



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 maximum 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 starting point for alignment design will be the STAG/Parliamentary centre line. Only in the event of an exceptional tram design constraint emerging will the design be completed outwith 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
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 their 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 (Line three services are assumed to 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*

Revision	Date	Prepared By	Comment
Pre	10-Feb-06	G Hainey	First issue
Pre	10-Feb-06	G Murray	Update after meeting
Pre	10-Feb-06	D Person	Issue to TPD
1	14-Feb-06	R Jones	Update after meeting
2	15-Feb-06	D Persson	Update after comments from TPD
3	15-Feb-06	G Murray	Update with comment from IK