APPENDIX 1

TRAM DESIGN MANUAL
The Design Manual is divided into two Parts:

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GLOSSARY OF TERMS AND ACRONYMNS

CCTV – Closed Circuit Television
CEC – City of Edinburgh Council
DDA – Disability Discrimination Act

LOD – Limit of Deviation – Area within which the tram project may be constructed – as defined in the Parliamentary Plans lodged with the Tram Bills

LLAU – Limit of Land to be Acquired or Used - Area which can be used temporarily or permanently for specified purposes connected with the tram project (e.g. temporary construction compounds) but not for the tram tracks – as defined in the Parliamentary Plans lodged with the Bills.

LTS – Local Transport Strategy 2004-2007 as approved by the City Council in March 2004

NPV - Net Present Value - the value of an investment based on an analysis of all life cycle costs and revenues adjusted to reflect present day prices. A positive net present value demonstrates that the investment will be profitable and the higher the figure, the more profitable it will be.

OLE – Overhead Line Equipment i.e. wires and insulators, support poles and fixings to buildings to support wires.

S75 Agreement – A legal agreement under s75 of the Town and Country Planning (Scotland) Act 1997 between a land/property owner and the Planning Authority to restrict the use of land/property or make a contribution of some kind.

TIE – Transport Initiatives Edinburgh Limited

TSAO – Tram System Aspirational Objectives - these are the Council’s aspirations for the type of tram system that will be delivered
Part 1

Strategic Overview
SECTION 1 – INTRODUCING THE TRAM DESIGN MANUAL

INTRODUCTION

1.1 The introduction of a major infrastructure project, such as a tram system, into an established urban context of the highest quality will, by its very nature, create significant change. The new system must be designed to make a positive contribution to the city. The principal means of ensuring this is through good design—ensuring the tram fits within the context of the city, is integrated into the townscape and reflects the identity of Edinburgh. All this requires great attention to detail.

1.2 Furthermore, good design requires a holistic process that addresses the nature of the city, responding equally to the inherited townscape, accessibility for all, traffic circulation and management, operational efficiency, sound engineering and economic prosperity. A holistically designed system, where all aspects of the tram are well resolved and integrated with context will provide an elegant and accessible resource and be a catalyst to future development.

1.3 The role of the Design Manual is to set out the context and requirements and mechanisms for achieving quality design for the Edinburgh Tram Project and to play a key part in the process of procuring a high quality design product.

STATUS, SCOPE ROLE AND INTERPRETATION OF DESIGN MANUAL

Status

1.4 The Design Manual was approved as supplementary planning guidance by the Planning Committee on 1 December 2005. It has been developed and refined in consultation with key stakeholders, and was placed on public consultation from the 8th July 2005 to the 9th September 2005.

1.5 The Design Manual acts as a reference point against which all submissions to the City of Edinburgh Council as ‘Planning Authority’ will be assessed, and will be incorporated into the contracts for the design and subsequent construction of the tram system.

1.6 The Design Manual was approved by Full Council on the ???.

Scope

1.7 The Design Manual outlines the aspirations for the entire tram system and sets out the guidelines for the fixed infrastructure.

1.8 The tram system is important to act as a catalyst for promoting quality design within the public realm and its integration into the townscape and existing structure of the city is key to its success. While the tram system will only be responsible for the sections of the public realm that fall within the Tramway Path, CEC recognises that an important opportunity arises to improve the quality of streets and public spaces, within Edinburgh, to a level commensurate with the quality of the city’s built heritage. A wider Public Realm Strategy, therefore, is being undertaken to complement the tram system and must be developed along side it.

Role

1.9 The Design Manual will:
Clearly set out the quality of design required and guide the preparation of procurement specification.

Ensure an open and robust decision-making process, by providing criteria against which decisions concerning the tram system can be evaluated.

Encourage an open decision-making process, which involves key parties, to help facilitate an efficient delivery process.

Regulate the decision-making process by allowing consistent approach/response by those involved.

1.10 It has three key roles:

- To outline aspirations and set the design objectives to influence the design process in delivering the system as a whole.
- To constitute an important tool to check that the detailed design and implementation meet the standard required to deliver a quality tram system.
- To act as a form of supplementary planning guidance – the key document, to be used by the Planning Authority, in assessing design details at the prior approvals stage.

Interpretation

1.11 The Manual is a holistic document and should be read as such. However, the three key roles outlined above are broadly reflected in the document as follows:-

- **Part 1** of the document sets out the 'Strategic Overview' which provides the context, strategic aspirations and strategic principles that will influence the design process as well as outlining how the design programme will be delivered. To ensure the fit of the system with the city’s townscape and provide the link with the detailed design requirements, a series of assessments will be prepared that consider all spaces and sections of the tram route.

- **Part 2** of the document covers ‘Detailed Design Requirements’ which will form the basis of design information that will be used in assessing design, planning and procurement.

- The document as a whole will be a consideration in the determination of any prior approvals or other approvals to be obtained from the Planning Authority. It should be noted that not all of the elements of the tram infrastructure will require consent from the Planning Authority. The extent of control that the Planning Authority will have will be determined by the Tram legislation. Appendix 2 outlines what is likely to controllable by the Planning Authority (further advice on this issue is provided in the following section ‘The Role of the Council’).

1.12 The requirements of the Design Manual apply not only to applications under planning legislation but also to other consents that will be required, such as Traffic Regulation Orders, Building Warrants and Scheduled Monument Consent.

**THE ROLE OF THE COUNCIL**

1.13 The Council has two specific roles in delivering a tram system. The Council has a role as the project promoter and as the Planning Authority. It is important that these roles are specified as they relate to how the aspirations and principals of this document will be delivered.

The Council as Promoter

1.14 The Council is committed to ultimately delivering a tram system for Edinburgh. The Council is working with the Scottish Parliament. In its role as promoter the Council will have to put in place all the elements...
required to allow the tram system to be implemented. With regard to the design of the system the Council through the Tram Project Board will have to take decisions on strategic issues relating to the project. Examples of such decisions include whether the system will be wire-free or whether advertising will be allowed on the exterior of trams.

The Council as the Planning Authority

1.15 The provisions of the Tram Bills (once enacted) will give the authorised undertaker the power to construct the tram system. However, it is likely that submissions to the City of Edinburgh Council, as Planning Authority, for prior approvals under (Class 29) Part 11 of Schedule 1 to The Town and Country Planning (General Permitted Development) (Scotland) Order 1992 will be required. ‘Prior approval’ is not quite the same as planning permission. “Approval may only be refused or given conditionally if the development ought to be and could reasonably be carried out elsewhere on the land designated (i.e., within limits of deviation), or the design or external appearance of any building or bridge etc would injure the amenity of the neighbourhood and is reasonably capable of modification to avoid such injury”.

1.16 Appendix 2 sets out different elements of tram infrastructure and the consent that will most likely be required under planning legislation for these works. Appendix 3 sets out the prior approval process that will be used for processing planning applications.
SECTION 2: DELIVERY

2.1 The Edinburgh Tram Project is a major transportation project for the city but its delivery has wider implications than just impact on transport opportunities. The delivery of the tram system must be accompanied by the development of wider public realm improvements along the route.

AN INTEGRATED APPROACH TO WORKING

2.2 In the case of any major new scheme that touches on all aspects of public life in the City, good design can only be brought about by an effective working partnership. An partnership approach is required throughout the entire design process, running from conception to completion and aftercare. This is to be achieved by the creation of a Design Working Group.

2.3 The Design Working Group will include representatives from the City Development Department - both Planning & Strategy and Transport Planning Sections, Historic Scotland, tie and the Tram System Designers and may include other bodes such as the Edinburgh World Heritage and Architecture and Design Scotland. The precise working arrangements are the subject of an agreed protocol.

2.4 The Design Working Group will give advice with regard to proposed Prior Approval applications, including the supporting information that needs to be provided with these, especially design and environmental impact. It will also ensure that the detailed development of the tram system allows for the concurrent or subsequent development of a wider public realm.

2.5 In terms of developing the Tram System Design, there are some elements that will need to be dealt with on system-wide basis (e.g. overhead line equipment) and other elements which can be carried out in geographical sections.

2.6 It is envisaged that there would be an initial inception meeting at which the issues that require to be addressed are set out and the mechanism by which they are developed is agreed. Through the use of townscape assessments the Design Working Group would be able to advise the Tram System Designers of

- urban design, heritage and environmental considerations that need to be addressed in any specific section or space, or with the design of the system element concerned; and
- information (including the format of this) that needs to be provided to enable it to assess how those concerns have been addressed in the Tram System Design

2.7 Draft designs would be reviewed by the Design Working Group and further meetings with that Group or other appropriate parties would be held where necessary to review iterations of that design before the lodging of a Prior Approval application. The Design Working Group should also provide a regular update to the Council’s Streetscape Working Group to ensure fully integrated working practices.

2.8 The requirements of the Design Manual will apply equally to all parties involved in the process. This will include the Client Group, Design Team, Council Departments and Contractors.

A Commensurate Quality of Townscape and Public Realm Design

2.9 The proposed tram system is important not only as a new public transport project but also, as a strategic piece of new development, to act as an important catalyst and promote quality design within the townscape and public realm of the city.
2.10 Partnership working will be needed to ensure that an appropriate strategy for Edinburgh’s wider public realm can be put in place to complement works undertaken as part of the tram project. Fitting the tram route and its alignment into the townscape is the first stage of the design process. An understanding of the urban design issues that apply to a section of the tram route or a specific space along the route are required in order to achieve quality of design. This wider townscape assessment is essential in order for the tram to fit comfortably within a wider public realm and to realise the opportunity to improve the quality of streets and public spaces to a level commensurate with the quality of the city’s built heritage.

2.11 In order to ensure that a piecemeal approach is avoided, a joint programme of public realm works must be drawn up by the Council with input from key stakeholders, in tandem with the proposed tram implementation programme. This is essential to minimise disruption on site and to minimise abortive works.

**DESIGN WORK PROGRAMME**

2.12 The design work will be carried out under a contract, known as System Design Services (SDS). The detailed design will be carried out against a pre-determined sequence of priority. The project will be broken down into stage builds and, within these, sectors for design and construction purposes. The stage builds are large portions of each line, based on being suitable parts of the project to be independently energised and commissioned.

2.13 The sequence will be developed based on several criteria. There are some sections that are needed early in the construction programme (such as the depot) and there are sections that are anticipated to take longer in the design and consultation/approval process due to their nature (e.g. through the World Heritage Site). Further, there might be trials required of construction technique before actual construction commences. As noted above, there are also certain system wide elements that need to be designed early for application throughout. A more detailed programme will now be developed as the SDS provider has been appointed.

2.14 It is the aim to carry out as much design as possible and take the approvals process as far as possible based on the priority identified, before the infrastructure contractor is appointed. This will minimise the further design work to be carried out under the Infrastructure Contract and allow construction work to proceed as rapidly as possible. Formal approvals can only be made once Royal Assent is given to the bills in the Scottish Parliament.
SECTION 3 – STRATEGIC ASPIRATIONS

EDINBURGH’S CONTEXT

3.1 It is vital that those involved in the design and implementation of the proposed tram system understand the townscape, heritage and environmental context of the city. To be successful, the tram must be seamlessly integrated into the urban fabric. This chapter examines Edinburgh’s distinctive context.

Heritage and Townscape

3.2 Edinburgh enjoys an international reputation as one of Europe’s most attractive cities. The townscapes of the city centre has long been recognised as a work of art in its own right and one of the UK’s principal heritage assets. It is a UNESCO designated World Heritage Site, renowned for its unique architectural heritage.

3.3 The Georgian New Town "constitutes the most extensive example of a Romantic Classical city in the world. The juxtaposition of the Old and New Towns across a landscaped divide creates a capital city of world renown”.

3.4 The value of the city’s heritage is reflected in the fact that one third of the city has conservation area status. This is reinforced by the presence of numerous listed buildings, scheduled ancient monuments and designed landscapes.

3.5 The proposed tram routes pass through diverse elements of Edinburgh’s heritage and townscape, from the medieval street pattern of the Old Town, the structured urban design of the Georgian New Town, both also displayed in the townscape of Leith, the Victorian and Edwardian residential expansions which ring the city centre, and the 20th-century suburban and peripheral developments to the emerging waterfront developments at Newhaven and Granton. The proposed route also encompasses significant areas of rural landscape. This essential character is described in the Conservation Area Character Appraisals, with more specific references presented in the World Heritage Site Management Plan.

3.6 The sensitivity and quality of Edinburgh’s townscapes will therefore present challenges for tram system design.

Policy Context

3.7 These contextual factors as well as those relating to the demographic, cultural and economic context of the city are recognised in various Council policies. Of particular relevance are policies contained within the Development Plan and the Local Transport Strategy.

3.8 The current Structure Plan, for instance (Structure Plan for Edinburgh and the Lothians 2015) contains a vision for Edinburgh referring to "the attractive environment of Edinburgh and the Lothians and the landscape setting of the capital city will be retained and enhanced. The unique blend of a world class city, a growing city region and an outstanding natural and built environment will characterise Edinburgh and the Lothians in the 21st Century." The Plan is founded on strategic aims seeking
- To maintain and enhance economic competitiveness
- To promote a more inclusive society
- To protect and enhance the natural and built environment
- To integrate land use and transport
3.9 All within an overarching aim “to provide in full for the development needs of Edinburgh and the Lothians in accordance with the principle of sustainable development, whilst maintaining and enhancing the environmental heritage that underpins the area’s quality of life.”

3.10 Trams are a key component of the strategy for public transport investment in Edinburgh and this is recognised within the Structure Plan.

3.11 The other element of the Development Plan – local plans – also include numerous policies relating to protection of the environment, the need for quality design, and commitment to delivery of high quality public transport and streetscape. The route of the tram runs through various local plan areas – Central Edinburgh, East Edinburgh, West Edinburgh, North West Edinburgh and Rural West Edinburgh. The up-to-date position regarding local plans can be viewed on the Council’s web site at:

http://www.edinburgh.gov.uk/CEC/Structure/Web/Property_and_Planning/Property_and_Planning.html

3.12 On the 26th May 2005 Planning Committee approved General Planning Provisions for New Development on or Near Safeguarded Tram Routes. This is contained in Appendix 4.

3.13 In addition to the statutory development plans there is a raft of supplementary planning guidance. This ranges from citywide guidance outlined in the “Edinburgh Standards for Urban Design” and the emerging Edinburgh Standards for Streets”, geographically specific guidance – such as the Leith Docks Development Framework (approved in December 2004) to issue specific guidance contained in the Development Quality Handbook. These guidelines aim to raise the quality of design in the built environment. (see Appendix 4)

3.14 The Council is keen to ensure that the proposed tram will enhance the image of the city and demonstrate the city’s commitment to high quality modern design and engineering that emphasises creativity and innovation and avoids prescription and pastiche. The “Edinburgh Standards for Urban Design” set out the Council’s aspirations for a creative and innovative approach to new development which draws on and interprets the city’s past. The principles set out in that document are intended to:

- Maintain and improve the visual image and identity of Edinburgh as a European capital by raising awareness of the city’s structure and the importance of its key structural components
- Ensure that strong pressures for development are directed to achieve better design quality in both the assemblage of buildings and their setting. An appropriate and durable fit of new development in its setting is sought
- Ensure high quality urban design is sought for new development across the whole city
- Foster greater interest in the contribution of new development to improving the public realm and commitment to the making of places for people to appreciate and enjoy"

3.15 The Standards describe Edinburgh’s character as stemming “from the relationship between its natural and built form, the configuration of buildings and city structure, the composition of historic buildings and tenement setting and the contrast between planned and organic, enclosure and openness”.

3.16 The emerging “Edinburgh Standards for Streets” will be a key reference document with regard to ongoing tram design work. This is currently at a draft stage and subject to a city wide consultation. The final document is expected in 2006.

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3.17 The key 'principles' set out in the Edinburgh Standards for streets are:
1. Preservation of the historic fabric and grain of the City, particularly the World Heritage Site
2. Respecting and enhancing local character
3. Facilitating the process of placemaking
4. New Streets to contribute to formation of a recognisable urban grain
5. Experimentation- a willingness to see what works
6. Achieving an aesthetic quality
   - reduction of clutter
   - high quality materials
   - minimum palette of materials
   - simple, clean designs
7. Co-ordination of design and colour
8. Inclusive access for all road users
9. Maintaining and managing the existing and improved environment
10. Delivery through process and protocols

The Standards bring together the city's aspirations for the public realm of Edinburgh's Streets.

3.18 The management Plan for the World Heritage Site states, "the city must strive for the standard which reflects the Site, both in the maintenance and in the enhancement of the public realm" and seeks "to support actions and initiatives that mitigate the negative impacts of vehicular traffic".

3.19 Clear strategic objectives have also been set out in CEC's Local Transport Strategy (LTS). These are addressed in more detail in the later part of this section relating to "Tram System Aspirational Objectives". (See Appendix 1)

THE IMPORTANCE OF GOOD DESIGN

3.20 The objective is to provide a high quality tram system for Edinburgh that embraces the best practice demonstrated in other European cities, and is of a standard appropriate to the city's world-renowned status.

3.21 The use of a holistic approach to design will ensure that the proposed tram system reflects and integrates positively with the quality of Edinburgh's world-renowned townscape. Contextual analysis through townscape assessments will inform the alignment of the tram route as well as establish how stop and structure locations and their designs are defined.

3.22 It is also important to establish an ordering principle for considering the relative importance of streets and spaces throughout the tram system. A new tram system presents an opportunity for greater integration within the city, linking old and new communities, linking areas of affluence and poverty. It can help to provide access for all across the city, including visitors and tourists. It has the potential both to create a new type of urban space for Edinburgh, a type not dominated by the car, and to civilise the city.

3.23 Perceptions of Scotland are framed in large part by the capital city; in turn the key areas and features of the City Centre influence perceptions of the capital city. There is an important opportunity for Edinburgh's tram system to become not only an icon for the city, but one that is of national relevance. The design approach to be followed needs to take account of the following.

- Good enough is not enough
Design to context

Adopt an Ordering Principle

Consistent Approach

Instantly recognisable tram system

**Good Enough is Not Enough**

3.24 The tram system will be highly visible and attention to its design is essential in ensuring a visual and cultural fit into Edinburgh’s townscape. Boldness, simplicity, style and elegance are fundamental characteristics of the design philosophy but should not seek to challenge the fundamental character of the city.

3.25 Edinburgh’s World Heritage Site status dictates that a solution of the highest quality is required if the new tram system is to be successfully implemented. A quality approach to design at each stage of the design and implementation processes, including quality of decision-making, along with an appropriate timescale in which to realise such a quality approach are prerequisites of the desired solution.

3.26 Merely “good enough” is “not enough” and would neither allow the realisation of quality design that is commensurate with the world-renowned city of Edinburgh nor satisfy the council’s aspirations set out in Guidance and Policy documents.

3.27 Design and the design process is key to delivering the necessary urban design and townscape solutions required.

**Design to Context**

3.28 The proposed tram routes pass through a significant number of urban and rural areas, each with its unique and distinctive character, as explained in the previous section. The tram system should integrate with its context, or rather, contexts, as the routes proposed pass through many townscape and landscape character areas each with unique and distinctive qualities. These range from the World Heritage Site and Conservation Areas, waterfront areas (both conservation areas and major new development areas), areas of more rural character, and areas of regeneration.

**Adopt an Ordering Principle**

3.29 It is not intended that a rigidly defined hierarchy be applied to the tram routes. However it is important to establish an ordering principle for considering the relative importance of streets and spaces along the route. Through systematic reasoning the most important streets and spaces can be identified for higher levels of investment.

**Consistent Design Approach**

3.30 Despite the need to take account of context, a consistency of approach is also required in relation to design details throughout the tram’s entire route. This will reinforce the principle of being recognisable where this is considered appropriate.

**An Instantly Recognisable Tram System**

3.31 The visual perception of the tram is extremely important and all aspects of the tram system, from engineering infrastructure to associated literature, must reflect this. The entire tram system requires a recognisable and cohesive identity.
STRATEGIC PRINCIPLES

3.32 The Council aspires to provide Edinburgh with a modern and efficient tram system, which forms the backbone of an integrated public transport system that is accessible to all and which will become a first choice mode of travel. The following strategic principles will apply to the tram system.

3.33 Achieving an appropriate design solution that respects the integrity of Edinburgh’s townscape is of critical importance. In order to set the appropriate standards of quality, the Design Manual sets the benchmarks for the minimum quality of design that will be acceptable in Edinburgh. Furthermore, Edinburgh’s World Heritage status presents a very specific set of challenges that must be addressed if the tram project is to be successfully delivered.

3.34 The following Strategic Principles will apply to the tram system:

1. Only a high quality tram system, in keeping with Edinburgh’s outstanding cultural status and environment, shall be developed. The tram should become a symbol of the City’s aspirations for its future image.

2. The tram system must provide rapid, reliable journeys and be attractive to passengers. The success of the system will depend on the number of people who use it.

3. The public realm along the tram corridor should be considered and, where desirable and feasible, upgraded as a whole, wall to wall, and designed to be appropriate to its context, recognising the tram acting as a catalyst for additional investment.

4. The tram system should be designed to facilitate access by all groups living, working and visiting the City.

5. The tram system should be designed to meet the Council’s sustainability objectives, providing this does not impact on the quality of the system.

6. The aspiration is for an overhead wire-free tram system, in whole or in part. However, if this aspiration is demonstrated to be impracticable, an alternative sensitive design, based on overhead wires, shall be pursued.

7. The infrastructure associated with the tram and all other street furniture should be co-ordinated to minimise the impact of clutter on the street scene.

8. Tram stop locations and their design should serve travellers effectively, should complement established urban form, have cognisance of the setting of listed buildings and should act as a catalyst to regenerate areas.

9. The tram system should be designed to maximise integration opportunities with other forms of public transport, in order to facilitate ease of modal interchange.

2.35 These Strategic Principles, other Council strategies and planning guidance will apply to the tram system. The final design proposals will be evaluated against the requirements of this document. In particular, the Council’s current Local Transport Strategy 2004-2007 (LTS), dated March 2004, contains objectives that will be used as the overall transportation objectives for developing the tram proposals. The current aims of the
Local Transport Strategy that are considered particularly relevant to the tram system are:

- To reduce the environmental impacts of all travel
- To support the local economy
- To improve safety for all road and transport users
- To promote better health and fitness
- To reduce social exclusion
- To maximise the role of streets as the focal point of local communities, where people can meet, shop, and, in appropriate circumstances, children can play.

2.36 These aims lead to the following objectives in the LTS:

- To make it easier to live without the car, or use the car less
- To reduce the amount of car use
- To encourage and facilitate walking cycling and public transport use
- To reduce the adverse effects of travel including road accidents, environmental damage, particularly for those worst affected by these impacts
- To enhance streets as civic spaces where priority is given to people rather than cars
- To improve the ability of people with low incomes or mobility impairments to use the transport system, especially by public transport, as pedestrians or by bicycle

2.37 More detailed “Tram System Aspirational Objectives” (TSAOs) are also considered necessary and these follow in the next section.
4. STRATEGIC DESIGN PRINCIPLES

4(a) Tram System

4.1 This section of the Manual sets out the Strategic Design principles relating to the identity of the tram system. These principles are to be used in guiding design work and as planning objectives against which future detailed planning submissions will be assessed.

4.2 In order to deliver the townscape fit and public realm aspirations for the tram it is essential that the routes and spaces that the tram runs through are analysed in sufficient detail. A series of townscape assessments prepared and considered by the Design Working Group using the Design Manual will inform the design process. Draft design principles have already been established for Princes Street and Haymarket. These principles, shown in Appendix 5 will be reviewed in the context of these townscape assessments and agree the objectives with the Design Working Group.

4.3 A range of system components, outlined through this chapter, will all have to be integrated into the existing townscape structure. A key aspiration of the Edinburgh Standards for Streets is to ensure that the choice of materials and new street features enables Edinburgh to maintain the streets as they were designed to be, avoiding their erosion over time and ensure that new street developments form a coherent extension to existing streets.

TRAMS

4.4 The choice of tram vehicle should be capable of use in Edinburgh’s unique environment.

Key issues

4.5 There will be a balance to be struck between choosing a tram vehicle which realises the aspiration of a tram identity that is unique to Edinburgh, and conveys the image sought by Scotland’s capital city, but also takes account of value for money and the lower acquisition and maintenance costs of standard vehicle designs.

Principles of Design

4.6 The key design principles for the Tram Vehicle are set out below, but principles set out in the “Graphics” section and in the section “Access for All” are also relevant and should be referred to.

- The Tram vehicles should be timeless, distinctive and elegant in appearance – they should have a strong and instantly recognisable identity
- The Tram system should be safe and convenient to use for both passengers and staff
- The Tram system should be designed to facilitate access for all
- The choice of tram vehicles should also have regard to sustainability criteria, running costs and ease of maintenance
- Tram should have the capability of operating comfortably in Edinburgh Streets

TRAM STOPS

4.7 The exact locations of the tram stops have not yet been finalised. Tram stops will be
the focal points of the system and their location and design will greatly affect how the whole system is perceived.

Key Issues

4.8 For technical and operational reasons, a number of elements need to be incorporated at tram stops: these will include platforms, shelters, street furniture, signs, ticket machines, lighting, CCTV and equipment cabinets. Not every tram stop will have the same requirements.

4.9 Design solutions for tram stops should be innovative and functional. As focal points of the system, their quality of design and finishes will greatly affect how the whole system is perceived. Attention to detail is particularly important. Given the number of different elements, detailed layout and design need to be carefully considered.

4.10 The key issues in delivering quality design in relation to the tram stops are:-

- Integrating stops with their context, as appropriate to on-street and off-street situations
- Providing a secure and comfortable space for users
- Ensuring a consistent suite of details

Principles of Design

4.11 When introducing a tram stop and its associated elements into an existing space, it will be vital to take cognisance of the overall form and coherence of the place affected. The key principles are

- To protect the integrity of important spaces and of important axial views
- To design tram stops to fit within the context and function of a space, being visible but avoiding visual intrusion
- Tram stop elements should complement the alignment along the street
- Unnecessary clutter should be avoided by providing only those facilities which are necessary to meet users’ needs
- Develop the tram system identity through a consistent suite of details for all stop elements. The suite of details should comprise
  - a co-ordinated family of elements, and
  - a lightweight, transparent system of components that are capable of providing a solid and robust design.
- Apply a consistent suite of details at each stop using a limited palette of materials to allow identity to be maintained whilst permitting change from tram stop to tram stop as necessary to reflect the specific context
- The comfort and safety of users shall be addressed and the design should
  - meet all safety criteria,
  - ensure ease of access for all users,
  - maximise the sense of security through appropriate visibility and natural surveillance.
TRACKSIDE EQUIPMENT

4.12 Trackside equipment refers to all the ancillary elements required for operation and maintenance of the tram system located close to the tram lines. Although many of these are small individual elements, cumulatively their siting can have a major impact within a space.

Key Issues

4.13 Trackside equipment includes such elements as:

- Substations
- Equipment cabinets
- Signalling
- Lighting (to be in conformity with Council Strategy on lighting)
- CCTV (to be linked with Council CCTV scheme and policy)
- Signing (see separate section on this topic)
- Access covers and cable ducts

4.14 The provision of trackside equipment is required for the safe and effective operation and maintenance of the tram system. It should be designed to achieve a balance between efficient operational use and reducing the impact on the setting of buildings and the open character of spaces, particularly well-used or sensitive places.

Principles of Design

4.15 The key principles are

- To avoid clutter wherever possible, through rationalising and sharing of facilities
- In all parts of the city visual impact and clutter should be minimised by concealing or integrating equipment within new buildings wherever possible
- Within the World Heritage Site, underground locations, locations within buildings or shared use of existing facilities are strongly preferred
- Where proposed, equipment will be designed to be unobtrusive
- Colour controlled
MAJOR STRUCTURES

4.16 A number of major new structures will be required as well as works to existing bridges. These works will have a major visual impact in prominent locations in different parts of the city.

Key Issues

4.17 The structures which will be necessary for the tram lines are new grade-separated road junctions, new bridges, extension/widening of existing bridges, and creation of elevated pedestrian walkways. These include

- crossing under the A8 near Gogar Roundabout
- New bridges over the railway at Edinburgh Park and Stenhouse
- Murrayfield Viaduct
- Starbank Walkway
- Extensions to existing bridges/viaducts at Balgreen, Roseburn, Coltbridge and Craigleith

4.18 Many of these are in prominent locations either in terms of height and impact on the setting of the city, or by virtue of their location on major routes into and out of the city. Others may impact on open spaces such as the seafront or greenspaces and hence their design will have local prominence as well as possible impacts on wildlife. Separate statements have been provided for each of these and are contained in Appendices 7 and 8. Other statements will be produced if additional structures are required.

Principles of Design

4.19 The key principles are

- Consider the visual intrusion of introducing a new structure or new components of an existing structure and their associated elements into an existing volume of space, taking cognisance of the overall form and coherence of the environments affected.
- Give particular consideration to the impacts associated with listed structures or structures situated within sensitive environments such as conservation areas.
- Consider the integrity of important spaces and axial views.
- Design structures to fit within the context of the surrounding townscape and ensure a safe and pleasant environment is created
- Choose materials and finishes carefully.
- Take particular account of the provisions contained in the relevant Environmental Statement, including mitigation measures.
- Extensions to existing bridges must respect the visual integrity and character of the original structure.
- The overhead line equipment design and the design of any relevant system requirements must take into account the need to respect the character of the structure and location, for example, the rhythm of poles should respect viaduct piers.
TRAM DEPOTS

4.20 Tram depots are required as a base for operations and maintenance of the fleet of trams and infrastructure. At present a potential site is being considered for each of the first two lines.

Key Issues

4.21 The depot sites need to accommodate all the necessary facilities and equipment to maintain and stable each tram fleet and to maintain and operate the entire infrastructure. It is likely that facilities for the network management (including security, customer information systems etc.), staff support and administration will also be incorporated within the depot buildings. The layout and scale of buildings required for the depots will, due to their function, require extensive site areas with large (or a series of interrelated) built structures. The challenge is to design these creatively as positive statements of functionality, and to use landscaping both to screen and to enhance controlled views into and through the sites.

Principles of Design

4.22 The key principles are

Depots should be designed to fit within the existing or emerging townscape and or landscape structure. In particular they should

- Be designed as a single entity rather than a series of separate components and to ensure that this will be the case, work will not be permitted to begin until the full depot design has been given approval
- Where close to residential or other noise and light sensitive uses, be designed to minimise these impacts
- Be visually screened as appropriate
- Seek to design in visual or physical permeability consistent with security considerations
GRAPHIC IDENTITY

4.23 The aspiration is for the Edinburgh Tram to be instantly recognisable and for its appearance to be appropriate to Scotland's capital city. Public perception of the tram will be heavily influenced by the graphic identity of the tram system, including system identity, vehicle livery and signage. It is vital that a sensitive and creative design approach be adopted.

Key Issues

4.24 Edinburgh's tram will become an important new feature for the city and the quality of its graphic identity must reflect this. Potential users must perceive the tram as a high-quality, modern, transport system, and all elements should be recognisable as part of a family. Design detailing and graphic design must build upon the engineering criteria and reinforce the image of a user-friendly, reliable and efficient system that is pleasant, clean and safe. A clear, distinctive graphic identity or branding strategy must be developed and applied consistently to all elements of the tram system.

4.25 The key issue is how to create a system that is contemporary, distinctive and readily identifiable as an Edinburgh tram.

Principles of Design

4.26 • A strong visual Edinburgh based identity is required for the tram system.
• This identity must be instantly recognisable by residents of and visitors to Edinburgh.
• Graphic continuity must be maintained throughout the tram system.
• Timeless elegant design solution.
• The character of the graphic identity must also be appropriate to Edinburgh aesthetically.
• Ensure commercial advertising does not detract from visual identity of the tram system and, if external, the amenity of the area.
• Keep on-street signage to a minimum to avoid clutter.
• Creative use of new technology for information provision and any permitted commercial advertising is encouraged.
• The concept should be prepared by an appropriately experienced specialist, who should also oversee the application design to the relevant aspects of the project.
4(b) Tram Alignment and Integration

4.27 This section of the Manual sets out the Strategic Design principles relating to the alignment of the tram infrastructure. These principles are to be used in guiding design work and as planning objectives against which future detailed planning submissions will be assessed.

ALIGNMENT

4.28 The alignment of the track is particularly important because it directly influences the speed of the trams and associated elements of the tram infrastructure, such as platforms, shelters and poles to support the overhead line equipment.

Key Issues

4.29 Edinburgh's variety of Conservation Areas with their distinctive character is renowned. Of particular importance is the planned 18th and 19th century townscape along with its medieval counterpart in the Old Town within the World Heritage Site. It is imperative that the introduction of the system respects the city's distinctive spatial pattern and structure. The alignment, therefore, needs to reflect the particular grain and street layout of the city. The key issue for the alignment of the tram is how to achieve the best urban "fit" yet at the same time conform to the most appropriate engineering principles to ensure delivery of the best quality tram system.

4.30 Alignments can be influenced by the treatment of power supply systems (e.g. track centre lines will be spaced further apart where required to accommodate centre poles), and these may, in turn, be driven by urban design issues. An alignment that avoids tight curves and is as straight as possible will provide fast journeys, which is a Strategic Principle of the scheme. It should be recognised that such an alignment would also minimise the number of overhead line poles or other fixings required to carry OLE and could, therefore, be deemed to be the best in terms of contribution to the urban environment.

Principles of Design

4.31 The essential principles of design are

- Minimise the visual impact of tram alignment and tram lines in an existing space.
- Contributing to a comprehensive approach to the public realm.
- Protect the integrity of important spaces and axial views.
- Design curves to minimise any additional visual intrusions and to relate well to existing buildings and enhance affected spaces.
- Maximise opportunities for development or regeneration through an integrated design approach.
- Ensure a good relationship of the tram system with other modes of transport, including pedestrians, cyclists, buses, taxis and private vehicles.
- Safety shall be designed in rather than mitigated against.
- Maximise accessibility for all users.
- There is a need to take account of the desire to achieve minimum journey time and optimum ride quality.
4.32 Overhead line equipment (OLE) may be required to distribute power to the tram system, and if so it must be carefully designed to minimise visual intrusion. Decisions on technical issues such as electrical supply will have implications for the appearance of the system and must be addressed as part of the holistic design process.

Key Issues

4.33 The Townscape and Visual Impact Assessment within the Environmental Statement has identified the magnitude of physical change emanating from OLE. Of particular importance is the potential change to the World Heritage Site, Conservation Areas, but even in minor streets and industrial estates the visual impact of the OLE is deemed significant.

4.34 Electrical supply is taken from the substations via underground ducts to the OLE system, where it is fed through columns to the suspended contact wire. The overhead wires will be supported either by free-standing poles or by fixings mounted onto existing buildings, or combinations of these.

4.35 The aspiration for a wire free system in whole or in part is a Strategic Principle and the key issue to be addressed initially is how the decision will be made about a "wire-free" system. Following that (if wire-free is not operationally feasible), key issues will be addressing the visual effects of OLE and the necessary fixing methods.

Principles of Design

4.36 • A 'wire free' operational system is preferred within the World Heritage Site and other sensitive locations.
• OLE will only be considered if an appropriate wire free system, or partial wireless system, is deemed not to be operationally feasible.
• If OLE is necessary, the design must respect the quality and sensitivity of Edinburgh’s townscape.
• Where poles are required the opportunity to rationalise through shared use with other street utilities such as street lighting and road signs should be considered.
• The visual impact must be assessed both at a strategic level (entire volume of space within a street or other public area) and a detailed level (individual buildings).
• New support structures must be positioned and styled to relate positively to key views, landmarks and historic buildings.
• Consider the colour
SURFACING
(Track, Tramway Path, Affected Roads and Footpaths)

4.37 The successful visual integration of the proposed tram system into Edinburgh’s streetscape is of paramount importance.

Key Issues

4.38 The overarching issue associated with surfacing in relation to the proposed tram system is the relationship between the Tramway Path and the wider public realm. In addition, the following are important considerations

- Response to Context
- Extent of Resurfaced Areas
- Technical Requirements
- Safety
- Noise
- Definition of Tramway Path
- Maintenance

Principles of Design

4.39 The essential principles are

- Response to Context: The tramway surfacing will be influenced by its environment/context. The final palette of materials selected must be capable of satisfying equally aesthetic and technical requirements and conform with the "Edinburgh Standards for Streets".
- Technical Requirements: Material changes/interfaces that should be addressed by simple and robust design.
- Safety: Where certain types of materials or changes in levels (such as those designed to deter cars and pedestrians) are required the design and choice of materials should be appropriate to the location.
- Noise: Consideration must be given to the potential noise generated by road vehicles when they cross tram tracks and so it may be necessary to use different surface materials for the tram route at such locations. However, the number of such material differences should be kept to a minimum.
- Definition of Tramway Path: The Tramway path of the tram system requires some form of delineation. The design of this feature and choice of materials must take account of the specific location context. The opportunity to rationalise with other features, e.g. curving and road markings shall be regarded as paramount.
- Maintenance: The materials chosen must be consistent with the Council's standards for this purpose.
ACCESS FOR ALL

4.40 Edinburgh's tram should become the transportation system of choice because it is convenient to use, safe, reliable and efficient. The system must, therefore, be accessible to all irrespective of age or physical ability.

Key Issues

4.41 To meet this aspiration, the requirement of each user type needs to be addressed as an inclusive part of the design. This approach must be applied to all elements of the system that have a public interface. This is not simply a design aspiration; it is also a legal requirement.

4.42 The key issues are how to ensure that ease of access is an intrinsic part of the overall design and also how to avoid segregation of different user groups.

Principles of Design

4.43 • The choice of tram and design of infrastructure must ensure maximum access and ease of use by all sectors of the population, including persons with young children, the elderly and those with sensory or physical disabilities.

• Ensure an inclusive approach that strives to fulfil the needs of each user group as closely as possible. If compromise is necessary, no single group should be discriminated against.

• Use the tram as a catalyst to improve and expand public access throughout the city.

• Address safety requirements for all user groups.
PEDESTRIANS AND CYCLISTS

4.44 The tram system should seek to maximise integration with pedestrians and cyclists.

Key Issues

4.45 Current Council policy aims to address traffic congestion problems by reducing the need to travel by private car, by prioritising an integrated public transport system, by introducing trams, and encouraging walking and cycling.

4.46 The key issues are:

- How to ensure desired freedom of movement by minimising restrictions on pedestrians and cyclists and maximising integration with the tram system
- How to create interesting spaces which encourage appropriate integration of the different user groups
- How to reduce potential conflicts between pedestrians, cyclists and tram

Principles of Design

4.47 The objective is to increase and improve the quality of the public realm by reassessing the distribution of space between the different user groups, including vehicles, public transport, pedestrians and cyclists. The following principles should help to achieve this.

- Respect existing routes and desire lines
- Improve and extend pedestrian and cycle routes and, wherever practicable, give greater priority of space to pedestrians
- Maximise integration of pedestrians and cyclists with the tram system
- Provide appropriate cycle parking facilities at tram stops
- Increase and improve the quality of the public realm by reassessing the distribution of space between different user groups and create a public realm that people wish to inhabit.
DESIGN ELEMENTS OF ENVIRONMENTAL MITIGATION

4.48 The impact of the proposed tram system is assessed fully within the relevant Environmental Statement. It will be important to achieve well-designed and long-lasting environmental mitigation measures.

Key Issues

4.49 The proposed tram route passes through a diverse range of character areas, including World Heritage Site, various Conservation Areas, seafront areas, semi-rural and rural urban fringe locations including areas within the Green Belt.

4.50 The key issues in relation to the design of environmental mitigation measures are:

- Appropriateness to context.
- How best to meet Council requirements, including sustainability requirements.
- How to pay particular regard to maintenance issues in terms of longevity of measures, cost-effectiveness and detailed maintenance arrangements.

Principles of Design

4.51 The principles to be followed in detailed design of mitigation measures are as follows.

- To be appropriate to the particular context in terms of historical and landscape character.
- To satisfy the full range of Council requirements – in terms of environmental health, protecting visual and residential amenity, fulfilling sustainability and biodiversity criteria.
- Measures should not in themselves create a detrimental visual impact.
- To achieve robustness of design, minimising difficult or expensive maintenance arrangements.
Part 2

DETAILED DESIGN REQUIREMENTS
5(a). TRAM IDENTITY

5.1 This chapter sets out Detailed Design Requirements for the Tram system. The requirements are framed as guidance and as a detailed checklist and these will be used primarily in the design and procurement process. Elements within the design of the tram system, such as tram stops, depots and structures will require a greater level of site specific consideration. Statements have been prepared for all of the major structures. These conclude with a series of objectives to be considered in developing the design proposal. A further level of review will be required through the Design Working Group to establish more site specific design statements. These design statements will also be considered for other elements of the tram system.

TRAMS

Guidance

5.2 It is expected that the trams bought to operate the Edinburgh Tram System will be variants of existing manufacturer’s designs. It is desirable that a proven design is used to maximise reliability and value for money. There are a number of areas of the tram design that may nevertheless be customised to the particular requirements of the Edinburgh Tram System and allow a distinctive tram to be produced. This will be vital to ensure that the tram chosen meets the aspiration of being instantly recognisable as the Edinburgh Tram, and is of a quality appropriate for Scotland’s capital city.

5.3 The range of customisation available will vary between manufacturers, and part of the procurement process will be to identify the specific elements of the design that may be customised and the potential range of choice that may be available. Once the contract has been let, there will be a clear programme within which the decisions must be made in order to allow manufacture to progress to the requirements of the project.

5.4 Selection of the tram to be supplied should also take account of issues of quality in construction, finishing and detailing as parts of the evaluation criteria.

The design of trams should be consistent with the following guidance:
- Development Quality Guideline on Access to the Built Environment
- HMRI Railway Safety Principles and Guidance Part 2, Section G, Tramways (Revised 2005)
- Rail Vehicle Accessibility Regulations 2000

5.5 Detailed Design Guidance Checklist

- General form and appearance to reflect system identity - timeless, distinctive and elegant.
- Conceal equipment mounted on the roof when viewed from the front and side
- Window area to be maximised
- Clear view through interior including the rear wall of the drivers cabs
- Passenger information displays (exterior and interior) to make best use of contemporary technology to assist both regular travellers and visitors, and minimise intrusion
- Livery and internal colour scheme should comply with Graphic Identity Checklist
- Interior fittings and detailing to use high-quality materials, easy to clean
and resistant to wear and vandalism and conceal fixings where possible

- Display of advertisements should comply with Graphic Identity Checklist
- Details of entry/egress and circulation should comply with Access for All Checklist
TRAM STOPS

Guidance

5.5 Fundamental to the success of the tram stops will be their ability to be instantly recognisable as part of the tram system without becoming visually obtrusive, and to enhance rather than detract from Edinburgh’s public realm.

5.6 The detailed siting of tram stops should relate well to locations of high trip generators and interchanges with other transport modes. Where possible, walking distances should be minimised to entrances of large generators of potential users.

5.7 Treating all the elements required at a tram stop as a single design exercise will result in a more coherent and visually composed design solution.

5.8 Consideration is given to the following aspects below

- Fit to Context
- Platforms
- Shelters and Canopies
- Lighting
- Security
- Information
- Ancillary Elements

The design of tram stops should be consistent with the emerging guidance on “Edinburgh Standards for Streets”. Other relevant Council guidance is contained in the Development Quality Guidelines on:

- Access to the Built Environment
- Advertisements and Sponsorship
- Setting of Listed Buildings

The guidance and requirements of the following are applicable:

- HMRI RSPG, Part 2, Section G, Tramways
- The Department for Transport Inclusive Mobility Guide to Best Practice on Access to Pedestrian and Transport Infrastructure

It is also useful to take note of the Strategic Rail Authority document: Train and Station Services for Disabled Passengers, A Code of Practice (March 2005), although this is not directly applicable to tramways.

Consideration should also be given to:

- Conservation Area Character Appraisals
- The World Heritage Trust Management Plan
- The Memorandum of Guidance for Listed Buildings and Conservation Areas

Design Guidance and Checklist - Fit to Context

5.9 Tram stop locations need to be planned with due consideration of the following:

- existing views
- destinations
- key buildings (i.e. listed buildings)
- pedestrian and traffic patterns
- accessibility

5.10 In some instances, where there are important vistas, groups of buildings or street layouts such as crescents within the World Heritage Site, the precise location of the
proposed tram stop will be critical and priority will have to be given to heritage issues. In other locations, economic or environmental issues may be more important.
The siting of proposed tram stops must fit within Edinburgh’s streetscape. Tram stops must relate positively to their existing and planned context. Tram stops should be located conveniently for users and be clearly visible. Tram stops must not detract from key public spaces or impede pedestrian circulation. Key views or vistas must not be interrupted. All tram stops must seek to integrate with other transport modes. All components required at the tram stop should be designed to be visually coherent. A modular design solution of consistent detailing should be adopted.

**Design Guidance and Checklist - Platforms**

5.11 The tram platforms are raised to allow level access to the tram. Good quality design detailing is required to ensure that the platform becomes a positive feature within the public realm. In general terms, the dimensions of the tram platforms will be determined by the choice of the tram vehicle, the particular location and the level of pedestrian activity.

5.12 Tram platforms should be designed as unobtrusive extensions of the footway, wherever possible. Platforms should be designed so that handrails are not required.

5.13 Access to platforms should be as easy as possible for all users. Careful consideration should be given to materials and how these are used.

- Minimum dimensions will be influenced by the final specification of the tram vehicle.
- Platforms should be of an appropriate area to accommodate the expected patronage.
- The platform height must be set to ensure level access into the tram but be as low as possible.
- Ramps up to platform levels must be designed as an integral part of the streetscape, avoiding trip hazards.
- Consideration should be given to lowering the track through tram stops to avoid raising the footway height for platforms where this could conflict with adjacent threshold levels or with the visual identity of the street.
- Platforms must be accessible by all users of the tram system.
- Abrupt changes in level, steps and railings should be avoided.
- Access to tram stops should be direct, avoiding lengthy detours.
- At grade access across tram lines should be provided at strategic points relating to tram stop locations.
- Platform surface and edging should comply with the “Edinburgh Standards for Streets” document.
- Materials used should be in accordance with the provisions of the “Edinburgh Standards for Streets”.
- A high standard of detailing is required to ensure that all parts of the platform fit together visually and that joints and changes of material line through.
- Tactile and visual contrast materials should be used in accordance with HMRI and DDA requirements and DfT Guidance but be implemented in such a way that they do not create unsubtle contrasts or visual confusion.
- Changes in colour or coursing should be used to delineate boundaries, edges or highlight features.
- Where access covers are integrated into the platform surface they should be orientated parallel to the front edge of platform, with recessed covers and paving infill, laid out to maintain the overall pattern of the platform.
surface.

- The module size /scale of proposed paving must reflect its context.
- Street furniture, tactile paving, crossings, covers etc. should be orientated to avoid awkward junctions and cuts.
- Consideration should be given to incorporating as an edge coping a monolithic block the full height of the platform such that there is no horizontal joint visible in the front face of the platform.
- Platform edges in the World Heritage Site and conservation areas must be of natural stone unless specifically agreed otherwise by the planning authority.
- Need for railings should be kept to a minimum.
- If handrails are required, consideration must be given to their integration with seats and other equipment, reducing visual and physical clutter.
- Handrails should be rounded/curved with no sharp edges.
- Design should emphasise transparency and reduce visual impact.
- All railings (including guardrails at pedestrian crossings, where required) must be of high design quality, robust, vandal-resistant and be fully co-ordinated with the tram system 'kit of parts'.

Design Guidance and Checklist – Shelters and Canopies

5.14 The tram shelters will be the most visible part of the tram stops and an important focal point. Consequently their design, detailing and subsequent maintenance will influence more strongly than any other single element how the tram system is perceived.

5.15 Each location must be assessed individually in terms of its suitability as a site for a shelter or a canopy. The architectural setting of important buildings, the urban quality of building groupings and existing vistas through the townscape should not be compromised.

5.16 Shelters should accommodate a wide variety of functions, such as:

- Ticket machines
- Seating
- Litterbins
- Passenger information
- Equipment cabinets
- Signing / Advertising
- Lighting
- PA System

5.17 It is not anticipated that a multi-functional shelter incorporating all the above features will be appropriate at every location. The final siting and design of a shelter will be dictated by balancing a number of criteria including availability of space, hierarchy of location, engineering and economic factors.

- A shelter or canopy should be provided on each platform of every stop.
- Shelters must be carefully located to address fully their urban context.
- A family of designs for shelters and canopies should be agreed, with design variations for different character zones and amount of space available.
- Shelters and canopies should be sufficiently transparent to allow visibility in and out, should incorporate appropriate lighting, and should seek to enhance the streetscene.
- Shelter dimensions should be kept to a minimum to provide a light and
elegant structure, but still sufficient to reduce the impact of wind and driven rain and to protect the anticipated number of waiting passengers.

- Stop nameplates should be considered as an integral part of the shelter design.
- Provision must be made for the blind and partially sighted.
- Commercial advertising may be appropriate in certain locations (see Graphic Identity and Signage sections).
- Particular attention should be paid to the design of the roof, panels and fittings to ensure adaptability of design and robustness.
- The approaching tram vehicle should be clearly visible from both seated and standing positions within the shelter or canopy.
- Lower edges should follow platform gradient with consistent gap.
- All surfaces must be easily cleanable. All fixings are to be concealed and vandal-proof but accessible for maintenance.
- All clear panels should be of toughened glass and any glazed panel adjacent to a road should incorporate a horizontal rail (to protect people from falling through gap when glazing is broken or missing).
- Water run-off system should not be vulnerable to blockage and rainwater discharge should be remote from the access openings.
- Seating should incorporate provisions for prams and wheelchair users, but should not dominate the length of the shelter.
- Seats should not be located so as to impede the circulation of passengers/pedestrians.
- Seats should be convenient for all ambulant users, including some with backrests and some with armrests.
- Seating surfaces should be of a material comfortable to use in winter, and unable to collect or retain liquid.
- Seats should be easily cleanable, robust and fireproof.
- In the design of every tram stop shelter consideration should be given to the incorporation of appropriate passenger information systems comprising display panels, Real Time Information and public address system.
- A Public Address (PA) system is required at all tram stops.
- The PA system should be mounted discreetly out of sight.
- The PA system should be clearly audible and intelligible to all passengers (except those with hearing difficulties) in shelters and on platforms under all weather conditions.
- Sufficient speaker points should be installed for the volume at the loudest point to be comfortable to passengers at that point and such that, in residential areas, the volume is low enough not to cause a nuisance, especially at night.
- At stops other than Park and Ride sites, the PA system should only be used for emergency, security and severe disruption announcements. General public announcements and advertising are not permitted.

**Design Guidance & Checklist - Lighting**

5.18 The lighting of shelters and their immediate surroundings will be crucial in making passengers feel safe whilst enhancing their ability to read transport information panels.

5.19 It is important that an ambient illumination of the shelter and stop area is achieved, which may incorporate light sources at several heights, including ground level, intermediate, and lighting from structures overhead. The use of multiple spotlights should be avoided due to the visual clutter they create and the added maintenance of numerous lighting fixtures.
5.20 Lighting can be incorporated into the overall design of the shelter, such as:

- lighting situated within perforated columns and beams (ease of maintenance should always be considered);
- lighting attached to the roof structure or surrounding street furniture;
- low lighting incorporated in bollards and railings; and
- recessed lighting used to denote the stop perimeters, or structural/design features of the shelter.

5.21 Lighting should be provided to all waiting areas and access routes, to the front edges of platforms, to passenger information systems and to any identifiable hazard points, sufficient to provide safety, comfort and practicality for passengers.

- Lighting levels should be provided during all hours of poor light, including when the service is not operational. The use of motion sensors could allow increased lighting levels when movement is sensed.
- Lighting provision should typically be independent of other light sources in the vicinity (street lighting, shop fronts, etc.). However, other sources can contribute and can be considered as an opportunity to reduce clutter providing that such alternative sources can be suitably controlled and maintained.
- The lighting colour must enable good colour rendition.
- Glare must be avoided for passengers, tram drivers and road vehicle users.
- Legibility of display panels should not be impaired by reflected light.
- Nuisance light spillage for local residents and night-sky pollution must be avoided.
- All equipment must be vandal-resistant, robust and easily cleaned and maintained.

**Design Guidance & Checklist - Security**

5.22 A safe environment is a necessary condition for the system to be successful and to be an enjoyable travel experience. All parts of the tram stop have to be unobscured. It must be obvious that security is provided.

5.23 Security aspects addressed are CCTV, Emergency Call Point, and Visibility, as follows.

- Security should be provided in a manner such that it is obvious but integral with the 'kit of parts'. The security equipment must not detract from the aesthetic integrity of the overall station design. For example, dome-type CCTV cameras are preferred, as these are identifiable but reasonably discreet.
- All crossing points, platforms (including within shelters) and any other areas where passengers might reasonably be considered vulnerable must be visible from the control centre by CCTV link.
- Camera numbers and locations should be such that all areas are visible even when newly planted trees have matured. For example, dome-type CCTV cameras are preferred, as these are identifiable but reasonably discreet.
- Each platform must have an emergency call point for direct communication with the control centre.
- Emergency call points must be positioned in a consistent location.
- The location of at least the nearest emergency call point must be visible from anywhere on the platform.
- Shelters with front panels must have more than one entrance (an escape route).
- Passengers approaching a shelter entrance must be visible to those inside
the shelter.
5.24 Information panels and advertising if appropriate should not dominate the design of the shelters or impinge upon the light and elegant design ethos. Care must be taken to ensure that large panels do not block views, posing a security threat. For more information on advertising, refer to section on Graphic Identity.

- Advertising should not block views.
- Advertising and logos should be restricted in accordance with current planning guidance.

5.25 The number of ancillary elements such as seating and litterbins, and their disposition should seek to avoid overprovision and clutter. (Cabinets and equipment are considered in the section on Trackside Equipment.)

- All tram stop components should be kept to a minimum in both size and number, minimising both visual and physical clutter from the street scene.
- Stops and their associated elements should be designed as multi-functional modules. For example, the shelter or canopy can provide not only shelter and seating space but also house ancillary elements such as litterbins, lighting, information and space for advertising. Bollards may also provide secondary seating and incorporate lighting to further reduce clutter.
- Litterbins must be of a high quality design, consistent with the other elements of the stop. They could be fixed to the shelter posts or lighting columns or integrated with either seating or handrails to alleviate clutter at the stop.
- Litterbins are to be vermin-proof when closed, have a closed top unsuitable for standing objects on top, and to have easily cleanable surfaces inside and out.
- Kiosks and ancillary functions are only appropriate where there are high pedestrian flows and sufficient space, reinforcing the hierarchy of stops.
TRACKSIDE EQUIPMENT

Guidance

5.26 It is important to understand the range of trackside equipment which is required for the Tram system. This section seeks to give a clear idea of the range of equipment which will be necessary, and how the cumulative impact of the equipment can be kept to a minimum. The avoidance of clutter through the sharing of facilities for equipment must be fully considered in all cases and in all parts of the city. Where proposed, equipment will be designed to be unobtrusive – modern and elegant design of these small elements will assist greatly in engendering a positive image of the Tram.

The design of trackside equipment should be consistent with the emerging guidance on "Edinburgh Standards for Streets". Consideration should also be given to:
- Conservation Area Character Appraisals
- The World Heritage Trust Management Plan
- The Memorandum of Guidance for Listed Buildings and Conservation Areas

Design Guidance and Checklist - Substations

5.27 Substations - primarily for the supply of traction power to the system - are required at intervals of around 2-3km along the route. Locations have been identified on the plans submitted at part of the Bills for each Line. Depending on the final traction power system design it may not be necessary for all the identified sites to be used in practice.

5.28 Each substation is a fully-enclosed, usually rectangular building. All cabling to and from the building will be ducted underground. Suitable vehicular access is required to the building for installation and subsequent, albeit rare, replacement of heavy equipment. Related parking for maintenance staff is required close to the building. Doorways to the building are required for personnel access, usually separately for staff of the tramway maintainer and the DNO, and for (infrequent) exchange of heavy equipment. The security of maintenance staff entering and leaving the building at all hours must be protected.

5.29 The general dimensions of the building are likely to be similar for all the substations, with the exception of that within a depot site which is likely to be larger as additional equipment is required at this location.

5.30 Due to internal heat generation, it is necessary to provide for ventilation of the building interior. Depending on the size of the building relative to the equipment contained within, it may be necessary to provide mechanical ventilation equipment with suitable louvered apertures to permit airflow.

5.31 It is possible to place substations underground although this is expensive in first cost, and also potentially, for maintenance. The plan area required is likely to be larger than for a building on the surface. It is also possible to place a substation within an existing or new building in a suitable location. In both cases, suitable equivalent access and ventilation requirements must be provided.

- Wherever reasonably practicable substations should be designed into an existing or proposed building.
- Within the World Heritage Site, greater priority must be given to the sympathetic siting of the structure. Where reasonably practicable, partial or
total submergence of the substation should be pursued.

- If a new building is required, it should be sited to reflect and integrate with the surrounding townscape or landscape
- Substation buildings should be as small as safety requirements dictate but large enough to accommodate all equipment
- Security fences or other enclosures will not normally be permitted.

**Trackside Cabinets:**

5.32 In summary, essential trackside cabinets not associated with tramstops will be situated on top of an access chamber in the chain of cable ducts and will be placed on a plinth which can be made flush with the ground, if it is level locally. Cabinets often have doors both front and back and space must therefore be left or created to allow safe maintenance access with the doors opened.

5.33 In principle, equipment can be placed underground in suitable enclosures, although these are not available as standard and a special factory-made unit would be essential in this application. Capital and maintenance costs would increase and access arrangements (including the location) would have to allow safe maintenance to be carried out at any time.

**Traffic Signalled Junctions**

5.34 By far the largest number of cabinets will be those related to traffic signal controlled junctions. There will normally be one cabinet for the actual controller for each junction that will replace the existing cabinet (where present), and be to the same roads design requirements. There will also be one cabinet for communications equipment related to the tram location and priority demands into the traffic controller. Different maintenance responsibilities favour a separate cabinet, as well as the standard nature of the traffic signal controller cabinets. It is highly desirable for safety reasons that the cabinets are in a position where maintenance staff can directly observe the operations of the signals controlled. A typical size for the communications cabinet is 1200mm high x 1000mm wide x 400mm deep.

**OLE Isolators**

5.35 The OLE is divided into electrical sections that can be individually switched on and off. This allows part of the network to be shut down due to an emergency or for planned work. Such sectioning locations are related to the track layout, in particular near junctions and emergency crossovers (reference should be made to the Network Diagram, when it becomes available). Where a substation is located near a sectioning point, the associated switchgear will be located within the substation building. Otherwise a trackside cabinet is required to contain the switchgear. There are particular requirements for these cabinets due to the higher voltage found within. The size depends on the number of switches required and a modular design is usually used. A typical trackside isolator cabinet is 1800mm high x 2000mm wide x 800mm deep.

**Point Control**

5.36 At each location where there are points that are motorised or are fitted with indicators (reference should be made to the Network Diagram, when it becomes available), a cabinet is required for the control. The principal locations on street are at Haymarket...
Points should be able to be controlled from a single cabinet. There may however be a requirement for an additional cabinet for an auxiliary power supply. However, alternative packaging arrangements are likely to be possible, changing the shape of the resulting cabinet. Where the points are motorised, the cabinet must be placed such that, during maintenance, there is clear view of the points from the cabinet, in the interests of safety. A typical points' control cabinet is 1500mm high x 800mm wide x 600mm deep.

**Point Heating**

5.37 At each location where there are points that are fitted with heating (reference should be made to the Network Diagram, when it becomes available) to prevent freezing in cold conditions, a cabinet is required for the control of the heaters. All the heaters at a particular location will be controlled from the single cabinet. A further cabinet may be required to provide the auxiliary power supply to the heaters. It should be possible to integrate these cabinets into one. A typical size for a double junction is 1200mm high x 1800mm wide x 400mm deep. However, alternative packaging arrangements are likely to be possible, changing the shape of the resulting cabinet.

**Tram Signalling Controls**

5.38 At a few locations, additional tramway-only signalling may be required, with associated control cabinets. The most likely locations are at the junctions on the main line providing access to the depot(s). At present, there are no other locations positively identified. These would probably be similar to traffic signal controller cabinets and would be additional to the point control/indication and heating cabinets at the same locations. It is possible that they could be located inside the depot perimeter fencing, although this would depend on the local layout and the distance between the junction and the depot perimeter.

5.39 There might also be isolated requirements for trackside cabinets for additional auxiliary power supplies or for communications equipment. These would however be very much the exception, if required at all.

5.40 The Checklist for assessing the design of all trackside cabinets is as follows.

- Consideration should be given to incorporating trackside cabinets into an existing or proposed building.

- The possibility of enclosing a cabinet within a building will need to be negotiated by the Planning Authority when determining planning applications and may need to be secured by a legal agreement (such as a s75 agreement).

- Within the World Heritage Site the preference is for all cabinets to be located underground or otherwise concealed, unless technical or safety requirements dictate otherwise.

- If acceptable on-street, cabinet dimensions should be as small as safety requirements permit and large enough to contain all equipment.

- Design and colour of cabinets will be consistent with the requirement of the “Edinburgh Standards for Streets”.

(possibly), York Place, North St Andrew Street (possibly) and Ocean Terminal.
5.41 In order to run cabling throughout the tramway route, either buried ducting or surface troughing is required. Equivalent provisions are required on structures along the route. Access is required along the routes by the provision of chambers with surface mounted covers at intervals. These will coincide with trackside cabinet locations and immediately, at intervals appropriate to the type of cabling. Certain types of cabling may be direct-buried but this is not the preferred solution and access chambers are still generally required.

5.42 Such cabling is required for a variety of functions. These include traction power supply strengthening, control and monitoring of the traction power supply and other functions, communications with tramstops and trackside equipment, and local auxiliary power supply distribution.

5.43 Surface-mounted troughing is not preferred from a security and maintenance viewpoint, but has a lower cost than ducting. However, making the lids of surface mounted troughing secure is likely to lessen the difference in cost. Access chambers will also be simpler with surface mounted troughing.

5.44 Troughing could be mounted on posts, as alongside railways, but this is unlikely. Troughing may also be either surface-mounted or inset flush with the ground. The approach would be dependant on the location.

5.45 The amount of trackside cabling may be lessened by adoption of wireless technology for communications and this is currently under investigation. At this stage, however, it is very unlikely that all cabling requirements can be eliminated.

- The detailed design and treatment of these elements must minimise any protrusion above ground, and be incorporated fully into hard or soft landscape treatments.
- Detailed design must also ensure that no hazard to safety or pedestrian or cycle circulation is likely to result.

**Design Guidance and Checklist - Tram Signals**

5.46 Trams have their own signalling with trackside signals mounted on poles. The casing of the signal head is essentially the same as one of the three as one of the three lamps forming a standard traffic light, but with the format being a set of white lights forming a bar or other-shaped aspect. Where co-located with a set of traffic lights, they can be placed to the side or above the standard signal head, similar to a filter arrow traffic signal. A single aspect will be placed with each traffic signal on the relevant approach to any traffic-signalled junction. This would include any signalled pedestrian crossings, for instance. Certain locations may require an additional aspect for visibility, as with traffic signals. All existing traffic signalled junctions along the line of route are likely to be retained and probably some more added, depending on the safety and other considerations at particular locations. These may include locations where the segregated tramway crosses a road (NB this is treated as a traffic-signalled junction and not as a railway-type level crossing).

5.47 Additional signal heads are required on the approach to any facing points showing the safe position of the point mechanisms.

5.48 It is possible that there may be other signals required at junction locations away from the street.
5.49 The precise location of all signals relative to the point mechanism or the stop line at traffic signalled junctions is very important.

- Signals should only be provided where necessary
- Clutter should be avoided by sharing signal poles wherever possible
- There is a preference for simple vertical poles
- Gantry signals should be avoided
- Design and positioning of signals will be consistent with provisions to be contained in the Edinburgh Standards for Streets
MAJOR STRUCTURES

Guidance

5.50 Major new structures are likely to include

- A8 crossing point under the Gogar Roundabout
- Line 2 depot access road bridge
- New bridges over railway at Edinburgh Park and Stenhouse
- Murrayfield viaduct
- Haymarket viaduct
- Starbank Walkway
- Lindsay Road retaining wall and grade structure
- Lower Granton Road retaining wall to maintain access to Granton Harbour
  eastern breakwater
- Crewe Toll retaining wall and grade structure
- Coltbridge Retaining Wall

5.51 Major extensions to structures are likely to include

- Extension of bridges at Roseburn, Balgreen, Craigleith Drive, St George's School
  and Groathill Road South
- Coltbridge retaining Wall
- Extension of Coltbridge Viaduct
- Balbirnie Place Underpass
- Balbirnie Place embankment

Initial planning statements have been provided for each of these and are contained in
Appendices 7 and 8. Other statements will be produced if additional structures are
required.

The design of structures should be consistent with the emerging guidance on "Edinburgh
Standards for Streets".
Reference should be made to the Council’s Development Quality Guideline on
Community Safety.
Reference should also be made to the relevant Environmental Statement.
Consideration should also be given to:
- Conservation Area Character Appraisals
- The World Heritage Trust Management Plan
- The Memorandum of Guidance for Listed Buildings and Conservation Areas

Detailed Design Guidance Checklist

- The design of major new structures and extensions to existing major
  structures needs to take account of the structure-specific statements and
  be accompanied by design statements to demonstrate this.
- All design statements should be agreed by the Planning Authority and
  other interested parties (such as land owners) prior to the commencement
  of detailed design work.
- The design of overhead line equipment and trackside equipment needs to
  take into account and reflect the structure specific requirements (for
  example the position of poles will need to reflect the overall structure
  design).
- These statements will take account of the physical context, the planning
  policy context and the nature of the structure proposed.
- Structures should be designed without dark recesses.
- Materials should be robust, vandal-proof and corrosion-resistant.
- Appropriate lighting should be included within the design.
DEPOTS

Guidance

5.53 The choice of depot location has been driven by a number of factors including the size, accessibility, planning status and environmental suitability of potential sites. Following assessment, a preferred site has been identified for each line. The proposed sites are currently a plot within Leith for Line 1 and immediately to the north of Gogar Roundabout for Line 2. If only 1 depot is required, Gogar is the preferred location for reasons relating to townscape and regeneration in the Leith Docks area.

5.54 The aim is through a creative and imaginative architectural response to a very specific set of criteria, to design structures that are assets to the city. Appropriate design will reduce the need for screening and other mitigation measures. In addition, where site conditions allow, visual impact may be mitigated by appropriate use of levels in the site relative to its surroundings, and the introduction of landscape screening. To achieve a high-quality design that fulfils the functional requirements and respects its surroundings, the following points should be considered:

Site Layout

5.55 Factors affecting site layout include:
- the size of structures,
- the requirements for efficient tram movement,
- The level relative to and the links with the tram route,
- the orientation of site and structures,
- the relative proportions of the site,
- the accommodation of all operational facilities, and
- access for pedestrians and vehicles, and security issues.

Functionality

5.56 All depot activities should be facilitated through:
- efficient layout offering minimal impact;
- compliance with statutory regulations (e.g. building regulations, disabled access etc); and
- connection with the wider tram network.

Visual Impact

5.57 Factors affecting visual impact include:
- the building footprint and height;
- massing of elements; materials and finishes (which should be chosen to complement the tram network and context);
- skyline impact;
- external storage areas
- views into and out of each site; and
- landscaping and physical or visual permeability.

Environmental Impact

5.58 Factors affecting environmental impact include:
- noise;
- treatment of lighting;
- softening of hard landscaping; and
- creation of habitat within the constraints of the locality e.g. requirements of the BAA.
The design of depots should be consistent with the emerging guidance on “Edinburgh Standards for Streets” and “Edinburgh Standards for Sustainable Buildings”. Reference should also be made to the relevant Environmental Statement. The Guidance set out in HMRl RSPG Part 2, Section G, Tramways and where applicable Section A Infrastructure (1996) also applies.

5.59 **Design Guidance Checklist**

- Each depot site should provide secure stabling for the fleet.
- The depot must be accessible by road and in close proximity to public transport links.
- Road access should be provided for the delivery of trams, and for routine access by heavy goods vehicles making deliveries. Road vehicle access must avoid blocking adjacent roads.
- Site layout should relate to surrounding activities and noise-generators as well as functionality and efficiency of use.
- Depot elements should be orientated to group noise-generating activities as well as functionality and efficiency of use.
- The depot should be designed as a single entity, bearing in mind all the elements.
- Depot buildings should be designed as architectural statements.
- Acceptable boundary noise level is to be agreed with the Council’s Department of Environmental and Consumer Services.

**Line 1 Considerations**

- The site layout suggests grouping building(s) close to existing industrial buildings where possible, for example, near the timber yard building along the southern boundary.
- The depot building(s) should be architecturally sensitive to the surrounding context, particularly to the Constitution Street facade and the gate piers to the port.
- Existing pedestrian links/routes around the port should be enhanced but for safety and security reasons public access through the depot site will not be possible.

**Line 2 Considerations**

- Planting must be incorporated along the southern and western boundary edges consistent with BAA guidance to prevent birdstrike difficulties – native deciduous species are to be used where possible.
- Peripheral screen mounding, in order to reduce landscape and visual impacts should be the preferred design option. This will be sympathetically graded out to tie into surrounding flat agricultural land and should be augmented by native scrub planting.
- Depot buildings are to be constructed to sit as low as possible within the site in order to mitigate adverse landscape and visual impacts and minimise the height of screening required.
SIGNAGE

Guidance

5.60 Signs are an important visual component of the tram system. They can be used to reinforce the legibility of the tram system whilst complementing existing signs within Edinburgh. Signs are also important in image-building (see also Graphic Identity Sections) for the tram system and should be both distinctive and instantly recognisable. Signs should be integrated with other elements associated with the tram, minimising clutter.

5.61 The legibility of signs can be maximised through the appropriate use of contrasting colour between the lettering and background. Pictograms should be used as part of the signage strategy, increasing accessibility for tourists with limited English, children and those with literacy disadvantages. Pictograms employed by Edinburgh's Tourist Board and meeting the criteria of the International Standards Organisation (ISO) for standardisation will be useful motifs in creating signs that are easily recognised and understood. However graphic modifications may be desirable to create the tram’s distinctive identity or to respect a particular site context.

5.62 The Council is committed to a reduction of street clutter and this applies particularly to signs. An array of oddly sized and shaped signs not only gives confusing messages for drivers, it reduces the quality of a street scene. Studies of individual streets show that in most streets it is possible to considerably reduce street clutter.

5.63 For instance, many traffic signs are not mandatory and may be used at the discretion of the Council. The avoidance of a proliferation of signs and hence street clutter and visual confusion is a positive act to improve road safety. As a result the minimum number and size of signs, consistent with the regulations, should be installed.

The approach to be taken with regard to signage should be consistent with that taken in the emerging guidance on “Edinburgh Standards for Streets”.
Reference should also be made to the Council’s Development Quality Guideline:

• Advertisements and Sponsorship

Design Guidance Checklist

• Signs should be designed as an integral part of the tram system, and instantly recognisable.
• Only the minimum number of signs will be permitted and, if justified, signs should be combined with other elements of the tram system.
• Signage should be considered as a whole, including identity, passenger information systems, directional signs and mandatory street signs.
• A generic family of signs should be developed that are clearly part of the tram infrastructure but are also sympathetic to their context.
• Typical signing at a stop may comprise stop names, perhaps illuminated, usually two per platform; direction signs and local map information, real time information displays, destination signs; timetable information and a braille information panel; and the Edinburgh Tram Logo. There may be a disabled boarding point sign although this may not be necessary.
• Signing associated with the tram must not create unnecessary street clutter with preference being given to integral mounting, and should be sited without impeding circulation on paths.
• Signs relating to the tram must be visible by all, in all weather and lighting
conditions.

- The scale of signs should relate to their context and content.
- Where the posts of signs are painted a colour other than grey the backs of signs should also be that colour.
- Where signs are fixed back to back, they should ideally be the same size.
- Consideration should be given to fixing signs to walls and railings, especially in residential areas.
- The graphic design of signs should achieve continuity, be legible, and reinforce the timeless design solution being sought throughout the tram system.
- Lettering should have little contrast between horizontal and vertical line weights.
- Recessed/raised light-coloured typefaces on dark backgrounds are preferred to be legible by both sighted and visually impaired people.
- Where bespoke characters are introduced, they should be easily understood and used consistently throughout the tram route.
- Primary information is to be clearly lit in a style and at a level that coordinates with the ‘kit of parts’.
- As a general rule display panels should not have internal moving parts.
- Panels should not be located to pose obstruction to visually impaired passengers.
- Passenger Information Systems should be considered in relation to all signage proposed for the tram, including the mandatory signs.
- At least one (double-sided) real-time display must be provided at each shelter or platform, positioned to be visible from the main waiting areas.
- If displays are integral with the shelter they must be legible from furthest point within the shelter and from all seating positions in the shelter.
- The real time display should be mounted horizontally and be capable of displaying scrolling and static information simultaneously. Upper and lower case lettering must be used (to maximise legibility).
- The real time display must incorporate the correct time.
- The display must be legible under all lighting and weather conditions.
- No advertising will be permitted on real-time display facilities, but public information could be incorporated within the display itself.
GRAPHIC IDENTITY

Guidance
5.64 The graphic component of the system design is concerned with typography, the selection of colours and the application of motifs, logos and artwork. How these elements are applied also extends to how the branding is expressed through both the interior fit-out of the trams and the elements that comprise the stops. The creation of a recognisable graphic strategy is crucial in creating a perceived association between tram elements and quality and efficiency.

5.65 To achieve a recognisable graphic identity particular consideration should be given to:
- System/Corporate Identity
- Tram Livery
- Tram Interiors
- Ticketing and Stationery
- Other Information
- Signing
- Advertising
- Uniforms

System/Corporate Identity
5.66 Corporate identity should be reinforced visually by the use of a specific logo, distinctive typeface or use of a particular colour. Consideration must be given to existing publications and branding associated with the city before considering a complementary or deliberately contrasting approach/style. Design solutions should be adaptable to varying scales and forms so that corporate identity can be reinforced throughout a wide range of elements from Tram livery and signs through to interior fit-outs and tickets. A timeless and high-quality solution to the graphic design is advocated.

Tram Vehicle Livery
5.67 The distinctive branding must be applied to the tram itself so that each tram car is instantly recognisable. A colour palette that respects the indigenous colours of Edinburgh’s cityscape is recommended and graphics should reinforce the image of movement in a simple, clear and coherent style. Careful consideration will be given to whether advertising on the exterior of the tram is appropriate.

Tram Vehicle Interiors
5.68 An easily accessible, open, bright and clean interior is paramount to creating a welcoming and safe environment. Interiors need to cater for the city's diverse range of users. Materials must be hardwearing and easily maintainable. Colours used internally should reflect the system identity adopted externally. Consideration should be given to floor coverings, seats, poles and racks, window frames, ceilings and internal lighting. A limited amount of discreet advertising may be considered.

Ticketing and Stationery
5.69 Tickets, passes, route plans/maps, timetables and other items should all be instantly recognisable as part of the tram system's associated material. Information should be displayed clearly. Good communication is imperative to the success of the tram. Whilst people will become familiar with the routes of the tram system because of the presence of wires and rails, knowledge of the system's routes and stops needs to be imparted to the users simply, quickly and in an easily understandable way if maximum usage is to be attained.

Advertising
5.70 Throughout the tram system, advertising must be very carefully controlled and an advertising strategy should be applied consistently along the tram routes. It should not be seen in a negative light, and consideration should be given to using new
technologies in creative advertisement facilities. Commercial advertising should be combined with public information. All external advertising must comply with Council policy guidance.

The preparation of a signage and advertising strategy is recommended to consider the extent of advertising sought.

Refer also to the section on Tram Stops and Signage

**Uniforms**

5.71 The clear, distinctive and discreet colour branding of the system must also extend to the uniforms of tram staff. They should be easily identified by all users.

<table>
<thead>
<tr>
<th>Graphic identity design should be consistent with the emerging guidance on “Edinburgh Standards for Streets”. Refer also to the Council’s Development Quality Guidelines on:</th>
</tr>
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<tbody>
<tr>
<td>• Art in Public Places</td>
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<tr>
<td>• Advertisement and Sponsorship</td>
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</tbody>
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**Design Guidance Checklist**

5.72 Overall System/Corporate Identity

- The system identity should be appropriate to Edinburgh’s character.
- The graphic identity should be clear and instantly recognisable.
- The graphic identity should create a perceived association with safety and efficiency.
- System identity should be reinforced visually.
- Design solutions need to be adaptable to fit a variety of tram system elements.
- The solution should be of a high quality and timeless in design.
- Pictograms should be consistent with those used by the ISO and Edinburgh’s tourist board.

5.73 With regard to Tram Vehicle Livery....

- Graphic design should be incorporated effectively on the tram vehicles.
- A discreet colour palette should be established.
- The colour palette should complement materials such as glass, stainless steel and anodised aluminium.
- Graphic identity/elements should be prominent yet not dominate the surrounding context.

5.74 With regard to Tram Interiors....

- Interiors should be easily accessible, clean, open, and sufficiently illuminated.
- All potential user groups need to be catered for with clear signage with regard to storage of luggage, cycles, wheelchairs, and prams.
- Materials used must be robust, hard-wearing and easily maintained to a high level.
- Colours incorporated should stem from the chosen tram colour palette, reflecting corporate identity.
5.75 With regard to Tickets and Stationery....

- Tickets, route plans/maps and other associated tram stationery must be instantly recognisable.
- Information on such elements should be clear and accessible by all.

5.76 With regard to Advertising....(See also the section on Signage)

- Advertising throughout the tram route should be restricted and comply with Council policy and guidelines.
- Advertising should be discreet.
- Advertising may be incorporated within trams.
- Adverts used on or close to tram shelters or platforms should not impair visibility.
- Adverts should not create street clutter, being instead incorporated into existing tram streetscape elements.
- Adverts on litterbins, multiple shelter panels, and seating should be avoided.
- Careful consideration will be given to whether adverts on the exterior of the tram will be acceptable.

5.77 With regard to Uniforms....

- Uniforms should be easily recognisable as part of the tram system.
- A suitable design of uniform should be selected to reinforce the tram identity.
5(b) TRAMWAY ALIGNMENT AND INTEGRATION

ALIGNMENT

Guidance

Limits of Deviation

5.78 The general route of the proposed tramways has already been set out. The “Limits of Deviation” shown in the plans submitted to Parliament refer to a clearly defined area within which the tram route, associated infrastructure and any mitigation required can be built. In addition to these, there are also Limits of Land to be Acquired or Used – additional land which is needed for construction work.

5.79 Within the urban environment, the limits of deviation are generally set from building line to building line. This allows for maximum flexibility when coming to design the alignment in detail.

Detailed Route Alignment

5.80 The adoption of a coherent/holistic design approach to determining the exact alignment of the tram route, assessing the streetscape in its entirety, will minimise unnecessary visual/physical intrusion.

5.81 Segregated running will be sought wherever possible. This gives faster journey times and also opens up the potential to create a new type of public realm. Segregated tramways add to the overall amount of public realm space and enhance connections between different parts of the city. They increase the visibility of the tram and also its attractiveness to users. Opportunities should be taken to use the tram as a catalyst for regeneration or enhancement.

5.82 The detailed alignment of the tram line will require many different and sometimes conflicting pressures and constraints to be assessed: safety, environmental, transport, engineering, aesthetic, financial, political and operational.

5.83 The final alignment should, therefore, provide an equitable balance between the users’ needs (i.e., those who live, work, visit and socialise in the city), operational requirements and the city’s urban form. An effective and attractive tram system not only provides a transport service but also has the potential to enhance the urban environment for pedestrians by reducing private vehicular traffic. The tram scheme is a key element within the Council’s Integrated Transport Initiative and is promoted as a quality alternative to the car for many urban trips. The aim is to reduce congestion within the city and, therefore, improve the quality of its public spaces.

Taking Account of Urban Context

5.84 The detailed alignment should complement the existing urban form in a sensitive, considered and positive way, reflecting the different character of conservation areas such as the geometry of the New Town, the medieval form of the Old Town, and the tight spaces within Leith and Trinity. It should avoid unnatural changes in direction or contrived curved deviations, facilitating ease of installation. This will also help to secure fast journey times. Edinburgh is also under significant development pressure and requires carefully considered, high quality solutions for more modern environments to encourage the successful and sustainable development of buildings and transportation networks.

Different Character Zones

5.85 The proposed routes for Line 1 and Line 2 pass through different character zones, presenting different design challenges. For instance, Edinburgh’s historic core must be preserved aesthetically and does not have the physical capacity to incorporate
dramatic change. Care must be taken to ensure that the alignment of the tram route complements existing buildings and the current spatial use of the public realm. Generally speaking, the tram line should run parallel to the predominant building line with care being taken to ensure that important visual axes are not broken. A set of Principles was devised for Princes Street (see Appendix).

5.86 In less intensively developed sectors of the city and adjacent to important open green spaces, the alignment of the tram line should be guided by strong visual lines in the landscape, such as fields, avenues of trees or natural variations in contours.

5.87 In more rural or remote locations, the subtle integration of the tram route is essential, in order to ensure that it does not stand out as an unnatural/ alien feature. Utilising existing transport corridors and natural landscape features may help to provide a “fit” with the existing landscape. In many situations, it is not possible to screen the tram’s associated infrastructure.

| The design of the alignment should be consistent with the emerging guidance in “Edinburgh Standards for Streets” and the requirements of HMR1 RSPG Part 2, Section G, Tramways. Consideration should also be given to: Conservation Area Character Appraisals The World Heritage Trust Management Plan The Memorandum of Guidance for Listed Buildings and Conservation Areas |

**Detailed Design Guidance Checklist**

5.88 The detailed design requirements which follow set how the design principles are to be achieved to comply with this guidance.

5.89 The detailed alignment of rails and surfaces should take account of the following requirements:

- Tram lines should run parallel to the predominant building line, and important visual axes (existing or proposed);
- Take due cognisance of the particular sensitivities within the WHS and Conservation Areas;
- Mitigate the impacts on the setting of listed and prominent buildings;
- Maintain important vistas either by running parallel to them or crossing them with minimum intrusion;
- In rural areas and through large open spaces, alignment should follow existing features in the landscape, such as field boundaries or avenues of trees;
- At junctions, the alignment should be as simple as possible, avoiding fragmented spaces and retaining ease of pedestrian movement;
- Minimise land and property severance or isolation;
- Minimise property take and demolition;
- Maximise the space for pedestrians;
- Minimise the impact upon key landscape features such as listed structures, scheduled monuments, archaeological remains and designed landscapes and gardens;
- If a loss of landscape features is unavoidable, replace these;
- Protect existing trees wherever possible and avoid damage to tree roots;
- Minimise potential noise (wheel squeal) and vibration arising from tight radii at junctions, points and crossings;
• Protect residential amenity by minimising the impact of any necessary noise and vibration;
• Address frontager servicing and parking requirements;
• Keep maintenance costs low;
• Minimise track "wiggle" to ensure minimal visual intrusion arising from OLE, kerb lines, fence lines, alignment markings or delineation);
• Minimise construction impacts both on the environment and residents;
• Seek to provide a balance of cut and fill volumes;
• minimise the requirement for visual screening;
• where route runs off-street, seek to avoid "overlooking" from trams; and
• Integrate with the surrounding environment.
OVERHEAD LINE EQUIPMENT

Guidance

5.90 The Council's preference is for a wire free system in the World Heritage Site and other sensitive locations. However, if it is accepted that this is not feasible then the following guidance applies.

General Description for Overhead Line Equipment (OLE)

5.91 Elements:

- Poles: Poles may take a number of standard forms e.g. hollow circular; hollow circular and stepped; universal columns; hollow square (special fabrication). Circular options are generally preferred and allow easier attachment of equipment at different angles. The top of the pole needs a cap to prevent water ingress. This may be a decorative finial if required. The height of poles is dependent on the location and there is a preference to adopt a limited number of standard lengths of pole. Higher poles are generally of larger diameter/width and there are again a limited number of standard options available.

- Pole foundations and mounting. There are a number of alternative foundation options for poles. Some require the base of the pole to be bolted onto the foundation, which has advantages for future replacement. Disguise or treatment at the base must be addressed.

- Rationalisation of Poles with street lighting etc: For safety reasons, OLE poles are not frangible, unlike street-lighting columns. Because of this, OLE cannot be mounted onto existing columns, therefore consideration should be given to rationalisation of other elements onto the new OLE columns. The principal implication of this is for street lighting, requiring electrical safety and maintenance principles to be established. Signage may also be considered.

- Location of poles: Poles may be placed centrally between tracks or to the side of a single track or of double track. Where poles are close to the track, rigid cantilever arms are normally used to support the contact wires. With central poles, the cantilevers are balanced to either side and pole height can be minimised. Cantilevers can be used over two tracks from a side pole, although there is an effect on the height of the pole due to the greater length.

- Building Fixings: In all normal circumstances these will take the form of a stainless steel eye-bolt.

- Contact Wires: A standard size single wire is expected to be used throughout the system. There is some variation in cross-sectional area available as standard and the selection will primarily be made on the overall traction power network design (There is a balance to be determined between cross-section, load requirements and substation location and spacing). In order to achieve a single contact wire, a parallel feeder cable is likely to be required. This would be laid in an underground duct and linked to the contact wire at intervals. Alternatively, solutions using twin contact wires, closely spaced, or catenary are required to give the required cross-section of copper along the route as part of the electrical design. The contact wires are suspended from cross spans of cantilever arms by smaller arms.

- The contact wire is divided into sections (typically 1200-1500m) which must be terminated off the line of the track to poles or other supports. An overlap to the next section is provided to ensure continuity of contact with the tram's pantograph. The contact wire is normally staggered from side to side along the length of the route (by typically +/- 300mm) to promote even wear on the pantograph.
Catenary: An option for off-street sections may be the adoption of a simple catenary system with the contact wire suspended from a messenger wire (that takes the general form of a catenary and gives its name to the arrangement). This would allow significantly increased pole spacing on straight or gently-curved sections.

Tensioning: The contact wire is normally longitudinally tensioned, usually by weights. For tramway applications, these are usually contained within poles of larger diameter. In some locations, it is possible that fixed termination equipment may be used, without tensioning. Operating speeds are limited without tensioning and supports must be spaced closer together.

Support Wiring: The contact wire is suspended from the pole cantilevers or from support wiring between poles and/or other support locations. Where necessary, the contact wire must be restrained or tensioned laterally to follow the alignment of the tracks within relatively small dimensional limits. This is to ensure that the pantograph retains contact without the risk of losing contact sideways due to movement of the contact wire in wind or due to variations in temperature. This is the reason for the increased number of support positions required on horizontal curves, more being required the sharper the curve. Similar requirements are also present in locations of vertical curvature, and are compounded where combinations of horizontal and vertical curvature are present. Components to allow adjustment of the network of support wiring are included in the complete layout design.

Insulation: Insulators must be placed in the support wiring and a system of double insulation is required by HMRI. In general, placing of the insulation as close as possible to the contact wires is preferred in order to minimise the amount of the total OLE network that must be considered as "live" in relation to safety considerations and arrangements for maintenance of both the tramway and adjacent properties. A variety of approaches to the insulating components is available. The aim must be to minimise visual intrusion.

Feeder Cabling (Insulated cables): Electrical power is supplied to the contact wire through cables from substations and additional trackside isolator cabinets (where necessary to provide electrical sectioning away from substation locations). Additional feeding cables are required to link periodically the parallel supply cable with the contact wires. Electrical sectioning is required in a limited number of locations, usually related to the positions of track crossovers to allow for the temporary suspension of services over sections of the route due to emergencies requiring OLE isolation, or planned or unexpected track blockages.

A standard set of components from which the complete OLE system is assembled will be provided.

Materials: to reduce maintenance, components are to be made from non-corroding materials such as stainless steel, or should be galvanised, and, for insulators, plastics or GRP. Poles are usually mild steel with galvanising. Painting (using an appropriate system) can be applied, although this would remain a maintenance liability. An alternative material for support wiring and related components is a synthetic rope. This has a black sheath and is of larger diameter than a stainless steel equivalent.

5.92 In any length of street or section of route, a number of factors have to be considered to achieve an overall balance of visual appearance. Issues to be addressed in achieving this balance include:

- Availability and suitability of buildings for the application of building fixings from both a technical, aesthetic, and architectural/historic sensitivity point of view.
Numbers and sizes of poles. A greater number of smaller poles may well be preferable to a smaller number of larger poles.

Position of poles in respect of highway safety (with consequential protection requirements) and rationalisation of street clutter.

In areas of curvature there are likely to be trade-offs between the numbers of supports (poles and/or building fixings) and the quantity of support wiring. There may be more flexibility in areas of horizontal curvature than in areas of vertical curvature.

To achieve maximum integration with street lighting, but typical spacing is usually different for the two requirements and height of street lighting must be considered in the visual impact of pole design.

Colour and design. The selection of colour and design of both poles and lines should be consistent with other street furniture and should consider the visual appearance.

Ancillary wires and other features should be co-ordinated and their effects considered holistically along with other trackside equipment.

The design of elements required for Overhead Line Equipment should be consistent with the provisions of the “Edinburgh Standards for Streets” currently in preparation. Other relevant planning guidance is contained in the following Development Quality Guidelines:

- Historic Buildings Repairs
- Development Affecting the Setting of Listed Buildings
- Conservation Area Character Appraisals
- The World Heritage Trust Management Plan
- The Memorandum of Guidance for Listed Buildings and Conservation Areas

5.93 Detailed Design Guidance Checklist

- Need for early discussion with the Planning Authority regarding suitable approach for particular streets or sections of streets
- Cross refer to Princes Street Guidelines and any other public realm/townscape guidance.

5.94 Where poles are accepted as the appropriate solution

- the alignment of poles should run parallel to the predominant building facade.
- the intervals between poles should be consistent and the locations must take cognisance of adjacent building fenestration and entrances.
- Poles should be spaced to maintain clear visual axis across bisecting streets.
- Where there is a strong visual axis along the full length of a street, the rhythm of the poles should be considered for the street as an entity.
- The effect of colour of the poles and OLE should be considered and a consistent colour chosen in accordance with “Edinburgh Standards for Streets”.
- The design (shape and height) should take reference from other street features and be consistently applied. Height of poles should be consistent.
throughout each section of the route.
5.95 Where building fixings are to be used

- Evidence of structural suitability to be provided
- Building fixing positions must in each case respect the building features, e.g. fenestration and ornamentation.
- Fixings should be discreet in terms of position and actual fixing design
- All building fixings must be stainless steel or other suitable corrosion-resistant material.
SURFACING

Guidance

5.96 Materials will need to comply with the provisions of the Edinburgh Standards for Streets document.

5.97 General requirements for tram surfacing are driven more by the requirements of other road traffic and pedestrians than by tramway-specific requirements.

5.98 Within existing streets, track construction in street will be developed to allow a variety of possible surface finishes to be applied. Surface finishes should be in line with those described in the Edinburgh Standards for Streets, or developed in consultation with the Council. The in-street track construction and possible surfacing options may include specific requirements when there is general traffic running along the track, or across the track. A similar approach will be adopted off street.

5.99 One additional general principle is to avoid excessive areas of metalwork (comprising rails, especially at pointwork, and manholes or equipment access covers) in trafficked carriageways.

**Surfacing should be consistent with the provisions of the emerging guidance in “Edinburgh Standards for Streets”. Refer also to the Council’s Development Quality Guideline on:**

- Sett Paved Roads

Guidance in the HMRI RSPG Part 2, Section G, Tramways also applies.

**Detailed Design Guidance Checklist**

5.100 General

- Surfacing should be simple and respond to the local context.
- Only a limited palette of materials should be used, reflecting the Council’s emerging guidance ‘Edinburgh Standards for Streets’.
- Road design standards must be satisfied in the context of the Edinburgh Standards.
- All materials should be capable of being laid to tolerances to provide free flow of drainage.
- The direction of movement or segregation should be clearly delineated/or protected within pedestrian zones.
- The need for physical barriers should be designed out where appropriate by the selection of appropriate materials.
- Physical control measures will only be considered where there is a risk that vehicles could cross the tramway.
- The selection of the most appropriate trackform and finish for each location depends on a number of factors and will be determined after detailed consideration.

5.101 Noise

- The construction of the trackslab must be designed to reduce ground-borne vibration or noise, particularly to adjacent properties.
- An acceptable balance must be reached between technical requirements for noise reduction and aesthetic requirements within sensitive areas of townscape, particularly in the WHS and conservation areas.
5.102 Definition of Tramway Path

- Final alignment of the tramway should take cognisance of potential visual impact at junctions/changes in direction.
- The lines and fine curves (ellipses) associated with Edinburgh's street grids and layouts must be respected and reflected in the proposed track alignment.

5.103 Workmanship and Maintenance

- Establish a co-ordinated, public/private sector partnership to address issues of public realm management and maintenance.
- Design out potential maintenance problems with particular regard to the layout of elements of street furniture and avoiding the creation of litter traps.
- Ensure the Council's preferred method of street cleaning can be accommodated, (for example, access for mechanised street cleaners).
- Ensure that paving surfaces, material and construction can withstand the potential eroding or corrosive effects of the preferred cleaning methods.
- Ensure that new paving is finished off to marry neatly with existing areas and that specifications for workmanship follow council requirements.

5.104 Surfaces

- The finish between the tracks should be the same as that of the carriageway material. However in a street environment consideration should be given to differentiating the tram lane (HMRI Requirement).
- The finish of platforms/ramps should mimic that of existing pavements, creating distinction between pedestrian and vehicular routes.
- Continuity of surface material is paramount, however paving size and layout may be adapted to fit a specific area, such as platforms although differentiation may need to be accommodated (HMRI Requirement).
- Where required, cycle lanes should only be segregated from pedestrian circulation through change in ground surface material or surface features instead of physical barriers.
- The design of pavement/platform kerbs should create contrast for ease of use by those visually impaired and fit with the "Edinburgh Standards for Streets".
- Pedestrian crossings should comply with Edinburgh's guidance with regard to surface treatment at crossing points.
- Where the tram runs through amenity grass the finish between the tracks should be low-maintenance, fine textured grass, unless otherwise agreed.
- In selecting grass track finish, consideration needs to be given to any unwanted effects such as pedestrian use.
- Ballast should be implemented in depot areas, industrial areas and less sensitive or visually unobtrusive locations. The ground treatment will provide a well-drained solution.
- Easy access for grass cutting and maintenance is required along the track and, depending on layout, two metres either side, cutting twice a year (minimum).
- Where vehicle over-run of grass track is foreseen, a plastic reinforcement grid system, or similar, should be included.
- Where pedestrian/cycle paths cross the track, the surfacing and edging of these will continue across the track infill.
- In low maintenance grass areas the finish between the tracks could be a
wildflower mix of low-growing fine grasses and low-growing native wildflowers, sown on low-fertility topsoil, cutting twice a year (minimum).

- Where dirt tracks cross the track, wet rolled, bound-gravel construction, which will be restrained by pegged, treated timber will be implemented for the 1.5m minimum wide path, 3m either side of the outside rails.
- Consideration should be given to Sustainable Urban Drainage Systems (SUDS) requirements.
ACCESS FOR ALL

Guidance

5.105 Care must be taken to ensure that all the statutory obligations are met with regard to access in the public realm and in relation to the tram system.

5.106 In order to achieve a high standard of accessibility throughout the tram system, consultation with representatives from each of the identified user groups will be necessary at key stages throughout the design process.

5.107 Reference should also be made to the sections on Stops (see page 44) and Surfacing (see pages 81-92).

The design should be consistent with the emerging guidance in “Edinburgh Standards for Streets”. Refer also to the requirements of the Council’s Development Quality Guideline on:

- Access to the Built Environment
- Community Safety

The provisions of the Department for Transport Inclusive Mobility Guide to Best Practice on Access to Pedestrian and Transport Infrastructure and the Disability Discrimination Act 2005 (DDA) and the Rail Vehicle Accessibility Regulations must also be complied with.

Design Guidance Checklist

- The accessibility requirements of different user groups must be satisfied with regard to each element of the tram system.
- Address any necessary changes in level as an integrated, positive design feature.
- Crossings should be designed to prevent wheelchairs and prams being caught in the rails.
- In all instances, it is proposed that any street furniture located within active or passive pedestrian spaces should be minimised, if absolutely necessary. This reduces the potential number of hazards, not only to wheelchair and pram users and the partially sighted, but to pedestrians in general.
- All necessary trackside equipment should be set out in a logical and considered way to avoid creating potential hazards.
PEDESTRIANS & CYCLISTS

Guidance

5.108 To maximise the use of the tram system by pedestrians and cyclists, access for these user groups to tram stops must be easy, recognisable, direct and safe. Footways/footpaths and cycle tracks should be well defined and aligned with the tram track, only merging with each other at tram stops if no other design solution can be implemented.

5.109 Consideration is required in the design and delineation of footways/footpaths and cycle tracks alongside tram tracks to ensure that existing widths are maintained and, if possible, extended. This is particularly important in areas of heavy pedestrian or cycle movements. An important part of the design will relate to the detailing of pedestrian, cycle and tram intersection points at tram stops and crossings, to ensure safe and direct access to the tram system.

Design should be consistent with the "Edinburgh Standards for Streets" document. Access arrangements shall also comply with the Disability Discrimination Act (DDA) and the Council’s "Movement and Development" guidelines for adoptable roads and its "Cycle Friendly Design Guide" document.

Detailed Design Guidance Checklist

5.110 The following design requirements must be satisfied.

- Pedestrians and cyclists should be given priority by providing appropriate circulation space adjacent to the tram route.

- The tram should either connect with existing pedestrian and cycle links, where practical, or give rise to new routes, creating a higher level of accessibility.

- Tram stops should connect with existing and proposed pedestrian links.

- Safe and appealing pedestrian paths must be created through careful delineation and use of changes in level or surfacing in preference to physical barriers.

- Physical barriers should be avoided where possible as they create unused or unsafe routes. However they may be needed in particular locations to promote safety for pedestrians or cyclists.

- There must be a minimum of one crossing point at any on-street tram stop, appropriately designed to create directness and ease of use. At off-street tram stops, two crossing points should be provided.

- Where a tram stop platform is integrated into the footway, the needs of pedestrians proceeding past the platform must be accommodated, including access to premises along the section of the footway that is also used as the platform.

- Dropped kerbs and flush crossing of tram lines should be provided.

- Crossings should, ideally, be at right angles to the tram track or the street, with minimal physical barriers surrounding them.

- Crossings should be sufficiently illuminated to enhance the visibility of...
pedestrians and cyclists by other road users.

- Crossing points should be provided at frequent intervals along the tram route and provide easy access for all users, including those with prams and wheelchairs etc.

- Sufficient ambient lighting must be incorporated along pedestrian and cycle routes.

- Cycle/pedestrian routes are to be provided alongside the tram track on those sections where the tram route follows a corridor currently occupied by a cycle/pedestrian path only.

- Where space allows, cycle/pedestrian paths should be separated from the tram track by a grass verge, with 2m desirable optimum.

- For on-street sections, cycle lanes should be implemented where possible, to encourage segregation from the tram tracks.

- Cycling on platforms will not be accepted and should be designed out.

- Cycle parking, in the form of cycle stands and/or secure lockers, should be sited close to or on platforms as an integral part of the tram stop, where appropriate. The number of spaces should relate to tram stop location and anticipated demand.

- If possible, cycle parking should be in locations able to be overlooked by CCTV.

- Cycle stands should be secure and sheltered from external elements. Materials used should be robust, vandal resistant, easily maintained and to conform to the tram identity.

- Cycle routes should be fluent throughout the tram route, avoiding interaction with both trams and other vehicles, such as parked cars or unloading areas, and be designed so as to minimise the crossing of the tracks.

- Where there is restricted space and cycle routes cannot be implemented safely, they should merge with pedestrian routes rather than tram or vehicular paths.
DESIGN ELEMENTS OF ENVIRONMENTAL MITIGATION

Guidance

It is important that the environmental impact of the tram is minimised and that this is a major consideration in the design process. All environmental mitigation measures must be well designed and long-lasting. Careful consideration must be given to the diversity and character of the areas through which the tram route passes. This includes the World Heritage Site, various Conservation Areas, seafront areas including the Firth of Forth SSSI / SPA, Sites of Importance for Nature Conservation, rural and semi-rural settings, and the Green Belt. Assessment of these and any other areas of interest together with survey work to identify essential and desirable mitigation to be incorporated into the overall landscape design will be undertaken. The survey work will be carried out by a qualified ecologist and will identify the requirements for complying with all protected species and habitat legislation.

The design, implementation and subsequent management of mitigation measures must respect not only the character of these various areas but their full environmental, ecological and cultural context. This work should be carried out in consultation with CEC and other relevant bodies such as Scottish Natural Heritage.

The design and construction of environmental mitigation measures must be consistent with the following:

- The relevant Environmental Statement
- Edinburgh Biodiversity Action Plan
- The Landscape, Habitat and Management Plan
- The Noise and Vibration Policy
- The Code of Construction Practice
- Control of Substances Hazardous to Health (COSHH)
- Health and Safety Regulations
- BS 5837:2005 Trees in Relation to Construction
- BS 3998:1989 Recommendations for Tree Work

Consideration should also be given to:

- Conservation Area Character Appraisals
- The World Heritage Trust Management Plan
- The Memorandum of Guidance for Listed Buildings and Conservation Areas

The design of measures of environmental mitigation should also take account of the Council's Development Quality Guidelines including:

- Quality of Landscaping in New Developments
- Biodiversity
- Tree Protection
- Urban Forestry

**Detailed Design Guidance Checklist - General**

Reducing the environmental impact of the tram and providing suitable mitigation should be central to the design process. The following design requirements should be considered:

- Refer to the relevant Environmental Statement.
• Comply with performance criteria set out by the CEC and other requirements (as identified above).
• Mitigation measures must be designed to take account of the full context of the area where they are to be introduced and be carefully related to the design of other elements of the tram infrastructure.
• Mitigation measures must be designed to create a positive visual impact.

**Detailed Design Guidance Checklist - Tree Works/Management**

There will be a presumption against the felling and pruning of existing semi-mature and mature trees unless this can be proved to be absolutely necessary for engineering or health and safety reasons. The trees which are expected to be felled or pruned are those already identified in the Environmental Statements. A qualified arboriculturalist will be appointed to prepare a tree report prior to any works commencing. This report will set out clearly baseline tree conditions (location, species, condition, height, spread and diameter, each tree being identified by numbering and tagging) within the Limits of Deviation of the corridor; trees to be felled and justification for this; trees requiring pruning or other arboriculture work; and continued tree management required. Notice of tree works should be given to:

- Third parties indirectly affected by tree work proposals;
- The local roads authority if traffic restrictions are required or where works are to take place within, or adjacent to, public spaces;
- The local parks authority if pedestrian restrictions are required in parks or where works are to take place within, or adjacent to, public urban green-spaces;
- Local councillors;
- The Forestry Authority, to ascertain if a felling licence is required; and
- The general public, by means of advanced notices/publicity.

Consideration should be given to the following design requirements:

- All trees, woodlands and hedgerows, irrespective of Tree Preservation Order (TPO's) or Conservation Area (CA) protection, are to be retained unless engineering or health and safety reasons dictate felling.
- If retention of existing trees, woodlands and hedgerows is not possible, then new planting on a similar scale to that which is to be lost must be designed.
- All trees, woodlands and hedgerows not to be felled must be clearly marked and protection measures put in place prior to site work commencing.
- Such work will take due account of season especially with regard to bat roosting and bird nesting (see above).
- All tree work will be carried out as per the Tree Report and will be in compliance with current best practice (see above).
- Timber will be disposed of in a sustainable manner, with alternative end uses to be found wherever possible, and will not be burnt on or off site.
- The relocation or location of utilities from 'soft' areas into shared conduits under 'hard' areas to protect existing trees and to maximise the potential for new planting.
- Proximity of track/OLE poles to existing trees to be retained and the relocation of poles to avoid tree removal;
- Minimisation of root severance to ensure tree longevity by employing hand digging around base of tree below canopy
- Finished levels of made-up ground in relation to root collar and root depth; and
- If retaining walls are required near trees, underground-bridging lintels should be used, in order to retain primary roots.
- Construction around trees will take full cognisance of current best practice.
Detailed Design Guidance Checklist - Planting

The design and choice of planting is vital to the successful integration of the tram into both urban and rural settings. Consideration should be given to the following design requirements:

- Retention of existing trees and hedgerows wherever possible, where they are in good health and tie in with new planting proposals;
- Provide a comfortable ‘fit’ with the adjacent context. Mitigation measures must not create visual intrusion in themselves;
- Avoidance of contained linear forms of planting such as hedgerows where the route crosses naturally open tracts of land, unless such planting is required for essential screening;
- Replanting of trees that are lost to the tram system construction;
- In principle all planting will be based on the use of native species proven to be locally hardy by established presence within the area.
- There will be a concentration on the use of young stock, which will more readily establish in these conditions, although larger plants may be used for initial impact in specific high-profile locations.
- Broadleaved woodland planting comprising a mix of transplants, whips and feathered trees with associated understorey species should be used to create multi-layered woodland with a mix dominated by native deciduous trees, comprising large woodland species and with oak and ash as the principal climax community.
- Mixed woodland planting comprising a combination of transplants, whips and feathered trees with associated understorey species should be used to provide mature multi-layered woodland with an appropriate mix of native deciduous, coniferous and evergreen species. Key species will include oak, ash and Scots pine. The balance between deciduous and evergreen species will be varied to suit desirable density of year-round screening and reflect local planting and landscape character.
- Enhancement and creation of habitat diversity, for example, the establishment of semi-natural grassland, scrub, freshwater and marginal habitats within severed areas, left-over corners or damp hollows immediately adjacent to the corridor.
- Compensation for loss of existing hedgerows and reinforcement of the existing hedgerow structure to enhance local landscape and ecological interests. Hedgerow trees and hedging species should be introduced in locations consistent with local landscape character and should be planted in a double staggered row.
- Use of mass planting at tram junctions, bridges and other structures to help assimilate the new arrangements into the surrounding landscape;
- There will be particular areas, such as in higher-profile urban and suburban areas and business parks, where the proposals will include amenity shrub and groundcover planting, with specimen trees and shrubs and feature hedges. These will normally be planted at a higher density and to a more robust specification than in more rural situations, in order to withstand the higher degree of wear-and-tear and vandalism to which they may be subjected.
- Planting to screen or reduce potential visual impact for identified receptors;
- Planting of severed field corners and landlocked areas where appropriate; and
- Introduction of local focal points of planting, where appropriate.
- In rural areas and wildlife corridors planting species should be native. In
urban areas ornamental species appropriate to context may be considered. Final selection will be governed by context and the requirement to ‘fit’ into the existing environment.

- Cognisance should be taken of the Edinburgh Biodiversity Action Plan.
- Boundary treatments must reflect the existing context.
- In key locations ‘one-off’ designs should be considered to provide a high-quality design statement.
- Three forms of seeding will be used throughout the substantial part of the design. A verge and track infill mix suited to low levels of annual maintenance and with the potential to develop semi-natural characteristics will be the principal mix. Where areas are to be returned to agriculture, appropriate seed mixes will be selected after consultation with the Scottish Executive Environment and Rural Affairs Department (SEERAD). For informal, low-maintenance areas, often in association with scrub and also for rural track infill, a rough grass mix is proposed, comprising native, non-invasive grass species and wild flowers.
- A landscape management plan should be put in place to ensure establishment of all new habitats and planting.

**Detailed Design Guidance Checklist - New Cuttings and Embankments**

Consideration should be given to the following:

- Cross-sections on cuttings and embankments should be natural-looking and rounded with smooth curves grading into adjacent contours.
- In rural and urban-fringe settings should grade out to a shallow gradient suitable for return to agricultural.
- Retaining walls are only appropriate in urban or suburban areas where space is constrained.
- Retaining walls may utilise natural stone that provides a visual ‘fit’ with the surrounding townscape. There may be other means of achieving an appropriate visual fit.

**Detailed Design Guidance Checklist - Acoustic Barriers**

Consideration should be given to the following:

- Acoustic barriers where required must meet the noise attenuation performance criteria required for each specific location.
- Where acoustic barriers are a requirement, their design should be aesthetically pleasing and sympathetic to the character of the local area.
- Adverse visual impact disproportionate to the benefits of noise impact mitigation must be avoided.
- The design of acoustic barriers should take account of available space, topography, maintenance and cost.
- Planting will of itself not be used as an acoustic barrier although it should be considered as a means of positively assimilating the barrier with its setting.

**Detailed Design Guidance Checklist - Fences, Railings and Walls**

Fences, railings and walls may be required for security, safety or aesthetic reasons. Consideration should be given to use of such structures in the following circumstances:

- Where it is desirable for the public to be kept away from the track in rural or semi-rural situations, for example, within Green Belt areas;
- In urban areas where existing boundaries are severed or there is a need to tie into existing boundaries;
• In rural areas where existing boundaries or hedgerows are severed, where stock proofing is required or there is a need to change or tie into existing boundaries;
• Where an acoustic barrier is required, acting both as a boundary and as a noise mitigation measure; and
• In other locations as may be agreed as necessary with the City Council Planning Authority.
• The design of any boundary structure must be in harmony with local townscape and landscape character, for example rural areas, seascapes, watercourses and be sympathetic to designations such as Conservation Areas or Wildlife Corridors.
• There may be situations where a design statement is provided if innovative or specific design solutions are required.

**Detailed Design Guidance Checklist – Archaeology and Historic Built Environment**

Consideration should be given to the following:

• Refer to the relevant Environmental Statement.
• Adverse physical impact upon archaeological sites and monuments must be avoided where possible.
• Designs must minimise their impact upon the settings of historic monuments and upon historic landscapes and designed gardens.