

ANNEX A

EDINBURGH TRAMS: DRAFT FINAL BUSINESS CASE AND START OF UTILITY DIVERSIONS

ANALYSIS OF DRAFT FINAL BUSINESS CASE

Summary

1. tie has undertaken a full appraisal of the tram scheme in line with the letter of the STAG guidance but in doing so has made a number of assumptions that are open to question and the results of the appraisal are highly sensitive to those assumptions.
2. tie has carried out an assessment of the scheme against 3 tests of scheme viability:
 - ◆ **economic viability** – a standard assessment of the quantifiable benefits and costs of the scheme plus environment, safety, integration and accessibility impacts;
 - ◆ **financial viability** – whether the scheme integrates with bus services and whether the combined bus and tram services can operate without subsidy;
 - ◆ **affordability** – whether the initial capital costs are likely to be affordable within the available funding.

Economic viability

(All costs discounted to 2002)	Phase 1a	Phase 1a + 1b
Costs (£m)	340	436
Benefits (£m)	373	709
NPV (£m)	+33	+273
BCR	1.10	1.63

These figures do not reflect initial consideration of Infraco bids received by tie. Transport Scotland’s view of the costs would have a negative impact on these figures.

Financial viability

3. The analysis shows that the combined tram and bus network is expected to be profitable from the 2nd year of tram operation assuming that fares increase at RPI+1% per annum. This assumption is consistent with both the national rail network and Lothian Bus recent practice and has been agreed by the board of Transport Edinburgh Ltd (TEL) who will operate the combined bus and tram network.
4. Financial viability also depends on TEL achieving the significant patronage growth predicted by the models between 2006 and 2011 (first full year of tram operation) and between 2011 and 2031 (once the tram is operational). This amounts to 2.5% per annum average growth to 2011 and 1.9% to 2031. Compared with national trends this appears ambitious but is actually lower than the growth that Lothian Buses has achieved since 1998 where average growth has been 3.5% per annum for all passengers and 2.9% per annum for full-fare paying passengers (ie taking out the effect of the improved concessionary fares scheme).

Affordability

5. Our current best estimate is that the outturn value of Ministers' contribution of £375m in 2003 prices would be £490m (with a range £450 - £500m). CEC has committed a further £45m in outturn prices (as a combination of cash and land). This provides available funding of £535m on consistent inflation assumptions for costs and funding. tie estimates the cost of Phase 1a at £477.5-517.5m (giving some headroom on costs) and Phase 1a + 1b at £610m (and therefore not affordable without substantial savings or additional funding). tie's cost estimates have been subject to independent review by Scott Wilson Consulting which has reported that the estimates have been prepared with due care and in line with reasonable commercial practice.

6. tie's estimate for Phase 1a starts at £545.5m and then estimates that £28-68m of savings are achievable. In principle, Transport Scotland is content with the approach that assesses opportunities for savings and includes them in cost estimates provided that opportunities are specified, quantified, have owners, action plans and deadlines. In short opportunities should be treated with the same rigour as risk. This approach is being applied to other projects successfully.

7. tie has a list of specific opportunities to realise the £28-68m of savings but not all are quantified with owners, action plans and deadlines. At this stage therefore Transport Scotland does not consider that there is sufficient evidence to support such a positive view of savings. It is certainly possible to achieve savings in the £28-68m range but plans are not yet in place to do so. tie continues to work to develop action plans for the remaining opportunities (including through a comprehensive value engineering exercise) and Transport Scotland will require them to complete the action plans urgently and demonstrate progress towards realisation of the opportunities before completion of the Final Business Case in Autumn 2007.

8. In the meantime Transport Scotland considers that it would be more prudent to assess identified savings at £15-20m giving an overall cost estimate of around £525m with a range of £510-545m, ie a range where most but not all of the range lies within existing project funding.

Revenue analysis

9. Other UK tram schemes have suffered from failure to achieve the revenue targets set out in business cases. This has been a significant factor in the failure of recent English PPP tram schemes as bidders have priced revenue risk very heavily. In the Edinburgh Tram scheme the revenue risk lies with Transport Edinburgh Ltd (TEL) and ultimately with City of Edinburgh Council and the revenue projections have been incorporated in TEL's business plan. Essentially those who have a financial stake in the revenue of the combined bus and tram network have signed up to delivering the revenue projections. For the first time on a UK tram scheme it can therefore be argued that it is more probable that the revenue projections will be exceeded than missed.

Other appraisal criteria

10. The executive summary of the DFBC presents notable positive benefits against each of Economic Regeneration, Environment, Safety and Reliability, Accessibility and Social Inclusion and Transport and Land Use Integration. The more negative impacts are included within the detail of the appraisal.

Economic Regeneration

11. The appraisal highlights the role of the tram in supporting economic development at Granton Waterfront, Leith Waterfront and West Edinburgh. The appraisal attributes 590 FTE jobs to Phase 1a and a further 340 to Phase 1b. The additional demand caused by this development is taken into account within the patronage modelling.

Environment

12. The STAG work does not show significant environmental benefits in terms of either local or global air quality. Under Phase 1a, the impact of Edinburgh Tram is broadly neutral in terms of local air quality and under Phase 1a + 1b there is some improvement. Both Phase 1a and 1a + 1b increase CO₂ emissions. CO₂ emissions from transport increase in the region of 2-3% for the two phasing options. This is largely due to the assumption that the introduction of tram will accelerate economic development and not all of the additional travel demand will be made by public transport. There are disbenefits in terms of cultural heritage, landscape and historical buildings.

Safety and Reliability

13. The scheme has accident disbenefits due to the nature of road-light rail interface within the same space. There are improvements in reliability in the off-road sections of tram operation and through the traffic signal priority assumed for the tram. The personal security of travellers is predicted to improve through the availability of increased CCTV and the deployment of inspectors on the vehicles.

Integration

14. The tram integrates well with the proposed land-use developments at Granton and some new journeys can be made effectively. Against this must be set that some existing journeys will in future involve forced interchange from bus to tram or a lower frequency of direct bus service.

Accessibility and Social Inclusion

15. The tram connects areas of relative social deprivation (Granton, Leith, Saughton, Broomhouse) with areas of job growth (new developments in Granton and continuing growth in West and Central Edinburgh). However, many of these areas are already linked by bus services. Additionally, the accessibility data produced by tie includes the tram quality benefits (as detailed ~~above~~ below, 18,19,20) in terms of In Vehicle Time weighting) as part of, what is known as, generalised journey time. No information is currently available as to actual rather than perceived (due to tram quality) accessibility benefits.

Concerns about tie's analysis

16. The assumptions made by tie are key to the positive economic appraisal they have produced. The appraisal is very sensitive to those assumptions and some of those assumptions are open to question. However, an independent due diligence report has been received that finds that the modelling work has been "developed in a professional and diligent manner with due regard given to current best practice guidelines. The identified shortcomings generally reflect [the Joint Revenue Committee's] need to adhere to an extremely challenging timetable."

Construction impacts

17. No account is taken of the construction impacts of the scheme. This is not in line with treatment of heavy rail schemes where compensation payable to train operators is included within the capital cost as a proxy for disruption. There is evidence from elsewhere that careful management and information provision during construction of similar schemes can mitigate the impacts significantly (or in some circumstances be beneficial) but tie have provided no detail of any plans to date. If the construction impacts are not managed well then the additional congestion caused could be sufficient to bring the BCR of Phase 1a below 1.

Value of time

18. A large proportion of the benefits of the scheme arise from the use of a weighting on tram in-vehicle time. Whilst the way in which this has been applied is unusual, it is a reasonably standard practice. What this means however, is that a large proportion of the benefits are derived from the fact that "people prefer a tram to a bus".

19. This degree of preference was calculated from a survey that discounted the views of those who expressed a preference against trams at the time. This was arguably because negative media coverage at the time the survey was undertaken was affecting some people's views whilst delivery of the scheme was in doubt. It is not unreasonable to suggest, as tie has done, that people would no longer express a preference against trams once they were in service. Taking account the sensitivity of the survey results the BCR could fall below 1 for Phase 1a and close to one for Phase 1a + 1b.

20. If the weighting on tram in-vehicle time is removed altogether then the case for both options falls below 1.

Bus alternatives

21. Comparison of the reference case which, at tie's insistence, contained bus priority measures not now in place or committed, with a formal do-minimum that represents the current situation shows that around two-thirds of the benefits achieved by the tram scheme could in theory be achieved by a bus priority scheme at much lower cost (although tie have not calculated what that cost would be). It is possible that such measures might be funded out of the increased revenue that would be raised.

22. The question therefore arises of whether a bus alternative could be implemented. There are 2 principal barriers to this: road capacity and securing approval for bus priority measures. tie argues that the capacity of key streets such as Princes Street and Leith Walk would not allow continuing increases in bus vehicle numbers to accommodate the projected demand. The acceptability of a tram scheme has been demonstrated through the ultimately successful Private Bills process and, although there are still statutory approvals to be sought including Traffic Regulation Orders, the issues that arise have already been debated before Parliament. Ministers have previously accepted these arguments and ruled out bus alternatives in supporting the tram bills.

RESTRICTED - POLICY

Level of modal shift from car

23. There is concern that the model used may overstate the level of modal shift from car. Standard values of time were used for car-users despite the survey, detailed above, calculating a lower value. The use of the survey value instead would tend to reduce the amount of modal shift.

24. The independent Model Construction and Application – Due Diligence Report, produced by Scott Wilson has been received recently. Although it does not consider the point above regarding the discarding of SP data for car use, it identifies shortcomings in the model – some of these would tend to present an overly positive view of the tram, some of them would tend an overly negative view. The report states that “the impact of the issues indicated on the business case is difficult to quantify without detailed investigation, however the view is that each aspect in isolation is likely to be minor... The potential areas where the business case is over estimated is almost equally matched by the areas whereby the case is under estimated. On balance it is expected that there is minimal bias in the way in which the study has been conducted.” ~~Analysts are currently examining the report in further detail.~~ This report has been accepted on the basis of the professional competence of the auditor.

Transport Scotland – Rail Delivery Directorate
Transport Scotland – Transport Economics, Analysis and Research
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ANNEX B

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KEY RISKS – ANALYSIS, COMMENTARY AND MITIGATION

ISSUE	RISK	LEVEL & MITIGATION
Economic Assessment	Economic Assessment has been validated independently as being in line with best practice guidance but case is very sensitive to assumptions made. Risk that assumptions are not borne out in reality.	Medium Some assumptions can only be reviewed after the event and so would have to be acknowledged and tolerated.
Programme	The programme is consistent and logically structured but lacks any allowance for slippage. It therefore assumes everything will run to time despite the track record of the tram scheme to date where programme deadlines have consistently not been met. The lack of float will also lead to pressure for decisions to be taken whether or not all the supporting information is available.	High With no “float” in the programme slippage in overall delivery is likely and Transport Scotland has already allowed 3 months slippage. The opportunities for mitigation are limited but tie/CEC need to be challenged to act effectively and reduce the number of tasks on the critical path wherever possible.
Capex Costs	Capex costs have been benchmarked against other schemes and independently validated by Scott Wilson. However, the costs are highly sensitive to the risk treatment applied by the infrastructure contractors to their bids and depend on savings being achieved through value engineering and negotiation. The commercial drive to reduce risk premiums is reduced by the fact that there are only 2 infrastructure bidders.	High Further design work would mitigate some of the risk together with a robust negotiating strategy with Infracore bidders. However, mitigation potential is limited by weak market for tram schemes in the UK. Savings can be achieved but further work is required to make sure all opportunities are specified and have owners, action plans and deadlines.

ISSUE	RISK	LEVEL & MITIGATION
Financial Agreement with CEC	Formal agreement not yet signed. It covers the quantum of investment by both parties, risks and responsibility for cancellation costs	Medium Agreement is being recommended by officials to Ministers and CEC elected members and approval of the draft FBC will allow completion of the agreement. However, the proposed arrangement relies on sufficient headroom for cost increase. If headroom is exhausted risk lies in theory with CEC but they would seek to reopen this issue. Binding agreement that is realistic about treatment of cost overrun is needed before financial close in August.
Contingency, Optimism Bias & Headroom	Scheme currently carries a risk and contingency allowance of x%. Relies heavily on success of tie's risk mitigation strategy. Other schemes with a different strategy have allowed circa 20% at this stage and this has been borne out where schemes have gone forward to construction.	Medium Phase 1a, at £510-545m, is probably affordable within the current overall £535m funding envelope, with up to £25m headroom. tie's Monte Carlo statistical analysis indicates that there is a greater than 90% chance that Phase 1a would be affordable within a funding envelope of £535m <u>provided savings are achieved</u> .
Design	The design contractors (SDS) have been performing poorly and remain behind programme. This may be exacerbated by the procurement strategy of novating the SDS contract to the successful infrastructure contractor where there is a risk of delay whilst the terms of the handover are agreed.	Medium Currently of concern given the continuing failure to deliver on time and on quality. This leads to capital cost risk over the Infraco contractors' pricing of the uncertainty that remains in some designs. Mitigation by tie with contractor is underway to ensure a culture of realism and production. Agreed change plan to improve behaviours of both parties being implemented.

ISSUE	RISK	LEVEL & MITIGATION
Design	Design of interchanges at Foot of Leith Walk, St Andrew Square, Crewe Toll (1B) not developed and therefore effectiveness not demonstrated.	Medium The design has of the “forced interchange” at the Foot of Leith Walk must be of very high quality to ensure that this does not become a barrier to patronage. Ongoing consideration with tie/CEC and others to evaluate quality of design.
Additional Costs for Phase 1b	Phase 1b is not likely to be affordable within current funding but pressure is coming from City of Edinburgh Council to provide additional funding. This may impact on funds available for other projects and is likely to reduce pressure on developers to contribute to infrastructure from which they benefit.	Medium Mitigation is to resist any calls to fund Phase 1b until there is firm evidence that Phase 1a is being delivered within budget and until meaningful developer contributions are secured.
Concessionary fares	The DFBC assumes that the Edinburgh Tram Project will be covered by the national concessionary travel scheme. As concessionary travellers make up roughly a quarter of all passengers, failure to include the trams in the national scheme could threaten TEL’s financial viability <u>and impact on public transport accessibility within Edinburgh. The impact on public finances, through potential increased costs of the concessionary fares scheme is not included in the BCR.</u>	Medium A substantial portion of the concessionary fares support is included in the current settlement and is paid to Lothian Buses. There will also be a reduction in Bus Service Operator Grant payable to Lothian Buses. However, the generated travel will put pressure on the concessionary fares budget and will fuel demands for the inclusion of the Glasgow Underground within the scheme.

ISSUE	RISK	LEVEL & MITIGATION
Traffic Regulation Orders (TROs)	The necessary TRO powers were not included in the private Bills and consequently remain a potential source of risk / delay to the programme and subsequent operational performance of the tram network.	High A programme of mitigation has been drawn up but requires closer communication and cooperation between CEC, its lawyers and Transport Scotland. Relies on willingness of CEC to take tough traffic management decisions and change in procedure through revised statutory instrument covering rules for hearings.
Functional Specification	Functional specification not yet finalised although significant progress has been made. If the functional specification is not agreed then proper project controls cannot be implemented.	Low Final agreement anticipated before end February

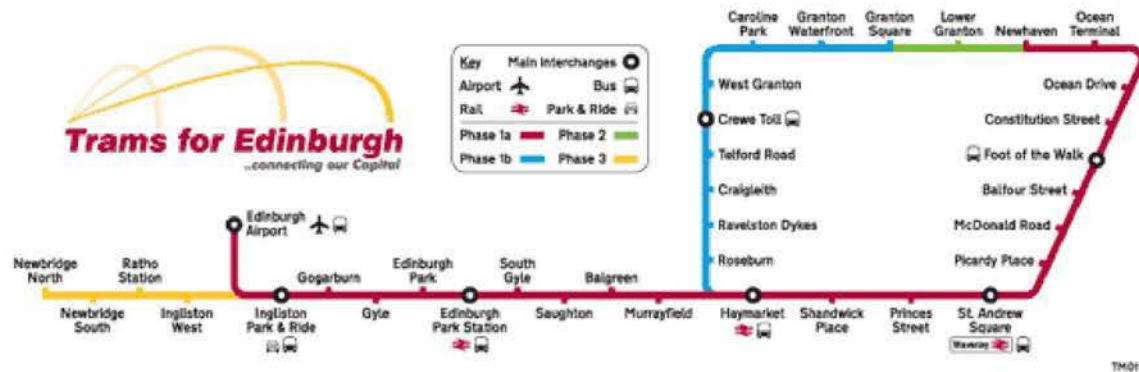
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ANNEX C

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TRAM FACTSHEET

Route map



Tram facts

- Phase 1a is approximately 18.8km in length and has 22 tramstops.
- Phase 1b is approximately 5.5km in length and has 9 tramstops.
- Phase 2 is approximately 2.2km and Phase 3 is approximately 4.2km.
- Phase 1a has a target journey time of 44½ minutes
- Phase 1b has a target journey time of 16½ minutes
- The scheme has been designed to allow a service frequency of up to 8 trams per hour in each direction for each of the two services, giving a frequency of up to 16 trams per hour on the common section.
- It is the intention of the operator to ensure that a tram is always present at the Airport tramstop.
- The target date for the start of construction of Phase 1a is October 2007 at the Depot. The Depot site has been identified between the Fife Rail Line and Gogar Roundabout.
- The depot building will house staff accommodation and control room for the system, together with maintenance facilities and storage. Stabling will be provided for the tram fleet, with an allowance for future fleet expansion.
- The tram vehicles will be 40m in length and have at least a 230 passenger total carrying capacity.
- The Edinburgh Tram will use off-vehicle ticket machines and have multi-door boarding.
- The basic assumption made by the designers for all interchanges is that where possible, interchange should strive to be cross platform, under cover, timetabled and simple. It should seek to avoid the necessity for passengers to cross roads, walk distances greater than 50 metres or have gradients greater than 2.5%.
- For phase 1a there are two designated bus/tram interchanges at the Foot of Leith Walk and St Andrew Square.

- Other interchange opportunities include Haymarket, Ingliston Park & Ride, Edinburgh Park Station, Granton Square & Newhaven.
- The scheme interfaces with a number of other projects. These include EARL, Waverly Infrastructure Enhancement, Edinburgh Airport Outline Masterplan, Ingliston Park and Ride Phase 2, Haymarket Masterplan, Granton Masterplan, Waterfront Masterplan, Leith Docks Development Framework, St Andrew Square Capital Streets Plan, City Centre Management and Road Network/Road Traffic Management Interfaces.

Planned bus service alterations

[Note: this section is commercially sensitive and not releasable]

In order to match public transport provision with demand and to optimise the operating costs of the combined bus and tram network, the TEL business plan proposes alterations to existing bus services. At this point the proposals are indicative and final decisions will not be taken until much nearer the trams coming into service as TEL will need to take account of actual developments in bus patronage. However, these proposals give an indication of the likely changes to bus services as a result of bringing in the tram.

The principles that TEL has followed are:

- to prevent unnecessary overlap of services
- where the tram follows a different alignment with no bus routes running parallel or in close proximity no reductions are anticipated
- bus reductions will only take place where in TEL's view the tram offers an acceptable alternative level of service
- the need for interchange should be minimised and made as seamless as possible to protect patronage and revenue

Foot of Leith Walk – St Andrew Square

The frequency of bus services from Leith Walk will therefore be significantly reduced with only a limited number of bus services retained to retain a through-service option for passengers with mobility difficulties. Passengers from parts of Leith not directly next to the tram, Granton, Restalrig and Portobello would have a choice between a less-frequent through service by bus and a more frequent journey involving bus/tram interchange. Most passengers would interchange at the Foot of Leith Walk where a high quality interchange is proposed. The quality of the interchange is key to the success of the public transport network.

St Andrew Square – Haymarket

Services from the West and South of the city that currently run through to the North and East of the City would terminate at a high quality interchange in St Andrew Square. This means that people travelling to or from Princes Street would not be forced to interchange between tram and bus. However, passengers travelling via Princes Street to Leith Walk would be forced to interchange.

Haymarket – Airport

The current airlink bus service would reduce in frequency as most passengers from the airport to the city centre would transfer to tram or EARL in future. The airlink bus would serve passengers travelling between the airport and the West of the City.

There would be some reduction in the frequency of the 22 bus which runs along the proposed tram route for parts of its route between Princes Street and the Gyle Centre.