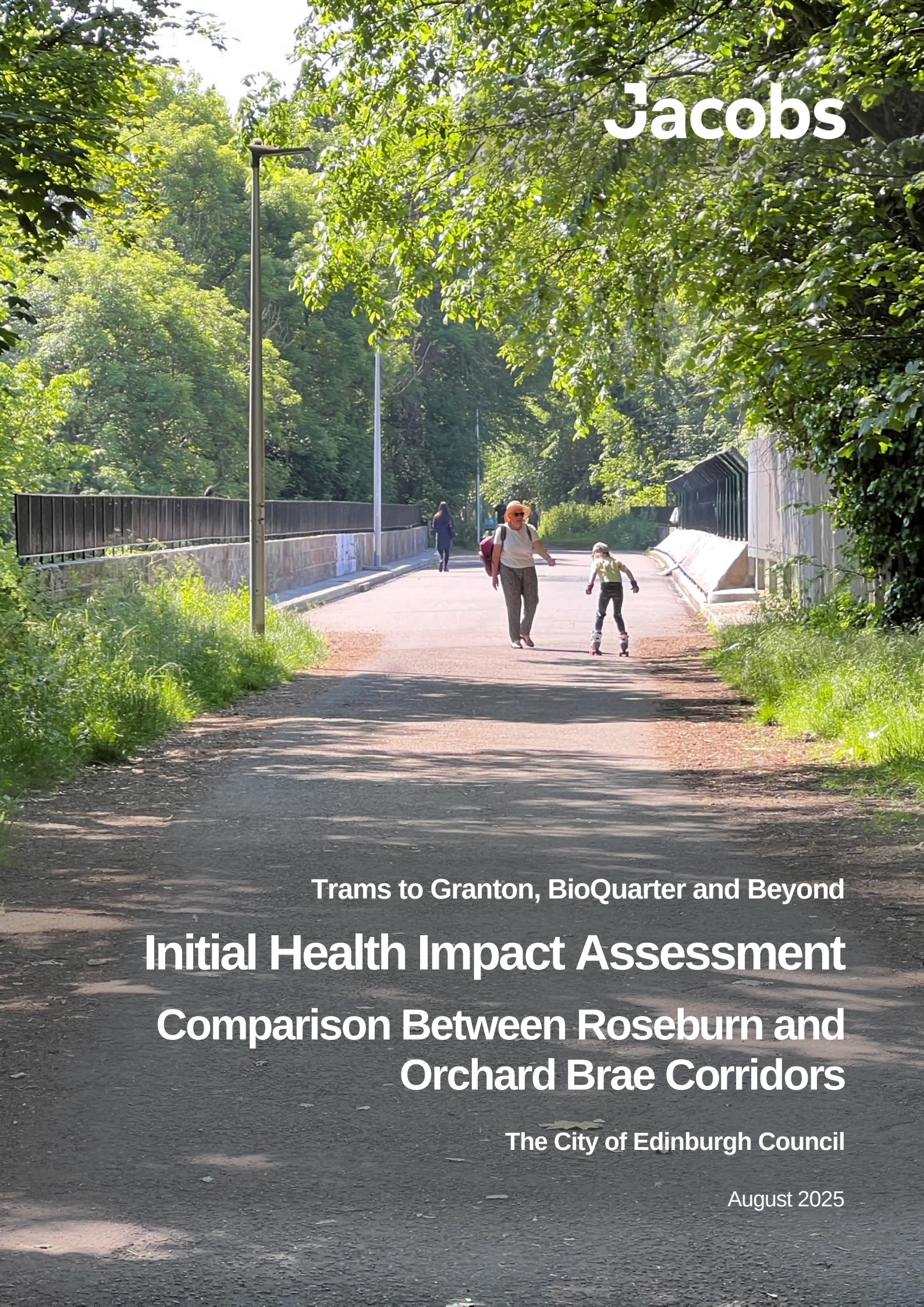

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Trams to Granton, BioQuarter and Beyond

Initial Health Impact Assessment

Comparison Between Roseburn and Orchard Brae Corridors

The City of Edinburgh Council

August 2025

Trams to Granton, BioQuarter and Beyond Initial Health Impact Assessment, Comparison Between Roseburn and Orchard Brae Corridors

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Executive Summary

A Initial Health Impact Assessment (HIA) has been conducted to identify differences in potential health impacts of the Roseburn corridor and Orchard Brae corridor options of the proposed Trams to Granton, BioQuarter and Beyond (TGBB) project. It complements the North-South Tram Health Impact Report prepared by NHS Lothian and the Integrated Impact Assessment prepared by The City of Edinburgh Council.

The Initial HIA has focused on the following scope of possible health impacts:

- Potential health impacts relating to levels of physical activity due to potential conflicts in tram proposals with existing active travel provision;
- Potential health impacts relating to access to greenspace and biodiversity as well as requirements for some tree and vegetation removal;
- Potential health impacts relating to loss of microclimate due to some tree and vegetation removal;
- Potential health impacts relating to public safety, crime and fear of crime due to changes in the character and usage of the Roseburn and Orchard Brae corridors; and
- Consideration of equity issues relating to each of the proposals.

While both options would result in health impacts during construction, including disruption of existing walking, wheeling and cycling routes, it is expected that this would not significantly affect levels of physical activity as the majority of people would divert and use alternative routes. Two new cycle routes would be added as part of the Roseburn corridor option to mitigate the loss of connectivity during the construction stage. These would be permanent and therefore there would be a legacy benefit of greater cycle connectivity.

During construction, the restriction of access to the Roseburn Path greenspace is likely to negatively affect the wellbeing of local communities. Children may be particularly disadvantaged by this due to the timespan which may represent an important development stage during which they would have limited access to greenspace to explore and play in. The overall impact of this to public health is considered to be moderate and negative due to the widespread concern, although many people could access alternative areas of space.

Once in operation, active travel provision along the Roseburn Path would be restored and people would have restored access to this area of green space. The character would have changed somewhat to a more open character with greater levels of social interaction. It is possible that this may have a positive impact on some groups who are more likely to avoid enclosed greenspaces due to fear of crime. For others, the character of the path will be changed negatively, with a more urban form and structured planting.

The Roseburn corridor option provides for four areas of enhanced placemaking which will include some places for children to play, areas of seating and places for improved social interaction. This is expected to be positive for social health.

There is potential for a loss of the cooling microclimate effect from tree canopy cover and vegetation along the Roseburn Path. This is expected to be negative for health given the importance of vegetation in providing shade and the likely increased frequency of heatwaves over time. Overall, once vegetation has established, trees lost during the construction phase 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. It has been recommended that landscaping and other opportunities are considered to help further mitigate loss of microclimate and provide good areas of shade along the route.

While the Orchard Brae corridor has fewer negative health impacts than the Roseburn corridor, along the corridor itself, it also does not offer any notable positive health impacts over the Roseburn option. For example, it offers less opportunity for placemaking, and there is not sufficient space to maintain cycle lanes along the route. Nevertheless, the Roseburn Path would remain untouched and so would continue to provide walking, wheeling and cycling provision, with existing greenspace and ecology retained.

The Orchard Brae corridor does not provide such a direct link to the Haymarket area which is a site of employment growth. Therefore, it offers less benefit in connecting deprived communities with key employment areas by public transport. Conversely, for some, it would provide more direct access to the Western General Hospital.

Contents

1. Introduction

1.1 Purpose of this Initial Health Impact Assessment

Health Impact Assessment (HIA) *'is a process which systematically judges the potential, and sometimes unintended, effects of a project, programme, plan, policy, or strategy on the health of a population and the distribution of those effects within the population. HIA identifies appropriate actions to avoid or mitigate health risks and promote health opportunities.'*[1]

This Initial Health Impact Assessment (HIA) summarises potential health impacts associated with the Roseburn and Orchard Brae corridors, two route options being considered as part of the proposed Trams to Granton, BioQuarter and Beyond (TGBB) project. It provides recommendations to help improve health outcomes, and has been prepared to make available information to support consultation on the scheme which is scheduled for mid-August 2025.

Work complements the North-South Tram Health Impact Report prepared by NHS Lothian and the Integrated Impact Assessment prepared by the City of Edinburgh Council.

1.2 Proposed Tram Route Options

The TGBB 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 southeast, 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 has been assumed at this stage for appraisal purposes, although an alternative route / future extension to Queen Margaret University via Craigmillar 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*

Appendix A provides a summary of each route including proposed active travel connectivity, and landscape mitigation and placemaking proposals.

Figure 1.1: Trams to Granton, BioQuarter and Beyond Routes

1.3 Scope and Options Included in Initial Health Impact Assessment

The focus of this Initial Health Impact Assessment (HIA) is a comparison between the Roseburn and Orchard Brae corridors. A full HIA, looking at the whole tram route between Granton, the BioQuarter and Beyond, will be undertaken at the next stage of the project.

The aim of the assessment is to identify differences in health impacts between the two options. It is based on how the options will differentially impact on wider determinants of health.

Wider determinants of health are the social, economic, and environmental factors which significantly influence the health of populations. Health inequalities result from unfair differences in wider determinants of health. For example, a particularly important determinant of health is income because it enables advantages such as good quality housing, living conditions and educational achievements[2].

A scoping exercise has been undertaken to identify key potential impacts. The focus of this HIA has been on a number of determinants which are of particular importance at this stage of the TGBB proposals. It is based on themes of public concern centred around active travel, greenspace and biodiversity[3]. It also includes the HIA team's consideration of which health determinants are likely to be within the TGBB proposal's influence, noting that the proposals are currently at Strategic Business Case level, and therefore not developed in detail. Where impacts on determinants are likely to be common to both options, such as environmental pollution, the determinant has been excluded.

The following issues have been considered:

- Potential health impacts relating to levels of physical activity due to potential conflicts in tram proposals with existing active travel provision;
- Potential health impacts relating to access to greenspace and biodiversity as well as requirements for some tree and vegetation removal;
- Potential health impacts relating to loss of microclimate due to some tree and vegetation removal;
- Potential health impacts relating to public safety, crime and fear of crime due to changes in the character and usage of the Roseburn and Orchard Brae corridors; and
- Consideration of equity issues relating to each of the proposals.

2. Methodology

2.1 Evidence

The assessment has been supported by a literature review. The focus of the evidence review has been around the following questions of relevance to the Roseburn and Orchard Brae proposals:

1) How does transport choice affect health? (Focusing on active travel and trams)
2) How does urban green space affect health?
3) What do we know about public safety, crime and fear of crime along active travel routes and greenspaces?

2.2 Health Data

The population health profile was developed using census data and health data from Public Health Scotland's ScotPHO Profiles Tool[4]. This allowed the development of a population health profile for communities in each of the Intermediate Zones that intersect the proposed tram routes.

2.3 Impact Assessment

The impact assessment has considered the proposals and the likelihood that it could affect health outcomes using a source-pathway-receptor model. This approach requires that there must be a source of impact and a plausible pathway to a receptor (i.e. population group) for a health impact to occur (see Table 2.1).

Table 2.1: Example of Source-Pathway-Receptor Model for Health Impacts

Source	Pathway	Receptor	Plausible Health Impact?	Explanation
✗	✓	✓	No	There is not a clear source from where a potential health impact could originate.
✓	✗	✓	No	The source of a potential health impact lacks a means of transmission to a population.
✓	✓	✗	No	Receptors that would be sensitive or vulnerable to the health impact are not present.
✓	✓	✓	No	Identifying a source, pathway and receptor does not mean a health impact is likely to be significant; health impacts are assessed and evaluated for significance in terms of public health and to inform recommendations.

Adapted from Cave et al., (2017)[5].

Drawing on the evidence gained through the initial literature review, the nature of impact is then appraised to understand whether health outcomes are likely to be positive or negative, and to ascertain which communities are most likely to be affected. The assessment has informed recommendations to help improve health and wellbeing outcomes as the proposals are developed further.

2.3.1 Assessment Criteria

The assessment has been based around the following qualitative criteria (Table 2.2):

Table 2.2: Initial HIA Criteria

Character of impact	Description of criteria applied
Character: Positive or Negative	**Positive:** expected to be beneficial to health **Negative:** expected to be detrimental to health **Uncertain:** Groups are likely to be affected differentially. It is uncertain whether the potential risks of the impact would outweigh the potential benefits of impact.
Scale of impact	**Local:** Impact is expected to affect communities immediately surrounding the proposals **City wide:** Impact is expected to affect communities across the city **Small minority of local population:** Impact is expected to affect a small proportion of the population, or a small proportion of minority groups **Large minority of population:** Impact is expected to affect a sizeable proportion of the population, across several groups. **Majority of population:** Most people are expected to be impacted.
Likelihood of impact	**Definite:** It is relatively certain that the health impacts would occur as a result of the proposal. **Probable:** It is considered likely that the health impacts would occur as a result of the proposal. **Possible:** It is speculated that the health impact could occur, depending on a number of factors.
Equity concerns	Consideration has been given to whether groups with particular characteristics such as age, sex, disability or social disadvantage may be differentially or disproportionately affected by the impact.
Importance to health	**Major:** This impact is significant in terms of achieving or undermining public health priorities due to scale of impact and a strong body of evidence linking the impact with changes in health outcomes. **Moderate:** This impact would have a modest impact in terms of achieving or undermining public health priorities due to relevance of impact to health priorities and/or some evidence linking the impact with changes in health outcomes. **Minor:** This impact is unlikely to have a noticeable impact on public health priorities due to the relevance of the impact to health priorities and/or limited evidence to demonstrate a link between the impact and health outcomes.

2.3.2 Limitations

The literature and evidence review has not included a detailed and more systematic analysis of findings. Therefore, there may be other good sources of evidence not identified, including evidence which may contradict some of the findings of the research used. However, for the purposes of comparing two options which are currently at Strategic Business Case level, it is considered that the approach has been proportionate.

As noted in Section 1.3, this Initial HIA has been conducted on a limited number of health determinants. It is recommended that a more comprehensive HIA of the whole north-south route is undertaken as part of an Outline Business Case for the project, scoped around a broader list of health considerations using Public Health Scotland's health impact checklist[6]. This would complement the Environmental Impact Assessment and Heritage Impact Assessment that would also be undertaken.

Ideally, an HIA would be conducted with participation from a range of stakeholders, including local public health teams. This Initial HIA has been desk based, drawing on various sources from desk-based analysis and therefore may not include some relevant local insights and perspectives. It is recommended that the TGBB proposal is subjected to a more comprehensive and participatory HIA at the next stage of the project. This will help maximise the identification of opportunities to contribute to and improve the proposals to improve overall health and equity outcomes.

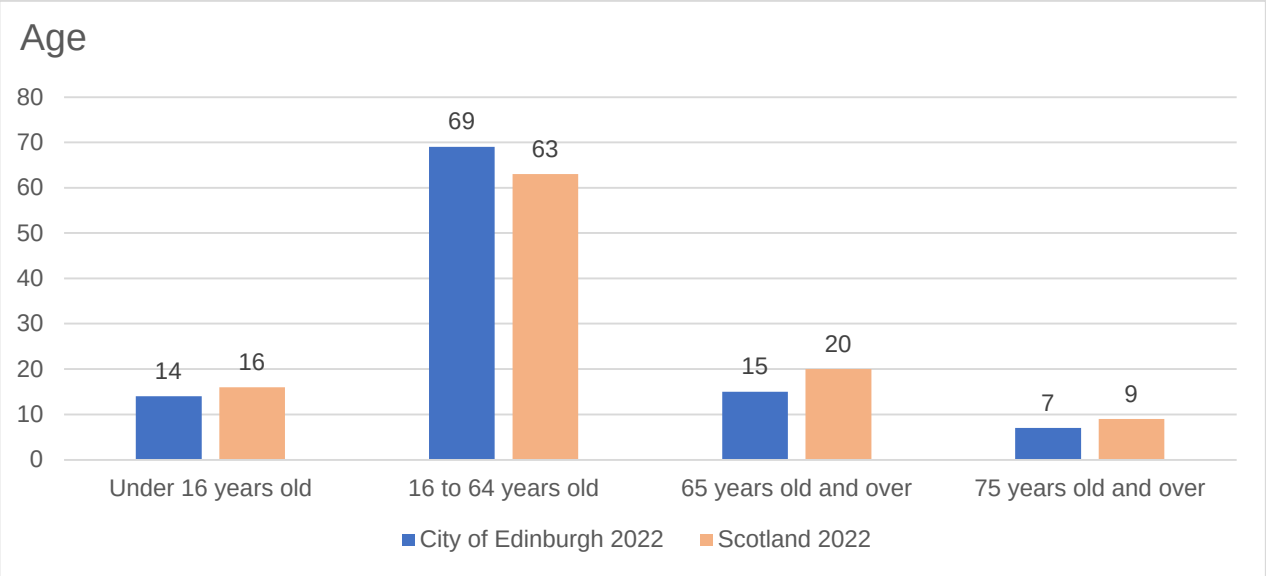
3. Population Health

3.1 Community Health Profile

The City of Edinburgh had a population of 514,543 in 2022 according to the census[7]. The age profile of Edinburgh is indicated in Figure 3.1. This shows that the city has a slightly lower proportion of children aged under 16 years, a larger working age population (16 – 64-year-olds) and a smaller proportion of elderly than the national population.

The city had a high student population at 58,400 full time students[7] (aged 18 to 74 years) in 2022 which equated to 11.3% of the city's population, compared to 5.4% of the Scottish population being full time students.

Figure 3.1: Age Categories of Edinburgh Population Compared to National Population



Source: Scotland's Census 2022[7].

The proportion of people reporting a long-term health problem or disability is lower in the City of Edinburgh than the Scottish national average (18% compared to 23% nationally)[7]. Health problems and disabilities are not evenly distributed across Edinburgh's population, however. Table 3.1 presents some health indicator data for the Intermediate Zones which intersect the alignment of the TGBB routes.

Notably the data show significantly higher than average rates of premature death (deaths under 75 years) in the Intermediate Zones in Granton, but also in Old Town, Princes Street and Leith Street, Craigmillar and Niddrie. A review of the Scottish Index of Multiple Deprivation (SIMD)[8] shows that within Granton, Craigmillar and Niddrie there are Data Zones which are ranked among the 10% most deprived in Scotland (with some Data Zones in Granton and Niddrie ranked among the 5% most deprived in Scotland). All the Intermediate Zones with higher-than-average rates of premature death are within the 20% most deprived in Scotland. This is indicative of the 'social gradient of health' which describes the phenomenon whereby those people who are socioeconomically disadvantaged tend to have a greater burden of health issues and shorter lifespans. Those Intermediate Zones with significantly lower rates of premature death than Scotland as a whole comprise data zones that are in the 10% least deprived in Scotland. This shows that there are health inequalities within the population surrounding the TGBB routes.

Table 3.1: Health Indicators for Intermediate Zones

Geographic Area	Deaths, under 75 2021-2023 Standardised rate per 100,000*	Early deaths from coronary heart disease (CHD) <75 yrs 2021-2023 Standardised rate per 100,000*	Early deaths from cancer <75 yrs 2021-2023 Standardised rate per 100,000*	Road traffic accident casualties 2021-2023 Standardised rate per 100,000*
Intermediate Zones				
Granton West and Salvesen	757.5	73.0	266.8	80.4
Granton and Royston Mains	861.2	159.8	193.1	34.8
Granton South and Wardieburn	932.8	105.3	283.6	66.5
Boswall and Pilton	286.1	25.4	123	38.9
West Pilton	597.8	124.8	87.1	72.6
Drylaw	565.5	61.1	172.8	35.8
Craigleith, Orchard Brae and Crewe Toll	220.6	8.6	122.7	11.2
Blackhall	185	12.2	96.2	18.4
Murrayfield and Ravelston	153.5	6	85.9	25.5
Dean Village	240	20.4	86.7	57.2
Dalry and Fountainbridge	566.9	63.1	70.6	39.3
New Town West	301.2	28.6	150.3	59.2
Stockbridge	276.6	22.7	118.4	53.7
Comely Bank	139.9	41.1	43.2	64.8
Old Town, Princes Street and Leith Street	790.7	149.8	189.7	85.7
Meadows and Southside	383.2	43.8	79.4	20.7
Newington and Dalkeith Road	401.2	60.5	159.4	50.8
The Grange	255.1	18.3	78.5	52.8
Blackford, West Mains and Mayfield Road	284.5	11.6	139.5	45.7
Prestonfield	342.3	51.8	106.1	42
Craigmillar	978.4	157.7	243.3	59.7
Jewel, Brunstane and Newcraighall	275.8	38.1	108.2	40.6
Shawfair	346.5	39.3	102.4	26.9
Niddrie	949.2	95.1	331.8	60.3
The Inch	589.4	52.4	181.7	35.6
Tollcross	528.1	59.6	78.9	23.3
Marchmont East and Sciennes	384.6	27.4	213.8	34.3

Geographic Area	Deaths, under 75 2021-2023 Standardised rate per 100,000*	Early deaths from coronary heart disease (CHD) <75 yrs 2021-2023 Standardised rate per 100,000*	Early deaths from cancer <75 yrs 2021-2023 Standardised rate per 100,000*	Road traffic accident casualties 2021-2023 Standardised rate per 100,000*
Fernieside an Moredun South	635.6	92.2	193	77
Gilmerton South and the Murrays	307.7	53.4	125.5	17.3
National Comparator				
Scotland	447.7	54.5	142.4	51

Table notes:
*Age-sex standardised rate per 100,000
Source of data: Public Health Scotland[4]

4. Evidence Review

4.1 Transport — Available, Reliable, Affordable, Accessible, Safe Active and Public Transport

4.1.1 Walking and Health

The health benefits of active travel, including walking, can be seen across generations, gender and accessibility groups. Many groups gain benefits from walking not just in terms of physical health, such as reduced likelihood of obesity, increased cardio-vascular health and better blood pressure[9], but also receive social and mental health benefits associated with walking. Evidence suggests that active commuting in Scotland, such as walking, could prevent close to 200 deaths a year[10]. This figure does not account for the reduction of illness as a result of walking, meaning it is likely an underestimation of the true health benefits of walking[10]. Walking can, in some respects, increase inclusive travel. However, in regard to safety there are varying barriers for those from minority groups that must be considered when wishing to unlock full health benefits for all groups.

As a population, we increasingly participate in more sedentary lifestyles, increases in obesity have led to interest in what role active travel can play towards meeting recommended daily exercise levels[9]. As we witness an aging population, it is sensible to consider what role walking plays in health benefits to older people. Research has shown that older people who go outside and walk more often are not only less functionally impaired but are also less likely to display symptoms of depression and are more likely to maintain independence[11]. However, like many groups the health benefits attributed to walking although numerous, are often at odds with a view of safety in the walking environment, making the design of walkable neighbourhoods a key consideration when assessing health benefits to older people. Older people often have concerns around aspects of the environment such as lengthy crossings, uneven pavements and steep inclines[12]. Falls are a leading cause of injury and death among elderly people and the leading reason they are in hospital[13]. The safety of walkable environments is a key barrier to health benefit realisation.

The health benefits attributed to walking for children and young people are numerous. Benefits identified range from improvements in cardio-respiratory fitness[14], achievements of WHO recommended amounts of exercise[15], overall wellbeing and cognitive function[16]. Additionally, independent mobility, such as walking in school aged children, increases wayfinding abilities and is often critical when accessing education. Similarly to that experienced by older groups, concerns of increased vehicular traffic, increased safety concerns, family schedules and longer distances from educational places[17], all pose as barriers to realising the full health benefits of walking by younger people.

In terms of mental and wellbeing benefits, walking as a form of active transport presents many health benefits through social and cognitive functions for all age groups. The social aspect of walking increases social connections and networks, but the social ‘contagiousness’ of the walking pattern, takes motivation from the individual to the group, motivating more people to walk[18], multiplying health benefits further. The social networks and ‘norms’ formed by shared activities such as walking also spill over into other physical activities that promote further health benefits, such as use of parks and free recreational activities.

Walking is often rightly seen as a form of inclusive travel. Compared to driving it presents a much lower cost, less physical barriers to access, and unlike driving there are less social, technical or religious barriers to walking. However, there are several barriers to accessing the full health benefits to inclusive travel, such as walking. A recent study found that people from an ethnic minority (excluding non-white minorities), are 25% more likely to be a pedestrian casualty[19] , concerns within this group over safety and institutional racism have also influenced physical activity and how much time people spend outdoors in public. For those who have physical marked religious identity through clothing, there is often increased risk of harassment and discrimination when participating in active travel in public[20]. Those who have disabilities face multiple barriers in the pedestrian environment, such as lack of confidence to travel as well as physical barriers such as uneven pavement surfaces[21]. Some therefore, rely completely on cars for mobility and do not usually consider active travel as a healthy option. Lastly, women are often the target of inappropriate comments and unwanted attention in accessing and using public transport[22], most notably a YouGov poll in 2022 found that 66% of women feel unsafe walking home at night at least ‘sometimes’ and another 20% never do so, many quote safety as a key reason[23].

4.1.2 Cycling and Health

Like many active transport options, cycling is an efficient, green and affordable mode of transport that brings multiple health benefits. Health benefits range from physical, such as improving aerobic capacity and strengthening the heart and lungs [24]. As a physical activity, cycling helps to prevent over 20 common health conditions[25] and is thought to prevent 4,199 serious long term health conditions in the UK each year [24]. Like walking, the health benefits of cycling are not limited to physical benefits, cycling can help reduce anxiety, stress and depression[24]. Cycling is ideally placed to accomplish short travel tasks such as shopping and commuting[26], making it a great tool to carry out social activities at convenience and little cost. People often cycle, despite various barriers to doing so, for reasons of convenience, cheaper prices, commitments or measures that discourage the use of cars and ability to park at work[27]. The motivation for cycling against perceived safety issues comes from the perceived health benefits and enjoyment of the actual activity[26], meaning that while there are direct physical benefits, the mere act of cycling to the person's wellbeing via enjoyment gives secondary benefit.

Cycling also provides health benefits by its replacement of car focused journeys. Copenhagen is known as a cycling city; its citizens cycle to work or school 49% of the time[28]. Not only does this generate the above benefits, but it directly contributes to a cleaner, less polluted city. As such Copenhagen has reduced carbon emissions by 40% since 1990[29]. Decreasing air pollution in such a way also increases health outcomes and benefits across a variety of factors including reductions in heart disease, cancer, obesity and diabetes[30].

Cycling presents multiple health benefits for younger children, often beyond purely physical benefits. There is evidence to show that benefits of cycling extend into adulthood, including protecting against chronic disease, and contributing to cardiorespiratory fitness[31 32]. Benefits to children go further into enjoyment and motivation to participate in cycling beyond commuting to school as a fun activity to do with friends and family[33]. The social aspect of cycling encourages children to use it as a way to meet friends, play and gain independence as they grow into adolescence.[33] As a result, cycling not only offers enjoyment and a practical means of transport, but also becomes a lifelong skill that supports health and wellbeing beyond its use for getting to school. Health benefits in terms of concentration and alertness once at school have been reported, increasing learning opportunities[33]. Where children are encouraged to cycle to school by parents, the health benefits to the child often spill over into accompanying adults too. Research has shown when older generations participate in helping their child cycle to school, it often encourages them to begin or return to the sport themselves[34].

Disabled people are twice as likely to be physically inactive than those who are able bodied, this has resulted in shorter life expectancies. Where cars offer negative impacts to the environment and an increase in sedentary lifestyles, inclusive cycling offers an active and sustainable alternative[35]. Handcycling and other inclusive cycling methods should be considered when measuring health benefits associated with cycling. The benefits range from enhancements to overall health and wellbeing, the promotion of physical freedom and mobility, the stabilisation of blood glucose levels, a reduction in social isolation, and the delayed onset of various medical conditions. However, like other active transport methods, design of the environment is key to fully realising the health benefits this offers disabled people. Wheels for Wellbeing conducted a survey of over 200 disabled cyclists across the UK. Of these, 45% have been asked to dismount their cycle, a third have been unable to store a non-standard cycle due to inadequate facilities, and inaccessible infrastructure was cited as the biggest barrier to cycling[36].

Safety risks are the key argument against any positive health outcomes of cycling. It has often been suggested that safety fears play the central role in a person's decision on whether or not to cycle[26]. Survey data indicates that women feel less safe cycling and men are three times more likely to cycle regularly than women. The Cycling Scotland survey into 'Attitudes and Behaviours towards Cycling in Scotland' indicates that that two thirds of respondents felt roads were too busy for people to be safe cycling with 70% respondents stating they did not feel safe enough on the roads[37].

In the West Midlands, a regional study found that road safety concerns were a major barrier to active travel, particularly for women and ethnic minority groups[38]. Improving perceived safety is likely to increase uptake by all sociodemographic groups, especially women, older adults and children, as these groups have been found to be more sensitive to factors that decrease perceived safety such as narrow paths, or proximity to fast-moving vehicles. Because of this they are less likely to use infrastructure that feels unsafe. One analysis of 10 million journeys on a bike-share scheme in London showed that women preferentially select routes with slower traffic and those that are offset from major roads[39].

School aged children have reported that despite the fun and enjoyable aspects of cycling, they have concerns over safety, something that is also reflected in accompanying adults' views[33]. Cycle training and infrastructure considerations will help with young people gaining skills and confident to cycle safely. Evidence further suggests that good quality cycle spaces separated from traffic creates safe cycling, in particular for young, school aged children.

A report by the by the Glasgow Centre for Population Health, 2020, collated reported cycling casualties over a 23-year period (1995-2018) in Scotland. The data showed that cycling casualties had significantly reduced and less children were casualties. Rather than indicating safer road conditions for cycling, this data largely reflects the reduction in cycling due to safety fears, with implications for the increasing burden of disease associated with sedentary lifestyles. The data indicated that between 2004-2018, the number of serious injuries and fatalities had increased, with the majority of cycling casualties involving cars with one-in-ten hit and run incidents. Pedestrian casualties colliding with cyclists were uncommon but even though the risk of injury remains low, the perception of risk is a major barrier to people cycling. Further key findings include many of the casualties were male, there were fewer children casualties in 2018 as compared with 1995 and more recently, 65% of all casualties were in the age ranges of between 25-54 years old. A different study over a more recent timespan found a different pattern of results. In 2023, 87 cyclists were killed in Great Britain whilst 3,942 were seriously injured[40]. However, pedal cycle traffic rose between 2004 and 2023, faster than serious injuries, whilst fatalities and slight injuries have fallen [40]. This is echoed in Copenhagen where despite the share of cyclists increasing, those who were seriously injured whilst cycling has fallen[28]. This points to the 'safety in numbers' concept for cycling.

One key study into this concept was reported by Jacobsen[41] (Jacobsen 2003). Jacobsen provided evidence based on analysis of national data from 14 European countries on walking and cycling, as well as data for 47 towns in Denmark, and 68 towns in California. The author concluded that:

'There is a relationship between motor vehicle collisions with pedestrians and or cyclists and numbers of pedestrians and or cyclists. For example, in a community where walking doubles it can be expected that there will be a 32% increase in pedestrian injuries, where cycling doubles it can be expected that there will be a 34% increase in cyclist injuries';

'Motorists appear to adjust their behaviour in the presence of people walking and cycling which largely controls the likelihood of collisions; as a result'; and

'The relationship between pedestrians or cyclists' exposure and casualties is not linear, that is, there is safety in numbers for these mode users.'

In the UK, while cycling participation and bike ownership is more common among higher income groups, cycling casualties are not disproportionately concentrated among wealthier demographics[42].

4.1.3 Trams and Health

The use of trams is often associated with creating less pollution versus both use of similar public transport, such as buses, and versus car driving. Per person, the use of trams produces less CO_2 than the driving of cars or non-electric buses and rail systems[43]. The health benefits of less pollution are countless, with less air pollutants we witness reductions in heart disease, cancer, obesity and diabetes[44]. Trams also have additional benefits when compared to other public transport modes when considering road conditions such as congestion, traffic collisions and idling. Trams can present significantly quicker journey times versus buses or cars across city locations[45], increasing convenience and overall enjoyment of the services. This also decreases time on the road therefore less idling, creating less pollutants as a result, as well as less risk of injury or death during the journey. There were only 3 passenger fatalities on light rails and trams across Great Britain in the year ending March 2022[46]. This is in comparison to 1,331 car fatalities and 45 bus or coach fatalities in 2022[47]. Several reports have shown that when compared to similar modes of public transport or cars, trams are significantly safer. Numbers show that overall trams are 12 times safer than buses in the UK[48].

Trams contribute health benefits through several ways such as, encouraging physical activity to and from transit stops. Benefits of increased physical activity include health care cost savings and improved academic attainment[49]. Findings from the Cambridge Busway case study indicated that those who lived close to the busway reduced their car only journeys and were more likely to participate in active travel in some way[50]. In

research conducted for the Department for Transport in 2019, those who use public transport, such as trams, reported feeling less strained, stressed and were less likely to experience mental health problems[51].

Socially, public transport like trams and other mass transit systems, helps to connect people, providing access to work, friends, family, education institutions and health supporting facilities[51]. This offers a host of social and mental health benefits beyond the actual use of the transport system itself. Having more connected communities through public transport unlocks accessibility for those who may be excluded from other forms of travel such as cars, cycling or walking. Public transport is generally a cheaper alternative to cars, unlocking connectivity for those who may have cost as a direct barrier to accessing health and wellbeing facilities. This is particularly pertinent when considering disabled people, older people and those with other mental and physical impairments. For disabled people, public transport can offer a lifeline, allowing them to be independent and connect with the world around them[52], contributing to better mental health and wellbeing outcomes. Older people who frequently use public transport are reported to be more physically active, have stronger lower limb muscles and reduced social isolation[53]. However, it is worth considering accessibility to transit stops when assessing the health benefits of tram use. Reports have shown that although public transport can increase independence, many facilities do not have adequate seating, wheelchair facilities or accessible information available[52]. This is a vital factor to consider when designing any aspects of public transport that aim to achieve health benefits across the community.

4.1.4 Public Transport Routes Alongside Active Travel Routes

There is little evidence to suggest that the presence of public transport in close proximity to active transport routes discourages walking or cycling. Instead, the majority of research findings are focused more on how the integration of these modes tends to support a shift away from car use, which is the primary goal of sustainable transport planning. When active travel infrastructure is well-connected to mass transit hubs, it tends to encourage more walking and cycling because it makes multimodal travel more convenient and attractive [54].

There is, however, evidence to suggest that when cycle lanes or footpaths are located in close proximity to bus lanes or tram tracks, this increases both real and perceived safety risks. Noise and visual stimuli from moving vehicles will potentially lead to a reduction in feelings of comfort and wellbeing for active transport users, which could result in a reduction in the propensity to use those walking and cycling routes. A lack of separation between active travel and public transport infrastructure can lead to increased injury risk, stress and reduced wellbeing, due to perceived or real safety threats, which can in turn lead to reduced use by vulnerable groups. For example, without an adequate physical barrier or buffer, users may feel exposed or unsafe due to the speed and size of passing vehicles.

The Cambridge Guided Busway was a new bus network which combined high-quality off-road path for walking and cycling. Research found that this supported higher rates of active commuting to work by people living in close proximity to the new infrastructure[55]. This demonstrates that the modes of public transport and active travel can be successfully integrated in a single corridor in a manner which encourages physical activity through active modes. However, in the case of the Roseburn Path, the tram infrastructure would be introduced to a route which is currently only used by walkers, wheelers and cyclists (unlike the Cambridgeshire Guided Busway which was an entirely new route for both modes). There is therefore some uncertainty as to whether the change in existing arrangement may discourage some walkers, wheelers and cyclists due to safety perceptions. The design of the Roseburn corridor provides for segregation between the active travel corridor and the tram route, including the provision of a buffer space and fence which should mitigate such potential impacts to a certain extent.

Active travel would be constrained on the Orchard Brae corridor as there would only be enough width to provide for a segregated pedestrian route. This would mean that any cycling along this corridor would be on road. Currently along the Orchard Brae corridor there are some stretches of demarcated cycle lanes (on road) and some stretches where cycle lanes are also separated from road traffic with bollards. Therefore, the use of the Orchard Brae corridor as the tram route would likely create more hostile conditions for cyclists as there would be no segregation from traffic and cyclists would also be following a route with tram infrastructure. In cities like Edinburgh and Manchester, tram tracks have been linked to increased cyclist injuries due to wheels getting caught in rails[73]. The integration of cycle paths with tram tracks can pose a danger to cyclists, both from the threat of collisions and from falls caused by bike tyres getting wedged in tram tracks[56]. A study by the University of Edinburgh found that tram tracks were responsible for a significant number of cycling injuries, leading to hospital admissions[57]. In response to this issue, the City of Edinburgh

Council introduced warning signs and improved road markings, but concerns remain about the fundamental design of shared tram/cycle corridors. Active Travel England outlines the two principal types of incidents arising from interactions between cycles and tram tracks as skid risk where cycle tyres skid on the smooth surface of tram tracks, particularly during wet conditions, and cycle tyres becoming trapped in rail grooves. The organisation sets out design guidance to mitigate these risks[58] but as noted above, there is insufficient space on the Orchard Brae corridor to provide for cycle segregation.

4.2 Greenspace, Biodiversity and Health

There is a strong body of evidence that suggests that good quality natural urban landscapes, such as tree-lined streets, riverbanks and parks, can have positive impacts on local communities. Impacts of greenspaces can include improved air quality, reduced noise pollution and reduce effects from heatwaves. For local communities, greenspace can offer a range of activities to connect with the space, such as children interacting with nature, using the space for physical activity as well as using the space for relaxation. It is also recognised that people who live in urban areas with access to green space have better mental health[59].

The Scottish Government Green Infrastructure Strategic Plan, 2020, reports the wider community benefits of access to local green space such as community cohesion, social connectedness and community resilience. There are inequalities in availability and use of greenspace in Scotland, with people living in more deprived areas not as likely to visit outdoor space[60].

A briefing from the European Environment Agency (EEA), 2023, notes the benefits of access to urban greenspace for certain socioeconomic groups in particular, including children and young people, the elderly and migrants and asylum seekers. The briefing also notes the societal importance of access to greenspace in the aftermath of the COVID-19 pandemic, which highlighted the wider need for open space, especially for people who had no access to private green space. The design of the space, such as density of the planting, width of paths and the spaces' upkeep determines the spaces' use by different population groups, for example, people with disabilities or reduced mobility may not use the greenspace if access is difficult or if facilities are not suitable[61].

The Scottish Biodiversity Strategy to 2045, sets out the opportunities of reversing the loss of biodiversity, which will lead to a 'Greener, Fairer and more prosperous Scotland for all.' A 2022, Fairer Scotland Duty Assessment, by the Scottish Government aimed at addressing the nature emergency, identified the potential impacts on socio-disadvantaged groups through public consultation. The evidence highlighted that individuals for these groups often face greater barriers to accessing green space, particularly in relation to proximity. The strategy concludes that by 2045, 'towns and cities will include nature-rich environments close to all communities'[62].

4.2.1 Microclimate

A case-study of Scotland on Heat-health recently suggested that while Scotland has a cool climate with an annual average temperature of 7 °C (between 1961 and 1990), there is an increased heat risk in Scotland under climate change. Evidence shows that high temperatures are associated with adverse health effects, including increased hospitalisations and mortality with the elderly population being particularly susceptible[63]. For example, the record-breaking warm summer in the UK in 2022 resulted in over 3,000 excess deaths in England and Wales. Further, there were 5,017 deaths above average in those aged 70 years and over, compared with 1,749 deaths below average in those aged under 70 years. Excess deaths due to cardiac arrythmias showed the largest proportional change during heatwaves, possibly because overheating exacerbates heart and breathing symptoms[64]. The Scotland case study concluded that planning and actions to protect the public health of Scottish residents from avoidable heat-related health impacts are desirable and suggested the natural environment is an important element to modify the local climate and help alleviate the Urban Heat Island effect[63].

4.3 Social environment: Public Safety, Crime and Fear of Crime

Whilst urban spaces can have a number of benefits, they can often have perceived concerns around safety and security. Perceived security refers to '*the degree to which urban residents feel safe from attacks and harm against them*'[65].

Research by UCL, 2019, explored how perceived safety varies between open pavements and more enclosed pathways. The research found that enclosed pathways are often viewed as less safe, primarily due to limited visibility, restricted escape routes and reduced pedestrian traffic, making people feel vulnerable. More open pavements, benefitted from more natural surveillance and better lighting and greater social interaction, which contributes to feeling safer. Other factors identified to influence perceptions include, familiarity and previous experience of using unsegregated shared-use paths[66].

Whilst it is recognised that greenspace has several positive aspects and benefits to health and well-being and improving air quality and absorbing air pollutants, there is also the element of environmental criminology which examines the potential risks and benefits of neighbourhood safety. It suggests that frequent use of greenspaces may help reduce risk of crime. However, there is also the counter argument that there could be an opportunity for crime if the urban greenspace reduced a perpetrator's visibility from well-covered/shaded areas[67].

Market research undertaken by the Town and Country Planning Association, 2018, found that whilst people knew that using greenspaces was good for them, there were certain demographic groups who were not using greenspace due to feeling vulnerable. The report indicates that middle-aged men dog walking feel the safest, whereas other groups such as women, young teenagers, and the frail elderly do not feel as comfortable or safe, often avoiding greenspaces. The report also describes how spaces are seen as being 'successful' if there are children playing and using the space, with many groups referring to this as an 'indicator species'[68].

Evidence suggests that if a green space is felt to be unsafe by users, then its quality is likely to be compromised. In 2014, Goode and Collins, categorised green spaces, considering the space's origin, development and walkability. If an area is desolated, then it could become a 'crime generator' where crimes can be committed. Green spaces can also be deemed 'crime attractor' where there are opportunities for crimes to take place. There are different factors that can make a green space safe or not safe, such as type of space, for example is it rural, urban or inner city. Further, temporal elements such as season, day of the week or time of day, plays an important role in whether a green space is seen as unsafe[69].

A neglected or unsafe park can significantly diminish the walkability and appeal of the surrounding area. The ways in which individuals perceive safety are complex and often influenced by the physical characteristics of the environment, such as, quality of streets and public spaces, that either encourage or discourage use. The presence of people in public areas can contribute to natural surveillance, or 'eyes on the street' which can influence both actual crime rates and how safe people feel. The quality of the urban environment, opportunities for social interaction, perceptions of safety, and public health are all interconnected and interrelated, and the fear of crime can alter or restrict a person's daily activities; ultimately limiting mobility and negatively affecting health[69].

Evidence suggests that there is no one single characteristic that creates the perception of fear, but a combination. Research indicates that individual factors such as gender and a person's past experience were more influential than social and physical factors in evoking a fear of crime. Individual characteristics, such as physical ability, age, gender, sexual identity, ethnicity, and socioeconomic status, can also play a significant role in shaping perceptions of risk and safety. As such, perceived safety is a complex, multi-dimensional phenomenon that emerges from the interaction between personal identity and the environments people navigate[69]. It is understood, that the 'fear of crime' is often a bigger issue than the crime itself, which in turn can make people change their habits, such as staying indoors or avoiding certain routes[69].

Only two instances of criminal activity involving the Roseburn Path were identified during the evidence review, including an indecent assault against a female cyclist in 2018[70] and the recent recovery of a gun related to a gang feud in June 2025 which resulted in the closure of the Roseburn Path for six days[71].

5. Health Impacts

5.1 Impacts Relating to Physical Activity via Active Travel

There is more evidence to suggest that active travel routes integrated with mass transit systems generally increase, rather than decrease, the propensity to walk or cycle, due to walking or cycling to and from stations or stops. The benefits of this may outweigh the more negative impacts.

Roseburn Corridor

The closure of the Roseburn corridor to active travel during construction would be compensated by the provision of the proposed additional cycle connectivity which would be implemented before the Roseburn Path closure, and would be retained as a legacy benefit. Therefore, there is not anticipated to be a significant reduction in physical activity via active travel during the construction period as key connectivity would be maintained.

During operation, there is potential that some walkers, wheelers, and cyclists may be dissuaded by the integration of the route with trams but there is little evidence to support this, so long as adequate separation is provided to successfully accommodate pedestrians and cyclists without conflict with the tram infrastructure. It is therefore considered likely that this option would overall result in an increase in physical activity via active travel through the combination of active travel retained on the Roseburn Path and the additional cycle connectivity which may encourage more people who live close to the new provision. Furthermore, the increased levels of activity and lighting on the corridor will help make the Roseburn Path available for some active travel users for more hours of the day and more days of the year.

Orchard Brae

During construction pedestrian and cycle access on Crewe Road and Orchard Brae is likely to be inconvenient as works to divert utilities and install tramways are likely to require traffic management and diversions of pedestrian routes. This has the potential to discourage some active travel journeys, especially for those with certain types of disability, including reduced mobility. The impact is most likely to affect walkers and wheelers, on the assumption that cyclists can more quickly and conveniently use the unaffected alternative routes such as the Roseburn Path or East Fettes Avenue.

During operation there is potential for reduced cycling along this route due to increased interaction with road traffic. It is uncertain whether it would result in an overall reduction in physical activity, or whether cyclists would simply divert along other routes. Along the Orchard Brae corridor itself, this option does offer reduced cycling connectivity compared to the Roseburn corridor option. Nevertheless, the Roseburn Path would remain untouched and so would continue to provide walking, wheeling and cycling provision, with existing greenspace and ecology retained.

5.2 Impacts Relating to Access to Greenspace and Biodiversity

Roseburn Corridor

During construction it is expected that the Roseburn Path would be closed for a significant period. While active travel connectivity would be maintained via alternative routes, this would reduce access to this open space area and its associated biodiversity. There are other areas of open space, green space and natural space in the wider area that would be unaffected that some of these communities could access, such as parts of Drylaw Park, Roseburn Public Park, Ravelston Park, Orchard Park and Ravelston Woods Nature Reserve, however, these sites being of a non-linear nature may not offer the same benefits in terms of combining journeys with a green corridor.

The health impacts of this could include loss of wellbeing and social interaction but may also include reduced physical activity should alternative routes not be as attractive as the current green corridor (see Section 4.2 for evidence on links between greenspace, biodiversity and health).

These impacts would particularly affect communities in the Intermediate Zones of Dean Village, Murrayfield and Ravelston, Blackhall and Drylaw for whom this is a local area of greenspace. However, it would also affect regular active travellers, joggers and dog walkers from communities to the north of the Roseburn Path

such as West Pilton, Granton West and Salvesen and Granton and Royston Mains who may use the route as part of a regular commute or exercise loop whereby they take in the greenspace corridor. While the impact to the majority of the population would be considered short term, the timespan may be more notable for children, for whom two years could represent a significant life stage in terms of cognitive, emotional and physical development.

Once constructed, the access to the Roseburn Path green corridor would be restored. The character would be changed through the inclusion of the tramway alongside the active travel route, providing a more open feel which some people may prefer, while others may dislike. However, the corridor would remain bordered by trees and vegetation and the tree loss would be mitigated by the planting and placemaking proposals. In particular, some of the placemaking proposals would potentially enhance access to more nature-rich spaces. For example, proposals for wildflower meadows between Drylaw Park and Leonardo Car Park, with the combination of improved and additional pedestrian paths and seating areas, may make this space more accessible to some groups, such as those with reduced mobility, to come and rest in a more natural space. A proposed woodland walkway and natural playground at the Old Murrayfield Railway Station may make this space more inviting to families with children. Therefore, it is expected that health benefits associated with natural space and biodiversity such as interaction with nature, physical activity, space for relaxation, social connectedness and improved mental wellbeing would be retained, and in places enhanced.

Orchard Brae

The proposals for Orchard Brae are unlikely to have any noticeable impact on health related to access to greenspace and biodiversity. The baseline benefits of the Roseburn Path would remain intact as it would continue to be available for active travel during construction. Once constructed, there would be an opportunity for some localised greening of the street environment. This would likely benefit shoppers and employees in the City Centre by improving local amenity. However, there is limited evidence to suggest small-scale greening of the streetscape will noticeably accrue the health benefits attributed to green space and biodiversity.

5.3 Impacts Relating to Microclimate

Roseburn Corridor

The TGBB Landscape Report[72] includes figures which illustrate areas where canopy would be lost and areas where it would be retained. While much of the canopy would be retained, there are some areas of loss where it is expected there would be an associated partial loss of shade. This will reduce the health benefits of shade in terms of mitigating heatwaves. Therefore, this has the potential to negatively affect health during heat-periods. This impact would occur during construction as people would not be able to access this area of shade anyway, and during operation due to the more open nature of the transport corridor.

The population affected by this impact would be walkers, wheelers and cyclists using the active travel route and potentially public transport users at tram stops (during operation). Elderly people and those with certain underlying health conditions would be more susceptible to this impact. The impact would likely be localised and affect a small minority of Edinburgh's population during periods of heat. The proposal to replace tree loss at a rate of 2:1 is likely to mitigate this impact to an extent, depending on the location of replacement tree planting in terms of providing beneficial shade.

Orchard Brae

No noticeable change to health impacts relating to microclimate are anticipated from the Orchard Brae proposal. The proposed rain gardens are likely to be too localised to have a noticeable effect and the pruning of overhanging trees along the tram route are not likely to be different from the occasional pruning that would occur along roads in the baseline. The existing benefits of the Roseburn Path would remain intact as it would continue to be available for active travel during construction.

5.4 Impacts Relating to Public Safety, Crime and Fear of Crime

Roseburn Corridor

The proposals for the Roseburn corridor would create a more open feel to the transport corridor and with more locations to enter and exit the corridor. Furthermore, the addition of a regular tram service and tram stops would increase the number of people interacting with the corridor. This is likely to increase the degree of passive surveillance along the corridor, whilst also reducing areas which are heavily shaded or concealed which may attract criminality or perceived criminality. The introduction of new / improved lighting in appropriate locations such as at the tram stops and some of the areas of placemaking would again support improved visibility and reduce perceptions of crime and security risk.

The change to the character of the Roseburn corridor could benefit those groups with a higher perception of crime and security risk, who may currently avoid the route more due to their safety concerns. The health impacts of this would be positive if it resulted in more uptake of the route by certain groups, for example women and ethnic minorities, who may benefit from increased physical activity and improved wellbeing.

Orchard Brae

No specific aspects of the current proposals for Orchard Brae have been identified to affect the health determinant of crime and security. The route already benefits from street lighting.

Built environment components (such as perceived safety at intersections) can influence how safe pedestrians or cyclists feel on their journey[73]. This is especially problematic at transit hubs where space is limited. In addition, paths shared between pedestrians, cyclists, and transit users can lead to conflicts between users, increasing stress and reducing the appeal of active travel. These impacts can be especially challenging for people with disabilities or visual impairments[73] . As cycling will not be fully segregated on Orchard Brae, there is a slightly elevated risk of bike tyres getting stuck in tram tracks. Although detailed design will aim to minimise this risk.

5.5 Impacts Relating to Equity

Roseburn Corridor

There is limited design information on which to base an assessment of impacts on equity. However, it is assumed that designs for new footways, cycleways and tram stops will comply with the requirements of the Equality Act 2010 in terms of considering the needs of those with disabilities.

The placemaking proposals for the Old Murrayfield Railway Station, Craigleith, and area between Drylaw Park and South End of Leonardo Car Park include seating, which will support those with reduced mobility with places to stop and rest, whilst benefitting from the improved green spaces.

The inclusion of incidental play furniture at Craigleith and a natural playground at Old Murrayfield Railway Station will provide spaces of particular benefit to children's wellbeing.

The Roseburn corridor proposals, including the associated additional cycle connectivity, would better link income deprived communities of Granton with Haymarket, a key area of employment growth. It therefore has the potential to improve access to employment for deprived communities through the provision of more direct and reliable public transport.

Orchard Brae Corridor

As with the Roseburn corridor there is limited design information on which to base an assessment of impacts on equity. However, it is assumed that the pedestrian footway and tram stops will comply with the requirements of the Equality Act 2010 in terms of considering the needs of those with disabilities.

Walkers and wheelers along the corridor would benefit from wider pedestrian footways along Queensferry Street compared with the baseline, but otherwise the equity benefits of this route appear to be limited. There will be some overall improvement by linking income deprived communities of Granton with the city centre and beyond, but the route offers less convenience in terms of linking with the Haymarket employment growth area.

5.6 Health Impacts Assessment Matrix

A Health Impacts Assessment Matrix is given in Table 5.1. For individual health determinants, this summarises,

- a description of the impact
- the route option being considered
- key affected populations
- the character and scale of impact and
- recommendations

Table 5.1: Health Impact Assessment Matrix

Impact on Health Determinant	Description	TGBB Option	Key Affected Populations	Character and Scale of Impact	Recommendations
Impacts of construction on levels of physical activity from active travel.	Closure of Roseburn Path during construction, partially mitigated with provision of active travel connectivity via alternative routes. The alternative routes are likely to mitigate impacts for cyclists, but for walkers, the alternatives are less direct. For some this may increase physical activity, but for others they may be dissuaded from walking/wheeling while the path is unavailable.	Roseburn Corridor	Commuters (walkers, wheelers, and cyclists) Communities in Deans Village, Murrayfield and Ravelston, Blackhall, Drylaw, West Pilton, Granton West and Salvesen, and Granton and Royston Maines.	**Character of impact:** Negative **Scale of impact:** Large minority of the local population. **Likelihood:** Probable **Equity Concerns:** Additional distance for walkers and wheelers will have a greater impact on existing users who are less able to manage the more indirect routes. **Importance:** Minor. People would still be able to reach their destinations by existing modes and the short-term loss of the route is likely to affect a small minority, with others able to accommodate the change.	▪ Ensure alternative routes are prepared and well sign-posted in advance of short-term closure of Roseburn Path. ▪ Provide segregation for active travel uses from general traffic on routes. ▪ Alternative cycle routes to be developed with suitable accessibility for those with disabilities and reduced mobility. ▪ Consider the inclusion of occasional seating along alternative routes to provide resting points for individuals who struggle to walk greater distances.
Impacts of construction on levels of physical activity from active travel.	Disruption of footways and traffic on Crew Road and Orchard Brae due to utility diversions and installation of tram routes. This would create inconvenience for cyclists, walkers, and wheelers during the construction period.	Orchard Brae Corridor	Commuters (walkers, wheelers, and cyclists) Communities in Comely Bank, Craigleith, Orchard Brae and Crewe Toll.	**Character of impact:** Negative **Scale of impact:** Large minority of the local population. **Likelihood:** Probable **Equity Concerns:** People with disabilities and reduced mobility, plus children are likely to be disproportionately disadvantaged. **Importance:** Minor. People would still be able to reach their destinations by existing modes and the communities most affected are generally in good health. Communities east of the route would be able to divert down E. Fettes Avenue.	▪ Traffic management to be designed to ensure safety and accessibility for walkers, wheelers, and cyclists throughout the construction phase. ▪ Pedestrian route segregation to provide for key crossing points and desire lines to support people reaching their desired destinations. ▪ Diversions to be clearly signposted and accessible for all users.
Operational impacts on levels of physical activity from active travel.	Reduction in walking, wheeling and cycling due to safety concerns from introduction of trams alongside active travel route.	Roseburn Corridor	Commuters (walkers, wheelers and cyclists) Communities in Deans Village, Murrayfield and Ravelston, Blackhall, Drylaw, West Pilton, Granton West and Salvesen, and Granton and Royston Maines.	**Character of impact:** Negative **Scale of impact:** Small minority of local population **Likelihood:** Possible **Equity Concerns:** People with disabilities, including sensory disabilities, women and parents with children may be more sensitive to this impact **Importance:** Minor. There is limited evidence to suggest that a well-designed public transport route alongside active travel would result in a reduction of physical activity and the associated health benefits. The overall width of the shared use path would not change from the baseline.	▪ Design to provide for the maximum amount of segregation between the tram corridor and active travel corridor, within the constraints of the former railway corridor. ▪ Ensure access to and from the active travel route is direct, convenient and avoids conflict with tram infrastructure. ▪ Consider additional enhancements for the active travel route such as low-level lighting/solar powered road studs to guide users in low light/night time conditions
Operational impacts on levels of physical activity from active travel.	Increase in physical activity due to active travel provision on Roseburn Path combined with additional cycle connectivity routes as a legacy benefit from the construction mitigation	Roseburn Corridor	Commuters (walkers, wheelers and cyclists) Communities in Deans Village; Murrayfield and Ravelston; Craigleith, Orchard Brae and Crewe Toll; Blackhall; Drylaw; West Pilton; Comely Bank; Deans Village; Granton West and Salvesen; and Granton and Royston Maines.	**Character of impact:** Positive **Scale of impact:** Large minority of the local population. The additional connectivity will provide for more communities. **Likelihood:** Probable **Equity Concerns:** Likely to benefit groups with a tendency to have greater road safety risk perceptions such as women and children **Importance:** Moderate. There is good evidence that providing good quality cycle infrastructure increases numbers of journeys by walkers, wheelers and cyclists and there is a strong body of evidence linking regular physical exercise with numerous health benefits.	▪ Segregation from general traffic is likely to encourage some groups to cycle more. ▪ Routes to be clearly signposted and accessible for all users. ▪ Provide for safety at junctions using up to date guidance for active travel provision.
Operational impacts on levels of physical activity from active travel.	Uncertain impacts on physical activity levels relating to cycling due to loss of cycle lanes on Crewe Road and Orchard Brae. It is likely that most cyclists will divert and use alternative routes which may increase their journeys (hence physical activity), but some cyclists may be dissuaded by alternative routes and reduce their levels of physical activity.	Orchard Brae Corridor	Cyclists	**Character of impact:** Uncertain **Scale of impact:** Small minority of the local population. **Likelihood:** Probable **Equity Concerns:** Those with disabilities who directly access the existing route may be disproportionately disadvantaged by the reduced provision. **Importance:** Low. It is unlikely that the loss of the on-road cycle lanes on one route will make a material difference to overall physical activity levels from cycling due to the presence of alternative routes.	▪ Consider providing alternative cycle routes with suitable accessibility for those with disabilities and reduced mobility.
Construction impacts on access to greenspace and biodiversity	Reduction in access to greenspace due to need to close Roseburn Path during the construction period, together with loss of trees.	Roseburn Corridor	Walkers, wheelers and cyclists Recreational users including dog walkers and joggers	**Character of impact:** Negative. **Scale of impact:** Large minority of the local population. The Roseburn Path is well used, particularly during the summer, for recreation due to its semi-natural environment.	▪ Provide clear information to local residents about the proposals. Seek to include local residents in helping to develop the detail of the proposals.

Impact on Health Determinant	Description	TGBB Option	Key Affected Populations	Character and Scale of Impact	Recommendations
			Communities in Deans Village, Murrayfield and Ravelston, Blackhall, Drylaw, West Pilton, Granton West and Salvesen, and Granton and Royston Maines	**Likelihood:** Probable. **Equity Concerns:** For children, the closure period may represent a significant life stage in terms of cognitive, emotional and physical development, and they may be less able to have the licence and independent mobility to access alternative areas of greenspace. **Importance:** Moderate. While the scientific evidence for the benefits of this type of greenspace on health outcomes may be mixed and of varying quality, there is considerable public concern about the proposals which is indicative of negative impacts on community wellbeing.	▪ Keep the period of closure as short as possible and consider a phased approach whereby parts of the route can be kept open. ▪ Seek to keep adjacent areas of greenspace such as Drylaw Park open and accessible while the Roseburn Path is closed. ▪ Consider phasing the placemaking work so that the enhanced spaces will be available before the Roseburn Path is closed.
Operational impacts on access to greenspace and biodiversity	Potential loss of community wellbeing due to reduced tree and vegetation cover along the route. Overall, there would be an increase in tree cover from the proposal, but some of these trees would be planted elsewhere in the city.	Roseburn Corridor	Recreational users including dog walkers and joggers Communities in Deans Village, Murrayfield and Ravelston, Blackhall, Drylaw, West Pilton, Granton West and Salvesen, and Granton and Royston Maines	**Character of impact:** Negative **Scale of impact:** Small minority of the local population. **Likelihood:** Probable. **Equity Concerns:** No specific concerns identified. **Importance:** Minor. It is anticipated that sufficient green cover would be retained and reestablished that the function of the green corridor would remain intact for most people and over time people would adapt to the changed environment.	▪ Provide clear information to local residents about the proposals. Seek to include local residents in helping to develop the detail of the proposals. ▪ Consider design measures that help compensate for some loss of greenery, such as strategic replacement planting and consideration of grassed tram route. ▪ Choose replacement vegetation that has high biodiversity value, such as native species of local provenance and species of benefit to a range of other wildlife.
Operational impacts on access to greenspace and biodiversity	Increased levels of social interaction and enjoyment of greenspace and biodiversity due to placemaking proposals.	Roseburn Corridor	Commuters (walkers, wheelers and cyclists) Recreational users including dog walkers and joggers Children and young people. Communities in Deans Village, Murrayfield and Ravelston, Blackhall, Drylaw, West Pilton, Granton West and Salvesen, and Granton and Royston Maines.	**Character of impact:** Positive **Scale of impact:** Large minority of the local population. **Likelihood:** Probable **Equity Concerns:** The communities that are closest to these proposals are generally in good health with low levels of deprivation. The more deprived communities in the Granton area are further away so less likely to benefit as much from the proposals, depending on how often they use the route. **Importance:** Moderate. There is some evidence supporting the health benefits of good quality greenspaces and placemaking that encourages social interaction. There is good evidence that regular social interaction is good for mental wellbeing.	▪ Seek to include local residents in helping to develop the detail of the proposals to support participation and inclusion. ▪ Choose replacement vegetation that has high biodiversity value, such as native species of local provenance and species of benefit to a range of other wildlife.
Construction impacts on microclimate of Roseburn Path	Loss of access to cooling benefit of Roseburn Path due to closure of the route during construction.	Roseburn Corridor	Commuters (walkers, wheelers and cyclists) Recreational users including dog walkers and joggers	**Character of impact:** Negative **Scale of impact:** Small minority of local population **Likelihood:** Possible **Equity Concerns:** Elderly and very young children, pregnant women and those with some underlying health conditions are more susceptible to health effects from excess heat. **Importance:** Minor. In the short term the loss of access to this particular area of greenspace is unlikely to have a discernible impact on population health due to the occasional nature of heatwaves and the alternative opportunities to avoid exposure to heat effects.	▪ Keep the period of closure as short as possible and consider a phased approach whereby parts of the route can be kept open. ▪ Seek to keep adjacent areas of greenspace such as Drylaw Park open and accessible while the Roseburn Path is closed. ▪ Consider phasing the placemaking work so that the enhanced spaces will be available before the Roseburn Path is closed.
Operational impacts on microclimate of Roseburn Path	Reduced cooling benefit of Roseburn Path due to reduced tree canopy cover and loss of some vegetation. The impact would be partially mitigated by replacement tree planting and the use of battery powered trams which reduce the need to cut back tree canopies.	Roseburn Corridor	Walkers, wheelers and cyclists Public transport users Recreational users including dog walkers and joggers	**Character of impact:** Negative **Scale of impact:** Small minority of the local population **Likelihood:** Possible **Equity Concerns:** Elderly and very young children, pregnant women and those with some underlying health conditions are more susceptible to health effects from excess heat. **Importance:** Moderate. In the long-term heatwaves are expected to become more frequent due to climate change and tree cover is an important measure to mitigate these impacts along transport corridors.	▪ Minimise loss of tree canopy during construction, and plant trees which offer good shade in the long term ▪ Consider placement of benches along the Active Travel route and at tram stop locations in locations which benefit from shade ▪ Consider grassed tram corridor rather than ballast to harness more microclimate benefits of vegetation due to transpiration ▪ Consider opportunities from SuDs in creating areas of microclimate due to cooling effects of water and plants ▪ Where replacement tree planting is to be off-site, consider places where people would benefit from shade, particularly in areas currently underserved by trees and greenspace
Operational impacts on public safety, crime and fear of crime	Reduced fear of crime and potentially reduced opportunities for crime as a result of increased passive surveillance along the Roseburn Corridor and the creation of more entry and exit points,	Roseburn Corridor	Walkers, wheelers and cyclists Public transport users Recreational users including dog walkers and joggers	**Character of impact:** Positive **Scale of impact:** Large minority of the local population **Likelihood:** Probable **Equity Concerns**: Women, young teenagers, elderly and some minority groups are likely to benefit more as they are most likely to feel unsafe in more isolated or enclosed greenspaces.	▪ Consider Secured By Design[74] principles and advice from police when developing the design of tram route and placemaking proposals. ▪ Consider design guides by Make Space for Girls[75] when developing placemaking proposals to include design elements

Impact on Health Determinant	Description	TGBB Option	Key Affected Populations	Character and Scale of Impact	Recommendations
	reduced enclosed spaces and more lighting.			**Importance:** Moderate. There is evidence that certain demographic groups often avoid green spaces due to feeling unsafe and therefore measures to improve perception of safety is likely to remove this barrier to accessing the benefits of greenspace for more people.	that are more likely to make teenage girls feel more comfortable.
Access to employment	Improved public transport connectivity between income deprived areas of Granton and the Haymarket area of employment growth.	Roseburn Corridor	Job seekers Communities of West Pilton, Granton West and Salvesen, and Granton and Royston Maines.	**Character of impact:** Positive **Scale of impact:** Large minority of the local population **Likelihood:** Probable **Equity Concerns:** Those without cars or who struggle to walk/cycle longer distances will benefit more from public transport connectivity. **Importance:** Moderate. This route in particular offers more direct linkages to key areas of employment. Access to secure and good employment is associated with improved health outcomes.	▪ Affordability of fares will be essential to accruing this health benefit. ▪ Plan for direct, efficient and affordable transport interchanges which are accessible to all.

6. Conclusion

6.1 Conclusion

The proposals to link Granton to the city centre, BioQuarter and Beyond will benefit many communities in terms of improvements in access to healthcare services, employment and social venues. Trams are efficient and low carbon forms of transport, bringing benefits of reduced air pollution and noise compared to general traffic. By transitioning from car use to public transport use, such as the tram, people will increase their physical activity levels and accrue health benefits associated with regular exercise.

During construction there will be noise disturbance, dust, and inconvenience for local communities surrounding the areas of works.

This Initial HIA has focused on where the options of the Roseburn corridor and Orchard Brae corridor are likely to differ in terms of health impacts. Both options are likely to negatively affect walking, wheeling and cycling opportunities during construction.

The Roseburn corridor option has been identified as having more health impacts compared to the baseline, than the Orchard Brae corridor option. However, these include four legacy impacts that are expected to be positive for health for some groups which the Orchard Brae Corridor option does not offer.

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