case development, planning, design, and commissioning phases, to ensure that the system will be capable of being operated effectively;

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- facilitates input from an experienced operator on issues such as fares and ticketing policy;
- facilitates proper planning of an integrated service network including the Lothian Bus operations and other operators; and
- facilitates a phased build out of the system, as has been successful on the Docklands Light Railway project.

6.3.2 Separation of Operations and System Delivery

The separation of the day to day operation of the tram network from the initial construction of the tram system is a further characteristic or consequence of early operator involvement.

It allows those parties responsible for providing vehicles and infrastructure to concentrate on their strengths, which ought to be reflected in more competitive contract pricing from those parties as they will not need to think about procedures and risks that they do not necessarily understand.

6.3.3 Establishment of Joint Revenue Committee

Edinburgh is in an almost unique position, in that the main bus operator in the city is majority owned by the public sector. Recognising the unique opportunity this presented, the City of Edinburgh Council decided to establish Transport Edinburgh Limited ("TEL"), to take on the responsibility for coordinating the services of Lothian Buses and the tram.

As part of the process of coordination and integration of buses and tram, a Joint Revenue Committee ("JRC") was established with the objective of the development, testing and successful commissioning of a Modelling Suite to support the viability of the Tram Business Case and ongoing revenue forecasting for TEL. The JRC contract was awarded to a joint team of Steer Davies Gleave and Sir Colin Buchanan & Partners and is due to provide the Modelling Suite to tie in August 2006.

A Modelling Revenue Stakeholder Group ("MRSG") has been established to assist JRC to define the parameters and inputs which allows them to deliver the scope of services under their contract. The members of this group will be required to source any information which their organisation has and which is required to inform the model building process to ensure it is robust. This group will report back to their respective organisations on progress and ultimately on the output from the modelling, although tie remains the contractual client for JRC.

6.3.4 Procurement of Technical Support Services provider

The resources provided under this contract facilitate design and project management and allow for continuity post novation of SDS to the Infraco. These resources will also be critical for testing, quality, safety and environmental management.

6.3.5 Early Involvement of Designer

Another key strand of the Procurement strategy was the early involvement of the design contractor. The design contract or System Design Services (SDS) contract was awarded in September 2005. This contract allows tie to advance design work for sensitive sections of the tram route, thereby reducing the planning and estimating risks to which bidders for the infrastructure contract are exposed. It also facilitates the opportunity to procure advanced works on utility diversions and identify at an earlier stage the land requirements and traffic regulation requirements, both temporary and permanent, of the identified network scope.

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6.3.6 Utilities Diversions Undertaken as Advanced Works

A significant benefit arising from having undertaken early design work is that **tie** is able to procure the necessary utility diversions prior to commencement of the system construction. This provides very significant construction programme benefits and therefore cost benefits, due to reduced risk exposure of the infrastructure provider, creating the best opportunity to minimise disruption and maximise construction productivity.

6.3.7 Separate Selection of Infrastructure and Vehicle Providers

There are a relatively small number of vehicle providers in the light rail market, compared to the number of infrastructure contractors. Had **tie** adopted the conventional approach and asked the infrastructure providers and vehicle providers to team up and present a single proposal covering both, this would have restricted the range of choice available to **tie**. Therefore, **tie**'s approach of having separate competitions for infrastructure and vehicle provision means that it will be able to select its preferred option for each from all possible combinations.

During the market sounding exercise conducted by **tie** in Autumn 2005, it became clear that the infrastructure providers would prefer to know in advance who the vehicle manufacturer would be in order that they could account for this in their infrastructure proposals. Consequently, **tie** intends to identify the "preferred vehicle supplier" prior to the submission of the infrastructure bidders' best and final offers to give them the opportunity to take account of the characteristics of the chosen vehicle in their final infrastructure proposals and costings.

6.3.8 Land Acquisition Process and Third Party Interface Agreements

Using the powers under the Parliamentary Bills, if enacted, **tie** will project manage the acquisition of all land and rights in land, temporary and permanent, required to construct, operate and maintain the tram system. **tie** and its advisers will identify all parties with an interest in each parcel of land, identify the compensation payable, consult with interested parties as part of an overall communications strategy and give appropriate notification to enable CEC to take title in the land prior to the appointment of Infraco.

The Bill powers will confer rights on CEC to compulsorily acquire the land required for the tram system. These rights include taking temporary possession of land for construction purposes and rights to enter land, following appropriate notice, to conduct various surveys as required. There are also powers with regard to wayleaves and fixings to buildings. Many agreements have been reached with land owners that include limiting these powers to a degree, whether in the extent of land taken or in the timing of taking it. In some cases, the temporary possession of land will be controlled by a licence.

A number of agreements have been put in place, or are in the process of being put in place, with key third parties such as Network Rail, BAA, Forth Ports and all the major utilities to facilitate the design process both from an access to land viewpoint in terms of the actual siting of the tram network and in terms of agreeing the responsibility for and management of utilities diversions works.

Although **tie** will project manage the land acquisition process, title in the land will be taken by CEC. Appropriate advice has been sought to determine the party best placed to take title with regard to tax efficiency and this is CEC. It is intended that title will not be taken until financial close. All land will therefore be acquired immediately prior to the appointment of Infraco. **tie** recognises that with the number of land transactions involved, by leaving them all open until immediately prior to award of the Infraco contract, there is a risk that some may not be concluded in time. Having recognised this potential risk, **tie** is developing a risk management strategy that minimises the likelihood of delay based upon early communication and resolution of issues with the parties concerned.

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A robust estimate of the compensation payable for land and property acquisition has been compiled. Valuations of each parcel of land have been conducted by the District Valuer. These valuations have been factored up to add in **tie** management costs and land owner legal costs. They have been further augmented to allow a prudent contingency; that contingency includes possible blight payments. Finally, all the costs have been inflated to the appropriate time. In addition to these compensation payments for land acquisition, a budgetary allowance has been made for Part 1 Claims. These are made in respect of diminution of property values due to operational effects such as noise, vibration and light pollution. Such claims can not be made until one year after the commencement of operations. The estimates have been inflated accordingly. In all, this represents a robust budgetary allowance for compensation.

tie will lead this process with advice and resources from D&W and from the District Valuer. Further advice as appropriate will be provided by DLA and PwC. The Books of Reference that were prepared for the Bills process will be updated and used for the notification processes. Its scope will be increased to include all interested parties that need to be consulted and notified such as for wayleaves, consents for building fixings and indeed compensation payments. **tie** has developed a Communications Strategy that includes an element for the land acquisition process. All notifications will be preceded by less formal correspondence explaining the purpose, process and timescales.

The entire Procurement Strategy set out above has been developed to help facilitate the speedy implementation and completion of the construction phase of the project and to remove uncertainty and therefore cost from bidders' proposals.

6.4 Overview of Procurement Process

6.4.1 Introduction

tie believes that the Procurement Strategy is the one most likely to deliver a value for money project to CEC and the SE. A key element in achieving this is the disaggregation of the procurement of the separate contracts required to achieve a tram service. However, **tie** also recognises the benefits delivered by a consortium structure which would normally be achieved through a single integrated procurement process and aims to retain as many of these benefits as possible by reaggregating the structure within the Infraco contract.

tie's intention is to achieve this by novating the design and vehicle supply and maintenance contracts to the Infraco. While this carries risks, **tie** believes that these can be managed through a robust procurement process. Further detail on the integration and novation process is set out below.

6.4.2 Integration of Contracts

It is an essential component of the overall Procurement Strategy for **tie** to be able to bring the system design, vehicle supply and vehicle maintenance contracts under the responsibility of the Infraco. This concept was tested during the market consultation undertaken in Autumn 2005 and received positive feedback from the participants.

This section sets out the steps that are required to effect a novation, the risks to novation not being achieved and the consequences of a failure to novate. This is considered separately for the two key contracts that **tie** intends to novate to the Infraco.

In addition, it is important to stress that the proposed structure transfers all of the systems integration and interface risk to the Infraco (with the exception of those contracts which remain held by **tie**, being the MUDFA, the JRC and the DPOFA). This approach is entirely analogous to that taken on the Docklands Light Railway projects.

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6.4.3 Novation of SDS Contract to Infraco

The SDS contract was awarded in September 2005 to Parsons Brinkerhoff and includes for full novation of the contract to the successful Infraco bidder. During the market consultation exercise, all Infraco bidders indicated their satisfaction with Parsons Brinkerhoff as the system designer and their willingness to take on the SDS contract under a novation. This will be a pre-requisite of the tenders for the Infraco contract.

However, it is still possible that a situation may arise where the preferred Infraco and Parsons Brinkerhoff will have difficulties accepting the novation. For example, disputes may have arisen between the two parties on contracts elsewhere that were not known at the time of tender.

If this was the case **tie** may need to take a view on whether to insist on the novation. Under the terms of the SDS contract with **tie** has the right but not the obligation to require the SDS contract be novated to the Infraco. Therefore, **tie** will be acting completely within its rights if it were to decide not to novate the SDS contract when signing the contract with Infraco. If **tie** chose to continue to novate then it could be faced with either an Infraco tenderer which is unwilling to close the contract, or Parsons Brinkerhoff terminating its relationship with **tie** (and therefore avoid being forced to novate to the Infraco). Termination in such circumstances by Parsons Brinkerhoff is not permitted and therefore, such termination would amount to a breach of contract.

If the Infraco refuses to sign the contract because it does not want to novate the Parsons Brinkerhoff contract, **tie** could reconsider whether to insist on novation, or dismiss the Infraco preferred bidder, and take up negotiations with the Infraco reserve bidder. An Infraco would be unlikely to want to do this because it has the right to amend the scope of the SDS contract post novation (**tie** having made proposals to amend such scope a part of the tender process), and could effectively take on only the warranty benefits arising from the contract. In addition, Parsons Brinkerhoff's knowledge of the planning process is likely to be attractive to any Infraco.

If Parsons Brinkerhoff chose to terminate their relationship with **tie**, then they would lose the element of their payment which is retained by **tie** (3% of the total amount) and although Parsons Brinkerhoff would be paid for work carried out (subject to lump sum arrangements) they would lose considerable anticipated fees from not continuing to work on the project.

In the event that the SDS contract is not novated, as a result of **tie** viewing it as the least unfavourable solution at that time, there would be implications for the procurement, but these would not cause the procurement strategy to fail.

If the SDS contract was to be retained by **tie**, this would not remove the Infraco's requirement to implement the elements of design already developed by Parsons Brinkerhoff, because these would be included in the contract. The Infraco would also be required to complete the design, presumably using its own selected designer. **tie** would not be required to pay the Infraco to provide a duplicate design. However, **tie** would be required to pay the Infraco to carry out due diligence on the design prepared by Parsons Brinkerhoff, so as the Infraco could accept full design liability if this was desired by **tie**.

This highlights that the benefits of the novation of the SDS contract accrue in the main to the Infraco, and this should be reflected in the pricing of tenders.

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6.4.4 Novation of Vehicle Supply and Vehicle Maintenance Contract to Infraco

When **tie** issues tender documentation for the Infraco, Vehicle Supply and Vehicle Maintenance contracts, it will set out the details of how the novation proposals will be implemented and how they will affect each party.

The original intention had been for the tender processes for the Infraco contract and the Vehicle Supply and Vehicle Maintenance contracts to run simultaneously. Each tenderer would know who was tendering for the other contract and would be required to provide a statement to the effect that it was willing to undertake the novation with any of the tenderers for the other contract. However, following the market consultation exercise in Autumn 2005, it became clear that the Infraco bidders would have a strong preference for the identity of the vehicle manufacturer to be known prior to the tendering process for the Infraco contract being complete as it could have a material impact on the content of their tender. There are also design efficiency considerations within SDS if the tram vehicle supplier can be concluded early.

Consequently, **tie** has amended the tender programme for tram vehicles such that tenders will now be received in advance of tenders for the Infraco contract with a view to identifying the preferred vehicle supplier in the final quarter of 2006 and the preferred Infraco supplier by first quarter 2007. This approach should minimise the risk of failing to novate the Vehicle Supply and Vehicle Maintenance contracts to Infraco.

However, as is the case with the SDS, events may lead to the withdrawal of support for novation. For example, one of the preferred tenderers may be experiencing financial difficulties at a corporate level. While this may not be sufficient for **tie** to believe that they should be replaced as preferred tenderer, it may result in the other preferred tenderer being reluctant to enter into a contractual relationship with the affected party.

tie's focus at this stage will be to deliver the optimal combination of Infraco and vehicle suppliers. If, at any stage, tenderers for either of these roles indicate that they are unwilling to work together, **tie** would select the best combination from those remaining. **tie** would also be able to dismiss any tenderer who refuses to accept a novation.

A failure to novate the vehicle supply and maintenance contracts would result in a situation where the responsibilities of the Vehicles and Infraco contractors would have to be reconsidered. This might require a re-tender of either or both contracts. However, this does not appear to be any more likely to occur in reality than the public sector losing all of the bidders due to disputes between partners where infrastructure and tram suppliers are asked to bid together.

6.4.5 Overall Procurement Process and Timetable

tie has already signed a number of contracts with parties responsible for specific aspects of the procurement, and intends to enter into further contracts over the next 18 months as follows:

- Selection of Operator
 - DPOFA – with Transdev May 2004;
- System Development
 - Joint Revenue Committee (JRC) – with Steer Davies Gleave and Colin Buchanan & Partners - September 2005;
 - Technical Support Services (SDS) – with Scott Wilson Railways - July 2005;

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- System Design Services (SDS) – with Parsons Brinckerhoff - September 2005;
- System Procurement
 - Multi-Utilities Diversion Framework Agreement (MUDFA) – June 2006;
 - Vehicle Supply and Maintenance Contracts – June 2007;
 - Infrastructure Contract – June 2007;

More detail on the tender process for Vehicle Supply and Maintenance and Infraco contracts are set out later in this section.

A programme detailing the key dates for the continuing procurement of the project is included at **Appendix I**. This programme includes provision for a staged review of procurement progress and Business Case preparation by CEC and SE as the primary stakeholders in the project. The sequence of procurement including the commencement of utility diversions and the interdependency with the Business Case process is described fully at section 5.11.

The programme reflects a 36 month programme for construction, testing and commissioning following a June 2007 award of the Vehicle and Infraco contracts with the commencement of tram operations in July 2010.

6.5 Overview of Key Contracts

A detailed description and justification of **tie**'s approach to the key contracts that it has or will enter into is set out below.

6.6 DPOFA

tie believe many previous tram procurements have suffered from insufficient operator engagement throughout the Parliamentary and development phases of these projects.

On this basis, **tie** decided to separate the operation of the system from its construction, and appointed Transdev as the future operator, under the terms of the DPOFA. This was done through a competitive procurement process, evaluated on the basis of both quality and cost.

Transdev representatives are part of **tie**'s core team for the project, and have played an active role in the development of the subsequent contracts. It was **tie**'s primary objective that this process would form the foundations for a strong and mutually beneficial long-term partnering relationship with Transdev for the later operation of the Edinburgh Tram system.

6.6.1 DPOFA Risk Transfer Issues

6.6.1.1 Operation and Performance Risk

The Operator will ultimately be in day to day control of the quality of service provided to the public. However, responsibility for project development and delivery lies with TEL and **tie** and its advisors. One of the main issues involved in bringing in an Operator during the early phases of the project is to inject their perspective into the development of the network, and hence to facilitate the development of the optimum tram network. **tie** anticipates that this approach, which was endorsed by CEC and was supported by operators interviewed at the PIN stage, has helped facilitate the successful delivery of the project to date and will continue to do so.

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To address performance issues during the operating phase of the contract, the DPOFA incorporates a payment mechanism which **tie** believes will offer the Operator an appropriate risk/reward balance. In summary, the Operator will be incentivised under a regime based upon clearly defined and understood Key Performance Indicators set against the required service specification, and an agreed pain/gain sharing mechanism designed to minimise costs and maximise revenue. The final element of the payment mechanism, namely the Vision Achievement Incentive, reflects a longer term goal to which the Operator should aspire. This payment will only be made in circumstances where the tram project's financial performance exceeds defined expectations, and where the quality of service delivery has been consistently maintained after an extended period to match a pre-agreed challenging target level.

The scope of cost responsibilities and the definition of the gain/pain share mechanism in the context of an integrated bus and tram system are under review.

6.6.1.2 Pricing and Revenue Risk

A key element of retained risk for the public sector relates to ongoing farebox revenue and operating costs. One of the factors influencing the decision to proceed with separate procurement of DPOFA and Infraco contracts was the past underperformance of a number of full PFI/PPP structures where 100% farebox risk was transferred to the private sector. In more recent deals, financiers have applied a heavy discount to revenue projections as a result of recognising that revenue is affected by many factors outside the operator's control and that operators therefore have great difficulty in forecasting it reliably. The Procurement Strategy proposes the retention of the majority of farebox revenue and a proportion of operating cost risk with the public sector.

The means to manage the public sector's exposure to operating costs and revenues has been built into the DPOFA approach in the form of the development of a pain/gain sharing mechanism. This mechanism, which rewards the operator for the degree to which actual costs and revenues outperform pre-agreed targets, has the joint benefit of incentivising the operator to minimise costs and maximise revenue, whilst helping to manage the public sector's risk. This pain/gain share mechanism operates such that 30% of revenue shortfalls against budget is borne by the operator, such budgets being set and reviewed triennially under the JRC contract.

The scope of cost responsibilities and the definition of the gain/pain share mechanism in the context of an integrated bus and tram system are under review.

Critically the management of the public sector's exposure to revenue risk is facilitated by the development of an integrated tram and bus business under TEL.

6.6.2 Activities Under the DPOFA**6.6.2.1 Pre-award of Infraco and Tramco contracts:**

The Development Phase of the DPOFA (Project Phase A) is drawing to a close and Transdev have played an integral part in this process, along with **tie's** technical advisors, bringing their wider commercial and practical experience of operating and maintaining tram (and bus) networks in the UK and elsewhere. This stage was originally scheduled to complete by April 2005 but with the required re-configuration of the Tram network, has extended through to early 2006.

During this phase of the project, and during the creation of the TEL framework, Transdev has:

1. Carried out a comparative analysis of journey times by bus and tram between a range of key locations, in order to establish whether, or under what circumstances, interchange and service integration could be effective, including:

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- What bus services could be affected e.g. withdrawn, diverted, truncated or created; and
 - What physical interchange facilities are required, and what scope there is for providing them;
2. Supported input to the design of Princes Street to maximise remaining bus capacity (but within the context of a fully segregated tramway, which has been regarded as fundamental to the project);
 3. Reviewed sources of additional socio-demographic and population data for potential use in the development of new transport models; and
 4. Agreed with Lothian Buses on a set of data to be provided by Lothian to support integration planning and developed integrated network proposals with Lothian Buses, for consideration and evaluation; and
 5. Reviewed patronage and revenue projections in detail with a view to the further development of integration plans.

Throughout the Infraco and Tramco Procurement Phase (Project Phase B), Transdev will provide continuity and assist **tie** by being a key component of a group of advisors acting as the 'Intelligent Customer', assisting with the shaping and preparation of information for the market to ensure that **tie** creates the best possible offer for the market, thereby generating a healthy competition and consequent value for money.

The following activities will be carried out at this stage:

- Consideration of the underlying operational aspects of the tram project and the presentation of these to the CEC planning department;
- Consideration of underlying demand assumptions and issues;
- Consideration of the operational implications of the overall tram Procurement Strategy;
- Consideration of revenue impact of the tram including ticketing arrangements and potential for third party sources of funding ;and
- Ongoing assistance in development of the contractual arrangements for the proposed tram procurement structure.

tie anticipates further development of the DPOFA during 2006 prior to Infraco Contract award.

6.6.2.2 Post-award of Infraco and Tramco Contracts:

During the Design, Build and Commissioning Phases (Project Phases C1 and C2), it is envisaged that Transdev will be a member of **tie**'s project management team. They will undertake system mobilisation in order to prepare for full operation and complete arrangements on service integration.

The majority of system mobilisation tasks will fall under the remit of Infraco as part of Commissioning Services Agreement to be entered into with Transdev by Infraco thereby mitigating interface risks borne by **tie**. Services included in this agreement would include driver training, depot security, control room manning, safety and establishment of operating procedures.

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During the Operations Phase (Project Phase D), Transdev will operate the Tram and accept the elements of the network incrementally under a phased construction. Transdev will continue to fulfil the functions for Project Phases A, B and C, as required by **tie**, in relation to any further expansion beyond the core network.

6.6.3 Incentivisation and Remuneration structure under the DPOFA

Transdev is remunerated as follows:

For Phases A to C1, a time based fee subject to an agreed cap and a retention;

During Phase D, a payment comprising:

- actual operating costs and an agreed fixed profit;
- a pain/gain share payment calculated as follows:
 - A target operating cost is agreed for each three year period of the contract and Transdev receives/pays a contractually agreed share of any out/underperformance
 - A target revenue will be agreed under the auspices of an Independent Revenue Setting Committee for each three year period and Transdev receives/pays a contractually agreed share of any out/underperformance; and
- fixed operating costs with no pain/gain share
- a performance regime payment calculated to incentivise performance against a set of KPIs covering headway, first and last tram, customer survey, security, cleanliness of tram interiors and stops, information and signage and revenue generation and protection.

These arrangements reflect the fact that revenue and costs are determined by a mixture of factors only some of which are controllable or capable of influence by the Operator. This approach therefore avoids the risk premium that has been included in the pricing of other tram projects due to start up uncertainty and other economic factors.

Finally, Transdev may be entitled to a Vision Achievement Incentive (VAI) if it satisfies certain longer term requirements. The VAI is a financial incentive dependent on consistent high standards of achievement against KPI's over a 3 year period from commencement of operations. The scope of cost responsibilities and the definition of the VAI mechanism in the context of an integrated bus and tram system are under review.

6.6.4 Benefits and Risk allocation

The key benefits of the early operator involvement strategy highlighted in the 2004 NAO report which pointed strongly to early operator involvement as a means of improving the execution of tram procurement and achieving a stable and affordable system due to early operator involvement in areas such as:

- Service specification and timetable;
- Specification and design of tram vehicles and maintenance facilities;
- Specification and design of infrastructure; and
- Operational requirements and specification of the tram system.

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Risks remaining with the public sector are as follows:

- The majority of revenue risk and an element of operating cost risk will remain with the public sector albeit this is mitigated by the incentivisation regime in place with Transdev and critically by the development of an integrated tram and bus business under TEL;
- The risk of Transdev not being ready to operate the system when Infraco and Tramco commissioning is complete will remain with the public sector to the extent that losses incurred are not covered by the LAD provisions in the Transdev contract;
- The risk of Transdev not fulfilling their obligations pre or post commissioning resulting in the need to replace them. Again the public sector's protection against costs incurred in replacing the operator would be limited to the liability provisions in Transdev's contract.

6.7 System Design Services (SDS)

As previously highlighted the letting of the SDS Contract early in the procurement process, followed by a novation of the contract to the Infraco at financial close, was a key element in delivering **tie's** overall Procurement Strategy objectives.

The primary advantage of this approach is the reduction in overall risk to the project which it facilitates. Development of the design ahead of and during the Infraco tender process helps create scope and cost certainty and significantly reduces the lead time between Royal Assent and commencement of operations. It also reduces or substantially removes the risks particularly associated with the award of a conventional Design, Construct and Commission Turnkey Contract e.g. planning approvals, traffic regulation orders, Network Rail and other key stakeholder interfaces. The SDS appointment substantially de-risks the Infraco contract.

The risk transfer to the SDS is substantial, particularly in relation to approvals and this has been verified by in-house and external consultants and affords **tie** control over liability and responsibilities that would not normally be achieved. A reasonable estimate of this risk transfer, particularly if multiplied by Infraco risk margins, would be significant.

Following novation of SDS, the design risks pass to Infraco (although **tie** will retain a collateral warranty over the work of the SDS provider) but without the disadvantage of substantial risk premiums applied by Infraco bidders where design works are executed post contract award. Therefore, **tie's** approach will provide the benefits of having a designer involved in the project from an early stage, whilst retaining full risk transfer to the private sector.

tie expects that the Infraco will benefit significantly from the SDS Provider's work and its experience of the planning and utilities diversion processes. **tie** also believes that the planned novation will mean that the SDS Provider will consider issues of practicality, cost and 'constructability' more than if it was simply **tie's** consultant.

The Infraco will be required to adopt the SDS Provider's design as at the date of Infraco contract signature. Variations to this design could be introduced with the agreement of **tie**, but at the risk of the Infraco.

The novation of the SDS Contract to the Infraco will mean that responsibility for the design and all risks arising are transferred to the private sector system integrator (Infraco) without the normal disadvantage of an increased risk premium which bidders would apply due to uncertainty if they had to carry out all of the design work post contract award.

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The SDS contract is capable of being flexed by **tie** prior to the point of novation or by the Infraco after novation to reflect any services not required by the particular Infraco and therefore avoid duplication with the Infraco's own designers. **tie** would like to retain flexibility, but would expect to negotiate at preferred bidder stage on the role that the Infraco would like the SDS Provider to perform after its contract is novated.

6.7.1 Activities under the SDS contract

The overall design process will take between 2 and 2.5 years. It is expected that the overall design work will be around 60-70% complete when the Infraco contract is signed. However by identifying key risk areas and prioritising SDS activities, **tie** is looking to have completed the design of these areas prior to Infraco award.

6.7.1.1 The *Requirements Definition* Phase of the design is largely complete and key elements of work undertaken have included:

- Development of full system requirements specifications;
- Production of Management Plans, including safety, project management, engineering, risk, communication, approvals and consents, environmental, configuration, verification and validation plans; and
- Technology Reviews.

The SDS provider has also initiated an extensive programme of survey and site investigation works including, ground penetrating radar, geotechnical surveys, surveys of existing structures, noise and vibration baseline surveys, environmental and ecological surveys.

Other key areas of activity have included procurement support for the MUDFA tendering process, establishing an interface and programme for submission of consents with CEC, Stakeholder Management support and development of traffic/transport modelling in conjunction with the Joint Revenue Committee (JRC).

The extent of design information available to bidders at the tender release date (scheduled for late April 2006) will largely encompass information falling out of the Requirements Definition Phase as described above, which will also serve to clarify, verify and update the existing STAG drawings. Further information available at tender release stage will include Route Plans, Sub-system Specifications, Outline System Testing Regimes, Critical Civil Engineering Specifications, Trackwork Specifications and Bills of Indicative Quantities for pricing.

It is intended that further design information will be released to the bidders during the tender process with a target date of July 2006 for updating all of the above information co-inciding with release of the entire Preliminary Design, including an update to the Bills of Quantities.

By the time of contract award (scheduled for July 2007) it is expected that detailed design will be significantly advanced, inclusive of completion of a majority of consents. Outstanding design work at this stage may include non-critical areas, any amendments required by consenting authorities (but not completed) and any remaining value engineering required by the Infracos.

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6.7.2 Control and Management of Activities under SDS Contract

tie is monitoring the quality of the solutions being identified by the SDS Provider with the assistance of the Technical Support Services (TSS) provider and Transdev, and drawing on the significant experience of other schemes held by the **tie** team members.

This process will mitigate the risk of 'gold plating' the design of the system, and any tendency towards low risk, high cost options which do not provide the overall best value for money that **tie** is seeking. **tie** is tracking the estimated cost of the system throughout the design period, so that cost overruns can be identified quickly and mitigating actions taken while there is still scope to change the solution.

6.7.3 Benefits and Risk Allocation

The key benefits of the SDS strategy are as follows:

- Shorter period from letting Infraco contract to completion of the system - a shorter procurement process not only helps achieve the target date for delivery of the project, it also reduces the overheads incurred by the Infraco, because it allows them to reduce the period for which they are involved.
- Removes substantial planning permission and traffic regulation order risk from the private sector - obtaining planning permission is a risk which **tie** believes is best tackled before asking the private sector to develop their bids. This should be reflected in a reduction in the margin that bidders would apply to cover the risks of increase in scope, quality and construction period as a result of the planning requirements. **tie**'s intention is to have critical approvals completed by the time that the Infraco Contract is signed.
- Reduces risks associated with utilities diversion and Network Rail Immunisation work - early completion of utilities diversion will mean a reduced likelihood that utilities works will interfere with the main infrastructure works. It will also reduce risk margins because utilities diversion cost is a risk that the private sector finds difficult to assess, quantify and then manage.
- Greater level of support for compliance with undertakings - early SDS involvement will ensure that stakeholders have greater certainty and clarity about the plans for the network which may avoid disputes and delays at a later date.
- Emerging certainty of scope and design is assisted the development of traffic and transport modelling by the JRC.

Key risks remaining with the public sector are as follows:

- **Potential reduction in innovation:** Because design is carried out in advance of tendering for the Infraco, the Infraco's ability to innovate could be restricted, possibly preventing them from realising possible cost efficiencies or design improvements. **tie** will mitigate this risk by inviting variant bids for any alternative design solutions or technical approaches which bidders believe might offer improved value for money. **tie** will also critically review the proposals of the SDS Provider, with the assistance of the TSS consultants, the Operator and the expertise within **tie**.
- **Risks associated with novation:** This strategy requires the Infraco to take over responsibility for the SDS contract. This is clearly a potential risk, but one which **tie** believes it can manage.

All other design and approvals risks remain with SDS or Infraco through the novation process.

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6.8 Multi Utilities Diversion Framework Agreement (MUDFA)

It is clear from other light rail projects that the risks associated with utilities diversions are among the most difficult for the private sector to manage and price and have been a barrier to progressing with light rail schemes as highlighted by the NAO.

One of the underlying reasons for this is that utility companies are not usually willing to negotiate with the private sector while there remain several competing bidders. However, for one or more preferred bidders to be selected, all bidders will have to provide costings, which include the costs of utility diversions for their specific solutions.

This means that much of the work related to Utilities is delayed until after a contract is signed. The process of agreeing a programme, designing the solution and carrying out the utility diversion works adds significant cost, time and risk to the development programme. A consequence of this is that there is a risk that utilities work can delay the scheduled construction works, and that the works are priced at a premium at bid stage.

Increased forecasts of the costs of utilities diversions have been one of the significant reasons for cost overruns on other tram procurements.

tie will retain and manage the significant risks associated with utilities diversions and implement the utilities diversions through a single framework contract with a contractor.

6.8.1 Activities under MUDFA

tie will directly let MUDFA to divert utilities, which will allow a majority of the utility diversion works to be carried out by a single contractor on the major utilities' assets under a single contract. This will help minimise cost and disruption to the public and to road users, whilst maximising construction productivity. The utilities affected are waste water, potable water, gas, telecommunications and power.

The scope of this contract has been determined by **tie** based on advice from the SDS provider, the TSS provider and input on scope from the utilities themselves. The SDS provider is determining the area of the track bed and which utilities apparatus underneath it will need to be replaced elsewhere, moved or protected. The extent to which utility apparatus will be diverted is the subject of detailed design work by the SDS provider, taking account of the tram and the utility requirements.

It should be noted that other utilities diversion work will be the responsibility of the Infraco, since it will relate to their specific design (e.g. re-siting of or working around utilities as a consequence of the location of supports for overhead line equipment). Clearly there will exist a risk that an item of newly installed apparatus may subsequently be diverted again by Infraco. However, this risk will be effectively eliminated by the SDS provider progressing the designs for the utility diversions and the infrastructure construction more or less simultaneously.

It is important to recognize that there are multiple utility companies that need to have their facilities diverted. This represents a number of interfaces which would be a major risk for the Infraco, and this would be reflected in risk margins applied by Infraco bidders as they would not be in a position to manage this risk until after their appointment.

Instead, **tie** and CEC will use their powers under the tram acts and as the roads authority to negotiate with the utilities, with the objective of securing their participation in MUDFA. These negotiations have resulted in a number of positive solutions for utility issues, highlighting the benefits of early engagement with the utilities companies which would have been impossible if utility diversions had been left to the Infraco. The overall strategy of trying to achieve the utility

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diversion works under one contractor, digging one trench and securing one set of temporary traffic regulation orders is highly innovative and maximises the opportunity to achieve the least disruptive and most productive solution.

The majority of utilities work is scheduled to commence in early 2007 and end in summer 2008. This will result in significant utilities diversion works being completed prior to commencement of Infraco works so potential conflicts between the utilities and infrastructure works will be minimised; any remaining time overlap can be managed so as to avoid conflicts on the ground.

6.8.2 Benefits and Risk Allocation

The key benefits of the MUDFA strategy are as follows:

- **Cost and disruption minimised** - allows the public sector to use its greater negotiating power to develop single contract solutions for all utilities in an area - thereby reducing cost and disruption to the public
- **Increased confidence in overall programme** - removes design of diversions, negotiations with utilities and carrying out of diversion works from being critical path activities for the Infraco – thereby removing substantial time related risk from the overall programme. Also allows utilities work to progress in advance of the Infraco appointment.
- **Price uncertainty for Infraco significantly reduced.** Removes a large source of cost uncertainty and therefore risk premium from the Infraco Contract.
- **Allows better forward planning for utilities.** This avoids the utilities having to make difficult decisions about whether to tackle problems now or wait and see whether there will be a diversion required on the problem area later.

Key risks remaining with the public sector are as follows:

- **Potential reduction in innovation** - if utilities were the Infraco's responsibility then they would have the opportunity to propose an alternative approach to utilities which could potentially be more cost effective. However **tie** believe the scope to innovate with regard to utilities under the swept path of the tram line is very limited and the SDS Provider will have the specific remit of devising innovative but robust solutions to utilities diversion issues; this, coupled with the appointment of the MUDFA contractor (who will be more specialised in utility diversions than, in all likelihood, Infraco) should effectively eliminate this risk .
- **Scope and Time** – these risks will remain with **tie** under this approach; therefore **tie's** ability to manage these risks will be critical. The TSS provider will assist **tie** in managing this risk. The MUDFA Contractor and SDS Provider will be carrying risks under the terms of their respective contracts. However, the cost of the risk to **tie** under this approach is considerably lower than would be the case had Infraco managed the utility diversions directly. This is because Infraco would be unable to quantify the risks in advance of its bid, and the knock-on effects of those unquantifiable risks to Infraco's programme would be considerable. Instead, **tie** can (to a large extent) manage and quantify the risks in advance of letting the MUDFA contract; in this way the unquantifiable risks at the time of tender are considerably smaller, and they will have less of a knock-on effect on Infraco's programme.

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- **.Price risk of MUDFA** - there are a number of areas in which there is a risk of price increase for the MUDFA contract. These will include extension of time, contract claims, unforeseen obstructions leading to additional work, work which is unquantifiable at the time of tendering but is reasonably foreseeable. These risks are managed in a number of ways:
 - The use of prime cost sums in the bill of quantities to make a provision for foreseeable but unquantifiable work. This means setting aside a sum of money for the execution of that work. The amount set aside is based on an assessment made by the procurement team using the best information available at the time of the tender issue. The contractor will have an option of adding a proportionate mark up to that work. The contractor will be required to demonstrate that they have obtained the best prices reasonably achievable for this kind of work.
 - The use of provisional items in the bill of quantities. These work in a similar way to prime cost sums, but are used where there is more doubt about whether or not the work in question will be required.
 - A contractor incentivisation scheme (“value engineering incentive”). There is a mechanism where the contractor will share in any benefits arising from efficient delivery, but will benefit from any cost overruns. This will help to ensure that it is in the contractor’s interest as well as **tie**’s that the contract outturn cost be kept down.
 - The use of a bill of quantities. This provides the best estimate available at the time of tender issue of the scope of the work, and therefore allows the tenderers to price against a reasonably expected volume of work. This will in turn enable the pricing to be as competitive as is reasonably achievable.
 - A tender assessment process that takes account of the developing detailed design. By incorporating the output from the design process, the most accurate reasonably achievable assessment of the scope of work and hence the tender prices can be made.

Betterment – discussions are still taking place with certain utility companies in respect of cost sharing and defement of renewal costs.

6.8.3 Process of Appointment of the MUDFA Contractor

The OJEU Notice in respect of the procurement of the MUDFA Contractor was issued on 28 September 2005. Four contractors have pre-qualified and will be invited to submit and negotiate tenders in response to the Invitation to Negotiate issued on 24 February 2006. The four contractors are Alfred McAlpine, Balfour Beatty, Morgan Est and United Utilities.

The award of the MUDFA is scheduled for early June 2006. On award, the MUDFA Contractor will undertake a series of pre-construction activities including working with the SDS Provider to optimise the design of the utilities, minimise disruption to the city of Edinburgh and maximise construction productivity. The contract is structured such that the physical utility diversions will not commence until instructed by **tie** and this is currently anticipated to be January 2007.

tie has entered into agreements with a number of utility companies and is in negotiation with others. Under the terms of these agreements, the utility companies have consented to the MUDFA contractor carrying out diversionary works on their respective utility apparatus which will be affected by the construction of the Tram. These agreements also deal with the payment of costs and require the utilities companies to work with the MUDFA contractor and the SDS Provider.

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6.9 Joint Revenue Committee (JRC)

Edinburgh is in a fortunate position, in that the main bus operator in the city is majority owned by the public sector. Therefore CEC is seeking to exploit this opportunity by establishing TEL which will have responsibility for managing and integrating the services of Lothian Buses and the tram as permissible under competition law.

The JRC was appointed by **tie** in September 2005, following a procurement competition, to develop a comprehensive and interdependent hierarchical Modelling Suite ("the Modelling Suite"), which includes a strategic model, a public transport model, a network assignment model and a micro-simulation model to support the development of the Tram. The JRC is responsible to **tie** along with the SDS Provider on a jointly and severally liable basis, (supported through an agreement between JRC and the SDS Provider) for the development, testing and successful commissioning of the Modelling Suite. The Modelling Suite is due to be delivered to **tie** in August 2006.

The JRC will also in time provide advisory support to **tie** and TEL in respect of:

- both short term and longer term target revenues for the Edinburgh Tram Network;
- the impact of specific system design features, interchange facilities and of service and frequency changes on revenue predictions;
- the effect of changes in passenger numbers and fare structures on revenue;
- the impact of the introduction and promotion of different fare and ticketing strategies, including integrated ticketing; and
- the likely benefits and dis-benefits of integration with other public transport modes and the likely short term and longer term revenue impacts of competition from other public transport modes.

The modelling work of the JRC will explicitly consider the prospective revenues and patronage of the combined tram and Lothian Bus business operating in an integrated manner under TEL, with and without EARL and with and without complementary developments such as additional or extension of existing park and ride facilities..

A Modelling Revenue Stakeholder Group ("MRSG") has been established to assist JRC to define the parameters and inputs which allows them to deliver the scope of services under their contract. The members of this group (representing **tie**, TEL, Transdev, CEC and SE) are required to source any information which their organisation has which needs to input to the model building process to ensure it is robust. This group will report back to their respective organisations on progress and on the output from the modelling. **tie** is the contractual client for JRC.

The JRC will have an ongoing role following commencement of operations of the tram system. Transferring revenue risk over the long term to the private sector has proved very difficult on other light rail schemes. Therefore, it is proposed to share revenue risk with the operator on a 3 year cycle. JRC (and their advisers) will produce a forecast of median expectation of patronage on a 3 year cycle.

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6.10 Major Third Party Agreements

tie has negotiated approximately 50 third party agreements which have already been or are about to be concluded between CEC (as the Promoter) and either private individuals or commercial interests which are affected by the installation and ultimate operation of the Edinburgh Tram Network and who lodged formal objections. These agreements commit CEC to acquiring land under certain conditions or to ensuring that works carried out are performed in accordance with the requirements of the affected party. A further category of agreements deals with simple reinstatement or accommodation works.

Many of these agreements are with significant commercial property owners or enterprises whose business operations may be impacted or interrupted by the Tram. Others such as First ScotRail, Forth Ports, Network Rail and BAA also have significant operational interface between their commercial interests and the design, construction and operation of the tram as well as planned advance utilities diversions.

6.10.1 First ScotRail

tie secured agreement with First ScotRail not to object to the Tram Bills in exchange for agreed protection of its interests at the Haymarket Depot (primarily access during, and reinstatement after tram construction works). A formal station change procedure is also required in relation to the physical reconfiguration necessary at Haymarket Station to accommodate the integration of the new tram stop. This involves not only ScotRail but other Train Operating Companies: GNER and Virgin and possibly Freight Operating Companies. This process will be administered by Network Rail as station owner and will ultimately result in an assessed cost (covering claims from the TOCs and FOCs) to the tram project. SE is addressing First ScotRail's submission in relation to loss of car park revenue directly under the ScotRail franchise agreement.

6.10.2 Forth Ports

Forth Ports has entered into an agreement with CEC regarding the protection of its interests during construction and operation of the tram network. The most immediate issue is the need for an arrangement permitting **tie** rights to procure advance utilities diversions in connection with the alignment of the tram proximate to and crossing Forth Ports land. The identified (and possibly unidentified) affected underground apparatus belongs to Forth Ports with the utilities companies acting as service providers. **tie** is in the process of securing Forth Ports agreement to participate in the MUDFA arrangements.

6.10.3 Network Rail

Due to cost constraints, **tie** was not able to commence preliminary discussion with Network Rail (NR) regarding their objections to the tram Bills lodged in March 2004 until late autumn of that year. Following intensive activity during March and April 2005, **tie** agreed a set of Protective Provisions (PPs) with Network Rail (NR). In common with other light rail projects that have interfaces with NR, the PPs are a pre requisite to NR removing their technical objection on the basis that they are satisfied that their assets are safeguarded. Neither tram Bill contains any provisions regarding NR protection and this has been negotiated as a separate agreement.

tie have a dedicated NR Interface Manager and legal team and are also drawing on the experience of Transdev and a number of external specialists with experience of brokering similar agreements with NR.

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tie in conjunction with DLA Piper (legal advisors) have established the scope of the PPs in conjunction with NR template agreements as follows:

1. Basic Services Agreement (“BSA”) which permits the formal , commercial and technical engagement of NR on the project at **tie's** cost;
2. Basic Asset Protection Agreement (“BAPA”) which sets the conditions under which **tie** may have access to NR operational railway property; and
3. Development Services Agreement (“DSA”) which will engage NR in the process of reviewing and agreeing the tram scheme design in relation to interface with the railway network.

One of the early requirements on NR under these agreements is to allow the SDS Provider access to NR information, personnel, and surveys and to gain necessary method statement approvals. It will be an important task of SDS to begin the process of securing track possessions from NR.

Downstream of this there will be a requirement for **tie**, with the support of SDS and TSS, to broker further necessary agreements between NR and the Infraco for the infrastructure works. NR will, in all likelihood, require that **tie** are a party to any agreement entered into by Infraco with NR concerning accommodation works and **tie** will include specific delegated functions in the Infraco contract to perform any agreements reached between **tie** and NR.

The three most important issues which will require management in relation to NR are:

1. the time that it will take for any decision, negotiation and agreement with NR to be achieved if NR deviates even slightly from its codified approach;
2. the effect of any NR policy change; and
3. the generally risk averse nature of NR to all projects which affect their operations.

Scottish Executive assistance and oversight on this matter will be important, given the new relationship between the Executive (through the Transport Agency) and NR.

6.10.4 BAA

tie has been discussing the tram alignment and related issues with BAA since early 2003. A series of meetings has also been held to discuss jointly ETL2, EARL and the Ingliston Park & Ride to facilitate an integrated approach to planning and implementation of these schemes.

An agreement has been concluded after lengthy negotiation with Edinburgh Airport Limited (BAA's operating subsidiary) which deals with the removal of BAAs objection to the Parliamentary Bill for ETL2, subject to a range of commitments given by CEC. The most significant of these commitments is that CEC has agreed not to exercise its Compulsory Purchase Order powers in respect of BAA land. In return BAA has agreed that the land at the airport on which the tram alignment will be constructed is to be licensed to CEC during construction and upon completion leased to CEC for 175 years by BAA. It is extremely important that the Infraco adheres to the requirements of BAA regarding minimising disruption during construction and complying with the Construction Code of Practice since BAA retains the right to suspend or curtail the licence granted to CEC for any material breach of conditions.

tie has agreed with BAA to include BAA's participation in MUDFA.

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6.11 Vehicle Supply and Vehicle Maintenance Contracts

tie is developing a nested set of contracts for Infraco, Vehicle Supply and Vehicle Maintenance based on those used successfully on other projects but tailored to Edinburgh's needs.

tie's key objective with regard to vehicle procurement is to select the vehicle and vehicle supplier which best suit Edinburgh's needs. This contrasts with other light rail procurements, where vehicle suppliers and infrastructure contractors have bid as consortia, and the public sector has been unable to separately select both the best vehicle and the best contractor.

Following the latest round of market consultation, it was decided to advance the tendering of the vehicle supply and maintenance contracts to address the concerns of the Infraco bidders who felt the quality and robustness of their tenders could be compromised by not knowing the type of tram vehicle which would be running on the network. It is therefore the intention to have identified two preferred vehicle suppliers in advance of receipt of Infraco tenders in September 2006 with the final choice of vehicle supplier being made towards the end of 2006 and prior to receipt of the Infraco tenderers' best and final offers in 2007.

6.11.1 Nature of Vehicle Supply and Vehicle Maintenance Contracts

Bids to supply vehicles will be evaluated based on the estimated whole life cost of the vehicles including initial purchase price, maintenance and lifecycle costs, as well as the vehicles' qualitative features. Therefore the cost of spare parts, special tools and specific maintenance programmes, both annual and periodic, will be considered, in addition to the upfront costs. **tie** proposes to procure two separate agreements with the successful bidder: the Vehicle Supply Contract and the Vehicle Maintenance Contract. These contracts will be executed simultaneously. The Vehicle Supply Contract will cover the design, manufacture and supply of vehicles, capital spares, special tools and associated equipment. It will also include, as necessary, option prices for additional rolling stock should the anticipated further phases of the system take place and to facilitate the proposed phased approach to the procurement.

The Vehicle Maintenance Contract covers the provision of vehicle maintenance services and vehicle spare parts. The reference case is to provide vehicle maintenance for an initial 6 year operating period only, in line with the Infraco contract. However, tenderers will be required to submit maintenance variant bids based on 15 year and 30 year maintenance contracts. This approach both maintains flexibility in terms of future maintenance provisions and tests the value for money of the reference case. At this stage it is envisaged that the vehicle supplier and vehicle maintainer, for the initial 6 years at least, will be the same company. However this policy remains the subject of further discussion and development within **tie** and TEL.

It is intended that both the Vehicle Supply Contract and the Vehicle Maintenance Contract will each be novated to Infraco as at financial close. The Vehicle Supply Contract is expected to have a warranty/defects liability period post full service commencement matched to the Vehicle Maintenance Contract duration of 6 years. The intention is that on expiry of the Infraco Contract, the Infraco will be contractually obliged to novate the Vehicle Maintenance Contract (assuming it has not expired) to TEL or another suitable party.

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6.11.2 Process of Appointment of Vehicle Suppliers and Vehicle Maintenance Providers

An OJEU Notice in respect of the procurement of the Vehicle Supply and Vehicle Maintenance Contracts was issued on 28 November 2005. The tender process for the Vehicle Supply and Vehicle Maintenance Contracts commenced in January 2006, with the issue of an Memorandum of Information and Pre-qualification Questionnaire. Seven bidders submitted returns and from that list of seven a shortlist of four has been selected: Alstom, Bombardier, CAF and Siemens.

The ITT process is scheduled to commence in April 2006 with Tender returns due in late July 2006. By August a shortlist of two bidders will have been identified and a CARP/BAFO process commenced with the aim of identifying the preferred bidder before the end of December 2006.

The vehicle procurement process is expected to be significantly quicker than that for the Infraco. The reason for this is that the vehicles will be primarily based on existing designs, with appropriate amendments by the manufacturers for **tie** and TEL's specific requirements. By contrast, infrastructure work is by its nature specific to its location.

Therefore, unless there are compelling unresolved commercial issues, the preferred vehicle supplier will be selected well in advance of the selection of the preferred infrastructure provider. This will allow further information regarding the chosen vehicle to be developed by SDS and provided to the Infraco bidders in the latter stages of that competition.

tie will issue to the potential vehicle suppliers the full terms and conditions upon which they will be expected to enter into both contracts. **tie** will sign contracts with the preferred vehicle provider and novate both contracts to the Infraco at the appropriate time (programmed for the end of June 2007).

6.11.3 Benefits and Risk Allocation

The key benefits of the vehicle procurement and maintenance strategy are as follows:

- no restrictions on the choice of vehicle **tie** can choose; and
- value for money of maintenance contract market tested through variant bids.

Risks remaining with the public sector are as follows:

- maintenance and lifecycle risks beyond the chosen maintenance contract period

All other risks associated with the cost (initial and ongoing) and on time delivery of the vehicles will pass to the private sector via the novation of the vehicle supply and maintenance contracts to Infraco.

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6.12 Infraco Contract

The Infraco will be the central contract in the procurement process. The Infraco will be responsible for delivering the tram system as a whole.

6.12.1 Nature of Infraco Contract

The Infraco will be responsible for integrating the outputs of the SDS Provider, the Vehicle Supplier and its own subcontracts. The Infraco will be required to carry out and/or manage a comprehensive turnkey contract including the design, construction, installation, commissioning, vehicle procurement, system integration, infrastructure maintenance, vehicle maintenance and supply of related equipment and materials in respect of the Tram system, the tram vehicles and related infrastructure. Certain of these obligations will persist for the duration of the maintenance contract period.

Bids to construct the infrastructure will be evaluated based on the estimated whole life cost of the infrastructure including the initial up front cost, maintenance and lifecycle costs, as well as qualitative features. Unlike the vehicles contracts, **tie** proposes to procure the initial construction and the ongoing maintenance under a single contract with the successful bidder.

The maintenance element of the contract will be subject to variant bids similar to the vehicle maintenance contract. The reference case will be to provide infrastructure maintenance for an initial 6 year operating period with the option to roll over for 3 year periods. However, tenderers will be required to submit mandatory variant bids based on 15 year and 30 year maintenance contracts. This approach both maintains flexibility in terms of future maintenance provisions and tests the value for money of the reference case.

6.12.2 Process of Appointment of Infraco

The competition for the Infraco was launched on 27 January 2006 by the issue of an OJEU Notice. It is intended to prequalify from 3 to 5 candidates for the main tender, with those tender documents being issued towards the end of April 2006.

The bidders for the Infraco Contract will have access to the design as developed by SDS up to the launch of the tender, and will be given a schedule of delivery of further updates on design. They will also be supplied with the specification for vehicles which will be the basis of the vehicle tender, currently expected to be launched at the same time.

Receipt of initial bids is planned for 30 September 2006 and following evaluation of those bids a shortlist of 2 tenderers will be selected. These will be asked to further refine their proposals, and to assist with this **tie** will provide updated design details and vehicle technical information sourced from the preferred vehicle tenders.

On selection of a preferred bidder, the selected bidder will be required to close the contract by the end of June 2007 and to have novated to it the SDS contract and the Vehicle supply and Vehicle Maintenance contracts.

6.12.3 Release of Design Information to Infraco Bidders

During the period when Infraco bidders are developing their proposals, design work will be continuing. This will necessitate a managed release of further design information to the tenderers.

Initially tenderers would be provided with the Outline design plus Preliminary design as available for critical areas. Tenders would be required to confirm the design parameters and

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raise any issues related to generic design solutions, including possible cost savings or efficiency improvements.

Transfer of further design information to the Infraco bidders during the tender period would be done in a completely transparent and balanced way, and will be strictly controlled by **tie**. Controlled access to the SDS Provider for each of the bidders will be facilitated by **tie** who will seek to ensure there is an effective relationship built between SDS and the Infraco bidders to further mitigate against the inclusion of excessive risk premia in the Infraco bids.

Design will continue whilst tenders are being evaluated and after selection of two preferred Infraco and one or two preferred vehicle supply bidders. The bidders would then have received a significant design update to price at the CARP/BAFO stage. Given that bidders will need time to digest information and incorporate this into their plans, there will be a design release cut-off date in advance of return of tenders.

Further design will be provided to the bidders after the cut-off date for information and with instructions to flag anything that has a significant impact on pricing. **tie** believes that continuing the design process will mean that design resources are used efficiently and will not disrupt the tender process. Final negotiations will be undertaken in the month prior to contract award to ensure a final match of contracts.

6.12.4 Benefits and Risk Allocation

The key benefits of the Infraco procurement strategy are primarily in the novation of the SDS and Vehicle contracts and the transfer of risks to the Infraco which are difficult to quantify. The benefits include:

- Single system integrator responsible for implementation of design and commissioning of system (including staff and driver training and mobilisation);
- Full design risk passed to Infraco post contract award;
- Full vehicle risk passed to Infraco post contract award;
- Reliability of Infraco supply chain and products to be supplied within it;
- Infrastructure and vehicle maintenance risk passed to Infraco and backed by financial support package (see VFM section for further details); and
- Value for money of maintenance contract market tested through variant bids.

Risks remaining with the public sector are as follows:

- maintenance and lifecycle risks beyond the chosen maintenance contract period; and

6.12.5 Financing Structure/Risk transfer provisions of Infraco Contract

The financing structure adopted for the Infraco Contract needs to reflect the risks that **tie** and other stakeholders are attempting to transfer and the way in which the Infraco is paid (whether in advance or in arrears, whether linked to achievement of milestone events or turnkey payments or whether related to achievement of ongoing performance).

The way in which the Infraco is paid will also determine the extent to which it has a financial incentive to manage the risks transferred to it.

The options for risk transfer to the private sector fall into two categories:

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- Transfer of all design, construction and commissioning risk with maintenance of vehicles and infrastructure for an appropriate initial period, long enough to test the initial functionality and quality of the system, assessed to be six years; and
- Full initial risk transfer as above with, in addition, full risk transfer for maintenance of vehicles and infrastructure for the expected life of the system, i.e. around thirty years .

The approach which **tie** has developed is based around the shorter maintenance period and utilising a suite of bonding instruments and LADs to deliver the risk transfer characteristics of a PFI scheme but without the additional costs. More detail on this aspect of the procurement strategy is set out in the VFM section of this document.

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7. VfM Assessment**7.1 Introduction**

During the spring of 2005, **tie** prepared a preliminary qualitative VfM assessment of the option to procure the Tram via a PFI route making use of the SE draft Application Note on the use of the Treasury VfM Guidance in Scotland as then subsisted. Since then **tie** has:

- a) Completed a comprehensive **ETN Procurement Route VfM assessment** comparing the 'enhanced' procurement route being followed by **tie** to a PFI route. This analysis was prepared both quantitatively and qualitatively
- b) Determined that the conclusions drawn in a) are still valid in light of the truncation of the initial scope of the project.
- c) Developed a series of value for money risk transfer mechanisms to be implemented for the Vehicle and Infrastructure contracts which will, in **tie's** view, be effective in incentivising the private sector in a manner similar to PFI whilst minimising the funding costs and risk premia which might be borne by the public sector.

7.2 Procurement Route VfM Assessment – November 2005

- 7.2.1 On the advice and with the assistance of the SE (Transport Division and FPU) **tie** and its advisors completed an extensive **ETN - Procurement Route VfM Assessment** in November 2005. That paper (the 'Nov'05 VfM Assessment') compared the 'enhanced' conventional procurement route developed by **tie** with a PFI approach. The conclusions were as follows:

'Prima facie, there is a case for considering a form of PPP for the ETN, and retaining the option of private finance has been a feature of the development of the 'enhanced' conventional procurement route. However, a preliminary assessment of the qualitative tests included under Stage 2 of the VfM assessment together with examination of a number of wider factors, suggests that tie's 'enhanced' conventional procurement route appears capable of delivering similar levels of contractual risk transfer and potentially better VfM than an 'on balance sheet' PPP option with its associated higher cost of capital.

The quantitative analysis has been high level, making use of the HMT model, and this is reflected in the suggested weighting. However, the emerging evidence here also reinforces a conclusion that suggests that PPP may not bring sufficient benefits to outweigh the expected higher cost of capital as compared with the 'enhanced' conventional approach'

7.3 Continuing validity of Nov'05 VfM Assessment for a phased delivery

- 7.3.1 A phased approach to construction was expressly anticipated in the Nov'05 VfM Assessment, although the quantitative analysis was based on network configurations around Lines 1 and 2. During January and February 2006, CEC and SE have announced a joint in principle funding package which, subject to delivery of a robust Final Business Case, will deliver a proposed first phase of the tram system from Leith Waterfront to Edinburgh Airport. CEC retain the desire to include the section from Roseburn to Granton in Phase 1 subject to affordability and Business Case.
- 7.3.2 A phased approach to the procurement of the ETN has been **tie's** recommended approach. Whilst total funding availability remained to be finalised, the assumption in the paper was *'that any first phase is likely to be in excess of £200m'* in terms of capital cost.

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This represents a significant project both for conventional and PPP procurement. It is considered that marginal variation around this scale of project – as Phase 1 is finalised - should not materially alter the judgements...about the likely VfM of the alternative procurement routes.

Similarly, in terms of project characteristics, the scope of Phase 1 will also be, essentially, the same, whatever the precise definition: the procurement will still be focussed on the design, construction and maintenance of tram infrastructure in Edinburgh, with very similar risk profiles. Again therefore, it is considered that the absence of a precise scope for Phase 1 at present does not impact on the validity of the analysis in this paper.

For the purposes of the qualitative analysis, tie has therefore focussed on a project which may be either or both of Lines 1 and 2. The quantitative analysis...uses costing and other figures from the ETN Line 1 and 2 configurations. The results of the VfM analysis are consistent across all configurations.'

- 7.3.3 Consequently, both the qualitative and quantitative analyses remain directly applicable to the current proposed Phase 1 and the conclusions on both are unchanged. As the Assessment also makes clear, *'given the breadth and depth of qualitative analysis that has driven the formulation of [the] 'enhanced' conventional option, and the unique characteristics of the ETN...qualitative factors merit a significantly greater weighting and emphasis than quantitative'*.
- 7.3.4 The basis of the conclusions of that qualitative analysis was the essential similarity, in terms of proposed risk transfer and risk management approaches, between tie's 'enhanced' conventional procurement strategy and the PPP option. Both options would be based on a planned series of advanced contracts which directly reflect the lessons learned from previous (largely PFI) light rail projects, with the aim ultimately of facilitating a fixed price contract for the infrastructure, under which the private sector Infraco was responsible for the key risks associated with that infrastructure (construction, system integration, maintenance and continuing system availability) but which mitigated wholly or substantially the pre-construction risks which often carry large price premiums under PPP structures e.g. design, planning, land purchase/access and utilities diversions.
- 7.3.5 The management of these interlocking contracts, to establish the best possible 'platform' for a fixed price Infraco contract, is a challenge, but one that applies whether the Infraco contract is let under an 'enhanced' conventional or PPP framework. The level of expertise and experience that tie has assembled within the tram project team and the group of specialist advisors who form part of that team (including Transdev as the future operator) is a direct response to this challenge.
- 7.3.6 The case for the 'enhanced' conventional procurement strategy includes the assertions that tie has assembled the means to carry out its own 'due diligence' on all aspects of the project ahead of the Infraco contract, in effect, simulating the rigorous analysis of contractual and management arrangements that would normally be undertaken by the senior lenders under a PPP approach.

7.4 VfM aspects on tie's Enhanced Conventional Procurement

- 7.4.1 tie has endeavoured to develop a procurement strategy which transfers risk to the private sector whilst minimising the funding, management costs and risk premia associated with the procurement strategy, with the overall objective of obtaining the best overall value for money position. This has been encapsulated in what tie refers to as an 'enhanced' conventional procurement.

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- 7.4.2 This has been based purely on the objectives of maximising value for money, while effecting a sensible transfer of risk to the private sector, that the Infraco will be capable of managing. The proposed approach includes many of the risk management features that a Special Purpose Company undertaking a PFI project would put in place e.g. liquidated damages for late completion, bonding requirements for construction and operating contracts.
- 7.4.3 **tie** believes that the approach that it has developed delivers many of the benefits of a PFI without significant funding cost. **tie** recognises that more risk transfer could be achieved under a PFI approach, but does not believe that the additional risk transfer justifies the extra costs involved. In particular, **tie** believes that some of the benefits which arise from its enhanced conventional procurement approach are similar to those which are delivered under PFI. During the construction period the risk transfer under the 'enhanced conventional' approach is very similar to how a PPP company would transfer risk to its construction subcontractor.
- 7.4.4 The key differentiator, in risk transfer terms, between the two options is in the area of post commissioning maintenance. Under a PPP option, this would be transferred to the private sector for the duration of the concession agreement (usually 25-30 years) whereas under the 'enhanced conventional' approach (reference case) it is envisaged that this period will be much shorter - 6 years. However, it is **tie**'s intention to request variant bids for longer 15 year and 30 year maintenance periods, both to maintain flexibility and to test the value for money of the reference case.
- 7.4.5 The reasoning behind this is that private sector operators are likely to charge a significant price premium to accept the long term risk, given the lack of accurate information as to the extent and cost of long term maintenance, whereas it is far easier to predict these for a shorter period. Moreover, **tie** and its technical advisers consider that any inherent defects in the design or construction of a tram system will have a high probability of manifestation in the first 3-5 years of operations.
- 7.4.6 Therefore **tie** believes that a combination of bonding and performance related payments can provide the necessary incentives to the private sector to deliver the tram system on time and ensure its continuing availability throughout the 6 year maintenance contract period thus providing a high degree of assurance that the condition of the system at handover will be of a sufficient standard to attract a successor Infraco maintenance contractor and to safeguard continued performance of the system for an acceptable further period of the asset life. This would be achieved as follows:
- 7.4.6.1 *Timely delivery* - Payment to the Infraco during the construction period will be governed by a comprehensive 'fine grained' milestone schedule. The schedule will include clear and rigorous criteria for the achievement of milestones during testing, commissioning and acceptance of each element of the system. Should Infraco be late with the delivery of the tram system it would be liable to **tie** for substantial Liquidated Damages.. This Liquidated Damages amount would relate to the potential loss experienced by **tie**, arising from a mobilisation of operations prior to the system being available. The Liquidated Damages provision would be within an overall substantial Performance Bond which would be callable in the event of non-performance or abandonment by Infraco of its obligations under the Infraco contract. The Performance Bond would be released at service commence date (i.e. post commissioning completion).
- 7.4.6.2 In addition and as per PPP contracts, **tie** would require a Parent Company Guarantee ("PCG") from Infraco in respect of its obligations.
- 7.4.6.3 *Continuing availability* - it is intended that there will be a 6 year infrastructure (and vehicle) maintenance contract following on from the main infrastructure construction contract. Payments under this maintenance contract will be subject to satisfactory performance of the maintenance obligations, the test for which will be a mixture of output based e.g. the

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availability of the infrastructure on an ongoing basis, or input based e.g. against an agreed schedule of maintenance works. The exact requirements in this regard are still under development.

- 7.4.6.4 There will also be a Defects Rectification Bond to cover any post commencement date “snagging” items and any deficiencies highlighted by the “in-service testing period” which takes place over a significant period following service commencement. This bond will be in for a significant sum and will only be released upon completion of the 6 year maintenance period, including all snagging items and the satisfactory conclusion of the in-service testing.
- 7.4.6.5 Release of the construction period Performance Bond will be conditional upon the implementation of the Defects Rectification Bond. Alternatively, the Performance Bond could be structured so as to step down at service commencement and become the maintenance period bond.
- 7.4.6.6 Any failure to immediately take action to correct defects would result in the Defects Rectification Bond being utilised to make good the defects. A robust final handover condition survey (of both the infrastructure and the vehicles) will also be carried out prior to the expiry of the maintenance contract to ensure the medium term viability of the system and again any defects identified will require to be made good to avoid utilisation of the performance bond to fund the works required.
- 7.4.6.7 The above package of incentives could be structured differently to achieve the same level of risk transfer e.g. stepping down of the Defects Rectification Bond from a higher amount, replacement of the Defects Rectification Bond with a cash retention or continuation of the construction Performance Bond to cover a specific major defects liability and so forth. The finer detail of the incentive package will be further developed, discussed and agreed with CEC and SE prior to the completion of the Vehicle and Infraco tender documents.
- 7.4.13 **tie** firmly believe that the structure outlined above, or a variant thereof, will deliver the required risk transfer provisions to maintain a high level of incentivisation throughout the contract period. **tie** also believes that the cost of the incentives package will compare favourably to the cost of finance incurred in PPP projects. **tie** and its advisors are currently testing the market’s capacity for bonding lines and the pricing that might attach to the package being sought.

7.5 Alternative Approach: Short Term PFI

- 7.5.1 **tie** has considered an alternative approach to risk transfer which would entail private funding being raised through a approach similar to a PFI. The key differentiator of this approach from a conventional PFI would be that it would be for a relatively short period, construction plus six years. While a full PFI was not deemed to produce sufficient value for money, this examination was carried out to determine whether a shorter term arrangement with a PFI provider could reduce the funding costs.
- 7.5.2 The concept is that a PFI provider would provide the infrastructure on an output based payment basis. This would be for a period of six years after the initial construction period. Only part of the funding for the whole system would be provided by the PFI provider – perhaps 33% of the contract sum. This structure would transfer significant risk in terms of the operation and maintenance of the system during the key first six years of the project, when latent defect risk is most likely to emerge. In this way, the short term PFI approach delivers the benefits of the ‘Enhanced’ Conventional Procurement approach, and puts more of the Infraco’s money at risk.
- 7.5.3 However, having this additional money at risk increases the cost of this approach compared with the ‘Enhanced’ Conventional Procurement approach. Moreover, on closer inspection, this approach has some drawbacks which, taken together, make it less attractive and probably

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more difficult to implement than the Full PFI, an approach which has already been ruled out. The key drawbacks arising from the Short Term PFI Approach include:

Confused signals to the Infraco – A PFI is a purely output based solution, with handback of assets in the distant future. The Short Term PFI would marry a short term output based contract with handback which is relatively early in the life of the assets. This could create perverse incentives for the Infraco. For example, if in year 5 of the contract the Infraco has a damaged ticket machine, why replace it with one which it believes has the best whole life cost, if it can procure a cheaper model which will still be functioning at the end of the 6 year period? Dealing with interface issues like this would require unpicking of the basic, simple approach of a PFI, which would increase complexity and risk for both public and private sectors.

Potential Low Gearing Increasing Funding Cost – Lending banks analyse project risks on the basis of sensitivities carried out on the funding structure. In a conventional PFI with a 90:10 funding structure, banks can satisfy themselves on key sensitivities such as construction cost and time overrun, because there is sufficient cover over the life of the concession to absorb a shock at the start of the concession. With only a six year operating period, the Short Term PFI would need to have increased cover in each year to achieve the same overall level of cover. In order to achieve this, a relatively low level of gearing would be required compared with a conventional PFI – i.e. more equity and less debt. This low gearing would increase the weighted cost of capital of the project company, reducing the saving which arises from moving away from a full PFI.

Unusual Equity Investment Failing to be Attractive – The above analysis suggests that proportionally more equity would be required than under a conventional PFI. This equity may be difficult to source, because of the relatively short term investment period. While developers usually provide equity funding in PFI vehicles, often they will look to third parties (often investment funds) to source part of the equity. These funds are unlikely to be interested in such a short term investment because their stated focus is on long term investments, and they also wish to have the opportunity to recycle investments (which is also true for the developers). It will be difficult to sell on such investments in the market (because of their short remaining life), and as this will make the deal less attractive, it could increase the returns that developers look for on their equity.

- 7.5.4 All of the above suggest that the Short Term PFI option will be difficult for the market to price, and result in an expensive funding solution. **tie's** view is that the combined effect of the above issues makes this approach less attractive than a Full PFI. On this basis, **tie** does not intend to pursue the Short Term PFI option any further.

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8. Risk Management

8.1 Introduction

- 8.1.1 Appropriate risk allocation is fundamental to achieving value for money for the tram system. Risks are being allocated to the parties best placed to manage and/or bear them and can be used as the basis for an incentive to the private sector to help ensure that CEC's objectives for the project are met. The purpose of this section of the OBC is to address the following aspects of risk analysis:
- Types of risk that need to be considered from development to residual value for the tram system;
 - Extent of identification, analysis and management of risk undertaken;
 - Effect of **tie's** procurement strategy and intended risk allocation; and
 - Overall contingencies including Optimism Bias and their consideration in the Financial Model.
- 8.1.2 **tie's** approach to developing the Edinburgh Tram Network has been heavily focused on the identification and management of risk. The methodology applied to the risk analysis is set out in more detail below. **tie** have maintained a full register of risks identified in respect of the project throughout its development.
- 8.1.3 **tie** has developed a sophisticated approach to risk management. Central to this is the appointment of a Risk Manager, and the establishment of a comprehensive risk management process including both a highly detailed risk matrix for the overall project, and detailed risk matrices for individual contracts within the procurement strategy. These risk matrices have been used effectively to influence the development of the enhanced conventional procurement approach described in sections 6 and 7 above.

8.2 Background

- 8.2.1 The background to risk analysis in terms of historical risks affecting light rail schemes has been identified in various industry reports. Risk analysis for the Edinburgh Tram scheme can be traced to the original Feasibility Study published in July 2001 and continues on the project to date. Industry best practice and government guidance from HM Treasury, National Audit Office, Department for Transport, Audit Scotland and Holyrood Inquiry have been considered by **tie** during the development, to ensure the application of risk management best practice.

8.3 Project Risks

- 8.3.1 The risks to the scheme can be allocated to the following four principal risk categories contemporary classifications:
- **Development Risk** : design and development, scheme approvals and procurement of all scheme components and activities to be concluded prior to commencement of construction;
 - **Construction Risk** : advance works including utility diversion, main infrastructure construction, project management and commissioning related risks;
 - **Performance Risk** : standards and defects related risks occurring during and post-construction; and
 - **Operation Risk** : repair and replacement risks impacting the scheme during operation of the system (outwith DPOFA Operator risks).

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8.3.2 tie has identified the following key project risk areas to the infrastructure components.

Development Risk	Construction Risk	Performance Risk	Operation Risk
Failure to acquire land	Incorrect cost estimates	Competition	Legislative / regulatory change
Delays in obtaining planning permissions	Incorrect time estimates	Latent defects to infrastructure	Changes in taxation
Delays in obtaining Royal Assent	Unforeseen ground / site conditions	Performance of sub-contractors	Changes in VAT
Cost and delays due to utility diversions	Unforeseen ground / site conditions under existing buildings / structures	Default by sub-contractors	Incorrect estimate of maintenance costs
Poor contractual interface with vehicle suppliers and system integrators	Failure to build to design	Industrial action	Incorrect estimate of lifecycle costs
Failure to design to brief	Delay in gaining access to the sites	Failure of system integration	Residual value
Continuing design development	Responsibility for maintaining on-site security	Failure to meet performance standards	Service integration
Delays in advance works	Responsibility for maintaining site safety	Incorrect choice of tram vehicles	Wage inflation
Changes in design required by the Operator	Third party claims	Availability of tram infrastructure	Quality of equipment
Changes in design required by stakeholders	Compensation events	Relief events	Accidents
Insufficient powers	Delay	Force Majeure	Vandalism
	Force Majeure	Termination	Terrorism
	Termination	Failure to upgrade to new technology resulting in obsolescence	
	Legislative / regulatory change		
	Changes in taxation		
	Changes in VAT		
	Contractor default		
	Poor project management		
	Contractor / Sub-contractor industrial action		
	Adverse weather		
	Protestor action		
	Changes in inflation during construction		
	Incorrect time and cost for commissioning new tram		

STRICTLY CONFIDENTIAL & COMMERCIALY SENSITIVE**8.3.3 Impacts of Project Risks**

8.3.3.1 **tie** have maintained a project risk register to ensure ongoing management of risk. The following impact areas are noted for the principal risk areas of development, construction, performance and operations lifecycle stages of the proposed tram system.

	Capital Costs	Operating Costs	Revenue	Programme	Quality	Functionality	Approvability
Development Risk	✓	✓	✓	✓	✓	✓	✓
Construction Risk	✓			✓	✓		✓
Performance Risk	✓	✓	✓	✓	✓		
Operations Risk	✓	✓	✓	✓			✓

8.3.3.2 **tie** have assessed the multiple primary and secondary impacts of the identified project risk register entries. Although the impact of each risk is being assessed against these impact areas, it is considered that the primary potential impacts for consideration are in relation to capital expenditure, operating expenses and profit and achieving delivery programme. Each of the identified risks is allocated to the most appropriate team member, each of whom has the responsibility for developing and implementing a risk mitigation strategy.

8.3.4 Overall Project Risks

8.3.4.1 **tie** have recognised a number of overall project risks that require to be considered. These include the project affordability, approvability and market appetite, any of which could lead to suspension, curtailment or significant delays being imposed. **tie** has mitigated these risks through development of robust cost estimates and adopting a plan to phase the introduction of the Edinburgh Tram Network. **tie** considers that the submission of a robust Draft Final Business Case in October 2006 will significantly mitigate these 'development' risks.

8.3.4.2 **tie** have significantly mitigated risks affecting the quality of the scheme through regular consultation with the Planning Authority on the tram system. However, delay and cost increases due to planning requirements from scheme development will need to be managed during the detailed design phase. **tie** have further mitigated this risk through the development of a Design Manual that identifies principles of the tram system design, provides supporting design guidance and states the design requirements for the main tram components. This Manual has subsequently been adopted by the Planning Committee. **tie** will be additionally supported by the TSS Contractor whom will undertake assessment reviews to ensure SDS/Infracore compliance with project specifications. TSS is performing a significant risk mitigation role for **tie**.

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8.3.4.3 Service integration risk is significantly mitigated by the planned delivery of a TEL Business Plan. TEL and **tie** will consider the influence of other transport initiatives including CETM. The following risks will require to be managed throughout the contract period:

- Bus/tram integration;
- Development of Edinburgh Airport Rail Link;
- Waverley and Haymarket Station developments;
- Inclusion of CETM and other transport schemes;
- Ticket integration; and
- Future phases and potential future expansion of the system.

8.3.4.4 **tie** have identified a number of key areas with potential to delay the project programme (with consequential cost impact), which they must manage as follows:

- Failing to reach agreement with Network Rail;
- Land and property acquisitions and utility diversion (MUDFA) delays impacting the planned dates for commencement of Infraco activities;
- Weak communications between **tie** and the Scottish Executive;
- Delay in funding availability or affordability;
- Protracted Bidder negotiation;
- Obtaining planning permissions;
- Development of integrated service pattern for tram and bus;
- Archaeological finds;
- Lack of market appetite in the scheme;
- Competing local and national projects cause shortage of resources;
- Successful commissioning and obtaining licence to operate; and
- Lack of political will to implement the scheme.

8.3.4.5 As the Parliamentary phase comes to an end and construction of the tram takes place over the next four years of the project, the majority of the above risks that are inherent in the development and construction process occur over the first four years of the SDS/Infraco contract and will have been resolved or become actual costs by end of commissioning.

8.3.5 Risk impacts

8.3.5.1 Capital Costs

The most significant capital expenditure risks are in the areas listed below because the eventual cost is largely determined by third parties and may significantly impact the total outturn cost of the scheme. These risks have been significantly mitigated through the considerable amount of work undertaken to date by **tie**'s Technical and Land & Property Advisers to generate the robust costs and contingencies allowed.

- Finance charge costs if insufficient public sector capital;
- Utility diversion costs;
- Land costs associated with acquisition, temporary disruption during construction and compensation;
- Network Rail costs for interchange design, immunisation of equipment, possessions, compensation costs to train operating companies, information supply, liaison and development of agreement;
- Unforeseen ground conditions for currently accessible and inaccessible areas;
- Poor interface and integration management of the scheme;
- Compliance with Planning Authority requirements;
- Poor project, interface and integration management;
- SDS and Infraco resource shortages resulting in increased premia for staff; and
- Stakeholder initiated changes to the scheme specification.

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The main risks that have been analysed are those related to third parties. Of these the majority relate to Development and Construction risks. As the design, procurement of components, and construction of the tram takes place over the first four years of the project the majority of risks that are inherent in the development and construction process occur over the first four years of the SDS and Infraco contracts.

8.3.5.2 Operating Expenditure

The most significant operating expenditure risks which will require to be managed with the support of CEC are those set out below. It is noted that these have been significantly mitigated, but not eliminated, through proceeding with early operator involvement and the leading role of TEL in service integration planning:

- Inclusion of potentially loss making sections of route;
- Slower run-times than anticipated;
- Lack of priority to schemes in rail/road network with proposed transport developments;
- Robustness and detail of modelling along tram corridor;
- Compromised routing to satisfy objectors;
- Specification issues including staffing levels;
- Variability of global market conditions impacting on insurance costs;
- Long term increases in operating costs e.g. energy, labour escalation & insurance;
- Maintenance and lifecycle replacement costs; and
- Stakeholder initiated changes to the scheme specification.

As the Infraco contract is currently planned to be for 'hard' facility management services (e.g. heavy maintenance) only and the agreed early operator contract covers all the operating risks relating to 'soft' facility management (e.g. cleaning of vehicles), **tie** consider that these risks will be appropriately transferred to or shared with the private sector.

The lifecycle replacement and repair costs have been estimated by **tie**'s technical advisers. A private sector contractor would also have to estimate likely spend on lifecycle costs in pricing their bid. A major risk in this process is the underestimation of the risks for maintaining the tram infrastructure e.g. depot buildings. The consequences of estimating incorrectly at the start of process may mean that there is a recurring cost to the provider which renders the contract non-viable from their point of view leading to breach. This operation risk is present throughout the contract following the commissioning of a full or phased system.

8.3.5.3 Revenue

Robust revenue analysis for Line 1, Line 2 and a network of lines 1 and 2 has been conducted by **tie**'s technical advisers. Further development of the revenue estimates is necessary in the context of an integrated service network with Lothian Buses and the planned phasing of the project. The Joint Revenue Committee ("JRC") are responsible for supporting analysis of ticket integration and fare strategy for the purposes of the TEL Business Plan. Revenue yield has been shown to be both underestimated and overestimated in previous light rail schemes. The following key risks are being actively managed by TEL, **tie** and their advisers:

- Quality control and reliability of model development;
- Slower run-times than anticipated making the system less attractive;
- Compromised routing or stop locations to satisfy objectors;
- Lower level of bus/tram integration than expected including different revenue apportionment;
- Customer attractiveness including fare strategy;
- Emerging competitive responses from bus operators;

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- Loss of patronage to EARL due to competitive fare levels;
- Public response during early years (i.e. slower than planned ramp up in demand);
- Failure of ticket machines or vehicle breakdowns; and
- Unplanned long-term demographic, lifestyle or land use changes.

tie's advisors have additionally taken account of the above risks which have previously resulted in an overestimation of tram revenues on some other light rail schemes. The DPOFA is for the provision of operator services for 9 years post-commissioning, with a planned annual review of 'target revenue'. The timing of the above risks is annual throughout the operational period of the project.

Performance risk (i.e. the potential for deductions due to poor performance against a number of Key Performance Indicators) is passed to the provider and impacts monthly against payment of operating costs and revenue share.

8.3.6 Procurement Strategy Risks

8.3.6.1 The procurement strategy has number of features which will require close management

- Detailed programme to reach financial close;
- Novation of SDS and Vehicle contracts at Infraco appointment;
- Clarity of scheme definition for Phase 1;
- Default, expiry or early termination;
- Partial handovers and staged commissioning due to incremental construction;
- Calibration of payment mechanisms and potential retentions/compensations;
- Change control.

8.3.7 Deliverables to Support Risk Management

8.3.7.1 tie continue to hold risk management as a core value and have reflected this in the SDS, TSS and JRC Contracts which include obligations to provide the following risk management deliverables:

- **Project Risk Management Plan** to confirm the objectives, roles and responsibilities, definitions, risk management process and application throughout scheme development, procurement and construction phases;
- **Assumption Register** to record all capex, opex, lifecycle, revenue, programme, quality, functionality and approvability assumptions and consequent risks to the project throughout scheme development, procurement and construction phases;
- **Project Risk Register** to summarise all capex, opex, lifecycle, revenue, programme, quality, functionality and approvability risks to the Project and proposed mitigation;
- **Design Diligence Risk Report** highlighting those areas that do not meet our specification requirements, those that require substantial development, those that require some development but are largely satisfactory and those that meet or exceed our specification for each key system component. Report to consider commercial, safety and reliability matters;
- **Risk Progress Report** on status of risk management and mitigation indicating summary of new risks identified, new assumptions, key matters to be resolved and achievements;
- **Cost & Programme Contingency Report** indicating the recommended capital cost and programme contingency allowances to be considered;
- **Design Construction Risk Report** indicating the risks to be considered by Infraco during remaining scheme development and construction including construction sequence, construction methodologies, access, quality, approvals, security, safety, PR and compliance with Parliamentary Bill and Objector requirements;

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- **Design Operation Risk Report** indicating the risks to be considered by the operator during remaining scheme development, construction, commissioning and operational stages including maintenance, lifecycle replacement, quality, approvals including HMRI, security, safety, PR and compliance with Parliamentary Bill and Objector requirements; and
- **Revenue Risk Report** indicating the risks to overall PT and tram patronages and revenues (overall PT and 'target' tram revenue) including results of Sensitivity Analysis (including demographic changes, land use changes, aging population, tourism and business travel incomes, potential survey data errors, overall PT fare changes, tram fare pricing ranges, inflation, localised competitive response from bus operator, vehicle breakdowns, fare evasion, compromised bus/tram integration proposals, influence of Park & Ride schemes, early years ramp-up of tram revenue and model parameter assumptions) and risk-return and trend plots of PT and Tram market size from first (or consequent) 15 years of tram.

8.3.7.2 **tie** has held a series of risk workshops and one-to-one meetings with those responsible for mitigating project risks over the past years. Regular risk management meetings and workshops are proposed during the planned development and construction phases. The allowance for this in supporting the above deliverables has been and will be included in all service provider remits.

8.3.8 Insurable Risks

8.3.8.1 **tie** has developed a schedule of potentially required insurances for the main stages of the project lifecycle in conjunction with Heath Lambert Group, their insurance advisers, as follows. The final decisions on the tram insurance portfolio including scope, cover and deductible will be subject to value for money, affordability and overall risk appetite of the parties concerned.

Development	Construction	Operational
<ul style="list-style-type: none"> • Employer Liability • Head Office Insurances • Professional Indemnity for Design & Construction 	<ul style="list-style-type: none"> • Employer Liability • Head Office Insurances • Professional Indemnity for Design & Construct • 3rd Party Liability ** • Cargo inc Loading and Unloading ** • Construction All Risks ** • Contractor Plant & Equipment • Delay in Start-Up inc Suppliers Extension ** • Environmental Impairment Liability • Goods in Transit ** • Material Damage ** • Motor • Offsite Storage ** • Products Liability ** 	<ul style="list-style-type: none"> • Employer Liability • Head Office Insurances • 3rd Party Liability ** • Business Interruption (including Customer & Utility extensions) ** • Continuing PI until expiry • D&O • Defects Liability under CAR ** • Employee Benefits • Engineering • Fidelity Guarantee • Material Damage ** • Money in Transit • Motor RTA

*Insurances marked "***" will be bespoke project covers.*

8.3.8.2 The construction phase would include manufacture, supply, construction and testing. Traditionally it was the approach even on major construction projects such as the Tram Project for the contractors to insure, or the main contractor to insure on behalf of all. If left to the contractors to insure, **tie** would receive a patchwork quilt of different policies provided by your individual contractors that would each expire on the contractual completion date of the individual contracts (or worse, be annually renewable). This would leave **tie** or Transdev with a complicated problem of gradually insuring or being responsible for all handed over contracts

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until a permanent insurance programme can be put in place. This would especially be the case where different works packages are let.

- 8.3.8.3 However it is common nowadays that a project of this type is covered by a project-specific bespoke Policy Wording that would be negotiated between the broker and his client, in this case **tie**. This has been the case for the last ten or more years, driven to an extent, but only partially, by the growth in concession projects. If **tie** were to insure the whole project, **tie** would therefore receive consistency of cover throughout the project period and would receive the benefit of one expiry date that would dovetail in with the start of operation of the Project.
- 8.3.8.4 It is **tie's** strategy to adopt an Owner Controlled Insurance Programme (OCIP) route. **tie** proposes to make this decision to allow this to be reflected in key contracts. The OCIP strategy has been successfully used on the majority of UK Light Rail Projects. Dockland Light Railway including all its extensions i.e. Bank, Beckton etc, Manchester, West Midland, Sheffield, Croydon, Nottingham and Dublin were all insured using the OCIP approach. Croydon also included the first two years of operational insurances within a five year project programme, which may be achievable.
- 8.3.8.5 OCIP Insurance has also become the popular choice of many owners including BAA generally and specifically for Terminal 5, London Transport's Jubilee Line, London and Continental Railways for the Channel Tunnel Rail Link and Network Rail for the West Coast Main Line refurbishment. Evergreen 2 (Laing Rail), the first Design Build Finance and Transfer rail project, which is currently being constructed, is insured by an OCIP programme.

8.3.9 Terrorism and Security Risks

- 8.3.9.1 **tie's** advisers have recommended that an investment in security systems is set aside as part of the overall approach to system security including CCTV coverage to evidential standards for all stop platforms, passenger emergency/help points linked to an Operations and Control Centre (OCC) together with public telephone facilities and appropriate levels of illumination via dedicated lighting. Estimated tram vehicle costs assume provision of CCTV coverage to evidential standards, passenger/driver communication facility and driver radio link to the OCC. Allowances are included within Signalling and Communication estimated costs for an automatic vehicle recognition system linked to the OCC.
- 8.3.9.2 **tie** recognise that the confidence in the security of the tram system will have a direct relationship to the overall quality of the system and therefore potential patronage. **tie** appreciate that the risk of terrorism exists both during construction and operation. However, it should be accepted that the tram could continue to operate, albeit in a reduced capacity, if part of the line or depot were damaged due to a terrorist event.
- 8.3.9.3 Under DPOFA, terrorism is treated as a Force Majeure event, however the operator is contractually responsible for the security of system operation including incident management and security management under plans which are presented to and agreed by **tie** prior to system commissioning. **tie** will define the extent of duties for the system including any requirements for anti-terrorism detection equipment or special terrorism risk reduction measures and build them in, if necessary, to the operating function.
- 8.3.9.4 Physical measures to protect the infrastructure, vehicles, interchanges and depot(s) will be a question of the supply requirements set by the output specification for the tram vehicle and infrastructure contracts, including, the responsibility of the infrastructure provider to carry out system surveillance.
- 8.3.9.5 **tie** are considering the merits of insuring key tram assets to provide Material Damage and Business Interruption coverage arising from the specific peril of Terrorism. However, it is recognised that these covers have a large deductible and relatively low cover relative to the premium and may not be available to the sector at the time of placing.

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8.4 Risk Contingencies**8.4.1 Specified Capital Contingencies**

Cost estimates have been built up from cost consultant inputs from **tie**'s technical advisers with contingency estimated on each element of the costs based upon perceived risk of the respective elements.

The consultants allowed between 10-18.5% contingency for each principal element of costs. Detailed analysis of individual cost items have been undertaken by the cost consultants with experienced in delivery of tram projects. The degree of risk in each element of the scheme is reflected in the allowance made.

8.4.2 Cost and Programme Management

The SDS and Infracore contractors are required to produce and report on a cost loaded programme to facilitate control, management of progress and direction towards critical activities. The visibility of budgets and resource loaded programmes will be used to monitor earned value.

The 'concept' design of the scheme has been prepared in developing submissions for Parliament. The SDS Provider is now further developing the scheme design over three distinct stages, namely, outline requirements, preliminary design and detailed design. At each of these stages **tie** has '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.

The SDS contractor is designing within the agreed parameters instructed by **tie** in accordance with the Design Manual and Detailed Specification and early agreement with the Planning Department. 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 delays and to mitigate this **tie** have identified critical activities such as design, approvals and consents to be scheduled at an early stage of the programme with the early appointments of the SDS and TSS to assist in this mitigation. The current programme has an element of float related to key activities. This degree of flexibility allows 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 real time analysis of programme activities.

8.4.3 Optimism Bias Contingencies

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.

Reduction in Optimism Bias has been recorded in the progress to manage each of the individual 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 identified project risks.

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The specified contingency to capital expenditure estimates of the tram system is approximately 10%. It is concluded that current estimates of Optimism Bias would increase the base costs by an additional 14%.

tie's technical advisors have carried out a QRA validation of the potential maximum increased capital cost from the project risk register to confirm the potential extent of Optimism Bias. **tie** will continue to develop this exercise further in conjunction with SDS and TSS.

8.5 Risk Allocation

The development of the enhanced conventional procurement route is 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.

The Risk Allocation Matrix for the enhanced conventional procurement route 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.

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 are using experience from previous tram schemes and the proposed risk allocation as a basis for settling contractual provisions where appropriate.

In the development of the 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.

8.5.1 Allocation during the Development Period

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 identified in section 6 comprising:

- Technical Support Services (**TSS**)
- System Design Services (**SDS**)
- Joint Revenue Committee (**JRC**)
- Multi Utility Diversion Framework Agreement (**MUDFA**).

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In addition, **tie** will be advised by the operator, Transdev 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	MUDFA 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 have benefited 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.

Ultimately, the SDS Contractor is responsible for planning applications being appropriate for the scheme, and there are sanctions under the SDS Contract for poor performance. However, the fundamentals of the success of planning applications 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 process must remain at least partially with the public sector, albeit with the majority of financial risk of increased costs passed to SDS and/or Infraco.

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 Infraco 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 a design failure would be borne by the public sector. **tie** will manage and mitigate this directly with the help of TSS.

Risk for the execution of utilities diversions will be transferred under MUDFA. The scope of work 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** will carry out detailed survey works under SDS to get a firmer view of the quantity of works to be required. This will provide the benefit of information to allow greater certainty to MUDFA.

Should MUDFA fail to complete in time to allow Infraco on to the site, then the public sector will be responsible for delay to Infraco works. **tie** will mitigate this risk by incentivisation of the

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MUDFA 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 Transdev 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 MUDFA contractor in the 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.

8.5.2 Allocation during the Construction Period

The financial risk that the Infraco contractor will be exposed to is the amount of money that it has expended, less the amount it has been paid, along with any bonding requirements. It is intended that payment will be against fine-grained milestones and subject to the achievement of those milestones there will not be a large exposure for the contractor based on the difference between income and expenditure on the contract. The specific proposals for the payment mechanism under the Infraco contract are given in section 7.

Risk Allocation During the Construction Period				
Category	Risk	Public Sector	Infraco Contractor	MUDFA 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		✓	

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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. However, a significant failure in the design would be more effectively transferred to the Infraco contractor following novation.

Utilities Diversion - As discussed above the risk associated with utilities diversion 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 they will be complete in key areas), the risks on these works will be carried by the public sector.

Construction risks – The strategy will transfer all of the typical risks transferred under a construction contract.

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. Under the enhanced conventional approach these will be transferred to the private sector by the institution of a robust regime of acceptance tests aligned to the payment mechanisms described in section 7.

Contractual risks – 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 the SDS and Vehicle contracts to the Infraco contractor.

Financial risks - If significant supply cost increases emerge these will be for the Infraco contractor to absorb.

8.5.3 Allocation during the Operating Period

Under the enhanced conventional procurement approach, **tie** will seek to manage the infrastructure risks during the operating period based on contractual obligations as described in section 7.

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 under the terms of a pain/gain mechanism. Maintenance and latent defect risks are key risks which will be effectively transferred under the payment and incentive mechanisms described in sections 6 and 7. Allied to these are risks associated with the

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supply chain and failures in warranty provision (e.g. due to bankruptcy of original subcontractors). It is intended that the Infraco contractor will bear not only the costs of correcting defects but also to an element of loss of income during the period during which the system is unavailable.

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 during the time it has a commitment to the project.

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

8.6 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.

8.6.1 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. However, **tie** has significantly mitigated the risk of operator requested change through the early involvement of Transdev through the DPOFA.

As discussed above, four potential risk areas remain with CEC relating to land, 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 tram with details of the consequential elements of management, design, procurement and construction activities that will effectively **de-risk** the main infrastructure contract.

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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 Infraco
Refine Revenue Projections	JRC – assessor and estimator of revenue generation from the operating tram network
Control of Infrastructure Cost Risk	SDS - 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/MUDFA Diversions - Advance design and utility single framework diversions
Select an appropriate Tram vehicle	Vehicle manufacture, design and maintenance contract(s) 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. The Infraco contractor's role as integrator for the system means that significant elements of the project risk will transfer to it.

8.6.2 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 work packages. 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 the early involvement of SDS through all the planned phases of project development.

tie is mitigating the risks associated with the development of the 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; engaging with Network Rail and Public Utility providers; and development of integrated service strategy with TEL.

tie's has mitigated the risks associated with the potential market interest for the construction of the tram system by undertaking market sounding with potential Infraco consortia members and has commenced enhanced revenue model development; development of an integrated service plan with Lothian Buses; commencing early design of critical areas of the system to achieve greater price certainty; engagement with the Planning Department; procuring advance survey works under SDS; and development of contract documentation for MUDFA.

tie's focus is now the commencement of the MUDFA contract; preparation of the Vehicle and Infraco contract documentation; and challenging the constructability of the scheme.

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9. Management Arrangements and Governance**9.1 Governance****9.1.1 Background**

The governance structure which is now operational fully incorporates all relevant entities. There are three principal dimensions to be considered:

1. Design of an effective governance and decision-making structure, which reflects clear project roles and responsibilities
2. Legal compliance and effectiveness – competition law, procurement regulation and contractual structure
3. Tax efficiency

The first is the primary feature, providing stakeholders and the construction market with confidence of delivery, but the other two dimensions must be handled carefully to avoid risk.

9.1.2 Governance structure

The structure has the following key features:

1. TEL has been instructed by CEC to take responsibility for delivering a fully-integrated system, including arrangements with **tie** as the party responsible for delivery of the tram system. TEL's responsibilities include acting for CEC in wider transport planning matters to optimise the value of the integrated system.
2. **tie**'s responsibility is to deliver the tram project behalf of CEC. The documentation of these services is embedded in the project programmes. **tie** is CEC's "in-house provider" of these services and continues to execute design, procurement, funding and delivery of the tram system (collectively "tram delivery"). The **tie** Board's responsibility is to ensure that **tie** fulfils the requirements of CEC in delivering the project. **tie** will be the contractual counter-party for all contracts through to commencement of operations, at which time the Infracore contracts will be novated to TEL.
3. The TEL Board is the primary governance mechanism. TEL Board meetings generally comprise the following principal strands :
 1. Development of the TEL Business Plan and Tram Business Case
 2. Tram Project Delivery
 3. Related Tram Project matters – external communications, safety, third party operators
 4. TEL transport strategy and related project activities
 5. TEL statutory matters

In addition to TEL Board members, relevant management and stakeholder representatives are invited to attend TEL Board meetings regularly for items 1-3.

The full continuing commitment of all parties to the TEL decision-making process is needed. However, the formal decision-making involves only the directors of TEL; other parties are technically in attendance only. Delegated Authority Rules govern the work of **tie**'s Tram Project Director and team. These rules include all forms of change control, including those requiring input from CEC.

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4. The preparation of the TEL Business Plan is fully coordinated with the production of the Business Case needed to support contractual commitment to tram construction and vehicles in mid-2007.
5. The TEL Board's authority will be executed on a day to day basis by the TEL CEO. The practical approach to the coordination and preparation of the TEL Business Plan and the Business Case is set out in the detailed programmes which capture the workstreams, deadlines, persons involved and leadership responsibilities. The TEL Board will also have sight of the business case as it develops and will have final approval over the entire document. A committee of the TEL Board will be formed, led by the TEL Chairman or his designee, to act as a regular forum to review progress, resolve issues and generally offer guidance to the Tram Project Director and individual workstream leaders. The committee is intended to act as a filter on behalf of the TEL Board, to ensure that matters are thoroughly addressed, in most cases aiming at a recommended course of action for the full TEL Board's approval.
6. Transdev continue to provide services to **tie**, under the DPOFA. This will include significant input to both tram delivery and to the TEL Business Planning process. At (or just before) commencement of operations, the DPOFA would novate to TEL.
7. The majority of work over the balance of calendar 2006 is likely to fall within the business planning process described in paragraph 4 above. However, there are a number of areas which are likely to be best executed as direct management responsibilities of TEL during this period. Examples could include Commercial & Legal, Stakeholder Interface & Management especially with CEC, Communication & Marketing, Pricing, Customer Matters and handling interfaces with third party operators. A further important dimension is the development of TEL's role in a wider strategic context including complementary capital investment such as park and ride schemes and interchanges. TEL will not initially employ a management team, except for its CEO. All management and other resource is initially provided by LB and **tie** (supported by Transdev). This will ensure best use of existing expertise, and will avoid duplication of people, process and cost. As TEL develops, additional people for specific roles will be required. The speed and nature of this development will be a matter for the TEL Board.
8. The composition and structure of the **tie** Board and its governance processes will continue broadly as it is now. In relation to the tram project, the **tie** Board has a responsibility to ensure that **tie** Limited, through the Tram Project Director, fulfils the requirements of CEC in delivering the project.
9. LB continues as bus operator.

9.1.3 Board responsibilities

The Boards of **tie**, LB and TEL have fiduciary duties to their shareholders and to creditors. The fiduciary duties extend to proper stewardship of each company. In view of the integrated nature of the activities of the three companies, it seems that the actions described above can fit with the concept of proper stewardship, because each entity has clearly defined responsibilities, which will be approved by its shareholder.

The most fundamental responsibility is financial stability. At present, **tie** is properly funded and has specific budget allocation to handle anticipated TEL spend in the current 2005-6 year. Costs already picked up by LB can be reallocated. If the activities of TEL are focussed on service integration as outlined above, subsequent funding awards for 2006-07 from SE (and partly from CEC) will cover the costs.

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9.1.4 Legal and taxation considerations

The underlying corporate structure and the anticipated governance responsibilities are believed to be fully compliant with all relevant legislative requirements and do not create any taxation difficulties.

9.2 Tram Management Team**9.2.1 tie Resources Deployed on the Tram Project**

The assembly of a high quality integrated management team has been essential in preparation for the successful implementation of the Tram project in terms of costs, quality and timescale. The formation of a highly competent and experienced team is a necessary prerequisite for the successful execution of the advanced conventional procurement strategy being followed by **tie** and the active management of risk that entails.

The organisation chart for the **tie** tram team is provided at **Appendix II** and reflects the resources that **tie** currently anticipates employing directly during the period up to financial close. This team structure has been developed based on the requirements of the Edinburgh project and hands-on experience from other UK projects. The conclusion in management terms is that an in-house management team is the correct way to resource this complex project offering the advantages of knowledge retention, flexibility and control. This facet is reinforced by Ian Kendall's ability to source experienced and skilled managers with expertise which is specifically relevant to the project. Informal soundings to parties knowledgeable about the English schemes have confirmed that the team structure and cost is in line with that experience, allowing for important differences in the projects.

The resources allocated directly to the tram project are fully supported by the Executive Board and central service function of **tie** limited.

Most of the key internal resources necessary to manage the development and implementation of the project are now either **tie** employees or engaged on a consultancy basis. The organisation chart also reflects that key resources may also be sourced under the TSS contract in the areas of safety, environment, quality, utilities, planning approvals and land and property acquisitions. The choice of source of resource is governed by a range of factors including the amount of time the resource will be required for, the availability of specific expertise in the market to meet the requirement and the relative cost of each methods.

The tram team at **tie** is organised into 5 functions as follows:

- **Commercial & Contracts** – Procurement (including contract preparation, prequalification, invitation to tender and tender assessment), commercial negotiation in respect of new contractual appointments and any variations to existing contacts and project controls including estimating, budgeting, programme management and procedures. (TSS and contractors utilised on procurement management including technical analysis of submissions for prequalification and tender submission, continuing development of project management procedures, including health, safety, quality and environment, and provision of project control resources) .
- **Project Development** – Project design under the SDS contract, consents (including planning approvals and Traffic Regulation Orders) and detailed modelling under the JRC contract. The Tram administrative resources also report through this function. (TSS and contractors utilised on traffic management and management of the design for track, architecture and landscape, highways, overhead lines and power. Technical resources to

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monitor method, progress and delivery of modelling and patronage/revenue forecasts under JRC).

- **Construction** – Utility diversions (MUDFA) and construction planning for Infraco. (TSS and contractors utilised on planning and design management for utilities, interface with Network Rail, management of construction of utility diversions and in the lead up to financial close the assembly of the construction management team for the Infraco and Vehicles contracts).
- **Land and Property** – All deliverables pertaining to the acquisition of land and property, compensation matters and property related agreements including operation of protocols with CEC relating thereto.
- **Finance** – Delivery of all Business Case and funding material through **tie's** central Project Finance group.

The tram team is managed by the Tram Management Group comprising the Project Director Trams, Deputy Project Director Trams, the heads of each of the functional groups above and **tie's** head of PR and Communications.

9.2.2 Legal, Financial and other advisors

DLA continue to provide primary legal support to the procurement process and delivery of contract documentation. Dundas & Wilson are now providing extensive medium term legal support in specific areas such a Traffic Regulation Orders and land and property related transactions.

PricewaterhouseCoopers continue to provide financial advice in respect of the procurement process and Business Cases. PR & Communications consultancy is provided by Weber Shandwick. **tie** also continues to work closely with Partnerships UK on a consultancy basis.

9.2.3 Accommodation

A highly integrated design review process is seen as essential for the successful mitigation of risk throughout the design process and thereafter during the construction of the project. Learning from the initial period of activities under the TSS and SDS contracts, the Tram team has resolved that this can be best managed by the co - location of TSS resources with SDS resources and the appropriate **tie** management staff and has entered into a lease on appropriate office accommodation for 90+ staff and contractors. An element of the costs is to be reimbursed by SDS is currently under negotiation.

9.3 tie project management procedures applied to the tram project**9.3.1 Project Management Procedure**

tie's Project Management Procedure comprises **tie's** Project Management Policy, The Project Stages (The Project Lifecycle), The Project Management Processes, generic activities and deliverables to be carried out at specific project stages e.g. Project Registry Document (PRD) and Stagegate Checklist and a series of protocols including, critically, that for the Management Of Change.

The purpose of the **tie** Project Management Procedure is to introduce a formal methodology for managing projects which will build on the experience and knowledge of **tie's** professionals to achieve excellence in project management (meeting the project objectives and achieving the benefits within agreed constraints), demonstrate good practice to clients and external parties and develop and implement a consistent approach to the management of projects.

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9.3.2 Project management process

Project risks can be managed by applying a common set of project management techniques that guide the structuring and execution of the project. These Project Management Processes as applied by **tie** are:

1. **Risk Management:** A project is subject to more risk than a continuously-running business process, and it is often the case that the more valuable the objective, the higher the risk. However, experience shows that risk can be managed, and projects can succeed despite numerous pitfalls, if the right techniques are used.
2. **Scope Management:** One risk is so important that it is treated as a separate area of project management: the risk that the project objectives might change. Nobody would dream of changing the terms of reference of a business unit without considering the consequences, but in projects, it is surprisingly difficult to spot that the terms of reference have changed, and to respond appropriately to that change.
3. **Monitoring and Control:** The time, resources and money set aside to carry out a project are finite, and the number of tasks to be done is large at the outset, and can get larger as the project unfolds unless there is active monitoring and control. The key to this process is to monitor actual progress against the planned progress. This will help the Project Managers understand the true status of the project, and also to help them focus their attention on the most critical areas.
4. **Planning:** Planning lies at the heart of project management. A plan is a description of how we intend to reach an objective; it not only says that we will do something, it also explains how we will do it. A plan can be narrative or graphical, depending on its specific use.
5. **Day to day administration:** The day-to-day tasks of project management involve administration tasks such as running meetings and keeping records. This includes recording project costs, establishment and management of a project file, and setting purchasing authority guidelines. Doing these things properly minimises the time that must be set aside for them and reduces the potential for further wasted time through misunderstandings.
6. **Organisation and Team:** Projects entail setting up the team that will do the work, and it is important that the right people are available at the right time. Furthermore, there will be new people who must be involved and whose support is essential on each new project. There are two distinct parts: Firstly you must define the roles and assign responsibilities to those involved in the project (e.g. sponsor, project manager, programme board, team members, support office, stakeholders, end-users and external suppliers. Thereafter, the team has to be managed, and people issues will then come to the fore.

9.3.3 Management of Change Protocol

This protocol covers two key 'change management' issues and introduces the following mandatory actions:

- When **tie** or the project Sponsor wish to alter the scope and / or modify an agreement or final approval, this change management protocol ensures that all relevant parties are aware of the implication of the change, that the change is properly considered, and that final outcome is recorded. This is particularly important when project stages overlap.

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- When **tie** or its advisors require to change the scope of a particular contract, this change management protocol ensures that the proposed change is properly considered and that the final outcome is recorded. This is important as change often affects project cost.

Throughout the life of the project (including the design work under the SDS contract) any changes to the project in terms of scope, programme, cost (capital and operating costs) and anticipated revenues will be proposed, analysed and approved in accordance with **tie's** Management of Change protocol. All **tie's** advisors (including the SDS contractor) and CEC will need to comply with this procedure throughout the design process.

Proposed changes to the baseline scope and cost of the Tram may come from a number of sources. This will include those which may be initiated by CEC as part of the planning approvals process and those that may be initiated by the SDS contractor as an output from the evolution of design.

In all cases a Change Request is required which will require to justify the change in terms of why it is necessary for meeting the overall objectives of the project in terms of quality, functionality, programme and commercial viability of the Tram. **tie** evaluates Change Requests with a firm view on the need to prevent "cost creep" and with a view to management of the capital costs of the project within budgetary constraints.

The register of Change Controls and a report on the more significant changes proposed is included in the monthly Tram Progress Report.

Glossary

BAFO	Best and Final Offer
BAPA	Basic Asset Protection Agreement
BSA	Basic Services Agreement
Capex	Capital Expenditure
CEC	City of Edinburgh Council
CETM	Central Edinburgh Traffic Model
DAM	Detailed Assignment Model
DfT	Department for Transport
DLR	Dockland's Light Railway
DPOFA	Development Partnering and Operating Franchise Agreement
DSA	Development Services Agreement
EARL	Edinburgh Airport Rail Link
HMRI	Her Majesty's Rail Inspectorate
Infracore	Infrastructure and Equipment Company
ITI	Integrated Transport Initiative
ITT	Invitation to Tender
JRC	Joint Revenue Committee
KPI	Key Performance Indicator
LB	Lothian Buses
LRT	Light Rapid Transit
LTS	Local Transport Strategy
LUTI	Land-Use and Transport Interaction
NAO	National Audit Office
NR	Network Rail
OBC	Outline Business Case
OFT	Office of Fair Trading
OGC	Office of Government Commerce
OJEU	Official Journal of the European Union
Opex	Operating Expenditure
PFC	Preliminary Financial Case
PFI	Private Finance Initiative
PIN	Preliminary Information Notice
PP	Protective Provisions
PPP	Public Private Partnerships
PT DAM	Public Transport Detailed Assignment Model
PU	Public Utilities
PUK	Partnerships UK
RPI	Retail Price Index
SDS	Systems Design Services
SE	Scottish Executive
STAG	Scottish Transport Appraisal Guidance
TEL	Transport Edinburgh Limited
the Executive tie	Scottish Executive tie Limited
TSS	Technical Support Services
VAT	Value Added Tax
VFM	Value For Money

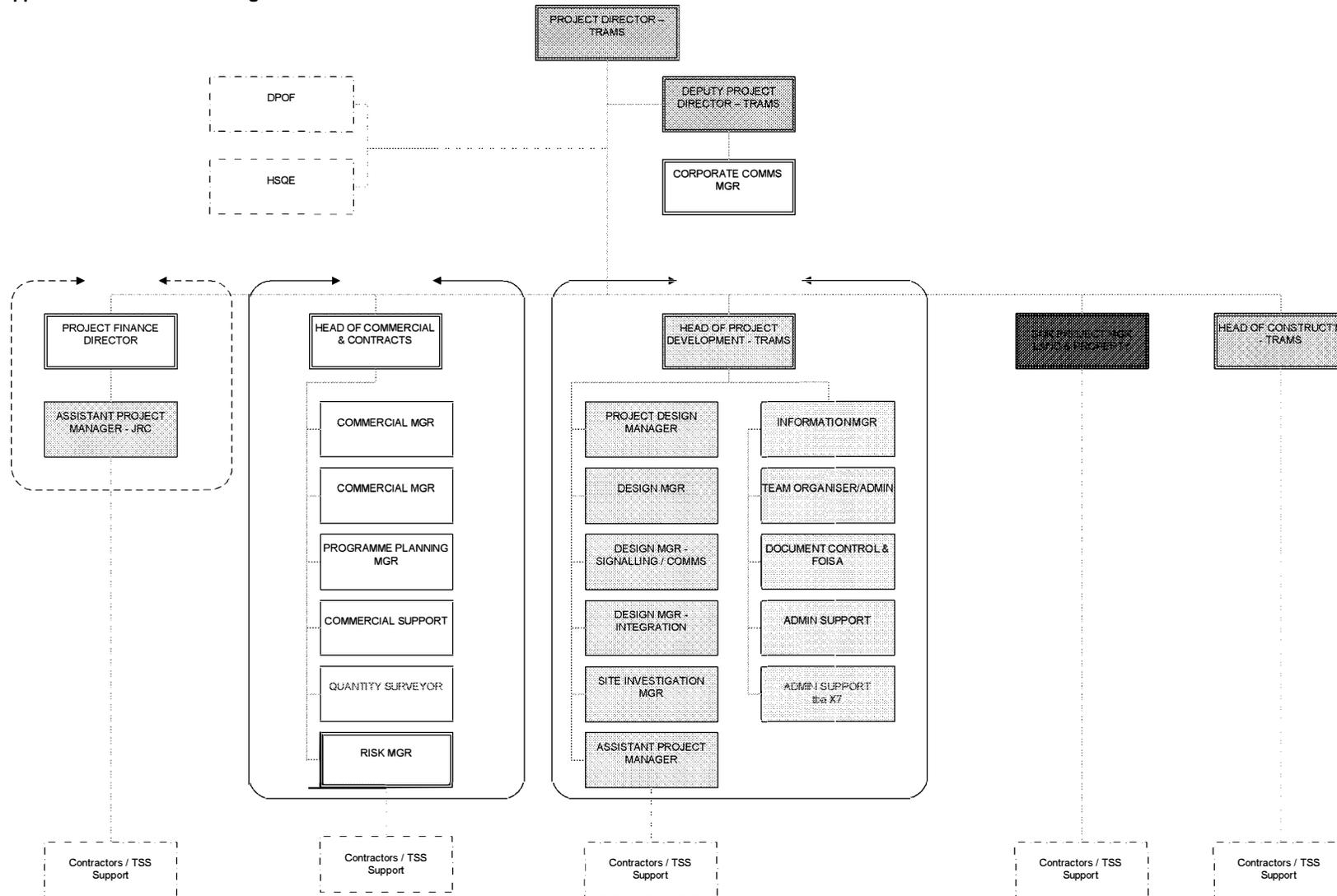
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Appendix I - Programme

SEE SHEETS INSERTED

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Appendix II - tie Tram team Organisation Chart



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Appendix III - Tabulation of Funding requirements from April 2006 to June 2007

£000s	05/06 FORECAST				APRIL 06 - COMMENCEMENT OF UTILITY DIVERSIONS (DEC 06)										JAN 07 - FINANCIAL CLOSE (JUN 07)						Yr to Mar 07	15 mnth total				
	Cum	Month	Month	Yr	Month	Month	Month	Month	Month	Month	Month	Month	Month	Month	Month	Month	Month	Month	Month	Month			Month	Month	Month	Month
	Jan-06	Feb-06	Mar-06	06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	9 mths Total	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07			6 mths Total	Mar 07	total	
IMPLEMENTATION																										
1 tie RESOURCES	2,208	222	668	3,098	289	288	287	288	288	293	293	293	294	2,612	294	292	293	295	295	295	1,765	3,491	4,377			
2 DPOF	322	40	40	402	60	60	60	60	60	60	60	60	60	540	60	60	60	60	60	60	360	720	900			
3 LEGALS	760	231	225	1,216	304	269	223	221	221	211	209	209	209	2,072	191	191	191	191	191	191	1,146	2,645	3,218			
4 SDS	1,800	690	1,310	3,800	2,261	2,015	1,128	981	721	1,021	1,139	1,229	983	11,478	850	838	760	605	725	762	4,540	13,926	16,018			
5 JRC	420	91	106	617	168	143	98	59	79	49	16	12	14	638	41	17	40	5	5	5	113	736	751			
6 TSS	870	264	376	1,510	382	410	420	445	448	450	338	341	351	3,585	352	356	360	359	372	372	2,172	4,654	5,757			
7 UTILITIES	21			21																						
8 DESIGN SUPPORT	285	9	9	303																						
9 3RD PARTY NEGOT																										
10 LAND & PROP	118	11	11	140	8	8	8	8	8	8	8	8	8	72	8	8	16,258	8	8	16,258	32,548	16,346	32,620			
11 TROs	1			1																						
12 COMMS / MKTG	87	4	4	94	43	36	39	36	56	59	76	66	49	461	46	46	46	53	53	53	297	600	758			
13 TEL	17	3	3	23	65	65	65	65	65	65	65	65	65	585	65	65	65	65	65	65	390	780	975			
14 SERV INTEG PLANNING	80	10	20	110	30	30	30	30	30	30	30	20	20	250								250	250			
15 PUK	71	5	5	81	6	6	6	6	6	6	6	6	6	54	6	6	6	6	6	6	36	72	90			
16 FINANCIAL ADVISORS	189	30	22	241						20	20	20		60					20	12	32	60	92			
17 INSURANCE	29			29	52	2	2	2	2	2	930	2	2	994	2	2	2	2	2	222	230	999	1,224			
18 CONSTRUCTION			50	50	90	90	90	120	240	300	5,070	130	130	6,260	4,520	3,600	3,610	3,630	4,360	4,380	24,100	17,990	30,360			
99 OTHER	19	5	5	28	5	5	5	5	5	5	5	5	5	45	5	5	5	5	5	5	30	60	75			
SPECIFIED CONTINGENCY		161	285	447	376	343	246	233	223	258	827	247	219	2,971	644	549	2,170	528	617	2,269	6,776	6,333	9,747			
IMPLEMENTATION TOTAL	7,297	1,774	3,140	12,211	4,138	3,770	2,707	2,558	2,451	2,836	9,092	2,712	2,414	32,678	7,084	6,035	23,866	5,812	6,784	24,954	74,534	69,663	107,212			
PARLIAMENTARY - TL1	2,034	203	219	2,456																						
PARLIAMENTARY - TL2	1,414	139	149	1,702																						