

RESTRICTED: ADVICE TO MINISTERS

From: Damian Sharp
TS: RD: Head of Major Projects
3 February 2006

Minister for Transport

EDINBURGH TRAMS: SCOPE, PHASING AND INDEXATION

Purpose

1. To recommend that you accept the phased approach to the construction of Edinburgh Trams agreed by City of Edinburgh Council on 26 January and that you agree in principle to indexation of the £375 million previously-committed Executive funding in line with general construction cost inflation.

Timing

2. **Immediate.** You are due to give evidence on this matter to the Edinburgh Tram (Line One) Bill Committee on Tuesday, 7 February.

Edinburgh Trams – Scope and phased construction

3. The City of Edinburgh Council (CEC) has agreed a phased approach to the construction of the Edinburgh Tram network. The first phase would be to construct Ocean Terminal (Leith) to the Airport at an estimated cost of £484m including Optimism Bias. **An acceptance, in principle, of this proposal does not commit Ministers to fund further phases.**

4. This represents a more realistic approach to the construction of the tram network. Further construction of the remaining phases of the network could be completed if CEC and tie ltd achieve savings below the £484m budget and/or future funding becomes available and patronage is confirmed. This is a common strategy successfully adopted elsewhere in the UK, particularly on other light rail projects such as Docklands Light Railway.

5. Although this represents a reduction in scope, it retains key benefits of the full network: Ocean Terminal to the Airport is essentially the spine of a successful network. It would retain high strategic value and patronage from the Leith waterfront development areas to the city centre and thereafter to the other key development areas of Edinburgh Park and the Airport. It would thus continue to meet both local and strategic aims.

Value for Money

6. Work on the viability of the new proposal has been forwarded to us by Tie Ltd (Annex A). The paper does not represent a full reappraisal of the scheme – that is due in the Summer when the further patronage modelling work of the Joint Revenue Committee is completed. However, this work provides us with confidence that there is a good prospect that the full reappraisal will represent value for money. The current work indicates a Benefit/Cost Ratio of around 1.5 and is a marginal improvement on

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

earlier versions of the business case despite the increased capital costs. This is driven by the focus on including the best performing elements of the scheme in the first phase.

In principle commitment

7. The commitment at this stage remains an in principle commitment: there will be no release of significant capital funds for utilities diversion works or main construction until CEC and tie have presented satisfactory updates of the business case for Phase 1. These updates will include further work on patronage and revenue modelling, production of a credible business plan for Transport Edinburgh Ltd (TEL) – the company that will manage the operation of both the tram network and Lothian Buses – and revised cost estimates in the light of the market response to the procurement exercises for trams and infrastructure.

Expectations of and conditions on CEC

8. As part of its decision to pursue the tram network in phases, CEC committed itself to a contribution of £45m towards the first phase to be raised mainly from land sales and developer contributions. We will require evidence from CEC that this funding is likely to be delivered and a commitment that they will not seek further funding from the Executive in the event that it is not.

9. We have repeatedly been clear that we will not provide any revenue subsidy to the tram network and CEC is clear about this. It is therefore essential that the business plan for TEL is viable and that CEC explicitly accepts any risks within that business plan.

10. We will also require CEC and tie to produce robust risk management proposals that build on best practice elsewhere. tie's preferred procurement strategy is a combination of conventional capital procurement for the infrastructure and leasing of the tram vehicles rather than PPP. Work on this is being concluded with the Finance Partnerships Unit. Following last week's meeting with the Minister for Finance we have made it clear that we need to see clear proposals for how the benefits of disciplined and rigorous risk management brought by PPP can be applied to this project given tie's preferred procurement structure. tie have already done some work on this and are due to present further proposals as part of the next business case update in March.

11. We have made it clear to CEC and Tie that the Executive commitment is capped and any future shortfall would be for CEC and Tie to deal with.

What do we get for Indexation?

12. Without indexation of the Executive's commitment the only tram link that would have a good chance of being funded would be Ocean Terminal to Haymarket. Without an extension to West Edinburgh and Edinburgh Airport the limited tram

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

network would serve local objectives only and would not provide the strategic link that justifies a large Executive contribution to the scheme.

13. If CEC's and tie's aspirations of making savings through efficient procurement and delivery were achieved then it might just be possible to afford Ocean Terminal to the Airport without indexation. However, this would be a very risky strategy and in other UK light rail schemes the market has shown itself to be very reluctant to invest the significant costs of bidding without certainty that there is sufficient funding for the scheme to go ahead. Recent experience in South Hampshire and Merseyside would tend to reinforce that reluctance. It is highly unlikely that CEC would expose itself to the risk of taking a scheme to market with only very limited chance of securing an affordable bid.

Financial implications

14. Indexation of the Executive's contribution would bring the cash contribution to £450-500m (depending on the actual level of cost inflation in the construction industry).

15. As discussed with the Minister for Finance last week, this is affordable within the Transport Invest Plan through the use of PPP on roads schemes where this represents value for money and through use of Network Rail's Regulatory Asset Base as a means of funding heavy rail schemes where that also represents value for money.

Further phases

16. One of the key variables in the outturn cost of the tram is the extent to which the contingency and Optimism Bias allocations are needed. tie ltd has proposals for more efficient construction and procurement that could reduce the need to draw on contingency and Optimism Bias. If these measures are successful then it may be possible to use savings from the first phase to deliver the section from Haymarket to Granton in support of longer-term economic development opportunities in Granton.

17. We are stressing to CEC and tie that the Scottish Executive is not committing to using savings towards any further phases of the tram: this would be a decision for a future Minister for Transport in the light of priorities at that time. However, it is important to retain this option to provide a strong incentive to CEC, tie and the infrastructure contractor to achieve maximum efficiency and savings in the construction of phase 1.

Parliamentary

18. You are appearing before the Edinburgh Tram (Line One) Bill Committee on 7 February. The Committee will be seeking reassurances that the Executive will provide sufficient funding for a viable tram network to be delivered. The Committee will ask for evidence from you on the Executive's commitment of £375 million, including any further commitment to index link the contribution.

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

Recommendation

19. I recommend that you welcome the CEC decision and the first phase proposal of Leith to Edinburgh Airport should be accepted in principle, subject to delivery of a robust business case which will become more substantial as the project data develops over the course of the spring and summer.

20. I also recommend that we proceed with the indexation of the committed £375 million to allow the construction of the optimum first phase proposal.

DAMIAN SHARP
Head of Major Projects
Ext [REDACTED]

3 February 2006

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

| Copy List: | For Action | For Comments | For Information | | |
|---|------------|--------------|--------------------|------------------|-------------------|
| | | | Portfolio Interest | Constit Interest | General Awareness |
| First Minister | | | | | X |
| Deputy First Minister and Minister for Enterprise | | | | | X |
| Minister for Finance and Public Affairs | | | X | | |
| Minister for Parliamentary Business | | | X | | |
| Minister for Communities | | | | X | |

| |
|---|
| PS/Perm Sec PS/ETLLD PS/FCSD PS/LPS PS/Transport Scotland John Ewing Liz Lewis Bill Reeve Frances Duffy David Patel David Reid Sandy Rosie David Dow Fiona Spencer John Ramsay Ian Turner Press Transport Scotland Press Transport Andrew Baird Press First Minister Press Deputy First Minister Sam Ghibaldan Douglas Campbell Andy Myles Adrian Colwell Cabinet Secretariat Strategy & Delivery Units |
|---|

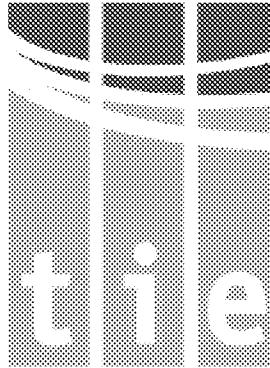
RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

ANNEX A

**EDINBURGH TRAMS: CITY OF EDINBURGH COUNCIL PROPOSAL AND
INDEXATION**

**TIE LTD EXAMINATION OF LEITH TO EDINBURGH AIRPORT AS A
FIRST PHASE**



Edinburgh Tram

**Examination of
Leith to Airport
As a First Phase**

January 2006

**COMMERCIALLY CONFIDENTIAL
FOISA EXEMPTED**

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

1. ECONOMIC VIABILITY

- 1.1 **tie's** strategy is to reconfirm the economic costs and benefits the Tram will deliver via outputs from the JRC modelling. The JRC modelling is being constructed such that a number of different options for the first phase of the tram network can be tested, including the way in which they would integrate with buses. The options selected for testing under JRC include the Ocean Terminal to the Airport plus a number of other configurations which include an evaluation of the Roseburn to Granton section and/or the Granton to Ocean Terminal section.
- 1.2 The JRC contract was awarded following approval of funding in September 2005 and the output from the modelling is programmed to be complete in August 2006. In the meantime **tie** has been asked to provide comfort now that the forecast economic benefits and costs of a first phase Tram from Ocean Terminal to the Airport would be likely to demonstrate that such a first phase would present value for money to the Government in its own right.
- 1.3 To achieve this aim, Faber Maunsell were requested to rerun the suite of models (hereinafter called the "STAG models") which were used by them to deliver **tie's** most up to date patronage and revenue projections for the entire Line 1 plus Line 2 network (hereinafter called the "Investment Enhancement Network") and the economic costs and benefits delivered by that network. The BCR and patronage projections for the Investment Enhancement Network have been presented to Parliament and have formed the basis of the Business Case work submitted by **tie** on the full network.
- 1.4 The STAG models have been adjusted to reflect the scope of the Tram being reduced to the Ocean Terminal to Airport option and to reflect the reduced capital, maintenance and operating costs.
- 1.5 As part of the governance of the JRC contract, a broad stakeholder steering group including representatives from CEC, TEL/LB, SE and Transdev have provided JRC with assumptions with regard tram operating frequencies on the Ocean Terminal to Airport network and a suite of changes to bus service patterns which would complement the Tram. Faber Maunsell have incorporated these core assumptions about bus and tram service patterns into the STAG models.
- 1.6 For the Tram it is assumed there would be 16 tph between Ocean Terminal and Haymarket with 8tph between Haymarket and the airport. The assumed changes to the bus services are detailed in a report prepared by TEL to review the financial and operational viability of an Ocean Terminal to Airport tram, the full text of which is included as Appendix 1.
- 1.7 The assumed changes to the bus network will continue to be examined throughout the JRC modelling process and the optimum bus network to integrate with Tram will continue to develop both in the period up to completion of the JRC modelling in August 2006 and indeed will be a continuous process.
- 1.8 The results of the rerun of the STAG models in BRC terms are set out in the TEE table below alongside those for the Investment Enhancement Network.

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

DRAFT TRANSPORT ECONOMIC EFFICIENCY TABLE - COMPARED TO INVESTMENT ENHANCEMENT OPTION

| | | Investment Enhancement Network <u>(£m)</u> | Ocean Terminal to Airport <u>(£m)</u> | <u>Difference</u> <u>(£m)</u> |
|--|----------------------|---|--|----------------------------------|
| | | TOTAL | TOTAL | TOTAL |
| SAFETY | | | | |
| Accidents | | | | |
| Total Discounted Savings | PV1 | 8.7 | 8.7 | 0 |
| ECONOMY (TRANSPORT ECONOMIC EFFICIENCY) | | | | |
| User Benefits | | | | |
| Travel time | PV2 | 573.5 | 374.1 | (199.5) |
| User charges | PV3 | 129.0 | 22.1 | (106.9) |
| Vehicle Operating Costs | PV4 | 20.7 | 20.7 | 0.0 |
| Quality/Reliability Benefits | Not to be quantified | | | |
| Private Sector Operator Impacts | | | | |
| Investment costs | PV5 | (371.3) | (263.9) | 107.4 |
| Operating & maintenance costs | PV6 | (179.4) | (139.1) | 40.4 |
| Revenues | PV7 | (17.0) | 125.3 | 142.3 |
| Grant/Subsidy payment | PV8 | 371.3 | 263.9 | (107.4) |
| Present Value of Transport Benefits | PVB | <u>535.4</u> | <u>411.7</u> | <u>(123.7)</u> |
| COST TO PUBLIC SECTOR | | | | |
| Investment Costs | PV9 | | | |
| Operating and Maintenance Costs | PV10 | | | |
| Grant/Subsidy payment | PV11 | (371.3) | (263.9) | 107.4 |
| Revenues | PV12 | 25.5 | 25.5 | 0.0 |
| Taxation Impacts | PV13 | (7.8) | (31.7) | (24.0) |
| PV of Cost to Government | PVC | <u>(353.5)</u> | <u>(270.1)</u> | <u>83.4</u> |
| Net Present Value | NPV | <u>181.9</u> | <u>141.6</u> | <u>(40.3)</u> |
| BENEFIT COST RATIO TO GOVERNMENT | BCR | <u>1.51</u> | <u>1.52</u> | |

The overall BCR is approximately 1.5 in both cases. However, there are significant differences in the components as follows (Note: All figures are in 1998 prices):

- a) Public sector grant (meaning capital cost) at PV11 is reduced by 29% or £107m in PV terms representing the costs of building the Newbridge shuttle and the line from Roseburn to Ocean Terminal via Granton which is not constructed in this phase. It should be noted that this figure includes both tie's Specified Contingency plus the incremental Optimism Bias of 14% as required by HM Treasury guidance.
- b) Operating and maintenance costs at PV6 reduce by 22% or £40m in PV terms again as a result of the reduced extent of the Tram network.
- c) Travel time benefits are reduced by 34% or £199m in PV terms. A detailed review of the results by Faber Maunsell indicates that the vast majority of this reduction arises due to omission of the section of Tram from Roseburn to Granton. This is also entirely consistent with the results of the Line 1 only STAG appraisal wherein over 60% of the PT travel time benefits of £126m (PV) were being generated from this section of the Tram.
- d) The benefit in terms of User Charges at PV 3 is significantly reduced by 83% or £107m. This is offset by an increase in Revenues to the operator (TEL) at PV 7 of £142m. These two changes in the components of the BCR calculation are connected due to the way the modelling deals with interchange between modes of public transport; the removal of the tramway between Roseburn and Ocean Terminal means that passengers who would have used that section of tramway to complete a journey of, for example, Granton to the Airport, will be

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

treated as making two journeys, one by tram and the other by bus. The impacts of this in modelling terms are:

- User Charge benefits are reduced as the passenger is now paying for two journeys and is incurring a monetised penalty for interchange between the two modes of transport – i.e. the modelling does not explicitly take account of the impact of integrated ticketing.
- Revenue benefits are increased by virtue of the fact two fares are collected.

This obvious limitation in the STAG modelling in dealing with the benefits of integrated ticketing will be fully addressed in the delivery of the JRC modelling and can be viewed as a potential upside when compared to the results produced above.

1.9 In terms of patronage, the outputs from the updated modelling by Faber Maunsell, again benchmarked against the Investment Enhancement network, are as follows:

| | 2011 | | 2026 | |
|----------------------------------|--------------|--------------|--------------|--------------|
| | Tram | No Tram | Tram | No Tram |
| Millions of passengers | | | | |
| Investment Network | | | | |
| Tram | 21.6 | - | 27.0 | - |
| Bus | 83.3 | 92.8 | 88.4 | 89.6 |
| | 104.9 | 92.8 | 115.4 | 89.6 |
| Other | 18.7 | 19.9 | 27.6 | 27.6 |
| Total | 123.6 | 112.6 | 143.0 | 117.2 |
| Ocean Terminal to Airport | | | | |
| Tram | 11.5 | - | 16.7 | - |
| Bus | 93.3 | 92.8 | 99.8 | 89.6 |
| | 104.8 | 92.8 | 116.5 | 89.6 |
| Other | 19.1 | 19.9 | 28.6 | 27.6 |
| Total | 123.9 | 112.6 | 145.0 | 117.2 |

1.10 The above table reflects that the STAG models are consistently forecasting demand for public transport in Edinburgh to be in the region of 105m per annum in 2011. Over the coming period we will work closely with Faber Maunsell to understand the complex relationship between patronage levels and detailed tram and bus service patterns with a view to informing the work of the JRC to be delivered in August 2006.

1.11 There are a number of reasons to take comfort that the BCR to government for the Ocean Terminal to Airport network delivered by the JRC in August 2006 can be expected to demonstrate the investment will still represent value for money for the Government compared to the result above. This is due to a number of potentially significant upsides as follows:

- Underlying conservatism in the STAG models – as noted above the STAG models have proven to be conservative in their underlying patronage forecasts by comparison to the actual growth in patronage experienced Lothian buses over the past 4 years.

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

- b) Impact of higher demand at the Airport - The STAG models, and therefore the BCR calculation above, do not yet reflect the much more significant growth in public transport demand at Edinburgh Airport anticipated now compared to that predicted by the STAG models, even allowing for the offsetting affect of patronage lost to EARL. In October 2005, the Line 2 Committee were informed that the anticipated BCR for Line 2 would be increased from 1.4 to 1.53 by these factors and Faber Maunsell have confirmed it is reasonable to assume that the calculated BCR for Ocean Terminal - Airport would be increased by a factor approaching the same order of magnitude. The same paper (a copy of which is included as Appendix 2) noted an increase in forecast patronage for Line 2 in the year 2026 by 70% (an additional 3 million passengers per annum) and that in the long term the increase in airport passengers could even put a strain on the capacity of Line 2.
 - c) Benefits of integrated ticketing and interchange – As explained at para 1.8 d) above the STAG models do not explicitly take cognisance of the strategy of TEL to implement integrated ticketing between bus and tram and, where practicable, between TEL and other operators. The implementation of a single ticket regime for tram and bus might reasonably be expected to generate additional user benefits when compared to the figures generated from the STAG models. Effective interchange has been identified as critical to the operational viability of tram and bus under TEL and this very important variable is being carefully examined through the work of the JRC.
 - d) Further examination of complementary bus and tram service patterns – The work undertaken by TEL to date has provided JRC with a robust set of core assumptions with regard to both tram and bus service patterns. However both are subject to further development and testing under the JRC and as part off the TEL Business Planning process with a view to optimising both economic benefits and financial viability. It might be expected that in the scenario of an Ocean Terminal – Airport network, additional economic benefits and patronage might be generated from e.g. increasing the level of bus services to Granton and the surrounding area to compensate for the absence of a tram service to stimulate/facilitate development and service the consequential demand.
 - e) Extension of modelled period from 30 to 60 years – It is now standard practice to assess the economic benefits and costs of a project over 60 yrs rather than the 30 years examined with the STAG models. A preliminary assessment of additional benefits and costs using the STAG models indicates that the BCR associated with the Ocean Terminal – Airport tram would increase significantly if assessed over a 60 year period.
- 1.12 In the coming weeks, **tie** will continue to examine the dynamics of the BCR calculation for the Leith to Airport network with Faber Maunsell and with input from TEL and Transdev. This exercise will focus on understanding fully how the dynamics of service integration, such as interchange and timetable considerations, are reflected in the model outputs. This work will be informative in planning the testing to be carried out on the updated transport modelling being carried out under the JRC contract.
- 1.13 In conclusion, an analysis of the economic cost and benefits from the Ocean Terminal to Airport network, using the existing STAG models, has given comfort that such a network is capable of being economically viable. The work on confirming this viability will continue with a view informing the work on updated transport modelling being conducted under the Joint revenue Committee contract

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

and which will be presented as part of the Final Business case for trams in the autumn of 2006.

2. FINANCIAL AND OPERATIONAL VIABILITY

- 2.1 Transport Edinburgh Limited (TEL), with the assistance of **tie** and Transdev, have conducted a review of the financial and operating viability of a Leith to Airport tram line integrated with bus services. The objective was to assess the financial performance of the TEL bus and tram business in the first full year of tram operations based upon current demand, costs and revenues with projected future growth and resource requirements. The full text of the initial report is attached as Appendix 1.
- 2.2 The operating assumptions for the tram in this scenario are 8 trams per hour from Leith to the Airport and a further 8 trams per hour from Leith to Haymarket. The bus services were reviewed to avoid duplication of provision (and thereby maximising operating efficiencies) and to avoid enforced interchange between bus and tram except where interchange infrastructure can be provided for effectively. The resultant assumed integrated service patterns have been the subject of initial testing for economic viability (see below) and will now form the core service patterns for updated transport modelling under the Joint revenue Committee contract against which a number of sensitivities and variants will be examined.
- 2.3 The result is a reasonable expectancy that the integrated bus and tram business can at least sustain the level of dividend currently payable by Lothian Buses to CEC without subsidy. In addition a number of action plans have been identified whereby the risks of an operating loss can be mitigated against and potential additional revenues realised.
- 2.4 This initial and prudent analysis will now inform the preparation a more detailed TEL Business Plan in the period between now and the end of September 2006. The TEL Business Plan will incorporate the output from the updated transport modelling being prepared under the JRC contract and will provide a more detailed analysis of service integration plans and projected costs and revenues for bus and tram over a 30 year planning horizon. The first version of the TEL Business plan will form the basis of the Final Business Case for tram.

3. GOVERNANCE AND TEL BUSINESS PLAN / TRAM FINAL BUSINESS CASE

- 3.1 The project governance procedures have been adapted to accommodate the needs of the project as it has developed. In 2005, the Tram Project Board structure was introduced, which enabled all key parties to have visibility of, and to participate in, the decision-making process. Since then, TEL has developed its presence with the appointment of the Board of Directors including two independent non-executives.
- 3.2 The process of developing a fully-integrated service plan has accelerated in recent months. Work to produce updated patronage and revenue modelling is now well-underway under the JRC contract and preparation of a full-scale business plan for the combined bus and tram business has commenced. The governance structure is currently being amended to reflect TEL's developing role, while continuing to ensure that the responsibilities of all parties are clear and that full transparent accountability to the Council is sustained. The revised structure is expected to be operational before the end of this financial year.

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

TEL BOARD – 23 JANUARY 2006

Agenda Item 7

DRAFT REPORT FOR DISCUSSION

REVIEW – OCEAN TERMINAL / HAYMARKET / AIRPORT

INTRODUCTION

This report assesses the prospects for operational financial viability of the Transport Edinburgh Limited (TEL) bus and tram network incorporating a single tramline running from Ocean Terminal, via Haymarket, to the Airport.

It is prepared on the basis that:

- A single line, Ocean Terminal – Airport, is constructed, and all other sections of lines 1 and 2 are, at this stage, left in abeyance, viz:

Ingliston – Newbridge

Haymarket – Ravelston Dykes – Granton

Ocean Terminal – Seashore – Granton

- The tramway is delivered “free at point of use”, i.e. all construction and commissioning costs are met elsewhere, and the operational finances of the tramway do not carry any costs of funding its construction.
- Tram life-cycle / heavy maintenance costs are met from operating revenues.
- Tram and tramway depreciation provision is not met from operating revenues.
- No operating subsidy is paid in respect of the tramway (or buses).
- An annual dividend of £2m is paid to CEC in respect of the TEL network *in toto* (as currently).
- The P&L account therefore comprises the current bus division trading performance, amended to take account of changes to the bus network that would be introduced concurrently with commencement of the tramway.

In respect of the tramway, the P&L does include:

- all day-to-day operating costs,
- all heavy maintenance / life-cycle costs,
- a £2m annual dividend charge,

but does not include:

- any cost for funding construction,
- any depreciation charges,

RESTRICTED: ADVICE TO MINISTERS

METHODOLOGY

The aim is to produce a realistic assessment of the most likely financial performance of the combined TEL bus / tram network in 2010, using known, real-world, current demand, costs and revenues which are then projected forward to 2010, taking account of anticipated changes in demand and resource requirements.

Although current demand and resource levels have been projected to 2010 levels, unit costs and fare levels have not been subject to inflation provision and are quoted at 2005 actual levels, i.e. all volume issues are at 2010 projected levels and all prices are 2005 actual unit prices.

This paper reflects the anticipated 2010 position – it is hoped that, once the tram becomes fully operational, demand will increase by a greater percentage than incorporated in the projections this paper is based on.

BUS DIVISION – COSTS

Lothian Buses' 2005 financial performance is projected forward to 2010, incorporating a growth in passenger usage of 2% per annum (the current LB run rate). To accommodate this 2% per annum passenger growth, the volume of variable costs rises proportionately, again consistent with current LB experience. (Some "off-peak" demand growth can be accommodated with little extra resource input, as it utilises existing spare capacity, but providing capacity for most "peak" demand growth requires significant additional resource input, as the network is very close to capacity at peak, and extra resources have to be added to accommodate peak growth.)

The resulting 2010 bus division costs are then amended to incorporate the changes to the bus network that will occur on commencement of tram operation. These changes are detailed in Appendix A.

TRAM DIVISION COSTS

tie and Transdev have provided operating costs based on their best estimate of providing a level of tram service as follows:

- 8 trams per hour - Airport – Haymarket
- 16 trams per hour - Haymarket – Ocean Terminal

This level of tram service will have a peak vehicle requirement of 20 trams, in addition to which 2 or 3 spare trams would be required, i.e. a total of 22 or 23 trams.

RESTRICTED: ADVICE TO MINISTERS

TEL COSTS (TOTAL TRAM & BUS)

The bus and tram division costs, arrived at as detailed above, are added to yield total TEL network operating costs.

TEL REVENUES (TOTAL TRAM & BUS)

The tram is not serving any areas not currently served by the bus division. Therefore, the base 2010 patronage projection is the bus patronage detailed above (2005 actual + 2% growth per annum), to which have been added the following:

- 4.1% per annum growth in numbers of passengers travelling to / from the Airport, based on BAA's "central case" forecast of increasing usage at Edinburgh Airport,
- 14% growth in numbers of passengers travelling where the tram service is introduced, based on STAG appraisal projection (which is consistent with experience elsewhere) of generated demand from current non-public transport users, i.e. existing car users who will transfer to tram when it becomes available.

This allows production of projected passenger numbers for the combined 2010 bus + tram network, which is converted to 2010 network revenue (at 2005 fare levels) by applying an average fare of 67p (LB 2005 network average fare).

SENSITIVITIES

No assumptions have been included in respect of possible patronage loss or gain resulting from factors such as:

- passengers lost due to forced interchange in place of existing through service
- growth from specific future developments, e.g. expansion of Edinburgh Park, developments west of Gogar, etc. (except for Airport growth as detailed above)
- revenue lost from fare evasion through multi-door, unsupervised boarding
- underlying organic growth (or loss) reflecting levels of economic activity / growth / economic development / population changes in the city (beyond the current LB 2% per annum "run rate" growth detailed above)
- bus operating cost increases as a result of bus operating speeds becoming slower due to loss of Greenways / bus lane priorities and mixing with general traffic and / or where traffic light priority for trams disadvantages buses
- passengers / revenue lost due to journeys becoming slower and less attractive for the reasons above
- generation on non-tram elements of TEL network arising from perceived enhanced quality of public transport generally following introduction of tram

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

- changes to any fare levels in “real” terms (assumed current Airport premium fare continues to apply)
- cut-backs to loss-making bus services
- possible changes to revenue resulting from proposed future changes to the concessionary travel scheme, or possible introduction of a young persons’ concessionary travel scheme
- EARL – i.e. assumption is that EARL is not built, and all current and projected Airport demand is handled by TEL
- Airport traffic growth may exceed BAA’s current forecast of 4.1% per annum (the figure used in the paper). It is hoped that beyond 2010 future airport related patronage growth would offset any loss of passengers to EARL (if EARL was to be built)
- amended service integration plan. The number of buses withdrawn may change; the impact is an extra cost / saving of £109K per annum for each bus added / removed compared to the “central” case outlined in Appendix A.
- change in level of competition from other bus operators, e.g. First / Stagecoach, etc., i.e. it is assumed there will be no change from the current level of competition

“THE BOTTOM LINE”

The table below shows the net result:

TEL Profit and Loss 2010 (£m at 2005 prices)

| | Pre-Tram | | Post-Tram | | |
|-----------------------|----------|------|--------------|---------------|------------|
| | 2005 | 2010 | Bus division | Tram division | TEL |
| | £m | £m | 2010 £m | 2010 £m | 2010 £m |
| Revenue | 76 | 83 | 76 | 8 | 84 |
| Operating Costs | 70 | 73 | 71 | 11 | 82 |
| Maintenance Provision | 0 | 0 | 0 | 2 | 2 |
| Total Costs | 70 | 73 | 71 | 13 | 84 |
| Operating Profit | 6 | 8 | 5 | -5 | 0 |
| Dividends | 2 | 2 | 2 | 0 | 2 |
| Pre-Tax Profit | 4 | 6 | 3 | -5 | -2 |
| Post-Tax Profit | 2 | 4 | 1 | -3 | -2 |

Projected revenues for the network amount to £84m, with operating costs also of £84m.

The result is an operating profit of zero, which, after payment of required dividend of £2m, would give a pre-tax loss of £2m.

RESTRICTED: ADVICE TO MINISTERS

ACTION PLANS

A mix of factors, to greater or lesser degree, could then be applied to close the gap and achieve the desired financial outcome, which is assumed to be LB's 2005 pre-tax profit of £4m.

Thus, for example, the following assumptions / actions, taken together, would generate the £6m needed to convert the pre-tax loss of £2m to the desired pre-tax profit of £4m:

- Assume 1.5m extra passengers per annum generated from improved perception of public transport following introduction of trams (1.5m x 67p = £1m).
- Assume increase in average fare per passenger in real terms of 4% gross (yield - £2m).
- Reduce loss-making "social" bus services, e.g. withdrawal / cut-back of formerly secured bus services (£1m).
- Assume 1.5m extra passengers from specific new developments, e.g. expansion of Edinburgh Park, growth of Park and Ride patronage, Leith Waterfront development, etc. (1.5m x 67p = £1m).
- Realise potential overhead cost savings from incorporating separate tram / bus division administration functions into one TEL consolidated administration (say £0.5m).
- Council introduce further bus priority measures to speed up bus services and thereby reduce operating costs (say £0.5m).
- Tram advertising revenues maximised. Based on other UK tram experience £0.25m could be achievable.

THE NEXT STAGE

The initial aim is to improve the "pre-action plan" result, thereby minimising the growth assumptions, fares increases, etc., that have to be built in to achieve the desired financial outcome.

Different frequencies of tram service on the Ocean Terminal – Haymarket – Airport route will be tested, since the premise of 8 and 16 per hour is not the only available option. The following pattern of tram service is the next to be tested:

- 6 trams per hour - Airport – Haymarket
- 12 trams per hour - Haymarket – Ocean Terminal

Work is under way on testing this option, and initial indications are that it may yield a better "pre-action plan" financial result.

RESTRICTED: ADVICE TO MINISTERS

BUS NETWORK REVISIONS – Bus / Tram Integration

As part of the work being undertaken to prepare the high-level operational costing evaluation of the 'core potentially viable' single tramline, Ocean Terminal – Airport, for consideration at the January TEL Board Meeting, the following details an initial option for a pattern of service integration of TEL buses with trams.

This has been prepared with input from Transdev and **tie**.

The possible alterations to bus services are based on services in operation as at August 2005. They do not entail any assumptions as to changes which may be made to bus services over the 5 years before commencement of tram operation. Thus, for example, Service X48, operation of which requires 8 buses and is assumed to cease on introduction of the tram, was introduced in September 2005 and is not therefore included. This has no effect on the conclusions of this paper, as neither the costs of operation of the X48, nor its revenues, are included in the calculations.

The possible bus service changes have been used to calculate operating cost savings which would result, were they to be implemented. These savings have then been applied to Lothian Buses' 2005 performance.

This paper only considers integration of 'red bus' and 'red tram'. Non-TEL bus services, such as FirstGroup / Stagecoach, etc., will be the subject of a separate paper in due course.

TRAMLINE ASSUMPTION

The tramline assumed is that considered to have the greatest likelihood of operating at break-even, or better, as part of an integrated network and runs from Ocean Terminal to the Airport via Haymarket at the following frequency:

Airport – Ocean Terminal - 8 trams per hour
Haymarket - 16 trams per hour

i.e. a tram frequency of:

every 7.5 minutes between the Airport and Haymarket
every 3.75 minutes between Haymarket and Ocean Terminal

TEL NETWORK DESIGN PRINCIPLES

The key objectives are to:

- avoid unnecessary duplication of provision, and thereby to maximise operating efficiencies
- avoid enforced passenger interchange between modes, except where interchange infrastructure is assumed to be deliverable

RESTRICTED: ADVICE TO MINISTERS

Following these principles, the main scope for reducing bus service provision is where the tram route runs parallel or very close to existing bus routes. Where the tram route follows a different alignment, along which or in the vicinity of which there are no existing bus routes, there will be no reduction as bus service reductions are assumed only where the tram offers an acceptable replacement facility. The tram route varies in its proximity to bus routes; hence the changes to bus services also vary according to the sections of tram route. These can be summarised as follows:

Ocean Terminal – Foot of Leith Walk

The section of tramline between Ocean Terminal and Bernard Street, via the Docks and Ocean Drive, does not closely mirror or replace any existing bus route. Hence bus services on this section will be maintained, feeding into the tram at the foot of Leith Walk.

Foot of Leith Walk – St Andrew Square

This section offers great potential for bus service reductions. On a rule of thumb bus:tram ratio of 2:1, for every 1 tram per hour, the objective is to take out 2 buses per hour. The following table, showing current inter-peak buses per hour, shows the volume reductions that it is hoped will be achievable.

| Leith Walk Bus & Tram Frequencies @ bus:tram ratio of 2:1 | | | | | | |
|---|----------------|---|----------------|-------------------------|------------|--|
| <u>Current</u> | | 21. | | | | |
| | tph | 22. Proposed | | | | |
| Tram | 0 | Tram | | tph | | |
| | | Equivalent bph | | 16 | | |
| | | Residual bus target | | 32 ratio 2:1 | | |
| | | | | 15 (47 minus 32) | | |
| 2005 inter-peak bus volumes | | Post-Tram inter-peak bus volumes | | | | |
| <i>Ser No.</i> | <i>bph</i> | <i>proposed</i> | <i>current</i> | <i>change</i> | | |
| | | <i>Ser No.</i> | <i>bph</i> | <i>bph</i> | <i>net</i> | |
| 7 | 6 | 7 | 6 | 6 | 0 | |
| 10 | 6 | 10 | 0 | 6 | -6 | |
| 12 | 4 | 12 | 0 | 4 | -4 | |
| 14 | 4 | 14 | 4 | 4 | 0 | |
| 16 | 6 | 16 | 0 | 6 | -6 | |
| 22 | 12 | 22 | 0 | 12 | -12 | |
| 25 | 6 | 25 | 0 | 6 | -6 | |
| 49 | 3 | 49 | 6 | 3 | +3 | |
| Total | <u>47</u> | Total | <u>16</u> | <u>47</u> | <u>-31</u> | |
| tph: | trams per hour | | | | | |
| bph: | buses per hour | | | | | |

This shows that the target bus volume reduction is virtually identical to the volume currently operating the full length of the Leith Walk – Princes Street axis. For that

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

reason, Services 10, 12, 16, 22 and 25 will be removed from Leith Walk. As all Princes Street / Leith Walk bus services are replaced by tram, the remaining buses on Leith Walk run on the Leith Walk – Bridges – ERI axis, as the tram will not offer a service on this corridor.

This proposal assumes high-quality interchanges are deliverable at the foot of Leith Walk and at St Andrew Square. The 'interchanges' section below expands on implications for bus services which are truncated at both St Andrew Square and the foot of Leith Walk.

St Andrew Square – Haymarket

The scope for reducing bus volumes on this section, which largely comprises Princes Street, is limited as the tram route does not offer any substantial cross-city link currently offered by bus. This means that, while most routes serving Leith Walk can be removed from Leith Walk, because the western or southern ends of those routes are not replaced by trams, they still need to traverse Princes Street.

For example, passengers travelling from, say, the Fairmilehead / Morningside / Bruntsfield corridor cannot be expected to transfer on to tram at the West End to complete their journey to, say, Waverley, as there is no suitable tram stop expected at the West End, nor is there space to locate an interchange. In any case, it is not considered a sensible option to introduce an enforced interchange for the very large numbers of passengers who would be affected only a very short distance from their trip destination or origin; neither would it be sensible to decant bus passengers at the foot of Lothian Road and expect them to walk along Princes Street.

For these reasons, the potential for reduction in buses on Princes Street itself comprises the reduction in frequencies of Services 22 and 100.

Haymarket – Airport

There are two facilities offered by the tram which yield the potential to reduce significantly the volume of bus service provision:

- Airport – City Centre passenger demand
- The section of route from Broomhouse to Saughton Mains, currently comprising the Fastlink guided busway

As far as the Airport is concerned, it is assumed that many passengers who currently use Airlink 100 will transfer to the tram. Those who will definitely not do so are those who use Airlink to travel between the Airport and points not served by the tram, namely all stops between Maybury and Wester Coates. To serve those passengers, a reduced-frequency Airlink will continue to run. For passengers travelling between the Airport and the Haymarket – Waverley section, the majority are assumed to choose the tram. The working assumption for present purposes is that the volume of service on Airlink will be cut by at least 50% to 4 per hour.

As far as the Fastlink section between Broomhouse and Saughton Mains is concerned, it is assumed that virtually all passengers travelling between this section and Princes Street will switch to the tram. This volume of demand is,

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

however, a relatively small proportion of the total demand on the existing service (22). Hence, a reduction in Service 22 frequency has been assumed. (The northern half of the 22 is withdrawn *in toto* between St. Andrew Square and the foot of Leith Walk.)

As far as the other Fastlink service (the 2) is concerned, it offers no links which will be provided by the tram, so no reduction in provision on Service 2 is assumed.

Specifically, the following heavily used sections of the 22 do not offer any potential for tram substitution:

- Lothian Road – Fountainpark – Westfield – Stenhouse
- Broomhouse – South Gyle Crescent – Edinburgh Park

Between Lothian Road and Stenhouse, the existing Service 22 follows a route which is outside an acceptable walking distance from the tram stops (with the exception of the East Whitson area, from where residents can access the tram stop at Balgreen Halt via the Balgreen Road pedestrian tunnel). While the reduction in Service 22 frequency referred to above will affect this section of route, there is unlikely to be any further impact on bus services on this section.

Between Broomhouse and Edinburgh Park, the bus route crosses under the railway line and serves South Gyle Crescent and Redheughs Avenue. There will be no walking route linking the tram stops across the railway to South Gyle Crescent, nor will the tram stops be within acceptable walking distance of Redheughs Avenue. The tram does not therefore affect the bus services on this section, so no changes are assumed, other than the frequency reduction on the 22 resulting from modal transfer on the Broomhouse / Saughton Mains section.

INTERCHANGES

Two designated bus/tram interchanges are assumed:

- a) Foot of Leith Walk

This interchange is the key to being able to curtail bus routes at the northern end of Leith Walk. Without it, there is no practical way in which buses approaching the foot of Leith Walk from Great Junction Street or Duke Street can be curtailed such that they no longer continue up Leith Walk. An effective interchange at this location must be delivered. Otherwise, bus volume reductions on Leith Walk (and the consequential cost savings) will not be realised. As the numbers of passengers involved in what will be enforced modal interchange is significant, a high quality of design, minimising both walking distances and waiting times, must be achieved.

If a sufficiently good design can be delivered, it is possible to arrive at a network design which matches routes curtailed at Great Junction Street with routes curtailed at Duke Street, so they can be linked into through routes, thereby reducing what would otherwise be an absolute requirement to accommodate terminating buses at this awkward location. Nonetheless, some provision for terminating buses must be built into the design.

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

b) St Andrew Square

An interchange at the east end of the city centre is essential to accommodate buses reaching the city centre from points west and south of the West End which currently continue via Leith Walk. These are the routes which need to be truncated in order to achieve modal transfer on Leith Walk.

TEL / LB and Transdev have looked at various options and there is no doubt that the design proposed by Transdev for St Andrew Square is by far the most effective as it accommodates the following:

- provision for passenger interchange between bus and tram
- provision for terminating buses and essential layover
- provision for turn-back for trams from both the west and the north

While it is recognised that there have been historical aesthetic concerns over layover in St Andrew Square, it is imperative that these are resolved, as neither TEL / LB nor Transdev believe there is any suitable alternative option.

RESTRICTED: ADVICE TO MINISTERS

TRANSPORT EDINBURGH LTD

BUS / TRAM INTEGRATION for OCEAN TERMINAL to AIRPORT TRAM LINE

Assumed Bus : Tram Ratio 2 : 1

PVR's Reflect Period of Maximum Output, Not Inter-Peak Cycle

| Service No. | Current Route | Revised Route | Notes | Basic | PVR | | +/- |
|----------------|--|-------------------------------|-------|---------------------|------------|------------|------------|
| | | | | Frequency (Mins) | Current | Proposed | PVR |
| 10 | Torphin - Newhaven | Torphin - St Andrew Square | A | 10 | 12 | 9 | -3 |
| 12 | Gogarburn - The Jewel | Gogarburn - St Andrew Square | B | 15 | 12 | 8 | -4 |
| 16 | Colinton - Silverknowes | Colinton - St Andrew Square | C | 10 | 17 | 11 | -6 |
| 21 | Gogarburn - Leith Links | Gogarburn - King's Road | D | 15 | 9 | 10 | 1 |
| 22 | Gyle - Ocean Terminal | Gyle - Leith Street | E | 6 | 26 | 17 | -9 |
| 25 | Riccarton - Restalrig | Riccarton - Leith Street | F | 10 | 15 | 11 | -4 |
| 32 | Clovenstone - Royal Infirmary | Clovenstone - Restalrig | G | 15 | 8 | 9 | 1 |
| 34 | Riccarton - Ocean Terminal | Riccarton - Silverknowes | H | 15 | 12 | 15 | 3 |
| 40 | - | King's Road - Royal Infirmary | I | 30 | - | 2 | 2 |
| 49 | Jewel - Rosewell | No change to route | J | 10 | 9 | 14 | 5 |
| 100 | Waverley - Airport | No change to route | | 15 | 11 | 6 | -5 |
| | | | | | | | |
| Summary | Ocean Terminal - Airport (16 tph OT - Haymarket; 8 tph Haymarket - Airport) | | | | 131 | 112 | -19 |

Notes

- A** Section between Newhaven and Foot of Leith Walk replaced by increased frequency on Service 32.
- B** Section between The Jewel and King's Road replaced by increased frequency on Service 49; section between King's Road and Foot of Leith Walk replaced by extension of Service 21.
- C** Section between Silverknowes and Foot of Leith Walk replaced by extension of Service 34; section between Muirhouse and North Junction Street by increased frequency on Service 32.
- D** Replaces Service 12 between Leith Links and King's Road.
- E** Section between Ocean Terminal and Foot of Leith Walk replaced by diversion of Service 1, 34, and 35 via Commercial Street, Shore and Henderson Street.
- F** Section between Restalrig and Foot of Leith Walk replaced by increased frequency on Service 32.
- G** Section between Restalrig and Portobello replaced by increased frequency on Service 49; section between King's Road and RIE by new Service 40.
Replaces Service 16 between Muirhouse and North Junction Street and Service 25 between Foot of Leith Walk and Restalrig.
- H** Replaces Service 16 between Commercial Street and Silverknowes and Service 22 between Foot of Leith Walk and Ocean Drive.
- I** New Service replacing Service 32 between King's Road and RIE.
- J** Frequency increased between The Jewel and Surgeons' Hall to replace Service 12 between The Jewel and Portobello, and Service 32 between Portobello and Lochend.

RESTRICTED: ADVICE TO MINISTERS

Other Services not shown above are assumed to have no change.

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED: ADVICE TO MINISTERS

RESTRICTED – ADVICE TO MINISTERS

BUS / TRAM INTEGRATION: DETAILED SERVICE PROPOSALS

- Service 1 **Currently** Clermiston – Ocean Terminal
Becomes Clermiston – Ocean Terminal, but via Henderson Street, Shore and Commercial Street, instead of Great Junction Street, to replace Service 22
- Service 10 **Currently** Torphin – Newhaven
Becomes Torphin – St. Andrew Square. Section between Newhaven and Foot of Leith Walk replaced by increased frequency on Service 32
- Service 12 **Currently** Gogarburn – The Jewel
Becomes Gogarburn – St. Andrew Square. Section between The Jewel and King's Road replaced by increased frequency on Service 49. Section between King's Road and Foot of Leith Walk replaced by extension of Service 21
- Service 16 **Currently** Colinton – Silverknowes
Becomes Colinton – St. Andrew Square. Section between Silverknowes and Foot of Leith Walk replaced by extension of Service 34, and between Muirhouse and North Junction Street by increased frequency on Service 32
- Service 21 **Currently** Gogarburn – Duke Street
Becomes Gogarburn – Leith Links, extending alternately to King's Road to replace Service 12
- Service 22 **Currently** Gyle – Ocean Terminal
Becomes Gyle – Leith Street at reduced frequency. Replaced between Ocean Terminal and Foot of Leith Walk by diversion of Services 1, 34 and 35 via Commercial Street, Shore and Henderson Street
- Service 25 **Currently** Riccarton – Restalrig
Becomes Riccarton – Leith Street. Section between Restalrig and Foot of Leith Walk replaced by increased frequency on Service 32, terminating at Restalrig
- Service 32 **Currently** Clovenstone – RIE
Becomes Clovenstone – Restalrig with frequency enhanced to every 15 mins between Muirhouse and Restalrig to replace Service 16 between Muirhouse and North Junction Street and Service 25 between Foot of Leith Walk and Restalrig. Section between Restalrig and Portobello replaced by increased frequency on Service 49 and between King's Road and RIE by new Service 40
- Service 34 **Currently** Riccarton – Ocean Terminal
Becomes Riccarton – Silverknowes via Henderson Street, Shore and Commercial Street, replacing Service 22 between Foot of Leith Walk and Ocean Drive and Service 16 between Commercial Street and Silverknowes
- Service 35 **Currently** Airport – Ocean Terminal
Becomes Airport – Ocean Terminal, but diverted via Henderson Street, Shore and Commercial Street to replace Service 22
- Service 40 New service, King's Road – RIE, to replace Service 32 on that section
- Service 49 **Currently** The Jewel – RIE / Rosewell
Frequency increased between The Jewel and Surgeons' Hall to replace Service 12 between The Jewel and Portobello and Service 32 between Portobello and Lochend
- Service 100 **Currently** Airport – Waverley
Frequency reduced to every 15 mins

Response 3

**Edinburgh Tram (Line Two) Bill Committee
Consideration Stage – Phase 1****Responses to the undertakings in the Preliminary Stage Report****Question**

Updated information on the expected impact of EARL on tram patronage for line two in the light of (1) all additional information presented to the Scottish Executive in the Outline Business Case for the project and (2) the Preliminary Financial Case for the EARL Bill when it becomes available.

Executive Summary

- 1 This note reports and builds upon the work previously outlined in the Edinburgh Tram (Line Two) STAG which considered the impacts of EARL on ETL2 as a sensitivity test. In light of recent modelling work undertaken as part of the promotion of the EARL scheme, the impacts of EARL on Edinburgh Tram (Line Two) have been re-appraised.
- 2 This paper focuses on the results of this updated modelling work, which will feed into the preparation of an updated Outline Business Case (OBC) for Edinburgh Tram (Line Two), which is due to be submitted to the Scottish Executive in early 2006, and also the Preliminary Financial Case (PFC) for EARL which will be submitted to the Scottish Parliament with the EARL Bill. It will be noted that neither the ETL2 OBC, nor the EARL PFC are currently available.
- 3 The findings of this updated modelling process are summarised as follows:

- *Based upon more recent information, the demand for travel across all modes to/from Edinburgh Airport is higher than was previously forecast.*
- *Using these updated airport forecasts and taking into account the availability of and the charge for car parking at the airport in future years, leads to a much higher usage of tram than the original STAG work predicted. This increases tram patronage, revenue and economic benefits.*
- *This higher airport related demand translates to an increase in the Benefit Cost Ratio (BCR) for Line Two from 1.40 to 1.87 with no EARL present.*
- *The Net Present Value of ETL2 increases from £89.5m to £127.2m with no EARL present.*
- *When EARL is operating, a significant number of tram passengers shift to EARL, particularly those travelling between the Airport and the City Centre movement. While the revenue and economic benefits are reduced in the presence of EARL (the BCR reduces to 1.53 and the NPV reduces to £91.9m), they are both still significantly higher than the tram only scenario presented in the previous STAG estimates.*

RESTRICTED – ADVICE TO MINISTERS

- 4 The EARL modelling of the demand for travel to/from Edinburgh Airport across all modes is more sophisticated and up to date than the ETL2 modelling reported in STAG. It is appropriate to update the ETL2 airport patronage with these more robust forecasts of demand to and from the airport. The use of data from the EARL modelling has been limited to airport demand only, and forecasts of tram patronage between zones elsewhere in the network remains unchanged.
- 5 As well as modelling airport demand in a more detailed manner, the three most important changes introduced to the ETL2 model are:
- use of the latest airport passenger forecasts, which predict a much faster rate in growth than those available in mid-2003
 - more recent airport employee forecasts; and
 - airport car park charges and capacity restraints cause a significant shift towards public transport.
- 6 Updating the ETL2 2003 STAG forecasts with the EARL model improves the financial case for ETL2, as illustrated in Table A, and the economic case for ETL2, as illustrated in Table B

Table A Comparison of 30 Year ETL2 Net Present Value (NPV)

| Values in £,000 and 2003 prices | ETL2 only | | EARL present |
|---------------------------------|-----------|-------------------------|--------------|
| | STAG 2003 | Revised with EARL model | |
| 30 year NPV for ETL2 | £89,539 | £127,150 | £91,952 |

Table B Comparison of ETL2 2003 STAG results with revised values

| Values in £,000 and 2003 prices | ETL2 only | | EARL present | |
|-------------------------------------|-----------|-------------------------|--------------|---------|
| | STAG 2003 | Revised with EARL model | | |
| Present Value of Transport Benefits | PVB | 287798 | 354519 | 352190 |
| PV of Cost to Government | PVC | -206151 | -189649 | -230861 |
| Net Present Value | NPV | 81647 | 164870 | 122049 |
| Benefit Cost Ratio to Government | BCR | 1.40 | 1.87 | 1.53 |

- 7 The net effect of this new modelling work indicates improved patronage and revenues on the tram (with or without EARL) over previous forecasts.
- 8 Annex 1 to this note describes the updated ETL2 modelling and the impact that has on the ETL2 STAG and EARL modelling in more detail.

ANNEX 1

Basis of ETL2 STAG Modelling

- 1 The modelling work for the ETL2 STAG Report was done in 2003, using the most recent forecasts available at that time. The base year airport trips were taken from the ‘Rail Links to Glasgow and Edinburgh Airport’ (RLGEA) Study. Forecasts for air passenger and airport employee trips were provided by BAA in March 2002, though this predated the White paper which came out after the modelling work was completed.
- 2 Testing of EARL impacts on ETL2 patronage was done as part of the ETL2 STAG work as a sensitivity test. This work was undertaken prior to more specific planning of what EARL would consist of and what fares EARL would charge.

EARL DDA Modelling

- 3 As part of the development of EARL, the most recent information in relation to Edinburgh Airport has been reviewed and improved, and this has been used to develop the model to assess the EARL scheme. It will be noted that this information only became available after 2003 ETL2 modelling was undertaken. The significant changes to the EARL model were as follows:
 - base year matrices were updated with recent airport survey data;
 - the latest airport forecasts were used, which predict a much higher growth rate to 2026 than was used for ETL2 STAG;
 - The Land Use Transport Interaction (LUTI) and Detailed Assignment Model (DAM) were used to produce for a more detailed Edinburgh Airport Surface Access Model (EASAM) model, specifically designed to model airport access;
 - The models incorporated the latest definition of the EARL scheme; and
 - EARL fare was set at £7.50 return to the City Centre.
- 4 The EASAM model introduces several sophistications to airport surface access modelling, including disaggregation of the demand to business and tourists, visitors and locals, and airport employees.
- 5 Another key improvement is that it takes account of airport car park charges and car park capacity limits. Car park capacity may become an issue in the future (ten plus years time). The consequence of this is to encourage a significant shift from car use to public transport use, which is one of the City’s objectives. It is also being promoted by BAA as part of their surface access strategy. All airport public transport modes, including EARL and tram benefit from this shift.

RESTRICTED – ADVICE TO MINISTERS

Revisions to ETL2 STAG Forecasts

- 6 It is considered highly desirable that the improvements in the EARL model are incorporated into ETL2 forecasts. It is recognised that the EARL forecasts are more based on more recent data, and are thus likely to be more reliable.
- 7 The EARL team have provided their demand forecasts and cost benefit forecasts for trips across all available modes to and from the airport.
- 8 These have been used to replace ETL2 demand forecasts, and as a result, it has been possible to produce revised ETL2 STAG results which incorporate the best elements of the two models and the latest definition of the EARL scheme. The ETL2 STAG report did not give breakdown of Present Value Benefits and Cost to Government of the ETL2 with the EARL scheme present.
- 9 This has been addressed and the Transport Economic Efficiency (TEE) tables for ETL2, with and without EARL, which highlight the implications of EARL on ETL2 are reported in subsequent sections of this note.

Revised ETL2 Patronage & Revenue Forecasts

- 10 Table 1 shows the original ETL2 STAG forecast for patronage and revenue and compares it with the revised ETL2 forecast. Note that neither scenario includes EARL. To give a perspective on the airport in relation ETL2 operations, the results have been presented for the whole route, as well as for those tram trips to/from the airport only.
- 11 The greatest changes are in 2026, when higher airport growth factors have the greatest effect and car parking charges and capacity issues are at their greatest. The increase in airport trips by tram increases the overall revenue of ETL2 by around 70% in 2026.

Table 1: ETL2 Patronage and Revenue Forecasts (No EARL present)

| | | ETL2 STAG 2003 | | Updated with EARL airport model | |
|------|-----------|----------------|--------------|---------------------------------|--------------|
| | | ETL2 | Airport only | ETL2 | Airport only |
| 2011 | Patronage | 5,377,497 | 1,582,084 | 5,474,672 | 1,679,259 |
| | Revenue | £6,691,278 | £3,416,483 | £6,901,125 | £3,626,330 |
| 2026 | Patronage | 6,937,279 | 1,644,273 | 9,223,789 | 4,336,255 |
| | Revenue | £8,314,918 | £3,555,101 | £13,810,227 | £9,376,413 |

Notes. (£m at 2003 prices).

- 12 The increase in airport passengers may put a strain on the capacity of ETL2 in the longer term. For the purposes of this analysis, and to ensure that the tram patronage estimates are conservative, tram passengers have been constrained to available capacity, (ie. it has been assumed that no additional trams or services are provided). It has also been assumed that no tram passengers retime their journey to less congested periods. It is recognised that, in advance of making any future investment to deal with capacity constraints, any increases in capital and operating costs would need to be considered against potential improved revenues arising from higher patronage estimates.

RESTRICTED – ADVICE TO MINISTERS

- 13 Capacity is not an issue in 2011 nor is it an issue when ETL2 is operating in the presence of EARL.
- 14 Table 2 shows the original ETL2 STAG forecast and compares it with the revised ETL2 forecast, assuming EARL is built. The sensitivity tests undertaken as part of the ETL2 STAG assumed that the return EARL fare between the airport and Edinburgh City Centre was £10. The improved modelling is showing that there is a significantly higher demand for ETL2 than was predicted in the STAG testing. Note that the work undertaken as part of the EARL modelling assumes a return fare between the airport and the City Centre of £7.50.

Table 2: ETL2 Patronage and Revenue Forecasts (With EARL Present)

| | | ETL2 STAG 2003 (EARL fare=£10) | | Updated with EARL airport model (EARL fare=£7.50) | |
|------|-----------|-----------------------------------|-----------------|---|-----------------|
| | | Total system | Airport only | Total system | Airport only |
| 2011 | Patronage | * | * | 4,843,609 | 1,048,196 |
| | Revenue | £ 5,011,768 | £1,736,972 | £5,538,356 | £2,263,561 |
| 2026 | Patronage | * | * | 7,515,713 | 2,222,707 |
| | Revenue | £ 7,117,570 | £2,357,753 | £9,565,556 | £4,805,739 |

(*) Note that patronage with EARL present was not assessed as part of the STAG sensitivity test.

- 15 Comparing Tables shows that 1 and 2 when EARL is operational the tram will lose market share to the train. It will be noted however that despite this transfer of trips from tram to rail, the results indicate that slightly higher patronage than previously forecast (2003 STAG without EARL case in 2026). This is due to this increased demand which includes the desire for trips between areas not served directly by EARL.
- 16 The net effect of this new modelling work indicates improved patronage and revenues on the tram (with or without EARL) over previous forecasts.
- 17 This increased demand has improved the economics of the scheme. The total benefits have increased as more passengers benefit from tram. The cost to the Government decreases, because the increased revenue helps to off set the capital costs of the scheme. Both these changes lead to increasing the Benefit to Cost Ratio.

Net Present Value

- 18 Table 3 summarises the Net Present Value (NPV) of the ETL2 revenue.

RESTRICTED – ADVICE TO MINISTERS

Table 3 Comparison of 30 Year ETL2 NPV Revenue (See Table A in the Executive Summary)

| Values in £,000 | ETL2 only | | EARL present |
|--------------------------|-----------|-------------------------|--------------|
| | STAG 2003 | Revised with EARL model | |
| 30 year NPV ETL2 Revenue | £89,539 | £127,150 | £91,952 |

19 Table 4 summarises PVB, Costs, NPV and BCR for these three tests.

Table 4 Comparison of STAG results with revised values

| Values in £,000 in 2003 prices | ETL2 only | | EARL present |
|---|-----------|-------------------------|--------------|
| | STAG 2003 | Revised with EARL model | |
| Present Value of Transport Benefits PVB | 287800 | 354519 | 352190 |
| PV of Cost to Government PVC | -206151 | -189649 | -230861 |
| Net Present Value NPV | 81649 | 164870 | 122049 |
| Benefit Cost Ratio to Government BCR | 1.40 | 1.87 | 1.53 |

20 For further information, Appendix A contains updated versions of the STAG tables with and without EARL

Airport interchange trips

21 This analysis ignores the potential for interchange trips at the airport, between rail and tram, which would boost demand for both systems by providing inter-urban links via rail with local Edinburgh access via ETL2. The attractiveness of interchanges will very much depend on fare schemes. If premium fares are charged for both tram and Rail, for movements through the airport, this will deter much of the demand. As part of the overall strategy for ticketing tie sees the inclusion of multi modal through ticketing as a key element of adding to the flexibility and usability of the public transport systems. tie is currently administrating ‘one ticket’ which is a multi modal through ticket. It is envisaged that this or a similar ticketing system will be developed in line with industry best practice and will be include Transport Edinburgh Limited as an operator. There may be a desire to charge some level of fare premium to airport interchanges to increase revenue, or to control unnecessary interchanges when alternatives such as Edinburgh Park exist.

22 The models currently available, do not handle though fares and therefore it is difficult to quantify the revenue and economic benefits of airport interchanges. By effectively banning all airport interchanges from the modelling, the financial and economic assessments are conservative.

RESTRICTED – ADVICE TO MINISTERS

Conclusion

- 23 Using updated airport forecasts and taking into account the impact of airport car park charging and availability of car park spaces in future years, leads to a much higher usage of tram than the original STAG work predicted. This increases tram patronage, revenue and economic benefits.
- 24 When EARL is operating, a significant number of tram passengers shift to EARL, particularly those travelling between the Airport and the City Centre movement. However, there remain a large number of airport passengers who continue to use tram to access the airport from addresses between The Gyle and Murrayfield. While the revenue and economic benefits are reduced in the presence of EARL, they are both significantly higher than the tram only scenario presented in the more conservative STAG estimates.

RESTRICTED – ADVICE TO MINISTERS

Appendix A

Table 1 shows the STAG: TEE Table and Safety; Costs to the Public Sector; and NPV and Benefit Cost ratio to the Public Sector. These are the tables shown in the STAG Report. They assume that EARL is not built.

Table 1: STAG ETL2 TEE Table (No EARL)

| Values in £,000 | STAG | TOTAL | Cars | Freight | PT |
|--|------------|-------------------|--------------|-------------|---------------|
| Safety | | | | | |
| Accident savings | PV1 | -2906 | -2906 | | |
| User benefits - consumers | | | | | |
| Travel Time | | 205502 | 50203 | | 155299 |
| User charges | | -25898.798 | -4 | | -25895 |
| VOC | | -15946 | -15946 | | 0 |
| net consumer benefits | | 163657.202 | 34253 | | 129404 |
| User benefits - business | | | | | |
| Travel Time | | 37015 | 18455 | 6263 | 12297 |
| User charges | | -836 | 0 | 0 | -836 |
| VOC | | 1737 | 473 | 1264 | 0 |
| net business benefits | | 37916 | 18928 | 7527 | 11461 |
| User benefits - TOTAL | | | | | |
| Travel Time | PV2 | 242517 | 68658 | 6263 | 167596 |
| User charges | PV3 | -26735 | -4 | 0 | -26731 |
| VOC | PV4 | -14209 | -15473 | 1264 | 0 |
| net user benefits | | 201573 | 53181 | 7527 | 140865 |
| Private Sector Provider Impacts | | | | | |
| Investment costs | PV5 | 0 | | | |
| Operating costs | PV6 | 0 | | | |
| Tram revenue | | 0 | | | |
| Bus/rail revenue | | 86528 | | | 86528 |
| Forth Bridge revenue | | -485 | -485 | | |
| City centre parking | | 3088 | 3088 | | |
| Net revenue | PV7 | 89130 | 2603 | | 86528 |
| Grant/subsidy | PV8 | 0 | | | |
| net private sector impacts | | 89130 | 2603 | | 86528 |
| Present Value of Benefits | PVB | 287798 | | | |

| Values in £,000 | STAG | TOTAL | Highway | PT |
|---|------------|----------------|---------|---------|
| Cost to government | | | | |
| Public sector investment costs | PV9 | -204954 | | -204954 |
| Public sector operating & maintenance costs | PV10 | -97219 | | -97219 |
| Grant/subsidy | | | | |
| Gifted public land | | -3273 | | -3273 |
| Net grant/subsidy | PV11 | -3273 | | -3273 |
| Revenues | PV12 | 109459 | 19920 | 89539 |
| Taxation impacts | PV13 | -10164 | 11921 | -22085 |
| Total PVC to Government | PVC | -206151 | | |

| Values in £,000 | STAG | Derivation | Value |
|-------------------------------------|------|---------------|---------|
| Present Value of Transport Benefits | PVB | sum(PV1:PV8) | 287798 |
| PV of Cost to Government | PVC | sum(PV9:PV13) | -206151 |
| Net Present Value | NPV | PVB+PVC | 81647 |
| Benefit Cost Ratio to Government | BCR | PVB/(-PVC) | 1.40 |

RESTRICTED – ADVICE TO MINISTERS

Table 2 shows the: TEE Table and Safety; Costs to the Public Sector; and NPV and Benefit Cost ratio to the Public Sector. These have been updated with the EARL model. It assumes that EARL is not built.

Table 2: Updated ETL2 TEE Table (No EARL)

| Values in £,000 | STAG | TOTAL | Cars | Freight | PT |
|--|------------|---------------|--------------|-------------|---------------|
| Safety | | | | | |
| Accident savings | PV1 | -2906 | -2906 | | |
| User benefits - consumers | | | | | |
| Travel Time | | 255074 | 57922 | | 197152 |
| User charges | | -27574 | -3 | | -27571 |
| VOC | | -4041 | -4041 | | 0 |
| net consumer benefits | | 223459 | 53878 | | 169581 |
| User benefits - business | | | | | |
| Travel Time | | 44581 | 22724 | 6245 | 15612 |
| User charges | | -890 | 0 | 0 | -890 |
| VOC | | 1941 | 678 | 1263 | 0 |
| net business benefits | | 45632 | 23402 | 7508 | 14722 |
| User benefits - TOTAL | | | | | |
| Travel Time | PV2 | 299655 | 80646 | 6245 | 212764 |
| User charges | PV3 | -28464 | -3 | 0 | -28461 |
| VOC | PV4 | -2100 | -3363 | 1263 | 0 |
| net user benefits | | 269091 | 77280 | 7508 | 184303 |
| Private Sector Provider Impacts | | | | | |
| Investment costs | PV5 | | | | |
| Operating costs | PV6 | | | | |
| Tram revenue | | | | | |
| Bus/rail revenue | | 84920 | | | 84920 |
| Forth Bridge revenue | | -1644 | -1644 | | |
| City centre parking | | 3088 | 3088 | | |
| Net revenue | PV7 | 86364 | 1444 | | 86890 |
| Grant/subsidy | PV8 | 0 | | | |
| net private sector impacts | | 86364 | 1444 | | 86890 |
| Present Value of Benefits | PVB | 352549 | | | |

| Values in £,000 | STAG | TOTAL | Highway | PT |
|---|------------|----------------|---------|---------|
| Cost to government | | | | |
| Public sector investment costs | PV9 | -204954 | | -204954 |
| Public sector operating & maintenance costs | PV10 | -97219 | | -97219 |
| Grant/subsidy | | | | |
| Gifted public land | | -3273 | | -3273 |
| Net grant/subsidy | PV11 | -3273 | | -3273 |
| Revenues | PV12 | 147070 | 19920 | 127150 |
| Taxation impacts | PV13 | -31273 | 5098 | -36371 |
| Total PVC to Government | PVC | -189649 | | |

| Values in £,000 | STAG | Derivation | Value |
|-------------------------------------|------|---------------|---------|
| Present Value of Transport Benefits | PVB | sum(PV1:PV8) | 354519 |
| PV of Cost to Government | PVC | sum(PV9:PV13) | -189649 |
| Net Present Value | NPV | PVB+PVC | 164870 |
| Benefit Cost Ratio to Government | BCR | PVB/(-PVC) | 1.87 |

RESTRICTED – ADVICE TO MINISTERS

Table 3 shows the: TEE Table and Safety; Costs to the Public Sector; and NPV and Benefit Cost ratio to the Public Sector. These have been updated with the EARL model. They assume that EARL is built.

Table 3: Updated ETL2 TEE Table (Includes EARL)

| Values in £,000 | STAG | TOTAL | Cars | Freight | PT |
|--|------------|---------------|--------------|-------------|---------------|
| Safety | | | | | |
| Accident savings | PV1 | -2906 | -2906 | | |
| User benefits - consumers | | | | | |
| Travel Time | | 223879 | 57694 | | 166185 |
| User charges | | -15717 | -3 | | -15714 |
| VOC | | 5612 | 5612 | | 0 |
| net consumer benefits | | 213774 | 63303 | | 150471 |
| User benefits - business | | | | | |
| Travel Time | | 42022 | 22617 | 6245 | 13160 |
| User charges | | -508 | 0 | 0 | -508 |
| VOC | | 1938 | 675 | 1263 | 0 |
| net business benefits | | 43452 | 23292 | 7508 | 12652 |
| User benefits - TOTAL | | | | | |
| Travel Time | PV2 | 265901 | 80311 | 6245 | 179345 |
| User charges | PV3 | -16225 | -3 | 0 | -16222 |
| VOC | PV4 | 7550 | 6287 | 1263 | 0 |
| net user benefits | | 257226 | 86595 | 7508 | 163123 |
| Private Sector Provider Impacts | | | | | |
| Investment costs | PV5 | 0 | | | |
| Operating costs | PV6 | 0 | | | |
| Tram revenue | | 0 | | | |
| Bus/rail revenue | | 98058 | | | 98058 |
| Forth Bridge revenue | | -2556 | -2556 | | |
| City centre parking | | 3088 | 3088 | | |
| Net revenue | PV7 | 98590 | 532 | | 98058 |
| Grant/subsidy | PV8 | 0 | | | |
| net private sector impacts | | 98590 | 532 | | 98058 |
| Present Value of Benefits | PVB | 352910 | | | |

| Values in £,000 | STAG | TOTAL | Highway | PT |
|---|------------|----------------|---------|---------|
| Cost to government | | | | |
| Public sector investment costs | PV9 | -204954 | | -204954 |
| Public sector operating & maintenance costs | PV10 | -97219 | | -97219 |
| Grant/subsidy | | | | |
| Gifted public land | | -3273 | | -3273 |
| Net grant/subsidy | PV11 | -3273 | | -3273 |
| Revenues | PV12 | 111872 | 19920 | 91952 |
| Taxation impacts | PV13 | -37287 | -5294 | -31993 |
| Total PVC to Government | PVC | -230861 | | |

| Values in £,000 | STAG | Derivation | Value |
|-------------------------------------|------|---------------|---------|
| Present Value of Transport Benefits | PVB | sum(PV1:PV8) | 352910 |
| PV of Cost to Government | PVC | sum(PV9:PV13) | -230861 |
| Net Present Value | NPV | PVB+PVC | 122049 |
| Benefit Cost Ratio to Government | BCR | PVB/(-PVC) | 1.53 |