

Edinburgh transport projects review



Prepared for the Auditor General for Scotland
June 2007

Auditor General for Scotland

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Summary

Purpose of the report

1. On 4 June 2007, the Cabinet Secretary for Finance and Sustainable Growth asked the Auditor General for Scotland to carry out a high-level review of the arrangements in place for estimating the costs and managing the Edinburgh trams and Edinburgh Airport Rail Link (EARL) projects. The Auditor General had already made a commitment that Audit Scotland would undertake a review of major capital projects in Scotland in its current work programme. On this basis, the Auditor General agreed to bring forward a more focused review of Edinburgh trams and EARL as part of the planned work. This report sets out the Auditor General's findings.

Aims and objectives of the review

2. The high level objectives of this review were to assess:
 - Whether the Edinburgh trams and EARL projects are progressing in relation to time and cost targets.
 - Whether appropriate management systems are in place to promote successful completion of the Edinburgh trams and EARL projects.
3. We have considered these objectives for each of the projects separately and the report is structured accordingly. Part 1 of the report pulls together common themes from each of the projects; Part 2 comments on Edinburgh Trams; and Part 3 comments on the EARL project.

Our review

4. The review examined the process for estimating project costs and project management arrangements for the two projects. It does not provide assurances on the accuracy of the estimated project costs. It is important to emphasise that we have not reviewed the operating costs or projected revenues of the projects. Both of these factors could have a significant impact on the financial operation of both projects. Nor have we reviewed the options appraisals for the projects or the benefits they are expected to generate.

5. In undertaking this review, we took account of the earlier work that we carried out for our performance overview of transport in Scotland published in September 2006 and our regular monitoring of the progress of major transport projects.¹ We also carried out interviews with senior officials from Transport Scotland, the City of Edinburgh Council (CEC) and transport initiatives edinburgh limited (**tie**) and reviewed supporting documents for each of the projects.
6. In preparing this report, we have shown our findings to all of the key players -Transport Scotland, CEC and **tie** - and taken their comments into account but due to our timescale we have not followed our usual formal clearance process.

Key messages

7. Both projects have been through the Parliamentary approval process to obtain statutory authority to proceed and have been developed in response to national, regional and local transport strategies.
8. There are three key players common to both projects – Transport Scotland, CEC and **tie** - all of which have satisfactory high-level governance arrangements in place.

Edinburgh trams

9. The Edinburgh trams project is intended to support and promote a growing local economy and create a healthy, safe and sustainable environment. The project is being taken forward in phases. Phase 1, the subject of this report, consists of a tram line connecting Leith Waterfront to Edinburgh Airport (Phase 1a) and a section from Roseburn to Granton Square (Phase 1b).
10. The current anticipated final cost of Phase 1 in its entirety is £593.8 million and estimated project costs have been subjected to robust testing.
11. The Scottish Executive has committed to provide up to £500 million for Phase 1a of the project and CEC a further £45 million. Funding for Phase 1b has yet to be confirmed.
12. A total of £79 million was spent on the project up to the end of May 2007, which includes £17 million to take the two Bills through the Parliamentary process.
13. Some slippage in the project has occurred but **tie** is taking action to ensure that Phase 1a can be operational by early 2011.

¹ *Scottish Executive: an overview of the performance of transport in Scotland*, Audit Scotland (September 2006)

14. Arrangements in place to manage the project appear sound with:
 - a clear corporate governance structure for the project which involves all key stakeholders
 - clearly defined project management and organisation
 - sound financial management and reporting
 - procedures in place to actively manage risks associated with the project
 - a clear procurement strategy aimed at minimising risk and delivering successful project outcomes.
15. The project is approaching a critical phase leading up to early 2008 when Cabinet Secretaries and CEC are expected to be asked to approve **tie**'s final business case. This will allow infrastructure construction to commence. A range of key tasks needs to be completed before the final business case can be signed off and unless work progresses to plan, the cost and time targets may not be met.

Edinburgh Airport Rail Link (EARL)

16. The aim of the EARL project is to allow direct rail services to and from Edinburgh Airport, connecting it to rail stations throughout Scotland.
17. The EARL project is expected to cost in the range of £550-£650 million. This cost range is based on a thorough estimating process but because the project is at a relatively early stage, there is less certainty about current cost estimates.
18. The EARL project is unlikely to be delivered by the target date of the end of 2011.
19. Lack of agreement over governance arrangements and a procurement strategy is inhibiting progress. There is no clear governance framework in place for the project to ensure that all of the parties are coordinated at the top level. An EARL project board exists but its membership and role are no longer agreed among the main stakeholders.
20. There is no procurement strategy in place for the project. In practice, this means that a number of key decisions still need to be made before there can be more certainty about the cost and time targets. For example, the reference design has not yet been completed, the form of contract is currently undecided with fixed price contracts being unsuitable for some parts of the work, and cost estimates have still to be tested in the market. All of these factors mean that there is a higher degree of uncertainty about the EARL project than might be expected.

21. The EARL project is expected to be financed primarily from public funds but this has still to be agreed. Around £20 million has been spent on the project to date, including £4 million to take the Bill through the Parliamentary process.

Part 1. Introduction

Both projects have been through the Parliamentary approval process

22. Both transport projects were the subject of Bills to the Scottish Parliament and after progressing through the relevant committees and approval stages have now received Royal Assent. The Bills process is intended to provide statutory authority to acquire land necessary for construction of the project. The Bills were presented to Parliament on the basis that to acquire all land by agreement would be impractical.

Both projects have been developed in response to national, regional and local transport strategies

23. Both projects can trace their genesis to the 1998 White Paper *Travel Choices for Scotland*. The White Paper required local authorities to develop local transport strategies to allow them to pursue their own transport priorities and better integrate transport services. The trams project was one of a number of projects developed in response to CEC's local transport strategy. The White Paper also recognised the desire to improve air services within a national airports policy. The EARL project was developed as part of consideration of how air services could be enhanced through improved access to airports.

There are three key players for both projects

24. There are a number of partners in the Edinburgh trams and EARL projects but three key players are common to both projects:
- **Transport Scotland** is an Executive Agency of the Scottish Executive. As the principal funder of both projects it takes a close interest in the progress of projects and their projected costs.
 - The **City of Edinburgh Council (CEC)** has different roles in each project. For Edinburgh trams, it is the promoter and a part-funder; for EARL it has a lesser role as the planning authority for the project.
 - **transport initiatives edinburgh limited (tie)** was established in May 2002 as a non-profit private limited company, wholly owned by CEC, to deliver major transport projects for CEC. **tie's** remit is to provide the procurement, project management and financial management capability to ensure that a number of major transport-related projects are delivered. It is currently project managing

Edinburgh trams and promoting the EARL project. **tie** has managed the Edinburgh trams project throughout, from obtaining Parliamentary approval to designing and appointing contractors to deliver the tram system itself. The Scottish Executive appointed **tie** as the promoter of the EARL project in 2003.

High-level governance arrangements are satisfactory

25. The Scottish Executive's project governance process requires three distinct component activities:
- **Authorisation** – where a project is presented to an authorising body in order to gain funding, approval to move to the next stage or agreement to change the scope, cost or definition.
 - **Ongoing oversight and review** – the ongoing monitoring and control of costs and progress, including consideration of emerging issues and risks, ensuring that projects are on track and working within their authorised remit.
 - **Gateway reviews** – before a project moves between phases and prior to its submission to the authorising body, it should be reviewed for completeness and robustness. Within the Scottish Executive, there is clearly defined and independent Gateway review process.²
26. Each of the three key players has its own high-level governance arrangements in place which are outlined below. The specific governance arrangements for each of the projects are outlined in **Parts 2 and 3** of this report.

Transport Scotland

27. Transport Scotland has in place governance procedures for investment decision making that address each of the Scottish Executive's overall governance requirements.
28. Transport Scotland's board meets on a monthly basis and reviews, amongst other things: progress against its business plan; major infrastructure projects; and significant corporate risks.
29. The Chief Executive of Transport Scotland, as Accountable Officer, has overall responsibility for decisions affecting its capital investment programme. A Major Investment Decision Making Board (MIDMB) supports the Chief Executive and meets monthly to consider major project proposals and financial changes exceeding the Project Owner's (a staff member chiefly responsible for a project within Transport Scotland) delegated authority.

² The Office of Government Commerce Gateway Review process is intended to examine programmes and projects at key decision points on their lifecycle and looks ahead to provide assurance that they can progress successfully to the next stage.

30. Separate to the MIDMB, Transport Scotland's Rail Delivery Directorate operates a four-weekly review of its own programme of major projects. All major rail projects are subject to Gateway reviews where an independent team reviews projects at key decision points throughout the project cycle. Most major rail transport projects are delivered by third parties but Transport Scotland has agreed that it would be beneficial to include this independent review process into projects for added assurance. The results of Gateway reviews are reported to Transport Scotland's Chief Executive.
31. Transport Scotland makes grant offers for funding based on **tie**'s estimated funding requirements for the year ahead. It exercises budgetary control over its interests through a four-weekly project report submitted by **tie** which is discussed by both parties.

City of Edinburgh Council (CEC)

32. CEC approves **tie**'s annual business plan and monitors its arrangements. It approved **tie**'s draft final business case for the Edinburgh trams project in December 2006 and is expected to be asked, along with Cabinet Secretaries, to approve the final business case in early 2008.³ Approval of the final business case will allow infrastructure construction to commence.
33. CEC administers funding received for the Edinburgh trams project. **tie** submits quarterly requests for funding to Transport Scotland via CEC and funds are released via CEC. CEC conducts a quarterly reconciliation of expenditure against the funds drawn down and its internal auditor certifies that spend has been properly incurred in respect of the project.

transport initiatives edinburgh (tie)

34. **tie** is overseen by a board which currently comprises an Executive Chairman, four CEC councillors and four non-council representatives. The board meets regularly to review the corporate strategy, and governance arrangements within **tie** and oversees project delivery and financial performance. The board has two sub-committees - remuneration and audit. The audit committee's remit includes overseeing governance procedures and assessing the adequacy of systems of risk management and internal control.
35. **tie** has made changes to its board membership over the last 12 months with the aim of improving the skills set among board members and providing a strong focus on project delivery. Four new board members were added including non-council members with experience in rail and trams. At the same

³ *Edinburgh Tram Network Draft Final Business Case*, **tie**, November 2006. The draft final business case sets out the project's economic and financial viability and progress to date.

time, individual project governance arrangements were updated in 2006. The current arrangements are set out in **Parts 2 and 3**.

36. **tie**'s executive team has also been re-organised with an Human Resources director and Chief Engineer being added to the team. There are currently Project Directors for both Edinburgh trams and EARL. The individuals holding these posts have changed over time to ensure that the necessary skills and experiences required are in place for each stage of the project. **tie** is currently mid-way through a recruitment exercise for both posts. Recruiting new Project Directors at this stage carries risks, as continuity is important. However, **tie** believes the skills and experience necessary for carrying the projects through their next stages to completion are different from those required for the earlier stages of gaining Parliamentary approval.
37. There is evidence of regular and effective reviews of progress within **tie** with the Executive Chairman, non-executive directors and senior staff playing a very active role in overseeing projects.
38. **tie** operates financial management through a clear scheme of delegated authority to incur expenditure. The **tie** board considers expenditure against budget at each meeting.

Part 2. Edinburgh trams

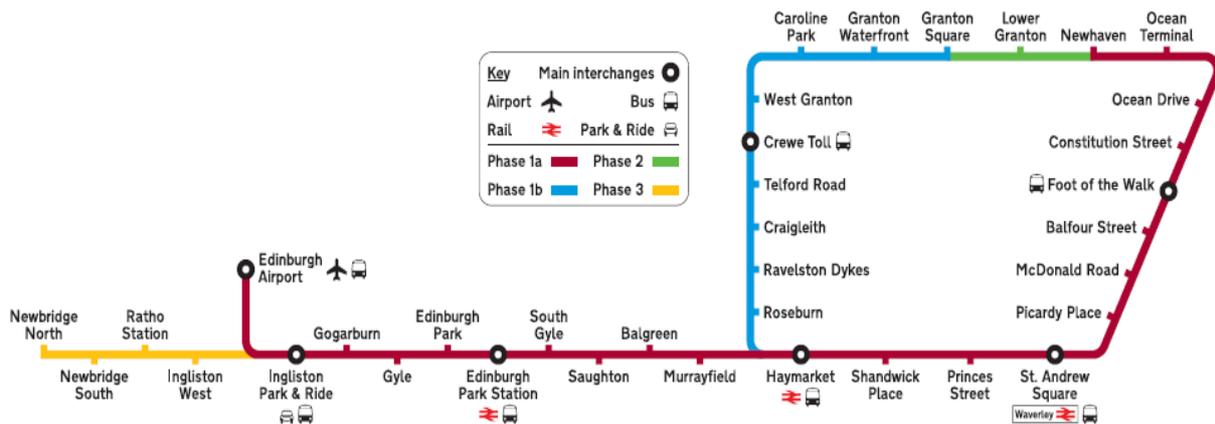
Background to the project

39. **tie** was established to conduct investigations into how best to deliver CEC's local transport strategy, including the desirability of building one or more tram lines in Edinburgh. In September 2002, **tie** submitted its proposals to CEC, identifying three trams lines as the most promising in terms of economic viability and benefits to the city:

- A northern loop connecting Granton and Leith to the city centre
- A western line connecting the city centre to Edinburgh Airport
- A south-eastern line connecting the city centre to the new Royal Infirmary.

40. In March 2003, following CEC's decision to take these lines forward, the Scottish Executive announced its support for the construction of the northern loop and western line (**Exhibit 1**). In January 2004, two Bills were submitted to the Scottish Parliament which received Royal Assent in spring 2006.

Exhibit 1: Proposed route of the Edinburgh trams project



Note: While legislative approval has been obtained for all three phases of the project, a phased construction approach means that only Phase 1 is being progressed at the moment.

Source: *Trams for Edinburgh website*

41. As the tram Bills were being considered in the Scottish Parliament, **tie**'s review of costs indicated that a complete network of both lines was unlikely to be affordable in one phase of construction. The key players involved concluded that the project should be taken forward in stages. Phase 1 of the project, the subject of this report, consists of a line connecting Leith Waterfront to Edinburgh Airport via Haymarket and Princes Street (Phase 1a) and a section from Roseburn to Granton Square (Phase 1b).

The Edinburgh trams project is intended to support and promote a growing local economy and create a healthy, safe and sustainable environment

42. The project's objectives are to:

- support the local economy by improving accessibility
- promote sustainability and reduce environmental damage caused by traffic
- reduce traffic congestion
- make the transport system safer and more secure
- promote social benefits.

43. A consultant's appraisal of the project, using the Scottish Executive's appraisal guidance, in November 2006 indicated that Phase 1 in its entirety was expected to deliver benefits of £1.63 per £1 of cost.⁴ Phase 1a is expected to generate benefits of £1.10 per £1 of cost. Phase 1b is expected to generate higher benefits because it is expected to contribute to the regeneration of Granton. Other outcomes expected from Phase 1 include:

- more than 40,000 m² of factory, office and retail space by 2011 increasing to 114,000 m² by 2015 (through regeneration)
- 900 additional homes by 2011 rising to 5,250 by 2015 (through regeneration)
- 930 additional jobs of which 590 are attributed to Phase 1a (through a mixture of construction and regeneration)
- improved air quality, traffic noise and CO₂ emissions resulting from the transfer of car trips to public transport

⁴ STAG 2 Appraisal, *Edinburgh Tram Network*, steer davis gleave, November 2006

- enhanced opportunities to make journeys on the public transport network through bus-tram service integration and ticketing arrangements
- improved access to key trip attractions and destinations.

The cost and time targets for the Edinburgh trams project have been developed using robust systems

The current anticipated final cost of Phase 1 is £593.8 million

44. In January 2004, the total estimated cost of the northern loop and the western line, including the phases not currently being developed, was £473.5 million at March 2003 prices. This estimate did not therefore take account of inflation and assumptions regarding the profile of expenditure over time. Since then, costs have been reassessed at regular intervals as the project progressed.
45. In January 2006, **tie** estimated the cost of Phase 1 as £435 million at March 2003 prices and £570 million in projected outturn prices, which included £135 million to take account of inflation and assumed expenditure profiles. By November 2006, cost had risen by about four per cent compared to January 2006 to £592 million in projected outturn prices to reflect extensions to the scope due to the project design being developed further.⁵ The current anticipated final cost of Phase 1a is £501.8 million at projected outturn prices. For Phase 1b, the current anticipated final cost is £92 million at projected outturn prices.

The Scottish Executive has committed to provide up to £500 million for the project and CEC a further £45 million

46. In March 2003, the Scottish Executive indicated its willingness to provide £375 million for the project. In March 2006, Ministers announced that this funding would be updated for inflation and that the Executive expected to provide between £450-£500 million for Phase 1a. CEC has also committed £45 million to the project.
47. There is, therefore, sufficient funding in place to proceed with Phase 1a (£545 million against estimated costs of £501.8 million) but a current shortfall of £48.8 million for Phase 1 in its entirety. Transport Scotland has not confirmed funding for Phase 1b. It expects that every effort will be made to generate savings from Phase 1a and to maximise contributions from private sector developers.

⁵ *Edinburgh Tram Network, Draft Final Business Case, tie*, November 2006

£79 million was spent on the project up to the end of May 2007 and a further £60 million funding has been provided for 2007/08

48. A total of £17 million was spent taking the two tram Bills through the Parliamentary process. These costs are not counted against the project's overall anticipated final cost of £593.8 million. **tie** spent a further £62 million up to the end of May 2007 implementing the project, including design work and other project management activities, legal fees and communications. These costs have been funded by grant support from Transport Scotland.
49. Transport Scotland has awarded a grant of £60 million for 2007/08 for utilities diversions, advance works and continuing development and procurement.

The project cost estimates have been subject to robust testing

50. In order to confirm its project cost estimates **tie** has subjected them to independent review by consultants and benchmarked them against other UK tram projects.⁶ For example, in November 2006, it compared its estimates for infrastructure construction (a significant element of the total project cost) with those of a recently completed tram system and found there was an overall difference of less than three per cent in directly comparable items. **tie**'s project estimates will be subjected to further development and review before the final business case is presented to CEC and Cabinet Secretaries for approval in January 2008.
51. **tie**'s confidence in its cost estimates has grown as the project has progressed and bids from potential contractors have been received. Following receipt of initial bids for infrastructure construction in January 2007, 79 per cent of the project estimate is now based on rates and prices from firm bids received or on known rates applied to estimated quantities, for example utilities diversion work. A further 20 per cent is based on market rates applied to quantities derived from preliminary designs, for example the cost of land acquisition.
52. The initial bids for infrastructure construction are subject to negotiation and **tie** intends to select the preferred bidder in September 2007. **tie** has developed a negotiation strategy which it intends to use to reduce bids including savings arising from changes to design and specifications (commonly known as value engineering savings). These negotiations have begun to generate significant value engineering savings and **tie** is confident that Phase 1a can be delivered to the current anticipated final cost of £501.8 million.

⁶ *Edinburgh Tram Capital Cost Review Lines 1a & 1b*, Brian Hannaby & Associates, November 2006

Some slippage in the project has occurred but action is being taken to ensure that Phase 1a can be operational by early 2011

53. At the time of submitting the Bills to Parliament in January 2004, the timescales for delivery of the project could not be fixed due to uncertainty about the time to obtain Parliamentary approval. Indicative dates for construction were expected to be from mid-2006 to mid-2009, with a margin of uncertainty of minus six months to plus 12 months.
54. These timescales have been amended as the project has progressed. **tie**'s draft final business case in November 2006 indicated an operational start date for Phase 1a of December 2010 and for Phase 1b of December 2011. Since then, the estimated dates to sign contracts for infrastructure construction and vehicle delivery have slipped by four months to January 2008, to allow sufficient time for negotiations. **tie** has responded to this delay by bringing forward advance works, including critical path works such as the construction of the tram depot at Gogar, and now expects Phase 1a to be operational on 21 January 2011.
55. **tie**'s strategy to deliver the programme on target is to maintain sufficient time between utilities diversion work and infrastructure work. Infrastructure construction bidders provided their own draft work programmes to **tie** in May 2007 and **tie** is currently analysing these. The full extent of contingency within the programme will be confirmed once the bidder programme is negotiated and agreed.

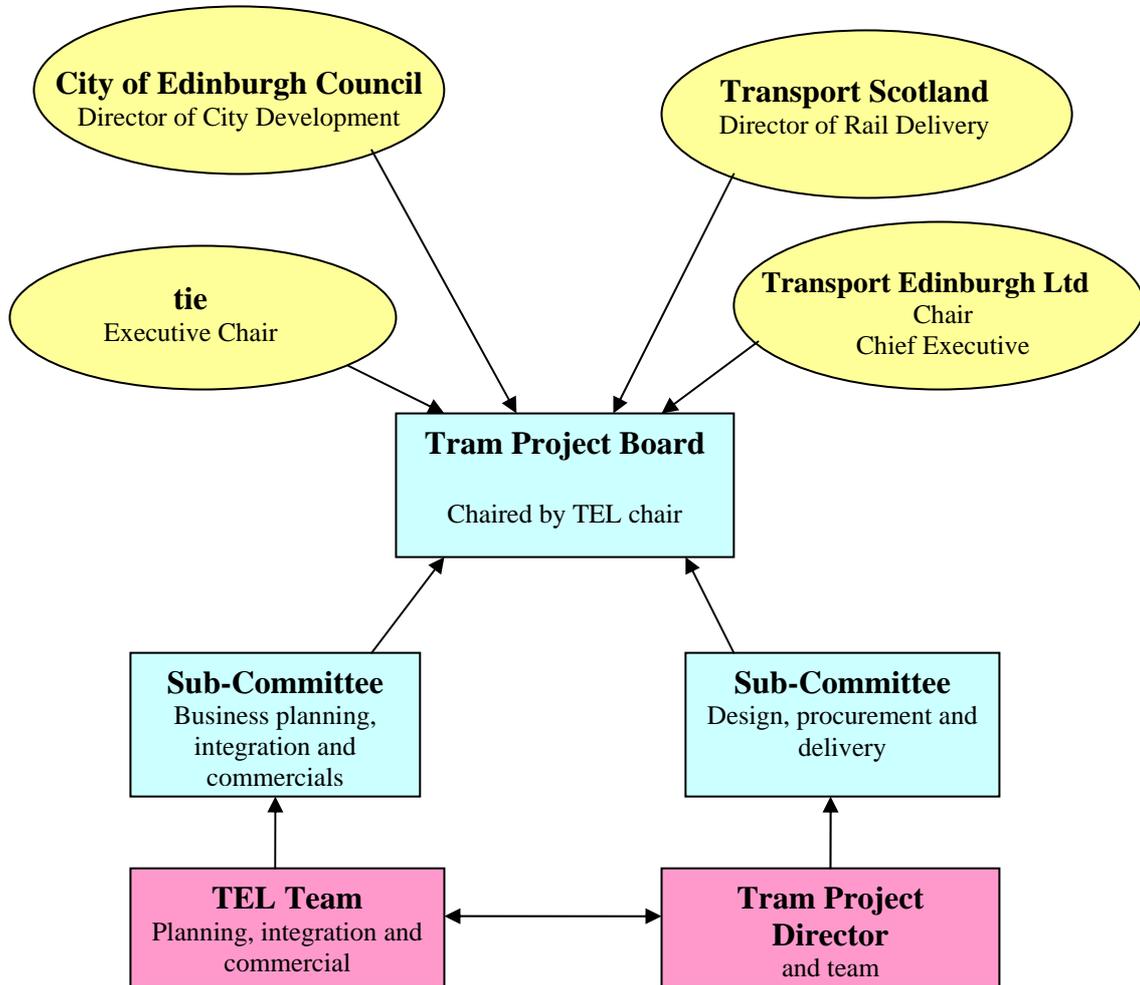
Arrangements in place to manage the project appear sound

There is a clear corporate governance structure for the project which involves all key stakeholders

56. The Tram Project Board exercises overall governance of the project. It includes senior representatives from **tie**, Transport Scotland, CEC and Transport Edinburgh Limited (TEL) and has full delegated authority from CEC (through TEL) and Transport Scotland to take the actions needed to deliver the project to agreed cost, timescale and quality standards (**Exhibit 2**).⁷ The Tram Project Board has a clear written remit, meets every four weeks to consider reports from **tie**'s Tram Project Director and is supported by two sub-committees with responsibility for assessing progress with the programme.

⁷ Transport Edinburgh Limited (TEL) is an arm's length company owned by CEC with responsibility for integrating bus and tram services in Edinburgh. It is intended that once the Edinburgh tram system is introduced, TEL will operate Lothian Buses and the tram system on behalf of CEC.

Exhibit 2. Tram Project Board governance structure



Source: tie

Project management and organisation is clearly defined

- 57. Day-to-day responsibility for delivering the project rests with the Tram Project Director who is supported by five teams responsible for delivery and programme, engineering matters, procurement, finance and operations and maintenance. The Tram Project Director exercises project control through four-weekly reviews of progress with project managers.
- 58. There is a clear project programme that provides start and finish dates for each stage of work. There are also clearly documented project change control procedures in place. The Project Director and Tram Project Board regularly review progress against the programme and consider requests to change it.
- 59. In September 2006, a Scottish Executive Gateway Review assessment of the project was undertaken to test tie’s overall organisation and control over the project. The assessment found that

there was a common understanding within **tie** of the requirements of the project and the challenges faced, and that the majority of recommendations from an earlier readiness review had been fully implemented. A further Gateway review is planned before the submission of **tie**'s final business case to CEC and Cabinet Secretaries.

Financial management and reporting of the project appears sound

60. **tie** operates financial control over the project through a clear scheme of delegated authority to incur expenditure. The Tram Project Board considers expenditure against budget at each meeting and also considers the financial consequences of requests to change the project programme.

Procedures are in place to actively manage risk associated with the project

61. **tie** has developed a risk management plan setting out its requirements for recording, monitoring and reporting risks associated with the project. All project managers, functional managers and workstream managers are responsible for identifying and assessing risk within their areas of responsibility. Risk is considered at the four-weekly meetings with the Tram Project Director and updates to the primary risk register are considered at each Tram Project Board meeting.
62. Quantitative allowances for risk and contingencies have also been built into the project cost estimate using assessments of the likelihood of each risk occurring and its financial cost. As the project has progressed and risks have either dropped off or action to mitigate them has been taken, the allowance for risk and contingencies has reduced. In January 2006, **tie**'s project cost estimate contained an allowance of 24 per cent for project risk and contingencies. In January 2007, a report to the Tram Project Board stated that the allowance for risk and contingencies formed 10 per cent of the current project cost estimate, reflecting progress in procurement and risk management in the interim period. The highest cost risks are currently utilities diversion work (where the volume of work is uncertain until digging starts) and general delay with the programme, for example failing to achieve Traffic Regulation Orders on time.

A procurement strategy has been designed to minimise risk and lead to successful delivery of the project

63. It is good practice to prepare a procurement strategy at the outset of a project to help determine how the project can best be procured. This requires analysis of the risks facing the project, the funding options and consideration of how different procurement routes can best meet the project objectives including value for money.

64. **tie** has developed a procurement strategy which is intended to enhance certainty over costs before construction begins and transfer risk to the private sector where this is relevant. It is based on lessons learned from other tram projects. The Procurement Strategy includes:

- **The early involvement of an operator in the design and development of the project** and to assist planning of an integrated service network with TEL. Transdev was appointed in May 2004. Developing the design as far in advance of procurement as possible helps reduce uncertainty and improves cost estimating of the construction phase.
- **Separation of the day-to-day operation of the tram network from the initial construction of the tram system.** This is intended to allow parties responsible for providing vehicles and infrastructure to concentrate on their strengths.
- **The early involvement of a designer to complete the design phase and reduce planning and estimating risks** associated with the provision of the tram infrastructure. The System Design Services contract was awarded to Parsons Brinkerhoff in September 2005 to facilitate the early identification of utility diversion works, land purchase requirements and traffic regulation requirements.
- **Utilities diversion to be carried out in advance of infrastructure construction work.** Risks associated with utilities diversions are difficult for the private sector to manage and price, and have been seen as a barrier to progressing light rail schemes. Separating utilities diversion work from infrastructure construction is intended to provide more cost certainty for infrastructure construction bidders. Advance utilities diversion are also intended to reduce the risk of disruption to the progress of infrastructure works. Alfred McAlpine was appointed as the contractor responsible to the diversion and protection of utilities along the tram route in October 2006.

65. Most of the large contracts associated with the project (design, utilities diversion, infrastructure construction and vehicle supply) are intended to be fixed price or, in the case of utilities diversion where the volume of work is unclear, based on agreed rates. Payment mechanisms are intended to provide incentives to contractors by ensuring that full payment is not made until the task is successfully completed.

The project is approaching a critical phase

66. The project is entering a critical phase leading up to when CEC and Cabinet Secretaries are expected to be asked to give final approval for the project to proceed to construction. Key tasks over the coming months include:

- the commencement of utilities diversion works
- negotiations with bidders for the infrastructure contract such that they result in an agreed price which is within the overall funding package for the project

- the completion of design works and commence preparation of Traffic Regulation Orders
 - preparation of **tie**'s final business case including updated cost estimates
 - Transport Scotland and CEC need to reach a formal agreement which governs the way in which both parties will fund the project.
67. Given the current uncertainty Transport Scotland has ordered that utilities diversion work be halted with a few key exceptions. In such circumstances, delivering the project to time becomes more challenging the longer work is delayed. **tie** has also expressed concern that the longer there is uncertainty as to whether the project will proceed, the greater the risk that potential contractors will become disillusioned with the project and it will lose key members of staff.

Part 3. Edinburgh Airport Rail Link (EARL)

Background to the project

68. In 2001, the Scottish Executive commissioned technical consultants (Sinclair Knight Merz) to carry out a detailed economic and engineering study on the options to link Glasgow and Edinburgh Airports to the rail network.⁸ In February 2003, following publication of the consultants' report, the Scottish Executive, in association with British Airports Authority plc (BAA), announced its commitment to the further development of the proposals for a rail link to Edinburgh Airport. The Scottish Executive instructed **tie** to develop the rail link, which subsequently became known as the Edinburgh Airport Rail Link (EARL). In March 2006, **tie** submitted the EARL Bill to Parliament and it received Royal Assent in April 2007.

The aim of the EARL project is to enable direct rail services to and from Edinburgh airport, connecting it to rail stations throughout Scotland

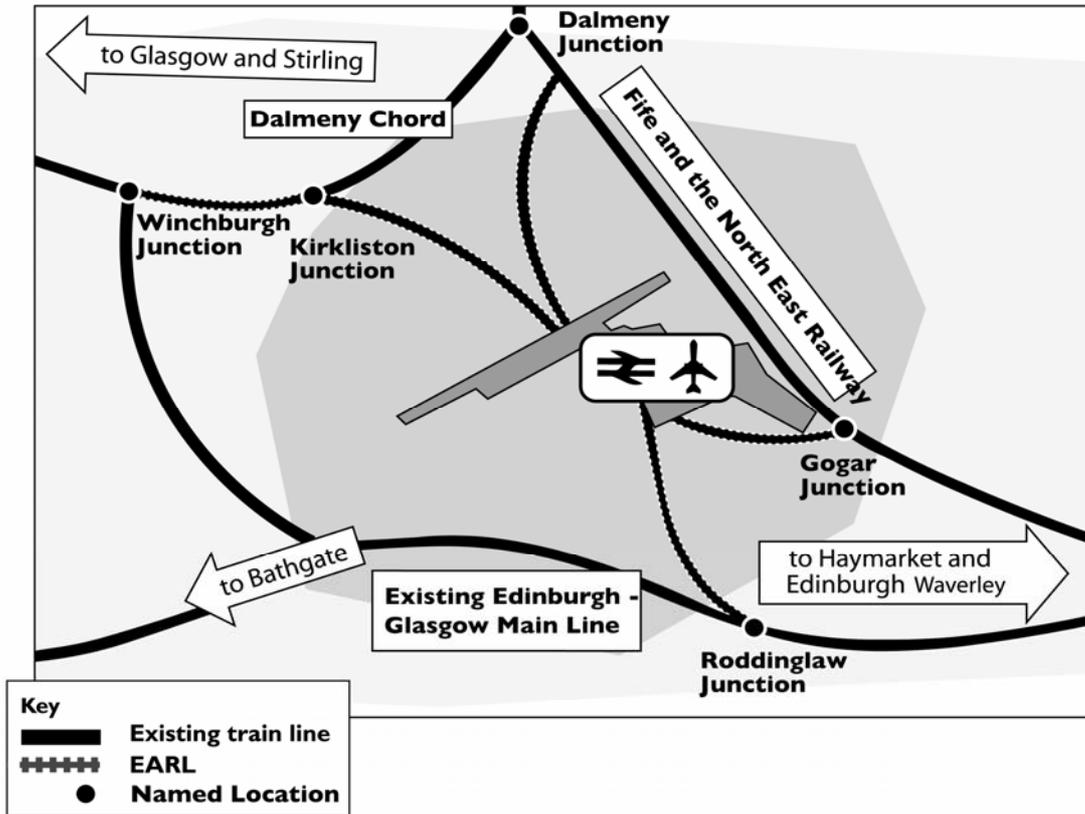
69. EARL comprises the construction of a new railway station at the airport which will be linked to existing rail networks by a series of new track links including a tunnel under the airport runway (**Exhibit 3**). The project objectives are to:

- stimulate economic local and national growth and assist tourism
- assist social inclusion
- offer a sustainable public transport alternative to accessing the airport, to promote a sustainable basis for growth at the airport and to facilitate a public transport interchange hub at the airport.

70. An economic appraisal of the project in December 2005 demonstrated benefits of £1.63 per £1 cost over 30 years and £2.16 after 60 years.⁹

⁸ In association with British Airports Authority (BAA), Scottish Enterprise, the Strategic Rail Authority and the Department for Transport
⁹ *Design Development Appraisal Final Report*, Scott Wilson Halcrow, December 2005

Exhibit 3. The Edinburgh Airport Rail Link



Source: tie

Due to the early stage of the EARL project the estimated cost and time targets remain uncertain

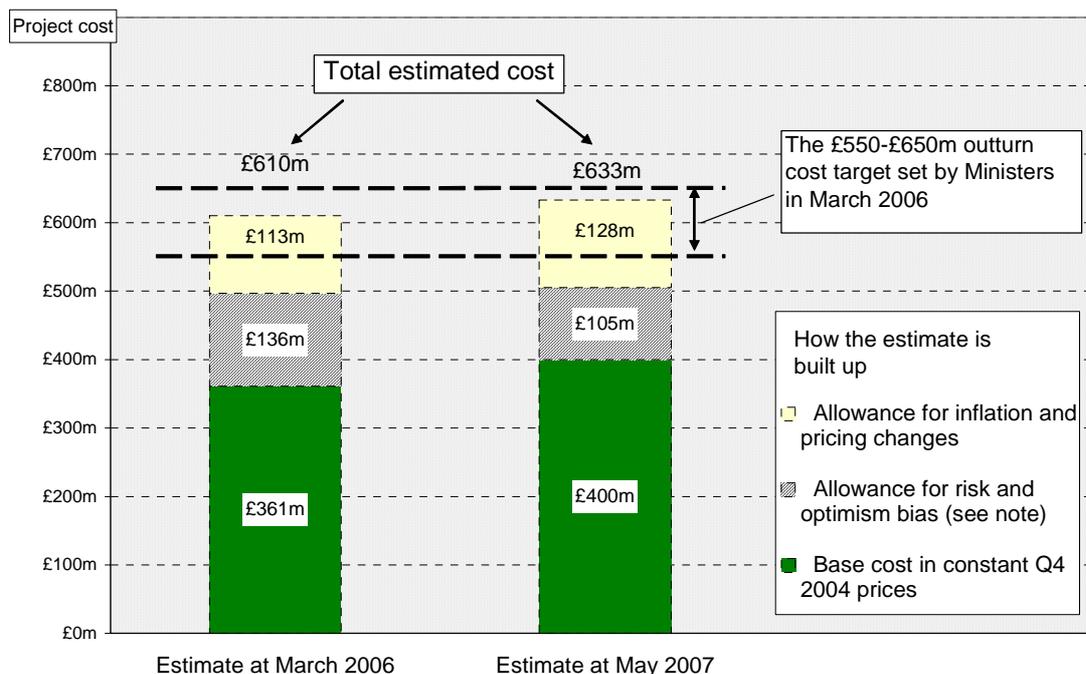
The latest cost forecast is within the range £550-£650 million

71. In March 2006, the estimated outturn cost of the project was £550 - £650 million. This estimate was based on an underlying estimate of £610 million (at projected outturn prices).¹⁰ Within the estimated project costs, the forecast level of risk and optimism bias has reduced while the underlying base cost has increased (**Exhibit 4**). This trend is to be expected for any project as the risk to the base estimate for construction is always greatest at the start of a project.

¹⁰ An inflation allowance was needed because the base estimate was made in constant prices (using 2004 as the price base) but the project development and construction was expected to extend until 2011.

72. In May 2007, the latest estimated cost was £633 million (at projected outturn prices). This is four per cent more than the original estimate of £610 million but is still within the overall cost target of £550-£650 million (**Exhibit 4**).

Exhibit 4. EARL cost estimates in 2006 and 2007



Note: The inclusion of risk and optimism bias allowances in the cost estimates reflects Scottish Executive and wider UK government policy on controlling major capital projects, which recognises evidence of a systematic tendency for over optimism in project planning. Guidance requires explicit adjustments to counter this tendency of optimism bias, to promote effective project appraisal and realistic planning.

Sources: EARL Bill Explanatory Memorandum March 2006; *tie* report to Transport Scotland 30 May 2007

73. **tie** has attributed the increase in costs since March 2006 to:

- An increase in the base cost to take account of project changes agreed as part of Parliament's considerations; external reviews of costs; and development of the detailed design of the project.
- An increase in the allowance for inflation and pricing changes because of an increased cost base and because spending is now profiled to take place later in the programme than previously forecast.

The project remains at a relatively early stage of development and costs will remain uncertain until more progress has been made

74. The EARL project is at an earlier stage than the trams project. There is less certainty about the £633 million current forecast cost for EARL because it is not yet derived from any tender prices resulting from competition.

75. **tie** has not yet awarded any significant construction contracts for the EARL project and its cost estimates have not so far been tested in the market. A concept design has been completed and approved but a more detailed and fully approved reference design which will fully define the scope of the scheme is required before tenders can be issued. **tie** now expects that the reference design will be finalised in September 2007.

Funding for the EARL project has still to be settled

76. The previous Scottish Executive committed, in principle, to fund the capital costs of the EARL project. The options being considered to fund the project are:

- **Grant funding.** To date all Transport Scotland supported rail projects have received capital grant. In practice, this means that Transport Scotland must meet the full cost upfront, which it would have to balance with the funding requirements of other major projects.
- **Other public sector funding sources.** One possible source is Regulatory Asset Base (RAB) funding. RAB is a special form of finance available to Network Rail, which allows it to borrow to fund investment on the basis that Transport Scotland would need to fund the subsequent increases in Network Rail's charges. RAB funding would help Transport Scotland fund more projects in the short run, although there is a limit to the level of borrowing against RAB and Network Rail would need to balance its use of RAB to fund EARL against its other investment needs. The decision also depends in part on the outcome of the Office of Rail Regulator's current assessment of Network Rail's Business Plan for 2009-14. This is not expected to be completed until the end of 2008.
- **European Community Funding** through the Trans European Network (TENs) Fund. This is a European Union grant which may be available for certain procurement options.

77. In addition to these sources of funding Transport Scotland started negotiations with BAA in 2006 with the aim of securing a financial contribution towards the capital cost of the EARL project. BAA did not commit to making any direct financial contribution but BAA and **tie** entered into legal agreements to facilitate development of the EARL project. These legal agreements include BAA's commitment to meet the costs of providing a passenger interchange between the airport terminal and the station and recognition, in principle, of a contingent liability to address the risks associated with operating the airport if the project goes ahead. The estimated cost of BAA's commitment is around £3 million but this is not part of the approved project cost estimates.

Around £20 million has been spent on the project to date

78. As the project has not yet reached the procurement stage there are no major contractual commitments. Transport Scotland has, to date, provided **tie** with around £20 million to progress the project.

- £4 million has been spent on the costs of promoting the project through the Parliamentary Bill process. These costs are not included within the estimated project costs.
- A further £16 million has been spent on preparatory costs including design work, technical investigation and ground surveys, enabling works, land assembly and purchase, legal and contractual research and preparation. These costs do count towards the overall project cost.

The £550-£650 million estimated cost range is based on a thorough estimating process

79. **tie** agreed the scope of the project and the basis for estimating costs with Transport Scotland and other stakeholders in December 2005. Consultants appointed by **tie** to develop the design of the project up to the stage at which the EARL Bill was presented to Parliament developed the initial cost estimate. These estimates were updated by a new set of consultants in October 2006.¹¹
80. Since the original cost estimate in early 2006, there have been two reviews of project costs, risk and optimism bias. Consultants acting for Transport Scotland carried out an independent review and Network Rail conducted a broad overview of **tie**'s cost estimate and found it to be largely consistent with the current cost estimate.¹²

EARL is unlikely to be delivered by the target date of the end of 2011

81. In March 2006, EARL was expected to be delivered by the end of 2011. This was based on **tie**'s underlying forecast which provided for construction to start in 2007 and to finish by April 2011, subject to a margin of uncertainty of plus ten months and minus two months.
82. The programme for completing any major project such as EARL is a highly complex undertaking, which relies on the planning and co-ordination of many separate but related activities and interests. The EARL programme is based on analysis and advice from **tie**'s appointed professional advisers. Since 2006, a great deal of work and planning has been completed.
83. However, despite the careful work and a safety margin of some eight months in the original programme, the target to complete the project by the end of 2011 now appears unlikely to be achieved. Amongst other matters, a procurement strategy has yet to be agreed and there are still

¹¹ Scott Wilson Halcrow report to **tie**

¹² Cyrill Sweett review for Transport Scotland, October 2006; *EARL rapid review*, Network Rail, December 2006

issues surrounding the governance of the project that need to be resolved. The latest available forecast in May 2007 suggests that construction will not be completed before February 2012.

Some arrangements in place to manage the project appear sound but others need to be improved

Lack of agreement over governance arrangements and a procurement strategy is inhibiting progress

84. Transport Scotland, as principal funder, and **tie** have established adequate decision-making processes and delegated limits to help control the project on a day-to-day basis. **tie's** EARL Project Director is accountable for the project and reports monthly to the **tie** board. **tie** submits reports on the EARL project every four weeks to Transport Scotland which are subject to review and discussion. There is also regular communication by **tie** with BAA and Network Rail as the other main stakeholders in the project.
85. There is, however, no clear governance framework to ensure the interests of all the parties are co-ordinated at the top level and **tie's** authority to progress the EARL project has been restricted to strict limits set by Transport Scotland. An EARL project board was originally established in 2005, which includes **tie**, Transport Scotland, Network Rail and BAA. However, this project board did not meet between April 2006 and February 2007 and has met only twice since then. Its membership and role is no longer agreed between the main stakeholders and there is no date for the next meeting.
86. Several issues highlighted in a Gateway review of the project in February 2007 which have yet to be resolved, have contributed to this uncertain position. Firstly, although BAA has co-operated constructively with **tie** on project design, construction and timetabling matters since November 2006, Transport Scotland has yet to persuade it to make a financial contribution of the order it originally expected and to get BAA involved as a delivery partner. Transport Scotland has also been unable to agree any role for Network Rail in delivering some, or all, of the EARL project.
87. In early 2007, **tie** proposed a revised governance structure based on a project board, which it would chair. This structure has yet to be agreed with the main stakeholders.
88. Similarly, a procurement strategy has yet to be agreed. It is good practice to prepare a procurement strategy at the outset of a project to help determine how the project can best be procured. This requires analysis of the risks facing the project, the funding options and consideration of how different procurement routes can best meet the project objectives including value for money.

89. Key decisions have yet to be made on the form of contract and how far it should be divided into separate work packages. The role of Network Rail, if any, in supervising the procurement of the necessary rail infrastructure and who, otherwise, is best placed to coordinate the work has also to be determined.
90. Some cost uncertainty is inevitable at this stage of any project. There is, however, a higher degree of uncertainty with the EARL project than might be expected because the key decision about the best way to procure the main contract works has yet to be made.
91. Even after contracts have been awarded some uncertainty is likely to remain since a fixed price contract is unsuitable for all the works. At present, the preferred form of contract involves agreeing a price based on reimbursing the contractor's costs up to a negotiated target cost limit. This form of contract should assist with providing cost certainty but does not guarantee it.

Financial management and reporting of the project appears sound

92. Transport Scotland makes grant offers for the EARL project based on forecasts submitted by **tie**. Because of uncertainty about the project Transport Scotland is releasing funds to **tie** every eight weeks. **tie**'s external auditors certify spend has properly been incurred against the project.
93. The **tie** board receives monthly reports on the critical issues surrounding costs and the potential impact on the overall capital budget. The next full review, recalculating total project costs, is due at the end of the reference design phase which was scheduled for early September 2007.

Procedures are in place to actively manage risks associated with the project

94. **tie** has developed a risk management plan setting out its requirements for recording, monitoring and reporting risks associated with the project. All managers are responsible for identifying and assessing risk within their areas of responsibility. There is a formal risk register with some 400 individual risks. The risk register provides the basis for systematic assessment of each risk and the development of plans to evaluate, control, mitigate and as far as possible manage them out.
95. Risk is considered at four-weekly meetings between the EARL Project Director and managers at which updates to the primary risk register are considered for reporting to the **tie** Board. The most significant risks identified for the project include:
 - delay in commencing construction linked to the uncertain procurement strategy
 - changes to Network Rail operating standards which could affect scope and design
 - loss of buy-in from key stakeholders

- design issues concerning the necessary tunnel under the main runway at the airport.
96. Quantitative allowances for risk and contingencies have been built into the project cost estimate using assessments of the likelihood of each risk occurring and its financial cost. In March 2006, the estimated project cost included allowances for risk and optimism bias equivalent to 38 per cent of the base cost. As the project has progressed and risks have dropped off or action to mitigate them has been taken, the allowance for risk and contingencies has reduced. The allowance for risk and optimism bias now forms 26 per cent of the estimated base cost.

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