DEVELOPING INTEGRATED MASS TRANSIT FOR THE GLASGOW CITY REGION:
INFORMING THE CLYDE METRO CASE FOR INVESTMENT

REPORT B:
HEALTH ECONOMIC REVIEW

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Developing integrated mass-transit for the Glasgow City Region: Informing the Clyde Metro Case for Investment

Report B: Health Economic Review

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Executive Summary

Background

Clyde Metro

Glasgow has the most ambitious net zero goal in the UK, with a key priority being reducing emissions from transport. The Clyde Metro mass-transit initiative is a key sustainable transport project supported by the Scottish Government and in alignment with national and regional transport strategies.

The Clyde Metro Case for Investment has been progressed jointly by Strathclyde Partnership for Transport (SPT) as Case for Investment Lead, Glasgow City Council (GCC) on behalf of the Glasgow City Region, and Transport Scotland in an assurance role, from February 2024 to March 2026. The development of the Case for Investment (CFI) commenced in February 2024, with a first-stage Case for Change report, including indicative network options, published in February 2025.

Between 2025 and 2027, work will continue to develop the Programme Business Case in line with Scottish Transport Appraisal Guidance and HM Treasury Green Book requirements. This will include establishing a preferred network option and setting out proposed governance arrangements, commercial and funding options, and delivery and operating models. As part of a recent governance review, SPT will be the sole accountable body for the CFI Stage from April 2026 onwards and will be the delivery lead for all workstreams.

Over a 30-year period, this multi-billion investment aims to improve connectivity for over 1.5 million individuals in the Glasgow City Region, serving as a comprehensive and integrated public transport system, offering a sustainable alternative to private car usage (e.g. bus, tram, light rail, and/or metro rail). It aims to connect people to employment, education, and health services in and around the Glasgow City Region.

GALLANT Collaboration

This study is a collaboration between the University of Glasgow and Glasgow City Council that aims to inform the development of the Clyde Metro Case for Investment. The collaboration is sub-project of the Glasgow As a Living Lab Accelerating Novel Transformation (GALLANT) project funded by the Natural Environment Research Council (reference NE/W005042/1). GALLANT is a partnership between the University of Glasgow and Glasgow City Council that uses Glasgow as a living lab to trial new sustainable solutions throughout the city.

This study was awarded GALLANT Innovation Funding to strengthen internal partnerships (School of Cardiovascular and Metabolic Health and Health Economics and Health Technology Assessment Unit) and external partnerships with Glasgow City Council to respond to their sustainable transport policy priorities. The Carnegie Trust for the Universities of Scotland also supported the study.

Overview of Study

Aim

This study aims to inform the development of the Clyde Metro Case for Investment in three key areas:

- Alignment of active travel infrastructure with mass-transit
- Widening the use of the Clyde Metro and increasing accessibility
- Realising the wider benefits of investment in regional mass-transit

Study Design

This publication forms **Report B** of *two reports* designed to inform the Case for Investment. The objectives and methods used in each report are summarised in **Table 1.** Report B is highlighted in green with two objectives (iv and v). Report A is published separately.

Table 1: Summary of Report A and B including relevant objectives and methods

Report	Part	Objectives		Methods
A (reported elsewhere)	**1**	i	To identify what comparable cities or city regions have planned and implemented a mass-transit system and what learning can be applied to proposals for the Glasgow City Region	Rapid literature review
		ii	To understand how other cities or city regions have integrated active travel infrastructure and mass-transit to enable safe multimodal journeys.	
	2	iii	To explore experiences of active travel and public transport with those who face barriers to sustainable transport usage	Interviews with optional photo elicitation
B		iv	To summarise the published health economic evidence on the costs, health, and broader societal impact of mass-transit schemes.	Scoping literature review
		v	To develop a conceptual model that maps out the costs and benefits likely to arise from a regional mass-transit scheme such as Clyde Metro in both the short and long-term.	Conceptual model

Outcomes

This report provides a summary of evidence to inform the Case for Investment, by reviewing relevant literature and developing a conceptual model to illustrate the potential costs, health and broader societal benefits of Clyde Metro. The outcomes are a set of recommendations for consideration as part of the development of the Clyde Metro Case for Investment. To continue to support the development of Clyde Metro and provide evidence for the Case for Investment, the potential next steps for research are outlined in the report.

Objectives of the Health Economic Review

The health economic review aimed to inform the Clyde Metro Case for Investment by addressing the objectives:

iv. To summarise the published health economic evidence on the costs, health and broader societal impact of mass transit systems.

v. To develop a conceptual model that maps out the costs and benefits likely to arise from a regional mass transit system such as Clyde Metro in both the short and long-term.

Methods: A scoping review was conducted following PRISMA guidelines, searching four databases (Web of Science, Embase, Scopus, and TRID).

Data on costs, outcomes and benefits were extracted and summarised. The scoping review informed the development of a conceptual model that illustrates the relationship between intervention costs, mass transit system types, consequences and resulting benefits.

Findings: Thirty-four studies were included in the review with 17 being peer-reviewed journal articles and 17 classified as grey literature. Most of the studies were conducted in high-income countries (30 out of 34 studies) and within urban settings (29 out of 34 studies), covering different types of mass transit systems.

Summary of Key Themes for Objective iv

Objective iv. Impact of Mass Transit Systems

- *Environmental impact:* Most studies from the review reported mass transit systems to have positive environmental impact through the reduction of greenhouse gas emissions, air and noise pollution
- *Health impact:* Health gains from mass transit were reported to arise through reduction in air pollution, reductions in road accidents, increased opportunities for physical activity and enhanced access to healthcare and social services, all of which improve quality of life, and reduce morbidity, mortality and healthcare system burden.
- *Economic impact:* For economic impacts, studies reported mass transit to impact the economy through multiple mechanisms, including job creation and wider economic productivity, increased activity in commercial and retail sectors, and greater access to employment and education. Economic impacts may, however, trigger gentrification through urban development and associated rising property/real estate values.
- *User/passenger impact:* User/passenger benefits included reduced travel times, improved journey reliability, lower transport costs, and increased mobility options. Even for people who did not usually use mass transit

(non-users), the development of mass transit provided them with the option in the future.

- *Cost vs Benefit:* Mass transit systems require substantial upfront capital investment (such as building infrastructure, land acquisition and vehicle procurement) followed by recurrent operating costs and occasional non-recurrent expenditures (e.g., legal or severance costs). However, most studies showed that the long-term benefits of mass transit outweigh its costs.
- *Evaluation Tools:* Some studies showed mixed findings depending on local context, scope of benefits included, and comparison scenarios. Value for money is, however, challenging to fully quantify using standard economic evaluation tools, as the value of mass transit span interrelated domains beyond transport, such as health, the environment and economic development.

Objective iv: Impact of Mass Transit Systems

Objective v. Conceptual Model

The conceptual model developed highlights that mass transit may lead to a broad range of societal benefits, categorised as health benefits, individual benefits, economic benefits to the transit company and broader societal benefits. The model also illustrates how outcomes identified from studies in the scoping review may impact equity in a society. A simplified version of the model is shown in Figure 1, illustrating the relationship between costs for mass transit development, the consequences resulting from the implementation of mass transit and the eventual broad societal benefits.

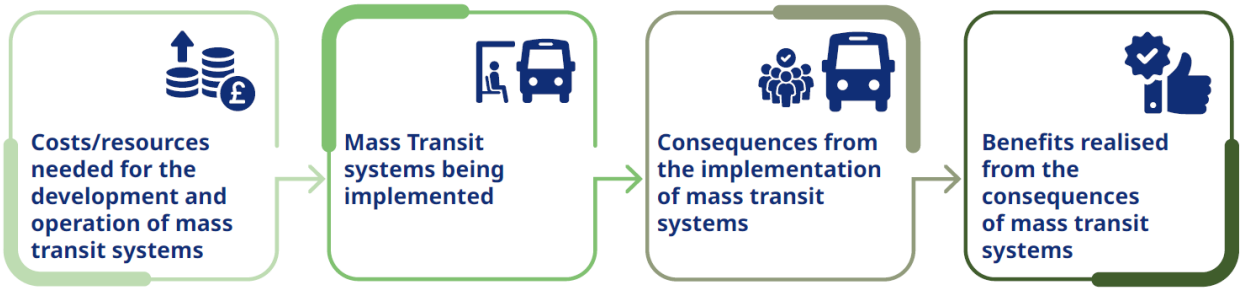

Figure 1. Overview of Conceptual Model

Key learning and Implications for Clyde Metro Case for Investment

This study reviewed the literature and developed a conceptual model to illustrate the potential costs, health and broader societal benefits. Key learning from the study has been summarised below, aligning with the study aim.

Realising the wider benefits of investment in regional mass-transit

- The review showed that the development of mass transit schemes has a broad range of impacts and benefits for populations and economies.
- Mass transit can generate benefits for the economy, however, there is a need to be aware of potential impacts of gentrification through urban development and associated rising property/real estate values.
- Most studies in the review show that while there may be significant upfront costs associated with the development of these schemes, value for money were generally positive over the long term.
- The review suggests the potential benefits of Clyde Metro are likely to be broad, but capturing these quantitatively presents multiple challenges and current evidence may not be directly applicable due to contextual differences. Hence, a robust evaluation that can fully capture and quantify this broad scope of potential benefits will require advanced analytical approaches that capture long-term, multisectoral impacts on costs and benefits.
- The review evidences the need for local data (e.g. geospatial data on transit and commuting, linked data on health outcomes, access to health services, by geographical area, etc.) and innovative modelling approaches to quantitatively estimate potential benefits in the Glasgow City Region context.
- While the estimation of the potential value of Clyde Metro may be useful in the development phase to guide investment decisions, it is also necessary to consider its evaluation following development and to ensure that structures and systems necessary for such evaluations are considered and incorporated in the design, development, and implementation of Clyde Metro.

Recommendations

Based on the evidence, two priority recommendations are proposed:

1. Further methodological and quantitative research will be needed to provide (quantitative) estimates of the potential value for money for Clyde Metro.
2. To fully understand and quantify the impacts of Clyde Metro, ongoing evaluation should be embedded throughout the delivery programme. Arrangements for monitoring and evaluation must be incorporated into the planning, design and implementation stages, rather than introduced retrospectively.

Conclusion

Mass transit schemes can produce wide-ranging benefits that justify investment when assessed over an appropriate time horizon (for example decades rather than years). This scoping review and conceptual model provide a foundation for future quantitative analysis to support Clyde Metro's business case and strategic development.