Health Impact Scoping Report: Proposed Edinburgh North-South Tram Extension

Public Health and Health Policy

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Contents

Introduction

The proposed North-South tram extension in Edinburgh represents a significant investment in sustainable transport infrastructure. This report evaluates the potential health impacts of the extension, focusing on population health, health equity, health and care service connectivity, economic and social impacts, and environmental considerations. The analysis incorporates evidence-based insights and highlights the broad population that stands to benefit, including vulnerable groups as well as identifying potential adverse impacts.

NHS Lothian's response to the proposed Edinburgh North South Tram extension is considered within the context of our strategic vision, as outlined in the Lothian Strategic Development Framework 2022-2027 (LSDF)[1], including that:

- We connect health and social care services seamlessly, wrapping around the citizen in their home
- Citizens live longer, healthier lives, with better outcomes from the care and treatment we provide
- We improve performance across our system, with better experiences for citizens and those who work for and with us

1. Population Health Benefits

The tram extension is expected to assist in supporting a shift towards sustainable modes of travel, with positive impacts on public health:

1.1 Physical Activity: Enhanced access to public transport assists in encouraging active travel, such as walking, wheeling, and cycling. According to Transport Scotland's Active Travel Framework[2], increasing active travel in urban areas can contribute significantly to the reduction of obesity and related health conditions, which currently affect around 29% of adults in Scotland. New tram infrastructure also presents the opportunity to enhance active travel provision by designing in improved infrastructure for walking, wheeling and cycling where possible.

1.2 Air Quality Improvements: Reduced reliance on private cars is anticipated to lower vehicle emissions, contributing to improved air quality. Edinburgh's Air Quality Management Area (AQMA) reports consistently highlight vehicle emissions as a primary source of urban air pollution, which exacerbates respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD), as well as contributing to cardiovascular disease and cancers[3]. Road traffic is by far the greatest contributor to the high concentrations of nitrogen dioxide (NO_2) in the city[4]. The City of Edinburgh Air

Quality Action Plan (2024) cites the development of the tram/mass rapid transport network in the city as one of a number of policy measures which are also key to the action plan. This is particularly important as, although a transition to lower tailpipe emission vehicles will help reduce NO_2 emissions, particulate matter (PM) pollution from tyre and break wear will continue to result from road transport. Connecting the tram network to include areas with higher levels of deprivation will contribute to addressing inequalities, as people in these neighbourhoods are more likely to be exposed to higher levels of air pollution, as well as being more likely to experience pre-existing health conditions adversely impacted by air pollution.

1.3 Noise Pollution Reduction: Trams offer quieter transit compared to road traffic and further increasing accessible public transport options can contribute to reduced car use, potentially leading to further reductions in traffic-related noise.

1.4 Road Safety: The modal shift away from cars, which tram extension is likely to contribute towards can assist to reducing road traffic and associated risks, lowering injury rates from road collisions and incidents. Data from Police Scotland[5] shows that people walking, wheeling and cycling are more likely to be injured in high-traffic areas, which can be alleviated by effective public transport systems. Connecting the tram network to include areas with higher levels of deprivation will contribute to addressing inequalities, as people in these neighbourhoods are significantly more likely to be injured or killed as road users than people in the highest socio-economic groups.[6]

1.5 Access to Services and Opportunities: Improved connectivity will enhance access to education, employment, healthcare, and recreational facilities, particularly benefiting communities currently underserved by transport infrastructure and with low levels of car ownership. In Edinburgh's most deprived areas, as identified by the Scottish Index of Multiple Deprivation (SIMD), lack of transport has been a barrier to accessing opportunities[7]. In 2022 in Scotland, 75% per cent of households had access to one or more cars or vans[8]. Figures for Edinburgh in 2019[9] show 45% of city households had no access to a car. Car ownership levels are lower for families affected by income poverty and lack of adequate public transport can lead to people being forced into running a car even if it puts real pressures on their budget. In addition to this, some groups are more likely to rely on public transport such as young people, older people, women and people from certain ethnic groups[10].

1.6 Climate Emergency Contribution: Encouraging sustainable travel modes supports Edinburgh's net-zero carbon goals, which includes reducing car kilometres by 30% by 2030. Transport accounts for almost 30% of Scotland's greenhouse gas emissions, with private cars being the largest contributor[11],

and a transition away from private car use to other modes including tram is essential in order to reduce the wide range of adverse impacts that further climate change will have on population health[12]. The tram extension will directly support reductions in these emissions.

2. Population Health Risks

Whilst acknowledging the wide range of benefits set out above, it is also important to recognise and mitigate against potential risks.

2.1 New tram infrastructure may impact on existing walking, wheeling and cycling infrastructure. Where impacts are identified, careful consideration should be given to how these can be mitigated. Such mitigations should be designed in collaboration with those most affected and should be effectively communicated.

2.2 Construction-Related Stress and Disruption: During construction, increased noise, dust, and vibration levels may negatively impact residents' physical and mental health, particularly for those living near the tram route. Evidence from the first phase of the Edinburgh tram system highlighted elevated complaints about sleep disturbance and stress.[13]

2.3 Air Quality: Construction activities and increased traffic diversions may lead to localised, temporary worsening of air quality, posing risks to individuals with respiratory conditions such as asthma and COPD.

2.4 Road Safety Concerns: Temporary diversions and increased heavy vehicle traffic during construction might raise the risk of collisions with negative impacts on the most vulnerable road users including people walking, wheeling and cycling during the affected period.

3. Health Equity Benefits

3.1 Physical Accessibility: The tram system has been designed to accommodate individuals with disabilities, older adults, and families with young children, ensuring equitable access to public transport. Low-floor trams, accessible stops, and clear signage are critical components. Evidence from the existing Edinburgh tram line shows a high satisfaction rate (over 95% in user surveys[14]) with accessibility features are cited as contributing to the high satisfaction rates among users.

3.2 Affordability: Affordable fares are essential to ensure the tram system is accessible to low-income households, reducing transportation-related financial barriers and promoting inclusive mobility. The proposal noted in the City Mobility Plan (Delivering Actions for Public Transport) around the introduction of 'Flexible and Affordable Fares/Integrated Ticketing' would assist in this. It should also be noted that a degree of integrated ticketing already exists within Edinburgh due to integration of ticketing between Lothian Bus and Edinburgh Tram, so any future tram extensions will benefit from this existing integration.

3.3 Safety: Edinburgh Trams have stated that safety measures including well-lit stops, CCTV coverage, and secure connections to local communities are prioritised to foster a sense of security for all users, particularly women, children, and other vulnerable groups. Research by Transport Focus15 indicates that perceived safety significantly impacts public transport use, particularly during evening hours.

4. Health Equity Risks

4.1 Disruption to Access for Vulnerable Groups: Communities reliant on specific public transport routes may experience delays or rerouting during the construction phase, impacting access to employment, education, and healthcare. Vulnerable groups, including older adults, individuals with disabilities, and low-income families, may be disproportionately affected if they are less able to make use of alternatives. It is essential that any rerouting of the environment for people walking, wheeling and cycling is fully accessible for those using, prams, wheelchairs and adapted cycles.

4.2 Noise and Visual Intrusion: Noise and visual intrusion may impact on those living close to construction works, with the impact being greater on those who spend a greater proportion of time in their homes, such as older people, disabled people, young children and those with caring responsibilities. Lower-income neighbourhoods may experience heightened disruption due to construction works through a combination of factors including proximity to infrastructure projects[16], weaker political advocacy[17] and fewer resources to cope with disruption[18] contributing to potential health inequalities.

These issues, as well as the potential impact on other vulnerable groups and those with protected characteristics should be identified and addressed through an Integrated Impact Assessment.

5. Health and Care Service Connectivity Benefits

5.1 Healthcare access: The tram extension will improve connections to key healthcare facilities, enabling patients, staff, and visitors to reach hospitals, clinics, and care homes more efficiently. The extension is expected to serve the Royal Infirmary of Edinburgh as well as running close to the Western General Hospital which could reduce travel times and support increased active travel for a significant number of staff and patients.

5.2 Support for Healthcare Staff: Operating schedules should align with shift patterns to ensure convenient transport options for healthcare staff working early, late, or overnight shifts. Staff surveys conducted by NHS Lothian consistently identify transport as a significant source of stress for shift workers, particularly for those who depend on personal vehicles or infrequent bus services. Notably, approximately 2,500 members of NHS Lothian's workforce reside within SIMD 1 (excluding East and West Lothian). The extension has the potential to provide direct benefits to a substantial number of staff for whom reliable and accessible public transport is crucial.

6. Health and Care Service Connectivity Risks

6.1 Healthcare access: Construction-related disruptions could temporarily hinder access to major healthcare facilities, including the Royal Infirmary of Edinburgh. This may particularly affect travel times for patients with critical conditions, routine appointments, or emergency needs. Priority access for emergency vehicles needs to be considered as part of any temporary re-routing.

6.2 Health and Safety: Consideration should be taken, both during construction and implementation, of the requirement for suitable pedestrian crossing points on site and any impact to blue light access and egress.

6.3 Support for Healthcare Staff: Healthcare workers may experience delays or difficulties reaching workplaces during construction. Good communication with healthcare staff about any temporary changes to transport routes and site accessibility will be required.

7. Economic Benefits

7.1 Temporary Generation of Employment: The construction phase of the project is projected to generate significant employment opportunities, with a focus on inclusive recruitment strategies targeting individuals from deprived communities. For instance, the construction of the existing tram line supported over 1,000 local jobs, with training programs for apprenticeships in collaboration with Skills Development Scotland. This aligns with the Scottish Government's commitment to Community Wealth Building which in turn is likely to bring benefits to health and health inequality[19]

7.2 Longer Term Stimulation of Local Economy: The Marmot Review highlighted that reducing health inequalities requires economic investment in early childhood, employment, and sustainable communities[20]. Once operational, the tram system will provide direct employment in its operation as well as stimulating local economies by enhancing access to businesses and employment hubs. Improved transport links can attract investment, fostering economic growth and long-term job creation. The City Mobility Plan estimates that every £1 invested in public transport generates £4 of economic benefit. Job creation helps provide people with financial security and access to essentials such as healthy food, healthcare and education.

Over time, increased public transport use may reduce pressure on roads, cutting congestion-related costs and lowering the city's carbon emissions, potentially saving money on environmental and health impacts.

8. Economic Risks

8.1 Temporary Impact on Local Businesses: Businesses located near construction sites may experience reduced footfall and economic losses due to access barriers, noise, and visual disturbance. Similar impacts were reported during the earlier tram project in Edinburgh, particularly for small and independent retailers. In recognition of this, £2m from the tram budget was allocated towards a small business support scheme[21].

8.2 Longer Term Financial Impact: Current uncertainty over how the project will be financed raises the prospect of economic risk. Estimates at this stage of the project indicate the overall cost to build the scheme could be in the region of £2 billion.

A report to the Edinburgh Council Transport and Environment Committee, February 2024[22], indicated an expectation that Scottish Government/Transport Scotland would allocate funding as the project moves forward and that there 'have been positive discussions with the Scottish Government and Transport Scotland on support to develop an Outline Business Case and Final Business Case in the future.'

In May 2024, Scottish Government indicated that it could not provide the estimated £44 million required for development of the Outline Business Case and Final Business Case (and all associated workstreams pre-construction) for the proposed extension. The Council has no funding allocated at present for such costs. The financial shortfall has prompted Edinburgh Council to explore alternative funding models, including public-private partnerships to continue to develop the project. Whilst there is no indication that any funding required for the project and its development would come from the local public purse, current uncertainty with regards funding does bring with a degree of economic risk. Aspects of this will become clearer with the development of the Council's Outline Business Case and subsequent Financial Business case.

9. Social Benefits

9.1 Connectivity: The tram extension will enhance social inclusion by improving connectivity within and between communities. This is particularly impactful for individuals in deprived areas, who may currently face social isolation due to inadequate transport links. SIMD data highlights specific zones in both North and South Edinburgh[23] where lack of connectivity correlates with lower social mobility and employment rates. Connections across the city to Edinburgh Royal Infirmary and the Bio-quarter will provide significant benefits in relation to connection to healthcare services as well as potential employment opportunities.

9.2 Amenity Spaces: The planned integration of public amenity spaces around tram stops will prioritise inclusive design, providing safe and welcoming environments that promote social interactions and community well-being. These spaces will be designed in consultation with local communities to ensure they reflect local needs and preferences.

10. Social Risks

10.1 Connectivity: Public spaces, walkways, and green areas near construction zones may be temporarily inaccessible during the construction phase, reducing opportunities for physical activity and recreation, particularly in areas where green spaces are already limited, and action should be taken to engage with affected communities to plan and promote alternative routes and opportunities.

10.2 Amenity Spaces: Dependant on the route chosen there may be a permanent impact leading to a reduction in amenity space in proximity to the tram line. The Edinburgh Tram Design Manual cites The Edinburgh Standards in Urban Design, where it recognises the importance of minimising the loss of public access to areas of outdoor/visual amenity, recreation, and biodiversity interest. Nonetheless there may be localised impact on space for walking, wheeling and cycling as well as on biodiversity and where this is the case measures should be put in place to offset this, in consultation with affected communities. With regards to biodiversity, the design and construction of environmental measures must be consistent with the Edinburgh Biodiversity Action Plan, and The Tram Act 2006 stipulates a 2 for 1 replacement for trees / bushes and this was exceeded in the development of the existing routes. These standards should be maintained and where there is likely to be significant environmental impact there should be consultation with affected communities with regards the design of mitigations.

10.3 Community Disruption: Construction activities may temporarily fragment communities, reduce connectivity, and deter social interaction due to physical barriers, noise, and increased traffic and action should be taken to engage with affected communities to plan and promote alternative routes and opportunities.

11. Environmental Benefits

11.1 Biodiversity Net Gain: Landscaping and green infrastructure along tram routes can enhance urban biodiversity. Edinburgh's Biodiversity Action Plan[24] highlights opportunities to integrate wildlife corridors into transport projects.

11.2 Climate Adaptation: Design features should incorporate resilience to climate impacts, such as improved drainage systems and heat-tolerant materials. Research from the Scottish Environmental Protection Agency (SEPA) underscores the importance of climate-adaptive infrastructure in mitigating urban flooding and heat stress.

11.3 Carbon Reduction: Transitioning commuters from cars to trams will lower carbon emissions, contributing to the city's net-zero targets. Evidence cited by Transform Scotland in 2024[25] indicates that cars emit six times more CO_2 per passenger Km than trams. [Car 170g/km CO_2, (EV 47g/km CO_2) Tram 28g/km CO_2]

12. Environmental Risks

12.1 Air, Noise, and Dust Pollution: Construction machinery, heavy goods vehicles, and excavation work can lead to temporary increases in emissions and particulate matter, impacting local air quality and noise levels, and these should be monitored with mitigations put in place where required.

12.2 Biodiversity Disturbance: Habitat disruption during construction may affect urban wildlife, particularly in areas close to parks, watercourses, or existing green corridors and these should be monitored with mitigations put in place where required.

12.3 Climate Impact of Construction: Although the project supports long-term carbon reduction goals, the construction phase will generate emissions through energy use, materials production, and transport operations. A plan to minimise these, including options to support sustainable travel of construction staff to and from constructions sites, should be put in place.

Conclusion

This document begins by referencing NHS Lothian's strategic plan, the Lothian Strategic Development Framework 2022-2027 (LSDF). Within the framework, three key statements are particularly relevant to the proposed Edinburgh North-South Tram extension:

- 'We connect health and social care services seamlessly, wrapping around the citizen in their home'
- 'Citizens live longer, healthier lives, with better outcomes from the care and treatment we provide'
- 'We improve performance across our system, with better experiences for citizens and those who work for and with us'

These principles underpin our strategic vision, which depends on ensuring that everyone, regardless of where they live or their individual circumstances, has the

means to access health services and the wider opportunities necessary for a healthy, active, and connected life.

While NHS Lothian and its partners continue to take a place-based approach, emphasising the principles of the 20-minute neighbourhood concept, to bring services and opportunities closer to people, there will always be some need for people to travel. Accessible, affordable, and efficient public transport plays a critical role in enabling this. It not only facilitates access to services but also supports broader goals of increasing sustainable and active travel, which are essential for achieving our net-zero aspirations.

In addition to this, the health impacts of the North-South tram extension will extend beyond those living adjacent to the proposed routes. The entire population of Edinburgh and the Lothians, including future generations, stands to benefit from:

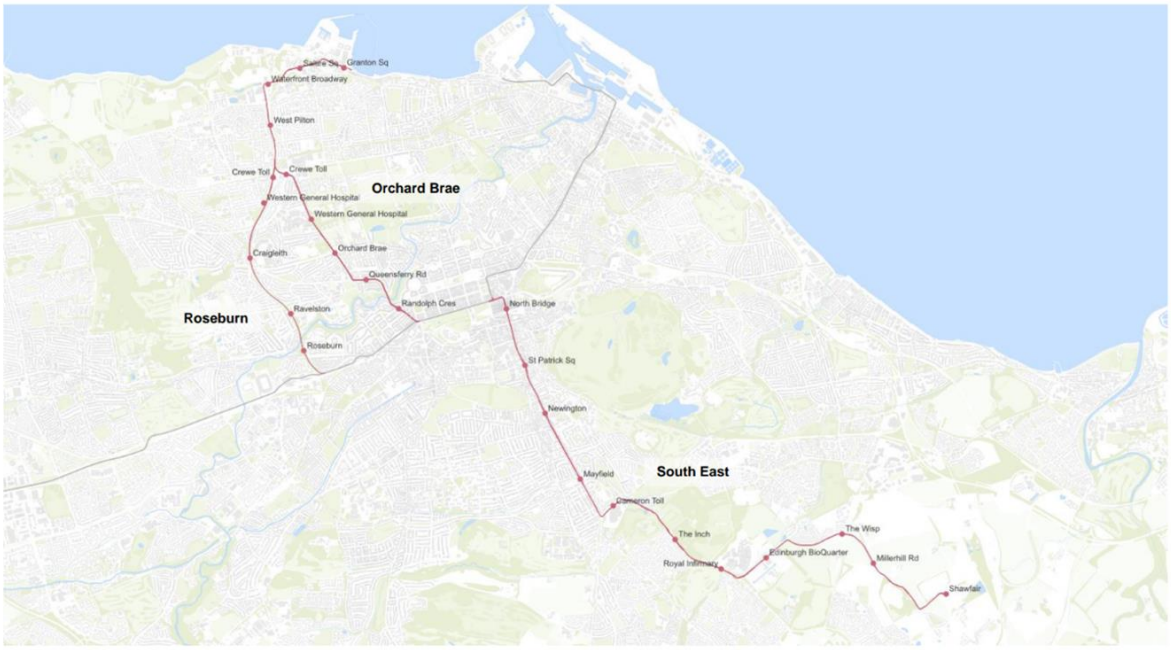
- A more sustainable, accessible, and inclusive transport network.
- Reduced health inequalities and improved access to essential services.
- Enhanced resilience to environmental challenges and climate change.

The proposed extension offers a range of population health benefits, underpinned by sustainable transport, health equity, and environmental stewardship. By ensuring the extension meets the needs of the most vulnerable groups and fostering a healthier, more connected Edinburgh, this project represents a critical step toward a more inclusive and sustainable future.

Within this, it is important to mitigate and address potential short-term negative health impacts. These include construction-related stress, environmental disturbances, and disruptions to accessibility and local businesses, which if not mitigated made disproportionately impact vulnerable communities. Drawing on lessons learned from previous infrastructure projects, proactive measures such as inclusive community engagement, transparent, equity-focussed planning, and environmental management will be crucial to minimising any adverse effects and ensuring equitable benefits across the population.

Appendix

Figure 1.1: Trams to Granton, Bioquarter and Beyond Route Overview



As reported at City of Edinburgh Council Transport and Environment Committee [1], the proposed route would connect the city's two principal hospitals (Edinburgh Royal Infirmary and Western General Hospital), in addition to directly connecting three of the four priority investment zones. Improved public transport would support social inclusion and continued local regeneration of communities, particularly in north west and south east Edinburgh.

[1] Tram from Granton to BioQuarter and Beyond: Consultation for Strategic Business Case Development report, 1st February 2024

References

[1] Strategic Development Framework – Strategies

[2] Transport Scotland Active Travel Framework

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[4] The City of Edinburgh Air Quality Action Plan 2024.

[5] Key Reported Road Casualties Scotland 2023

[6] Transport Scotland Key issues and evidence 2022

[7] CEC Delivering Actions for Public Transport - Integrated Impact Assessment – Summary Report 2024

[8] Scottish Household Survey 2022

[9] Edinburgh City Mobility Plan 2021-2030

[10] Transport Scotland Health Inequalities Impact Assessment 2022

[11] Transport Scotland A route map to achieve a 20 per cent reduction in car kilometres by 2030 (2022)

[12] Climate change: health effects in the UK - GOV.UK

[13] Edinburgh Tram Enquiry Report 2023

[14] Edinburgh Trams Passenger Focus Survey 2024

[15] Transport Focus: Perceptions of safety on public transport - Key drivers analysis 2021

[16] NIC - Infrastructure, Towns and Regeneration 2021

[17] Local Government Association – Power, politics and community assets 2021

[18] UK Government: Challenges facing disadvantaged and deprived communities 2024

[19] Community Wealth Building in Scotland: A health impact assessment. Public Health Scotland 2024

[20] Fair Society Healthy Lives: The Marmot Review 2010

[21] Edinburgh Trams Small Business Support Scheme 2017

[22] CEC Transport Committee Item 7.3 1 February 2024

[23] Scot Gov - Scottish Index of Multiple Deprivation – Geographic Access to Service Indicators (2020)

[24] Edinburgh Biodiversity Action Plan 2022-2027

[25] Transform Scotland. Decoding Carbon Footprints 2024