Trams to Granton, BioQuarter and Beyond

Landscape, Streetscape and Heritage Report

The City of Edinburgh Council

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Trams to Granton, BioQuarter and Beyond Landscape, Streetscape and Heritage Report

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1. Introduction

1.1 Purpose of this Report

This report provides an overview of the key landscape, streetscape and heritage issues along the route of the proposed Trams to Granton, BioQuarter and Beyond corridor, and potential mitigation to offset these. This document is one of three interrelated reports, the others covering Ecology and Health & Wellbeing. Together, these help inform the Strategic Business Case (SBC) for the scheme.

On the Roseburn corridor, landscape impacts are of greatest significance, with the potential for tree loss and a reduced level of amenity. On the Orchard Brae and South East corridors, streetscape and heritage impacts are typically of greater concern, although local landscape impacts also require to be addressed.

1.1.1 Roseburn Baseline

Much work has already been undertaken on the Roseburn corridor. This report provides a review of the Landscape and Visual context to the Roseburn corridor, including confirmation of the baseline situation +20 years since original survey work was undertaken. It has been prepared following a review of the Landscape and Visual Impact Assessment (LVIA) published as part of the Environmental Statement (ES) to the Edinburgh Tram Line 1 report in 2005, the Landscape Habitat Management Plan (LHMP) (prepared December 2006) and field survey work undertaken between November 2020 and May 2025.

The LVIA to Line 1 (2005) included an assessment of effects on the landscape character of the Roseburn corridor in addition to an assessment of the impacts on the visual amenity of people likely to be affected by the tram project where it passed through the Roseburn section.

The Landscape Habitat Management Plan (LHMP) was initially prepared in June 2005. As the engineering design was revised so too was the LHMP taking into account changes to the alignment and design of the tram line. This included consideration of the width of the track and cycleway / footpath which had implications on elements such as the steepness of earthworks and the requirements necessary to ensure stability.

1.2 Proposed Tram Route Options

The Trams to Granton, BioQuarter and Beyond route comprises of three sections. Two alternative alignments between the city centre and Granton are being considered: one off-street via the Roseburn Path and one on-street via Orchard Brae and Crewe Road South. Both options serve the Western General Hospital and planned major development at Granton Waterfront.

To the south east, between the city centre and the BioQuarter, a single route is proposed via North and South Bridge, Minto Street / Craigmillar Park, Lady Road and Cameron Toll. This provides connectivity to the University of Edinburgh, Cameron Toll shopping centre, the Royal Infirmary and BioQuarter. Beyond the BioQuarter, a route to Shawfair would provide interchange with the Borders railway, improving regional connectivity. A route to Queen Margaret University and Musselburgh Station, via Craigmillar and Fort Kinnaird, is also under consideration.

Each tram section is shown in Figure 1.1. Potential tram stop locations from north to south are:

Granton (via Roseburn)
- Roseburn
- Craigleith
- Telford Drive (for WGH)
- Crewe Toll - Roseburn Path
- West Pilton
- Caroline Park
- Saltire Square
- Granton Square

Granton (via Orchard Brae)
- Queensferry Street
- Queensferry Road
- Comely Bank
- Western General Hospital
- Crewe Toll - Telford Road
- West Pilton
- Caroline Park
- Saltire Square
- Granton Square

South East
- North Bridge
- Nicolson Street
- Newington
- Mayfield Gardens
- Cameron Toll
- The Inch
- Royal Infirmary
- BioQuarter
- The Wisp
- *Millerhill Road**
- *Shawfair Station**

**Within Midlothian*

Figure 1.1: Trams to Granton, BioQuarter and Beyond Route Options

2. Roseburn Corridor

2.1 Review of Baseline Conditions

2.1.1 Planning Review

In 2005 the Roseburn corridor between Roseburn Terrace and Telford Road was designated an Urban Wildlife Site. This designation is no longer maintained in the City of Edinburgh Development Plan. Instead, in City Plan 2030, the Roseburn corridor is divided into three Local Biodiversity Sites:

- Dalry to Blinkbonny;
- Davidsons Mains to Quarry; and
- Craigleith to Pilton.

These sites are considered by the City of Edinburgh Council to be of local importance for wildlife or for their geological or geomorphological interest and are identified in order to protect biodiversity at the local level.

More widely, it is acknowledged that as well as the amenity value that trees and woodland provide for path users, the tree cover along the disused railway lines of north Edinburgh contribute to the structure and character of the urban area, as perceived from surrounding streets, serving as a backdrop to buildings and neighbourhoods.

The vegetation on the Roseburn corridor is not protected by a Tree Preservation Order (TPO), although the section south of Ravelston Dykes is within the Coltbridge and Wester Coats Conservation Area, which affords some protection to trees.

2.1.2 2005 Landscape and Visual Baseline Review

The 2005 Landscape and Visual Impact Assessment (LVIA) provided a baseline description of the landscape and visual context to the Edinburgh Tram Line 1 including the Roseburn Railway corridor. An extract of the 2005 baseline description of the Roseburn corridor is provided below.

> "The disused Granton Branch of the Caledonian Railway is now a linear open space and well used cycle and pedestrian path. The northern end is a broad flat strip of neglected open ground, an area of overgrown grass and shrubs bounded by low-rise housing estates and in part opening out onto a lightly used playground and mown grass recreation space. The southern half is mostly a lush woodland valley below surrounding residential areas but occasionally surfaces to level and in parts runs on embankment. A continuous overgrown hedge lines the path on either side and defines the boundary of the corridor.
>
> A quiet park used mostly for recreational walking and cycling, parts of the route can feel somewhat insecure and remote, particularly at night, because little of it is overlooked.
>
> Stone bridges, extensive stone retaining walls and old platforms act as reminders of the disused railway line. The cycle route is a simple asphalt path with no edge treatment, and timber steps lead to crossing streets. The only street furniture is street lighting and some information boards, mainly vandalised."

2.1.3 2025 Landscape and Visual Baseline Review

General

Following a desktop study, including a review of the 2005 LVIA, a number of walkover surveys of the Roseburn corridor have been completed in order to identify any changes to baseline conditions that have occurred since the publication of the original LVIA. The walkover was conducted by members of the design team including professionally qualified landscape architects.

In general terms, the walkover confirmed that there is little or no physical change to the landscape qualities and character of the Roseburn corridor and the route remains very similar to how it was described in 2005. Nevertheless, vegetation within the corridor has in the interim continued to establish and mature. This

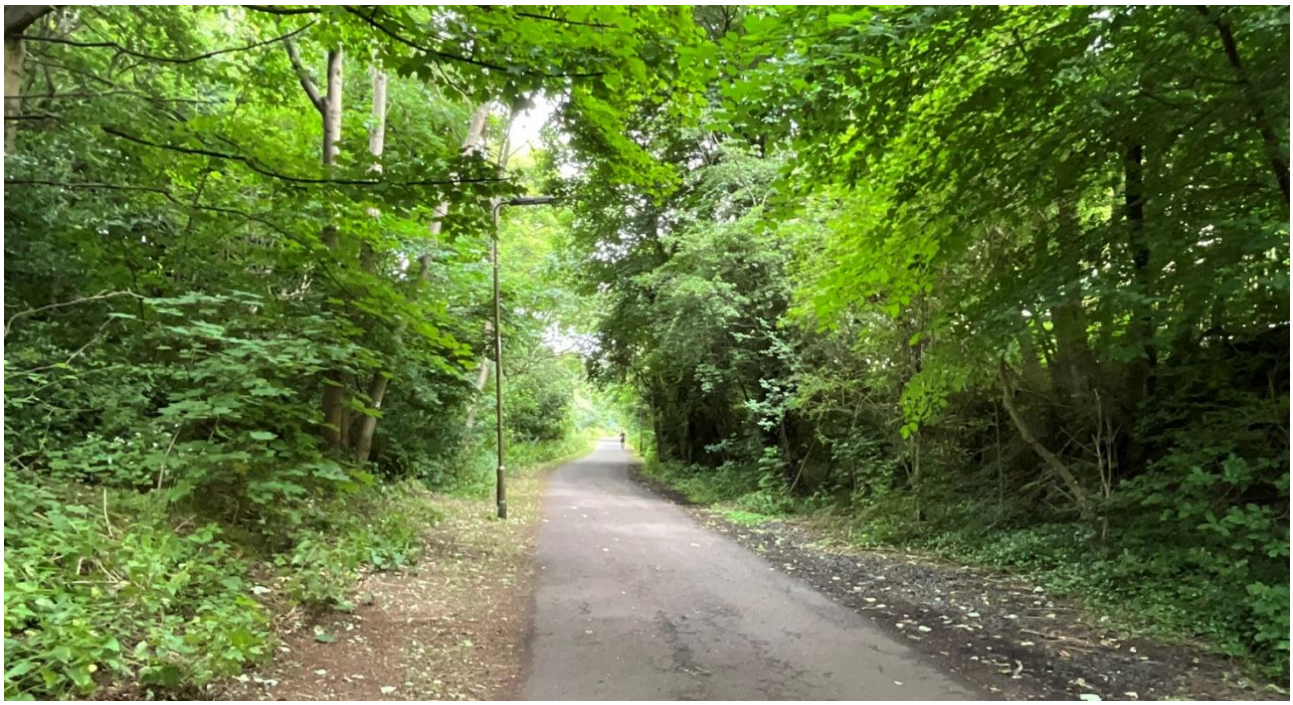
includes establishment of the existing trees within the corridor such that there is a greater extent of canopy closure above the 3m wide cycleway / footpath.

Further detail on the character of the landscape and other observations is provided below.

Landscape Character

The walkover survey confirmed that the Roseburn Railway corridor is largely unchanged in character since 2005. Vegetation within the corridor has continued to grow and mature and from review of online aerial photography, corroborated by the walkover survey, there is greater canopy closure as trees have matured, and a greater extent of overshadowing of the footpath and properties adjacent to the corridor. An illustrative view highlighting the closure of the canopy and establishment of trees within the corridor is provided in Figure 2.1 below.

Figure 2.1: Roseburn Corridor Highlighting the Closure of the Canopy Above the Footpath / Cycleway



Vegetation within the corridor has been largely retained and / or established further. This is evident in the increasing maturity of tree species within the corridor and the closure of the canopy above the footpath / cycleway, and an increased establishment of scrub, particularly in the southern section of the corridor close to where the proposed line would tie into the existing tram line. There was evidence of some management of vegetation in places within the southern section of the corridor with evidence of tree planting (including tree guards). There was also evidence of tree cutting but it was not possible to ascertain when this was conducted and by whom. It was not apparent if any large tree specimens had been recently felled or managed. Coppicing, which was indicated as having previously been undertaken within the corridor as part of tree management (refer to the LHMP) also does not appear to have been maintained, evident in the establishment of some of the multi-stem trees within the corridor. There is a need to remove a number (~300) of trees due to Ash Dieback, which the Council will be actioning in due course.

The composition of the vegetation within the corridor appears to be much the same as previously described. Sycamore remains a dominant tree species with other tree types present such as birch and ash. As trees within the corridor have continued to mature and enclose the corridor the establishment of any understorey planting has remained hindered and as previously identified in 2005 there is limited structural diversity. An illustrative view of the typical vegetation structure within the Roseburn corridor is provided in Figure 2.2.

The retention of trees within the Roseburn corridor was a key topic during the passage of the Tram Bill through the Scottish Parliament and the subsequent Tram Inquiry. Residents were particularly keen to retain as much vegetation as possible for its amenity value, and there were indications that some objections to the Roseburn corridor proposals were made in relation to privacy / visual screening.

There is a TPO adjacent to the Roseburn path in the grounds of the Holiday Inn Express Hotel on Queensferry Road at Craigleith junction (TPO-15). This is however out with the project boundary on private land.

Figure 2.2: Tree and Scrub Vegetation Establishment Within the Roseburn Corridor

The survey found that since the original LVIA was published, there do not appear to be any changes to the landform including the cuttings and embankments within the Roseburn corridor. For reference, illustrative views of the Roseburn corridor as it appears in 2025 are provided in Figures 2.3 to 2.5 below.

In advance of the next stages of design work, a full tree survey would be required to understand the extents of the impact on the existing trees. The project would seek to retain and design around any significant trees of merit.

Figure 2.3: Roseburn Corridor Adjacent to the Roseburn Maltings Development Looking South

Figure 2.4: Roseburn Corridor Looking North Towards Queensferry Road

Figure 2.5: Roseburn Corridor North of Drylaw Park Facing South

2.2 Tram and Active Travel Requirements

A significant level of detailed tram design work had been undertaken before design work was stopped in 2008. Initial tram and active travel design for this current work has been based on the earlier scheme.

The original proposal was for a twin track alignment throughout, with 3-metre-wide active travel provision where possible, but reduced at key locations including most Victorian bridge structures. Structures and Geotech solutions had been identified, and a package of landscape and environmental measures identified. Since 2008, legislation has changed, particularly around environmental impacts, but also in terms of design standards and accessibility. The 2025 scheme design adapts the 2008 proposal to take account of current legislation requirements.

The Roseburn section of the tram route starts at Roseburn junction (at Balbirnie Place) and runs northwards towards the A8 and Roseburn tram stop on an embankment.

Figure 2.6: Roseburn to Ravelston Dykes

Several options for active travel provision are being considered. Delivering both tram and active travel on the existing embankment would result in significant tree loss. It may also require major retaining wall structures with resulting visual impacts.

An at grade route to the west would use Russell Road connecting into recently completed infrastructure on the A8.

An at grade route to the east would pass under the tram line connecting onto Balbirnie Place. An improved ramp (at a lower incline than existing) would be provided to enable access onto the A8 overbridge; alternative at grade provision could also be provided, east of Wester Coates.

Both options provide improved connectivity to the Roseburn to Union Canal active travel scheme, reducing the gradient and removing the hairpin turns that currently connect Russell Road to the Roseburn Path.

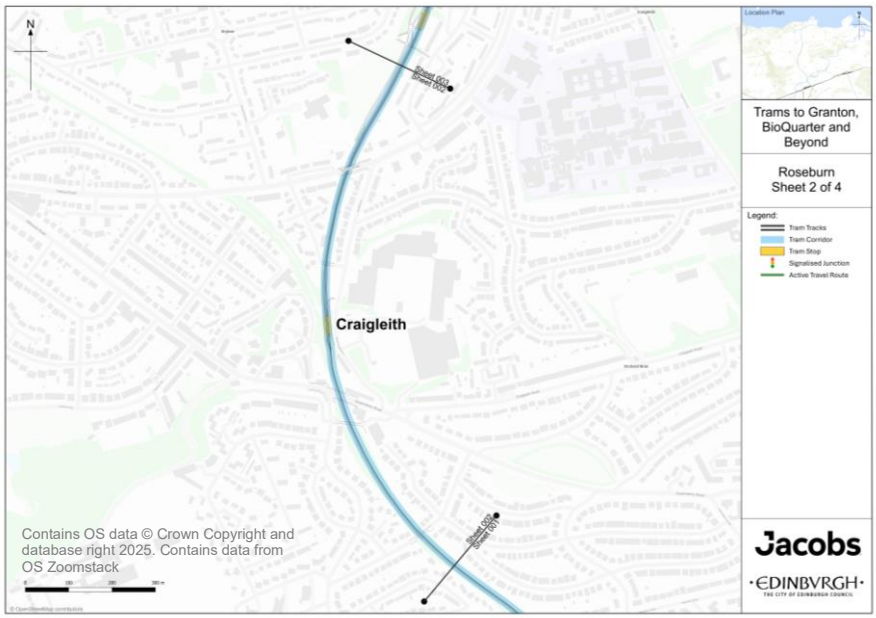
Figure 2.7: Alternative Active Travel Provision Options Between Russell Road and the A8

Crossing the A8, the alignment follows the Roseburn Path crossing Coltbridge Viaduct. With twin tracks, the 2008 scheme design assumed that a new walking, wheeling and cycling bridge would be constructed on the west side of the viaduct.

North of Coltbridge, the route first runs on a steep embankment before transitioning to a cutting. The tram route passes under Chapelhill Road and the St George's school pedestrian Bridge. It then continues in steep cutting under Ravelston Dykes. Two tracks require the active travel path to be narrowed under Victorian railway structures.

With long access ramps, the 2008 design for the Ravelston Dykes Stop is no longer considered Disability Discrimination Act (DDA) compliant. Lift access would therefore be required to serve passengers with reduced mobility.

Figure 2.8: Ravelston Dykes to Telford Road



Beyond Ravelston, the tree canopy is significantly reduced; however, space constraints limit the availability to provide twin tracks, active travel and landscaping. Craigleith Drive bridge would be replaced as part of the scheme. The route then continues in increasing cutting, passing under Queensferry Road; again, this bridge is a constraint with active travel provision requiring to be narrowed to fit within the <9 metre cross-section.

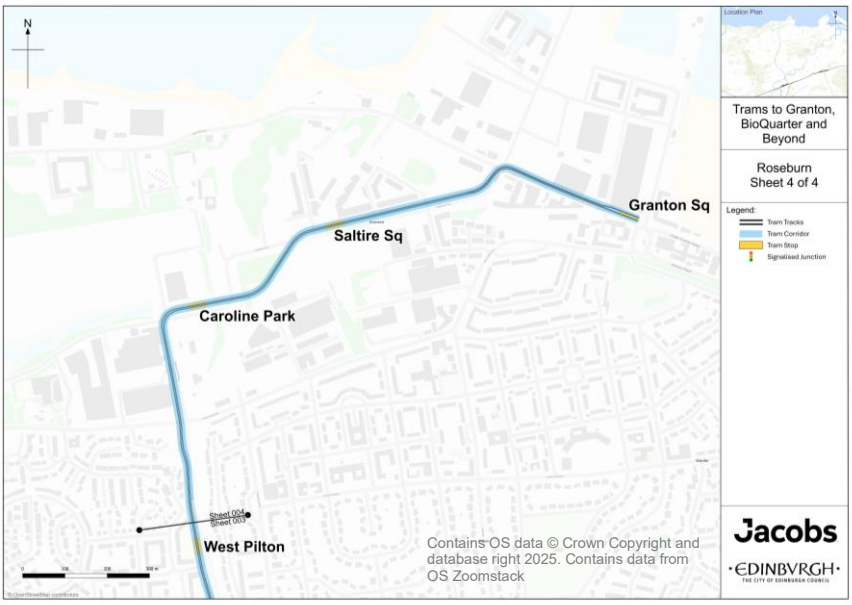
A tram stop would be provided at Craigleith, serving the local community and nearby retail park.

Figure 2.9: Telford Road to Crewe Toll and West Pilton

The alignment cross-section is narrow between Craigleith and Telford Road, providing twin tracks and an active travel path means that there is limited opportunity to provide new landscaping. Over this section, the active travel path is 3 metres wide.

For a short section through Telford Road bridge, the active travel path is reduced to approximately 2.1 metres. Beyond, the alignment widens to the west of Easter Drylaw Park, continuing in open land to a new tram stops at Telford Drive / Western General Hospital and Crewe Toll.

Figure 2.10: West Pilton to Granton Square



North of Crewe Toll, the route runs adjacent to or on-street, on an alignment previously reserved for tram.

2.3 2025 Additional Scheme Mitigation

Design principles and constraints have moved forward significantly since 2008. Environmental legislation has changed, accessibility requirements have been improved, and tram operating regulations have been regularly updated. In addition, there has been significant public comment regarding the original scheme, particularly with regards to tree loss, future active travel provision, the loss of amenity, and impacts on health and wellbeing.

Based on the above, the 2008 design for the Roseburn corridor has been revised, with a particular focus on reducing the environmental impact of the scheme. Key mitigation proposals are:

- Single tracking between Roseburn and Craigleith tram stops;
- Battery powered tram operation between Roseburn junction and Crewe Toll tram stop;
- Additional tree retention, including pruning instead of removal where possible;
- Improved greenspace and placemaking; and
- Additional on-street active travel provision (on Queensferry Road and through Murrayfield).

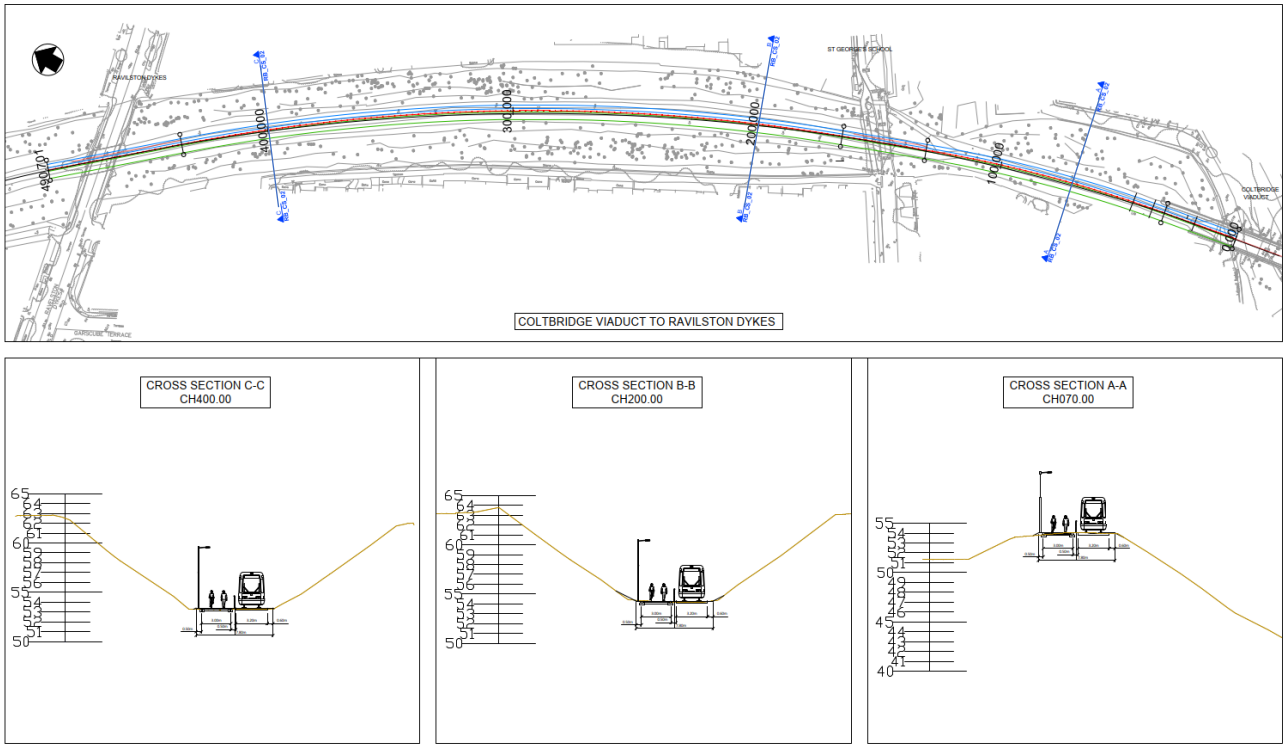
2.3.1 Single Tracking Between Roseburn and Craigleith Tram Stops

Between Roseburn and Craigleith tram stops, it is now proposed to provide a single-track section, helping minimise land take and reduce the impact of the scheme on landscape and ecology. A previously proposed stop at Ravelston Dykes is also omitted for this reason. Figure 2.11 illustrates three cross-sections between Coltbridge Viaduct and Ravelston Dykes, showing how a single tram and cycle track can be accommodated within the existing path formation. Single, bi-directional, track sections are used widely in tram systems worldwide.

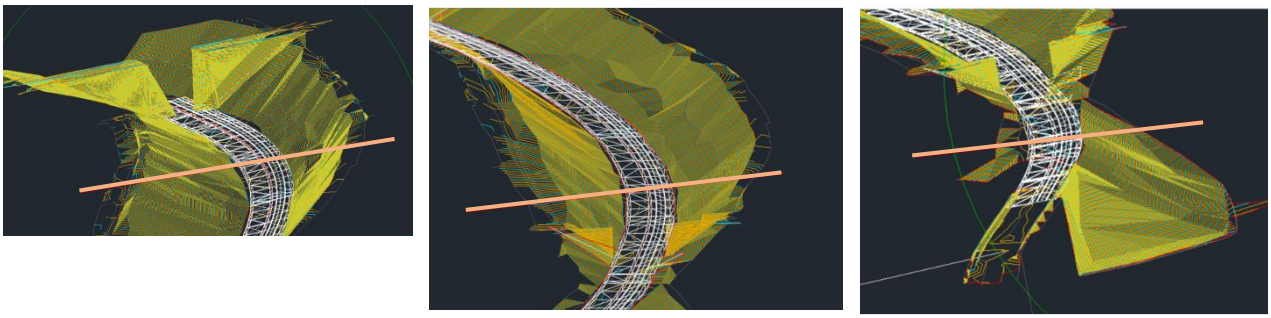
As per the 2008 design, the alignment would continue to be double tracked between the existing tram corridor junction and Roseburn tram stop. Two tracks are also retained between Craigleith and Ferry Road tram stops.

Beyond Ferry Road, the alignment would continue via the West Granton Access towards Waterfront Avenue and a terminus at Granton Square.

Figure 2.11: Coltbridge Viaduct to Ravelston Dykes, Cross-Section of Tram and Active Travel Path Looking North



3D Cross Sections



2.3.2 Battery Powered Trams

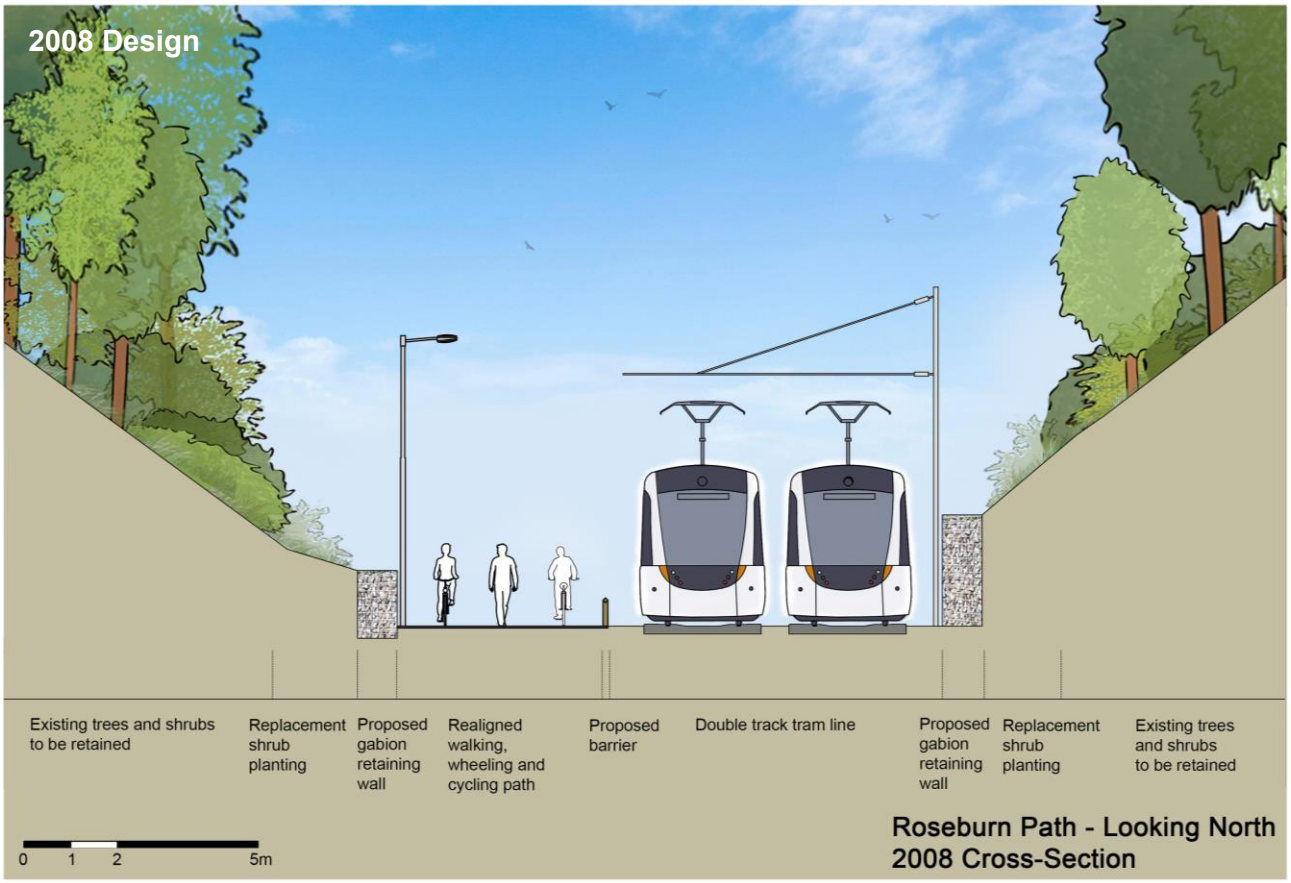
Battery powered[1] trams are being introduced across many cities; Birmingham has successfully implemented the technology on extensions to Edgbaston and Wolverhampton Station. Trams require Overhead Line Equipment (OLE) along the majority of the route, but can operate on battery power for significant sections.

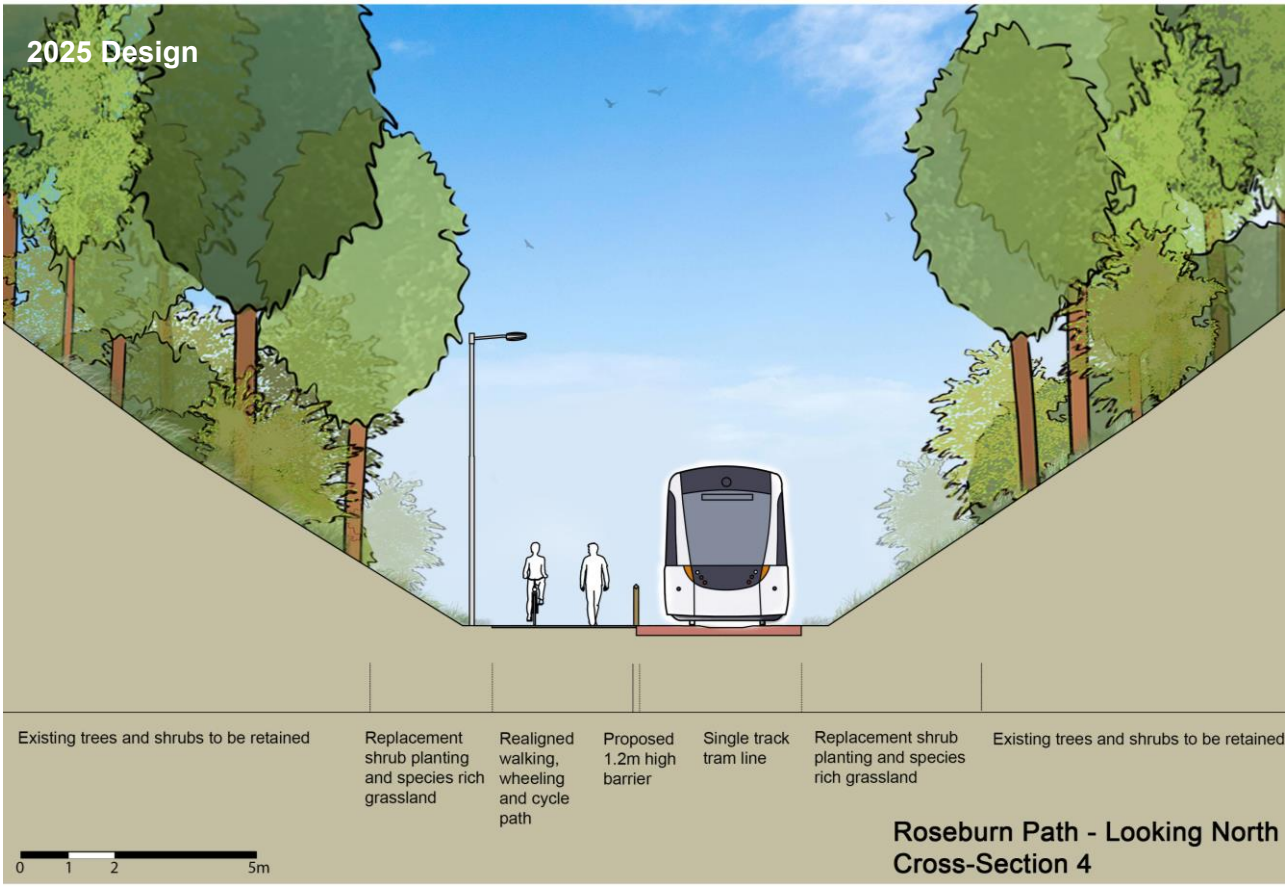
Battery trams would allow the section of OLE between Roseburn junction and Crewe Toll tram stop to be descoped. Doing so would improve visual amenity and reduce the potential need to cut back the tree canopy and other vegetation.

Figure 2.12 shows the potential benefits of single tracking and battery power in terms of visual impact and potential tree retention.

[1] The term “battery powered” is used here as an umbrella term for various different technology solutions that allow trams to be self-powered rather than require power delivery via overhead line equipment.

Figure 2.12: Cross-Section of the Roseburn Corridor Looking North – 2008 Versus 2025 Design





2.3.3 Additional Tree Retention

The introduction of a single track section means that tram and active travel provision are accommodated within the existing cross-section. This reduces the need for new retaining walls, and soil stabilisation, which in turn helps reduce tree and vegetation loss.

Tree information is available from:

- a previous topographical survey, and
- the national tree survey.

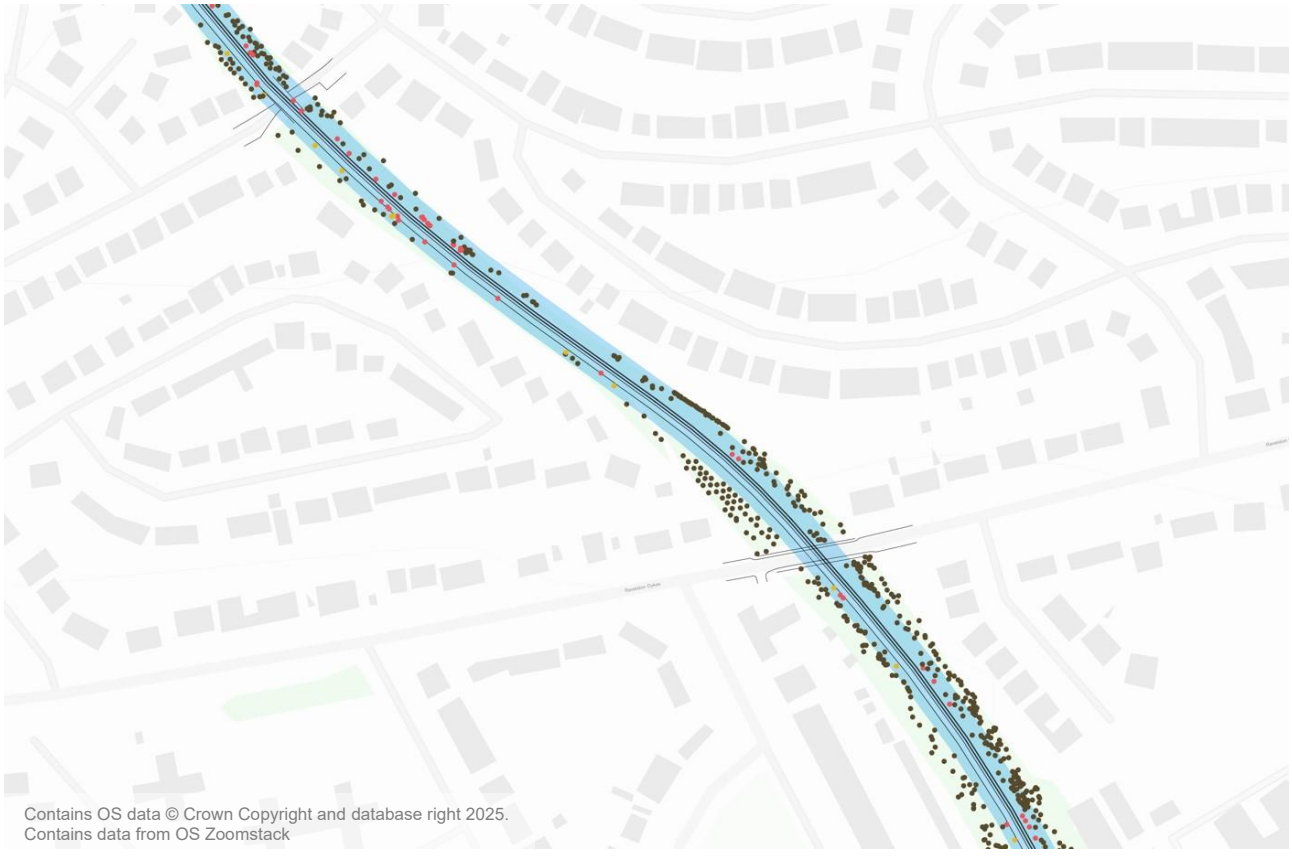
Topographical Survey

The topographical survey is considered to be more accurate than the national tree survey and has been used to inform a high-level estimate of potential tree loss, based on double and single track options.

Appendix A illustrates the location of each tree. All trees within a 3-metre off-set from the edge of the tram rail and 1-metre from the edge of the active travel path are assumed to be lost; these are shown in Red. Trees between 1-metre and 2-metres of the active travel path could potentially be removed and are highlighted in Yellow.

Figure 2.13 illustrates the envelope used to estimate tree loss.

Figure 2.13: Tree Loss Envelope



The topographical survey contains approximately 3,100 trees. Doubling tracking between Roseburn and Craigleith tram stops would result in the loss of approximately 1,200 trees. Single tracking requires the removal of 1,000 trees, with around 2,100 remaining, reducing tree loss by 20% (Table 2.1).

Table 2.1: Estimated Tree Loss

	Number of Existing Trees*	Estimated Tree Loss	Trees Remaining
Double Track	3,100	1,200	1,900
Single Track	3,100	1,000	2,100

* from topographical survey

Trees lost during construction are likely to be replaced at a rate of at least 2:1, although some tree planting will be in other sites around the city. More mature trees would need to be replaced to a higher ratio and a mix of sizes would be planted, depending on location, with street trees or feature trees typically being larger to create an immediate impact. Where possible pruning of trees would be undertaken instead of removal.

National Tree Survey

The national tree survey provides a better visualisation of potential tree canopy loss; this is shown in Figures 2.14 to 2.17 below.

As above, all trees within a 3-metre off-set from the edge of the tram rail and 1-metre from the edge of the active travel path are assumed to be lost; these are shown in Red. Trees between 1-metre and 2-metres of the active travel path could potentially be removed and are highlighted in Yellow.

As part of the next stage of design work, as full tree survey would be procured to enable a thorough consideration of trees to be retained and removed.

Figure 2.14: Potential Tree Canopy Loss – Roseburn to St George's School (Single Track)

Figure 2.15: Potential Tree Canopy Loss – St George's School to Craigleith Drive (Single Track)

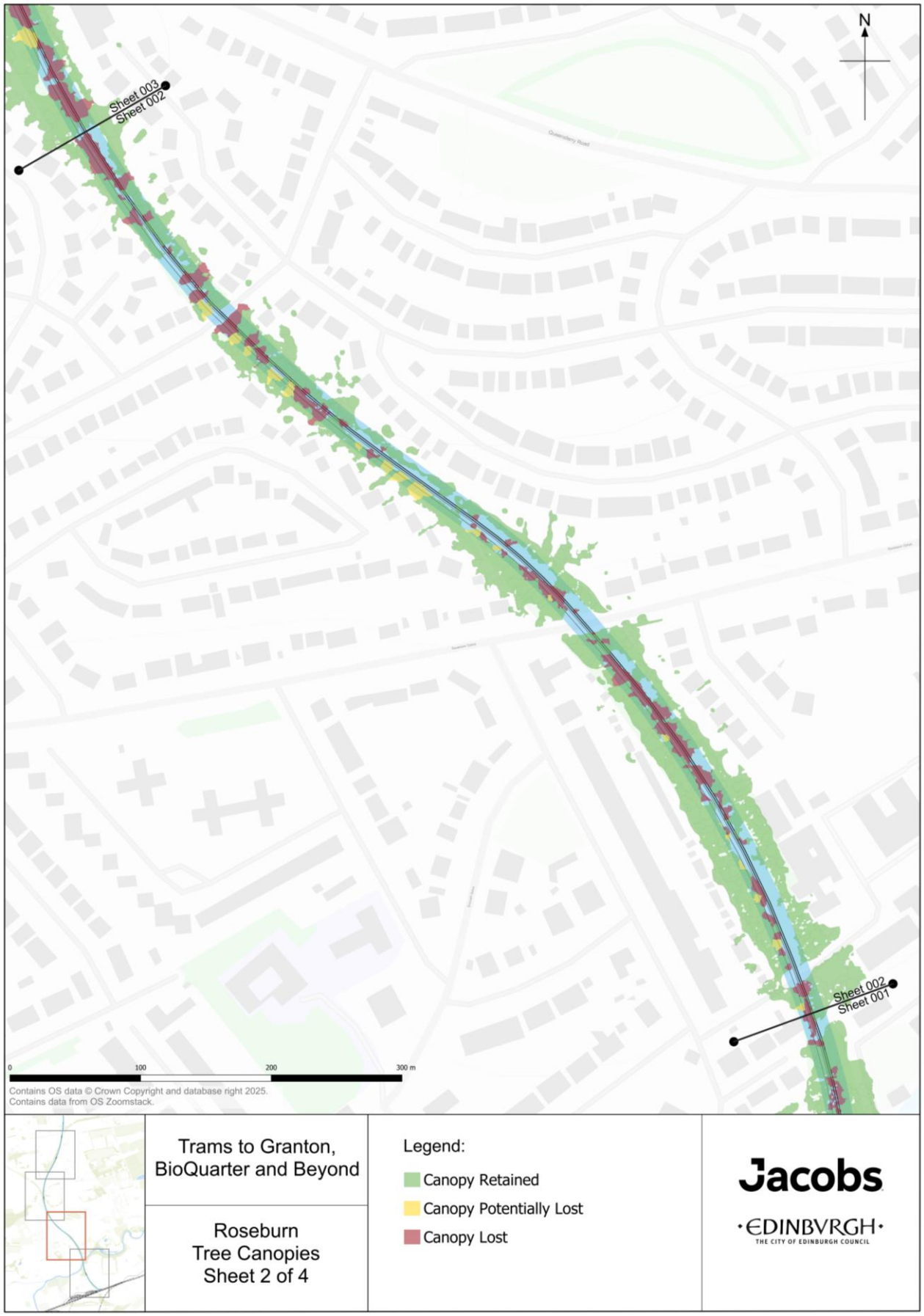


Figure 2.16: Potential Tree Canopy Loss – Craigleith Drive to Telford Road (Single Track)

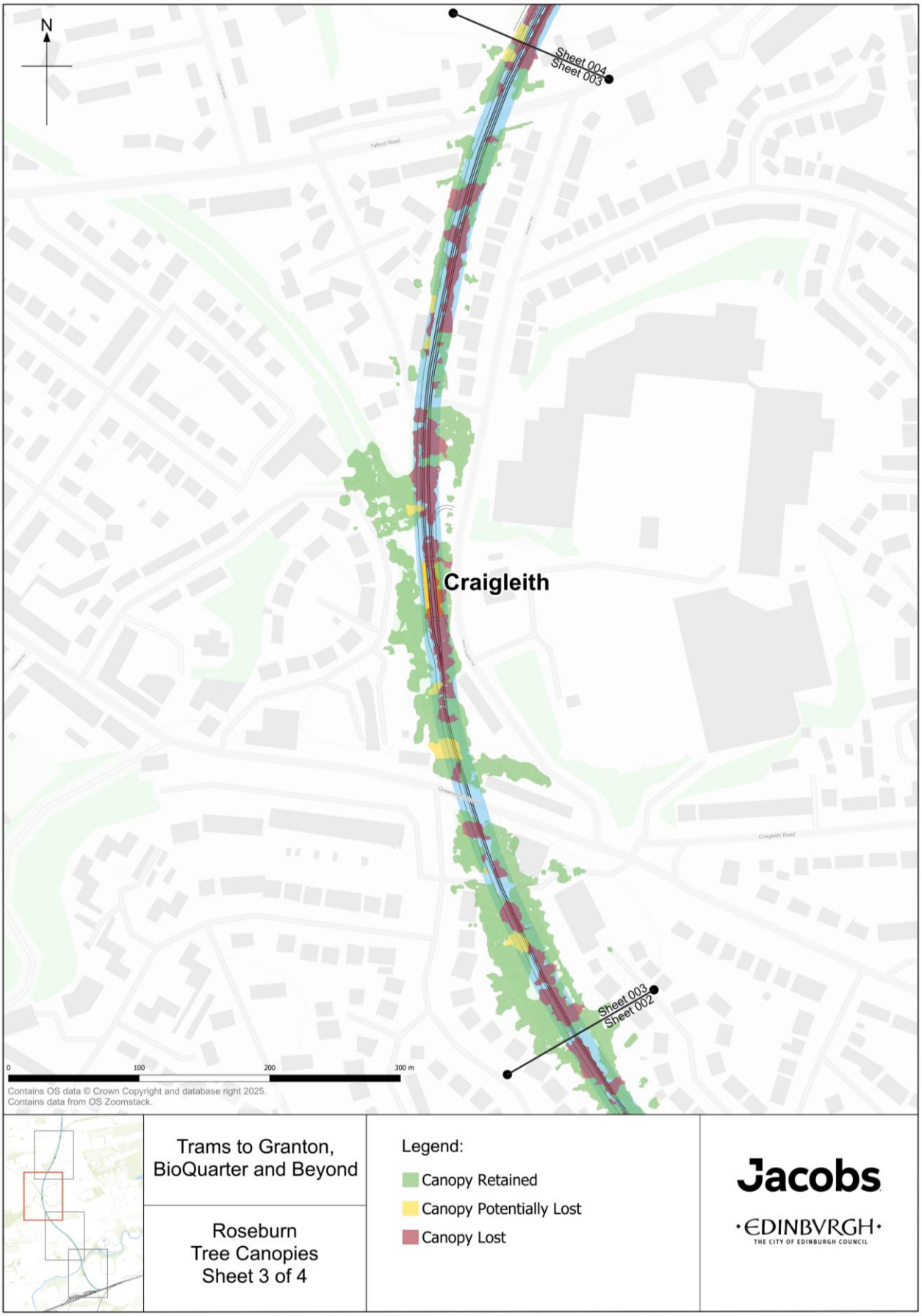
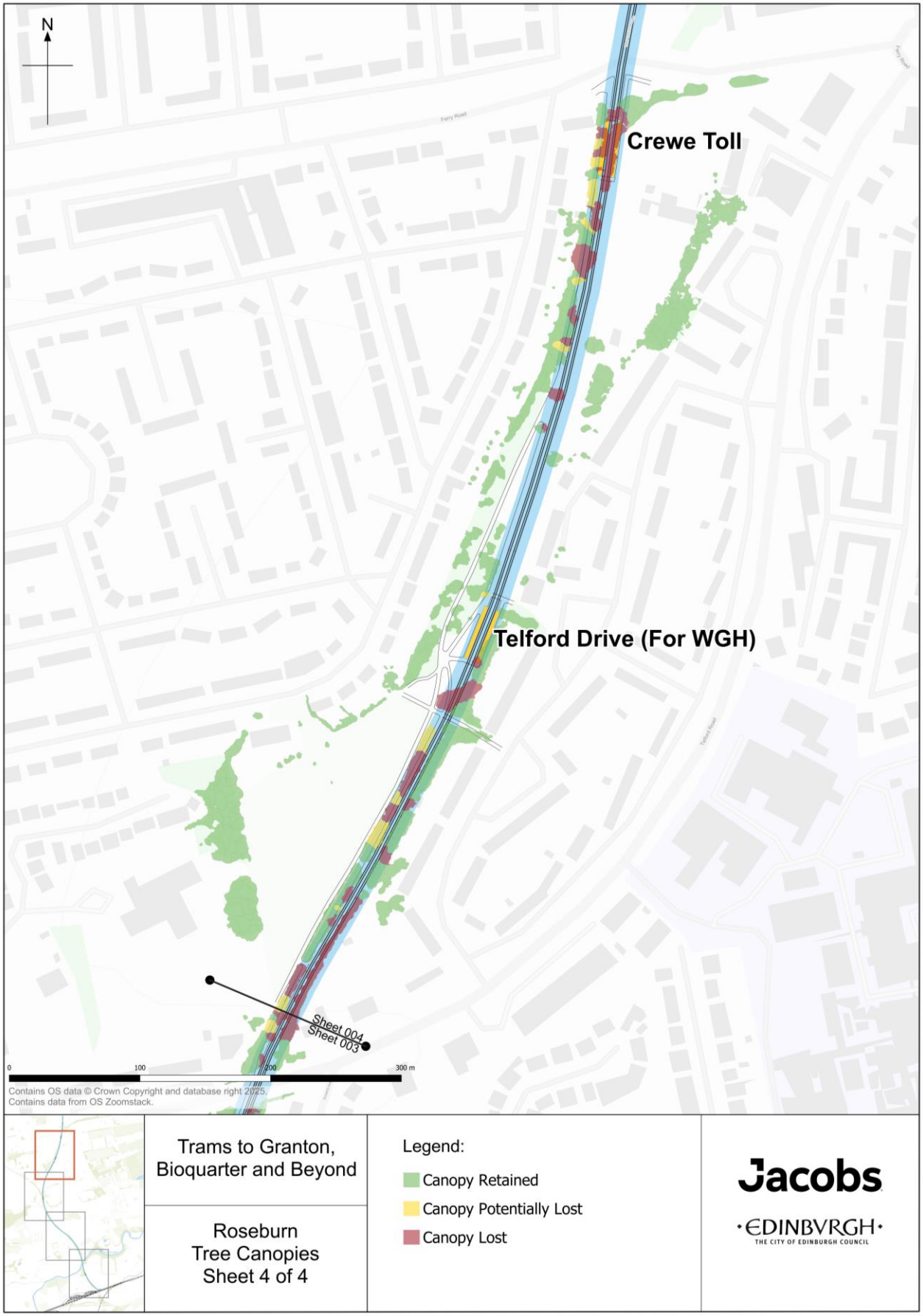


Figure 2.17: Potential Tree Canopy Loss – Telford Road to Crewe Toll (Single Track)



2.3.4 Improved Greenspace and Placemaking

To offset the loss of trees, new planting would be undertaken at a rate of at least two new trees for each tree removed. Planting will be taken adjacent to the corridor where possible and elsewhere in northwest Edinburgh as appropriate.

In addition to replacing the lost trees, four areas of placemaking have been incorporated along the route to provide betterment by improving the environment and creating desirable spaces to use and dwell in, as shown in Figure 2.18.

These are (south to north): the Old Murrayfield Station goods yard, Craigleith tram stop adjacent to the shopping centre, Drylaw Park, and the land between Drylaw Park and the Leonardo car park. The details of each scheme are outlined in Figure 2.19 to 2.22.

Consultation has previously been undertaken for Drylaw Park proposals; these plans have been adapted to integrate with tram and active travel. Other placemaking proposals are indicative at this stage.

Figure 2.18: Improved Greenspace and Placemaking – Overarching Plan

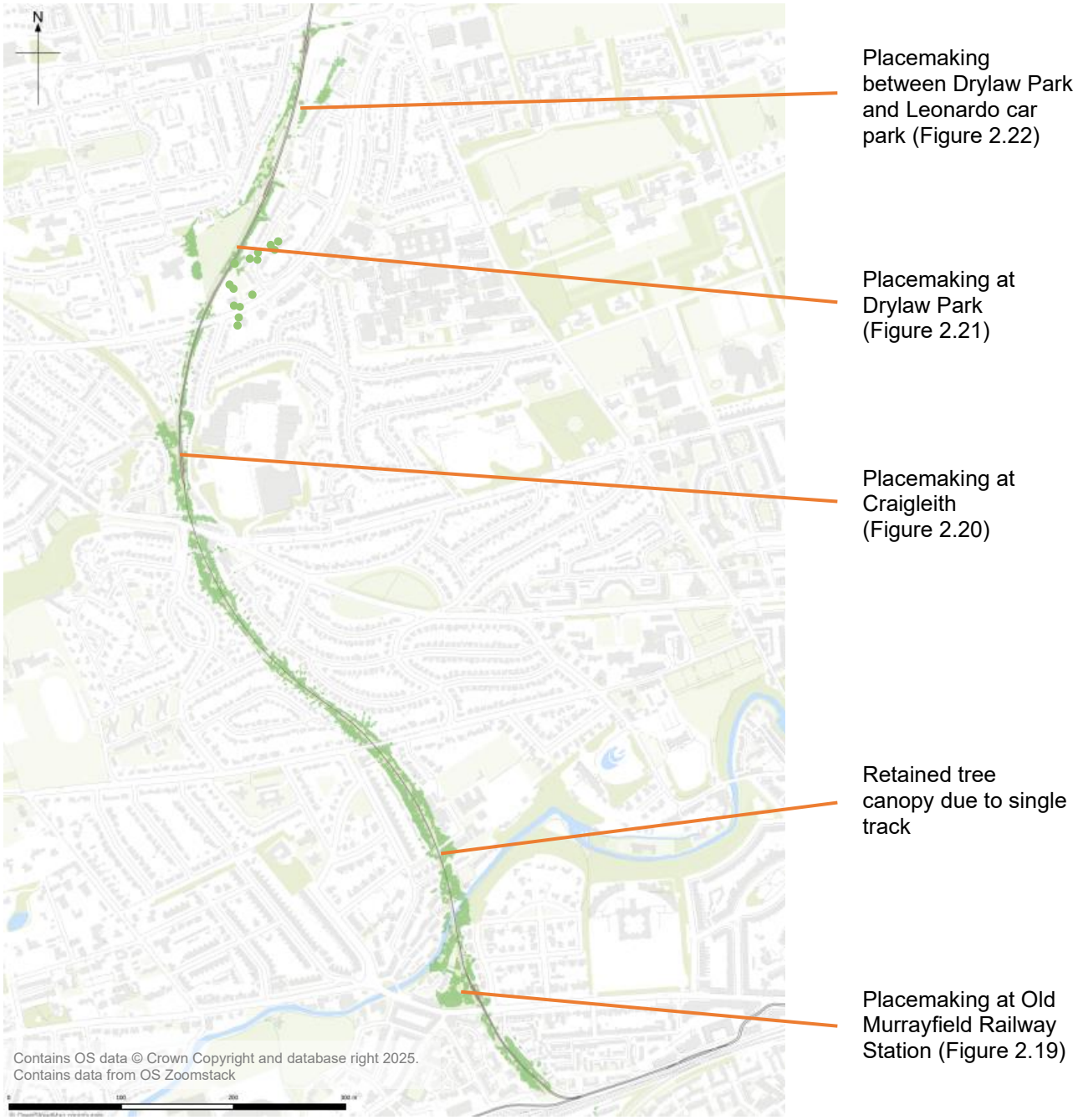


Figure 2.19: Placemaking at Old Murrayfield Railway Station

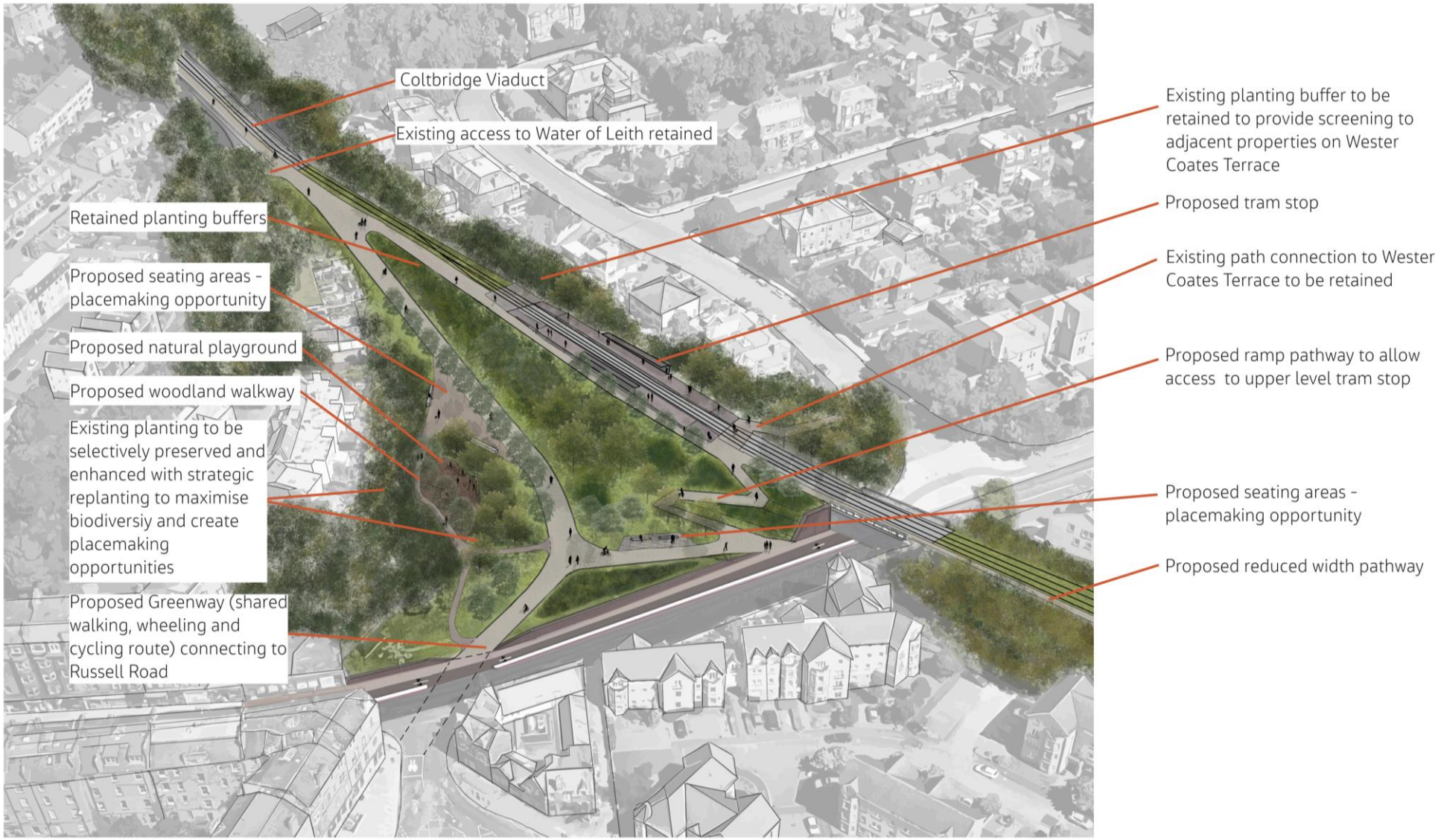


Figure 2.20: Placemaking at Craigleith

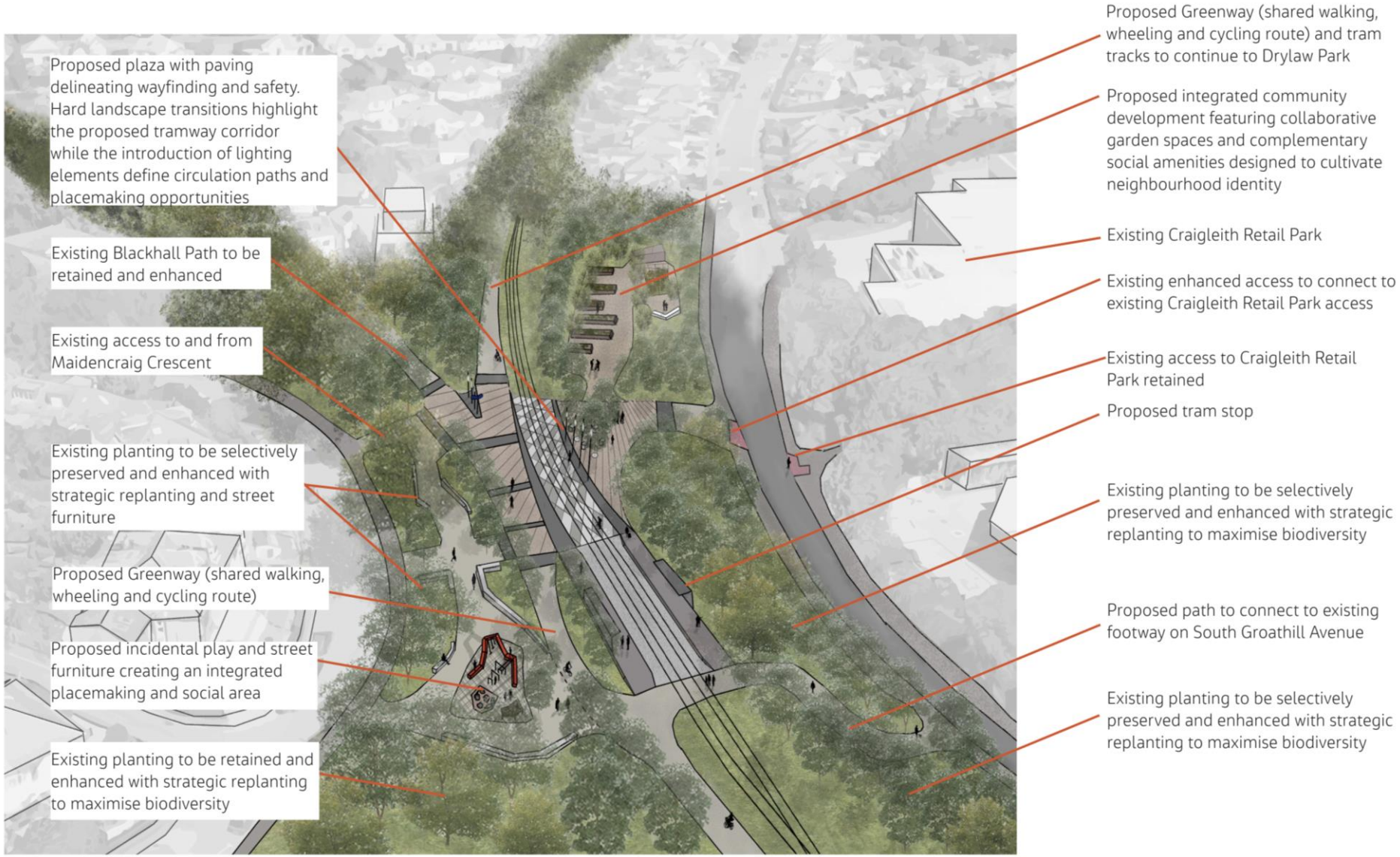
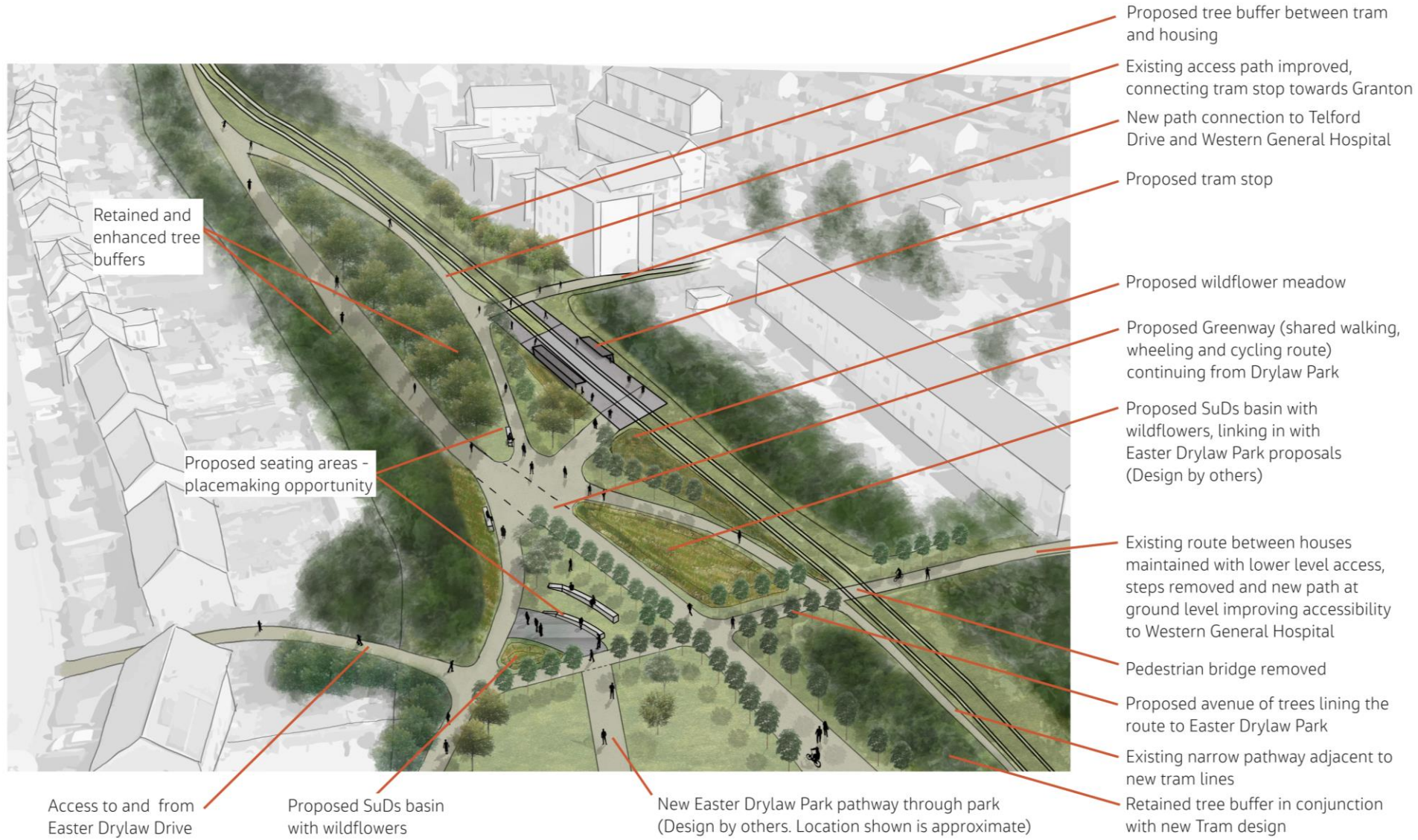


Figure 2.21: Placemaking at Drylaw Park

Figure 2.22: Placemaking Between Drylaw Park and South End of Leonardo Car Park



2.3.5 Additional Active Travel Connectivity

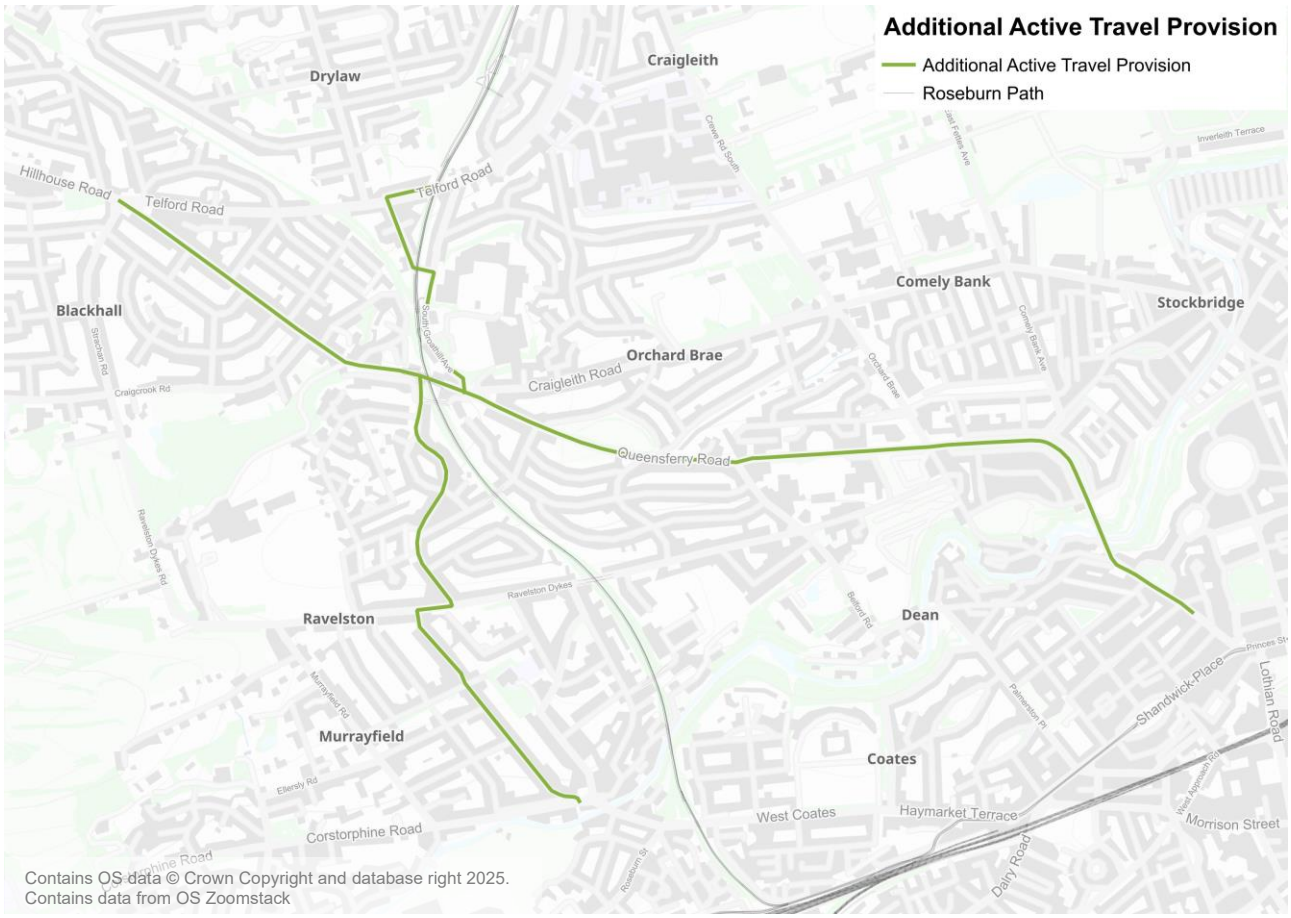
In order to maintain active travel connectivity during construction, it is proposed that additional provision would be made in advance, supporting wider Circulation Plan network proposals (Figure 2.23).

On Queensferry Road, existing Spaces for People cycle provision would be enhanced to provide a permanent scheme. Options to improve cycle safety across Dean Bridge would be explored, providing a connection into the City Centre West to East Link (CCWEL).

Permanent improvements would also be made through Murrayfield to provide improved cycle connectivity towards Roseburn.

Between Queensferry Road and Telford Road, temporary improvements to enhance cycle safety would include the removal of parking on South Groathill Avenue between Queensferry Road and Groathill Road South, with cyclists then following a route via Groathill Road South to Telford Road.

Figure 2.23: Additional Active Travel Provision



2.4 Landscape Habitat Management Plan

2.4.1 2005 Landscape Habitat Management Plan

The 2005 Landscape Habitat Management Plan (LHMP) set out the planting philosophy and management to be applied to the Roseburn corridor and included specifications for aspects such as the protection of existing vegetation, site clearance and new planting. In addition to these it included drawings of the landscape proposals within the Roseburn corridor, a tree schedule and commitments.

As the engineering design was still in progress at the time of the writing of the LHMP the following caveats regarding potential design changes were noted as:

- The track is generally regarded as in or close to its final alignment but may still vary slightly in the vicinity of bridges and tram stops. Realignment of the track affects all other design elements.
- The footway / cycleway follows the track alignment for much of the corridor and is close to its final alignment. At access points its final alignment has not been fixed and what is shown here is subject to alteration.
- Retaining walls, reinforced earth and soil nailing are used to stabilise cutting and embankment slopes and result in the loss of all existing vegetation over the area where they are used. Tree and shrub planting is not possible after completion in these areas. The extent of disturbance varies with the track alignment, but a small change in the track alignment may result in a greater change in the earthworks limit because of the angle of slopes. Earthworks and retaining structures therefore have a significant impact on the landscape proposals.
- Noise mitigation is not determined at present, but any mitigation measures are likely to be located close to the track on embankments or on the boundary of adjoining properties in cuttings. Noise mitigation on the boundary would result in the loss of existing vegetation along the actual boundary and for construction access.
- A distance of 3m from the track, 1.5m from retaining structures, 0.5m from the footway / cycleway and 1.0m beyond the limit of the soil nailing, has been taken as the minimum additional vegetation clearance zone required for construction purposes. Trees with more than one third of their canopy within this zone will generally have to be removed since the loss of part of their root system will render them unstable.

The LHMP also included a section on Planting Philosophy. For reference, an extract of this section is provided below.

"The existing trees in the Roseburn corridor have mostly been coppiced in the past, and are mainly either multi-stemmed, with several trunks arising from near ground level, or crowded and drawn up. Once coppiced, trees tend to develop weak joints at the base, and to counter this they need to be coppiced again every 7-15 years. In addition the cutting slopes are not entirely stable, as evidenced by fallen trees. The general strategy therefore is to remove all but well-formed and stable trees (usually retention Class A and B in the tree schedule) which lie outside the zone of construction disturbance, and replace them with new native tree and shrub planting which will not be dependent on a regular coppice regime and which will therefore give a denser long-term screen. A further advantage of this approach is that the corridor tends at present to be dominated by sycamore and to lack an understorey, so replanting allows a mixture of large and small trees and shrubs to give a more diverse structure.

An existing hawthorn hedge runs intermittently along the boundary. In places it has been maintained as a hedge but in others it has developed into a line of trees offering little screening value. In general, it is intended to lay this hedge to regain density. Laying involves cutting part way through each trunk near ground level and bending the upper part near to horizontal to form a dense barrier which will regrow into a stock proof barrier. There are also existing hedges and dense shrubs on the boundary or just inside adjacent gardens in some places and these will be protected as far as possible. If earthworks are proposed close to the boundary which would affect their roots, appropriate tree surgery or replacement will be offered to their owner.

In some instances, strengthened earthworks extend right up to the limit of deviation leaving no space for planting. In such instances a number of approaches can be used and these areas will be subject to more detailed attention as the design progresses.

The planting proposed is not continuous since areas are left to develop a herb layer where screening is not required. After the initial work, most of the corridor will be lightly managed to retain its natural appearance.

At tram stops a more urban, manicured style is proposed, using a groundcover of ivy, which is common locally, as a unifying feature with a different landmark tree species at each stop to provide instant recognition and a distinctive appearance.

Existing trees are tagged on site as part of an updated tree survey carried out in November and December 2006, and the tag numbers will be used on the LHMP plans. All tree locations in project grid co-ordinates are known and the plans show the extent of tree removal required to accommodate the proposed

infrastructure works. The species and condition survey of existing trees is two-thirds complete, and as a result it is not yet possible to show exactly which trees (within areas of trees currently shown to be retained) would have to be removed for safety reasons. A cross-reference of the trees surveyed and tagged, allowing a check of the ecological data for each tree shown, will be annotated onto the drawings in a future issue of the Plan.

Of the 1950 trees surveyed so far, 466 have been identified as needing removal because they are rotten or unstable. It may reasonably be assumed therefore that at least a further 25% of the remaining trees will have to be removed. Prior to the cross-referencing of tree location/removal and ecological survey data, it is also not yet possible to identify on the tree schedule which trees will have to be removed to allow construction of the tram and associated infrastructure, although these are shown on the drawings."

2.4.2 2025 Review of Landscape Habitat Management Plan

The LHMP highlights the implications the engineering design would have on the landscape proposals within the Roseburn corridor. This includes implications in respect of the tree planting proposals in addition to the retention of existing trees within the corridor. Both of these elements of the design are key aspects in the mitigation of visual impacts likely to be experienced by nearby residents and any commitments to maintain, as far as practicable, the 'leafy' character of the disused railway line, and minimise impacts on amenity. The LHMP also highlights that changes to the alignment of the tracks would affect all other design elements (which would include the alignment of the cycleway / footpath).

The updated design of the shared travel corridor includes for a variety of widths along the route. A summary of the implications is noted below:

- By providing additional active travel provision via either Balbirnie Place or Russell Road, the width of the path adjacent to the tram tracks can be reduced to approximately 2.0m. This lessens the overall footprint of the proposed infrastructure in this area.
- Between the Roseburn and the Craigleith tram stops, single track operations are proposed, greatly reducing the overall width required for the proposed infrastructure and generally maintaining the tram and active travel path within the existing travel corridor. This is an extremely positive revision to the original design enabling the retention of a large number of existing trees and vegetation.
- At Drylaw Park the active travel route will run through the park, again reducing the path to 2m adjacent to the tracks thereby reducing its impact on existing vegetation. This also provides the active travel route with a more scenic and desirable route going forwards.
- Past Drylaw Park the derelict land is utilised to keep the tram to the east of the space allowing the existing path to remain in its place and be separate from the tram tracks, and it helps to reduce tree loss. The tram stop here also creates better links to the Western General Hospital.

An additional risk to the existing planting relates to noise mitigation (fencing). The location of noise mitigation fencing was not provided in the December 2006 LHMP but it was noted within the document that where the tram route is in cutting, the mitigation would be sited on the boundaries of adjoining properties. Where this is the case, the mitigation may result in the loss of existing vegetation along the actual boundary and for construction access to install the fencing. The location of any noise mitigation fencing is still not defined, so this is still unknown; however, the project will seek to minimise visual impact through careful design and the use of appropriate materials. Positive impacts include increased security and privacy for nearby residents. Detailed proposals will consider this in more detail.

Consideration has also been given to confirming the operational requirements to the tram in respect of tree species which may or may not be planted in proximity to the line. Network Rail have prepared guidance on tree management in proximity to railway lines (Lineside Vegetation Management Manual 2020) and have identified a number of species that are considered to present an operational risk. This risk results from leaf fall in autumn; the leaves on the line forming a 'greasy' layer or coating that affects the acceleration and braking of a train. The trees that Network Rail consider to be high risk leaf fall species include sycamore (found extensively within the Roseburn corridor as indicated previously), lime trees and ash, both of which form part of the planting proposals set out in the LHMP.

While these species can be replaced as part of a review and update to the LHMP any replacement species will need to be considered in terms of the risk they might present to the safe operation of the tram.

Further detailed mitigation will be progress as part of the next stage of design work.

Since the original LHMP was written, requirements for biodiversity net gain (BNG) have changed. In Scotland from 2023, National Planning Framework 4 (NPF4) notes that developments must contribute to the enhancement of biodiversity and demonstrate positive effects on biodiversity, aiming for a net gain. It must ensure that any development must be left in a demonstrably better state than without intervention. There is currently no metric for how this is measured (unlike in England and Wales), but the Scottish Government is currently looking into this to provide a similar matrix to the rest of the UK.

It is the intention that with the replacement and enhancement of lost trees, vegetation and habitats, along the Roseburn path, the new/enhanced spaces, and additional ecological enhancements, such as bee hotels and hedgehog houses (for example), that these elements will combine to achieve the BNG required. This will become clearer as the scheme progresses through to the next stage of design.

Figure 2.24 to the right shows the original 2008 tram design, looking north at Ravelston Dykes, with twin tracks and OLE equipment.

Figure 2.25 below illustrates proposed mitigation with a single track alignment and battery powered operation.

Figure 2.24: 2008 Design at Ravelston Dykes

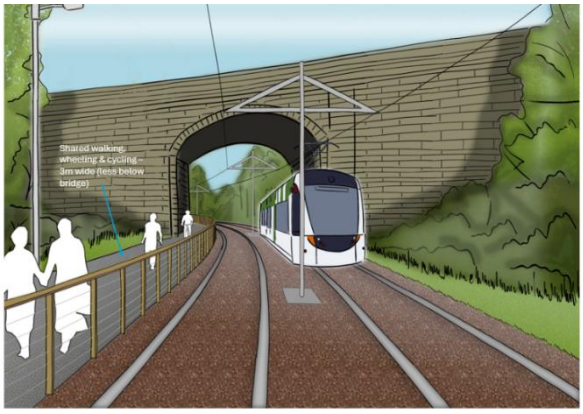


Figure 2.25: Visualisation of Proposed Tram Mitigation on the Roseburn Corridor at Ravelston Dykes

2.4.3 Summary and Conclusions

Summary

In summary, this landscape and visual appraisal has been prepared following review of the Landscape and Visual Impact Assessment prepared in 2005 for Edinburgh Tram Line 1 and the Landscape Habitat Management Plan (December 2006) and the undertaking of a number of walkover surveys of the Roseburn corridor over the last few years.

The walkover surveys confirmed that the character of the Roseburn corridor is very similar to that reported in the 2005 LVIA albeit that the trees lining the route have matured further and show limited signs of management (including the coppicing indicated as being undertaken prior to 2005). Visual characteristics remain the same, and the vegetation continues to influence views experienced from neighbouring properties and afford properties a similar level of privacy.

The LHMP was prepared on the basis of a shared travel corridor of approximately 10m wide, allowing 3m for a shared cycleway / footpath and a width of 7m for the dual tram line. The LHMP indicated that any changes to the alignment such as an increase in the width of the cycleway / footpath or tram lines would result in an increase in the extent of retaining walls and reinforced slopes plus an increase in the amount of existing vegetation that would require to be removed / felled.

Updating the design of the tram and active travel route, as noted in the chapter above, it is likely that in some areas the route can sit within the footprint of the existing path or have only a minor widening due to the rerouting of the active travel route. These are positive changes to the scheme. In some other areas there will be tree loss due to the narrow corridor, where we have twin tracks, as per the original design.

Some additional vegetation, particularly trees, may require to be removed where noise mitigation (fencing) is required to be installed, especially where the route is in cutting, although this is still unknown.

Furthermore, retention of some species of trees within the corridor, sycamore in particular, may present a risk to the safe operation of the tram due to operational problems caused by leaf fall. Some species of the proposed species within the LHMP also present potential operational problems. These concerns stem from consideration of Network Rail's Lineside Vegetation Management Manual. Whether the concerns are appropriate will be confirmed with Edinburgh Trams at the next stage of design.

Conclusion

In conclusion, the design change to the Edinburgh Tram proposals within the Roseburn corridor, will have a generally positive outcome compared to the original scheme. There would likely be a reduction in the extent of existing vegetation and the number of trees removed, helping to retain the 'leafy' character of the Roseburn corridor and there would be positive placemaking elements along the route helping to integrate the tram into the local environment, providing added benefit and facilities to local people.

2.5 Granton Streetscape

North of Crewe Toll, the proposed tram alignment is largely unchanged from the 2008 scheme; provision is already made within much of the street network.

The alignment would be located off-street to the west of West Granton Access, with a widened structure constructed at Crewe Road Gardens. The route would cross West Granton Road at-grade before continuing off-street to the west of Waterfront Broadway. Tram would be located to the north of Waterfront Avenue within the existing protected corridor. The route would then be located on the north side of West Harbour Road, terminating at Granton Square.

Over the above on-street section, it is assumed that OLE equipment would be provided throughout.

2.6 Heritage and Archaeology

Potential heritage impacts have been identified based on available GIS mapping, including the following data layers:

- World heritage site;
- Conservation areas;
- Garden designed landscapes;
- Scheduled monuments; and
- Listed buildings.

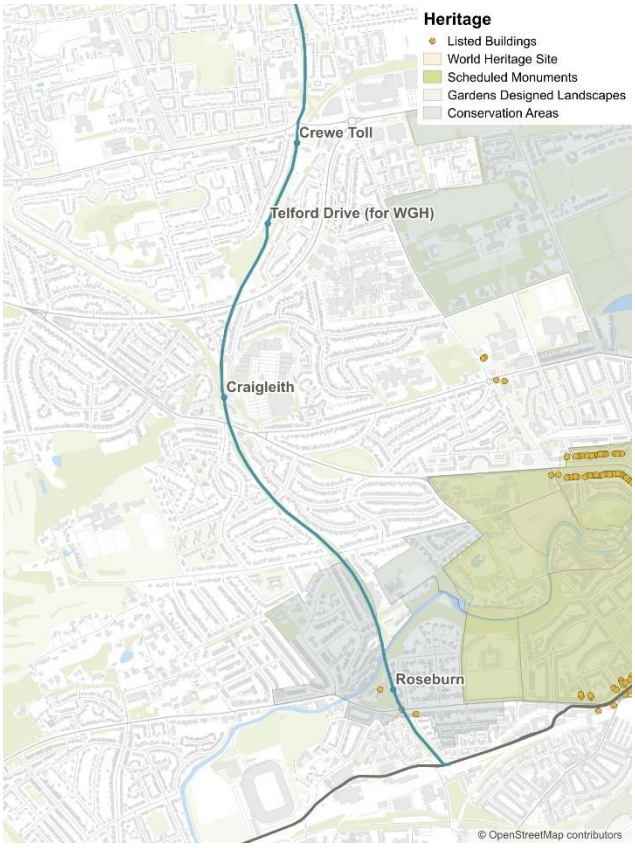
In addition, meetings have been held with council officers to discuss the potential for archaeology finds and to discuss other known issues.

Figures 2.26 and 2.27 map the above information.

Between the A8 and Ravelston Dykes, the Roseburn Path is located within the Coltbridge and Wester Coates Conservation Area.

Given its previous use as a railway corridor, there is only one listed structure and no significant archaeology along the Roseburn Path. The Roseburn Railway Bridge is the only listed structure and although this is proposed to be replaced, the existing railings would be restored and reinstalled to retain the original look.

Figure 2.26: Roseburn Corridor



Other structures along the route may be impacted, but Roseburn Railway Bridge is the only one listed.

Multiple buildings on West Harbour Road are listed including the Lighthouse and Buoy Depot, and adjacent workshops.

The majority of buildings around Granton Square are also listed including Harbourmasters House and the Granton Hotel. Granton Middle Pier is also of interest but is unlikely to be impacted by the scheme.

Figure 2.27: Granton Waterfront

2.7 Protected Views

The Edinburgh Skyline and Key View Study identifies views from and to the city's core landmarks. This is a tool to help prevent development that would affect these key views.

A number of specific views from the north of the city looking towards the city centre are protected. These include views from Ferry Road towards Arthur's Seat, the Pentland Hills, St Mary's spires and the Castle and Old Town skyline. None of these would be impacted by the introduction of trams along the Roseburn corridor.

3. Orchard Brae Corridor

3.1 Proposed Tram Alignment

The Orchard Brae route option commences at the junction of Shandwick Place / Queensferry Street and follows Queensferry Street, Queensferry Road, Orchard Brae, Crewe Road South, West Granton Access and Granton Waterfront to Granton Square.

Geometric constraints mean that only an east facing junction can be delivered between Queensferry Street and Princes Street. Travelling from the Granton corridor to the West End, Haymarket and all stops beyond to the airport would require interchange at Princes Street. Operations are complicated by trying to merge two tram routes at the busy Princes Street / Lothian Road / South Charlotte Street junction.

Figure 3.1: Princes Street / Queensferry Street and Dean Bridge

An indicative tram stop is shown on Queensferry Street in Figure 3.1; the exact position of this will need to be developed as part of a detailed design, as there are multiple trade-offs in finalising a preferred location.

The proposed tram stop at Queensferry Street requires the relocation of busy bus stops to other locations yet to be determined. In doing so, heritage impacts will require to be minimised.

Trams would continue via Drumsheugh Place, Dean Bridge and Queensferry Road to Queensferry Road tram stop, sited to the east of the top of Orchard Brae. Width constraints mean that no segregated cycle provision can be provided across the bridge. Similar to Roseburn, no OLE equipment is proposed over this section, minimising the impact of tram on Dean Bridge and wider impacts on key views (Section 3.4.1).

Figure 3.2: Queensferry Road / Orchard Brae

The junction of Orchard Brae and Queensferry Road will require careful design to accommodate trams; Additional land take may be required, outside of the existing carriageway (Figure 3.2).

Typically, tram articulation can negotiate tight turns or steep gradients, but not both at the same time. Future design development may need to consider the reprofiling of the southern section of Orchard Brae to accommodate chosen tram vehicle performance.

Consideration of landscape character and heritage sensitivities, including the historic street scene, would be taken into account with this.

Orchard Brae was originally built for trams, with a constant 6% gradient. Due to the narrow cross-section and aforementioned gradient, no stop is proposed on this section. Instead, the next halt would be at Comely Bank Roundabout.

Comely Bank Roundabout would require to be signalised. To minimise the number of traffic stages, (necessary to improve overall junction performance while accommodating trams), Orchard Road would require to be stopped-up, with traffic diverted via Orchard Place or Orchard Drive. Tram platforms would be staggered either side of the junction (northbound to the south on Orchard Brae, southbound to the north on Crewe Road South) to minimise delay.

Figure 3.3: Crewe Toll / Crewe Road South

Travelling northwards, the alignment would follow Crewe Road South, with a tram stop provided midway to serve the Western General Hospital. The route would then continue to Crewe Toll, crossing Ferry Road to join the West Granton Access, as shown in Figure 3.3.

A preferred alignment at Crewe Toll has still to be determined. There are trade-offs between traffic impacts, land take and the aspiration to provide a tram stop with effective bus interchange, and walking, wheeling and cycling connectivity.

North of Crewe Toll, the route to Granton Square is the same as for the Roseburn alignment. This is based on the 2008 detailed design being developed for construction at that time. Tram is largely off-street, running parallel to Waterfront Avenue and West Granton Access.

3.2 Active Travel Constraints

While delivering a tram route via Orchard Brae retains existing active travel provision on the Roseburn corridor, it restricts future cycling provision elsewhere. On Queensferry Road, with tram, it would not be possible to provide segregated cycling provision over Dean Bridge.

The cross-section of Orchard Brae is too narrow to provide a cycle lane.

On Crewe Road South, the delivery of a short section of cycle lane may be possible between Carrington Road and Crewe Road South. Otherwise, the cross-section and number of active frontages make segregated cycling provision challenging.

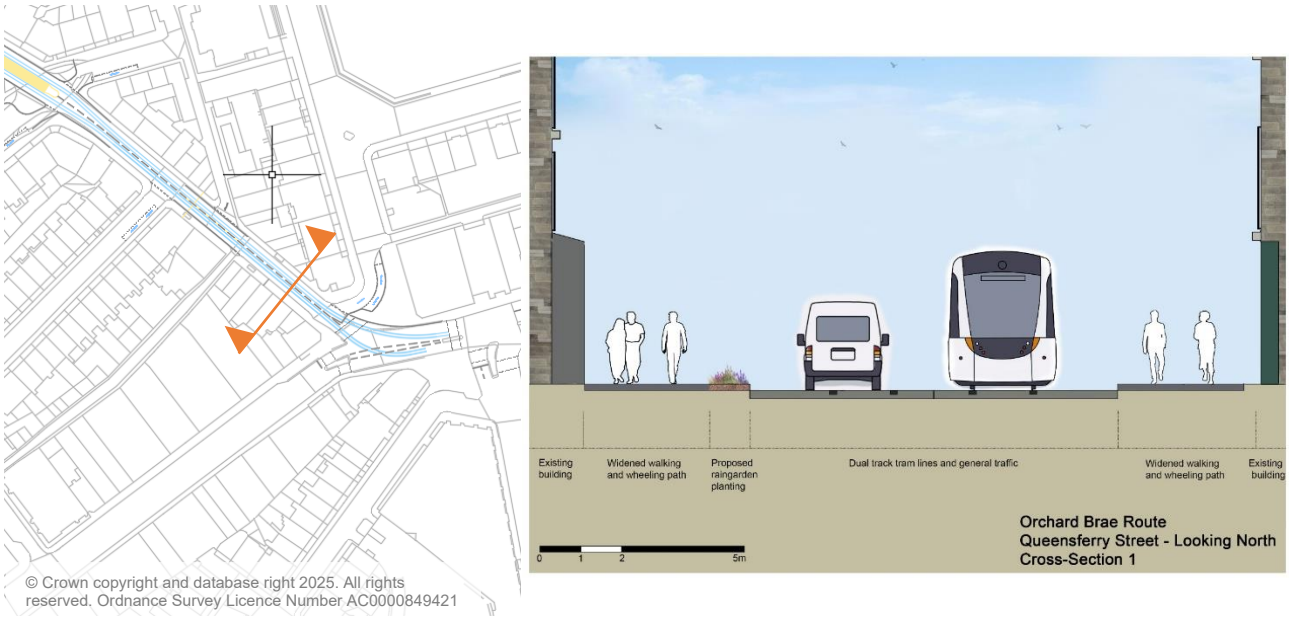
3.3 Landscape / Streetscape

The landscape along the Orchard Brae corridor route consists of the predominantly hard landscape of roads and footways. Due to the constrained corridor there is very limited space for any soft landscape or public realm elements between the private residences / business on either side of the route.

At the southern end of the route along Queensferry Street there is an opportunity to widen the footways to enable an easier flow for pedestrians, with potential to include rain gardens to green the street (see Figure 3.4). The detailed design of landscape proposals will be developed at detailed design stage, in line with appropriate council strategies.

Trams could operate on battery power between Queensferry Street and Queensferry Road tram stop, east of Orchard Brae, and so OLE would not be required.

Figure 3.4: Cross-Section Through Queensferry Street Looking North



Past the Dean Bridge, along Queensferry Road, the street is lined with hedges and trees from adjacent properties or green space. These are however set back from the street and should be mostly unaffected, apart from some minor pruning of branches.

On Orchard Brae itself the corridor tightens up with narrower footways and a steeper gradient. In the northern section of this road, after Orchard Brae Avenue, the footpath on the west side ceases and vegetation forms a buffer between the road and the adjacent flats and properties. Closer to the roundabout the footpath returns, behind the vegetation, from Orchard Brae Gardens (see section in Figure 3.5 below) and runs back up to the road and down to the roundabout.

Due to the tightness of the corridor, there would be some pruning of adjacent trees required to open up this section, as illustrated in Figure 3.6. Any pruning would be undertaken in line with council policies on safe travel and in agreement with landowners.

Figure 3.5 Cross-Section at Orchard Brae Looking North

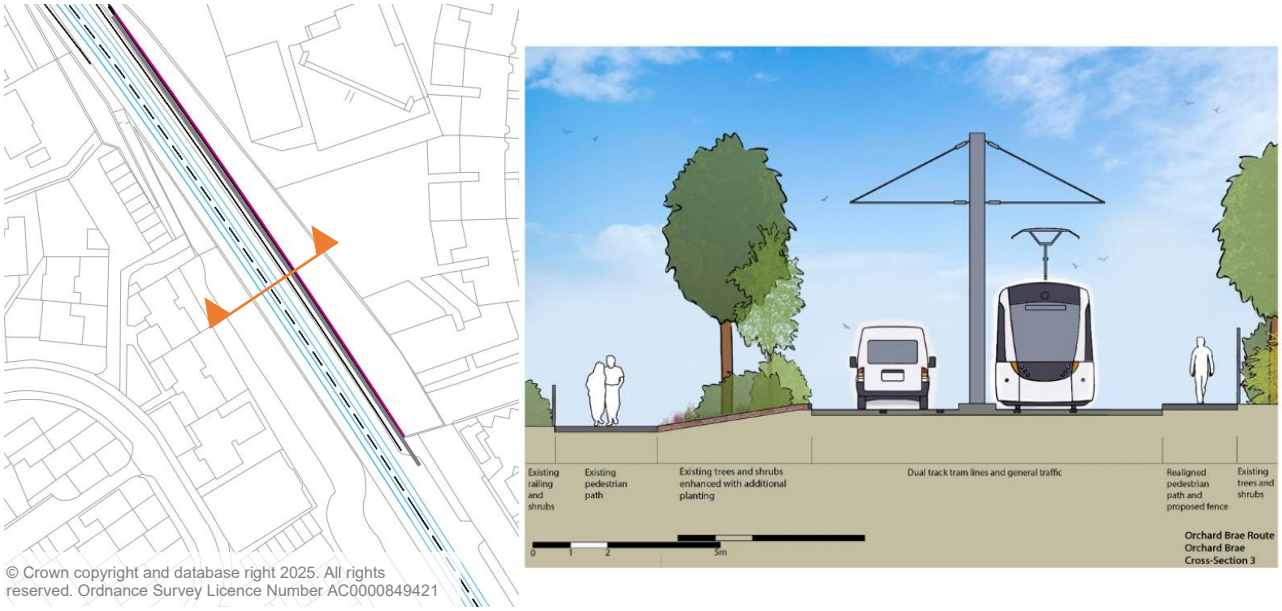


Figure 3.6: Looking South on Orchard Brae

From the roundabout, at the bottom of Orchard Brae heading north on Crewe Road South and past the hospital (Figure 3.7), there is greenery located on both sides of the road. The trees and hedges / planting are however out with the streetscape and located in the adjacent private land.

Figure 3.7: Looking North on Crewe Road South

In some areas pruning may be required to overhanging tree branches, although this is not dissimilar to the pruning back of branches which is completed for the current bus route which also runs along this stretch.

A visualisation of tram in the vicinity of the Western General Hospital is shown in Figure 3.8.

Figure 3.8: Visualisation of Tram Outside the Western General Hospital

3.3.1 Tree Preservation Orders (TPO)

There are four TPOs located adjacent to the Orchard Brae Scheme (Figure 3.9), however none are within the public areas impacted by the scheme: Bells Brae (TPO 47); corner of Orchard Brae and Queensferry Road (TPO 158), Comley Bank Cemetery (TPO 96) and Avenue Villas (TPO 157).

Along Queensferry Road the trees are also protected by being within the New Town Conservation Area.

Some of the tree branches along Orchard Brae and Crew Road South extend over the current road and so some of these overhanging branches may need to be pruned as part of the works.

Figure 3.9: Tree Protection Order Plan (CEC)

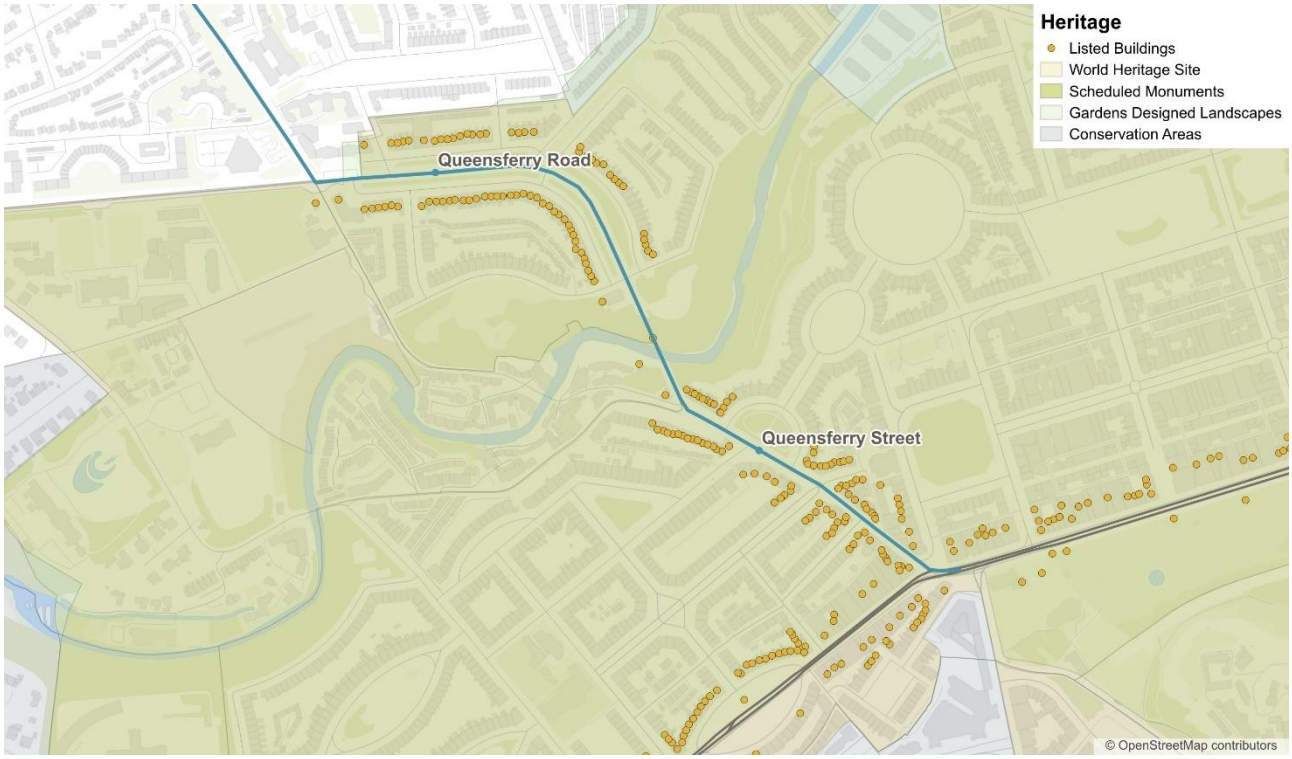
3.4 Heritage and Archaeology

Queensferry Street, Dean Bridge and Queensferry Road are all located within the World Heritage Site (WHS) and New Town Conservation Area. The Queensferry Road / Orchard Brae junction is also bounded by the Dean Conservation Area. Inverleith Conservation Area is located on the east side of Crewe Road South.

As tram has already been delivered within the WHS, the impact of this mode on the site has already been considered and accepted. On the Orchard Brae corridor, it is proposed that the use of battery powered trams would allow there to be no OLE between Queensferry Street and Queensferry Road tram stop. This would reduce the visual impact of the scheme across Dean Bridge (Grade A listed) and on key protected views along this section of the corridor (see below).

Figure 3.10 shows the Orchard Brae tram route within the WHS and the listed buildings adjacent to the route.

Figure 3.10: Queensferry Street / Dean Bridge



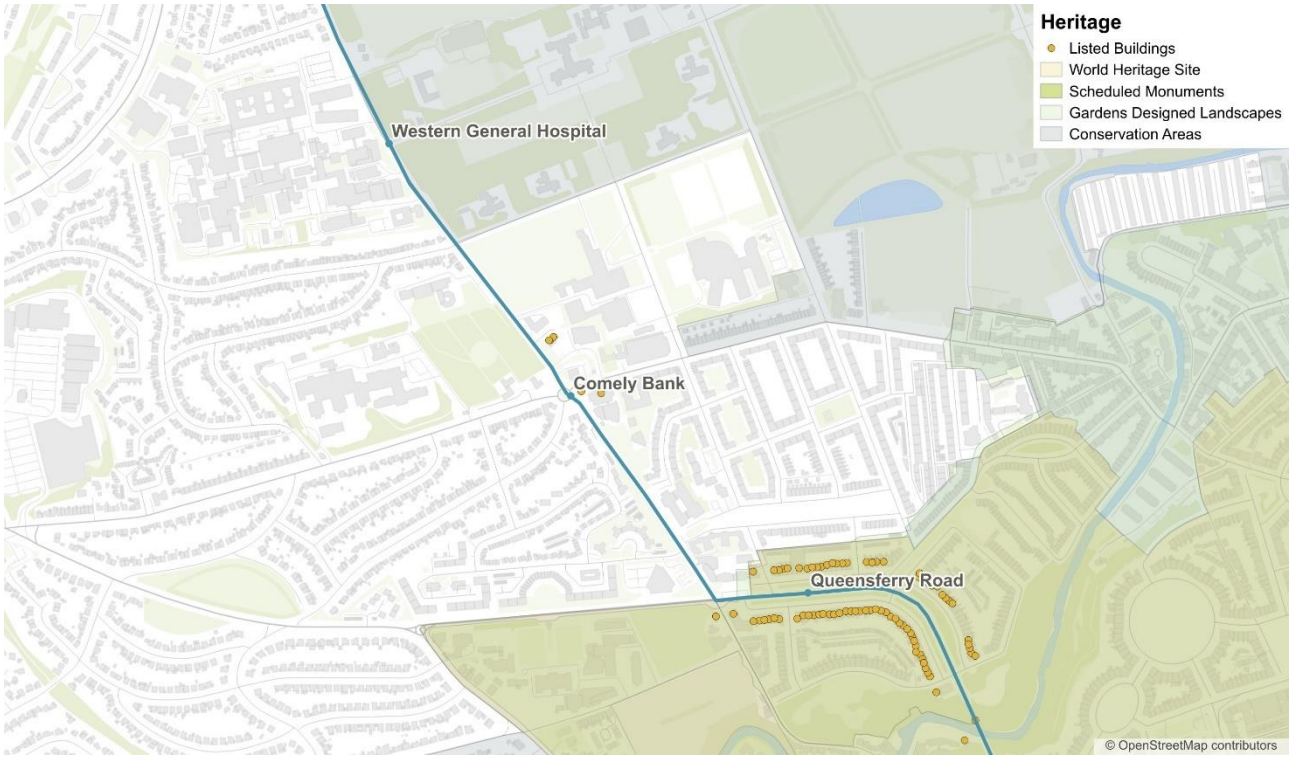
The proposed Queensferry Road tram stop will need to be carefully designed to minimise impacts on the Conservation Area. As indicated, the tram stop platform would be in the centre of the road, similar to the West End stop, but further design and consultation is required to develop a design that minimises any possible impact on adjacent walls and vegetation, and has no impact on nearby trees.

There are a number of listed buildings in the vicinity of Comely Bank, including 177 Comely Bank Road, Flora Stevenson Primary School and Avenue Villas. At this stage, there is not considered to be any scheme effect on the properties.

At Comely Bank Cemetery, the archaeological issues that were discovered on Constitution Street, during tram construction to Newhaven, are not expected here. Potential impacts on the cemetery walls and trees will be avoided.

Figure 3.11 illustrates the tram route within the WHS together with the listed buildings adjacent to the route.

Figure 3.11: Queensferry Road / Comely Bank



3.5 Protected Views

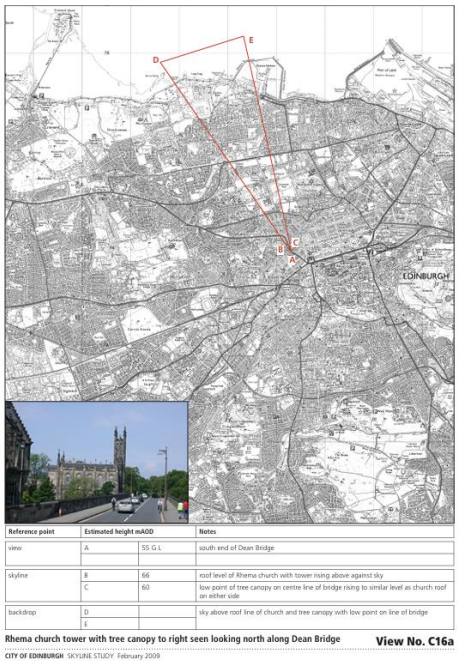
There are a number of protected views on the Queensferry Street / Dean Bridge / Queensferry Road section of the corridor. These are:

- St Mary's Cathedral spires looking along Melville Street from Queensferry Street;
- Rhema church tower with tree canopy to right seen looking north from Dean Bridge;
- Firth of Forth from south-east abutment of Dean Bridge;
- View south-west from Dean Bridge;
- Corstorphine Hill and art gallery towers from Dean Bridge; and
- Fettes College from Queensferry Road.

Full details of each are provided in Appendix B for information.

With the assumption that trams will be battery powered between Queensferry Street and Queensferry Road tram stop, the scheme will have no significant visual impact.

Figure 3.12: Protected View, Rhema Church Tower



4. South East Corridor

4.1 Proposed Tram Alignment

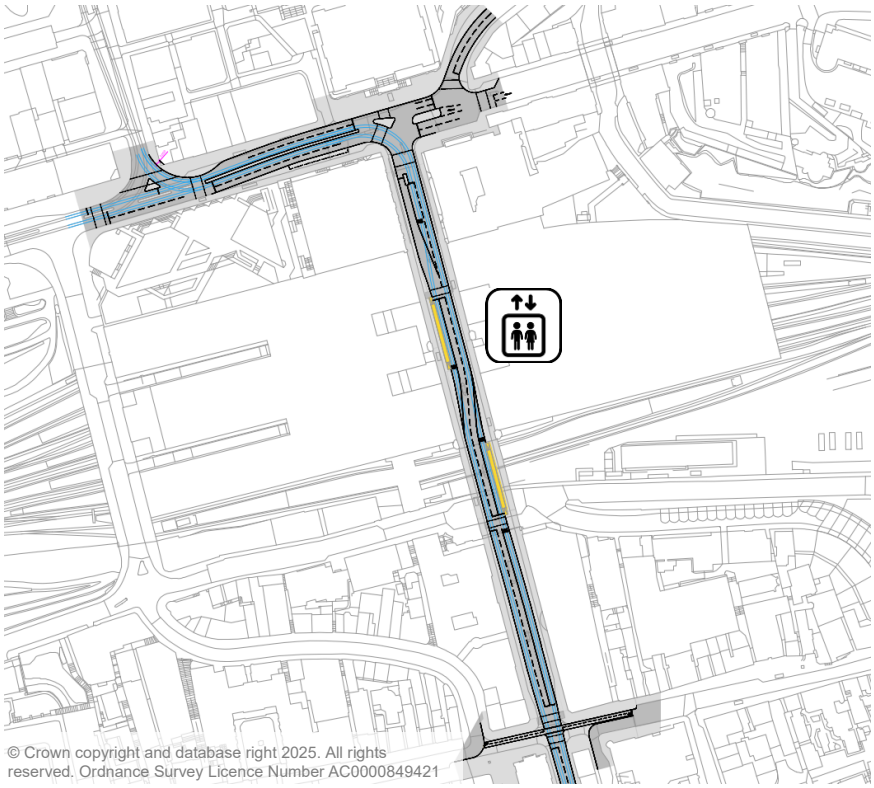
The proposed South East tram alignment connects Princes Street to Shawfair via the Bridges corridor, Cameron Toll, Old Dalkeith Road, The Royal Infirmary and The Wisp.

Figure 4.1: Princes Street to St Patrick Square

A Delta Junction would be created at Princes Street / South St Andrew Street, providing an all-movements connection to the existing network (Figure 4.1).

To minimise the visual impact of the scheme, no OLE would be provided between the Princes Street / South St Andrew Street and Newington tram stop. Trams would operate under battery power over this section.

Figure 4.2: North Bridge Trams Stops



A tram stop would be provided on North Bridge, as shown in Figure 4.2.

Tram stop platforms would be offset to minimise the cross-section, maximising footway space. It is assumed that direct lift access would be provided between the tram stop and Waverley Station, delivering a high-quality interchange. This feature was a key element of City Centre Transformation. It would improve access between the station and the Old Town, which is currently difficult, especially for passengers with reduced mobility or with luggage.

Discussions are being held with Network Rail regarding lift provision and the potential for integration within a future Waverley Station masterplan.

On the South Bridge section, the design seeks to improve pedestrian provision, with widened footways. This is achieved by reducing the number of traffic lanes from four to three (or two where bus stops and loading is provided). Doing so helps address a specific issue at bus stops, where it is almost impossible for pedestrians to pass waiting passengers without stepping into the roadway.

Figure 4.3: Existing Poor Pedestrian Provision on South Bridge

Figure 4.4 illustrates an example cross-section on South Bridge, north of Chambers Street. Three metre footways are provided, with two shared traffic / tram lanes and a southbound bus stop on the east side.

Figure 4.4: Cross-Section at South Bridge Looking North

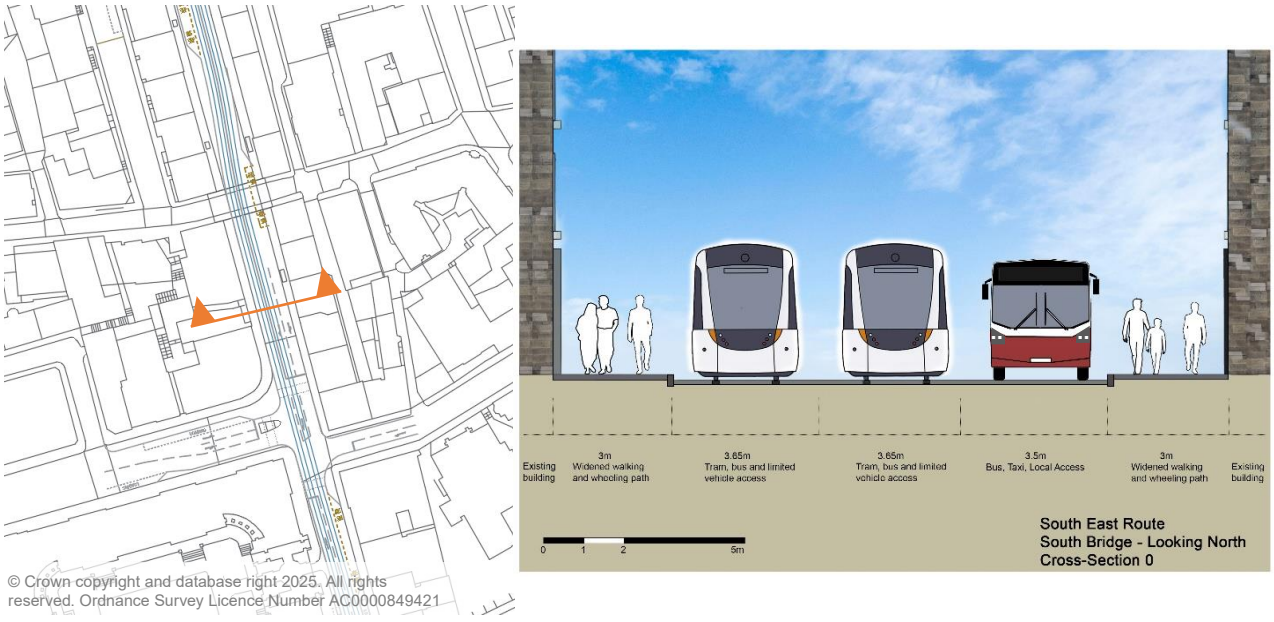
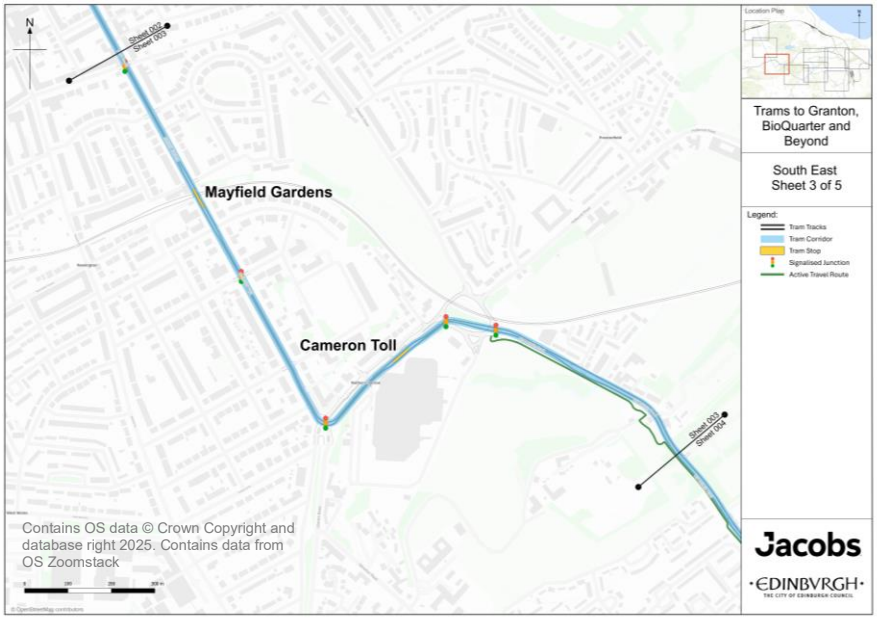


Figure 4.5: St Patrick Square to Mayfield Gardens

Between Minto / Salisbury Place and Lady Road / Craigmillar Park, a single shared traffic and tram lane would be provided in each direction, together with right turn filter lanes as required. All buses and loading would be in bays, minimising potential delays to tram.

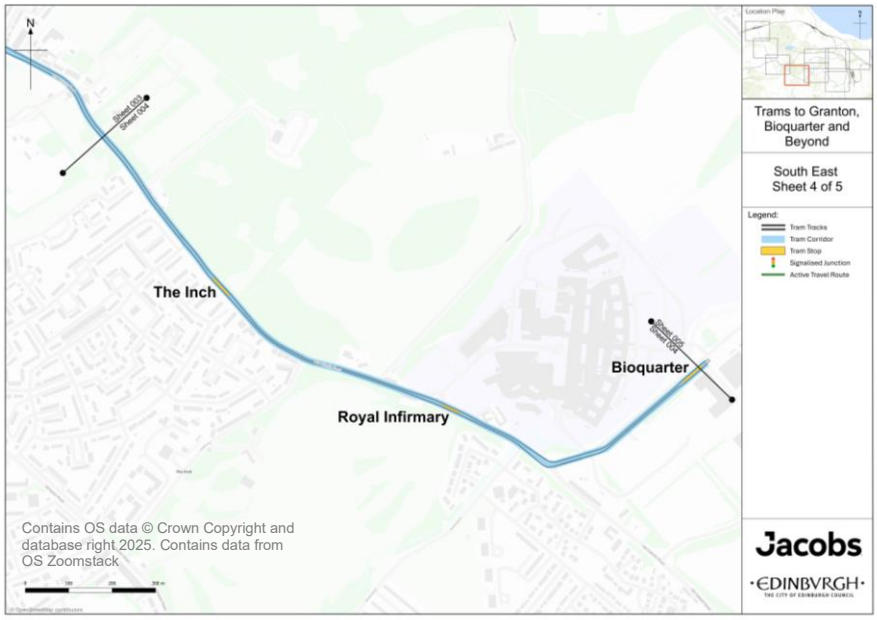
Figure 4.6: Mayfield Gardens to Old Dalkeith Road



The tight turn between Craigmillar Park and Lady Road means that trams will traverse the junction slowly (~10kph), reducing the available capacity for buses and general traffic. To deliver even 70% of current traffic capacity, a complicated junction layout is required with multiple traffic lanes. On Lady Road, east of Craigmillar Park, two tram tracks and five general traffic lanes are necessary, limiting opportunities for placemaking and streetscape improvements. It may be possible to reduce the number of lanes required, but modelling indicates that this will result in significant levels of congestion.

A route adjacent to the Cameron Toll shopping centre was previously agreed with the site owner. Due to the subsequent construction of a fast-food restaurant, the route has been amended to pass through the centre of Cameron Toll roundabout rather than to the south. Otherwise, delivery of tram through this junction is simpler than at Liberton Road / Craigmillar Park / Lady Road.

Figure 4.7: Old Dalkeith Road to BioQuarter



Beyond Cameron Toll, the route is largely on-street along Old Dalkeith Road, mitigating potential impacts at Bridgend Farm, and wider tree loss along the route. The trams design takes cognisance of active travel proposals for the corridor. However, it has been agreed that the materials used in that scheme should reflect the fact it will likely be more cost effective to rebuild cycle provision as part of the construction of tram at a point in the future.

Little France Drive includes a segregated corridor for tram.

Route to Shawfair: Beyond the hospital, the tram route turns right to run adjacent to Tobias Street and then right again to follow the A6106 and Harelaw to Shawfair. These sections are also assumed to be largely off-street although the detail of this section of the alignment will be agreed with Midlothian Council at a future stage.

Route to Queen Margaret University: the route follows the existing local development plan route to Newcraighall Station via Greendykes Road, Niddrie Mains Road and Fort Kinnaird, with a further possible extension to Queen Margaret University with detailed alignment to be discussed at a future stage with East Lothian Council.

These alignment extensions are illustrated in Appendix C.

4.2 Active Travel Provision

In accordance with the Council's Circulation Plan, it has been assumed that the Bridges corridor will not be a primary cycle route.

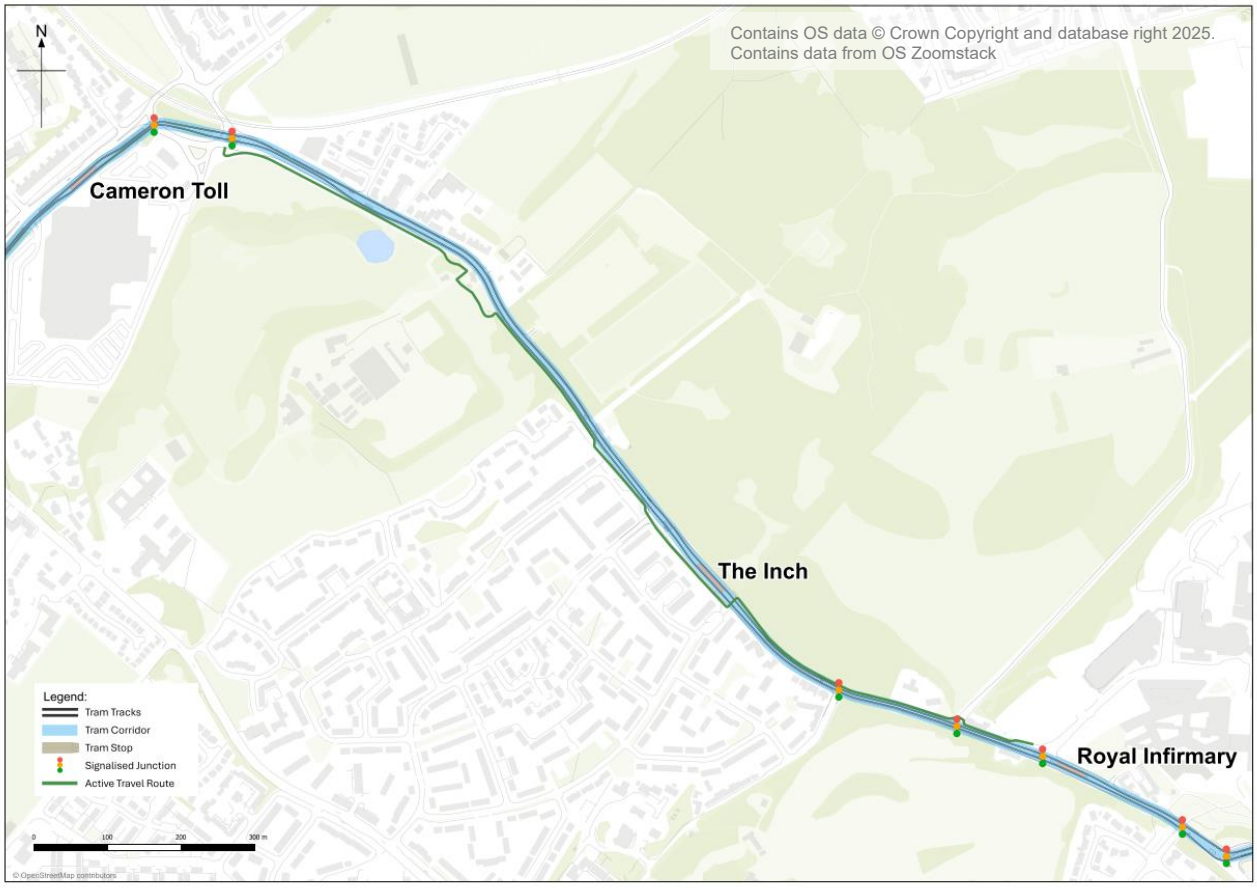
South Bridge and the Southside is an important local centre and footways will be widened to improve walking and access.

Otherwise, between North Bridge and Cameron Toll, the corridor will be prioritised for public transport, including both bus and tram. To support this, and in accordance with the Circulation Plan, a modal filter is proposed in the vicinity of North Bridge, restricting access to buses, trams and taxis. In doing so, the section of South Bridge, north of Chambers Street, would be open for local access only, with an exit via Blair Street.

South of Cameron Toll, the tram design seeks to accommodate the Cameron Toll to BioQuarter Cyling and Walking Route proposals, which have been developed in consulation with this scheme (Figure 4.8).

For the majority of the route, it will be easier to reconstruct the active travel elements rather than retain these during construction. Material choices for the active travel route therefore reflect the semi-permanent nature of the scheme.

Figure 4.8: Active Travel Provision on Old Dalkeith Road

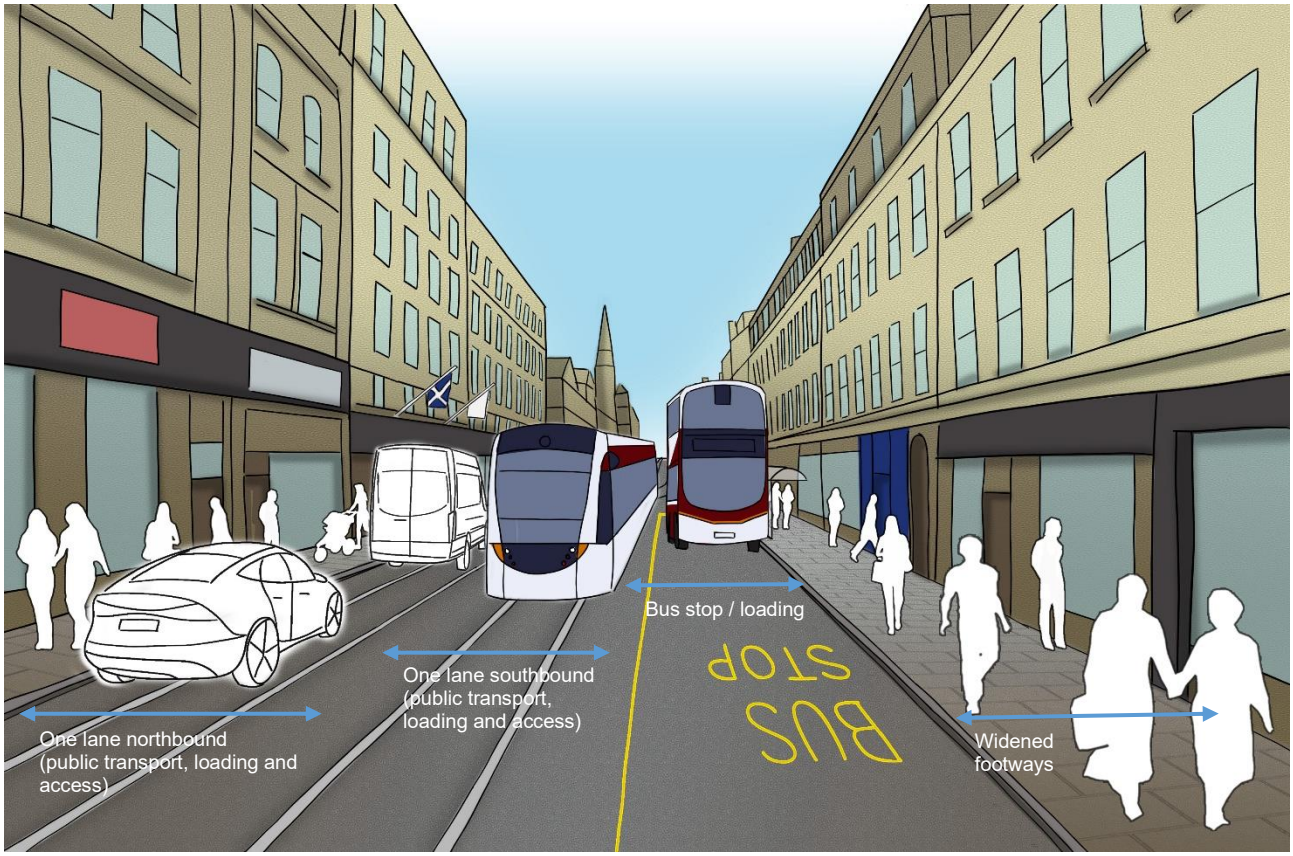


4.3 Landscape / Streetscape

The landscape/streetscape character of the route of the South East corridor is of a predominately urban setting of roads and footpaths. There is little green until the route is further out of the town centre and into a more residential typology. The vegetation at this point is generally off the main road in private residencies, or within adjacent park areas, such as Inch Park and Craigmillar Park. A summary of the different styles and characteristics of the sections of streetscape are described below.

The streetscape along the North Bridge / South Bridge corridor route consists of the only hard landscape with narrow footways and roads. Due to the constrained corridor there is not space for any soft landscape between the buildings which dominate both sides of the route. The proposals will widen the footways helping to increase the safety and permeability of the space for pedestrians, as illustrated in Figure 4.9 below.

Figure 4.9: Visualisation of Tram on South Bridge



From Nicolson Street south, the new layout provides opportunities with the widened footways for streetscape improvements. Apart from the green within Nicolson Square Gardens (Figure 4.10), outside Southside Community Centre and St Patrick Square Garden, there is currently no soft landscape adjacent to the route until the residential properties south of West Preston Street.

The widened footways create opportunities to include rain garden planting adjacent to the road which, as well as helping to collect and infiltrate rainwater, provide visual interest and create a green lung running along the edge of the street (see Figure 4.11). The design of rain gardens and all other landscape proposals will be undertaken at detailed design stage, in line with appropriate council policies and placemaking strategies.

Streetscape improvements will not impede any ongoing or future developments. Tram is a long-term intervention but short and medium-term public realm upgrades, including bus stop improvements and footway widening proposals, can be delivered in the interim.

Figure 4.10: Nicolson Square Gardens

Figure 4.11: Cross-Section Through Clerk Street Looking North

Up to this point the buildings are still very dominant within the streetscape. From West Preston Street south the buildings are set farther back from the road edge. From Sailsbury Place, gardens with low walls and hedges front the footway edge, becoming greener with more trees adjacent to the road closer to the Cameron Toll junction (see Figure 4.12).

Figure 4.12: Craigmillar Park Looking South

The configuration of the route at the junction at Cameron Toll, has not been finalised, but could result in some trees being lost on the southern bank, however future potential developments at Cameron Toll itself, may already impact these trees prior to the tram running through this space.

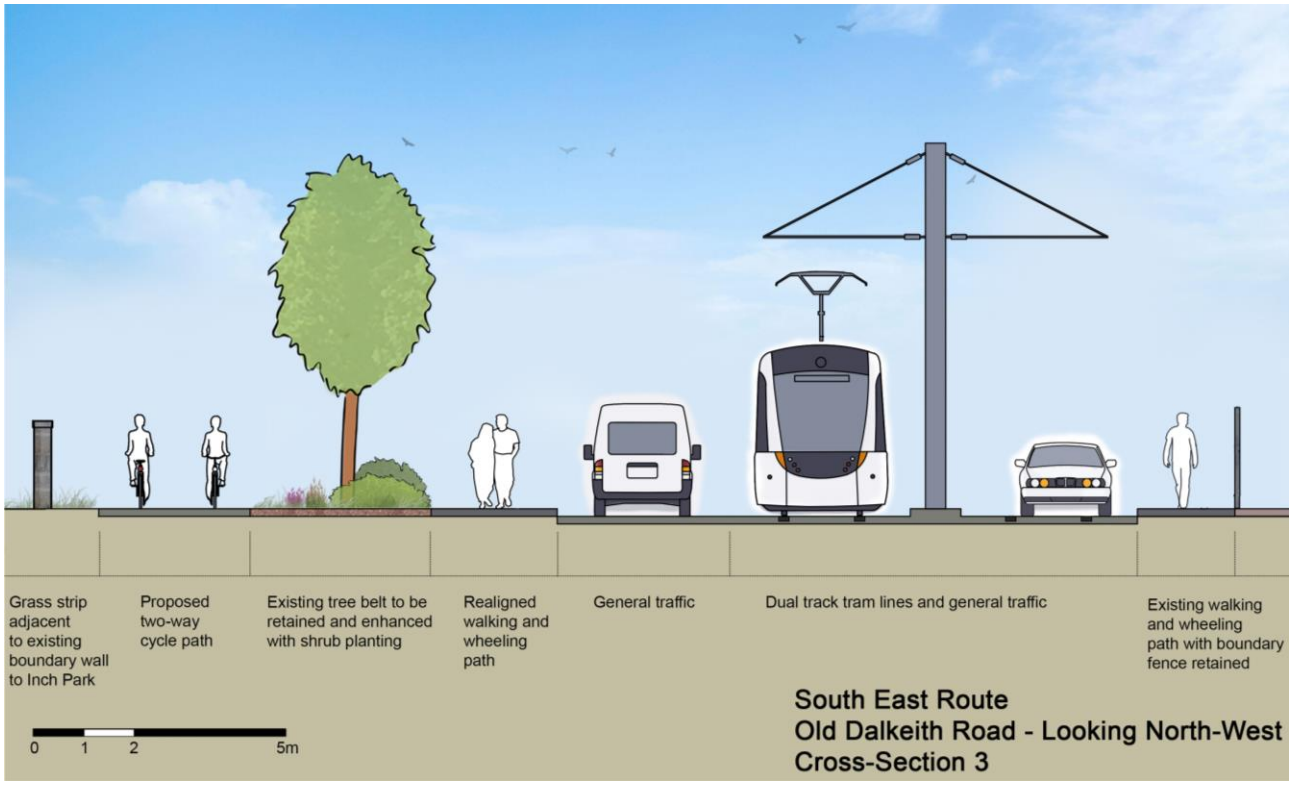
This may be an opportunity to enhance the connection into Cameron Toll, creating a boulevard effect into the shopping centre, which will develop over time as the route is firmed up.

As the tram passes through the Cameron Toll roundabout and along the edge of the shopping centre extents, there will be additional impacts on the soft landscape (see Figure 4.13 below). The full extent of this will develop as the design progresses.

Figure 4.13: Cameron Toll Roundabout Facing North East

As the route continues on Old Dalkeith Road there is a landscape buffer between Inch Park and the road, which provides opportunity to include a cycle path away from the road and mostly retain the existing trees within the landscape (see Figure 4.14 below)

Figure 4.14: Cross-Section Along Old Dalkeith Road Looking North-West



Vegetation further south along Old Dalkeith Road is located out with the road corridor behind walls, with the Inch Park on the west and Craigmillar Castle Park Cemetery followed by Craigmillar Park on the east. There may be some overhanding branches that may need to be removed, but in general the trees should not be

impacted. There is however a pinch point as the road bends around the corner opposite the Arron Lodge Guest House, which will be difficult to negotiate (see figure 4.15 below), and it may impact the wall and trees within Craigmillar Castle Park.

Figure 4.15: Old Dalkeith Road Looking North Just South of Arron Lodge Guest House

As the route reaches the BioQuarter and the Edinburgh Royal Infirmary Hospital, Liberton Golf Club banks up on the western side and the hospital spans out to the east. Overhanging branches may need to be pruned along the perimeter of the golf club, but the wall retains the trees in place (see Figure 4.16 below).

Figure 4.16: Visualisation of Tram at the Royal Infirmary, Edinburgh

The route bends around the corner along Little France Drive with green space, including Burdiehouse Burn, on the east of the road (Figure 4.17 below). This is due to be retained with the route remaining on the road.

Figure 4.17: Greenspace Adjacent to Burdiehouse Burn

The route then follows Little France Drive and onto the bus priority route after it has passed the hospital and retaining on the existing road.

Figure 4.18: Little France Drive Facing East

The routes along to Shawfair and Queen Margaret University are in early stage design, and need to be discussed with Midlothian Council, however in principle the route will be aligned to minimise disruption to views and the landscape, and include any relevant landscape mitigation as required.

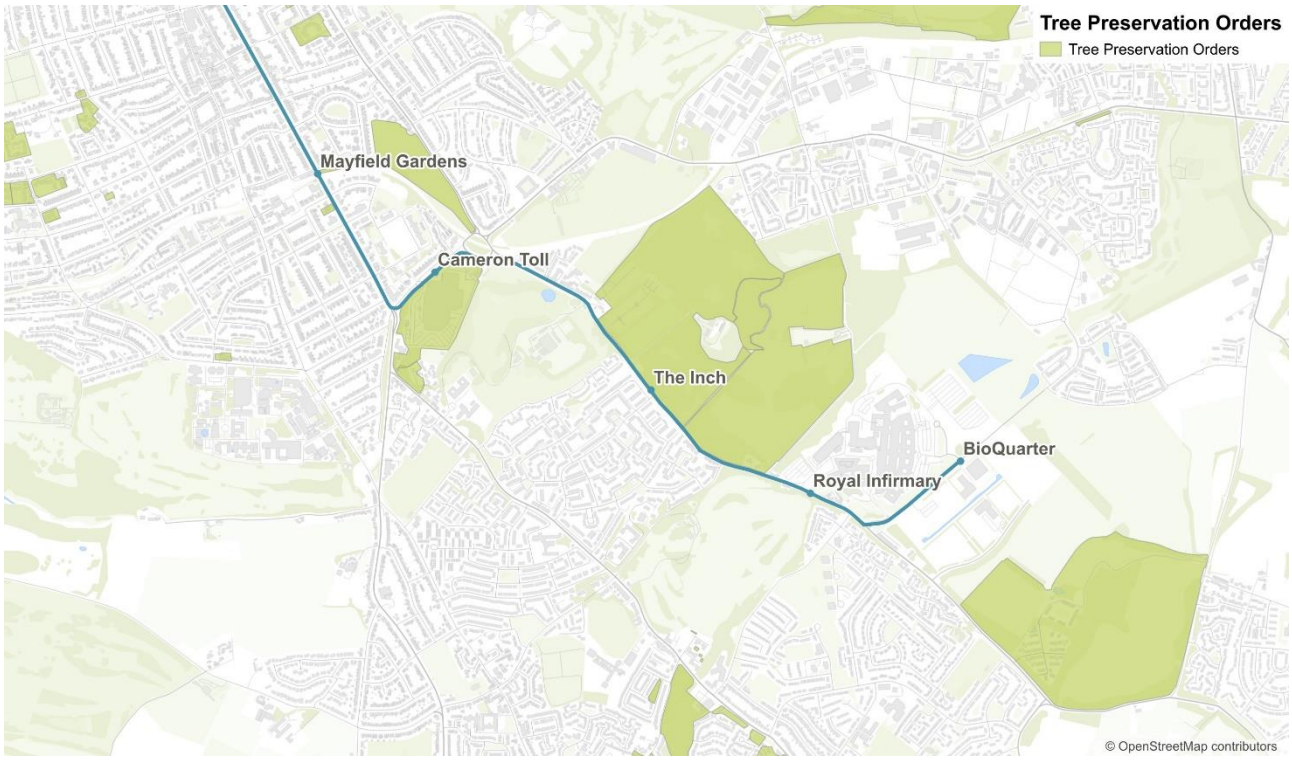
4.3.1 Tree Preservation Orders

Tree preservation orders are shown in Figure 4.19 and are located at:

- A701 between Ventnor Terrace and the south suburban rail line;
- Cameron Toll shopping centre;
- Craigmillar Castle Park; and
- south west of the junction of Niddrie Mains Road / Niddrie Marischal Road.

Based current design information, there will be limited impact on these sites, as the site are adjacent to (not on) the route. Until more detailed design information is available it is difficult to know which, if any, trees will be impacted.

Figure 4.19: Tree Preservation Orders at Cameron Toll and Old Dalkeith Road



4.4 Heritage and Archaeology

The section of tram route between east Princes Street and Cameron Toll passes many heritage buildings and assets, as shown in Figure 4.20.

It has been assumed that trams would be battery powered between Princes Street and Newington tram stop, negating the need for OLE over this section. As a result, the impact on the WHS and nearby buildings is minimised.

North and South Bridge are both category A listed. Construction impacts across these structures are discussed in a separate report.

It is anticipated that there will be significant archaeology between the Old Town and Salisbury Place, reflecting the historic Portsburgh area, located to the south of the original city walls. While it will take time to assess the site, there are no known substantive issues impacting project construction.

South of Salisbury Place, there are further listed buildings towards Cameron Toll. OLE equipment is proposed to be in the centre of the road and so there will be no impact on these properties.

Figure 4.20: Heritage North Bridge to Cameron Toll

On Old Dalkeith Road, tram is proposed to be on-street (Figure 4.21). Bridgend Farm is particular significance. Now a community space, parts of the property are believed to be the remains of a 15-16th century royal chapel. The tram alignment avoids these buildings, but track geometry requires a reduced speed limit to do so.

Figure 4.21: Heritage Old Dalkeith Road

The tram alignment passes the grounds of Craigmillar Castle (a scheduled ancient monument – shown in green). The existing boundary wall is in poor repair, and there is an opportunity for full restoration as part of this project.

Beyond the BioQuarter, towards Shawfair, historic mining may require mitigation. The Wisp is a historic north / south route and so archaeology may be present.

Beyond the BioQuarter, towards Queen Margaret University, there is likely to be significant archaeology in the vicinity of the Niddrie Burn and Jack Kane Park. The latter was part of the Niddrie Marischal House estate and previous excavation located the remains of an ice house, a discrete area of medieval activity and the remains of a possible path or estate road associated with the 17th century Niddrie House.

Within East Lothian additional archaeology and mining activity is expected.

4.5 Protected Views

There are a number of protected views on Old Dalkeith Road that could be impacted by the installation of OLE. Therse are:

- Old Dalkeith Road by Craigmillar Caste towards the Castle
- Old Dalkeith Road by Cameron Toll towards Salisbury Crags
- Old Dalkeith Road, south of Cameron Toll, towards Arthur's Seat and Salisbury Crags

Full details of each are provided in Appendix B for information.

At this stage, it is assumed that that this section of the route would require OLE and so consultation will be required with planning officers and key stakeholders to minimise potential visual impacts. Nevertheless, battery tram operation may be possible, subject to requirements elsewhere along the route, and continued improvements in battery technologies.

5. Summary

5.1 Introduction

This report summarises the key landscape and heritage issues along the route of the proposed Trams to Granton, BioQuarter and Beyond corridor, and potential mitigation to offset these. This document is one of three interrelated reports, the others covering Ecology and Health & Wellbeing.

The Trams to Granton, BioQuarter and Beyond route comprises of three sections.

Two alternative alignments between the city centre and Granton are being considered: one off-street via the Roseburn Path and one on-street via Orchard Brae and Crewe Road South. Both options serve the Western General Hospital and planned major development at Granton Waterfront.

To the south east, between the city centre and the BioQuarter, a single route is proposed via North and South Bridge, Minto Street / Craigmillar Park, Lady Road and Cameron Toll. This provides connectivity to the University of Edinburgh, Cameron Toll shopping centre, the Royal Infirmary and BioQuarter. Beyond the BioQuarter, a route to Shawfair would provide interchange with the Borders railway, improving regional connectivity. A route to Queen Margaret University and Musselburgh Station, via Craigmillar and Fort Kinnaird, is also under consideration.

On the Roseburn corridor, landscape impacts are of greatest significance, with the potential for tree loss and a change in the amenity. On the Orchard Brae and South East corridors, heritage impacts are typically of greater concern, although local landscape impacts also require to be addressed.

5.2 Roseburn Corridor

5.2.1 Roseburn Landscape

Initial tram and active travel design has been based on the previous 2008 scheme; a significant level of detailed design work had already been undertaken when design work was stopped. Nevertheless, design principles and constraints have moved forwards significantly since then. Environmental legislation has changed, accessibility requirements have been improved, and tram operating regulations are regularly updated. In addition, there has been significant public comment regarding the original scheme, particularly with regards to tree loss, future active travel provision, the loss of amenity, and impacts on health and wellbeing.

Based on the above, the design for the Roseburn corridor has been considerably revised, with a particular focus on reducing the environmental impact of the scheme. Key mitigation proposals are:

- Single tracking between Roseburn and Craigleith tram stops, including the removal of the Ravelston Dykes tram stop;
- Use of battery powered trams, removing the need for Overhead Line Equipment (OLE) between Roseburn junction and Crewe Toll tram stop;
- Additional tree retention;
- Improved greenspace and placemaking; and
- Additional on-street active travel provision (on Queensferry Road and through Murrayfield).

The Landscape Habitat Management Plan (LHMP) highlights the implications the engineering design would have on the landscape proposals within the Roseburn corridor. This includes implications in respect of the tree planting proposals in addition to the retention of existing trees within the corridor. Both these elements of the design are key aspects in the mitigation of visual impacts likely to be experienced by nearby residents and any commitments to maintain, as far as practicable, the ‘leafy’ character of the disused railway line, and minimise impacts on amenity. The LHMP also highlights that changes to the alignment of the tracks would affect all other design elements (which would include the alignment of the cycleway / footpath).

The updated design of the shared travel corridor includes for a variety of widths along the route. A summary of the implications is noted below:

- By rerouting the active travel path along Balbirnie Place or Russell Road, the width of the path adjacent to the tram tracks can be reduced to 2m. This reduces the overall footprint of the proposed infrastructure in this area.
- Between the Roseburn and the Craigleith tram stops, the provision of single track greatly reduces the overall width required for the proposed infrastructure and generally maintaining the tram and active travel path within the existing travel corridor. This is an extremely positive revision to the original design enabling the retention of a large number of existing trees and vegetation.
- For a short section through Telford Road bridge, the active travel path is reduced to approximately 2.3 metres.
- At Drylaw Park the active travel path will run through the park, providing a more attractive route.
- Past Drylaw Park, derelict land is utilised to keep the tram to the east of the space allowing the existing path to remain in its place and be separate from the tram tracks, and it helps to reduce tree loss. The tram stop here also creates better links to the Western General Hospital.

Single tracking Roseburn to Craigleith means that tram and active travel provision are accommodated within the existing cross-section. This reduces the need for new retaining walls, and soil stabilisation, which in turn helps reduce tree and vegetation loss.

Tree information is available from:

- a previous topographical survey, and
- the national tree survey

The topographical survey is considered to be more accurate and has been used to estimate potential tree loss, based on double and single track options. The survey contains approximately 3,100 trees. Doubling tracking between Roseburn and Craigleith tram stops would result in the loss of approximately 1,200 trees. Single tracking requires the removal of around 1,000 trees with 2,100 remaining (Table 5.1). At least two new trees would be planted for each one lost.

Table 5.1: Estimated Tree Loss

	Number of Existing Trees*	Estimated Tree Loss	Trees Remaining
Double Track	3,100	1,200	1,900
Single Track	3,100	1,000	2,100

* from topographical survey

An additional risk to the existing planting relates to noise mitigation (fencing). The location of noise mitigation fencing was not provided in the December 2006 LHMP but it was noted within the document that where the tram route is in cutting, the mitigation would be sited on the boundaries of adjoining properties. Where this is the case, the mitigation may result in the loss of existing vegetation along the actual boundary for construction access and fencing installation. The location of any noise mitigation fencing is not yet defined, and so potential impacts are unknown.

5.2.2 Granton Streetscape

North of Crewe Toll, the proposed tram alignment is largely unchanged from the 2008 scheme; provision is already made within much of the street network.

The alignment would be located off-street to the west of West Granton Access, with a widened structure constructed at Crewe Road Gardens. The route would cross West Granton Road at-grade before continuing off-street to the west of Waterfront Broadway. Tram would be located to the north of Waterfront Avenue within the existing protected corridor. The route would then be located on the north side of West Harbour Road, terminating at Granton Square.

Over the above on-street section, it is assumed that OLE equipment would be required throughout.

5.2.3 Heritage and Archaeology

Given its previous use as a railway corridor, there is no significant heritage or archaeology along the Roseburn Path. The design would not directly impact listed buildings on West Harbour Road and at Granton Square; streetscape improvements would seek to enhance their setting where possible.

5.3 Orchard Brae Corridor

5.3.1 Landscape / Streetscape

The landscape along the Orchard Brae corridor route consists of the predominantly hard landscape of roads and footways. Due to the constrained corridor there is very limited space for any soft landscape or public realm elements between the private residences / business on either side of the route.

At the southern end of the route along Queensferry Street there is an opportunity for local widening of footways to enable an easier flow for pedestrians.

Past Dean Bridge, along Queensferry Road, the street is lined with hedges and trees from adjacent properties or green space. These are however set back from the street and should be mostly unaffected, apart from some minor pruning of branches.

On Orchard Brae, the corridor cross-section is narrow and a steeper gradient. On the northern section of this road, after Orchard Brae Avenue, the footpath on the west side ceases and vegetation forms a buffer between the road and the adjacent flats and properties. Closer to the roundabout the footpath returns, continuing down to the roundabout. Due to the tightness of this section, some pruning of trees is required to provide sufficient clearance.

From Comely Bank Roundabout heading north on Crewe Road South and past the hospital, there is again greenery located on both sides of the road. Trees and hedges / planting are outside the streetscape, instead being located on adjacent private land. Local pruning may be required to overhanging tree branches although the removal of mature trees would be avoided.

5.3.2 Heritage and Archaeology

Queensferry Street, Dean Bridge and Queensferry Road are all located within WHS and local conservation area. As tram has already been delivered within the WHS, the impact of this mode on the site has already been considered and accepted.

On the Orchard Brae corridor, it is proposed that the use of battery powered trams would allow there to be no OLE between Queensferry Street and Queensferry Road tram stop. This would reduce the visual impact of the scheme across Dean Bridge and on key protected views along this section of the corridor.

The proposed Queensferry Road tram stop will need to be carefully designed to minimise impacts on the Conservation Area.

There are a number of listed buildings in the vicinity of Comely Bank, including 177 Comely Bank Road, Flora Stevenson Primary School and Avenue Villas. At this stage, the scheme is not considered to have any effect on the properties.

At Comely Bank Cemetery, the archaeological issues that were discovered on Constitution Street, during tram construction to Newhaven, are not expected here. Potential impacts on the cemetery walls and trees will be avoided.

5.4 South East Corridor

5.4.1 Landscape / Streetscape

The streetscape along the North Bridge / South Bridge corridor route consists of only hard landscape with narrow footways and roads. Due to the constrained corridor there is not space for any soft landscape between the buildings on either side of the route. The proposals will widen the footways helping to increase the safety and permeability of the space for pedestrians.

From Nicolson Street south, the new layout provides opportunities with widened footways for streetscape improvements. Apart from the green within Nicolson Square Gardens, outside Southside Community Centre and St Patrick Square Garden, there is currently no soft landscape adjacent to the route until the residential properties south of Salisbury Place. The widened footways create opportunities to include rain garden planting adjacent to the road which, as well as helping to collect and infiltrate rainwater, provide visual interest and create a green lung running along the edge of the street.

Trams are proposed to be battery powered between the east end of Princes Street and Newington tram stop, removing the need for OLE.

From West Preston Street south the buildings are set farther back from the road edge. From Sailsbury Place, gardens with low walls and hedges front the footway edge, becoming greener with more trees adjacent to the road closer to the Cameron Toll junction.

The route at Cameron Toll shopping centre may impact some trees however future development around the centre itself is likely to have a greater impact. As the tram passes through Cameron Toll roundabout there will be additional impacts on the soft landscape; the full extent of this will be determined as the tram design is developed.

Vegetation on Old Dalkeith Road is located out with the road corridor behind walls. There may be some overhanding branches that may need to be removed, but in general the trees should not be impacted.

There is a pinch point as the road bends around the corner at Craigmillar Castle. Nevertheless, the existing boundary wall is in poor repair, and there is an opportunity for full restoration as part of this project.

As the route reaches the BioQuarter and the Edinburgh Royal Infirmary Hospital, Liberton Golf Club banks up on the western side and the hospital spans out to the east. Overhanging branches may need to be pruned along the perimeter of the golf club, but existing walls will be retained.

The route bends around the corner along Little France Drive with green space, including Burdiehouse Burn, on the east of the road. This is due to be retained with the route remaining on the road. The route then follows Little France Drive onto the bus priority route after it has passed the hospital and retained on the existing road.

The routes along to Shawfair and Queen Margaret University are in early-stage design, and need to be discussed further with Midlothian Council and East Lothian Council, however in principle the route will be aligned to minimise disruption to views and the landscape, and include any relevant landscape mitigation as required.

5.4.2 Heritage and Archaeology

The section of tram route between Princes Street and Cameron Toll passes many heritage buildings and assets. It has been assumed that trams would be battery powered between Princes Street and Newington tram stop. As a result, the impact on the WHS and nearby buildings is minimised.

There are multiple Conservation Areas along the corridor, each with a unique character. These are:

- New Town;
- Old Town;
- South side;
- Blacket;
- Waverley Park; and
- Craigmillar Park.

North and South Bridge are both category A listed. Construction impacts across these structures are discussed in a separate report.

There is likely to be significant archaeology between the Old Town and Salisbury Place, reflecting the historic Portsburgh area. While it will take time to assess the site, there are no known substantive issues impacting project construction. South of Salisbury Place, there are further listed buildings towards Cameron

Toll. OLE equipment is proposed to be in the centre of the road and so there will be no impact on these properties.

On Old Dalkeith Road, tram is proposed to be on-street. Bridgend Farm is of particular significance, now a community space, parts of the property are believed to be the remains of a 15-16th century royal chapel. The tram alignment avoids these buildings, before passing the grounds of Craigmillar Castle.

Beyond the BioQuarter, towards Shawfair, historic mining may require mitigation. The Wisp is a historic north / south route and so archaeology may be present. Towards Queen Margaret University, there is likely to be significant archaeology in the vicinity of the Niddrie Burn and Jack Kane Park. Within East Lothian additional archaeology and mining activity is expected.

Appendix A. Tree Loss Locations: Topographical Survey

Figure A.1: Roseburn Tree Locations Sheet 1

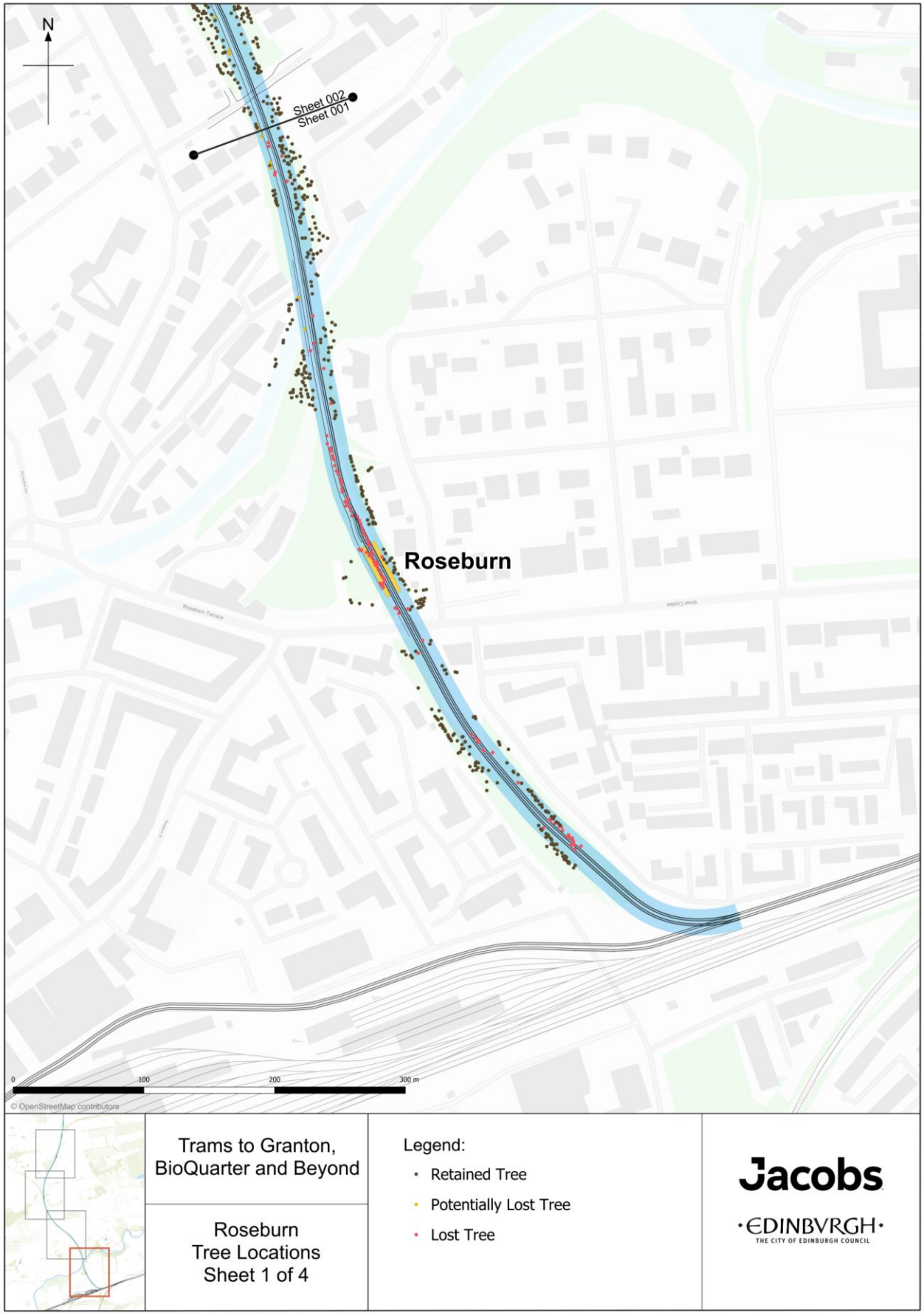
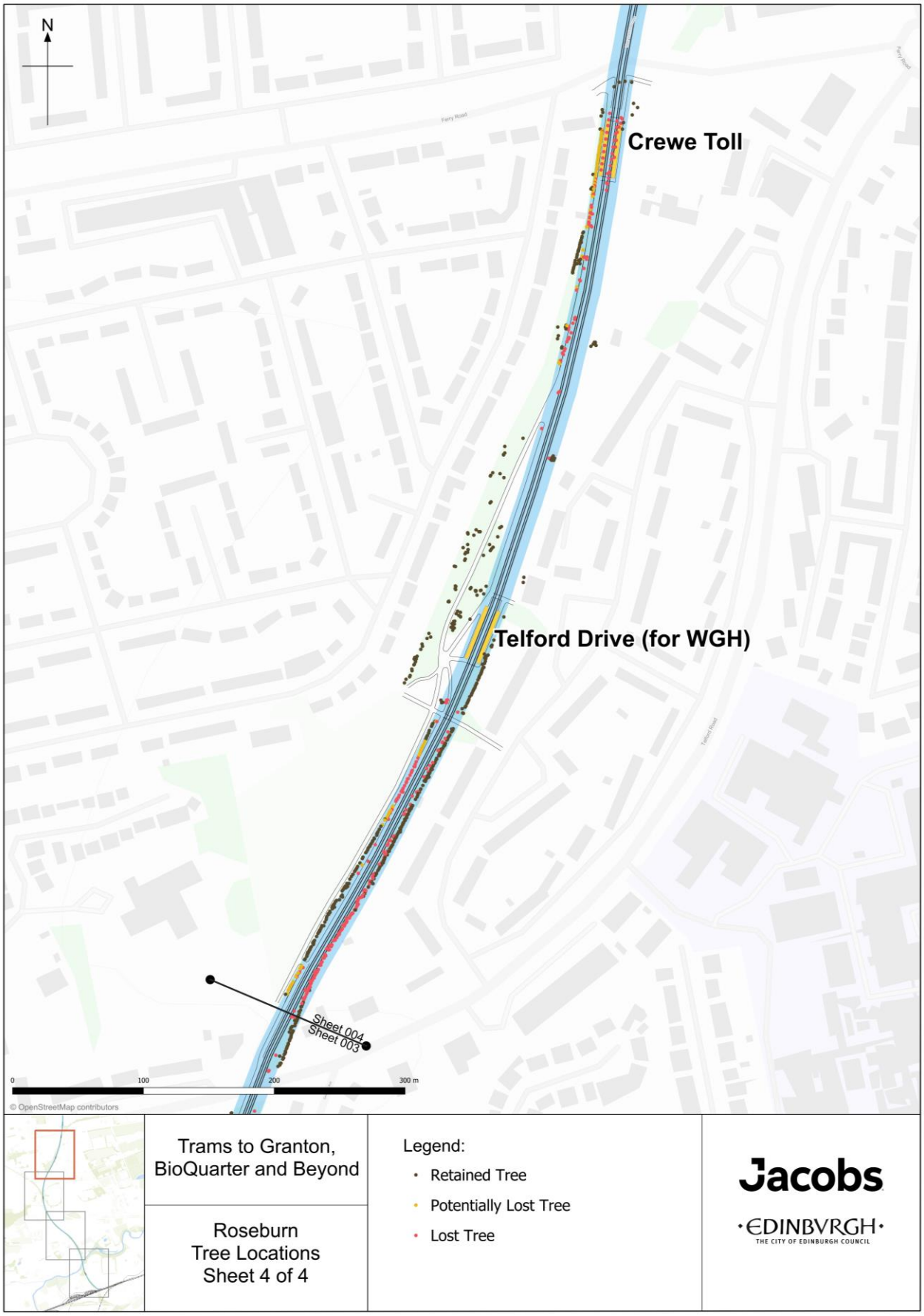


Figure A.2: Roseburn Tree Locations Sheet 2

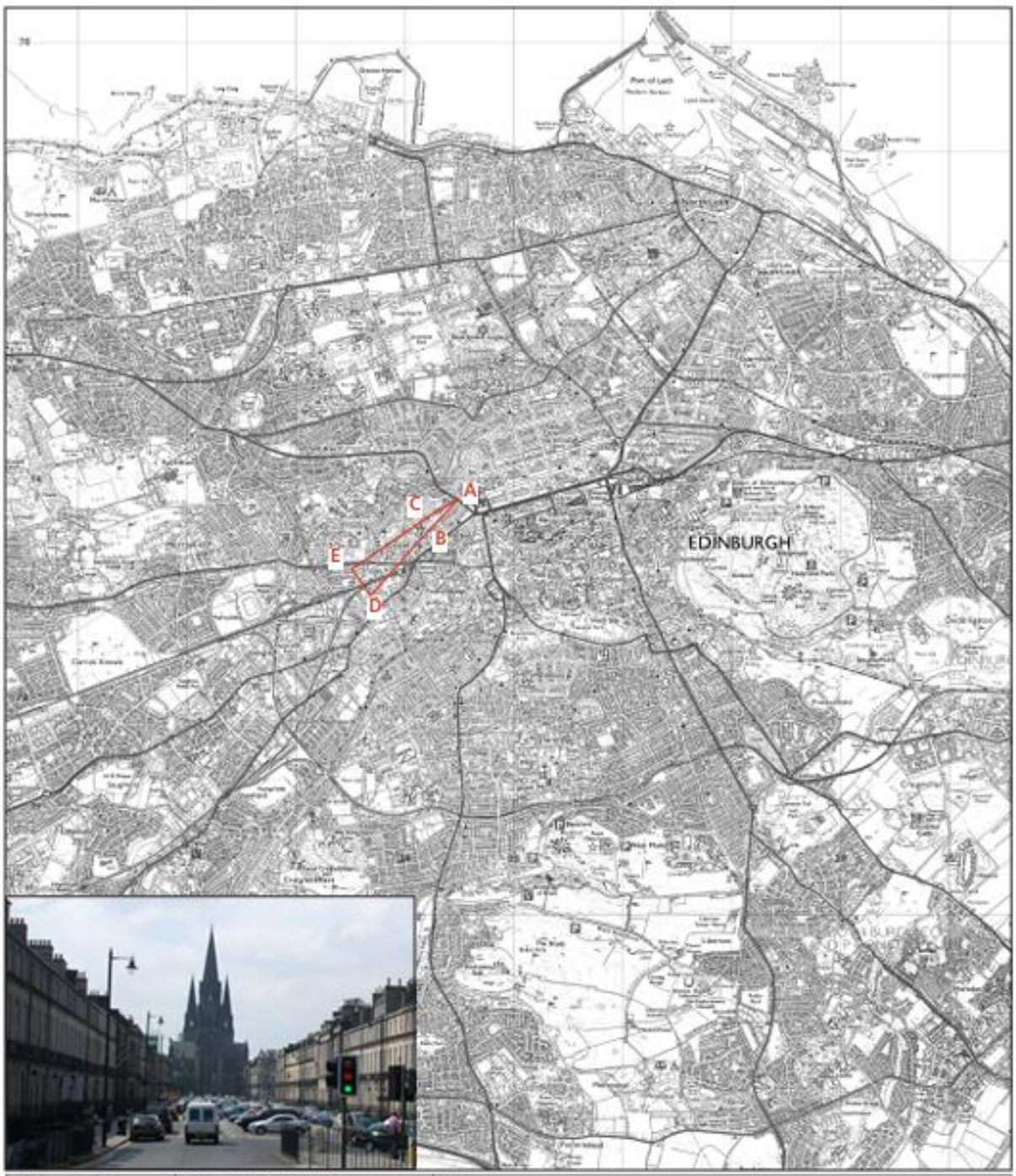
Figure A.3: Roseburn Tree Locations Sheet 3

Figure A.4: Roseburn Tree Locations Sheet 4



Appendix B. Protected Views

Figure B.1: St Mary's Cathedral Spires Looking Along Melville Street



Reference point	Estimated height mAOD		Notes
view	A	61 G L	centre line of Melville Street at Queensferry Street; view cone wide enough to incorporate views from north and south pavements of Melville Street
skyline	B	87	roof level of St Mary's Cathedral; spires rise above roof level against open sky
	C		
backdrop	D		rising sight line
	E		

St Mary's Cathedral spires looking along Melville Street from Queensferry Street **View No. C15**

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Figure B.2: Rhema Church Tower with Tree Canopy Looking North Along Dean Bridge

Reference point	Estimated height mAOD		Notes
view	A	55 G L	south end of Dean Bridge
skyline	B	66	roof level of Rhema church with tower rising above against sky
	C	60	low point of tree canopy on centre line of bridge rising to similar level as church roof on either side
backdrop	D		sky above roof line of church and tree canopy with low point on line of bridge
	E		

Rhema church tower with tree canopy to right seen looking north along Dean Bridge **View No. C16a**

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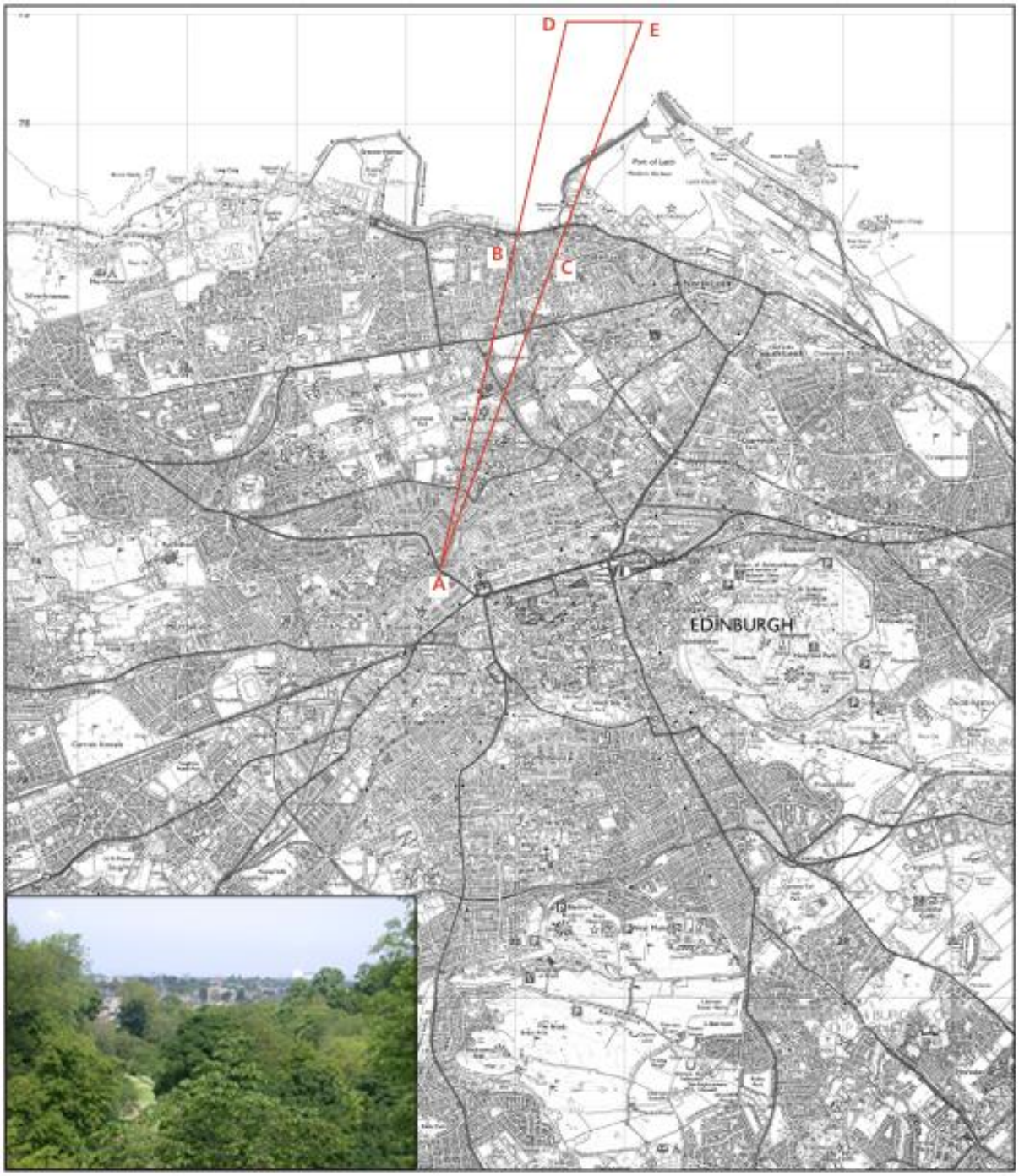
Figure B.3: Firth of Forth from South-East Abutment of Dean Bridge



Reference point	Estimated height mAOD		Notes
view	A	54 G L	south-east abutment of Dean Bridge, on bridge
skyline	B	40	tree canopy on coastal scarp, seen between trees
	C		
backdrop	D		sea and distant hills
	E		

Firth of Forth from south-east abutment of Dean Bridge **View No. C16b**

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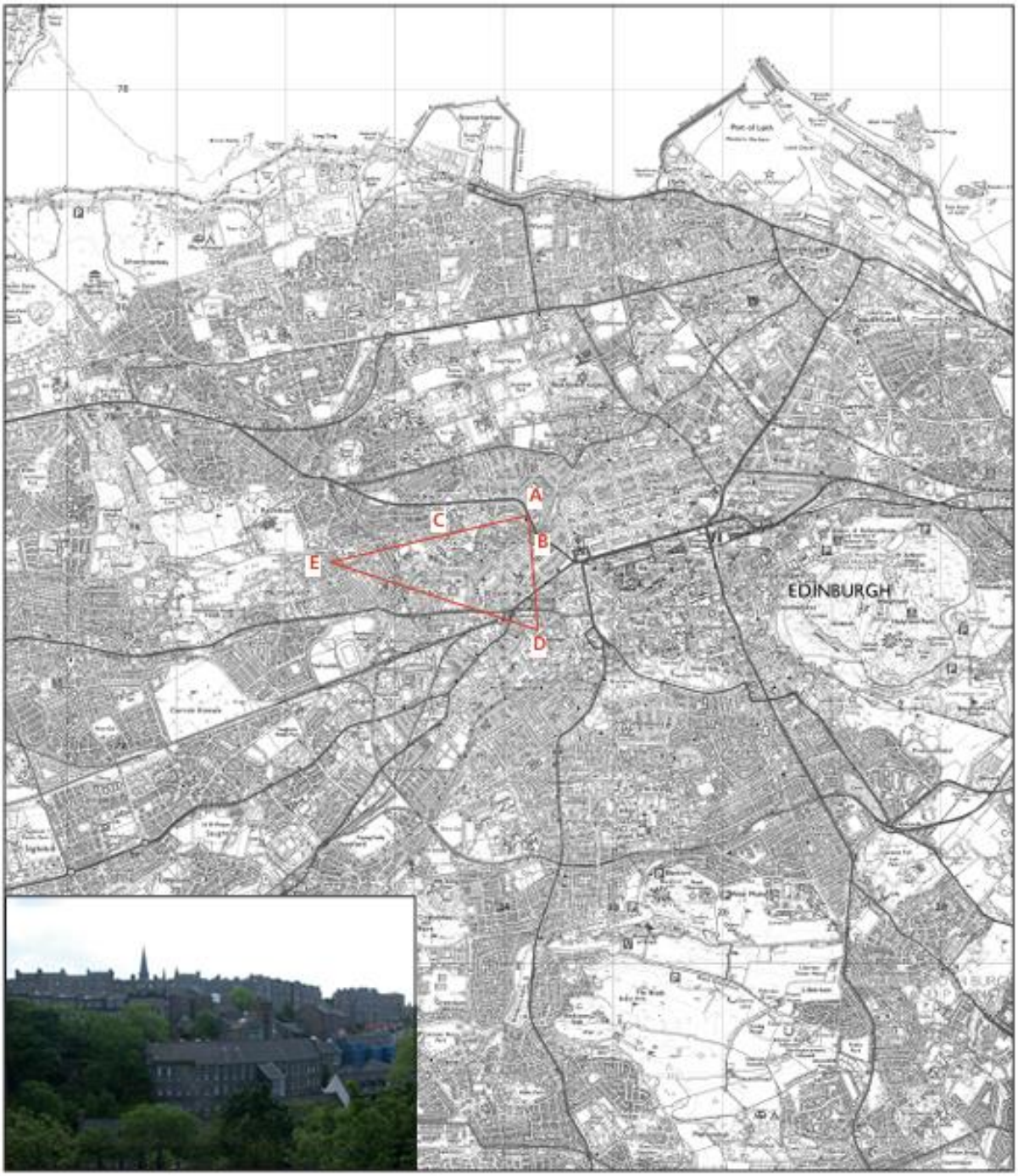
Figure B.4: View South-West from Dean Bridge



Reference point	Estimated height mAOD		Notes
view	A	53 G L (bridge)	30m south of north end of Dean Bridge, west side
skyline	B		rooftops of north terraces in West End
	C		wooded skyline above the Water of Leith gorge
backdrop	D		open sky beyond skyline, with the tops of spires
	E		

View south-west from Dean Bridge **View No. C16c**

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Figure B.5: Corstorphine Hill and Art Gallery Towers from Dean Bridge

Reference point	Estimated height mAOD		Notes
view	A	54 G L	40m from south end of Dean Bridge, west side
skyline	B		wooded skyline along the top of Water of Leith gorge
	C		
backdrop	D		Corstorphine Hill with open sky to left of art gallery towers
	E		

Corstorphine Hill and art gallery towers from Dean Bridge **View No. C16d**

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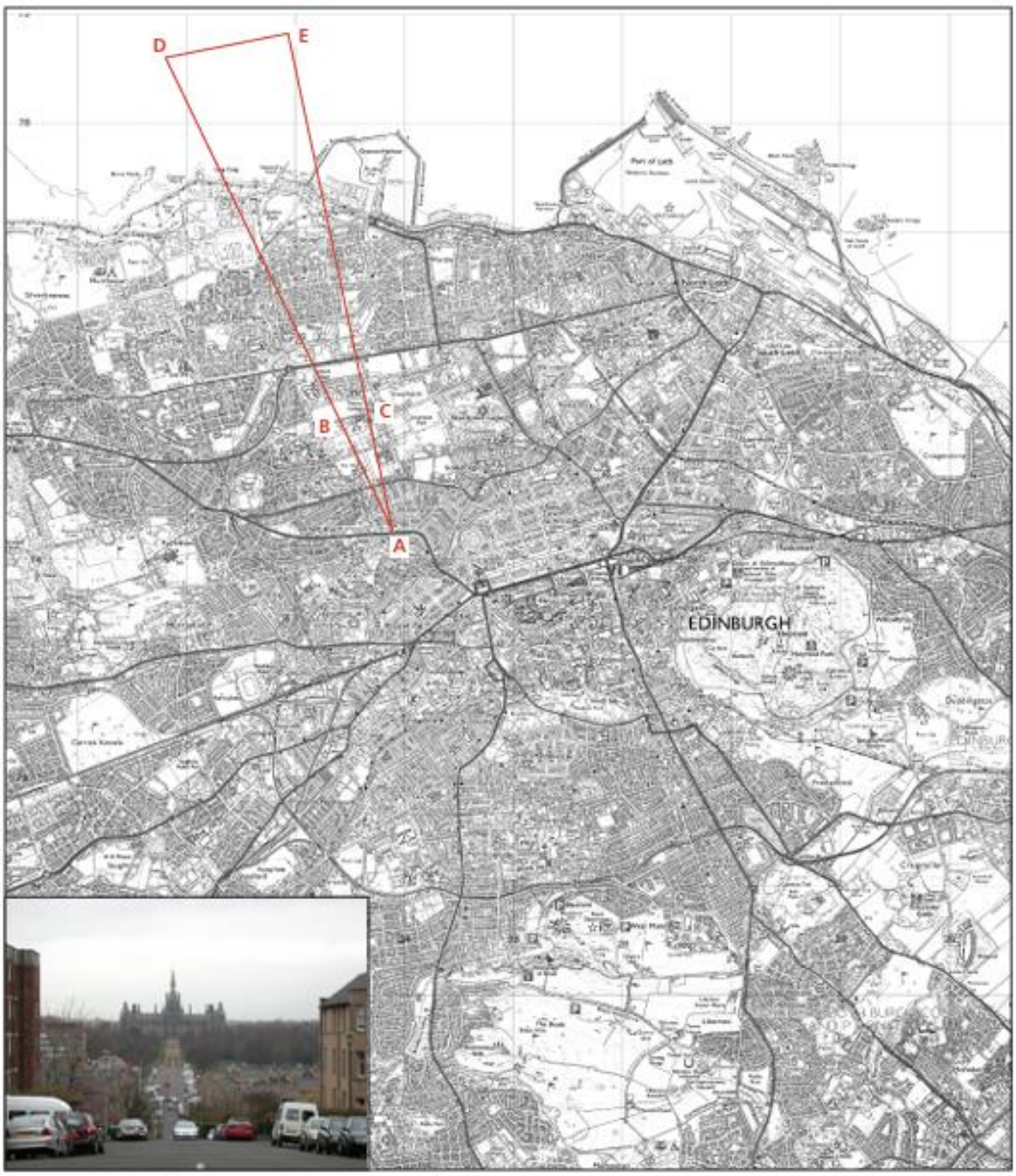
Figure B.6: Fettes College from Queensferry Road



Reference point	Estimated height mAOD		Notes
view	A	44 G L	Queensferry Road looking north along Learmouth Avenue
skyline	B	50	tree canopy along ridge with the picturesque profile of Fettes College rising above
	C	50	
backdrop	D		open sky
	E		

Fettes College from Queensferry Road **View No. C18**

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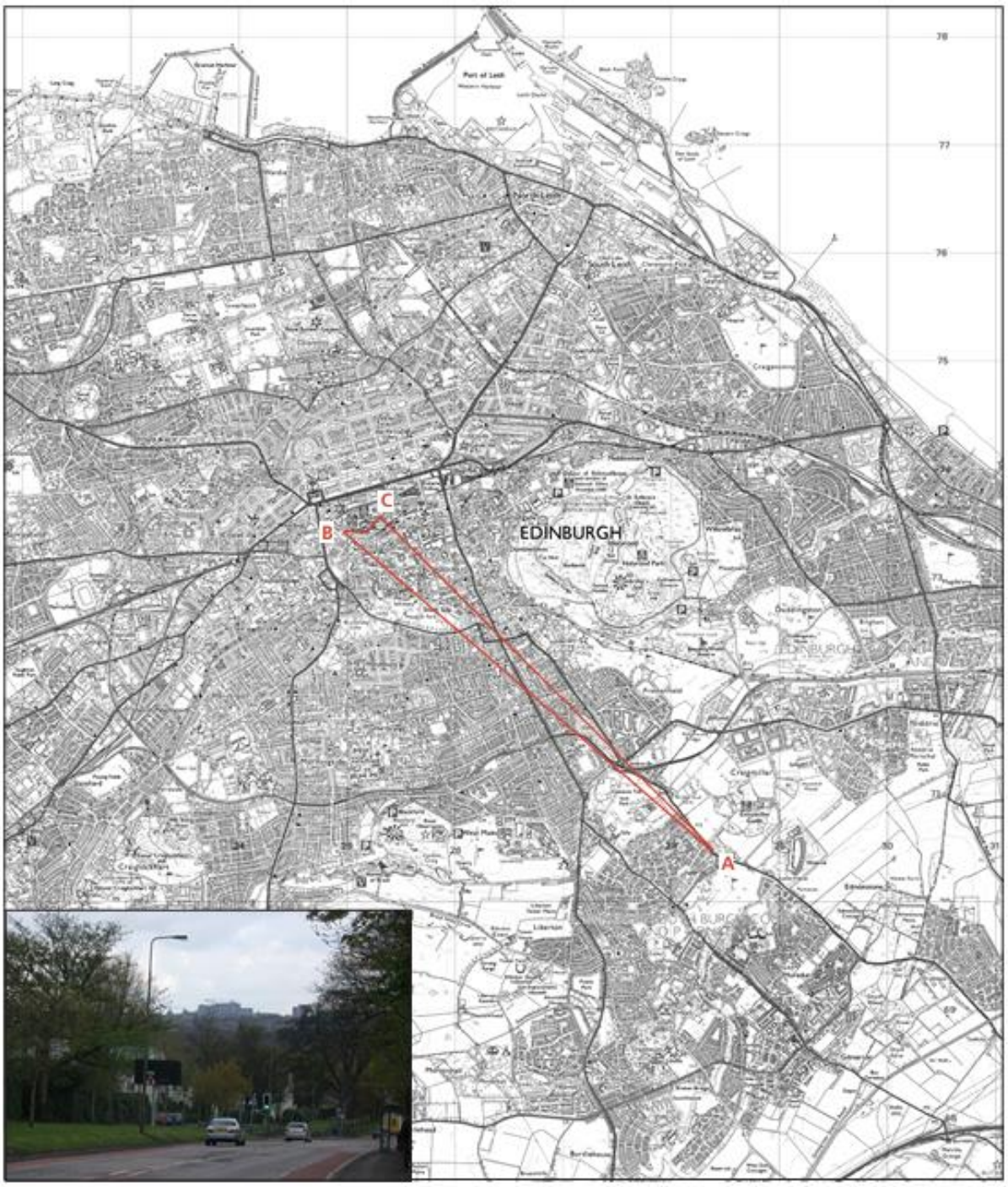
Figure B.7: Castle from A7 South-West of Craigmillar Castle



Reference point	Estimated height mAOD		Notes
view	A	65 G L	A7 upward sightline to Castle over Mayfield skyline, care is needed over management of trees on west side of road to keep view open
skyline	B	110	heights given are estimates of base of visible part of Castle
	C	110	
backdrop not used	D	-	not relevant
	E	-	

Castle from A7 south-west of Craigmillar Castle **View No. S11a**

CITY OF EDINBURGH SKYLINE STUDY 2006/08

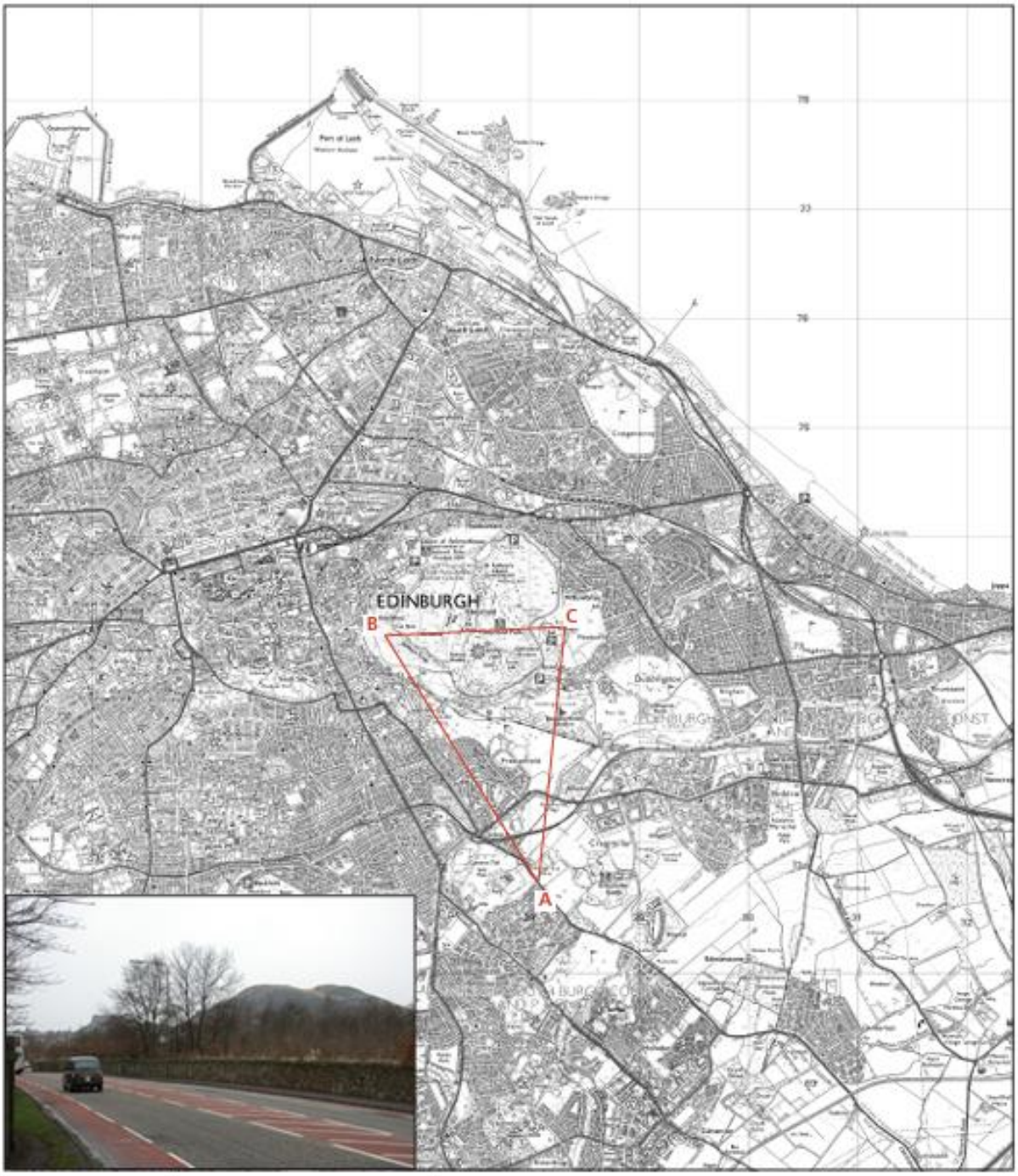
Figure B.8: Salisbury Crags from A7 South-East of Cameron Toll

Reference point	Estimated height mAOD		Notes
view	A1	51 G L	A7 near The Inch, SE of Cameron Toll
skyline	B		Salisbury Crags above Preston field; rising sight line
	C		
backdrop not used	D		
	E		

Salisbury Crags from A7 south-east of Cameron Toll **View No. S11b**

CITY OF EDINBURGH SKYLINE STUDY February 2009

Figure B.9: Arthur's Seat and Salisbury Crags from A7 Near the Inch



Reference point	Estimated height mAOD		Notes
view	A	52 G L	A7, SE of Cameron Toll, near The Inch
skyline	B		profile of Salisbury Crags and Arthur's Seat, framed by trees; foreground trees will need management to conserve view
	C		
backdrop not used	D		
	E		

Arthur's Seat and Salisbury Crags from A7 near the Inch SE of Cameron Toll **View No. S11c**

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Appendix C. Indicative Tram Alignments: BioQuarter to Shawfair and Queen Margaret University

Figure C.1: Indicative Tram Alignments: BioQuarter to Shawfair and Queen Margaret University