

## Edinburgh Tram Final Business Case

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The City of Edinburgh Council

25 October 2007

### 1 Purpose of report

- 1.1 To seek approval for the Final Business Case version 1 (FBCv1) for the Edinburgh Tram Network.
- 1.2 To explain the remaining steps in the procurement for the tram project up to financial close.
- 1.3 To note that a separate report is being presented to the Council which will set out the result of **tie**'s tender evaluation, for the supply and maintenance of the infrastructure works (Infraco) and tram vehicles (Tramco), and give recommendations on the preferred bidders for each of the contracts.

### 2 Summary

- 2.1 This report starts by reviewing the history of the development of the Tram project, highlighting important landmarks, including pertinent past decisions of the Council, leading up to the final contract awards that are the subject of this report.
- 2.2 The report reiterates the vital role trams have to play in supporting the growth of Edinburgh while protecting and enhancing its unique environment.
- 2.3 An overview of the Tram Final Business Case version 1 (FBCv1) is presented before capital cost and the affordability of the Tram project are set out and the revenue implications of Tram explained, showing that the assumptions in the Draft Final Business Case (DBFC) hold good for the FBC. Additionally the benefit cost ratio (BCR) for Phase 1a has improved to 1.77. This ratio improves further to 2.31 with the addition of Phase 1b, which is a very high ratio compared to many rail projects, (for example the Waverley Line of 1.3). The improvement is due to the cancellation of the EARL project as recently announced by the Scottish Government.
- 2.4 The most important risks arising from the Tram project are presented and appropriate mitigation measures to manage these risks described. The outcome of a detailed analysis of the risks is summarised noting that there is a 90% chance that the final cost for Phase 1a will come in below the risk adjusted level.

- 2.5 The Report acknowledges the confidence afforded to the project including sufficient headroom through **tie's** approach to risk management and recommends proceeding with the project with the assurance that Trams will provide an essential catalyst for the continuing growth of the Edinburgh economy and facilitate the City's' future development.
- 2.6 Transport Scotland has agreed a funding package up to a maximum of £500m for Phase 1, on the basis of a cost split ratio of 91.74% Transport Scotland and 8.26% CEC.
- 2.7 The decision being sought from Council is the approval of the FBC v1 with respect to Phase 1a (from the Airport to Leith Waterfront). This will provide a direct tram link to the Airport, which also interchanges with Edinburgh/Glasgow main line and also the anticipated rail interchange at Gogar. There will be an option within the contracts to defer the decision on Phase 1b (from Roseburn to Granton Square) for a period up to March 2009.
- 2.8 The FBC v1 will be updated for any material changes arising during the final period of negotiations up to contract close. The results of these activities will be reported to Full Council on the 20 December 2007, when approval will be sought for the updated Final Business Case and to proceed to contract award in January 2008.
- 2.9 The Council has aspiration for further expansion of the network to a wider network, incorporating phases 2 and 3 of the current proposal, 'Line 3' to the Edinburgh Royal Infirmary and Newcraighall, and extensions to Livingston, Dalkeith, Musselburgh and Queensferry.

### **3 Main Report**

#### **The Origins of the Project**

- 3.1 There have been a series of Council reports with regard to various aspects of Tram and these are set out in Appendix 1.
- 3.2 The origins of the Edinburgh Tram project can be traced back to 1998. Appendix 1 summarises the key decisions and reports from 1998 to date. The benefits of a tram system have been identified as
  - For high flows of passengers, a lower operating cost per passenger due to higher speeds and higher vehicle capacities than buses.
  - A distinct 'right of way' – the track
  - Where segregated from other traffic, high speed and very good acceleration
  - low noise
  - smooth ride
  - Level – step free access
  - Air pollution free at the point of use due to electric traction
  - A distinctive image

These benefits which encourage a change in mode from private to public transport.

- 3.3 In March 2003, the Scottish Executive announced that £375m would be made available in principle for the construction of the first two lines -- subject to STAG

2 assessment (STAG 2 is the second stage of the appraisal under the formal guidance issued by Transport Scotland).

- 3.4 The Council and **tie** proceeded with the Tram project with the Parliamentary Bills receiving Royal Assent in spring 2006.

### **Why Tram?**

- 3.5 The Report to Council of 21 December 2006 on the Tram Draft Final Business Case emphasised the vital role that the Edinburgh Tram would play in continuing the success of the Edinburgh City region at the centre of the Scottish economy. That Report argued that the region was the most important national attractor of population, investment and development. It pointed out that the City was punching above its weight in the level of GDP per capita and in the recent growth in GDP.
- 3.6 The most recent population and employment statistics reinforce this argument. They show significant increases in employment and particularly important increases in population in north Edinburgh close to the route of the Tram. The travel demand associated with those demographic changes and the continuing improvement in the quality of the bus services provided by Lothian Buses is reflected in the most recent bus patronage figures that show a sustained growth of 5% per annum.
- 3.7 The December 2006 Report expected that some 800,000 m<sup>2</sup> of employment development and 28,500 units of residential development, would be created within the city by 2020. It foresaw that much of this increase would arise from developments in north Edinburgh, especially on the city's waterfront, with the potential to accommodate up to 26,000 new homes in the longer term. This potential is emphasised by the continuing exceptional current growth in housing in Leith and around Leith Walk which show the highest growth rates of any neighbourhood in the City. At the same time the City Centre and West Edinburgh, are both forecast to see significant increases in jobs. West Edinburgh, identified by the Scottish Executive as a national growth point, is forecast to grow particularly strongly. The Edinburgh Tram will provide an effective and efficient link between these two growth hubs. In concert with the excellent local bus services, it will also provide an attractive alternative to the private car for these key movements
- 3.8 Trams are considered fundamental to achieving the growth in north and west Edinburgh. Without Tram, development proposals would have to be scaled down. Buses alone, though currently providing very effective local public transport cannot provide the speed, quality or capacity to support development on the scale envisaged.
- 3.9 The tram will be part of the city's public integrated transport network, with buses continuing to play a dominant role on most routes. It is envisaged that bus services will continue to develop to meet the changing needs of the city. Tram will be integrated with bus, both in terms of through ticketing and ease of interchange. Equally important will be connections with the rail network. Ease of interchange from rail to tram will help expand the number of Edinburgh employers who can draw on staff commuting by rail – crucial to further development of the city's economy. The recently announced proposals for an interchange between Tram and rail at Gogar to provide direct access to Edinburgh Airport will further enhance the benefits from tram / rail integration. It should be noted that the funding being provided by Transport Scotland is purely for the Tram and cannot be used to fund bus or other public transport initiatives.

3.10 The current tram proposals potentially form the core of a more extensive network within the City and beyond. The 2015 Edinburgh and Lothians Structure Plan development strategy is built around a wider network, incorporating further phases of the current proposal, 'Line 3' to the Edinburgh Royal Infirmary and Newcraighall, and extensions to Livingston, Dalkeith, Musselburgh and Queensferry. The draft SEStran Regional Transport Strategy endorses this wider tram network, and, along with this Council, calls for any new Forth Crossing to be constructed to allow for future tram use.

### Partners

3.11 The following organisations are key to the success of the project

- **Transport Scotland** is the agency responsible for the delivery of the Scottish Government's transport investment programme and is the principal funder of Edinburgh's tram project. The agency has agreed to provide up to £500m of funding towards the project but has no exposure to cost overruns over and above the total funding of £545m. It therefore does not take a direct role in the delivery of the project, but undertakes regular monitoring to ensure that the Council is complying with grant conditions.
- **The City of Edinburgh Council** is the promoter of the Tram project and has been responsible for its inception through the Local Transport Strategy, and the promotion of Parliamentary Bills enabling its construction. Following Royal Assent the Council is now the "authorised undertaker" for Edinburgh Tram Lines 1 and 2 under their respective Acts. The Council is the recipient of grant funding for the project and is ultimately responsible for the project's success. The Council is also the sole or major shareholder in three limited companies, all of whom play a vital role in Tram, namely **tie**, Transport Edinburgh Ltd (TEL) and Lothian Buses. Within the Council, management of the project is undertaken by the Chief Executives Internal Planning Group (IPG). It is intended that the IPG should report to the tram sub-committee.
- **tie Ltd** acts as the Council's delivery vehicle for the tram project. **tie** staff are involved in the procurement and management of contracts with third parties.
- **TEL** is the central focus for Tram delivery and was specifically set up by the Council to implement an integrated bus and tram system for Edinburgh. Councillors and Council officials, Lothian Buses executives and one **tie** executive sit on the Board of TEL. The Board of TEL also has private sector representation.
- **Transdev** will be the eventual operators of Tram and have played a full role in the development and evaluation of the project including the Tramco and Infraco tenders. The day to day operation of Tram will be the responsibility of Transdev who were appointed following competitive tender in 2004 and have played a vital role in the development and specification of the Tram.
- The **Tram Project Board** is anticipated to become a sub-committee of the TEL board and is responsible for monitoring the project on behalf of the Council and TEL. As the project moves into the delivery stage it will be empowered to take decisions on the project, within limits of its delegated authority. Council Officers and TEL and **tie** directors are represented on this committee and the Tram Project Director (a **tie** employee) reports to it on a 4-weekly basis.
- **Lothian Buses** will carry on its present role after commissioning of Tram and it will become a part of TEL.

3.12 On 23 August and 20 September 2007 Council considered Update Reports on the Tram Project. The Report of 20 September clarified the governance arrangements for the Project as detailed in the Report of 23 August. Amongst matters reported on were the Tram Project Sub-committee and Delegation of Powers. Council were advised of the proposed remit of the Sub-committee and of the remit of the Tram Project Board (TPB), the precise details of which were

attached as an Appendix to the Report. Council agreed to the proposed remit of the Sub-committee.

- 3.13 Amongst the matters within the remit of the Sub-Committee were “to receive reports and recommendations on the progress of the Edinburgh Tram Project from officers, the TPB, **tie** and TEL.” The remit of the TPB included approval of procurement selection decisions and to recommend to the TEL and **tie** Boards (as appropriate) that they enter into contractual commitments.
- 3.14 It is intended that the TPB will be established as a formal Sub-committee of TEL with full delegated authority through its Operating Agreement to execute the Tram project on behalf of the Council in line with the remit referred to above. The terms of the Operating Agreements between the Council, TEL and **tie**, the conclusion of which was instructed by Council on 20 September, remain under negotiation and the proposed terms of them will be reported to the Tram Project Sub-committee in due course. The Operating Agreement with TEL will formalise the powers conferred on it by the Council.
- 3.15 On 15 October 2007 the TPB considered a report setting out the result of **tie**'s evaluation of the tenders for the Infraco contract and recommended the selection of the preferred bidder for that contract to the **tie** Board which met at the same time. This recommendation was accepted by the **tie** Board.

### **Progress During 2007**

- 3.16 2007 has seen substantial efforts on the part of all those responsible for bringing the Edinburgh Tram Project to the final stages of its procurement and implementation in line with the procurement strategy mapped out by **tie**. The procurement strategy took account of the report of the National Audit Office in 2004 on the effectiveness of light rail schemes.
- 3.17 As reported by the Chief Executive on the 23 August, this year, **tie**'s procurement strategy has been given the seal of approval by the Auditor General for Scotland. The Auditor General had been asked by the Cabinet Secretary for Finance and Sustainable Growth to carry out a high-level review of the arrangements in place for estimating the costs and managing the Edinburgh trams. He reported that procedures were in place to actively manage risks associated with the Tram Project; and that **tie** had implemented a clear procurement strategy aimed at minimising risk and delivering successful project outcomes. Full details of the procurement strategy are given in the Final Business Case Section 7.

### **Procurement**

- 3.18 The strategy followed by **tie** to procure the Infraco and Tramco contracts had been developed to address the common challenges faced by all light rail procurements and the specific issues associated with Edinburgh. The procedures adopted follow EU procurement regulations and are aimed at ensuring that best value can be achieved in the negotiations over price, and contract terms and conditions. The key contracts which **tie** either has already entered into are given in the following table :

<b>Contract</b>	<b>Awarded</b>	<b>Bidder</b>
Development Partnering and Operating Franchise Agreement (DPOFA)	May 2004	Transdev
System Design Services (SDS)	September 2005	Parsons Brinkerhoff
Joint Revenue Committee (JRC)	September 2005	Steer Davies Gleave and Colin Buchanan and Partners
Multi Utilities Diversion Framework Agreement (MUDFA)	October 2006	Alfred McAlpine

3.19 Bids for Tramco and Infraco were returned in October 2006 and January 2007 respectively. Negotiations have continued throughout 2007, in a competitive environment with the shortlisted bidders. The Preferred Bidders have recently been selected. A separate report on the tender negotiations and evaluation is also being presented to Council.

### **Designing for Tram**

#### **Forecasting Tram Patronage**

- 3.20 From the projects early days under the management of **tie** a very substantial amount of work has been carried out by **tie**, its advisors, officials in the City Council and the staff of Lothian Buses (latterly from TEL). Their work in developing, designing and refining the project has supported the acquisition of parliamentary powers and the applications for grant support from the Scottish Executive and Transport Scotland.
- 3.21 Design work has been carried out by Parsons Brinkerhoff (with sub-consultants Halcrow) who were appointed to provide system design services (SDS) in 2005. Parsons Brinkerhoff is a world-wide consultancy with its headquarters in New York and is recognised as a leader in transportation which has been the cornerstone of the firms practice since its founder William Barclay Parsons was chief engineer for the original New York City subway. The support of Halcrow with its local experience and its own worldwide pool of expertise made a formidable team for the Edinburgh Tram Project.
- 3.22 The SDS have prepared preliminary designs and are currently finalising the detailed designs for all of the Tram components, including track and track-bed, signalling, overhead line equipment, structures, a tram depot, on and off-street roadworks and the traffic management measures necessary to allow trams to operate effectively as part of an integrated transport network.
- 3.23 An essential input to the design process are the predictions of level and patterns of travel demand associated with the introduction of Tram to Edinburgh's streets. This task was taken on by Steer Davies Gleave (SDG) and Colin Buchanan and Partners (CBP) following their appointment in September 2005. Acting as the Joint Revenue Committee (JRC) these two companies, who

are among the leading specialists in transport planning and travel demand modelling in the UK, have completed an entirely new set of forecasts of passenger demand and revenue for Tram and also a new set of detailed forecasts of traffic flow on the street network in Edinburgh and surrounding areas.

The forecasts for tram patronage and revenue are derived from a high level transport model and they formed an essential input to the TEL Business Plan and drive the project justification assessment required by Transport Scotland. The results of that assessment are presented in the STAG2 Report and conform to the guidance provided by Transport Scotland (Scottish Transport Appraisal Guidance). The STAG2 report is provided as a background paper to this report to Council. The high level model was developed from extensive set of new travel surveys and made good use of the 2001 National Census Data. The JRC reported a successful calibration and validation of the new model deeming it fit for its role.

- 3.24 Since the modelling was completed, the Scottish Government announced that they would no longer proceed with the Edinburgh Airport Rail Link project. This is likely to increase tram passenger numbers and have a positive impact on the TEL business plan.
- 3.25 Output from the high level model has also indirectly formed essential input to the design of Tram infrastructure and the associated highway and traffic management measures needed to accommodate Tram. A separate suite of detailed simulation models was developed by JRC and takes as input, selected output from the high level model. Known as the Low Level Model these provide detailed information on the traffic demand and performance at junctions along the route of the Tram and at key locations across the city. The Low Level Model enabled the formulation and appraisal of detailed junction designs providing the necessary priority for trams while maintaining an efficient level of service for other road users, especially buses.
- 3.26 The JRC is responsible on the basis of joint and several liability with SDS for the elements of the modelling suite which related to the design process. The sharing of liability formed part of **tie's** procurement strategy and is designed to pass risks to those parties most able to bear and manage those risks.
- 3.27 It is anticipated that the SDS and Tramco contracts will be novated to the provider of the infrastructure works. This means that significant elements of the responsibility for the design and vehicle provision and the risks associated are transferred to the private sector.

### **The Final Business Case**

- 3.28 FBCv1 reflects the substantial efforts by **tie** and its advisors during 2007. In particular it reflects the progress in the procurement of the principal contracts and the agreement on funding from the Scottish Government. Capital cost estimates have been finalised from the firm rates and prices received from the Infracore and Tramco bidders at a level slightly below those presented in the Draft Final Business Case. Phase 1a (Airport to Newhaven) is forecast at £498m and Phase 1b from Roseburn to Granton at £87m if a decision to construct is made before March 2009.
- 3.29 The FBC recommends initially proceeding with Phase 1a with the funding of £545m committed to the project. Funding available from the Scottish Government will be capped at £500m.

- 3.30 That recommendation is built on the strong case in favour of Trams presented in the FBC. The FBC cites the long standing and central role of tram in the City's transport policy and planning and wider economic development aspirations. The FBC re-affirms the viability of the Tram in terms of economic viability, financial viability and affordability. The FBC provides the financial, economic and social benefit justification and sets out the wider benefits to Edinburgh and to Scotland as a whole over the medium and long term.
- 3.31 As reported to the Council in December 2006, the economic viability of Tram has been assessed through updating the STAG2 appraisals originally prepared in support of the submissions to Parliament in support of the Private Bills. Within the STAG2 report the impact of Tram is assessed under the headings of economic regeneration; environment; safety and reliability; accessibility and social inclusion; transport and land use integration; patronage and mode shift; and in transport economic efficiency. According to formal cost-benefit analysis required by the Scottish Transport Appraisal Guidance, expected benefits are shown to exceed costs (in net present value terms). Tram will provide a benefit to cost ratio of 2.31 for the whole of Phase 1 (Airport to Newhaven plus Roseburn to Granton) and 1.77 for Phase 1a (excludes Granton section).
- 3.32 The financial viability and affordability of the project are discussed in detail below in the sections on financial implications and risk.
- 3.33 The executive summary of the Final Business Case is included as Appendix 2 to this report. The full FBC and the TEL Business Plan (the operational plan) are included as separate background papers.

#### **4 Financial Implications**

- 4.1 The report to Council in December 2006 provided a detailed financial analysis of draft final business case, which supported the continuation of the procurement process. This section reappraises the financial implications and risks associated with the project in light of results of negotiations, further design work and the commencement of utilities diversions.

##### **Capital Costs**

- 4.2 Since the report in December 2006, further design work has been completed and firm bids have been received for the supply and maintenance of tram vehicles and tram infrastructure. This has given further confidence in cost estimates. Revised estimates are shown in the table below and compared to previous figures:

	January 2006 Estimate £m	November 2006 Estimate £m	October 2007 Estimate
Leith to Airport plus Roseburn to Granton (Phase 1)	569	592	585
Leith to Airport (Phase 1a)	484	500	498
Roseburn to Granton (Phase 1b) (incremental)	85	92	87*

*\*based on non-concurrent construction with Phase 1a*



There is detailed information behind these estimates, which take due allowance for risk contingency and further scope for savings, but a fuller breakdown cannot be provided at this stage for reasons of commercial confidentiality.

The tram vehicle cost is based on a fixed price bid from recommended preferred bidder for the construction and delivery of trams. Inflation and exchange rate risk is to be carried by the contractor.

- 4.3 The infrastructure costs are also based on the fixed prices and rates received from the recommended infrastructure bidder. However, there is scope for this cost to move slightly, prior to contract close as further design work is required to define more fully the scope of the works to allow a firm price to be negotiated. There is a risk allowance to take account of these variations. The price also assumes that savings can be made on the proposals through certain Value Engineering<sup>1</sup> innovations proposed by the **tie** and the infrastructure bidder.
- 4.4 The majority of the utilities diversions will be completed under the MUDFA contract. This contract is a re-measurement contract which has fixed rates, but the scope of the works may vary, depending on the number and complexity of utilities to be diverted. The cost calculation is based on the design information available and then applying the rates in the MUDFA contract. In addition to MUDFA works, certain diversions must be carried out by the utility companies themselves. These have been priced based on current design information and estimates from the utility companies. The MUDFA risk allowance accounts for 18.9% of the total risk allowance of Phase 1 and 20.5% of the risk allowance for Phase 1a.
- 4.5 Land compensation estimates have been provided by the District Valuer. The majority of this land is being acquired by compulsory purchase. However, the amount of compensation payable will not be known until all claims are made and settled.
- 4.6 Additional costs have been estimated by **tie** for their own project management, design and legal costs. Internal costs to the Council, including legal costs, land assembly and the promotion of Traffic Regulation Orders are also included in the cost estimates.
- 4.7 The significant majority of contracts are either fixed price or fixed rate. This means that any inflation costs will be borne by the contractors and not by the project. Land costs will be subject to interest and Non MUDFA utilities subject to inflation. Allowances have been included in the project estimate for these items.

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<sup>1</sup> Value Engineering is the process whereby innovative and less expensive solutions are found to solve engineering issues while maintaining full operational functionality.

4.8 The expenditure profile for Phase 1a, based on the current programme is shown in the table below:

Estimated capital expenditure	Phase 1a
Cumulative expenditure to March 2007	£44m
April 2007 to end January 2008 - award of Tramco and Infraco	£84.8m
<b>Cumulative up to award of Tramco and Infraco</b>	<b>£129.0m</b>
Cumulative to to March 2008	£208.3m
Year to March 2009	£115.1m
Year to March 2010	£125.4m
Year to March 2011	£45.3m
Year to March 2012	£4m
<b>Total capital expenditure</b>	<b>£498m</b>

4.9 Capital costs have been benchmarked against those of other tram schemes in the UK and Ireland. The capital costs per mile of track in Edinburgh appear high compared to some other schemes. This is due to the fact that the proposed scheme includes a higher percentage of on-road running and runs through the centre of Edinburgh which is a World Heritage Site. However, the fact that the costs are comparable provides additional confidence of the accuracy of these estimates.

4.10 The above estimates also include a risk allowance of £49m. This allowance is calculated based on the perceived cost and likelihood of over 400 risks in the project risk register. A statistical analysis known as a QRA (Quantified Risk Assessment) is then carried out at a 90% probability level. The analysis concludes that there is a 90% chance that final costs will be within this risk allowance. This demonstrates a higher than normal confidence factor for a project of this scale and complexity.

4.11 The risks associated with the capital cost estimates are discussed below.

### **Funding**

4.12 The available funding for the project is estimated to be £545m, as reported to Council on 26 January 2006. This comprises grant funding from Transport Scotland of up to £500m and a committed funding of £45m from the City of Edinburgh Council.

4.13 Officers in City Development and Finance have reviewed the various elements making up the £45m Council contribution, although further work on generating Capital Receipts and revaluing the land contributed by developers is required. A breakdown of the estimated contribution is included in the table below:

Contribution	September 2007 Update £m	Notes
Council Cash	2.5	
Council Land	6.2	This contribution is made up of land for phases 1a and 1b. Should 1b not proceed, alternative sources of funding will be required.
Developers Contributions - Cash	25.4	
Developers Contributions - Land	1.2	This contribution is made up of land for phases 1a and 1b. Should 1b not proceed, alternative sources of funding will be required.
Capital Receipts (Development Gains)	2.8	
Capital Receipts	6.9	
<b>Total</b>	<b>45</b>	

4.14 Contributions from developers have always been identified as a key component of the Council's financial contribution to the project. The Council has now concluded a number of agreements securing contributions towards the project. The Council has already banked contributions of £2.2m. Forth Ports have recently submitted an Outline Planning Permission for the Leith Docks Development Framework area and this will attract a very significant developers contribution to the tram.

4.15 The Tram Developer Contribution Guideline has been revised as a draft for consultation and was put before the Planning Committee on the 4th October 2007. It is intended that the Guideline will be put before the Planning Committee again in early December 2007 for full approval. This will allow the Council to borrow against future developers contributions for the tram.

### **Affordability**

4.16 The total project cost of £585m (inclusive of a risk contingency) is some £40m or 7% above the committed funding of £545m. However Phase 1a, at £498m (again inclusive of risk contingency), falls well within the funding envelope, with additional financial headroom of £47m

4.17 In response to these affordability issues the FBCv1 recommends a phased approach with a target opening for Phase 1a in the first quarter in 2011, with an option for Phase 1b to open one year later in Quarter 4, 2012. The contract for Phase 1a will start in January with options on deciding on Phase 1b up to March

2009. This approach is designed to achieve better certainty on the cost of Network so that Phase 1b construction will only commence when it can be demonstrated that costs can be met from available funding. The Report to Council in December 2006 reviewed the merits of Phase 1b of the Tram Project which would connect Roseburn to Granton Square. The draft contracts for both Tram Vehicles and Tram Infrastructure include an option for the Council to commence Phase 1b once there is greater cost certainty on Phase 1a, if additional funding can be put in place.

4.18 The Council is considering a variety of additional funding sources which may be used either for Phase 1b or for public realm works to enhance the tram. In a worst case scenario, this funding will also be available against the possibility of cost overruns. Funding sources under consideration include

- City Growth (Round 3)
- Capital Investment Programme
- Further Capital Receipts
- Review of TEL business plan, including tax planning

4.19 The source and amount of any additional funding will depend on outturn costs for Phase 1a and the extent to which the risk allocation and headroom has been used. By this time MUDFA will be complete, Infraco will be well underway and the impact of any variation orders will be known. As a result there will be greater certainty over costs. The decision on Phase 1b will not be recommended to Council until there has been confirmation that a number of risks have been passed, eliminated or mitigated. The decision for inclusion of Phase 1b into the contract can be deferred up to March 2009.

### **Interim Funding**

4.20 There is currently funding in place from Transport Scotland and the Council to take the project to Contract Close (anticipated January 2008). Should this be delayed for any reason, a further advance of funding from CEC and Transport Scotland will be necessary.

### **Revenue Implications**

4.21 The financial viability of the integrated tram and bus network is dealt with in the TEL Business Plan. While noting that TEL aims to achieve broader social and economic benefits, TEL will also be a viable and profitable business. The Draft Final Business Case forecasts that future tram revenues will exceed operational cost by the second year of operation and grow steadily through later years, resulting in significant surpluses. However, it is possible that the Council will not receive its current level of annual dividend (£2m) in the first three years of tram operation, as this may be needed within TEL. Careful dividend planning will be required to ensure that increased dividends can be paid in earlier or later periods to compensate for any loss of income to the Council.

4.22 Income projections are based on current bus fares and passenger numbers, increased to reflect passenger growth and fares inflation based on Lothian Buses experience over the past decade. Passenger growth has been estimated by the JRC modelling processes, and also prudently includes a 3 year 'ramp up' period, to allow time for predicted passengers to switch to trams. Even with that "ramp up" period the projections prepared by JRC show a steady growth in both bus and tram passenger numbers over future years. Experience from Nottingham and Dublin suggests that three years may be a conservative assumption.

- 4.23 Future operating costs, including infrastructure maintenance will be borne by TEL and has been incorporated in their business plan. Bus costs have been derived from current costs incurred by Lothian Buses. Tram costs are based on figures provided by Transdev, the future tram operator. Both sets of costs have been adjusted for planned changes to service patterns and inflation, including above RPI increases for both fuel and salary costs. The costs of maintaining the infrastructure of tram (tram tracks, overhead line equipment etc) will be borne by TEL, but of course the tram operates for much of its length on public highway presently maintained by the Council. An agreement is therefore necessary between TEL and the Council for the demarcation of maintenance and liabilities associated with shared infrastructure (this is currently in preparation).
- 4.24 The integrated service plan for the TEL operations initially includes 6 trams per hour in each direction running from the Airport (and Granton if Phase 1b is built) through the centre of Edinburgh to Leith Waterfront. This gives a service of 12 trams per hour in each direction on Princes Street and Leith Walk. Avoiding unnecessary duplication of services TEL, plans to significantly reduce bus services on Leith Walk and on the present Airlink service. Limited reductions are planned to bus services operating between St Andrew Square and Haymarket together with some reductions on the Broomhouse to Saughton Mains corridor.
- 4.25 Tel has developed an integrated service plan to take account of changes and any requirements for interchanging between bus and tram. TEL are seeking to make this interchange as attractive as possible through the design of the interchange stops. The introduction of an integrated suite of transferable tickets for both bus and tram (including a single flat fare) combined with high quality facilities will make interchange second nature.
- 4.26 The EARL project has been cancelled by the Scottish Government. This cancellation does have an advantageous effect on the Tram Business Case in relation to increased patronage and an increase in the benefit to cost ratio.

## **Risk Management**

- 4.27 The complexity and size of the Tram project have long been recognised and consequently required a comprehensive and thorough approach to risk management. The risk management strategy has been mindful of recent reports by the National Audit Office and Audit Scotland and has been developed to achieve value for money from the Tram. As noted above at the request of the Cabinet Secretary for Finance and Sustainable Growth the Auditor General for Scotland has carried out a high-level review of the arrangements in place for estimating the costs and managing the Edinburgh trams. He reported that procedures were in place to actively manage risks associated with the Tram Project; and that **tie** had implemented a clear procurement strategy aimed at minimising risk and delivering successful project outcomes. In the FBC **tie** report that many of the development and construction risks are now either crystallized, superseded or effectively mitigated, through management action or transfer to the private sector. However some significant risks still lie with the public sector, and given the cap on Government funding, may impinge directly on the Council as the funder of last resort.
- 4.28 The independent Office of Government and Commerce (OGC) Gateway 3 review concluded on the 4<sup>th</sup> October 2007 that the project was given the green light and stated the following findings:

- The project is continuing to make good progress. **tie** has conducted a robust competitive procurement in a difficult market within the agreed procurement strategy.
- There have been a number of changes in the senior management team including project director and **tie** has successfully managed these changes.
- The project faces a challenging period over the next three months with the requirement to appoint a preferred bidder; for due diligence and contract novations to be finalised, and formal funding support to be evidenced. However there are procedures and work streams in place to address these issues.

4.29 The project's approach to the identification, allocation and mitigation of these and other risks is set out in some detail in Section 11 of the FBC. In addition, as a follow-up to the OGC gateway review, the Council and **tie** sought an assessment and quantification of the risks to the project and the impact on the Council from the OGC team. Their report concluded that "the **tie** risk management is well-developed and reflects best practice". Furthermore, the report also states that the current risk contingency in **tie's** budget is sufficient. For reasons of commercial confidentiality, this report cannot be released at this stage, but will be available early in 2008, following contract close.

4.30 The detailed contractual apportionment of risk and responsibility between the public and private sector remains the subject of structured negotiations up to and beyond the selection of a preferred bidder. The procurement strategy aims at an outcome on risk retention and transfer which is balanced, transparent and market aligned, while taking account of the relationship between affordability and the true cost of a risk transfer position for CEC. External legal advisors in the procurement, advised that, set in the context of the project's design and technical information readiness, the status of the draft project delivery contract suite reached with both bidders at this procurement stage represents a reasonable, though qualified, platform from which to move to the next stage of the procurement. They advised that intensive work on all fronts would be required from now until planned contract award in order to achieve fully defined contractual commitments prior to contract close. Some of the legal/commercial risks are as detailed in the risk appendix 3.

4.31 Council officers also review the risks associated with the project and its wider impact on Council activities. These risks are reported on a monthly basis to the Tram Internal Planning Group chaired by the Council Chief Executive so that these risks can be appropriately monitored and managed. As the project progresses, these risks will also be reviewed by the Council. Appendix 3 reviews these risks in detail.

4.32 The procurement strategy aims to minimise risk to works costs by placing risks with those best suited to manage those risks. The risk contingency is designed to cover additional unforeseen costs, but it is recognised that there is an element of residual risk of costs exceeding current estimates. It should also be notified that the risk contingency does not cover major changes to scope. The scope of such changes will be reviewed after completion of the Tram works and commencement of Tram operations.

- 4.33 In the context of potential cost overruns, it should be noted that the cost of Phase 1a (inclusive of risk contingency of £49m) is £47m less than the total available funding. This represents a total contingency sum of £96m, compared to £220m of estimated outstanding costs (excluding fixed costs and costs already incurred).
- 4.34 Only when further cost certainty has been achieved for Phase 1a and further sources of funding found for Phase 1b will a decision be made on whether to commence Phase 1b.

### Next Steps

- 4.35 The table below (taken from the Final Business Case) summarises the milestone events in the final stages of the procurement and construction of the Edinburgh Tram Network. Some adjustment to these dates may be required in due course to fit with the Council meeting schedule.

Milestones	Date
Approval of Draft Final Business Case by CEC	21 Dec 06
Approval of Draft Final Business Case by Transport Minister – approval and funding for utility diversions	16 Mar 07
TRO public deposit commences	12 May 08
Tramco - complete initial evaluation/negotiation	07 Mar 07
MUDFA - completion of pre-construction period of MUDFA contract	30 Mar 07
MUDFA – commencement of utility diversions	09 July 07
Infraco – return of stage 2 bids	08 May 07
Infraco - completion of evaluation/negotiation of bid	19 Sep 07
Infraco and Tramco – appointment of Preferred Bidder	15 Oct 07
Approval sought of Final Business Case (V1) by CEC and Transport Scotland	25 Oct 07
Tramco/Infraco – Final facilitation of novation negotiation complete	31 Oct 07
Tramco/Infraco – final negotiation and appointment	19 Nov 07
Infraco - negotiation of Phase 1b complete.	12 Nov 07
Approval sought of Final Business Case (V2) by CEC and Transport Scotland – approval and funding for Infraco / Tramco	20 Dec 07
Tramco/Infraco - award following CEC/TS approval & cooling off period.	28 Jan 08
Construction commences on Phase 1a	18 Feb 08
TRO process complete	17 Nov 09
Construction complete Phase 1a	27 Sep 10
Operations commence Phase 1a	25 Feb 11

## 5 Conclusions



- 5.1 Analysis of the FBC has shown that the cost estimates presented in the Draft Final Business Case are still valid.

- 5.2 Given the scale and complexity of the project there are inevitably risks associated with the project. **tie** have ensured that risk management has been given a high priority in the preparation of the project and appropriate mitigation measures have been designed to ensure value for money from the project. The detailed risk analysis undertaken by **tie** and confirmed by the OGC review assures the Council that the project can be realised and Phase 1a is viable, affordable, and value for money.
- 5.3 The total project cost estimate including the negotiated price at the preferred bidder stage is £498m. It is acknowledged that there are a number of design related matters which have yet to be finalised but allowances have been included for these in the estimate. Consequently there is the potential for some variation to capex out turn costs. Fixed price and contract details will be reported to the Council in December 2007 before contract close in January 2008.
- 5.4 All of the analyses of patronage and revenue completed confirm that the Edinburgh Tram Network will provide an essential catalyst for the continuing growth of the Edinburgh economy, facilitate the planned major expansions in the north and west of City and form the basis for future developments. The development and procurement of the project under the auspices of **tie** and TEL has allowed the formulation of a practical, integrated and viable bus and tram transport network which will serve the North, West and Centre of the city for many years to come.
- 5.5 The Edinburgh Tram Network will be successful in reducing the demand for car travel, will promote the environmental, safety and social objectives of the Local Transport Strategy and will provide a sound stimulus for continued economic growth across the City.

## **6 Recommendations**

- 6.1 To approve the Final Business Case version 1.
- 6.2 To note that the Auditor General for Scotland reported that procedures were in place to actively manage risks associated with the Tram Project; and that **tie** had implemented a clear procurement strategy aimed at minimising risk and delivering successful project outcomes. As previously stated this has been endorsed by the OGC Reviews.
- 6.3 To note that final Council approval for the award of the Infraco and Tramco contracts will be sought in December 2007 with the formal award of these contracts in January 2008.
- 6.4 To note the schedule of milestones presented at Section 4.34 above.
- 6.5 To note that the Directors of City Development and Finance will continue discussions with the Scottish Government with regard to including Edinburgh Tram in the national concessionary travel scheme.



  
  
**Donald McGougan**  
Director of Finance  
**Andrew Holmes**  
Director of City Development

17.10.07

**Appendices**


**Appendix 1:** List of previous Council Reports on Tram  
**Appendix 2:** Edinburgh Tram Network Final Business Case  
Version 1 Executive Summary  
**Appendix 3:** Risks

***Copies of these appendices are available in Group Rooms  
and from Committee Services:***

- Edinburgh Tram Network Final Business Case Version 1
- TEL Business Plan

**Contact/tel**

Duncan Fraser  
Rebecca Andrew

**Wards affected**

All

**Background  
Papers**

Edinburgh Tram Network STAG2 Appraisal  
Edinburgh Tram Network Revenue and Risk Report

**Appendix 1**  
**List of Council Reports**

<b>Report Title</b>	<b>Date</b>	<b>Key Recommendations</b>	<b>By</b>
Edinburgh Tram:Further Update	20/09/2007	Agree the proposed remit for the Tram subcommittee	Chief Exec
Edinburgh Tram: Update	23/08/2007	Council Solicitor to conclude Operating Agreements with <b>tie</b> and TEL Agree the establishment of Tram subcommittee	Chief Exec
Edinburgh Tram Draft Final Business Case (Part 1)	21/12/2006	Approve the Final Business Case Approve continuation of Infraco and Tramco negotiations Approve MUDFA progress subject to confirmation of affordability	Directors of City Dev and Finance
Edinburgh Tram - Land Acquisition	26/10/2006	Note progress on GVD	
Edinburgh Tram - Appointment of Contractor for the Multi-Utilities Diversion Framework Agreement (MUDFA)	21/09/2006	Grants approval to <b>tie</b> to appoint the MUDFA contractor, subject to Scottish Executive approval	Director of City Dev
Edinburgh Tram - Appointment of Contractor for the Multi-Utilities Diversion Framework Agreement (MUDFA) - Background Paper	21/09/2006	Background Paper	Director of City Dev
Edinburgh Tram Project Delegated Powers	01/06/2006	Council to extend the Scheme of Delegation to include Tram Prior Approval submissions	Convener of Planning Committee
Edinburgh Tram	26/01/2006	Approve development of Airport to Leith Waterfront as the first phase of the Tram Network. Approve in principle contribution of £45m.	Director of City Dev

<b>Report Title</b>	<b>Date</b>	<b>Key Recommendations</b>	<b>By</b>
Edinburgh Tram Project: Tram Lines 1 and 2 Proposed Amended Limits of Deviation	02/06/2005	Approve 3 amendments to limits of deviation for Tram	Director of City Dev
Edinburgh Tram Project - Tramlines 1 and 2 Proposed Amended Limits of Deviation - Background Papers (1)	02/06/2005	Background Paper	Director of City Dev
Edinburgh Tram Project - Tramlines 1 and 2 Proposed Amended Limits of Deviation - Background Papers (2)	02/06/2005	Background Paper	Director of City Dev
Edinburgh Tram Project - Tram Line 3	09/12/2004	Note a number of issues with regard to Tram 3 Approve the Draft Bill Approve the safeguarding of the line of Tram 3	Director of City Dev
Edinburgh Tram Project - Tram Line 3: Section 82 Resolution	09/12/2004	Formal Resolution under the Local Government (Scotland) Act 1973	Directors of City Dev and Corp Services
Edinburgh Tram Project - Integration of Tram and Bus Operations in Edinburgh	29/04/2004	Note the progress made in developing a framework for future transport integration	Chief Exec
Edinburgh Tram Project - Appointment of Tram Operator	29/04/2004	To approve the appointment of tram operator within the Design, Partnering, and Operating Franchise Agreement	Director of City Dev
Edinburgh Tram Project - Tram Lines 1 and 2: Section 82 Confirmation	19/02/2004	Formal Resolution under the Local Government (Scotland) Act 1973	Directors of City Dev and Corp Services
Edinburgh Tram Project - Tram Lines 1 and 2	22/01/2004	To note the lodging of the Bills for Tramlines 1 and 2 with the Private Bills Unit.	Director of City Dev

Report Title	Date	Key Recommendations	By
Edinburgh Tram Project - Tram Lines 1 and 2: Section 82 Resolutions	22/12/2003	Formal Resolution under the Local Government (Scotland) Act 1973	Directors of City Dev and Corp Services
Edinburgh Tram Project - Tram Lines 1 and 2	11/12/2003	Approve tram lines 1 & 2 including STAG appraisal and Preliminary Financial Cases Note that a final business case would be submitted to the Council in due course.	Director of City Dev
Edinburgh Tram Project - Tram Lines 1 and 2	13/11/2003	Approve alignments/associated works for tram lines 1 & 2 Approve draft Design Manual Approve a strategy for securing developer contributions Note that Bills are being prepared for tram lines 1 & 2	Director of City Dev
Executive Minutes Edinburgh Tram Network	28/01/2003	( <b>tie</b> ) to take forward bus-tram integration To safeguard routes for the Edinburgh Tram Network lines 1 to 3	
Executive Decision on Edinburgh Light Rail Development Framework	20/11/2001	To environmental scrutiny panel's agreement with Executive decision of 09/10/2001	
Executive Decision on Edinburgh Light Rail Development Framework	09/10/2001	To safeguard through the planning process the required alignment of the North Edinburgh light rail route and the identified Leith depot site	
Executive Decision on City of Edinburgh Rapid Transit (CERT) – Future Options for the Development	11/09/2001	Progress reports to be submitted on the introduction of a Light Rail Scheme for the Western Corridor	
Executive Decision on City of Edinburgh Rapid Transit (CERT) – Future Options for the Development	31/07/2001	Approve in principle the strategy for delivering CERT (City of Edinburgh Rapid Transit) in longer term following the abandonment of PPP project	
Council Minute NEW TRANSPORT INITIATIVE - PHASE 1: FINAL REPORT	04/05/2000	To undertake further development and consultation on a transport investment package for the city based on road user charging as Phase 2 of the New Transport Initiative,	

Report Title	Date	Key Recommendations	By
Minutes: Transportation Committee	31/05/1999	To approve undertaking Phase 1 of the New Transport Initiative including examination and consultation on the introduction of road user charging etc as a means to fund a substantially improved transport system for Edinburgh.	
Council Minute The "new deal for transport": response to the transport white paper and future development of moving forward strategy	29/10/1998	To instruct the Director of City Development to prepare for consideration by the Transportation Committee a draft "local transport strategy" meeting the criteria and guidance set out by central government	

## Appendix 2: Executive Summary of FBCv1

### 1. Executive summary

#### Introduction and principal recommendation

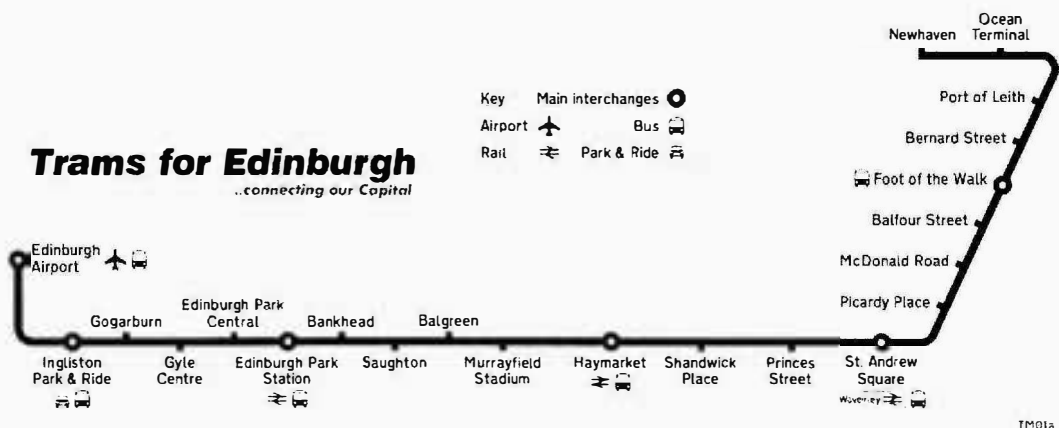
- 1.1 In December 2006, the City of Edinburgh Council (CEC) approved the Draft Final Business Case (DFBC) for the project to construct the Edinburgh Tram Network (ETN). The DFBC presented the strong case in favour of trams. It concluded that a) the proposed scheme is economically and financially viable; b) Phase 1a, the primary tram line from Edinburgh Airport to Newhaven, was affordable within current sources of funding; and c) that Phase 1b has significant benefits for the economic development in Edinburgh. It also demonstrated the operational sustainability of the future integrated tram and bus network.
- 1.2 Since approval of the DFBC, considerable progress has been made on all important aspects of the project. This Final Business Case (version 1) (FBCv1) takes full account of the progress made to date and is a key part of the documentation which supports the commitment to the principal contracts for construction of the system and supply of the tram vehicles. However, it is not anticipated that there will be any changes to the substance of this document or the recommendations.
- 1.3 Two main aspects of the Business Case have progressed to a conclusion since the DFBC was approved:
- The procurement of the principal contracts has reached a stage where all material terms are agreed, including the capital, operational and maintenance costs; and
  - The funding available to support the delivery of the ETN has been agreed by CEC and the Scottish Government.
- This FBCv1 explains in detail the important consequences arising from the finalisation of these two critical areas.
- 1.4 After an intensive and lengthy competitive procurement process, the capital and maintenance costs of the scheme have now been finalised at a level slightly below the DFBC estimate. Based on firm rates and prices received from the bidders for system construction, vehicle supply and maintenance, the capital cost for Phase 1a, the tram line from Edinburgh Airport to Newhaven, is forecast at £498m. The capital cost to deliver Phase 1b (the tram line from Roseburn to Granton) is now forecast at £87m. The contractual arrangements permit CEC to commit to Phase 1b on fixed cost terms at any time until March 2009. However, concurrent construction of Phase 1b with Phase 1a would offer significant benefits of scale, and reduce capital costs to £82m.
- 1.5 The Scottish Government and CEC have confirmed their commitment to funding contributions of £500m and £45m respectively. These commitments will be structured in such a way that the final aggregate funding for Phase 1a reflects equivalent pro-rata contributions, with a cap of £500m on the Government contribution.
- 1.6 The primary economic viability test is known as the Benefit Cost Ratio (BCR). Further analysis has concluded that the BCR for Phase 1a is 1.77 which indicates a return of £1.77 in economic benefit for every £1 of cost. This ratio reflects the decision not to proceed with the project known as the Edinburgh Airport Rail Link (EARL). It does not yet take into account the option of a future interchange with heavy rail at Gogar, which is an option under consideration by the Scottish Government and may have a beneficial impact on the tram BCR. The BCR for Phase 1 including both Phases 1a and 1b is 2.31, which reflects the strong economic case for Phase 1b.

- 1.7 The principal recommendation of this FBC is that Phase 1a should proceed, with funding of up to £545m committed to its delivery. The FBC sets out the full supporting analysis which leads to this recommendation. The FBC also provides the analysis which supports the implementation of Phase 1b, but acknowledges that additional sources of funding are needed before it may proceed. This matter is under review and it is recommended that a decision on Phase 1b should be taken during 2008.
- 1.8 The phased approach was anticipated in the DFBC and now forms the basis on which the project will proceed. Most of the material that was produced at considerable effort and cost for the DFBC remains valid and intact. However, there has been some editing to update figures and to clearly define the initial Phase 1a approach.
- 1.9 It is a fact that many tram schemes implemented in the UK and in Ireland in recent years have subsequently implemented extensions once their successful operation has been demonstrated. Accordingly, a section has been included in this document describing the wider network options which may bear further examination in the future.
- 1.10 The Government has recently announced its intention to develop a new rail station at Gogar and to create an interchange with the tram project. The tram project costs in the FBC do not reflect the effect of this proposed project, which will be subject to appropriate assessment in due course and which will require to be funded under separate consideration. As is normal in transport project assessment, the influence of a new project on existing transport infrastructure, benefits and costs will require to be taken into account in the assessment of the new project. The proposal that a new interchange be created is likely to have a net beneficial effect on future tram revenues and possibly BCR, but no detailed work has been done to date in view of the relatively recent announcement of the Gogar project.

### Phase 1a

- 1.11 The route for Phase 1a is as depicted in Figure 1.1 below.

Figure 1.0 Tram Route for Phase 1a.



### Facts for Phase 1a

#### Trams

27 trams  
250 passenger  
100% low floor

#### Route

18km  
22 Stops  
Single depot at Gogar

#### Service

5 min intervals between trams  
Integrated bus and tram ticketing  
Inspectors on all trams

## Background

- 1.12 Substantial road traffic growth across the Edinburgh area, combined with forecast population and employment increases, will lead to significant growth in road congestion and demand for transport solutions. CEC has identified an integrated tram and bus network as the preferred way to provide the backbone for a comprehensive, higher quality public transport system to support the local economy and to help to create sustainable development. The ETN (“the tram”) has been central to transport policy and planning and the wider economic development aspirations of the city for more than seven years. The scheme has had in-principle funding support from the Scottish Government (now represented by Transport Scotland (TS)) since 2003.
- 1.13 Early 2006 saw the tram scheme reaching an important milestone as it received Parliamentary approval. Both the Edinburgh Tram (Line One) Act and Edinburgh Tram (Line Two) Act came into force following Royal Assent in May and April 2006, respectively.
- 1.14 Concurrent with the parliamentary process, a careful review of cost estimates was carried out which concluded that although Line 1 only or Line 2 only had a high degree of deliverability within the constraint of available funding, a complete network of Lines 1 and 2 was unlikely to be affordable in one phase of construction and that a phased approach to procurement and delivery would be implemented.
- 1.15 The phasing assessment produced a proposal for Phase 1 comprising two sub phases namely 1a: Newhaven to Edinburgh Airport and 1b: Roseburn to Granton Square. The core of the network from Newhaven to Edinburgh Airport (Phase 1a), via Haymarket and Princes Street, will give a good balance of costs and benefits, is forecast to be financially viable and can be effectively integrated with Lothian Buses (LB) services.
- 1.16 The proposed phasing also carries the support of Transport Edinburgh Limited (TEL), which is charged by CEC with the delivery and management of an integrated tram and Lothian Buses network and of Transdev, the future operator of the tram.
- 1.17 The three core tests examined to assess the continued viability of the scheme are:
- **Economic viability** – The quantified economic benefits and costs of Phase 1a of the tram, as well as the wider benefits relating to urban regeneration; environment; safety; transport and land use policy integration; and accessibility and social inclusion;
  - **Financial viability** – The way in which Phase 1a of tram will be integrated with buses under the umbrella of TEL in a manner which preserves and enhances the public transport service in the city and does so in a profitable manner. This is embodied in the TEL Business Plan; and
  - **Affordability** – The prospective deliverability of Phase 1a of the tram within the constraints of available funding.

A summary of these core tests is set out below.

### Economic viability

- 1.18 The economic benefits and costs of Phase 1a of the tram have been assessed in accordance with Scottish Transport Appraisal Guidance (STAG) by Steer Davis Gleave. This built upon the previous work submitted to Parliament in 2004 but was updated, where appropriate, to reflect more recent and extensive transport modelling, again led by Steer Davis Gleave. The following are the highlights from the assessment:



## **Economic regeneration**

- 1.19 Phase 1a of tram is integral to the regeneration of the Newhaven and Leith area. Substantial new residential, commercial, retail and other development is projected to be built in the area progressively between now and 2020, reflecting the growth in Edinburgh's economy and population. Without Phase 1a of the tram it is unlikely this large scale redevelopment would go ahead on the desired scale and timetable.
- 1.20 Significant new development is also envisaged in West Edinburgh with some 250,000 m<sup>2</sup> of new office space (mostly at Edinburgh Park) and over 200,000 m<sup>2</sup> of other commercial space, again predicted to be progressively built between now and 2020. Phase 1a of the tram will facilitate and encourage this new development and, crucially, provide improved public transport between the new housing in Leith and the new job opportunities in the west of the city.
- 1.21 In employment terms, it is anticipated that at least 590 full-time permanent jobs in the city will be generated or brought forward by the development impact of Phase 1a of the tram. These jobs do not displace jobs elsewhere in Scotland. It should also be noted that a substantial proportion of the capital investment will be spent in Scotland, encompassing utility works, land purchase, civil engineering works and professional services.
- 1.22 The positive relationship between high quality transport capability –specifically light rail – and enhanced economic development is a well-known phenomenon. There is also now little debate about the reverse scenario, the retarding impact on development of poor transport connections. The Edinburgh tram scheme is based on the need for improved transport connections to vital development areas, efficient capacity provision on key corridors and is a critical driver of future economic growth in Edinburgh and Scotland as a whole.

## **Environment**

- 1.23 Phase 1a of the tram will make a positive contribution towards the objectives of reducing emissions and improving air quality in the city centre and in the transport corridor to the west of the city and the airport. Vehicles within the city account for up to 88% of emissions of nitrogen oxides and trams will provide a large number of journeys through the city centre, improving mobility and accessibility but without adding to current levels of pollution. Trams are also a relatively quiet mode of road transport providing a higher quality environment for those living, working and travelling in the area. The tram's contribution to mode shift from private car to public transport (see below) will further progress the objectives set in the Air Quality (Scotland) Amendment Regulations 2002 and to national objectives to reduce emissions of greenhouse gases.
- 1.24 The construction and operation of Phase 1a of the tram will address potential impacts on the World Heritage Status of Edinburgh by applying design and mitigation standards set out in the Tram Design Manual, approved by CEC planners. Details of mitigation measures to retain, protect and enhance or replace existing plantings and wildlife habitats on Phase 1a, including badger setts, are prescribed in the Environmental Management Plan and specific elements were approved during the Parliamentary process.
- 1.25 To the fullest extent reasonably deliverable, disruption during construction will be minimised. Clear and open communications will ensure that the effects of construction are anticipated and the construction planning will ensure that work is restricted to the shortest time period consistent with safe working practice. Schemes to provide financial assistance to local businesses affected by construction have been implemented.

### **Safety reliability and capacity**

- 1.26 Personal security will improve, reflecting tram design elements (CCTV and help points at all stops and vehicles) and designed access arrangements aimed at enhancing security. The planned use of inspectors on all vehicles will also assist this objective as experience in other cities has clearly shown.
- 1.27 Trams will improve the overall reliability of public transport as they generally benefit from greater segregation from general traffic and priority at junctions. They also present an opportunity to significantly reduce the variability of dwell time at stops compared to a bus-only public transport service. A significantly increased number of bus vehicles would be required on the main Phase 1a corridor on Princes Street and Leith Walk to cope with forecast increased demand in the absence of trams. Despite continuing implementation of a wide range of bus priority measures, buses remain vulnerable to the effects of increasing congestion across the city.

### **Accessibility and social inclusion**

- 1.28 Areas around Leith Walk and around Saughton and Balgreen in the west are areas where socio economic status is considerably less affluent than surrounding areas and where employment, income levels and car ownership tend to be comparatively low. Opportunities for people living in these areas will be improved by direct connection via tram to the city centre and other employment areas, including the new development in Leith and the west of the city at Edinburgh Park and the airport.
- 1.29 Trams and tram stops will be fully accessible by people with mobility impairments, those travelling with small children and the elderly. These travellers will benefit from the design specification, ride-quality and reliable accessibility of trams. Where the distance between tram stops presents a challenge to accessibility, the service integration patterns with buses have been designed to maximise the continuing and improving accessibility of LB.

### **Transport and land use integration**

- 1.30 The tram will be particularly vital in responding to the expected growth in travel demand arising from the new development in the north of Edinburgh at Leith. Phase 1a of the tram will help ensure this new development can be delivered without exacerbating city wide congestion by ensuring that land use and transport policies are integrated. Any displacement of new development to greenfield and greenbelt sites would have planning implications and could result in a settlement pattern that would be more difficult to serve by public transport.
- 1.31 Carefully considered bus-tram service integration plans and common ticketing arrangements will enhance the opportunity to make journeys on the public transport network. Effective interchange facilities will be provided at Ocean Terminal, the foot of Leith Walk, St Andrew Bus Station, and the Gyle Shopping Centre. The tram route will integrate with Ingliston Park and Ride, already operating successfully and planned for expansion, and with other park and ride sites under active consideration. Phase 1a of the tram also provides an opportunity to significantly improve integration with other transport modes, particularly at Haymarket and Edinburgh Park railway stations and Edinburgh Airport. These interlinking services, along with the proposed frequency of the service, means tram will afford easier access to employment, retail and leisure locations.

### Patronage and transport mode shift

- 1.32 Extensive work has been undertaken to build new demand forecasting models to predict use of the tram and the impact upon use of other transport: bus, rail and car. The modelling deployed to support the Edinburgh tram scheme is recognised by the professionals involved as among the most sophisticated ever prepared in support of a large-scale transport scheme.
- 1.33 Annual demand for Phase 1a is predicted to be 11m tram passengers in 2011 and rises to 25.5m by 2031. This growth is predicated on a forecast of substantial growth in the total travel market, as well as the additional predicted commercial and housing development as a result of the scheme. Between 2005 and 2031, demand for journeys by public transport is forecast to increase by 61% (1.8% p.a.). In the context of economic growth in Edinburgh and actual experience of patronage growth by LB, this is a conservative estimate with actual growth in bus patronage in 2006 of around 5% p.a. The tram provides the capacity to meet a large proportion of this increased demand which could otherwise be met only by cars or considerably more buses on increasingly congested roads.
- 1.34 Modal shift from car is a key objective of the Local and Regional Transport Strategies and is fundamental to achieving the environmental, sustainability, health and traffic aspirations of the tram. Phase 1 (Phase 1a and Phase 1b) of the tram project are forecast to generate 3m additional public transport trips in 2011, increasing to over 6m additional trips in 2031. These are mostly in areas directly served by the tram where the change from car to public transport use will be up to 10%. It is estimated Phase 1a will produce approximately 2.5m of these trips by 2011, rising to 4.2m by 2031.
- 1.35 In 2011, about 17% of tram patronage will be new to public transport, rising to 20% in 2031 with the balance being predominantly those who would otherwise travel by bus and other modes of public transport. Congestion is characterised by the disproportionate effect that marginal increases in car use have on the total system. Therefore it is very important to maintain downward pressure on additional road use and the proportion of tram patronage new to the public transport market is therefore significant. It is also in keeping with results achieved on successful tram schemes elsewhere such as Croydon Tramlink, Nottingham, and Dublin.

### Benefits and costs to Government

- 1.36 The benefits and costs of Phase 1a of tram calculated in accordance with STAG requirements are summarised in the Table 1.1. The FBC has been prepared on the basis that will not proceed as per the advice received from the Scottish Government. The resulting BCR for Phase 1a of 1.77 represents an excellent return and reflects significant increased decongestion benefits to other road users (including cars). In the with EARL evaluation a proportion of these benefits were not accrued to the tram project due to the pre-existence of EARL already achieving some decongestion within the model.

Table 1.1 Value of the ETN Benefits for Phase 1a (£m Present Value, 2002 Prices).

<u>£m Present Value, 2002 prices</u>	<u>Phase 1a</u>	<u>with EARL</u>
Value of scheme benefits	592	373
Value of scheme costs	335	340
<b>Net benefits</b>	<b>257</b>	<b>34</b>
<b>Benefit Cost Ratio to Government</b>	<b>1.77</b>	<b>1.10</b>

## Financial viability (the TEL Business Plan)

### Background to TEL

- 1.37 TEL was established by CEC to build on the success of the current LB services through the delivery and management of an integrated tram and bus business. CEC requires TEL to achieve profitable operations, to meet its investment obligations and to continue payment of dividends broadly at the level currently received by CEC from LB.
- 1.38 Transdev are one of the world's largest tram operators and were awarded the development and operating contract in 2004. Using their wealth of experience it will be their role to establish the tram operating system, reporting directly to TEL.
- 1.39 However TEL, like LB, will also target the delivery of a 'social dividend' by maintaining realistic and affordable fares and a more comprehensive level of service provision than would normally be the case for a private sector transport operator. TEL's objectives are also aligned to the delivery of the wider economic benefits of the tram. The measure of success for TEL will be the overall performance in commercial, social, customer and financial terms of the integrated bus and tram network. The summary presented here focuses on the drivers of the forecast financial results of TEL.
- 1.40 Section 9 provides a detailed analysis of the financial viability as it is presented in TEL's full Business Plan, a copy of which is included at Appendix I.

### Financial forecast highlights

- 1.41 Table 1.2 provides a summary of the financial highlights from the forecast of TEL's profitability operating with bus and tram.

**Table 1.2 TEL profitability operating with bus and Phase 1a tram.**

Tram in service	Pre-tram						
	n/a	n/a	6/12	6/12	8/16	8/16	8/16
Tram service pattern (see below for explanation)	2006	2010	2011	2012	2016	2021	2031
<b>Patronage (Pax m)</b>							
Bus	108	117	113	115	125	133	150
Tram	-	-	11	13	19	21	25
<b>Total TEL Patronage</b>	<b>108</b>	<b>117</b>	<b>124</b>	<b>128</b>	<b>144</b>	<b>154</b>	<b>175</b>
<b>Revenues and costs (£m)</b>							
TEL Revenues	88	109	119	128	167	216	356
TEL operating costs			120	126	156	194	312
<b>Pre-tax operating profit / (loss)</b>			(1)	2	11	22	44
<b>Tram lifecycle costs</b>			-	-	1	2	2
Notional taxation			-	1	3	6	12
Dividend payment			-	-	3	3	5
<b>Net TEL cash surplus / (deficit)</b>			(1)	1	4	10	25

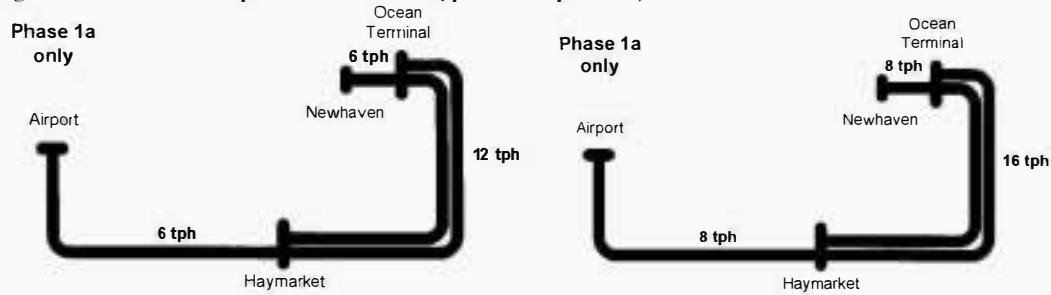
NB All £ figures inflated

- 1.42 The forecast represented in the table above has been developed using the patronage and revenue forecasts produced for the DFBC for both tram and bus, using the transport model described above and validated by TEL, **tie** and Transdev. The forecast reflects that TEL is prospectively both a cash positive and profitable business. As explained above, the model is based on economic growth assumptions, which, in light of the actual experience of patronage growth to date, is considered conservative.
- 1.43 The patronage and revenue forecast for tram in 2011 to 2014 have been conservatively reduced to take account of a ramp-up period as new services have, on occasion, taken time to be fully adopted by users. The forecast reflects that TEL's operational cash flow profile will be positive once the tram and bus patronage has stabilised after the first year of the ramp-up period in 2012.
- 1.44 For the DFBC, sensitivity testing was undertaken to assess the impact of EARL on TEL's patronage and revenue forecasts. These had confirmed the premises that EARL and tram would serve different patronage markets and that, although tram without EARL would gain some small market share, overall TEL revenues would be net neutral as the absence of EARL results in a marginally smaller overall public transport market within Edinburgh. It should be noted that the alternative option under consideration of linking heavy rail at Gogar with the tram line serving the airport will further improve the tram viability.
- 1.45 It is assumed that the policy of maintaining the current level of LB dividend to CEC will be applied prudently and that the annual dividend might be reduced or foregone for short periods in response to lower profits or short term demands on TEL's cash-flows. In such circumstances, the dividends for future periods would be adjusted upwards to ensure the shareholders receive the target dividend on a cumulative basis.
- 1.46 The projected operating costs for TEL include provisions for:
- The purchase of new buses to renew and / or expand the existing bus fleet; and
  - The required expenditure on the tram infrastructure and vehicles necessary to ensure effective performance of the tram assets during their useful lives, including half-life refurbishment of the trams after 15 years. (Note: The TEL Business Plan does not specifically provide for the major replacement expenditure which will be required after 30 years.)
- 1.47 Updated information received from the bidders confirms the costs included in the DFBC for this are conservative.
- 1.48 Taxation is provided at the currently prevailing rate on forecast net profits, applied consistently with that of the DFBC. TEL, **tie** and CEC have begun to engage in the examination of tax mitigation opportunities in the same way as other commercial entities. As a result, the notional taxation applied in the table may be considered to be conservative.

#### Integrated service patterns

- 1.49 Using the geographical analysis of where forecast demand is likely to originate / terminate, TEL has developed a service integration plan reflecting planned tram services and bus services after the introduction of tram. The service patterns for tram must provide sufficient and reliable capacity to meet the demand and ensure overcrowding does not dissuade passengers from using public transport. The planned service patterns for opening of Phase 1a of the tram are depicted below (Figure 1.2).

Figure 1.2 Planned service patterns for Phase 1a (tph = trams per hour).



- 1.50 The forecast of demand indicates that, after the initial five years of growth, the '6 / 12' trams per hour service depicted above will require to be increased to provide sufficient capacity to serve demand on the Newhaven to Haymarket section. The TEL Business Plan assumes that from 2016, the service will be increased to an '8 / 16' trams per hour pattern. A further increase in services is likely to be required after the year 2027 to provide sufficient capacity to serve demand on the Haymarket to Edinburgh Park section of the tram network.
- 1.51 Amendments to bus service patterns are envisaged where the tram runs parallel or close to an existing bus route to prevent unnecessary overlap of services, the principle being that bus service reductions are only applied where the tram offers an acceptable alternative mode of travel. This approach will allow TEL to match the most effective mode of transport to levels of demand while the travelling public will continue to benefit from high quality public transport provision.
- 1.52 TEL's service integration plan aims to offer as near seamless a journey through the network as possible. The inconvenience of interchange is minimised by eliminating it where possible. The service integration plan seeks to achieve optimal alignment of service frequencies at interchanges, thus making interchanging as simple as possible and minimising the risk of loss of patronage. Key bus and tram interchange locations addressed by the service integration plan are Ocean Terminal, the Foot of Leith Walk, St Andrew Bus Station, and the Gyle Shopping Centre.

### 3<sup>rd</sup> party responses

- 1.53 Good relations with 3rd party operators are considered essential, not least due to the opportunities which enhanced integration with those operators may offer and the benefits of being part of the wider provision of public transport within Scotland. Dialogue is underway to develop appropriate service plans with these operators including common and through ticketing arrangements.

### Fares and ticketing strategy

- 1.54 The TEL fare structure will be a single, fully integrated, flat fare for bus and tram, regardless of the distance travelled. The only exceptions will be – as now – journeys to and from the airport and night services. It is a fundamental assumption that TEL's tram operations will participate in the national concessionary ticketing scheme in a manner equivalent to that of bus operations, in order to ensure parity across modes and sustain effective integration. Under the terms of the scheme, operators receive payment of 73.6% of the price of an adult single for each journey by concessionary travel holders and this currently applies to c20% of LB patronage. This level of recompense is assumed to continue.
- 1.55 The assumption is that the average fares yield for TEL will be increased at the rate of the Retail Price Index (RPI) +1% growth per annum. This is in line with historical

increases in fares by LB, meets political and stakeholder expectations and supports TEL's aim to provide transport services at an affordable price.

- 1.56 Tram tickets are to be purchased off-board with ticket machines provided at all tram stops and a number of bus stops. The only tickets to be sold on-tram are to be adult and child single tickets, which will be priced at a premium above the price available from off-tram ticket vending machines. TEL will continue to develop LB's current strategy to encourage wider use of pre-paid and / or multi-journey types of tickets by offering discounts to the standard fare.

#### Revenue protection

- 1.57 Fare evasion and fraud on the existing LB bus network has been limited. Trams, with multi-door boarding, require active processes in place to limit the opportunity for fare evasion and fraud in general as well as the particular need to enforce the premium airport fare. TEL's revenue protection regime for trams is a combination of placing inspectors on each tram and providing ticket machines at all tram stops, with a significant price incentive to buy a ticket off-tram. The presence of inspectors has also been shown to promote a sense of security for passengers and be an effective deterrent to anti-social behaviour.

#### Other income opportunities

- 1.58 TEL with its combined bus / tram network offers attractive opportunities to generate additional revenues from advertising, small scale commercial development and marketing and tourism driven revenues. The TEL Business Plan includes a prudent assessment of the income which might be earned from these additional sources, based primarily upon the existing experience of LB.

#### Operating costs

- 1.59 TEL's bus operating cost projections are based on the current experience of LB for buses. Tram operating costs were validated by Transdev, and subjected to a thorough review and benchmarking process. They are based upon the planned service patterns and required number of tram vehicles. Effective control over all aspects of operating costs is essential for TEL to achieve its profit objectives. However, the public's perception of the quality of services translates directly to patronage and revenue generation. Therefore, TEL must balance opportunities for cost savings against the impact this may have on the quality of services provided.
- 1.60 Maintenance services are being procured separately. A significant proportion of the maintenance fees accruing will be based on key performance indicators (kpi's) including punctuality, availability and presentational standards.
- 1.61 TEL's success in realising the benefits expected from the integrated bus and tram business will be measured using a number of developed kpi's. These have been incorporated into the relevant contracts and operating agreements with service providers to TEL including the operator of the trams, Transdev, and the maintenance providers for the tram system.

#### New development and economic growth risk to patronage and revenue forecasts

- 1.62 Phase 1a of the tram will encourage and facilitate the new development planned in North and West Edinburgh and stimulate economic growth in the city. However, the forecast future TEL patronage and revenues, both for bus and tram, is in turn highly sensitive to the level and timing of new development and the underlying level of economic growth. Sensitivity tests indicate that with new development delayed by

five years in other areas, overall TEL revenue would be reduced by 3% in 2011 (12% in 2031).

- 1.63 In the event of slower than expected development or a general economic downturn, TEL would plan and implement services to match the reduced demand. On the Phase 1a corridor, where there is already a high level of demand, the opportunities to implement revised integrated service patterns for buses and tram, with commensurate savings in operating costs, would significantly mitigate the risk of failure to meet annual operating profit targets. In 2011, approximately 30% of forecast demand between Leith and Haymarket and 50% of demand between Haymarket and the airport will be directly dependent on new development.

### **Affordability**

- 1.64 The summaries above demonstrate that Phase 1a on its own can deliver significant economic benefits in return for the proposed investment. Here we consider the affordability of Phase 1a of the tram in the context of visible funding and the risks being borne by the principle funders, with a particular emphasis on the risks retained by CEC. Section 10 contains the detailed analysis.

### **Cost estimates**

- 1.65 Building on the detailed cost estimates prepared in November 2006 and incorporating the firm rates and prices received from bidders in 2007, the updated project cost estimates reflect the agreed scope for Phase 1a and a programme for delivery of Phase 1a by the first Quarter 2011. If the option for Phase 1b was exercised within the window of opportunity to March 2009, it could commence revenue service in 2012.

	Concurrent construction	Sequential construction
<b>Phase 1a</b>	<b>£498m</b>	<b>£498m</b>
<b>Phase 1b</b>	<b>£ 82m</b>	<b>£ 87m</b>
<b>Phase 1 in total</b>	<b>£580m</b>	<b>£585m</b>

- 1.66 There is a high level of confidence in these estimates. Approximately 99.9% of the costs included are based on the rates and prices for firm bids received for the main contracts (Infraco, Tramco, MUDFA and SDS), the remainder of the costs are based on known rates and prices for personnel and, in the case of land, from the Valuation Office Agency (District Valuer's) assessments. The overall level of confidence is reinforced by benchmarking against other tram schemes and the provisions for risk included in the estimate, as explained below.
- 1.67 It should be noted that a sum of approx. £3m has been incurred in relation of the design development for Phase 1b, which is included in the capital cost estimates for Phase 1b throughout this business case.
- 1.68 The updated estimates comprise base costs and an allowance for risk and uncertainty. A rigorous Quantitative Risk Assessment has been applied to identify project risks to derive a risk allowance to deliver a very high level of confidence (statistically at a 90% confidence level meaning that there is a 90% chance that costs will come in below the



risk-adjusted level). The level of risk allowance so calculated and included in the updated estimate represents 16% of the underlying base cost estimates for future costs at Contract Award. This prudent allowance for cost uncertainty reflects the evolution of design and the increasing level of certainty and confidence in the costs of Phase 1a as procurement has progressed through 2006/2007 and fixed priced bids for the Infraco and Tramco contracts have been received.

1.69 **tie** and CEC will continue to analyse, quantify and mitigate risks during the period through to final negotiation and award of the tram vehicles (Tramco) and infrastructure (Infraco) contracts and during construction with the objective of reducing or eliminating the impact of individual quantified risks and thereby the element of the allowance for risk which crystallises into actual costs.

1.70 The principal elements of the base cost estimates are:

- **Utility diversions** – The Multi Utility Diversion Framework Agreement (MUDFA) was awarded in October 2006 and rates, prices and allowances in the contract have been reflected in the updated estimate;
- **Tram vehicles** – Tenders were received for Tramco in October 2006 and the updated estimate reflects those of the recommended Preferred Bidder;
- **Infrastructure** – Tenders were issued for Infraco in October 2006 and the updated estimate reflects those of the recommended Preferred Bidder. The cost estimates have been benchmarked against other comparable tram schemes;
- **Land compensation costs** – Estimates have been provided by the District Valuer and are subject to regular review. Reviews performed in spring 2007 confirmed the adequacy of the estimates; and
- **Internal costs** – Comprises mainly the firm price SDS design costs as contracted plus the costs of project management team and overhead, legal costs related to procurement and support of approval processes and the support of the operator, Transdev, all of which have been estimated using a detailed resourcing plan to which staff costs and rates agreed with service providers have been applied.

1.71 The Infraco and Tramco contract cost and the MUDFA contract rates are fixed at outturn price levels. The base estimate costs for remaining items, principally internal costs, are based on fully inflated costs estimates supplied by service providers and on industry standards for salary cost inflation.

1.72 In summary, the cost estimate reflects substantial external validation from the procurement process for the major contracts and contains a sensible level of risk contingency.

### Measuring affordability

1.73 On 27<sup>th</sup> June the Scottish Government confirmed support for up to £500m funding for the Edinburgh Tram scheme. In January 2006, CEC made an in-principle commitment to make a contribution of £45m towards the capital cost of Phase 1, to be deployed initially on Phase 1a. The benchmark total funding package is currently therefore £545m. The updated cost estimates above reflect that Phase 1a, at a cost of £498m, is affordable within this level of funding, with a 9.2% headroom over and above the 16% risk allowance provided for in the cost estimate.

### Application of available funding

1.74 Payment for capital costs will be made by **tie** in accordance with principles of the contractual payment mechanisms for each contract. A detailed table showing the

profile of planned expenditure is included in Section 10. Funding from the Scottish Government and CEC is for capital expenditure only. All operating and lifecycle costs in relation to the tram will be borne by TEL. This means that CEC, in its capacity as sole shareholder of TEL, is explicitly bearing the risks in relation to revenues, operating costs and the long term maintenance of the tram insofar as these risks are not wholly, or partly, passed contractually to the private sector.

- 1.75 CEC must balance its desire to support the project with its fiduciary responsibility and limited resources. Therefore, CEC's contribution, 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 CEC, 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 route and anticipated capital receipts from tram related Council owned sites.
- 1.76 Transport Scotland and CEC have agreed to work together to regularly review and revise (as necessary) the contribution schedule, as required by the Grant process.

### **Procurement strategy and risk allocation**

- 1.77 The Procurement strategy followed by **tie** responds to feedback from the National Audit Office in 2004 on the effectiveness of light rail schemes. The objectives of the Procurement Strategy are summarised as follows:
- Transfer design, construction and maintenance performance risks to the private sector;
  - Minimise the risk premium (and / or exclusions of liability) that bidders for a design, construct and maintain contract normally include. Usually at tender stage bidders would not have a design with key consents proven to meet the contract performance obligations and hence they would usually add risk premiums for this;
  - Mitigation of utilities diversion risk (i.e. potential impact of delays to utilities diversion programme on Infraco works); and
  - Gain the early involvement of the operator to mitigate the risk relating to the future operation of the tram.
- 1.78 To date, **tie** has entered into four key contracts:
- **Development Partnering and Operating Franchise Agreement (DPOFA)**  
Awarded to Transdev in 2004;
  - **System Design Services (SDS)**  
Awarded to Parsons Brinkerhoff in September 2005;
  - **Joint Revenue Committee (JRC)**  
Awarded to Steer Davis Gleave in September 2005; and
  - **Multi Utilities Diversion Framework Agreement (MUDFA)**  
Awarded to Alfred McAlpine in October 2006.
- 1.79 This leaves the two main contracts to be placed, namely:
- **Infrastructure provider and maintenance (Infraco)** - the tender process is concluded and Preferred Bidder selected, contract to be awarded in January 2008 on conclusion of final negotiations and completion of design due diligence.
  - **Vehicle Supply and maintenance (Tramco)** - tender process is concluded and Preferred Bidder selected, contract to be awarded in January 2008 on conclusion of final negotiations and completion of design due diligence. Spanish firm CAF has now been recommended by **tie** as the preferred bidder for this contract.
- 1.80 The Infraco will act as a "holding contract" with the intention that the design and vehicle provision (including maintenance contract) will be

novated to the Infraco at the point of award. The entire strategy 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 i.e. deliver value for money.

1.81 In summary, the key attributes of the strategy are:

- The separation of system delivery and operations – to focus organisations on their strengths and to minimise mark-ups and risk premiums;
- Early introduction of the operator – to ensure effectiveness of design, construction and commissioning ready for operation;
- Early commencement of design by the SDS contractor – to reduce scope and pricing risk in Infraco and Tramco bids and to reduce the overall project programme;
- Separate procurement of the tram vehicles – to enable the selection of the optimum combination of tram vehicle and infrastructure suppliers;
- Re-aggregation of the supply chain at the point of award – by novation of the SDS and Tramco contracts to Infraco, thereby creating single point responsibility for design, construction, commissioning and subsequent maintenance of the tram system, with consequential transfer of performance risk to the private sector;
- Maintenance of the tram vehicles and infrastructure for up to 15 years post commencement of operations by Tramco and Infraco – to incentivise selection of components with 'whole life' costs in mind and to incentivise Infraco to mitigate the risk of latent defects arising during the operational phase;
- Separate procurement of utilities works under MUDFA – to enable completion of the utilities diversions before commencement of infrastructure works thus reducing risk during the construction phase and avoiding the risk premiums that would otherwise be included if this work was included with the Infraco package;
- Validation of the SDS designs by a Technical Support Services (TSS) consultant – to provide comfort that the designs produced will deliver the required performance;
- Incentivise delivery in accordance with programme – by adopting a milestone payment mechanism in the SDS, Tramco and Infraco contracts, with a significant element of the price withheld pending completion of system reliability tests; and
- Bonds and Warranties in the SDS, Tramco and Infraco contracts – to provide recourse in the event of failure.

1.82 These arrangements provide early involvement of the tram system operator, risk transfer to the private sector at an affordable level, a shorter overall programme and a single point of responsibility for the delivery of the operating tram system and subsequent maintenance.

1.83 Section 7 provides a detailed analysis of the procurement strategy and Section 11 describes the approach to risk management in all aspects of the project.

## Risks retained by the public sector

- 1.84 The Procurement Strategy, when fully implemented, will be effective in transferring a very significant number of risks to the private sector. However, as explained above, the strategy is also predicated on delivering value for money and certain risks are retained in the public sector where they can be effectively managed. **tie** maintains a comprehensive register of all identified risks in relation to the project and has an active management and mitigation plan for each risk. Where these risks can be quantified they have been assessed and included in the risk allowance in the capital cost estimates.
- 1.85 As the project moves towards physical construction, the following are the most significant risks which could impact on the delivery of the project on time and within the capital cost estimates (including risk allowances):
- **Utility diversions** – **tie** will manage the interface between utility diversions and the follow on works by Infraco. A significant delay in the hand over of worksites to the Infraco could result in significant financial penalties to the extent these are not met by the MUDFA contractor's liability limits. For this reason, a prompt start to these works was made in 2007, including advance works at the Gogar depot site. This allowed some of the delay, caused by the review of the project following the May election, to be absorbed. The current programme is fully aligned with the preferred Infraco bidder's programme of works and progress to date has been excellent with no major issues encountered so far.
  - **Changes to scope or specification** – A great deal of care has been taken in defining the scope and specification of the tram project throughout the Parliamentary process and during design development with input from TEL and Transdev and extensive consultation with CEC and TS. However significant unforeseen changes to scope and specification could have a very significant impact on the deliverability of the project. Similarly, any changes introduced by stakeholders that are over and above the approved scope will increase the project estimate. Effective management of the consideration of changes through the Governance processes implemented for the project will be vital to mitigate this risk.
  - **Obtaining consents and approvals** – Responsibility for the preparation and application for most necessary consents and approvals has been passed to the SDS provider and this risk will pass to the Infraco at the point of novation. However, **tie** and the other stakeholders must continue to ensure there are clear strategies and effective processes to deliver all consents and approvals including planning approvals and Traffic Regulation Orders (TROs).

## Implementation

- 1.86 **tie** has developed a number of key strategies and management plans to ensure the successful implementation of the construction phase of the project. They cover land acquisition, obtaining the required approvals and consents, compliance with statutory requirements and side agreement with third parties, as well as traffic management plans and a people strategy. These are based on the policies developed through either public consultation or testing and consideration during

the parliamentary process. They set out **tie**'s approach to mitigate the likely impacts of both the construction and operation of the tram.

- 1.87 Extensive work has been undertaken to establish the impact of tram on the wider traffic flows in Edinburgh and the finalisation of traffic modelling will include any necessary changes to the traffic arrangements that are indicated to be beneficial to the public.
- 1.88 In conjunction with development of the TEL Business Plan, the tram operating and maintenance contracts have been developed with a coordinated performance regime, safety management organisations and implementation plans. The contracts are aligned to achieve the integrated mobilisation, testing and commissioning of the tram and delivery of service.
- 1.89 A staged approach has been developed to allow passenger services to commence at a lower level of intensity, building with patronage growth and experience of revised road traffic flows through the city. Review and optimisation of traffic signal phasing will be performed in conjunction with CEC both before and after service commencement, to achieve effective traffic management.

### **Programme**

- 1.90 The table below (Table 1.3) summarises, in chronological order, the key milestones achieved since the approval of the DFBC in December 2006 and the next stages of the project up to commencement of revenue service of Phase 1a. The detailed programme from which these dates have been extracted is described in Section 12 and has been prepared on the basis that contracts for Infraco and Tramco will be awarded in January 2008, with construction commencing in February 2008. The immediate start of construction is predicated on some limited mobilisation in late 2007.

Table 1.3 Milestone Programme – Key dates

Milestones	Date
Approval of Draft Final Business Case (DFBC) by the City of Edinburgh Council (CEC).	21 Dec 06*
Approval by Government of continuing funding including utility diversions based on the DFBC.	16 Mar 07*
Traffic Regulation Order (TRO) process commences.	28 May 07*
Tramco – complete initial evaluation / negotiation.	07 Mar 07*
MUDFA – completion of pre-construction period of MUDFA contract.	30 Mar 07*
MUDFA – commencement of utility diversions.	09 July 07*
Infraco – return of stage 2 bids.	08 May 07*
Tramco – appointment of Preferred Bidder.	20 Sep 07
Infraco – completion of evaluation / negotiation of bid.	09 Oct 07
Infraco – selection of Preferred Bidder.	15 Oct 07
Tramco / Infraco – Final facilitation of novation negotiation complete.	16 Nov 07
Tramco / Infraco - final negotiation and appointment.	19 Nov 07
Infraco – negotiation of Phase 1b complete.	12 Dec 07
Approval of Final Business Case (FBC) by CEC approval and funding for Infraco / Tramco and all related works to completion of project.	20 Dec 07
Tramco / Infraco – award following CEC / TS approval and cooling off period.	28 Jan 08
Construction commences Phase 1a.	01 Feb 08
TRO process complete.	17 Nov 09
Commencement of Test Running Phase 1a.	27 Aug 10
Operations commence Phase 1a.	Q1 2011

\*completed

## The Business Case for Phase 1b

- 1.91 Phase 1 b (Roseburn to Granton Square) has a strong economic Business Case, but in the context of the £500m capped funding from the Scottish Government, the project funding position and risk appetite at this time, a Phase 1a only approach is recommended. It will be possible to progress with Phase 1b, with a limited financial penalty for this staggered approach, as long as commitment is made by 31 March 2009, following which, there could be substantial additional cost.

### Economic viability

- 1.92 The strong incremental economic benefit of augmenting the network with the Roseburn to Granton tram line is a striking factor. There is a close relationship between this assessment and the scope and timing of new development at Granton, which carries both risk and opportunity. The economic benefits, alignment to planning objectives and financial implications that are specific to Phase 1b are summarised below.
- 1.93 The tram is integral to the regeneration of the brownfield area in the North of Edinburgh at Granton Waterfront. Some 7,800 new residential units and nearly 244,000 m<sup>2</sup> of new office, retail and other commercial development is projected to be built in Granton progressively between now and 2020, reflecting the growth in Edinburgh's economy and population. The absence of Phase 1b of the tram is likely to have a substantial adverse effect on the scale and timetable for this redevelopment.
- 1.94 The forecasts reflect that by 2015 more than 4,500 residential units and 64,500 m<sup>2</sup> of employment related development in Granton will not be built in the absence of

Phase 1b of the tram. Beyond 2015, the predicted level of new development in Granton in the absence of tram recovers, but ultimately it is predicted that 3,800 residential units and 43,800 m<sup>2</sup> of new commercial development may not be built without Phase 1b of the tram.

- 1.95 In employment terms, it is anticipated that more than 930 full-time permanent jobs in the city will be generated of which circa 340 can be attributed to Phase 1b. These jobs do not displace jobs elsewhere in Scotland.
- 1.96 On Phase 1b, Granton and Pilton to the north are areas where socio-economic status is considerably less affluent than surrounding areas and where employment, income levels and car ownership tend to be comparatively low. Opportunities for people living in these areas will be improved by direct connection via tram to the city centre and other development areas.

### Benefits and costs to Government of a composite Phase 1a and 1b

- 1.97 The benefits and costs of Phase 1 of tram calculated in accordance with STAG requirements are summarised in the table below. The appraisal assumes that EARL, as discussed previously, will not proceed. Table 1.4 assumes that construction of Phase 1b would be commissioned prior to the end of March 2009, if not there will be substantial penalty cost.

**Table 1.4 Value of the ETN Benefits for Phase 1, 1a and incremental 1b (£m Present Value, 2002 Prices).**

<b>£m Present Value, 2002 prices</b>	<b>Phase 1</b>	<b>Phase 1 a</b>	<b>Incremental Phase 1b</b>
Value of scheme benefits	980	592	388
Value of scheme costs	424	335	89
<b>Net benefits</b>	<b>556</b>	<b>257</b>	
<b>Benefit Cost Ratio to Government</b>	<b>2.31</b>	<b>1.77</b>	

Note: Phase 1b is only operationally viable as part of the wider network of Phase 1. Therefore no separate assessment of the NPV and benefits per £1 cost is performed.

### Financial highlights – Phase 1b included

- 1.98 Table 1.5 provides a summary of the financial highlights from the forecast of TEL's profitability operating with bus and tram. This is based on a Phase 1a + Phase 1b approach and remains valid until March 2009 providing 1b is commissioned by that date:

**Table 1.5 TEL profitability operating with bus and Phase 1a and Phase 1a and 1b tram.**

Tram in service	Pre-tram		Ph1a Only	Phase 1a plus 1b			
	n/a	n/a	6/12	6/12	8/16	8/16	8/16
Tram service pattern (see below for explanation)							
Year	2006	2010	2011	2012	2016	2021	2031
<b>Patronage (Pax m)</b>							
Bus	108	117	113	112	121	128	143
Tram	-	-	11	16	24	28	34
<b>Total TEL Patronage</b>	<b>108</b>	<b>117</b>	<b>124</b>	<b>128</b>	<b>145</b>	<b>156</b>	<b>177</b>
<b>Revenues and costs (£m)</b>							
TEL Revenues	88	109	119	128	168	216	357
TEL operating costs			120	127	157	195	312
<b>Pre-tax operating profit/(loss)</b>			<b>(1)</b>	<b>1</b>	<b>11</b>	<b>21</b>	<b>45</b>
Tram lifecycle costs			-	-	1	2	2
Notional taxation			-	-	3	6	13
Dividend payment			-	-	3	3	5
<b>Net TEL cash surplus/(deficit)</b>			<b>(1)</b>	<b>1</b>	<b>4</b>	<b>10</b>	<b>25</b>

NB All £ figures inflated

### **Integrated service patterns**

- 1.99 TEL's strategic operational plan fully incorporates Phase 1b as an option.
- 1.100 The operational assumptions and strategies that apply to an integrated bus and tram network including Phase 1b are the same as for Phase 1a alone (in terms of service integration, ticketing and operating costs). The financial highlights above show that TEL is potentially a very viable and profitable business. However, there is a higher level of uncertainty attached to the forecasts for patronage and revenue on Phase 1b. Although forecast patronage on Phase 1b in 2011 amounts to approximately 30% of total tram passengers, nearly 70% of that demand will be directly dependent on the new development at Granton waterfront. In context this represents a relatively small proportion of TEL's total revenue.
- 1.101 Compared to Phase 1a, the opportunities to mitigate the impact on operating profits of short term lower demand are less on Phase 1b, since a greater proportion of the patronage will be carried by the tram on 1a. However, opportunities will exist to reduce the planned level of tram services to mitigate any negative impact.

### **Affordability**

- 1.102 There is no doubt that pursuing Phase 1b in tandem with Phase 1a, with either concurrent or staggered construction, further enhances the Business Case. However, it is recognised that, within current funding constraints alternative sources of funding will be required. Nevertheless, there is a reasonable period, during which the opportunities for funding can be investigated. This will also give time for risks currently pertinent on Phase 1a to crystallise / disappear during this period and this may give impetus to the possibility of undertaking and completing Phase 1b in an overlapped timeframe with 1a.

### **Funding requirements**

- 1.103 To date, TS and CEC have approved funding which should be sufficient to meet forecast expenditure commitments up to Financial Close, scheduled for January 2008. This includes funding for compensation under a General Vesting Declaration process to secure land required for the construction of Phase 1a and for the design, development and commencement of utility diversions.
- 1.104 Upon approval of this FBC, **tie** will require approval and immediate release of the remaining funding committed to the project, as per the milestone drawdown schedule agreed between CEC and TS.

### **Summary of specific approvals arising from this Business Case**

- 1.105 To approve the recommendation that the Edinburgh Tram Project Phase 1a proceeds at an estimated cost of £498m.
- 1.106 To approve the selection of the chosen preferred bidder for the Infraco and Tramco contracts.
- 1.107 To approve the request to **tie** Limited, with CEC officials, to examine the means of funding Phase 1b, with a view to potential commitment in 2008.



## Conclusion

- 1.108 The Edinburgh tram project has now been under assessment for more than seven years. During that period, the underlying rationale for the project, support to the growth of the Edinburgh economy by providing high quality transport connectivity, has been reinforced by events. The city's economy and population continue to grow and the prospects are that this will continue. The Scottish economy as a whole is strongly influenced by the success of Edinburgh.
- 1.109 The Business Case seeks to set out in an objective and clear manner the advantages and disadvantages of the proposed scheme as a means of providing the enhancement to transport provision which the city will require if its growth ambitions are to be realised. The documentation reflects the scale and complexity of the scheme and the need for rigorous, professional analysis of the proposal. In its entirety, the document should represent a "balanced scorecard" assessing all the key aspects of the proposal. The document also sets out the means by which the project may be implemented in a risk-controlled manner, should the Business Case be approved.
- 1.110 The responsibility for delivering this document was given to the Tram Project Board by CEC through TEL. It is these organisations who now have the responsibility of concluding on the way forward for the project, based on the evidence presented in this Business Case.

## Appendix 3: Risks

The risks fall into the following broad categories

- a Project Risks (risks affecting the timeous completion of the project within time and budget and to the desired quality)
- b Operational Risks (risks affecting the long-term viability of TEL)

### Project Risks

1. Between now and financial close there is a risk that the preferred bidder may withdraw from negotiations for a number of reasons, including the potential refusal to accept a novated contract for SDS or Tramco. **tie** are working to minimise this risk through negotiations with the final bidder prior to Financial Close.
2. The most significant risks affecting the timeous completion of the project within budget are identified in the FBC as those arising from the advance utility diversion works (MUDFA); changes to project scope or specification; and obtaining consents and approvals.
3. The main risk in respect of utilities is that delays from MUDFA in handing over sites to the infrastructure contractor could lead to claims from the infrastructure contractor and significant additional costs. **tie** staff are working to minimise this risk by working with both Infraco and MUDFA on their respective programmes. There is a further risk regarding the interface between MUDFA and the Scottish Utilities Companies (SUCS). If SUCs fail to approve designs on time, this could delay MUDFA works, which in turn could delay Infraco, leading to claims.
4. The Infraco contract is a substantially fixed price contract, so any scope changes post financial close will have to be implemented using a variation order, which will add costs to the project. It is therefore important that changes are kept to a minimum and to that end, the Tram Project has clearly defined, tight change control procedures supervised by the TPB.
5. It is recognised that designs are not yet complete and some design assumptions may be different to the aspirations of CEC and / or other third parties (e.g. Forth Ports). If the designs are built into the contract at contract close and the decision is made to change them at a later date, this will lead to additional costs and potential delay. In order to reduce this risk, further work will be done on the tram designs prior to contract close in the context of available funding.
6. Linked to this risk is that the visual aspects of designs do not represent the preferences of the prior approvers so that that Planning Approval is not given and designs have to be reworked. Such variation order to the contract would again lead to additional cost and delay. The planning prior approvals programme is expected to be complete by March 2008, which is post contract close. To minimise the risk of planning approval being withheld post contract close, SDS and **tie** are involving planning staff in the design process so that concerns can be addressed at an early stage.

7. As noted in paragraph 4.3, Value Engineering savings have been built into the cost estimates. If these cannot be achieved, there is a risk to the project cost estimate. To reduce this risk, further work will be done on Value Engineering prior to contract close to improve the robustness of the VE savings. This will be considered prior to Contract Award taking account of the available contingencies and allowances for unrealised risk at that time.
8. TRO hearing is mandatory requirement under current legislation and financial allowance has been made for this under the risk register. It should be noted that the Scottish Government is consulting on potential changes to the legislation, which, if approved, would remove the mandatory requirement to hold a hearing where a project has been subject of Parliamentary Approval.
9. It was noted in the Report to Council in December 2006 that, on the recommendation by **tie**, the Council is taking a long lease of land rather than outright compulsory purchase on two sites, one owned by Network Rail the other by BAA. There is a small risk that these landowners may seek to impose conditions on the operation of Tram at some future date.
10. It should also be recognised that any decision by the Council or Scottish Ministers to cancel the trams is not free from costs, as costs including compensation to contractors and redundancies at **tie**, it is estimated this could be between £20m/£40m (dependent on the timing of cancellation) . Transport Scotland has also indicated that should the Council cancel the tram for other than purely commercial reasons, the Council would be liable for the full cost of that decision. Conversely, should Scottish Ministers cancel the project for similar reasons, it is assumed that they would pay for the project termination costs. Transport Scotland have acknowledged this in discussions.
11. The £545m of approved funding also is not completely free of risk. In particular, contributions to Tram from developers are of course subject to development activity. However Agreements under Section 75 of the Town and Country Planning (Scotland) Act total some £6.77m to date, with a number of further major contributions in the pipeline.
12. It should also be noted that since **tie** has no assets the Council will be called upon to give some form of formal guarantee of **tie**'s contractual obligations. Current indications are that both Infraco bidders will be seeking a letter of undertaking from the Council to the effect that subject to final approval of release to the Council of grant funding by the Scottish Government, **tie** will be fully funded by the Council in respect of all payment obligations and financial liabilities incurred by **tie** pursuant to the Infraco contract, subject to compliance by the contractor with the contract terms. This will be subject to final approval of Grant Funding being released by the Scottish Government to the Council. The undertaking would constitute a guarantee of payment only and not a commitment by the Council as to performance of the contractual obligations.

### **Operational Risks**

13. Future risks arising from the forecasting process have been examined by the JRC. After recapping on the central or reference case forecasts and the assumptions in these forecasts the Revenue and Risk Report tests the sensitivity of Tram to alternative planning and growth assumptions. The JRC also tested assumptions on the attractiveness of Tram to potential users and on the possible impact of bus competition. The analysis of the JRC illustrates the sensitivity of Tram to development

assumptions. The interdependence of Tram and development – especially in north Edinburgh should be noted.

14. A detailed statistical analysis has also been carried out that allows the assessment of the impact of a variety of relevant factors within assumed ranges. The analysis notes the sensitivity of the FBC financial projections for TEL. It also re-emphasises the fundamental relationship between the Tram and the continued growth of the City and associated movement demand, and consequently the sensitivity of Tram revenues to planning and economic growth.
15. In mitigation, it should be noted that Lothian Buses' extensive knowledge of the local transport market has been used to inform and validate the modelling process. Passenger growth assumptions are significantly lower than growth Lothian Buses has experienced in recent years.
16. While Council policy can influence planning and economic development there are decisions in the power of the Council and TEL which have a bearing on the outcome for Tram. In this regard the JRC examined the impact of partial completion of Phase 1, the effect of the Edinburgh Airport Rail Link (EARL) and of various detailed operational factors such as the quality of interchange, tram run-times, and bus service integration plans. The recent decision of Parliament to shelve EARL and the associate proposals for a new station at Gogar have not been included in the financial analysis for the FBC but will be positive.
17. The JRC concludes that the most significant risk to Tram arises from the planning growth assumptions (this applies especially to Phase 1b) but that TEL could manage its operations and reduce costs in response. However the most recent data available shows a continuing strong growth in development in areas close to the route of the Tram in north Edinburgh. The highest growth rates in the number of dwellings the City are to be found in Leith and Leith Walk where growth rates of approximately 8% from 2003 to 2005 have been recorded (Source Scottish Neighbourhood Statistics). Confidence can also be drawn from the continued growth in Lothian Buses patronage levels which continues at around 5% per annum – a figure well above the projections of the JRC report.
18. It also should be noted that current modelling assumes that the Edinburgh Tram Project will be covered by the Scottish Executive's Transport Scotland's national concessionary travel scheme. It is a fundamental assumption that has consistently been understood and endorsed by Transport Scotland for business planning purposes that TEL bus and tram will both participate in the national concessionary travel scheme. However, this concessionary travel scheme will be reviewed by Government prior to the commencement of the tram. There is a risk that either the scheme will no longer apply (or provide a lower rate of compensation to transport operators), or that it could apply to bus and not tram. Given the long-standing commitment to integrated operation it is difficult to understand how this would be feasible.