



Project Definition Statement and Strategic Design Principles

Project – Edinburgh Tram (Phase One)

Approved by TEL Board 15 May 2006

Project Summary

Project Name:	Edinburgh Tram (Phase One)	Client:	City of Edinburgh Council
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Project Purpose

Project Stage 1 – Output Definition

Substantial road traffic growth across the Edinburgh area combined with forecast population and employment increases will lead to significant growth in road congestion. To support the local economy, City Of Edinburgh Council identified trams as the preferred way to provide a comprehensive, higher quality public transport network to support the local economy and help to create sustainable development. [1]

The Promoter's Memoranda submitted with the Bills states:- the broad policy objective of the Bill is to help to create the transport infrastructure necessary to promote and support a growing local economy and create a healthy, safe and sustainable environment. Sustainable economic growth can only take place with a step change in public transport. Road space must be created (by modal shift away from cars) to enable economic growth to take place without aggravating congestion. A tram system will enable new development and continued growth of existing development in a sustainable way. Without it, growing traffic congestion and lack of access to development sites will curb future growth and threaten the economic prosperity of the city. [2]

Project Stage 2 - Feasibility

Recommended that a north Edinburgh tram loop (Tram Line 1) be accorded the highest priority, and that there is a strong case for considering a West Edinburgh line (Tram Line 2) next, and thereafter, a line to the south east of the city (Tram Line 3). [3] & [4]

Project Stage 3 – Option Selection

Edinburgh Tram Line 1 and 2 having been assessed using the Scottish Transport Appraisal Guidelines (September 2003), are considered to be viable schemes, and should be considered by the Scottish Parliament. [5]

Project Stage 4 – Single Option Development

Due to a funding constraint, the construction of the tram network (a combination of Tram Line 1 & 2, as defined in the Parliamentary Bills) is to be phased.

Subsequently, the network has been divided into four sections. These are:

- Sector 1a: Leith (Newhaven tram stop) to Edinburgh Airport tram stop, via St. Andrew Square.
- Sector 1b: Balbirnie Junction (adjoining Sector 1a) to the Granton Square tram stop.
- Sector 2: Granton Square tram stop to Newhaven tram stop, via the waterfront (thus closing the tram line 1 loop).
- Sector 3: Ingliston Junction (adjoining Sector 1a) to the layover to the west of Newbridge North tram stop.

Sectors 1a and 1b are to be constructed, however Sector 1b may be truncated back from the Granton Square tram stop depending on funding and operational considerations, which will be determined at 'financial close'.

References:

1. *City Of Edinburgh Council Local Transport Strategy, adopted in 2000.*
2. *The Promoter's Memoranda, submitted with the Parliamentary Bills.*
3. *Edinburgh Light Rail Transit (LRT) Masterplan Feasibility Study (January 2003).*
4. *Feasibility Study for a North Edinburgh Rapid Transit Solution, 2001/2, Work Package One*
5. *Tram Line 1 & 2 STAG & Parliamentary Bills (December 2003).*

Objectives	Provide an operational tram service within the geographical boundaries approved by the Scottish Parliament.
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Critical Success Factors	<ul style="list-style-type: none">• The tram project has a viable business case.• The system will encourage the use of public transport, and provide good integration between transport modes (specifically tram /bus).• Definition and justification for the most financially viable, technically robust / practical elements that can be constructed within the agreed available budget as 'Phase 1' of the network. This may prove to be Sector 1a plus all of, or part thereof, of Sector 1b (as defined in the 'Project Purpose' of this document).• Phase 1 in operation by July 2010, within the assigned budget at Financial Close.
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Benefits	<ul style="list-style-type: none">• To improve air quality, reduce accidents, improve social inclusion.• To allow for sustainable development, without increasing congestion, and allow development areas of the city to be reached.• Assist with the provision of public transport alternatives for access to key destinations in the city, for example the city centre, public transport hubs, Ocean Terminal, the Waterfront, the airport, Edinburgh Park, the Gyle.• Allow the 'City' to retain existing businesses and investors in the city and attract new businesses and investors to the Edinburgh area.• Achievement of passenger carrying and fare revenue targets (established at 'financial close' to meet operating and lifecycle costs).• To be a catalyst for stimulation of economic growth along the tram route corridors and into surrounding areas.
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High Level Physical Project Assets	<ul style="list-style-type: none">• Parliamentary powers that will permit the construction of TL 1 & 2.• The physical construction elements of the first phase of the tram network.• Appropriate tram vehicle infrastructure.• Integration of tram service provision and with other public transport provision in the city.• Introduction of integrated ticketing that is usable on all modes and interoperable between operators in Edinburgh and the surrounding area.
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Other Outputs	<ul style="list-style-type: none">• HMRI Safety Approval• Planning Consents• Operating agreement• Bus / Tram Service Integration agreement• Traffic Regulation Orders
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Key Roles	<p>Scottish Executive (Principal Funder) Provides funding, ensures project Stage Gates are applied, and realises project benefits at a national level.</p> <p>City Of Edinburgh Council (Client) Provides key stakeholder support, and realises benefits of the projects at a national scale.</p> <p>City Of Edinburgh (Sponsor / Promoter) Ensures benefits are delivered, owns the Business Case, accountable for the project, mobilises management capability, and generates confidence</p> <p>Transport Edinburgh Limited Tie Limited (Project Delivery) Manages the project, by defining the scope and budget; Assigns resources, plan activities, prepare cost estimate and budget); monitor and control project performance; deliver the impact / products / changes to ensure that the benefits are delivered.</p> <p>Transdev (System Operator)</p>
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Key Assumptions	<ul style="list-style-type: none"> • Royal Assent is granted for TL 1 & 2 by 31 March 2006, without restrictive conditions. • Project funding is released to the project for defined contract awards. • Project budget is £535M. [City Of Edinburgh Council, 26 January 2006]. This is predicated on the award of contracts, and construction commencing, as per the dates defined in the baseline master programme. • Continued (political) support and willingness from the client and sponsor to the project. • The assessment at financial close as to what denotes Phase 1, or if the project commences, will be based on the viability stated in the 'Tram Final Business Case', which will include a Benefit Cost Ratio (BCR) analysis. The measure of viability is that the integrated TEL system should be capable of producing a financial result for CEC no worse than the current level of annual dividend from Lothian Buses of c£2M. • The introduction of a viable tram system in Edinburgh will require: <ul style="list-style-type: none"> • a yet to be defined level of traffic signal priority for trams, • modification of existing bus services • Project construction activities are restricted to be within the limits of deviation, as defined in the Tram Line 1 & 2 Parliamentary Bills. • The extent of the streetscape design is not out with the tram 'Zone of Influence', which is defined in the attached document, 'Corridor For design'. • The on-street section of the route will be constructed utilising large geographical (short duration) closures. • Construction (InfraCo and MUDFA) will have up to three consecutive worksites operational in the city at any one time. • Temporary Traffic Management solutions will only deploy modelling solutions to demonstrate the subsequent impacts, if agreed to be necessary. • Network Rail possessions can be secured, and protected, to enable construction of the tram infrastructure adjacent to, and over / under, the railway. • The consents and approvals process is agreed and fixed, and is efficient, thorough, and accountable. • All necessary CEC approvals, committees, and timescales are fixed, as defined in the baseline project master programme.
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	<ul style="list-style-type: none"> • Adequate resources are applied by CEC to expedite land & property purchases, and all necessary consents and approvals, within the milestones defined in the project baseline master programme. • The use of Gogar Depot is unchallenged as a network depot. • The Traffic Regulation Order statutory hearings process is not inappropriately delayed by external influences
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Key Constraints	<ul style="list-style-type: none"> • Project streetscape design is governed by the Tram Design Manual. • Construction work is not allowed in the City Centre (to be adequately defined) on the eight calendar weeks which precede Christmas. • Minimise (but NOT eliminate) the temporary traffic management impacts on the city. • Agreed conditions imposed by Parliament (awaiting) • Code Of Construction Practise. • Noise & Vibration Policy • Roseburn Landscape Habitat & Mgt Plan
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Stage Gate Review Applicability	Stage	Applies?
	1 – Output Definition	No – Stage now complete. Ref. (CEC Local Transport Strategy)
	2 – Feasibility	No – Stage now complete. Ref. (Edinburgh LRT Masterplan Feasibility Study & Feasibility Study for a North Edinburgh Rapid Transit Solution, 2001/2, Work Package One)
	3 – Option Selection	No – Stage now complete. Ref. Tram Line 1 & 2 STAG and Parliamentary Bills.
	4 – Single Option Development	Yes – Tram Business Plan, April 2007.
	5 – Financial Close	Yes <ul style="list-style-type: none"> 1. “Tram Final Business Case”, inclusive of BCR analysis for Tram Phase 1, and capital cost of project. 2. TEL Business Plan.
	6 – Construction, Testing & Commissioning	Yes - TBC
	7 – Scheme Handback	Yes - TBC
	8 – Project Close Out	Yes - TBC

Strategic Design Principles

Network build scope

The complete initial network comprising lines one and two has formed the basis for all work done so far. Changes to this will have an impact on the business case, and will also place an increased emphasis on the integrated ticketing system.

The currently proposed phasing of implementation is:

Phase 1a	Airport to Newhaven
Phase 1b	Haymarket to Granton Square
Phase 2	Waterfront section
Phase 3	Ingliston to Newbridge

Approvals: SDS to focus on 1a & 1b agreed by TPB

Run time

It is pivotal that the run times for the tram services are kept or improved from the initial figures arrived at by the advisors for the parliamentary works:

- Line one has a journey time (including layover), for a complete loop, of 45min in each direction.
- Line two has a journey time of 35min (including layover) in each direction between the Airport and St Andrew Square.

Any time saving shown by the modelling process on these maximum figures is then available for revision of items such as junction priority.

Frequency of service

The design basis for the service frequency allows eight trams per hour in each direction for each of two services, giving a frequency of 16 trams per hour on the common section.

Together with the run time, the frequency of service creates the foundation for the business case. The current business case uses 6 trams per hour in the peak in each direction on line two and eight on line one. A range of sensitivity studies are being undertaken by JRC in support of a final business case decision.

The frequency has a direct impact on the revenue generated. It will also have a direct impact on the aspiration to attract car drivers.

Segregated running

The general design principle is to provide the optimum segregation for the tram way. The principal areas where there is a choice to be made are in Princes Street and on Leith Walk. Segregation, in the sense of preventing the sharing of roadspace with general traffic and buses, gives significant operating benefits including consistency of run time and reduced interaction with other road traffic.

*Approvals: Princes Street and Leith Walk agreed by TPB
CR0018 & CR0019*

Tram capacity

The trams must be able to carry 200 passengers with a standing density of no more than 4/m² and two wheelchair spaces occupied. This forms the basis of the business case.

The system design is to allow trams of nominally 40m length to be accommodated on the network, but the above capacity requirement does not need a 40m nominal tram. The ability to increase the capacity of trams by increasing the length at a later date is to be assessed in the tram procurement process.

In relation to the business case, the work done so far shows net benefits from shorter trams operated at a higher frequency.

*Approvals: Tram length approach agreed by TPB
CR0050*

Low floor trams

The principal of retaining the options of either 70% or 100% low floor tram designs is being pursued in the procurement process to maximise competition. In all cases, level access is available at all doorways.

*Approvals: 70/100% low-floor agreed by TPB and CEC
CR0010*

Tram infrastructure within the LoD

The design will be developed within the parliamentary Limits of Deviation (LoD). Within the LoD, the alignment will be developed using the STAG centre line as the starting point. Only in the event of an exceptional tram design constraint emerging, the design will be completed out width the LoD with associated agreements pursued.

The zone of influence for Tram Project infrastructure design

The area of the works required to implement the Tram Project will be minimised. The design will aim where possible to be compatible with the developing public realm aspirations of CEC.

Design compliance with the Tram Design Manual

The design will comply with the Tram Design Manual. The design will also aim to comply with the CEC Standards for Streets, once this has been finalised.

Tram stop location

The tramstops will be placed essentially as shown on the STAG drawings. It is however recognised that in certain locations (for instance St Andrew Square), locations have already been changed, or that further development is required. The business case includes the requirement for high-quality interchanges with bus at St Andrew Sq and Foot of the Walk. These are to be developed.

Integration with other developments

The design and construction will seek to interface with major developments along the routes, to avoid unnecessary rework or disruption. These will include:

- EARL, at the depot site, Edinburgh Park, and Airport
- Capital Streets programme, notably St Andrews Square
- Developments along the waterfront
- Haymarket interchange

Cycle provision

Cycle provision will be enhanced compared with the current bus network by the addition of cycle parking at appropriate tramstops. However, no cycles will be carried on the trams.

Approvals: Not confirmed
CR0009

Design to minimise construction disruption

The design will aim to minimise the duration of the construction period, one particular example being the in-street trackslab.

750Vdc traction power from overhead lines

Agreement to use overhead line supply throughout has been achieved. The most appropriate equipment and type of support for each area will be selected.

Approvals: Wire free traction agreed by TPB to be inappropriate
CR0014

Revenue collection strategy

The strategy will be based on an integrated approach for tram and bus services and both modes will use common equipment where possible. The back office interface will be common and based on a proprietary system.

Management of utility works

The programme of utilities works will be managed in a single contract. The aims are to both minimise the scope of works and to minimise the timescale, and hence disruption by carrying out the works in an integrated manner. This will remove risk in advance of the infrastructure contractor commencing on site.

Approvals: MUDFA agreed by TPB
CR0041

Future-proofing of Network

Future-proofing of the design will be carried out to minimise future disruption as the Edinburgh Tram Network is extended, without building in costly works at the initial stage. The provisions will include the ability to run longer trams, the increase in service frequencies on existing routes, and the addition of the planned line three. This includes the assumption that service would run through towards Haymarket rather than north towards Leith.

There will be consequences for the alignment, tramstops, road layouts, traction power and communications networks, and the depot.

One tram network control centre and depot

There will be a single network depot and control centre.

Noise and Vibration Policy compliance

The design will target compliance of the operating system with the Noise & Vibration Policy and adopt a cost-effective approach to the limitation of legitimate Part 1 claims under the Land Compensation (Scotland) Act 1993.

*Approvals: Noise & Vibration Policy agreed by TPB
CR0015*

Approach to safety

The tramway will need to be demonstrated as being "acceptably safe" before it can enter public service. The project is pursuing this by integrating safety and engineering elements throughout its implementation, and beyond into the operations phase. This will avoid making mitigation of hazards a "bolt-on". Phased "Cases for Safety" will be produced at key points in the project. HMRI and the Roads Authority will be party to these documents.

Substation location

The locations of substations will be selected to avoid placement underground if at all possible.

Advertising at tram stops and on trams

The business case includes the revenue from advertising. The design will include appropriate provisions at tramstops and on trams.

*Approvals: Agreed by TPB
CR0066*