

# Edinburgh trams

Interim report



 AUDIT SCOTLAND

Prepared for the Auditor General for Scotland and the Accounts Commission  
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# Summary

## This report

1. The Edinburgh trams project is currently the fourth largest public capital project in Scotland. During the period since the City of Edinburgh Council (CEC) gave its approval to the project's final business case in December 2007, there has been significant media attention given to it with concerns raised about cost over-runs and delivery delays.<sup>1</sup> In October 2010, the Auditor General and the Accounts Commission decided that an audit report should be produced to provide an update on the project's progress and to consider issues for the future. It is intended to be an interim report which might lead to further audit work and another report at a later date.
2. The decision to produce this report follows a previous report which the Auditor General published in June 2007 reviewing the arrangements in place for estimating the costs and managing the Edinburgh trams project and the Edinburgh Airport Rail Link. At that time, both projects were still at a relatively early stage. In the case of the Edinburgh trams project some utilities diversion works had commenced but major contracts for the construction of infrastructure and tram vehicles had yet to be awarded. While the project was approaching a critical phase, the City of Edinburgh Council (CEC) had yet to approve the final business case.
3. This report is a factual commentary which builds on work completed for the 2009/10 annual audits of Transport Scotland and CEC. The report is augmented where necessary by further analysis of the project's progress and costs (most of which is based on information already in the public domain) and interviews with key parties such as Transport Initiatives Edinburgh (**tie**), the company originally established by CEC in May 2002 with responsibility for delivering the project.<sup>2</sup>
4. There is currently a very public contractual dispute between **tie** and the Bilfinger Berger Siemens consortium (BBS). It would be inappropriate for us to make any comments that may be regarded as prejudging any issue of fact or law that might be perceived to have a bearing on that dispute, or its progression or resolution. We did not interview any contractor as part of the report's preparation and no inference is to be drawn from the inclusion in this report of views expressed by **tie**. The report does not include a detailed review of the various works contracts which are in place. We do not express any opinion on the project's management, the cause or cost of time overruns or the

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<sup>1</sup> The biggest three projects are the construction of a new £1.7 billion to £2.3 billion Forth Crossing, a new £842 million South Glasgow Hospital and the £692 million M74 Completion project. The Scottish Parliament approved the Bill for the new Forth Crossing and the final business case for the Southern General Hospital in December 2010. The M74 Completion is due to open in June 2011.

<sup>2</sup> CEC transferred ownership of **tie** to Transport Edinburgh Limited, another CEC owned company, in August 2009. See Part 3 of this report.

performance of any of the contractors involved. In particular, we have not examined in detail the form of contract or contractor performance relating to infrastructure construction.

## The Edinburgh trams project

5. CEC established **tie** as a wholly owned subsidiary in May 2002 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. Following consideration of three options, the then Scottish Executive announced its support for the construction of a northern tram loop connecting Granton and Leith to the city centre and a western tram line from Edinburgh Airport to the city centre. Bills to construct these lines received Royal Assent in spring 2006.
6. The Edinburgh trams project is intended to support and promote a growing local economy and create a healthy, safe and sustainable environment for Edinburgh. The project is being taken forward in stages. Phase 1a consists of a tram line connecting Leith Waterfront to Edinburgh Airport. Phase 1b consisted of a tram line between Roseburn and Granton Square but this was postponed in April 2009 due to the economic downturn. CEC has not indicated when construction of Phase 1b might commence.
7. The Scottish Government, via Transport Scotland, committed up to £500 million to Phase 1a. The grant agreement between Scottish Ministers and CEC required CEC to provide evidence that it had approved a final business case showing that the capital cost would not exceed £545 million; that the project would deliver more benefits than it costs; and that the tram network would not require any ongoing subsidy once trams become operational. CEC approved the final business case, which confirmed these conditions were achievable, in December 2007 and provided the required evidence to Ministers. The balance of funding is expected to come from CEC, most of it from developer contributions and capital receipts.
8. Construction of Phase 1a includes a number of different stages and contracts:
  - Project design including design drawings for all infrastructure and associated land purchase and traffic regulation requirements
  - Utilities diversion works and other enabling works, such as construction of a park and ride at Ingliston, which were intended to take place before tramlines and other infrastructure was installed
  - Infrastructure construction including tramlines, a tram depot, overhead power lines, ticketing machines and passenger shelters

- Construction of 27 tram vehicles.
9. CEC's governance arrangements for the project are intended to allow the work of **tie** to be subject to scrutiny while keeping all elected members informed of the project's progress. They also reflect the planned future role of another council owned company, Transport Edinburgh Ltd (TEL), in providing integrated tram and bus services. TEL is now responsible for strategic and other material decisions affecting the project subject to delegated limits. The Tram Project Board, as a formal sub-committee of TEL, continues to be the project's main governance body.

## Key messages

### The project's progress to date

- The original plan to have trams operational by summer 2011 will not be achieved. Utilities work is now 97 per cent complete and good progress is being made with the delivery of tram vehicles. However, greater than anticipated utilities works and disputes with the contractor responsible for infrastructure construction have delayed progress. It is possible that trams will not be operational until at least 2013.
- The dispute between **tie** and BBS, the consortium responsible for infrastructure construction, shows no sign of abating. **tie** has tested a number of principles associated with the contract's scope and specification through formal dispute resolution processes, with the stated intent of driving down the estimated cost of contract changes submitted by BBS and getting work started at a number of locations. While this has had some success, it is resulting in **tie** incurring additional project management costs and significant disagreement between **tie** and BBS remains about the interpretation of elements of the infrastructure construction contract.
- Negotiations have been protracted and, although a further round of talks involving an agreed mediator is planned for March 2011, **tie** and BBS have not yet achieved a more co-operative way of working. Some 28 per cent of infrastructure construction works have been completed against an original plan of 99 per cent by the end of December 2010. Works which do not involve the installation of tram lines on existing streets have seen a little more progress (40 per cent completed against a plan of 100 per cent) than on-street works (11 per cent against a plan of 99 per cent).

### The project's costs to date

- **tie** has spent a total of £402 million on Phase 1a to the end of December 2010, representing 74 per cent of the available funding. Infrastructure construction has cost £150 million to date. While **tie** considers it can accurately predict the final outturn expenditure for most elements of the project, the final cost will need to include the cost of resolving the infrastructure construction dispute, which is at

present largely unknown. **tie** has, however, indicated that it is unlikely that all of Phase 1a can be delivered for £545 million.

- Due to the programme and cost difficulties experienced so far, **tie** and CEC are in the process of developing options for taking the project forward. **tie** has been considering an incremental introduction of Phase 1a and the possible impact on the project if the contract with BBS was terminated. The council has been undertaking contingency planning around options to increase its funding of the project. The current situation between **tie** and BBS is, however, complex and the outcome of mediation talks will help inform the options to be taken forward.

## **Governance arrangements**

- Elected members of the current administration at CEC hold differing views of the Edinburgh trams project, and considerable debate is generated at council meetings when the subject is discussed. This has made it more difficult for CEC as a whole to present a unified commitment to the project.
- CEC's governance arrangements for the project are complex and are intended to allow the work of **tie** to be subject to scrutiny while keeping elected members informed of the project's progress. Some members of the project's main governance body, the Tram Project Board, are also members of **tie**'s own board. CEC's Director of Finance and Director of City Development also exercise a number of different oversight roles in the project.
- Transport Scotland considers its need to be represented on the Tram Project Board ended in June 2007 when, following a Scottish Parliament debate and vote, Ministers announced that the Scottish Government's contribution should be capped at £500 million. Transport Scotland does not consider that it has the same oversight role for the trams project as it has for other Scottish Government transport projects because it is neither the promoter of the project or has a contractual relationship with any of the private sector bodies engaged in the project's construction and delivery. Transport Scotland does, however, hold quarterly meetings with CEC where the project's progress is reviewed.
- **tie** makes regular reports on the project's progress to the Tram Project Board and CEC also provides regular reports to elected members at full Council meetings. The commercially sensitive nature of the dispute with BBS and future financial projections, however, has meant that the information presented to members who are not directly involved in the project has been limited. Given the high profile of the project, the lack of detail which has been made available to some councillors has caused frustrations.

## Key issues for the project

10. The Edinburgh trams project is at a significant decision point. There is a high level of concern and media coverage about what the project may finally cost and whether a tram network will be realised. Progress is now largely at a standstill although **tie** is still incurring staff and other project management costs. While **tie** is aware of the issues and has attempted to enforce compliance with its interpretation of the infrastructure construction contract, it is imperative that CEC, **tie** and BBS work together to establish a clear way ahead for the project. The following table outlines the key issues which need to be considered in taking the project forward.

- The continuing dispute between **tie** and BBS over the infrastructure construction contract is clearly a matter of public concern. It is vitally important therefore that a cost effective resolution of the current dispute is achieved. In particular, care needs to be taken that a negotiated solution secures value for money for the public purse. It is important that CEC and **tie** maintain a clear view of the benefits of a negotiated solution when compared against any additional costs which might be incurred.
- At the same time, if a satisfactory solution cannot be found from mediation, CEC and **tie** will need to consider fully the consequences of alternatives including terminating the contract with BBS. This needs to take into account the value of any proposed financial settlement and any project delays which may flow from such action.
- Given the circumstances of the project, there is significant concern about what the project may finally cost and whether it will deliver the expected benefits. CEC and **tie** should continue to work together to develop options for the project which clearly set out costs and timetables for delivery. If an incremental approach to the delivery of the tram system is adopted, **tie** should update its calculations of the benefits accruing for each extension of the tram line and ensure that the benefits are maximised for the additional costs which will be required. All budgets and option appraisals should be subject to independent scrutiny and verification, with any requirements for overriding confidentiality constraints kept to a minimum.
- As **tie** has indicated that it is unlikely that all of Phase 1a can be delivered for £545 million, it needs to define its strategy for the project to ensure that its commitments and available funding are aligned.
- CEC and **tie** urgently need to strengthen public confidence in the project. In addition to the above measures, there are a number of steps which they could take to help this:
  - a number of staff have left **tie** in recent months and others may also leave creating a risk that it may lack the necessary skills and experience to complete the project. **tie** is aware of the effects that criticism of the project is having on staff morale and organisational resilience, and may therefore wish to consider how best it can reassure the public over its project management



capabilities including its organisational structure and reporting lines.

- develop more effective communications with the general public on the project's complexities and progress. Without sufficient public engagement, it is difficult to see how criticism of the project can be managed or prevented. In particular, there is a need to consider how best to communicate the project's benefits compared to the costs incurred.
- Project governance arrangements are complex. Although CEC has agreed to review the operational and governance arrangements necessary to integrate bus and tram services once trams are operational, it needs to consider the scope for a wider review of governance arrangements while the project is still in the construction phase. In particular, CEC needs to be able to satisfy itself that the membership and remit of each element of the governance framework contains sufficient scrutiny of the project's progress and risk management arrangements.
- Because there are differing views held by elected members, it may be difficult for the council to present a unified commitment to this major project. There are also difficulties in allowing elected members who are board members of TEL to share full information on the project's costs and progress more widely with political group colleagues. CEC needs, therefore to consider the best ways to ensure elected members are kept informed about the project while having due regard to the requirements of companies act legislation and any commercial confidentiality of the issues under consideration.
- Although Transport Scotland already monitors project spend, the Scottish Government has a significant financial commitment to the project and it needs to consider Transport Scotland's future involvement in providing advice and monitoring the project's progress. In particular, if CEC decides that an incremental approach should be taken to the delivery of Phase 1a, there may be implications for the conditions of the grant which would require to be considered. The Scottish Government should also consider whether Transport Scotland should use its expertise in managing major transport projects to be more actively involved and assist the project in avoiding possible further delays and cost overruns.

# Part 1. Introduction

## The Auditor General's 2007 report on the trams project

11. In June 2007, the new Scottish Government asked the Auditor General to carry out a high-level review of the arrangements in place for estimating the costs and managing two transport projects for Edinburgh which were then being developed. The Auditor General's report examined whether:
  - the Edinburgh trams and Edinburgh Airport Rail Link (EARL) projects were progressing to time and cost targets
  - appropriate management systems were in place to promote successful completion of the projects.
12. The review was a short exercise and examined the process for estimating project costs and project management arrangements on the two projects. It did not provide assurances on the accuracy of the estimated project costs, nor did it examine the operating costs or projected revenues, and it did not review the options appraisals for the project and the benefits they were expected to generate.
13. At that time, both projects were still at a relatively early stage. In the case of the Edinburgh trams project some utilities diversion works had commenced but major contracts for the construction of infrastructure and tram vehicles had yet to be awarded. While the project was approaching a critical phase, the City of Edinburgh Council (CEC) had yet to approve the final business case.
14. The Auditor General's report concluded that the arrangements in place to manage the trams project appeared sound. It said that a range of key tasks, such as the commencement of utilities diversion works and negotiations with bidders over the infrastructure construction contract, needed to be completed before the business case could be signed off. It added that unless work progressed to plan, cost and time targets may not be met.
15. Following publication of the Auditor General's report in June 2007, the Scottish Parliament conducted a major debate on the future of the Edinburgh trams and EARL projects. After a vote, the Scottish Parliament called on the SNP administration to proceed with the Edinburgh trams project within the £500 million budget limit set by the previous administration. The Scottish Parliament also noted that CEC should meet the balance of any additional funding required. Scottish Ministers subsequently agreed with this motion but decided to cancel the EARL project

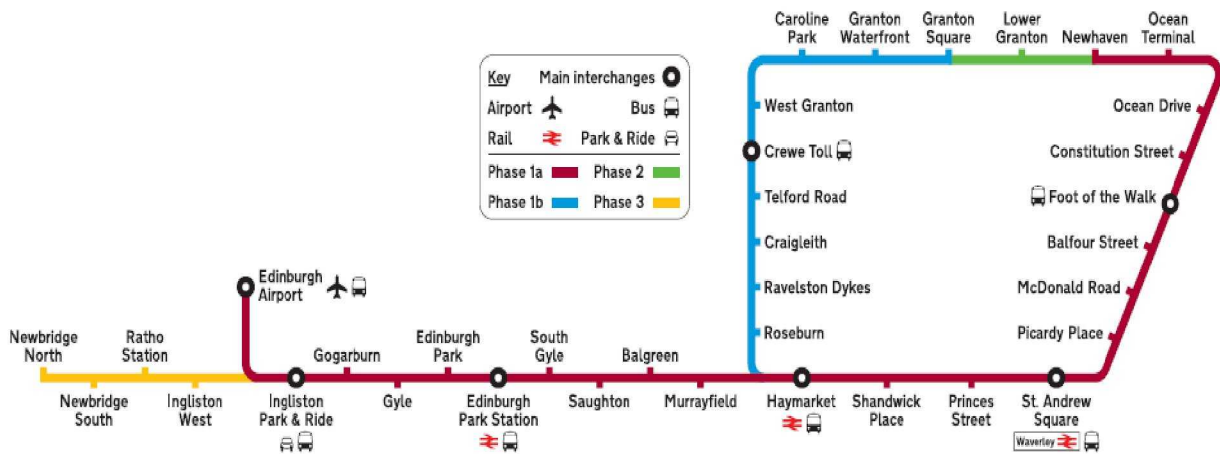
## Background to the project

16. The City of Edinburgh Council (CEC) established **tie** as a private limited company, wholly owned by CEC, in May 2002 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.

17. 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 was obtained for all three phases of the project, only Phase 1a is currently being progressed.

Source: *Trams for Edinburgh website*

18. 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. CEC

and **tie** concluded that the project should be taken forward in stages. Phase 1 of the project consists of a tram line connecting Leith Waterfront to Edinburgh Airport via Haymarket and Princes Street (Phase 1a - involving 18.5km of track) and a section from Roseburn to Granton Square (Phase 1b - involving 5.5km of track).

## The Edinburgh trams project has a number of objectives

19. 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.

20. Phase 1 in its entirety was expected to deliver benefits of £2.31 per £1 of cost.<sup>3</sup> Phase 1a was expected to generate benefits of £1.77 per £1 of cost. Phase 1b was expected to generate higher benefits than Phase 1a because it was expected to contribute to the regeneration of Granton. Other outcomes expected from Phase 1 include:

- 3,800 residential units and 43,800m<sup>2</sup> of factory, office and retail space through regeneration of the Granton area
- 930 additional jobs of which 590 are attributed to Phase 1a (through a mixture of construction and regeneration)
- improved air quality, traffic noise and CO<sub>2</sub> emissions resulting from the transfer of car trips to public transport
- 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.

21. Phase 1a was expected to be constructed first, although contractual arrangements allowed CEC to commit to Phase 1b at any time until March 2009. In April 2009, CEC announced that, as a result of the economic downturn, Phase 1b of the project was being postponed. This report therefore concentrates on Phase 1a.

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<sup>3</sup>Edinburgh Tram Network Final Business Case Version 2, December 2007, **tie**

## **The Scottish Government agreed to provide a maximum of £500 million towards Phase 1a**

22. In January 2008, Scottish Ministers, via Transport Scotland, offered grant support for Phase 1a of 91.7 per cent of eligible capital costs subject to a maximum grant of £500 million. The Scottish Government's grant offer was conditional on CEC approving a final business case for the tram network containing:
- an affordability assessment that the capital cost of Phase 1a will not exceed £545 million
  - a benefits cost ratio (BCR) for Phase 1a which was greater than 1 i.e. benefits were to exceed costs
  - a projection that the Edinburgh tram network would not require any ongoing subsidy during its operation i.e. income was expected to exceed the tram network's running costs.
23. The purpose of the agreement is to enable Scottish Ministers to ensure that grant funding is being properly applied to the project. There is no requirement in the grant offer that the Scottish Government's continued funding of the project should be withdrawn if it became clear that Phase 1a could not be delivered for £545 million.
24. CEC is expected to provide the balance of funding for Phase 1a, up to £45 million, mostly from developer contributions and capital receipts. Consultants reported in December 2007 that CEC's strategy for delivering this funding was a sound basis on which to proceed.<sup>4</sup>

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<sup>4</sup>*Independent Review of Tram Funding Strategy – Council Contribution*, report considered at CEC meeting of 20 December 2007. Consultants subsequently reassessed this strategy in light of the economic downturn and the results were reported to CEC in August 2009.

# Part 2. Progress and costs to date

## Key messages

- The plan to have trams operational by summer 2011 will not be achieved. Greater than anticipated utilities works and contractual disputes with the consortium responsible for infrastructure construction have delayed progress. It is possible that trams will not be operational until at least 2013.
- **tie** has spent a total of £402 million on Phase 1a to the end of December 2010. This represents 74 per cent of the available funding. While **tie** considers it can accurately predict the final outturn expenditure for most elements of the project, the final cost will need to include the cost of resolving the infrastructure construction dispute, which is at present largely unknown. **tie** has, however, indicated that it is now unlikely that all of Phase 1a can be delivered for £545 million.
- Due to the programme and cost difficulties experienced so far, **tie** and CEC are in the process of developing contingency measures. **tie** has been considering an incremental introduction of Phase 1a while CEC has been considering options to increase its funding of the project. The current situation between **tie** and BBS is, however, complex and the outcome of a further round of mediation talks planned for March 2011 will help inform what options are taken forward.

## **tie's procurement strategy was intended to transfer risks to the private sector**

25. **tie** developed its planning for the delivery of the tram infrastructure at the same time as the Scottish Parliament was considering the tram enabling Bills and the project's funding was being finalised. In forming its procurement strategy, **tie** visited a number of other light rail projects, such as the Lewisham extension to the Docklands Light Railway, and sought to learn lessons from these and relevant guidance. For example, the NAO found that the design, build, maintain and operate form of contract which was used in five out of the seven light rail projects in England it examined could result in higher construction costs because consortia might not be best placed to bear all the revenue risk of running a light rail system<sup>5</sup>. **tie's** procurement strategy was therefore designed to have separate construction and operation contracts. It also sought legal advice on the form of the contracts, including how best the form of the contracts could be used to transfer risks to the private sector where this was appropriate.

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<sup>5</sup>*Improving public transport in England through light rail*, National Audit Office, April 2004

26. **tie**'s procurement strategy involved a series of different contracts intended to reduce the overall time taken to deliver the project, provide certainty over costs before construction began and allow the selection of the optimum combination of vehicle and infrastructure providers. The procurement strategy included:

- **The early involvement of an operator in the design and development of the project.** Developing the design as far in advance of procurement as possible was intended to reduce uncertainty and improve cost estimating of the construction phase.
- **Undertaking detailed design ahead of the award of the main construction contract.** Early award of the Systems Design Contract (SDS) was intended to facilitate the early identification of utility diversion works, land purchase requirements and traffic regulation requirements.
- **Tendering the utility diversion works as a separate package and diverting these in advance of the main tram works contract.** 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 was intended to provide more cost certainty for infrastructure construction bidders. Advanced utilities diversion was also intended to reduce the risk of disruption to the progress of infrastructure works.
- **Tendering the infrastructure construction contract (infraco) and tram vehicle contract (tramco) separately.** This was intended to allow the parties responsible for providing infrastructure and vehicles to concentrate on their strengths.
- **Tendering the infrastructure construction contract as one large package.** The infraco contract included all civil engineering works, systems construction works and integration of the whole system.

27. **tie** also considered that there would be benefits in having a single consortium responsible for the overall delivery of construction and other works. The procurement strategy therefore included that on the award of the infraco contract, **tie** would transfer the SDS and tramco contracts to the infraco contract.

28. As a result, **tie** sought to award initially six contracts associated with the project ([Exhibit 2 overleaf](#)). Most of these contracts were designed to ensure that a high proportion of costs were fixed or, in the case of utilities diversion where the volume of work was unclear, based on agreed rates. Payment mechanisms were intended to provide incentives to contractors by ensuring that full payment was not made until the task was successfully completed.

29. For the reasons outlined earlier on in this report, we have not considered in detail the procurement strategy or the form of contracts used. Issues arising such as the overall risk management arrangements, and the potential benefits and risks from having a procurement strategy which differed from other tram projects, are matters for any subsequent examination of the project.

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## Exhibit 2: The main contractors associated with the Edinburgh trams project

**tie's** procurement strategy resulted in a number of different organisations being appointed to deliver different elements of the project.

**Tram operator:** **tie** appointed Transdev as the tram operator in May 2004 to assist planning of an integrated service network with Transport Edinburgh Limited (TEL), the CEC subsidiary company with overall responsibility for delivering an integrated tram and bus network for Edinburgh. The contract with Transdev was later ended by mutual agreement in December 2009 and CEC now intends that TEL, or a subsidiary of TEL, will be responsible for operating an integrated tram and bus service.

**System Design Service (SDS):** **tie** awarded the SDS contract to Parsons Brinkerhoff in September 2005 to facilitate the early identification of utility diversion works, land purchase requirements and traffic regulation requirements and the completion of design drawings. **tie** transferred the SDS contract to the Bilfinger Berger Siemens consortium (BBS) when the infrastructure construction contract was signed in May 2008.

**Utilities diversion:** **tie** appointed Alfred McAlpine Infrastructure Services as the contractor responsible for the diversion and protection of utilities along the tram route in October 2006. Carillion bought-over Alfred McAlpine in December 2007 and assumed contractual responsibility for delivering utilities diversion works. When Carillion completed its agreed work package in late November 2009, **tie** appointed Clancy Docwra and Farrans to complete utilities diversion works.

**Tram construction (tramco):** **tie** signed pre-contract agreements for the supply and maintenance of 27 tram vehicles with Construcciones y Auxiliar de Ferrocarriles SA (CAF) in October 2007. When the infrastructure construction contract was signed in May 2008, **tie** transferred the tram vehicle construction contract to BBS, and CAF joined the consortium.

**Infrastructure construction (infraco):** **tie** awarded the contract for the design, construction, commissioning and maintenance of the tram infrastructure, including rails, overhead power cables and a tram depot to BBS in May 2008. On award of this contract, **tie** transferred the contracts for systems design and tram vehicle construction and maintenance to it.

*Source: Audit Scotland*

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## The original plan to have trams operational by summer 2011 will not be achieved

30. **tie**'s project plan, when the infrastructure contract was signed in May 2008, stipulated that Phase 1a was expected to be open for service by summer 2011. However, several elements of the project have experienced delays and it is not yet clear when trams will be operational ([Exhibit 3](#)). **tie** advises that delays in the completion of design work and the movement of utility pipes and cables created an unplanned overlap with infrastructure construction work, and further delay to the project has resulted from a contractual dispute between **tie** and BBS over infrastructure construction.

### Exhibit 3: Phase 1a delivery against key milestones

The main construction elements of the project have all taken longer than planned.

Note that construction of the Edinburgh trams system is a complex project and the key milestones shown below simplify to a considerable extent the complex programming issues involved.

	Year Quarter number	2006		2007				2008				2009				2010				2011	
		3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	
Business Case	Planned		1	2		3	4														
	Actual		1	2		3	4														
Design and Traffic Regulation Orders	Planned					1		2	3	4				5							
	Actual					1															5
Utilities	Planned	1		2	3	4					5										
	Actual	1		2	3	4															
Tramco	Planned			1		2		3						4			5				
	Actual			1		2			3										4		
Infraco	Planned		1	2	3		4	5						6		7					8
	Actual		1	2	3			4	5												

#### Key Milestones

Business Case	1	Approval of draft final business case by CEC	Tramco	1	Completion of initial evaluation/negotiation of bids
	2	Confirmation of Infraco tender prices to CEC		2	Recommendation of preferred bidder
	3	Approval of final business case by Tram Project Board		3	Award of Tramco contract
	4	Approval of final business case by CEC		4	Delivery of first tram
Design and TROs	1	TRO process commences	Infraco	5	Delivery of all trams
	2	Completion of construction drawings - utilities diversion		1	Return of Stage 1 bid
	3	Completion of planning drawings		2	Completion of evaluation/negotiation of Stage 2 bid
	4	Completion of detailed design construction drawings		3	Recommendation of preferred bidder
	5	TRO process complete		4	Award of Infraco contract
Utilities	1	Award of utilities diversion contract	5	Construction of track and tram depot commences	
	2	Completion of pre-construction period of utilities diversion contract	6	Depot completion	
	3	Commencement of utility diversion works trial site	7	Commencement of test running	
	4	Commencement of utility diversion works	8	Delivery into revenue service	
	5	Completion of utility diversion works			

Source: *Edinburgh Tram Network Final Business Case version2, 7 December 2007, tie and Audit Scotland*

## Utilities diversion work is almost two years late but is 97 per cent complete

31. **tie** expected that utilities diversion work would take 70 weeks between July 2007 and November 2008. Surveys undertaken by **tie** along with information received from individual utility companies indicated that the original scope of the work would cover 27,000 metres of pipes and cables. However, **tie** had to significantly extend the scope of work once the physical conditions underground became clear. According to **tie**, the complexity of utilities along the tram route, congestion of pipes and cables in key locations and unforeseen obstructions were much more extensive than originally anticipated. In addition, records held by utility companies and CEC were far from comprehensive.<sup>6</sup>
32. Carillion finished its contracted works package at the end of November 2009 by which time utilities diversion work had covered some 40,000 metres of cables. **tie** now estimates that the final extent of diverted utilities is around 50,000 metres and it has appointed two contractors, Clancy Docwra and Farrans to complete it. **tie** has reported that around 48,500 metres of utility diversion work has now been completed. In **tie**'s view, the remaining utilities diversion work, mainly in the vicinity of Baltic Street, would not prevent infrastructure construction work from going ahead.

## Contractual disputes over infrastructure construction have resulted in significant delays to the project

33. The planned infrastructure construction programme required the project to be delivered in a series of sections with tram lines and overhead line equipment being installed after utilities diversion work was completed ([Exhibit 4](#)). **tie** had also programmed for design drawings to be largely completed before relevant elements of infrastructure construction started.
34. **tie** intended to obtain cost certainty for infrastructure construction by agreeing a lump sum, fixed price contract (infraco) for an agreed delivery specification and programme. It appointed the Bilfinger Berger Siemens consortium (BBS) as the preferred bidder in October 2007. Between then and contract award in May 2008, **tie** and BBS held a series of meetings to discuss the terms of the contract. As part of the negotiations, BBS submitted a request for additional funding of £12 million. This resulted in a further series of meetings which culminated in **tie** agreeing to pay up to £4.8 million in incentive bonuses and to underwrite BBS's demobilisation costs of £3.2 million in the event Phase 1b did not proceed.

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<sup>6</sup>Edinburgh Tram Project – Update Report, report considered at CEC meeting of 24 June 2010

## Exhibit 4: Planned infrastructure construction programme

**tie** planned that infrastructure construction would take place in stages.

Note that the Edinburgh trams system is a complex project and the programme phases shown below simplify to a considerable extent the construction work necessary to deliver it.

	Year Quarter number	2007			2008				2009				2010				2011
		2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1
Newhaven to Foot of Leith Walk	Utilities																
	Roads and Trackworks																
	Overhead Line Equipment																
Foot of Leith Walk to St Andrew Square	Utilities																
	Roads and Trackworks																
	Overhead Line Equipment																
St Andrew Square to Haymarket	Utilities																
	Roads and Trackworks																
	Overhead Line Equipment																
Haymarket to Edinburgh Park Station	Utilities																
	Roads and Trackworks																
	Overhead Line Equipment																
Edinburgh Park Station to Airport	Utilities																
	Roads and Trackworks																
	Overhead Line Equipment																

### Sections:

#### Newhaven to Foot of Leith Walk

Newhaven to Ocean Terminal  
Ocean Terminal to Port of Leith  
Port of Leith to Bernard Street  
Bernard Street to Foot of Leith Walk

#### Foot of Leith Walk to St Andrew Square

Foot of Leith Walk to Balfour Street  
Balfour Street to McDonald Road  
McDonald Road to Picardy Place  
Picardy Place to St Andrew Square

#### St Andrew Square to Haymarket

St Andrew Square to Princes Street West  
Princes Street West to Shandwick Place  
Shandwick Place to Haymarket

#### Haymarket to Edinburgh Park Station

Haymarket to Roseburn Junction  
Roseburn Junction to Murrayfield  
Murrayfield to Balgreen Road  
Balgreen Road to Saughton Road North  
Saughton Road North to South Gyle Access  
South Gyle Access to Edinburgh Park Station

#### Edinburgh Park Station to Edinburgh Airport

Edinburgh Park Station to Edinburgh Park  
Edinburgh Park to Gyle  
Gyle to Depot Stop  
Depot Stop to Gogarburn  
Gogarburn to Ingliston Park and Ride  
Ingliston Park and Ride to Edinburgh Airport

Source: Edinburgh Tram – Construction Programme, report to the Tram Sub-Committee, CEC, 12 May 2008

35. The overall result of the negotiations between **tie** and BBS was an increase in the budget for infrastructure construction from £223 million at the time the project's final business case was approved in December 2007 to £243 million in May 2008. In exchange, **tie** considered it had achieved more cost certainty and also transferred more risks to the private sector in line with its procurement strategy of having a series of discrete contracts based on fixed costs where possible.
36. The infrastructure construction contract also sets out mechanisms to discuss and resolve the financial and time impact of additional work not covered in the contract. However, its form, which has

not routinely been used in other tram projects, may present a risk because of lack of legal precedent with which to inform the outcome of any contractual dispute between the purchaser and contractor.

37. Contractual disputes between **tie** and BBS began almost as soon as infrastructure construction commenced. The first major dispute arose in February 2009, one week before track-laying work was due to start in Princes Street, amid claims that BBS was seeking an extra £50-80 million funding, mainly to compensate for incomplete utility diversion works at the Mound and alleged design changes. **tie** considered these claims to be unsubstantiated. In its view, in addition to the impact of delays caused by utilities work, the contractual difficulties with BBS are associated with:
- design issues, including delays in design completion
  - failures to achieve progress on the works.<sup>7</sup>
38. **tie**'s strategy for systems design work was to appoint a contractor who would be responsible for completing systems design drawings for items such as utility diversions, overhead pylons, electronics, power supply and passenger ticketing machines and shelters before infrastructure construction began. **tie** appointed Parsons Brinkerhoff to the Systems Design Service (SDS) contract in September 2005. **tie** then transferred the contract to BBS in May 2008 when it was awarded the infraco contract. BBS assumed overall responsibility for integrating the track, vehicle and systems design after May 2008, although Parsons Brinkerhoff still undertook the work
39. **tie** told us it encountered a number of problems with the delivery of the SDS contract including slow mobilisation, poor quality of design work requiring several revisions and late delivery. As a result, design packages which were expected to be finished by May 2008 were not delivered until autumn 2008.
40. **tie** has also expressed concern about the quality of design work after May 2008 when it transferred responsibility to BBS for managing the SDS design contract to completion. According to an audit conducted by consultants on behalf of **tie**, around 80 per cent of the design work has been completed although a complete design package which integrates tracks, vehicles and supporting systems has still to be delivered.
41. Following the dispute over the Princes Street works, **tie** and BBS agreed to convene a Project Management Panel, as allowed for under the contract, with the aim of resolving a number of other contentious differences between the parties. Although this showed some potential to assist the resolution of outstanding issues, the early impetus was not sustained. In June 2009, **tie** and BBS

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<sup>7</sup>Edinburgh Tram Project – Update Report, report considered at CEC meeting of 24 June 2010

held a week of informal mediation which examined, among other things, the interpretation of key clauses in the pricing schedule, the allocation of risks and the substantiation of claimed contract changes.

42. In July 2009, **tie** reported to the Tram Project Board that the informal mediation had not been successful.<sup>8</sup> In light of the ongoing dispute with BBS, the Tram Project Board endorsed **tie**'s strategy of enforcing its interpretation of the contract's terms with the aim of:

- testing a number of contractual principles which lay at the heart of the changes to the contract's scope and specification which BBS were claiming
- driving down the estimated cost of the changes being submitted by BBS
- getting work started at a number of locations through the issuing of formal instructions to proceed
- encouraging a more collaborative working approach from BBS.

43. **tie** accepts that there is liable to be some change in the specification of any large construction project for a variety of technical and commercial reasons. It has accepted that some design-related changes are additional to the contracted scope of works and it concedes that some infrastructure construction works have been affected by delays to the completion of utility works. However, **tie** considers that, compared to other construction projects, the number of claims submitted by BBS for additional payments has been excessive.

44. To the end of December 2010, BBS has submitted 816 notices to claim of which 139 were later withdrawn ([Exhibit 5 overleaf](#)). BBS has submitted cost estimates in respect of 426 out of the remaining 677 notices to claim. **tie** and BBS have settled 198 of these claims with the others either rejected or not yet agreed. The cost to **tie** of those settled has been £23.8 million compared to the £44.0 million claimed by BBS (54 per cent). Included within the 198 settled are 20 which have been settled through formal dispute resolution procedures, as allowed for in the contract.<sup>9</sup> These have reduced BBS's claims for additional payment from £24.0 million to £11.2 million (47 per cent). A further five cases being resolved through dispute resolution procedures have been referred for external adjudication or negotiation is in progress. **tie** considers these adjudications have helped clarify some of the contractual issues which were in dispute with BBS.

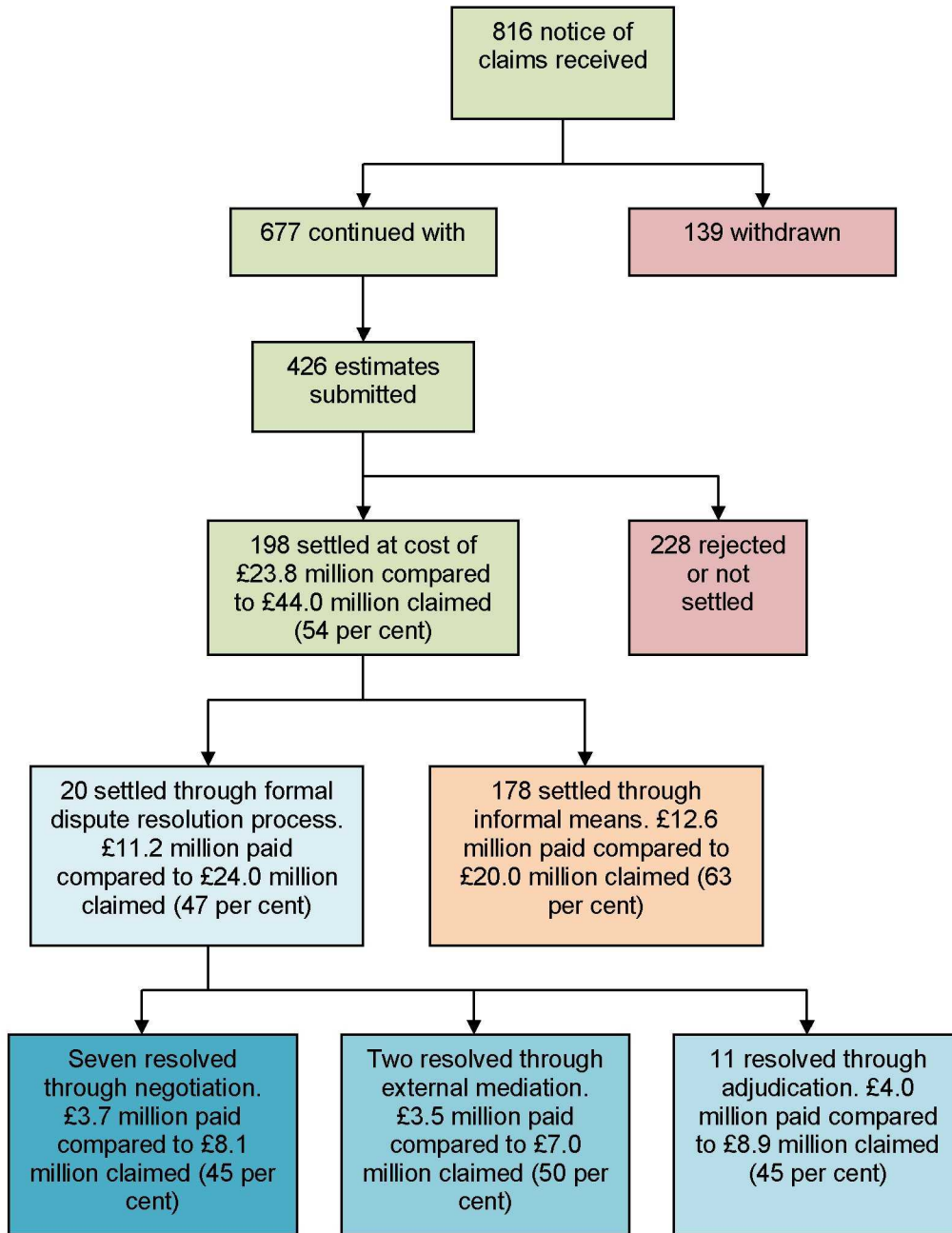
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<sup>8</sup> The Tram Project Board is the project's main governance body. See Part 3 of this report.

<sup>9</sup> Dispute resolution processes fall into two major types. There are adjudicative processes, such as litigation or arbitration, in which a judge, jury or arbiter determines the outcome. There are also consensual processes, such as mediation, conciliation or negotiation in which the parties attempt to reach agreement.

**Exhibit 5: Changes and disputes to date**

**tie** has paid £23.8 million in respect of 198 claims for additional payments submitted by BBS which have been settled to date.



Source: Audit Scotland

45. While **tie** considered its strategy was successful in getting work started at some locations and driving down the final value of the submitted cost estimates, in its view this was intensive of management time and expensive in advisor costs. In December 2009, **tie** concluded that little real progress was