Clyde Metro Case for Investment | Case for Change Report

Clyde Metro - connecting people, creating opportunities, transforming places

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F	15.08.2024	JC	MD	SN	Addition of ‘security/safety’ and ‘accessibility’ transport outcomes
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Contents

Executive summary

The Clyde Metro programme offers the opportunity for transformational change in economic, environmental, and social outcomes across the Glasgow City Region (GCR). The GCR is home to a diverse set of places, economic opportunities, and visitor attractions which require additional connectivity to make their full contribution to the region and nation. Building on the cross-sector complementary investment portfolio, proposed investment in the Clyde Metro network will deliver a step change in connectivity and accessibility, allowing businesses to attract more workers and customers and people to access more opportunities and services. This will help drive the programme of place-making and place-mending for areas which are currently unserved or underserved; doing so in a sustainable manner which makes a significant contribution to Net Zero.

Clyde Metro was a central pillar of the Scottish Government's Strategic Transport Projects Review 2 (STPR2). This 'Case for Change' (CfC) builds on the STPR2 outputs to refresh the case-making for Clyde Metro, confirming those places with greatest need. In conjunction with the separate 'Network Options Development Report' it provides the 'Case for Investment' (CfI) consistent with Stage 1A of Transport Scotland's Scottish Transport Appraisal Guidance (STAG).

The GCR is served by a suburban and regional rail network, with most stations benefitting from two or more trains per hour (tph) to/from Glasgow City Centre. Within the core, built-up, urban area an extensive bus network is complemented by the Glasgow Subway which provides connections for the inner 'ring' around the City Centre. While rail serves selected places and a significant hinterland beyond 15 to 20km, and buses provides local access for trips of up to 10km, there is a gap for intermediary rapid transit which Clyde Metro aims to fill. This will provide faster and more frequent journeys, with an integrated network between Metro routes and to/from other modes, providing significant enhancements in accessibility and connectivity. The increased opportunities will extend beyond the bounds of the Metro network itself, with increased inward investment, the potential for released capacity on the National Rail network, and integration between modes benefitting the wider GCR by:

Connecting places which are currently unserved and underserved. New or enhanced connections will enable residents to access the opportunities and services which are essential to prosperity and wellbeing, working with complementary investment to address entrenched adverse socio-economic outcomes and create places to live, work, and invest.

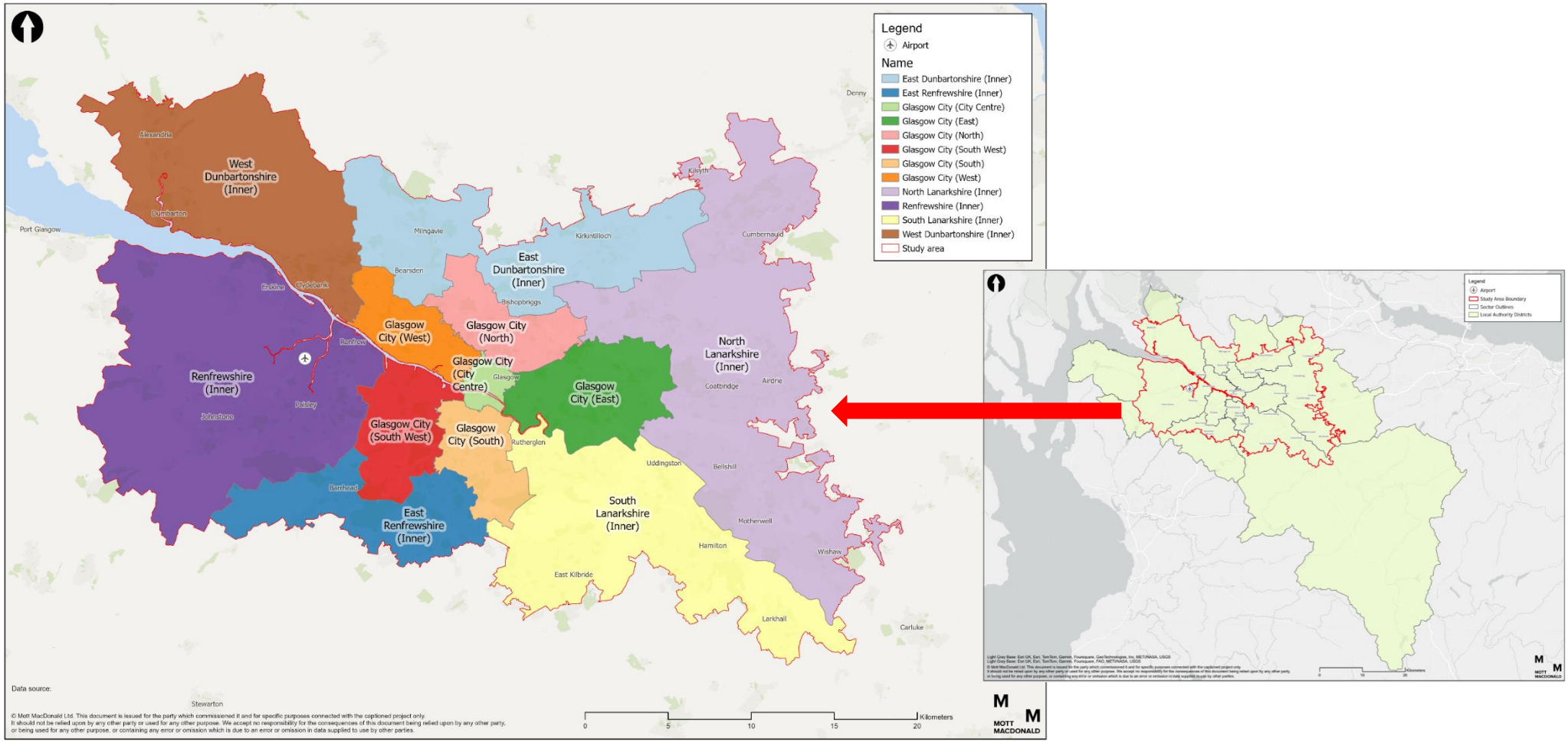
Acting as a catalyst for inward investment and economic growth. Fast and efficient connections to an increased supply of labour will be a locational pull for new and established businesses, increasing the GCR's density and productivity. Links to national and international gateways will help grow the visitor economy across the region.

Helping the GCR and Scotland transition to a more sustainable mix of travel. By providing a step change in the attractiveness and integration of alternatives, and integrating with active and other public transport modes, Metro will be a catalyst to reduce car dependency (for those who have access to one). It will achieve this by working to actively enhance the built and natural environmental environments and 'sense of place'.

This CfC report explores the importance of Clyde Metro in addressing current problems, complementing future opportunities, and delivering transformational change across strategic economic, environmental, and social outcomes.

The Places

The Metro study area covers the core urban area of Glasgow and principal centres within 20km. The definition of the study area has been based on benchmarking of rapid transit systems (consistent with STPR2) which typically extend this distance from a major centre(s) across dense urban areas; beyond this, traditional rail becomes the more viable option. The delivery of the Clyde Metro Programme would be expected to offer much wider opportunities across the full GCR and beyond.



The study area is home to approximately 1.6 million people, approximately 30% of Scotland's total population, with circa 600,000 of those residents in Glasgow City, the largest urban area in Scotland and the centre of the GCR. In 2021, the area's economy was worth over £45 billion and provided employment for over 800,000 people.

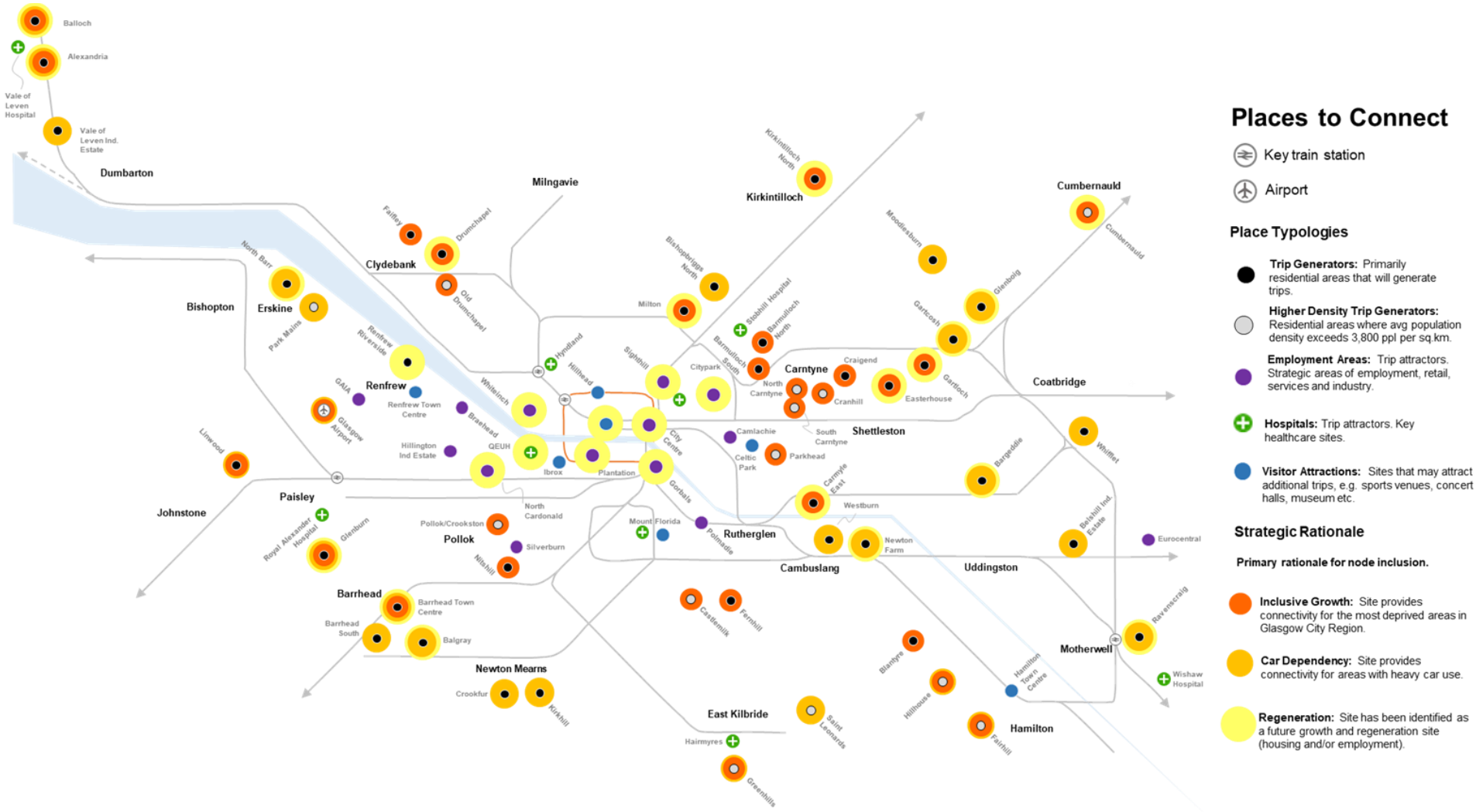
Glasgow City (175km^2) 	• Residents: 595,000 • Places: Glasgow City Centre, Pollok, Partick, Milton, Easterhouse, Cathcart • Total GVA: £23,000 (2021, millions) • Workers: 425,000 • Deprivation: 45% of areas in most deprived quintile • Key sectors: Public admin' & defence; Business admin' & support; Financial & insurance
East Dunbartonshire – Inner (96.2km^2) 	• Residents: 95,000 • Places: Bearsden, Bishopbriggs, Kirkintilloch, Milngavie • Total GVA: £1,300 (2021, millions) • Workers: 25,000 • Deprivation: 3% of areas in most deprived quintile • Key sectors: Education; Public admin' & defence; Arts, entertainment, and recreation; and retail
North Lanarkshire – Inner (218.5km^2) 	• Residents: 315,000 • Places: Cumbernauld, Coatbridge, Airdrie, Motherwell • Total GVA: £7,300 (2021, millions) • Workers: 115,000 • Deprivation: 35% of areas in most deprived quintile • Key sectors: Public admin' and defence; Construction; Mining and utilities
South Lanarkshire – Inner (139.4km^2) 	• Residents: 230,000 • Places: East Kilbride, Hamilton, Rutherglen, Cambuslang • Total GVA: £5,800 (2021, millions) • Workers: 90,000 • Deprivation: 23% of areas in most deprived quintile • Key sectors: Mining and utilities; Construction; Public admin' & defence
East Renfrewshire – Inner (55.2km^2) 	• Residents: 85,000 • Places: Newton Mearns, Barrhead, Giffnock, Clarkston • Total GVA: £1,000 (2021, millions) • Workers: 20,000 • Deprivation: 6% of areas in most deprived quintile • Key sectors: Public admin' and defence, Education, Construction, Arts, entertainment, and recreation

Renfrewshire – Inner (207.0km^2) 	• Residents: 170,000 • Places: Paisley, Renfrew, Johnstone, Erskine, Glasgow Airport • Total GVA: £4,300 (2021, millions) • Workers: 85,000 • Deprivation: 25% of areas in most deprived quintile • Key sectors: Transport & storage; Public admin' & defence
West Dunbartonshire (128.3km^2) 	• Residents: 90,000 • Places: Clydebank, Dumbarton, Alexandria, Balloch • Total GVA: £1,800 (2021, millions) • Workers: 30,000 • Deprivation: 40% of areas in most deprived quintile • Key sectors: Public admin' and defence; Finance and insurance; Health

Inverclyde (160km^2) 	• Residents: 80,000 • Places: Greenock, Gourock, Kilmacolm, Wemyss Bay, Port Glasgow • Total GVA: £1,100 (2021, millions) • Workers: 25,000 • Deprivation: 45% of areas in most deprived quintile • Key sectors: Financial & insurance; Health; Retail

				
People and Places	**Economy**	**Environment**	**Transport**	**Opportunities**
Areas of the GCR are amongst the most deprived nationally, reflected in adverse outcomes for health and wellbeing 50% of the areas in Scotland's most deprived quintile are within the GCR. These are skewed towards the north, east, and southwest of Glasgow City, parts of West Dunbartonshire and the major centres in each GCR district. Deprivation is heavily correlated with lower skills and qualifications, car availability, and healthy life expectancy. Constraints in housing supply are increasing prices and reducing access to opportunity.	**A lack of (effective) urban density is leading to poor economic outcomes** **In common with other urban centres outside of London and Edinburgh, the GCR does not provide sufficient** job density**. This diminishes the effects of city size and leads to lower productivity and higher car dependency**, further reducing density**.** There is an overdependence on public administration and a need to capitalise on opportunities in higher value sectors by providing increased access to labour in denser, well connected, locations. An integrated step change in land use and transport is required to attract the inward investment.	**Transport is now the largest contributor to greenhouse gas emissions in Scotland and a source of local air quality problems** To address the climate emergency and help achieve Net Zero, a (-)20% reduction in car-kms has been identified nationally and a (-)9% reduction in car driver trips regionally. The changes in travel demand sought require a step change in the need for owning and using a car, with an integrated package of alternatives that provide connections and access to a wider range of opportunities. Reduced car dependency supports an increase in achievable densities**.**	**There are inequities in transport provision, with many areas not benefitting from fast and/or frequent public transport** Less connected places face greater difficulty accessing opportunity and attracting inward investment. Significant gaps exist in areas including Glasgow's four main peripheral estates, which suffer from adverse outcomes. Public transport provision is poor in many areas with infrequent services putting a constraint on access to the major economic opportunities. There are significant challenges in trying to expand capacity and accessibility to more people on existing rail-based networks.	**Place-based planning priorities have identified scope for over 90,000 new dwellings and 1,000 hectares of economic development** There is 24km^2 of vacant or derelict land within the study area, with sites spread across the region. Targeting long-standing V&D land will ensure that investment reaches the places that need it most. Planning policy is focussed on promoting footfall and vibrancy in a hierarchy of centres. The GCR City Deal, totalling over £600 million, is the bedrock for joint public and private sector investment to unlock the first wave of transformational inward investment.

Investment Rationale



Source: Mott MacDonald

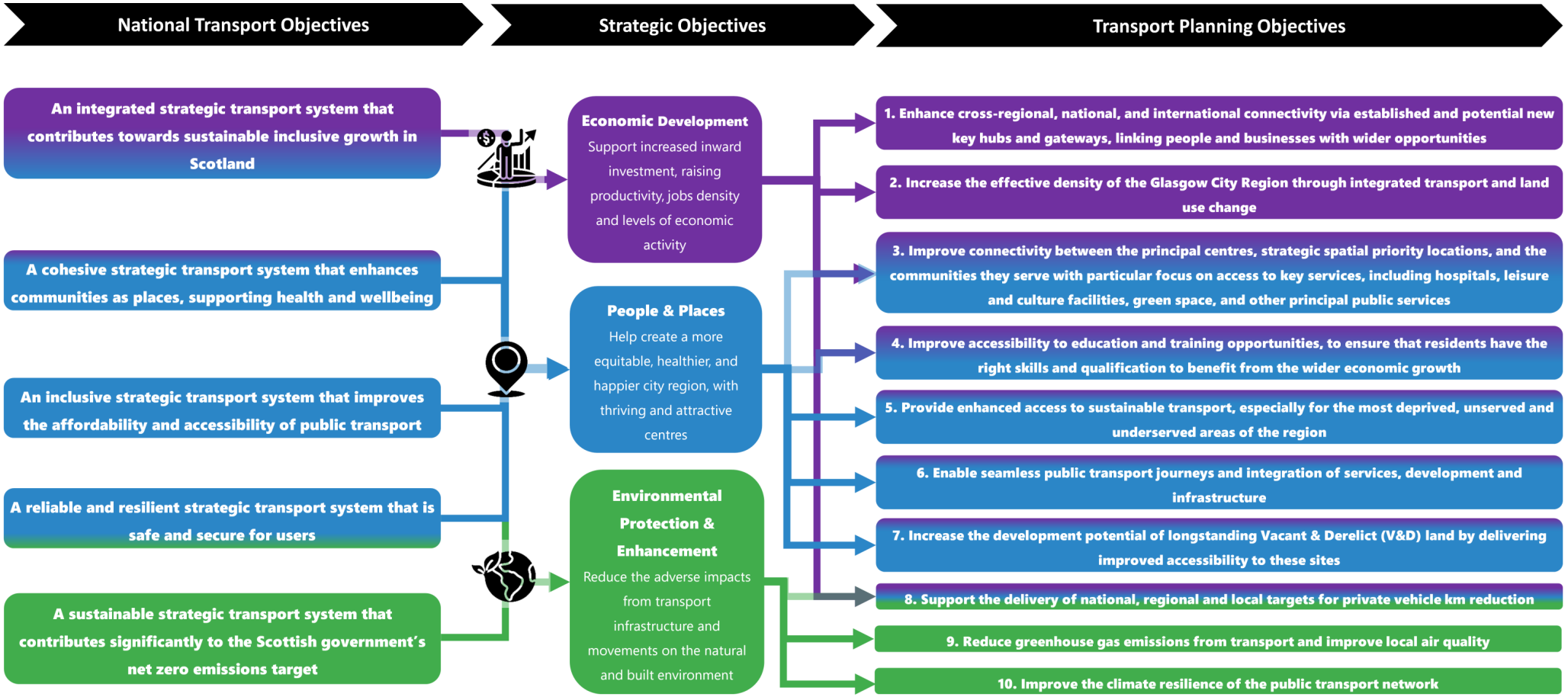
Vision

Based on the strategic fit (and national, regional, local, and hyperlocal priorities), collaboration between key stakeholders, and with reference to the evidence on the need to invest, a vision for the Clyde Metro programme has been created:

Source: Mott MacDonald

Objectives

To facilitate the delivery of the vision, a set of strategic objectives, and linked Transport Planning Objectives (TPOs), have been derived. A priority of the CfC is ensuring alignment and continuity with the work undertaken as part of STPR2, which aligns with the National Transport Strategy 2 (NTS2) and National Planning Framework 4 (NPF4).



Source: Mott MacDonald

Outcomes

The programme of investment for Clyde Metro aims to enable lasting transformational change by:

Enhanced connectivity across the Glasgow City Region

- Better access to opportunities and services
- Growth in labour supply
- Greener travel and reduced car dependency
- More equitable access for all

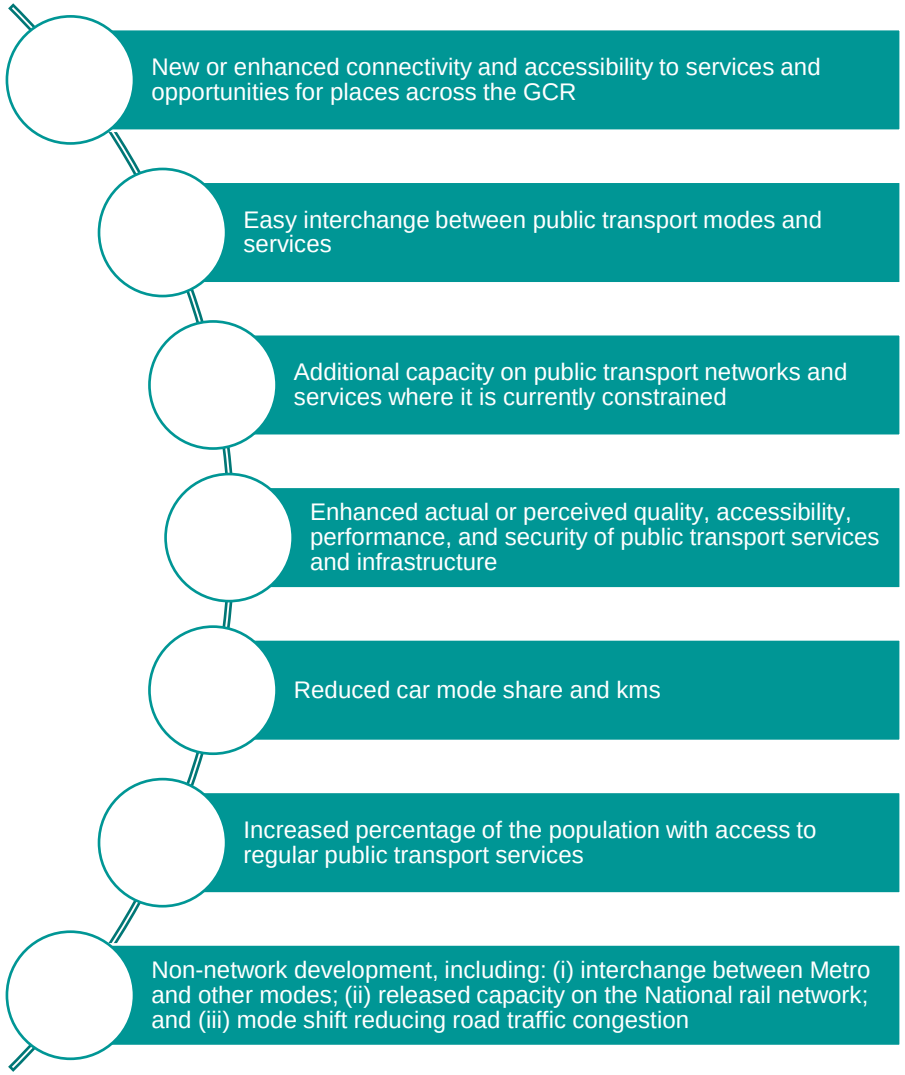
Complementary place-based regeneration

- Integration with the wider GCR portfolio, including transport and non-transport programmes and projects
- Transit Orientated Development (TOD) delivering increasd densification, housing, labour supply, and productivity
- An enhanced 'sense of place' and quality of life, with more liveable neighbourhoods

Holistic, lasting, transformational change

- Increased inward investment
- More productive and higher value jobs
- Reduced deprivation and greater wellbeing
- Lower need for, and dependency on, the car
- Reduction in global and local emissions

This change will be underpinned by the following transport outcomes:



Why Invest?

The proposed investment will directly address national, regional, local, and hyperlocal priorities for the economy, environment, people, and places:

Meeting user needs

- Much enhanced access to opportunities and services across the GCR
- A step change in door-to-door journey quality
- A safe and secure environment at stations, stops and onboard
- A network that is more accessible for a greater proportion of the population
- Additional capacity where it is most needed

Economic growth

- A catalyst for inward investment by businesses, increasing the available labour supply
- Increasing the effective density of the GCR through integrated transport and land use planning
- Growth in productivity and economic activity amongst residents
- Improved economic standing of places across the GCR

Visitor economy

- Better connections to the GCR's national and international gateways
- Quick, accessible, convenient, and attractive links across the GCR, increasing attractiveness as a place to visit and stay
- Supporting the vibrancy and vitality of key attractions and local centres

Regional equality

- Directly, by enhanced connectivity, and indirectly, through links with complementary investment, support reductions in deprivation and improvements in health, wellbeing, productivity, and economic activity
- Promote the area as a place to live, work, invest, and visit, maximising opportunities for investment and reducing gaps in prosperity

The environment

- Promoting a shift towards more sustainable travel demand and behaviour
- Reducing car dependency through an integrated network of alternatives
- Zero emission operations
- Protecting and enhancing the natural and built environments

Source: Mott MacDonald

Next steps

The CfI, covering the CfC and Network Options Development, forms Stage 1A of the STAG. The Vision, Objectives & Options will be subject to consultation during 2025 Q1. A set of coordinated work packages will then advance the network options through STAG Stage 2 to identify a preferred option:

Stage	Package	Indicative Start
2A	STAG Appraisal and supporting technical workstreams	March 2025
2B	Strategic Environmental Assessment and Habitats Regulations Assessment	March 2025
2C	Non-Environmental Impact Assessments	March 2025
2D	Programme Business Case, Transformation and related Technical Workstreams	May 2025
2E	Programme Business Case Audit	October 2025
2F	Preliminary Engineering Statement	March 2025
2G	Land-Use &/ Housing Assessment Technical Workstreams	March 2025
2H	Transformation Delivery	April 2027

Source: Strathclyde Partnership for Transport

1 Introduction

1.1 Purpose of the Case for Change

Mott MacDonald was commissioned by Strathclyde Partnership for Transport (SPT) to develop the Case for Change (CfC) for the 'Clyde Metro' programme. Continued development and delivery of the programme was recommended from Transport Scotland's second Strategic Transport Projects Review[1] (STPR2), the proposed investment portfolio to deliver on the vision, priorities, and outcomes in the second National Transport Strategy[2] (NTS2).

Clyde Metro is a once-in-a-generation opportunity to transform the Glasgow City Region (GCR) by delivering step changes in connectivity which, integrated with land use change, will be a catalyst to better access to opportunities and key services for all communities. This will help enable further investments and support future growth across the GCR.

The CfC provides a comprehensive and compelling narrative of the:

- Challenges that the GCR experiences 'today';
- Opportunities available to deliver better economic, environmental, and social outcomes 'tomorrow';
- 'Vision' for a transformed future with the Clyde Metro programme integrated into a wider portfolio of complementary investment to deliver on national, regional, local, and hyperlocal priorities; and
- 'Golden Thread' for the programme, and how transformational changes in connectivity and land use will address the challenges of today and unlock the opportunities for the future.

Key socio-economic data, environmental constraints and opportunities, regional trends, connectivity metrics, and policy context are integrated into the CfC to develop a robust case for investing in Clyde Metro.

1.2 Study area

The future Clyde Metro will span the GCR, with the potential for outcomes and impacts to cascade across a wider region, and nationally, as opportunities are taken to use existing and new infrastructure more efficiently.

What does this mean for the Clyde Metro programme?

Investment in the Metro programme will focus on the strengths of rapid transit modes which typically extend for 10 to 15km from the major centre(s) across dense urban areas. Delivery of the programme offers much wider opportunities for changes in level of service across the full GCR, including Inverclyde, the travel-to-work area, incorporating Stirling, Falkirk, and Ayrshire, and nationally. This can be achieved through released capacity on the National Rail network, diverting some services within the study area away from congested sections of the railway and the terminus platforms at Glasgow Central and Queen Street.

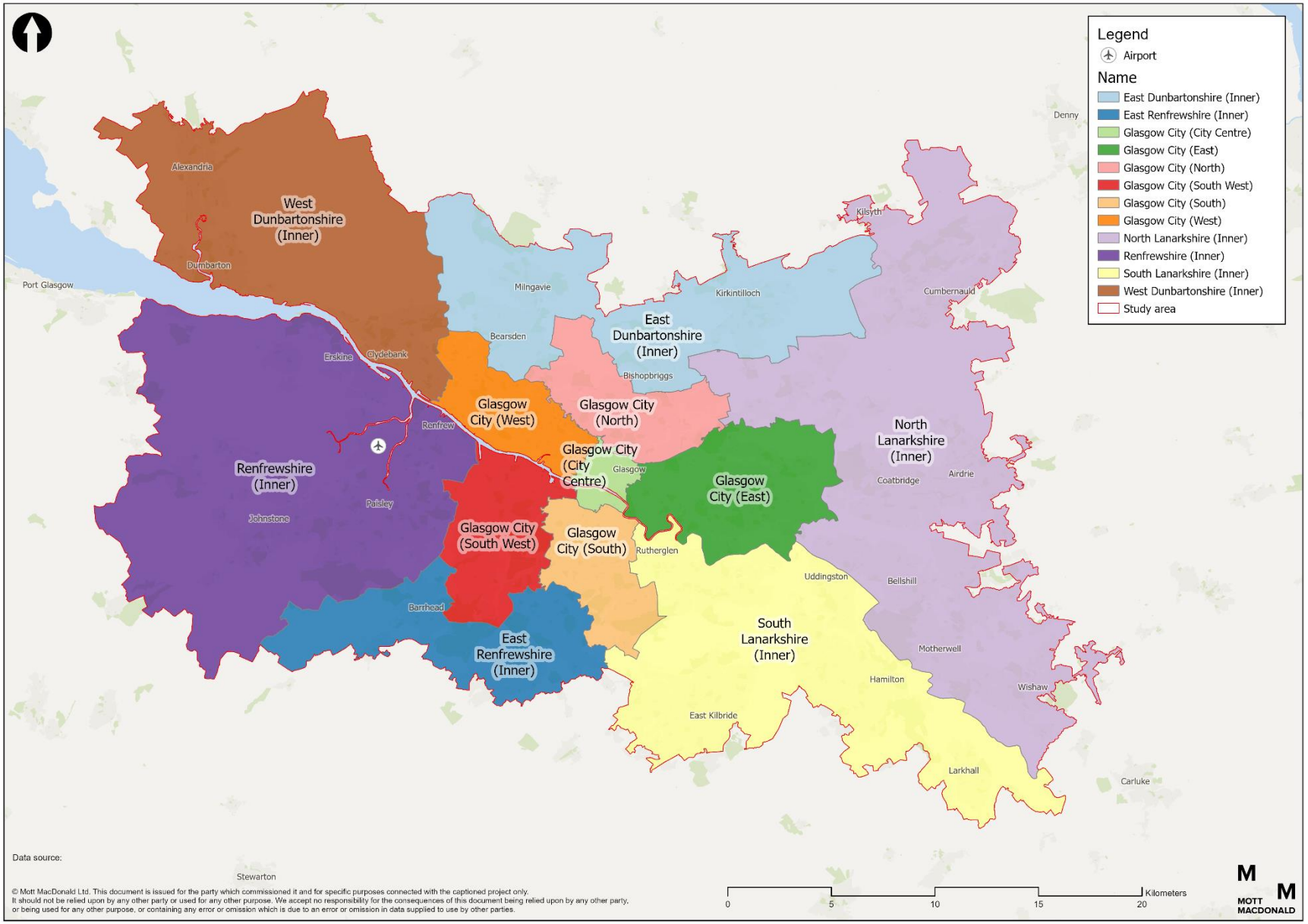
For this analysis, a study area (see Map 1.1) was defined based on the furthest most populous commuter towns which make up the greater Glasgow built-up area, and the indicative extent of a new 'Metro' network (extensions beyond the study area may be justified). The geography of the area is based on Data Zones[3].

[1] See: View in Summary Report | Strategic Transport Projects Review 2 (arcgis.com)

[2] See: National Transport Strategy 2 | Transport Scotland

[3] Data Zones are the key geography for the dissemination of small area statistics in Scotland. Data Zones boundaries (2011) are available here: https://spatialdata.gov.scot/geonetwork/srv/api/records/7d3e8709-98fa-4d71-867c-d5c8293823f2><

Map 1.1: Clyde Metro study area



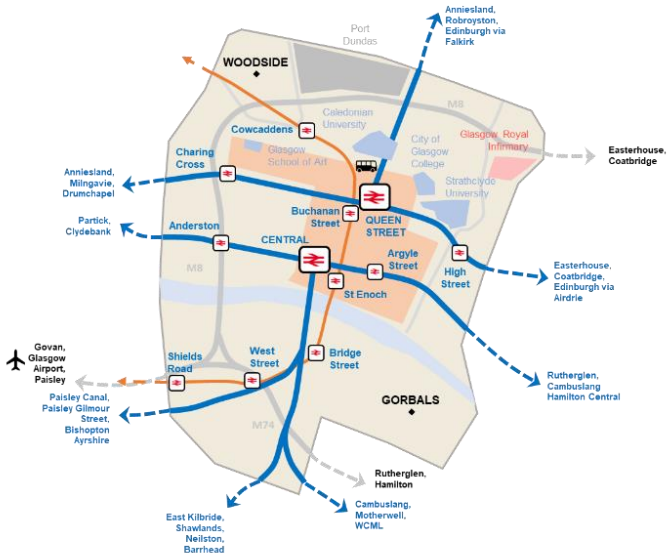
Source: Mott MacDonald

The study area:

- Covers over 1,000 square kilometres;
- Is home to approximately 1.58 million people, 30% of Scotland's total population. The proportion of working age is greater, reflecting internal migration within the nation and the opportunities provided in the GCR. 920,000 people are aged 45 or under;
- Provides nearly 800,000 jobs, with these opportunities accessed by a much wider population beyond the study area and the GCR;
- Generated, in 2021, £45 billion of GVA, 30% of the Scottish total; and
- Contains a multitude of major cultural, heritage, leisure, and recreation attractions, and, in the last decade, has been home to a series of major international events.

1.3 Sub-areas

Within the study area, twelve reporting (sub-)areas were established, including six Glasgow City sectors and the six GCR Local Authorities which border Glasgow City. In this report, this study area makes up the definition of the GCR.

Sub-Area	Characteristics
Glasgow City – City Centre (7.1km²)	
Residents: 30,000 Places: • Central Business District (CBD) • Sauciehall Street • Merchant City • Gorbals Total GVA: £10,600 (2021, millions) Workers: 175,000 Deprivation: 36% of areas in most deprived quintile Key sectors: • Finance and insurance • Public admin' & defence • Business admin' and support • Professional, scientific, and technical	

Sub-Area	Characteristics

Glasgow City – South West (35.3km²)

Residents: 100,000

Key places:

- Govan
- Pollok
- Cardonald
- Nitshill
- Mosspark

Total GVA: £2,900 (2021, millions)

Deprivation: 50% of areas in most deprived quintile

Workers: 55,000

Key sectors:

- Health
- Public admin' & defence

Sub-Area	Characteristics

Glasgow City – West (26.5km²)

Residents: 145,000

Places:

- Partick
- West End
- Scotstoun
- Drumchapel

Total GVA: £3,300 (2021, millions)

Workers: 65,000

Deprivation: 33% of areas in most deprived quintile

Key sectors:

- Health
- Education

Sub-Area	Characteristics

Glasgow City – North (31.6km²)

Residents: 80,000

Places:

- Springburn
- Robroyston
- Summerston
- Milton

Total GVA: £1,600 (2021, millions)

Workers: 35,000

Deprivation: 66% of areas in most deprived quintile

Key sectors:

- Construction
- Business admin' & support

Glasgow City – East (48.0km²)

Residents: 125,000

Places:

- Easterhouse
- Dennistoun
- Mount Vernon
- Carntyne

Total GVA: £3,100 (2021, millions)

Workers: 55,000

Deprivation: 58% of areas in most deprived quintile

Key sectors:

- Motor trades
- Construction

Sub-Area	Characteristics

Glasgow City – South (26.5km²)

Residents: 115,000

Places:

- Pollokshields
- Castlemilk
- Cathcart
- Newlands

Total GVA: £1,500 (2021, millions)

Workers: 40,000

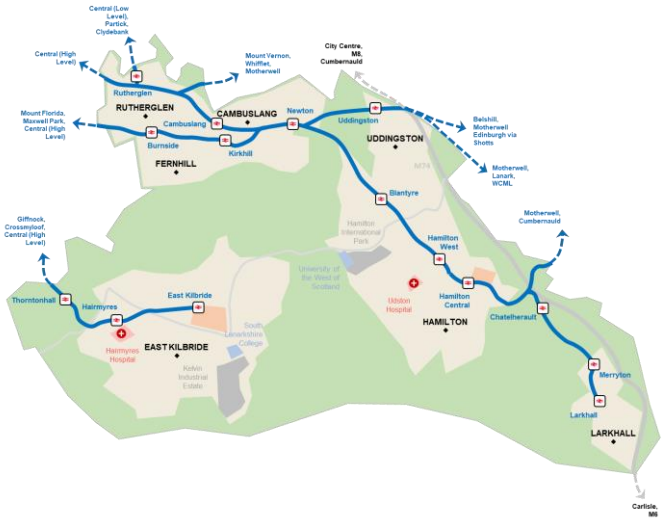
Deprivation: 29% of areas in most deprived quintile

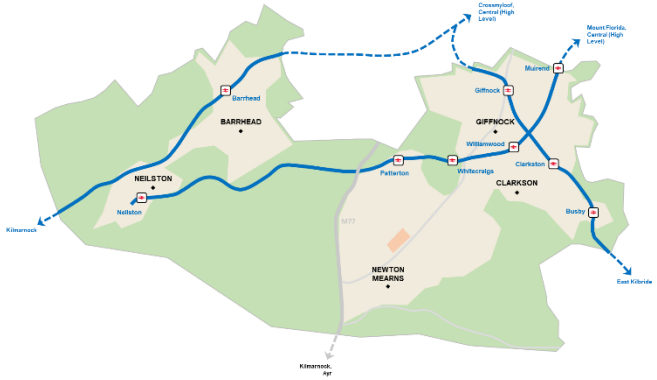
Key sectors:

- Business admin' & support

Sub-Area	Characteristics
East Dunbartonshire – Inner (96.2km²)	
Residents: 95,000 Places: • Bearsden • Bishopbriggs • Kirkintilloch • Milngavie Total GVA: £1,300 (2021, millions) Workers: 25,000 Deprivation: 3% of areas in most deprived quintile Key sectors: • Education • Public admin' & defence • Arts, entertainment, and recreation • Retail	

Sub-Area	Characteristics
North Lanarkshire - Inner (218.5km²)	
Residents: 315,000 Places: • Cumbernauld • Coatbridge • Airdrie • Motherwell Total GVA: £7,300 (2021, millions) Workers: 115,000 Deprivation: 35% of areas in most deprived quintile Key sectors: • Public admin' and defence • Construction • Mining and utilities	

Sub-Area	Characteristics
South Lanarkshire – Inner (139.4km²)	
Residents: 230,000 Places: • East Kilbride • Hamilton • Rutherglen • Cambuslang Total GVA: £5,800 (2021, millions) Workers: 90,000 Deprivation: 23% of areas in most deprived quintile Key sectors: • Mining and utilities • Construction • Public admin' & defence	

Sub-Area	Characteristics
East Renfrewshire - Inner (55.2km²)	
Residents: 85,000 Places: • Newton Mearns • Barrhead • Giffnock • Clarkston Total GVA: £1,000 (2021, millions) Workers: 20,000 Deprivation: 6% of areas in most deprived quintile Key sectors: • Public admin' and defence • Education • Construction • Arts, entertainment, and recreation	

Sub-Area	Characteristics
Renfrewshire – Inner (207.0km²)	

Residents: 170,000

Places:

- Paisley
- Renfrew
- Johnstone
- Erskine

Total GVA: £4,300 (2021, millions)

Workers: 85,000

Deprivation: 25% of areas in most deprived quintile

Key sectors:

- Transport & storage
- Public admin' & defence

Sub-Area	Characteristics
West Dunbartonshire - Inner (128.3km²)	

Residents: 90,000

Places:

- Clydebank
- Dumbarton
- Alexandria
- Balloch

Total GVA: £1,800 (2021, millions)

Workers: 30,000

Deprivation: 40% of areas in most deprived quintile

Key sectors:

- Public admin' and defence
- Finance and insurance
- Health

1.4 Structure of the Case for Change

Following this initial introductory section, this document contains:

- Section 2 summarises the programme's Golden Thread, strategic fit, and vision.
- Sections 3, 4 and 5 detail baseline conditions for:
  - People and places
  - Economy
  - Environment
- Sections 6 and 7 describe the role of connectivity and access in:
  - Current challenges (or 'problems')
  - Integrating with future opportunities
- Section 8 summarises the 'theory of change' and both the strategic and transport planning objectives. A summary of key metrics indicating 'need' for enhanced accessibility and connectivity to deliver the desired change is shown. This is the evidence base which will be used through subsequent stages of option generation, assessment, and sifting to define a shortlist of options for the programme.

2 Strategic Fit and Vision

2.1 Golden Thread

2.1.1 The city region in context

The Glasgow City Region:

- Is home to over 1.8 million people.
- Serves a critical role in Scotland's economy, contributing over £44 billion of GVA in 2021.
- Has a vibrant and diverse leisure culture offer. It has successfully hosted multiple major international events and attracts over 3.6 million overnight stays every year.
- Has grown, with population increasing by 7% in the last decade, driven by inward migration.
- Is home to over 60,000 higher education students, attending globally renowned institutions.

2.1.2 Inequalities and challenges

However, growth in the GCR remains uneven. The region is geographically diverse with a wider variety of socio-economic outcomes, including areas with high levels of deprivation, low healthy life expectancies, and challenges around skills and qualifications.

2.1.3 The role of transport in existing challenges

Bus and Subway networks cover the inner GCR areas around the City Centre, with the National Rail network strongest in outer suburban areas. However, these networks are fragmented. Connectivity and access are unequal, contributing to some of the adverse social outcomes. A lack of alternatives results in car dependency. Many households cannot afford the costs involved in owning and using a car, and their use can be detrimental to national, regional, local, and hyperlocal priorities. Car dependency is also reducing 'sense of place' and generates economic, environmental, and social disbenefits.

These failures to serve major centres and other strategic destinations stifle inward investment, create barriers to opportunity, and lower living standards and quality of life. For all these reasons, the GCR cannot fulfil its economic potential. For a city of its size, it underperforms on output and productivity. Like other large British cities outside London, these gaps are driven by a lack of actual and effective density, both the people and jobs per hectare and the connectivity between places. These suboptimal outcomes will persist without efforts to address connectivity gaps and their integration with land use changes.

2.1.4 Context of Clyde Metro

In 2019, Transport Scotland commenced the Strategic Transport Projects Review 2 (STPR2[4]), an update of the first review undertaken in 2008. STPR2 informs transport investment in Scotland for 20 years (2022 to 2042), with the desired outcomes of:

- Helping make Scotland more accessible for residents, visitors, and businesses;
- Creating better connectivity with sustainable, smart, and cleaner transport options; and
- Highlighting the vital contribution that transport investment can play in enabling and sustaining Scotland's economic growth.

[4] See: Strategic Transport Projects Review 2 (arcgis.com)

STPR2 is a key component of Scotland's journey to net zero emissions and will, in conjunction with existing commitments and other policy ambitions, enable a reduction in transport emissions. It also aims to address inequalities and improve health and wellbeing.

STPR2 recommendations are grouped under six themes:

1. Improving active travel infrastructure
2. Influencing travel choices and behaviours
3. Enhancing access to affordable public transport
4. Decarbonising transport
5. Increasing safety and resilience on the strategic transport network
6. Strengthen strategic connections

45 measures and enhancements to the nation's transport network(s) were recommended for further development, including Clyde Metro. Proposals developed before and during STPR2 were identified as meeting key national objectives to:

Improve safety and resilience	Improve health and wellbeing	Address inequalities and accessibility	Tackle climate change	Support sustainable economic growth

Delivery of Clyde Metro was identified as helping to deliver multiple outcomes:

- Connect unserved and underserved areas, tackling social exclusion;
- Improve access to key hubs;
- Provide significant capacity to encourage switch from car use;
- Reduce greenhouse gas emissions and improve air quality;
- Enhance integration and interchange; and
- Flexibility for the rail network, including freeing capacity for longer distance journeys.

The content of this CfC builds on the extensive evidence base, and rationale, established through STPR2, updating and localising as appropriate.

2.1.5 The role of better connectivity in transformational change

Clyde Metro can transform underserved communities disadvantaged by inefficient, unreliable and/or poorly connected local public transport, i.e. those at risk of 'transport poverty'. Through better connectivity, the health and wellbeing of communities and places will improve. It will also help deliver an inclusive, net-zero, and climate-resilient economy. It will connect economic growth areas to unlock inward investment and densification, and national level priorities outside of the city centre including the Clyde Mission, the Glasgow Airport Investment Area, and others. It will aim to connect highly dense and fast-growing areas with areas which would benefit from improved accessibility to seed growth and foster equality.

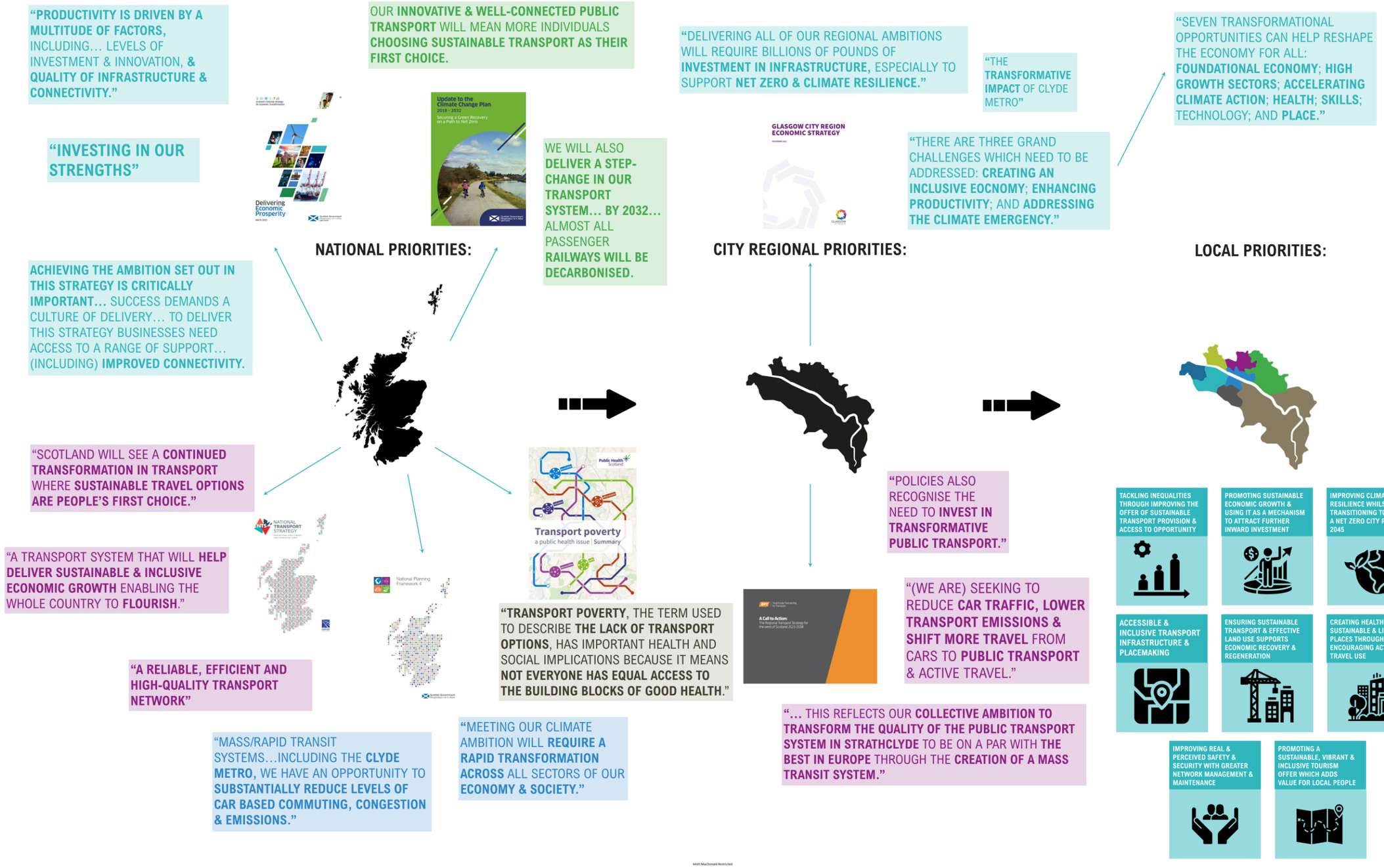
2.1.6 Integrated solutions to deliver the desired outcomes

Clyde Metro is not the solution in and of itself. It will require complementary investment and reform including densification and place-making around stations and better integration across modes to promote accessibility.

2.2 Strategic fit

Figure 2.1 highlights key content from National, Regional, and Local strategic ambitions which are of direct relevance to the Clyde Metro programme. Appendix A summarises the policy and strategy documents considered in the

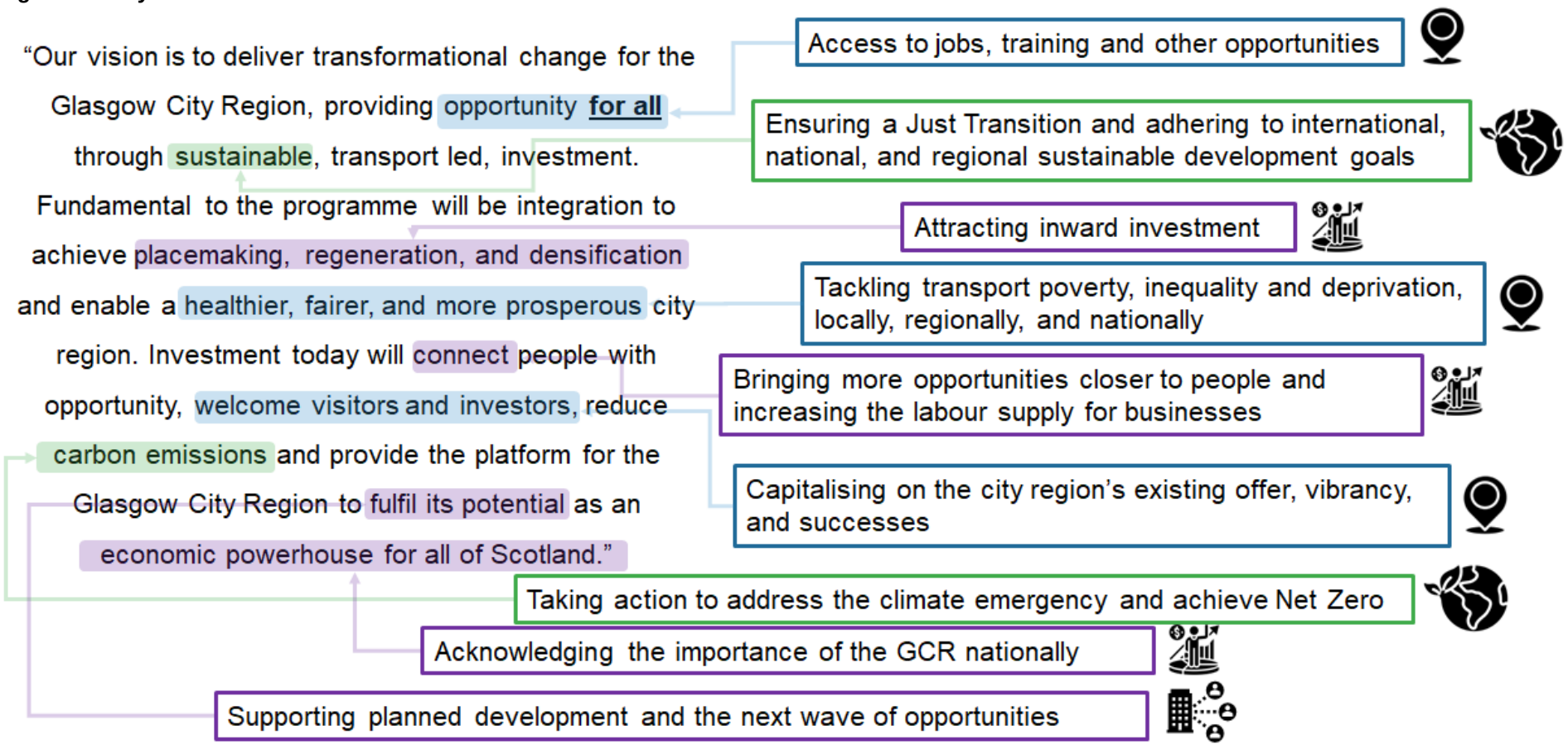
Figure 2.1: Strategic Fit at Tiers of Governance



2.3 Clyde Metro vision

Based on the strategic fit context (and national, regional, local, and hyperlocal priorities), collaboration between key stakeholders, and with reference to the evidence in the following sections, a vision for the Clyde Metro programme has been created.

Figure 2.2: Clyde Metro vision



Source: Mott MacDonald

3 People & places

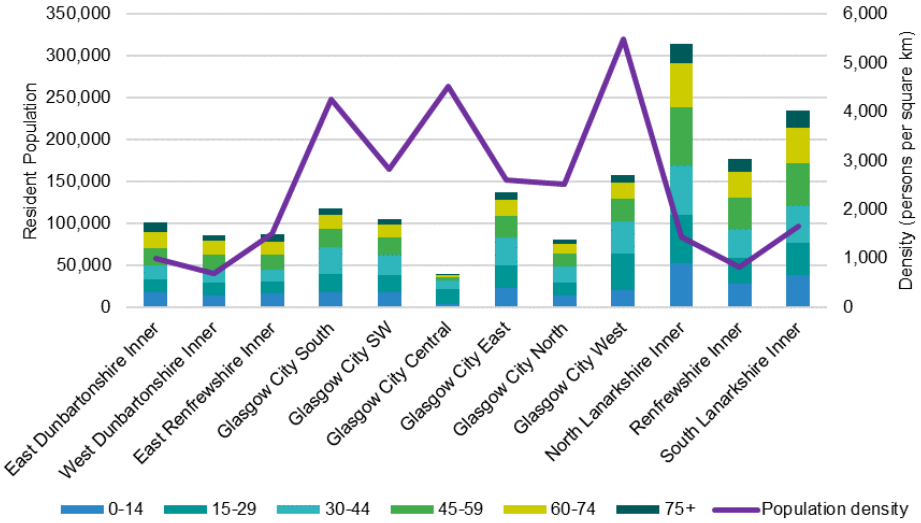
Because of its size, the study area is diverse in terms of population distribution and growth. In general, the area observes low density, deprivation, and a housing shortage. However, these problems tend to be concentrated in specific locations in the GCR. While some places witness notable population increases and housing demands, other places do not see such growth. Altogether, these inequalities hinder the ability of the GCR to attract investment and labour supply and fulfil its potential.

3.1 Population characteristics

3.1.1 Overview

The study area is home to approximately 1.58 million people, nearly one third (29%) of Scotland's total population, and 2.5% of the British total. Map 3.1 (overleaf) shows the population density across the study area, and Chart 3.1 shows population by age band and density across the 12 sub-areas. As shown in Map 3.1, only 17.7% of the GCR residents live in areas with more than 6,000 residents per sq.km. The level remains below the UK urban average of 32.3% and the Edinburgh average of 36.5%. There is a correlation between density and age, with the younger population clustered in denser central sectors such as the West End, Southside, and parts of the East End. These areas have been the focus for recent population growth, driven by net inward migration from across the GCR, Scotland, and further afield.

Chart 3.1: Population and density

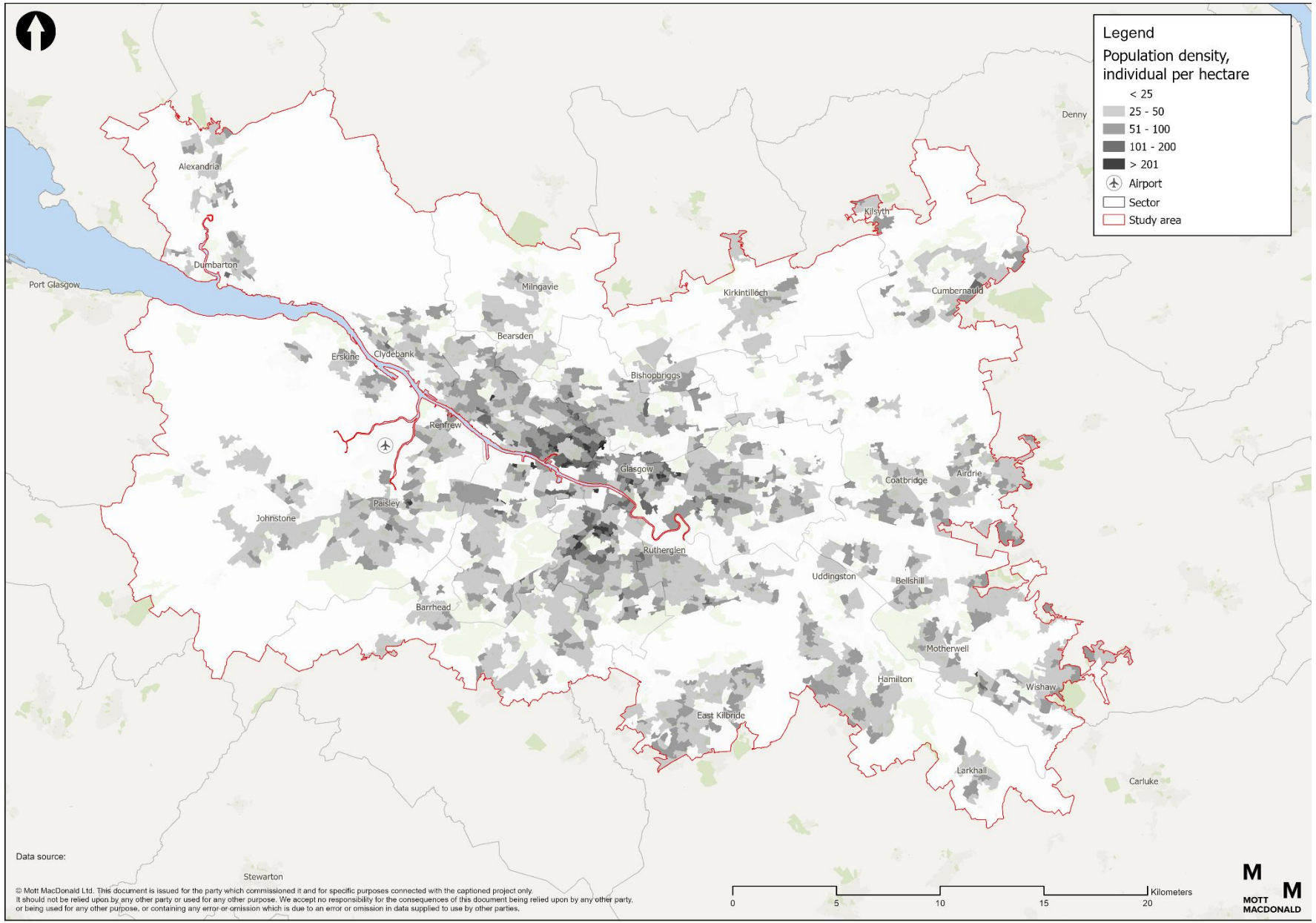


Source: ONS, Census, 2021

What does this mean for the Clyde Metro programme?

Low density effectively reduces the size of the GCR since it results in insufficient access to labour and poor economic performance. Section 6.3 explores the role of density in driving productivity and Section 7 existing 'within plan' development opportunities.

Map 3.1: Study area population density



Source: Mid-2021 Small Area Population Estimates for 2011 Data Zones, ONS

3.1.2 Population growth

Primarily because of net inward migration[5], the GCR has experienced a decade of population growth. Map 3.2 (overleaf) shows the growth in the area between 2011 and 2021. Overall, the GCR resident population grew by 4% (+70,000) between 2011 and 2021. The absolute population aged 16 and 64 grew, driven by increases in those aged 25 to 34 and 55 to 64, but declined as a percentage as the population aged over 64 increased by 17%. Shifts in the demographics of the GCR have implications for labour supply, to help support inward investment, and housing needs.

However, this growth remains uneven with net migration being focused primarily on Glasgow City (+7% (+40,000) between 2011 and 2021). There is also evidence of some increases at the periphery of the study area, but these are in larger and lower-density zones, resulting in a low absolute number. Some sectors have even seen no growth or a decline.

What does this mean for the Clyde Metro programme?

National Records of Scotland predicts growth of 3% to the early 2040s in the Clyde Plan area. Growth is projected to be driven by international, UK, and Scottish migration as deaths exceed births within the current resident population. Ensuring this population growth is key for the GCR because inward investment will depend on access to labour supply. Delivering transformational change is likely to require more ambitious 'stretch' targets to ensure sufficient labour supply, which will be dependent on densification. Changing population mixes, including those linked to increased inward investment and working age population, require corresponding changes in housing needs and types.

3.2 Deprivation

Map 3.3 (also overleaf) shows the prevalence of deprivation in the GCR. According to the Scottish Government[6], 50% of the most deprived two deciles in Scotland are within the GCR, compared to only 33% of the population.

Geographically, deprivation is heavily skewed towards specific sectors and places, including the north, east and southwest of Glasgow City and southwest of West Dunbartonshire (Clydebank). Other pockets of deprivation include places in Paisley, Hamilton, Airdrie, Dumbarton, and Motherwell. Deprivation is highly correlated with other adverse socio-economic outcomes, including below average skills and qualifications and Health Life Expectancy (HLE), as evident in Sections 3.3 and 3.4.

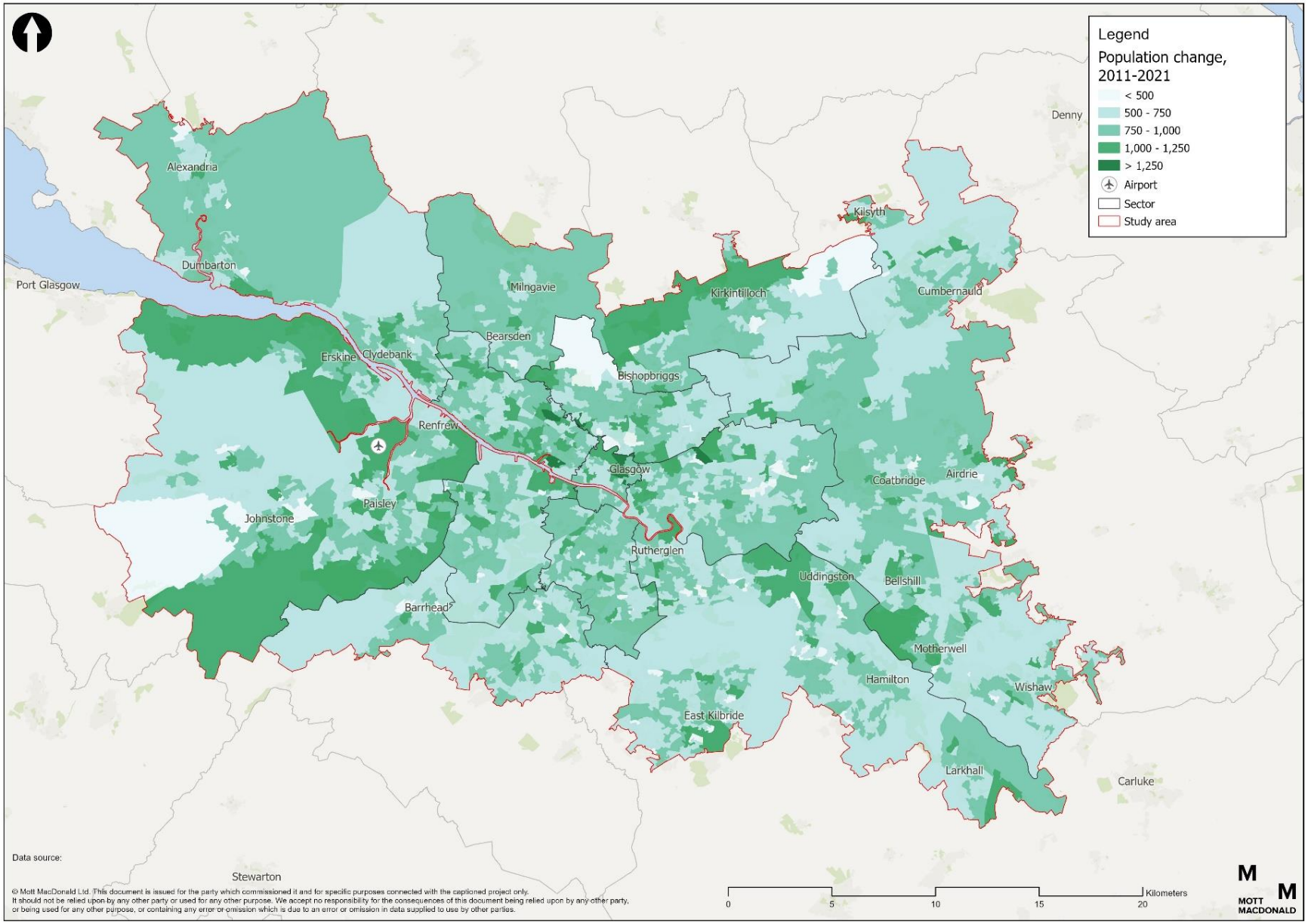
What does this mean for the Clyde Metro programme?

Deprivation levels are the primary indicator of adverse socio-economic outcomes, correlating with reduced health life expectancies, lower average incomes, a lack of access to a car and road congestion, and below average levels of skills and qualifications. Transport poverty (a lack of available, reliable, affordable, accessible, and safe provision, as seen in Section 6) results is a significant factor in the outcomes experienced by communities and places across the GCR.

[5] Without net inward migration, deaths exceeded births within the background resident population.

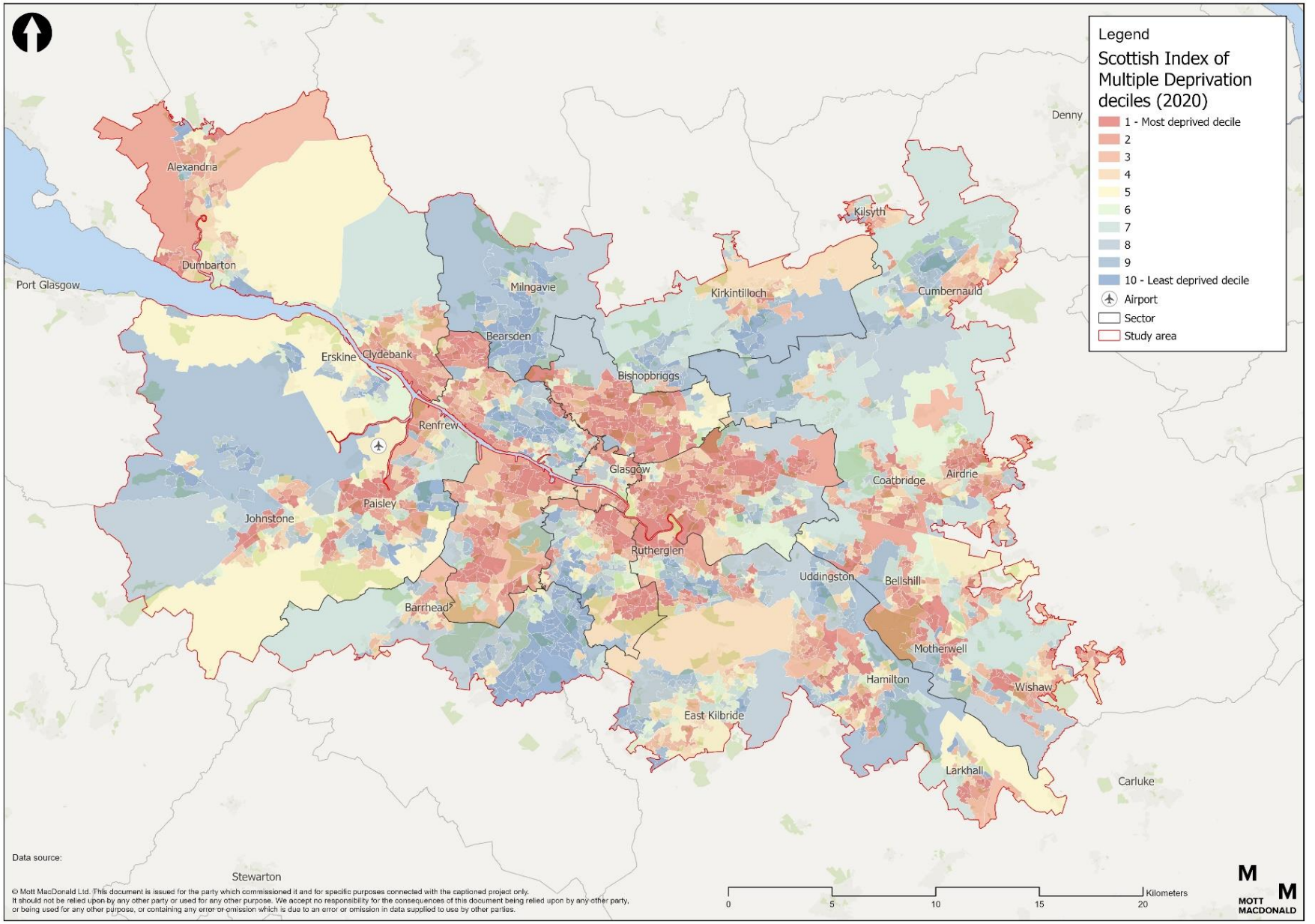
[6] (2020). Scottish Index of Multiple Deprivation, Scottish Government. Available at <https://www.gov.scot/collections/scottish-index-of-multiple-deprivation-2020/>

Map 3.2: Population growth projections



Source: National Records of Scotland, Small Area Population Estimates, 2011 & 2021

Map 3.3: Deprivation



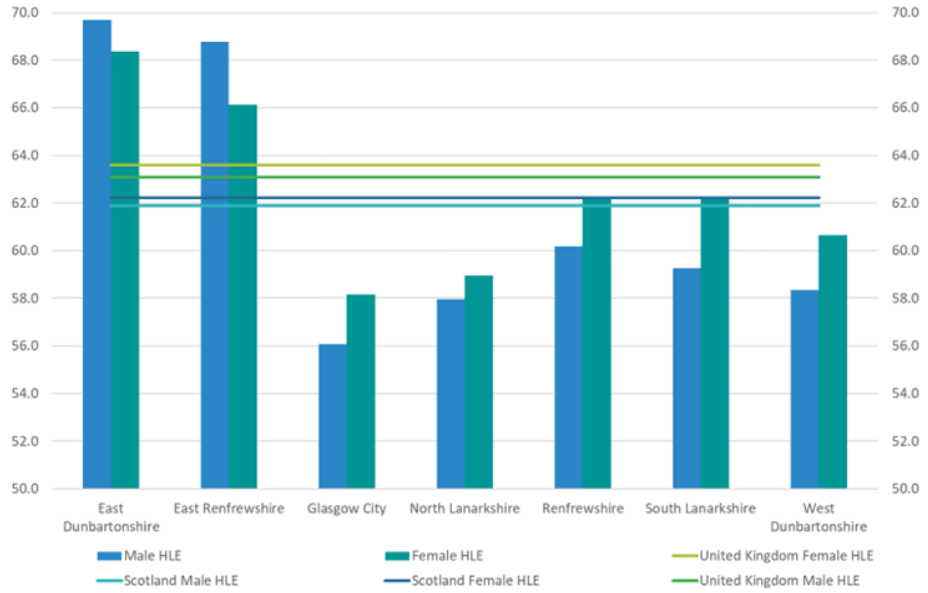
Source: Scottish Government, Scottish Index of Multiple Deprivation

3.3 Healthy life expectancies

Healthy Life Expectancy (HLE), shown in Chart 3.2, is intrinsically linked to deprivation and access to opportunities and services. Several adverse outcomes are observed, including:

- Both Female and Male HLE are below the Scottish averages in Glasgow City, North Lanarkshire, and West Dunbartonshire; and
- Male HLE is a particular challenge in the GCR and is below the Scottish average in five of the seven local authorities.

Chart 3.2: Healthy life expectancies by GCR local authority



Source: National Records of Statistics - Healthy Life Expectancy in Scotland, 2019-2021, 2022

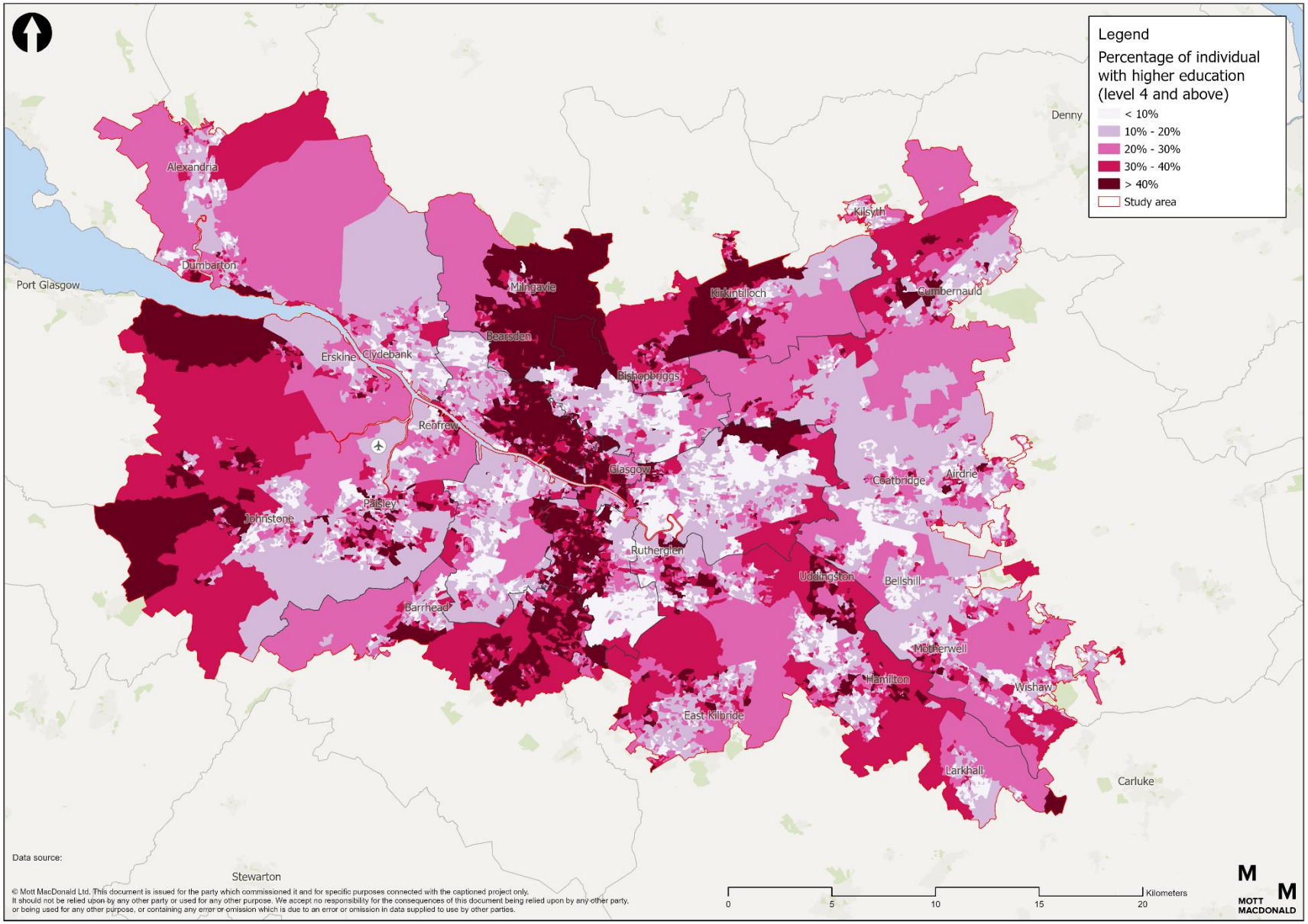
3.4 Skills and qualifications

Map 3.4 (overleaf) shows the percentage of residents with a Higher Education (HE) degree level qualification or equivalent. The 'ribbon' of higher qualification levels which runs north to south through Glasgow City Centre is correlated with the lower levels of deprivation observed in Map 3.4, and either directly or inversely with other socio-economic outcomes, e.g. car ownership (see Section 6.7).

What does this mean for the Clyde Metro programme?

Access to education and training (with current provision shown in Map 7.5) is critical both directly, in improving immediate opportunities for residents, and indirectly in upskilling the labour force to help attract inward investment and create more, higher value, opportunities.

Map 3.4: Percentage of individuals with a higher education qualification or equivalent



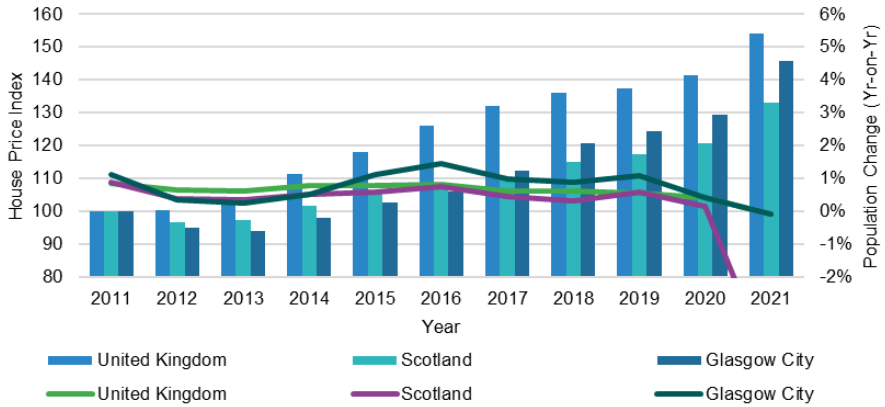
Source: 2011 Census

3.5 Housing supply

Population growth, especially in some areas, contributes to heightened housing demands. Due to insufficient supply, housing prices are growing faster than incomes, contributing to 'cost of living' pressures. As reflected in Chart 3.3, Glasgow City has seen house prices rise above the Scottish average – an indicator of demand exceeding supply.

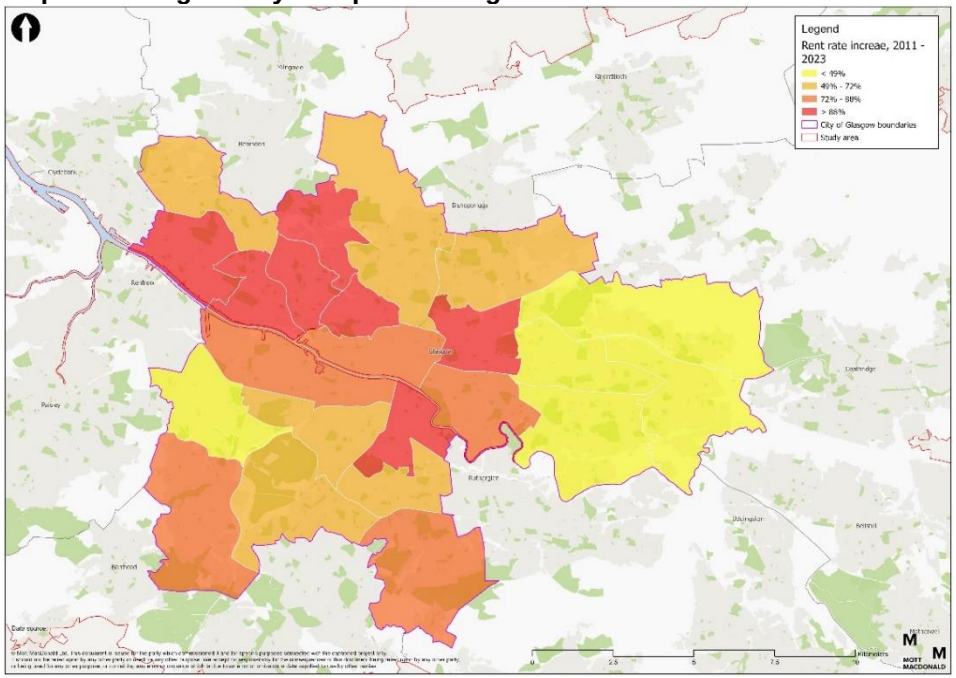
Rent price increases in Map 3.5 follow a similar pattern. There are significant disparities in the rate of rent increases, linked to both demand to live in those areas and constrained supply. These areas are in, in particular, in the West End and north of the city centre, including areas around Knightswood, Jordanhill, Summerston, and Dennistoun neighbourhoods. The Scottish Government introduced controls on rental increases in 2022 to help mitigate supply restrictions impacting on existing residents.

Chart 3.3: Glasgow house price index and population change



Source: Land Registry, UK House Price Index & Estimates of the population for the UK, England, Wales, Scotland, and Northern Ireland, 2011 – 2021

Map 3.5: Glasgow City rent price change 2011 – 2023



Source: Glasgow Open Data, Citylets, 2023

What does this mean for the Clyde Metro programme?

House price and rent increases are both indicative of constrained supply which will, in turn, be a limit on labour market supply in the GCR, and, ultimately, the potential for inward investment. Indicative locations of future development are shown in Map 7.1.

3.6 Key takeaways

Key takeaways

- Only 17.7% of the GCR residents live in areas with more than 6,000 residents per sq.km. The level remains below the UK urban average of 32.3% and the Edinburgh average of 36.5%.
- There is a correlation between density and age, with the younger population clustered in denser central sectors such as the West End, Southside, and parts of the East End.
- These areas have been the focus for recent population growth, driven by net inward migration from across the GCR, Scotland, and further afield.
- Low density effectively reduces the size of the GCR since it results in insufficient access to labour and poor economic performance.
- 50% of the most deprived two deciles in Scotland are within the GCR, compared to only 33% of the population.
- Deprivation is heavily skewed towards specific sectors and places, including the north, east and southwest of Glasgow City and southwest of West Dunbartonshire (Clydebank). Other pockets of deprivation include Paisley, Hamilton, Airdrie, Dumbarton, and Motherwell. Deprivation is highly correlated with other adverse socio-economic outcomes, including below average skills and qualifications and Health Life Expectancy (HLE).
- Both Female and Male HLE are below the Scottish averages in Glasgow City, North Lanarkshire, and West Dunbartonshire. Male HLE is a particular challenge in the GCR and is below the Scottish average in five of the seven local authorities.
- A ‘ribbon’ of higher qualification levels runs north to south through Glasgow City Centre.

Key takeaways

- Access to education and training is critical both directly, in improving immediate opportunities for residents, and indirectly in upskilling the labour force to help attract inward investment and create more, higher value, opportunities.
- Due to insufficient supply, housing prices are growing faster than incomes, contributing to ‘cost of living’ pressures.
- There are significant disparities in the rate of rent increases, linked to both demand to live in those areas and constrained supply. These areas are in, in particular, in the West End and north of the city centre, including areas around Knightswood, Jordanhill, Summerston, and Dennistoun neighbourhoods.
- House price and rent increases are both indicative of constrained supply which will be a constraint on labour market supply in the GCR, and, ultimately, the potential for inward investment.

4 The economy

The GCR has significant untapped economic potential. Like other UK cities, it falls behind European comparators in job density and productivity. The productivity in the region tends to concentrate in central Glasgow. Supporting connectivity could unlock some of the region's economic potential. Clyde Metro aims to contribute to further economic development in the area.

4.1 Economic structure

As detailed in Chart 4.1 overleaf, the GCR's economy specialises (Location Quotient > 1.0[7]) in public administration and defence, utilities, construction, business administration and support, and health. Health is the largest sector (125,000 employees) followed by business administration and support (95,000 employees). Public administration and defence are the only growing specialist sectors[8].

Among non-specialist sectors, education has grown significantly. Specialisation is low (Location Quotient < 1) in some targeted high value and knowledge-based sectors, such as professional, scientific, information and communication, and financial sectors.

Table 4.1 shows the concentration of employees in Glasgow City local authority, and variations in specialisms:

- North and South Lanarkshire retain a manufacturing and construction strength;
- Glasgow has high volumes of the business administration and support, plus professional, scientific, and technical activity; and
- Public administration and defence, education, and health are all important in the other outer authorities.

Table 4.1: GCR economic structure by local authority

Local authority	2022 Employees	Specialisms (LQ)
East Dunbartonshire	25,500, including education (3,500), health (3,500), and retail (3,000)	• Education (1.6) • Arts, entertainment & recreation (1.6) • Public admin' and defence (1.5)
East Renfrewshire	21,400, including education (3,000) and health (3,000)	• Public admin' and defence (1.8) • Construction (1.7) • Education (1.6) • Arts, entertainment & recreation (1.6)
Glasgow City	430,000, including health (63,000), business admin' and support (59,000), and professional, scientific and technical (40,000)	• Public admin' and defence (1.5) • Business admin' and support (1.5)
North Lanarkshire	131,000, including health (18,000), construction (16,000), and manufacturing (12,000)	• Construction (2.5) • Mining, quarrying and utilities (2.1) • Public admin' & defence (2.0) • Transport & storage (1.7)
Renfrewshire	86,000, including health (12,000), business admin' and support (11,000), and retail (9,000)	• Public admin' & defence (1.5)
South Lanarkshire	115,000, including health (19,000), retail (11,000), and manufacturing (10,000)	• Construction (1.8) • Mining, quarrying and utilities (1.7) • Agriculture, forestry and fishing (1.5)

[7] A location quotient (LQ) is a measure of an area's industrial specialisation relative to a larger geographic unit, here Scotland. The ONS Standard Occupational Classification (SOC) is used for the classification of industries.

[8] (2022). Business Register & Employment Survey, ONS. Available at: <https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/businessregisterandemploymentsurvey>

Local authority	2022 Employees	Specialisms (LQ)
West Dunbartonshire	33,000, including health (7,000), retail (3,500), and public admin' & defence (3,500)	• Finance and insurance (2.3) • Public admin' and defence (2.3) • Health (1.6)

Source: Business Register & Employment Survey

What does this mean for the Clyde Metro programme?

A lack of volume and strength in higher value sectors which are usually attracted to major city regions remains a key concern and demands more policy action. Specifically, to attract more inward investment in these underdeveloped sectors, the GCR needs to provide increased, more qualified, labour supply, better connectivity, and a quality of life offer which can retain and attract the people and businesses to make the GCR thrive.

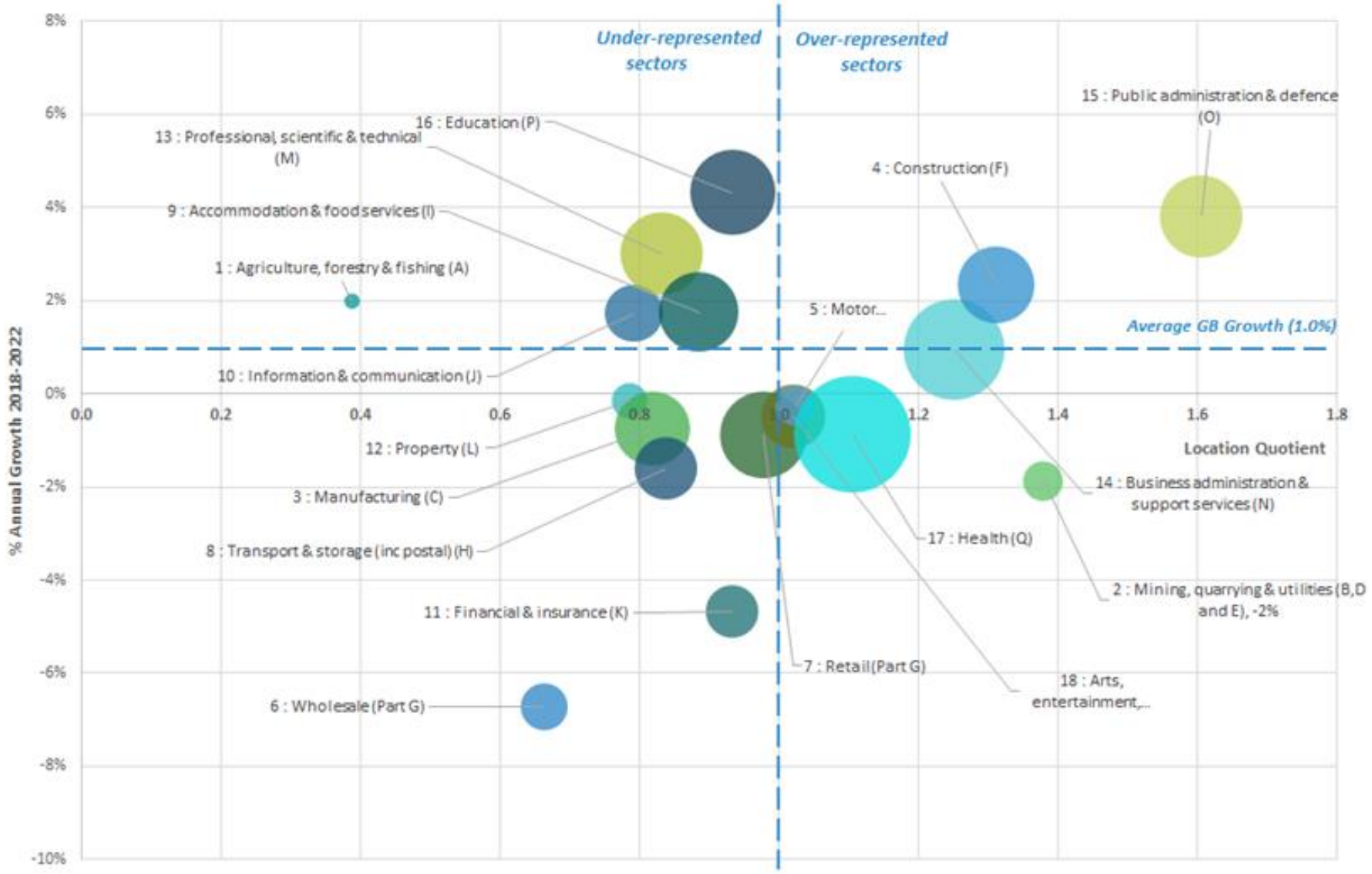
4.2 Productivity

As shown in Chart 4.2 and Map 4.1 (both overleaf), economic output is primarily concentrated around specific economic cores, including Glasgow City Centre, North Lanarkshire Inner, Renfrewshire Inner and South Lanarkshire Inner. With Glasgow City Centre concentrating most high-value jobs, GVA per worker is amongst the highest, but matched by the inner areas of North and South Lanarkshire, reflecting the output delivered by some of the specialisms seen in Table 4.1. In totality, the study area generated £45 billion of GVA in 2021, approximately 30% of the Scottish total (of £152 billion).

What does this mean for the Clyde Metro programme?

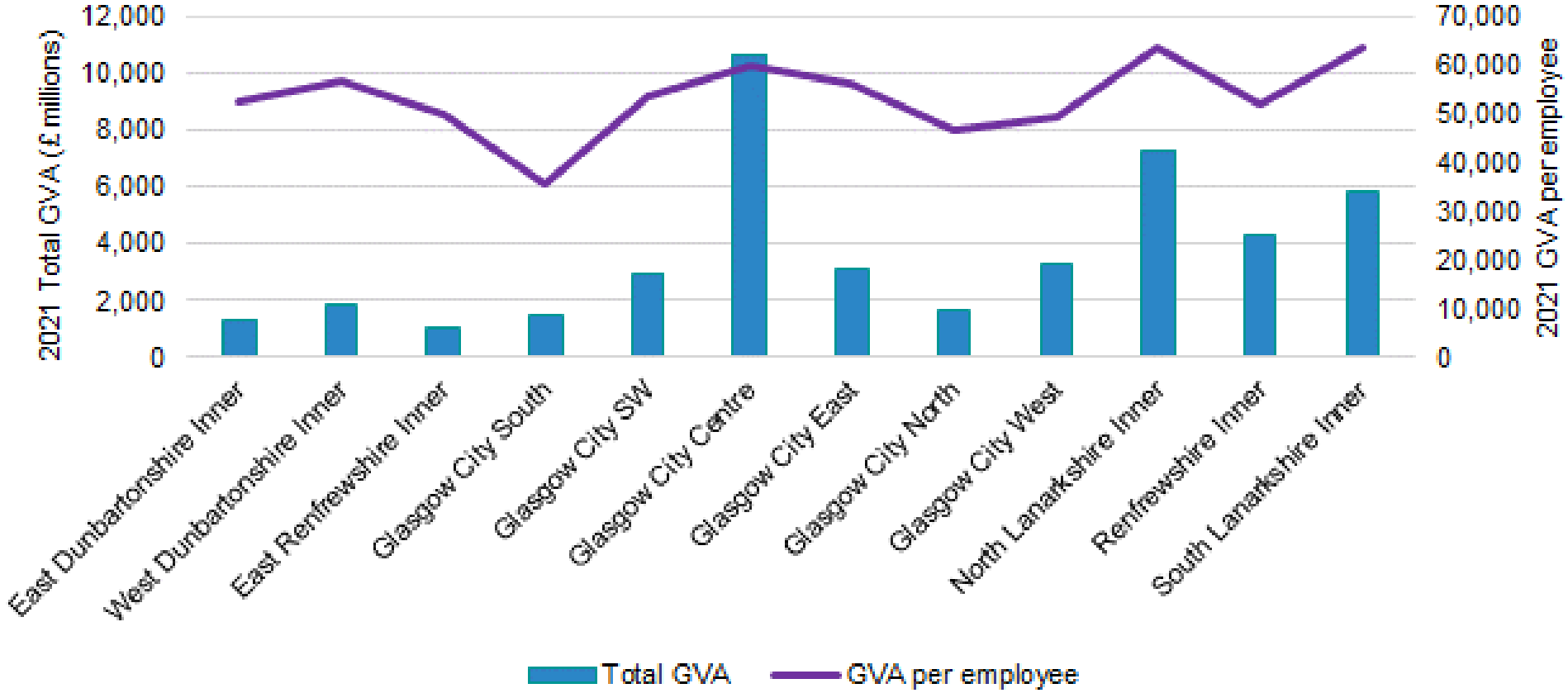
The strengthening of these existing clusters as well as further development in currently lagging sectors, in terms of GVA outputs, will require significant inward investment as well as access to a suitable labour supply. Glasgow city centre, and the surrounding sub-areas, do not outperform others as would be expected from other comparator cities. This is indicative of a lack of specialism in certain higher value sectors, and difficulties in attracting the required inward investment.

Chart 4.1: Glasgow City Region economic structure



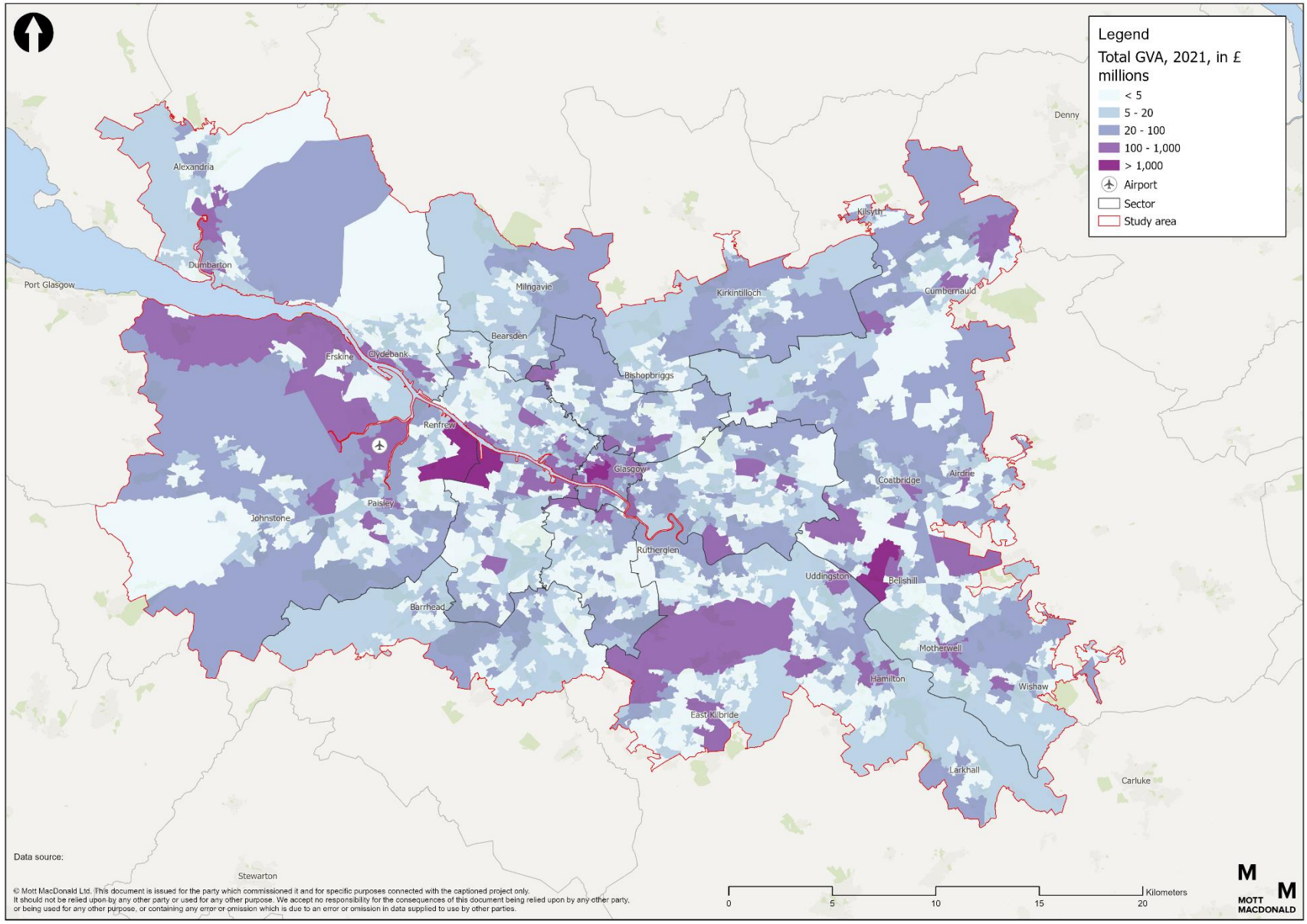
Source: Business Register & Employment Survey

Chart 4.2: GVA by sub-area



Source: ONS – UK small area gross value added (GVA) estimates, 2024

Map 4.1: Total GVA



Source: ONS, UK small area gross value added (GVA) estimates, 2024

4.3 Employment density

Map 4.2 (overleaf) shows the existing density (employees per square km) across the GCR. Real density drives agglomeration economies where the physical proximity of businesses and workers contributes to increased productivity and a more attractive inward investment environment (see Section 6.3 for an exploration across British and Northern European city regions).

What does this mean for the Clyde Metro programme?

Increases in real density require sufficient capacity and connectivity to enable access to the required labour markets. Increases in productivity, through agglomeration, can also be achieved through greater effective density – where locations with mutual synergies are brought closer together through better connectivity which reduces the times, costs et al of travel between them.

4.4 Key takeaways

Key takeaways

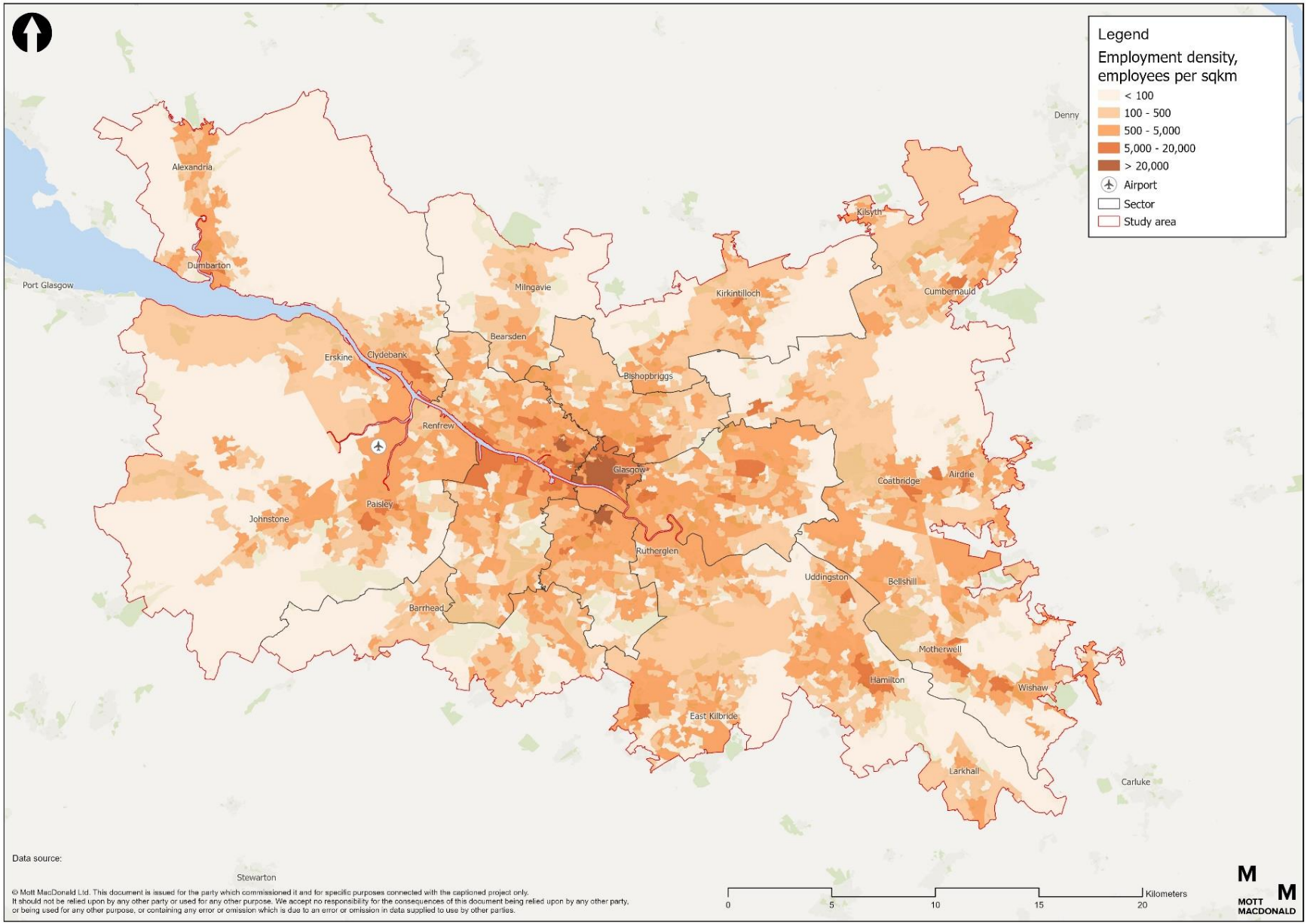
- The GCR's economy specialises (Location Quotient > 1.0[9]) in public administration and defence, utilities, construction, business administration and support, and health. Health is the largest sector (125,000 employees) followed by business administration and support (95,000 employees). Public administration and defence are the only growing specialist sectors.

Key takeaways

- Underdevelopment remains a key concern and demands more policy action. Specifically, to attract more inward investment in these underdeveloped sectors, the GCR needs to provide increased, more qualified, labour supply, better connectivity, and a quality of life offer which can retain and attract the people and businesses to make the GCR thrive.
- Economic output is primarily concentrated around specific economic cores, including Glasgow City Centre, North Lanarkshire Inner, Renfrewshire Inner and South Lanarkshire Inner.
- Glasgow City Centre concentrating most high-value jobs, GVA per capita is significantly higher in the sector compared to other parts of the study area.
- Strengthening of these existing clusters as well as further development in currently lagging sectors, in terms of GVA outputs, will require significant inward investment as well as access to a suitable labour supply.
- Employment densities (employees per square km) are low across the GCR. Real density drives agglomeration economies where the physical proximity of businesses and workers contributes to increased productivity and a more attractive inward investment environment.

[9] A location quotient (LQ) is a measure of an area's industrial specialisation relative to a larger geographic unit, here Scotland. The ONS Standard Occupational Classification (SOC) is used for the classification of industries.

Map 4.2: Employment density



Source: Business Register & Employment Survey

5 The environment

The Clyde Metro study area is a mix of urban and more rural surrounding areas both of which contain a rich natural, built, and cultural environment including protected ecological areas, heritage assets, and green networks. Glasgow City Council declared a climate and ecological emergency in 2019, with several of the other Local Authorities in the study area also declaring a climate emergency. Clyde Metro has a key role to play in protecting natural and heritage sites, by making best use of existing infrastructure, sensitive introduction of new assets, and promoting mode shift which lessens the requirement for other, less efficient, modes. This can support nature recovery through reduction of transport-related emissions and pollution, improving access to nature and heritage features, and supporting ecological areas and networks.

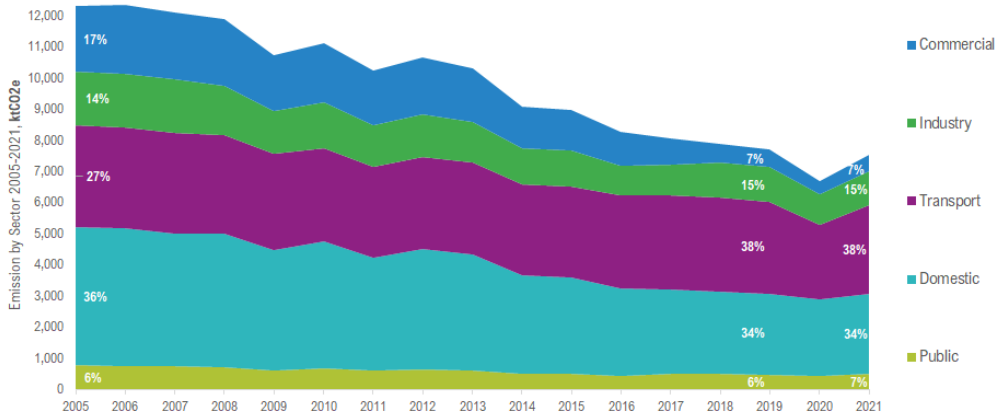
5.1 Climate change

5.1.1 Past trends

Over the last few decades, Scotland has experienced a warming trend, shifting rainfall patterns and rising sea levels. Scotland's ten warmest years on record have all occurred since 1997 and the average temperature in the last decade was 0.69^{O}C warmer than the 1961-1990 average. There has been an increase in rainfall over Scotland in the past few decades and the annual average rainfall in the last decade was 9% wetter than the 1961-1990 average, with winters 19% wetter. The mean sea level around the UK has risen by approximately 1.4mm/year from the start of the 20th century[10].

Transport is now the largest contributor (38%, see Chart 5.1) to domestic greenhouse gas emissions and has grown in percentage terms as other significant sectors have declined. Absolute emissions from transport have, except during COVID-19 pandemic lockdowns, remained static for the last decade, i.e. any gains in vehicle efficiency have been offset by wider changes in travel behaviour and demand.

Chart 5.1: Domestic Greenhouse Gas Emissions, by sector, GCR LAs



Source: Department for Energy Security and Net Zero, June 2023

5.1.2 Future Climate Projections

The 2018 UK Climate Projections produced by the Met Office Hadley Centre, provide information about the potential future climate in Scotland. The projections provide a range of potential climate outcomes, based on a set of four pathways for greenhouse gas emissions:

[10] Adaptation Scotland (2021) Climate Projections for Scotland – Summary. Available at: LOW_RES_4656_Climate_Projections_report_SINGLE_PAGE_DEC21.pdf (adaptationscotland.org.uk)

- A low emissions scenario (RCP2.6);
- Two medium emissions scenarios (RCPs 4.5 and 6.0); and
- High emissions scenario (RCP8.5).

Table 5.1 presents the projected climate changes for 2050 and 2080 under the low and high emissions scenarios. The figures present the central estimate (50th percentile).

Table 5.1: Climate projection for Scotland

Parameter	2050		2080	
	Low Emission	High Emission	Low Emission	High Emission
Change in summer temperature (°C)	1.2°C	1.5°C	1.1°C	3.0°C
Change in winter temperature (°C)	1.0°C	1.5°C	1.1°C	2.7°C
Change in summer rainfall (%)	-7%	-8%	-11%	-18%
Change in winter rainfall (%)	8%	12%	5%	19%

Source: Adaptation Scotland, Climate Projections for Scotland – Summary, 2021

The climate changes are already experienced are projected to continue and intensify. These include:

- Average temperatures will increase across all seasons;
- Typical summers will be warmer and drier;
- Typical winters will be milder and wetter;
- Intense heavy rainfall events will increase in both winter and summer;
- Sea levels will rise;
- Reduced frost and snowfall; and
- Weather will remain variable and may become more variable[11].

What does this mean for the Clyde Metro programme?

Climate change has the potential to reduce the efficiency and reliability of transport infrastructure through:

- Rail tracks buckling and road tarmac rutting and melting during hot weather,
- Reduced capability from mechanical and electrical systems which are sensitive to temperature changes,
- Passengers using public transport experiencing heat stress,
- During periods of drought, increased risk of subsidence affecting infrastructure foundations,
- During periods of extreme precipitation, drainage capacity may exceed capacity resulting in flooding affecting transport infrastructure and risk of landslides.

Future climate change will need to be considered through the planning and development of Clyde Metro.

In response to the climate emergency and Net Zero targets, the Scottish Government has a 20% car-kms reduction target between 2019 and 2030. The Strathclyde Regional Transport Strategy (RTS) analysed the potential mode share implications, with a decrease in the 'car driver' mode share of (-)9% required by 2030, delivered by:

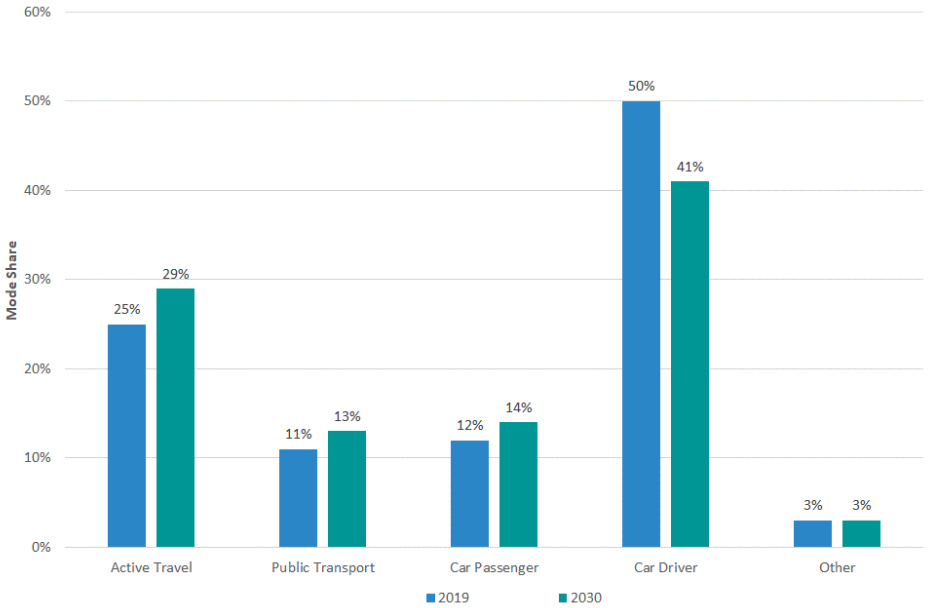
- Reductions in the need and/or distance travelled;

[11] *Ibid.*

- Substitution with other modes; and
- Shared journeys.

Chart 5.2 shows the split by mode with the RTS headline target is for 45% of all journeys to be made by non-car modes by 2030. The 'just transition'[12] phases recognise that shifts in behaviour will help achieve greater equality, with low income, people with a long-term disability or health problem, certain ethnic minorities.

Chart 5.2: GCR 2030 mode share targets versus the status quo



Source: SPT Regional Transport Strategy Appraisal Report, 2022

These mode share targets will vary by location, reflecting densities and the potential for mode shift where alternatives to the car are more viable, i.e. the target for Glasgow local authority will be higher due to both of these considerations.

What does this mean for the Clyde Metro programme?

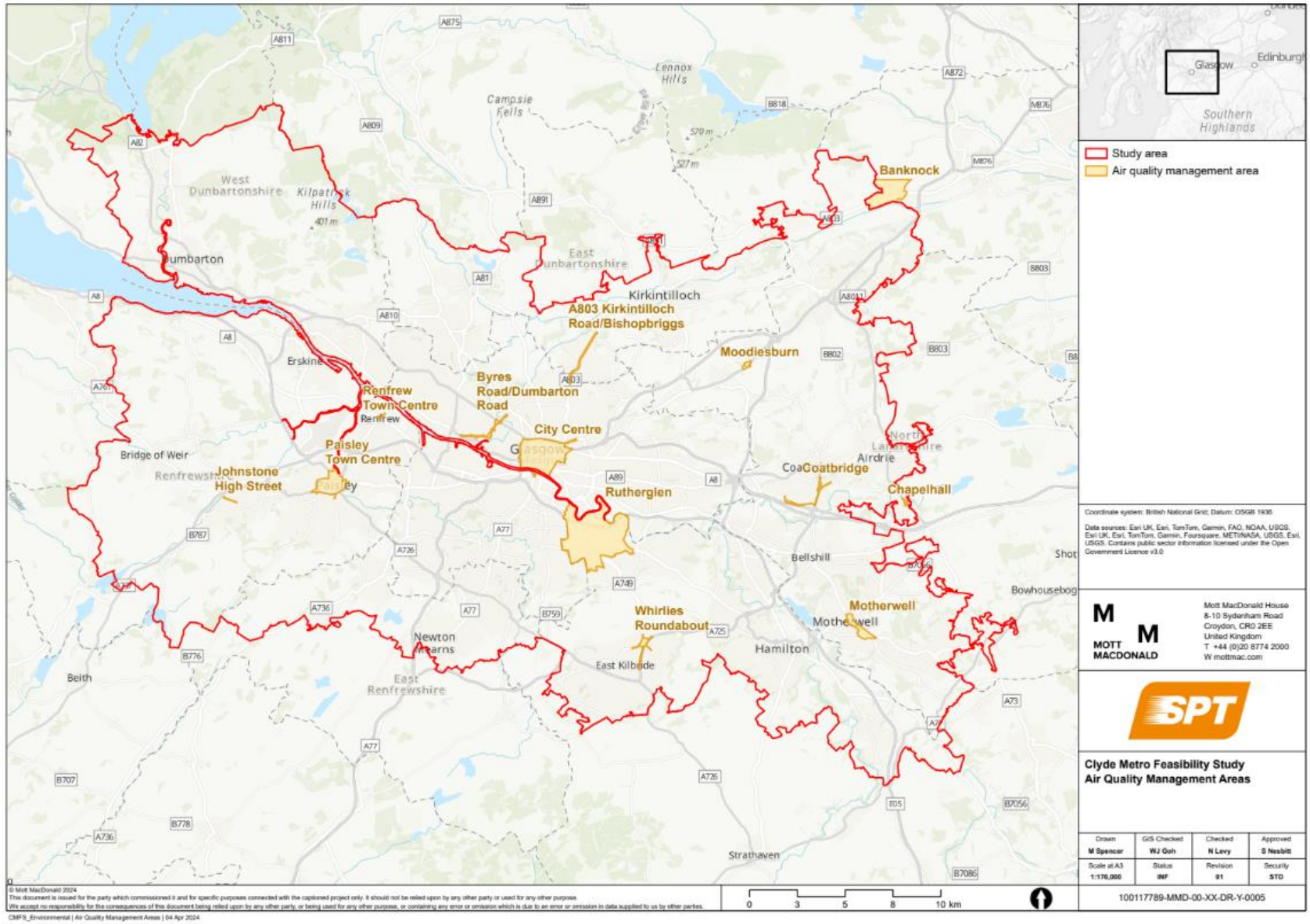
Changes in mode shares and ownership levels will also provide economic and social benefits, reducing car dependency and road traffic congestion, contributing to place-making priorities. Further, more transformational, mode shifts will be required post-2030 to achieve national targets.

5.2 Air quality

Map 5.1 (overleaf) shows the existing Air Quality Management Areas (AQMAs). The study area contains 12 Air Quality Management Areas (AQMA), mainly declared due to NO_2 and/or PM_{10}, with a transport-related source. Local emissions have a significant long-term detrimental effect on health and wellbeing, diminishing quality, and sense of place. Glasgow City Centre and several of the major district centres are covered by AQMAs. In response, a Low Emission Zone (LEZ) has been implemented in Glasgow City Centre, with charges for non-compliant vehicles.

[12] See: https://www.gov.scot/policies/climate-change/just-transition/

Map 5.1: Air Quality Management Areas



Source: Scottish Government Note: Banknock a & Haggs AQMA in Falkirk on the boundary of the study area was revoked in 2021, and Parkhead Cross, east of the city centre and north of Rutherglen, has been added.

5.3 Natural and built environment assets

The study area contains over 6,500 listed buildings, 139 scheduled monuments, and 79 conservation areas (see Map 5.2 overleaf). Protection and enhancement of built and archaeological assets is a key priority for all local authorities, preserving and enhancing to support 'sense of place'. The study area has a mixture of 'special areas', SSSIs, and 50 nature reserves, including regionally important sites such as the Clyde Climate Forest and Seven Lochs Wetland Park.

What does this mean for the Clyde Metro programme?

Designated and informal green spaces are essential for quality of life priorities, providing health and wellbeing benefits and also contributing to 'sense of place'. Transport provides access to these opportunities, but infrastructure can, without careful design, generate adverse impacts for both the natural and built environment. As an example, on-street alignments will need to integrate with the built form and urban grain with a finite amount of space.

Further detail of the natural and built environment assets can be found in Appendix C.

5.4 Key takeaways

Key takeaways

- Over the last few decades, Scotland has experienced a warming trend, shifting rainfall patterns and rising sea levels.
- Scotland's ten warmest years on record have all occurred since 1997 and the average temperature in the last decade was 0.69^{O}C warmer than the 1961-1990 average.

Key takeaways

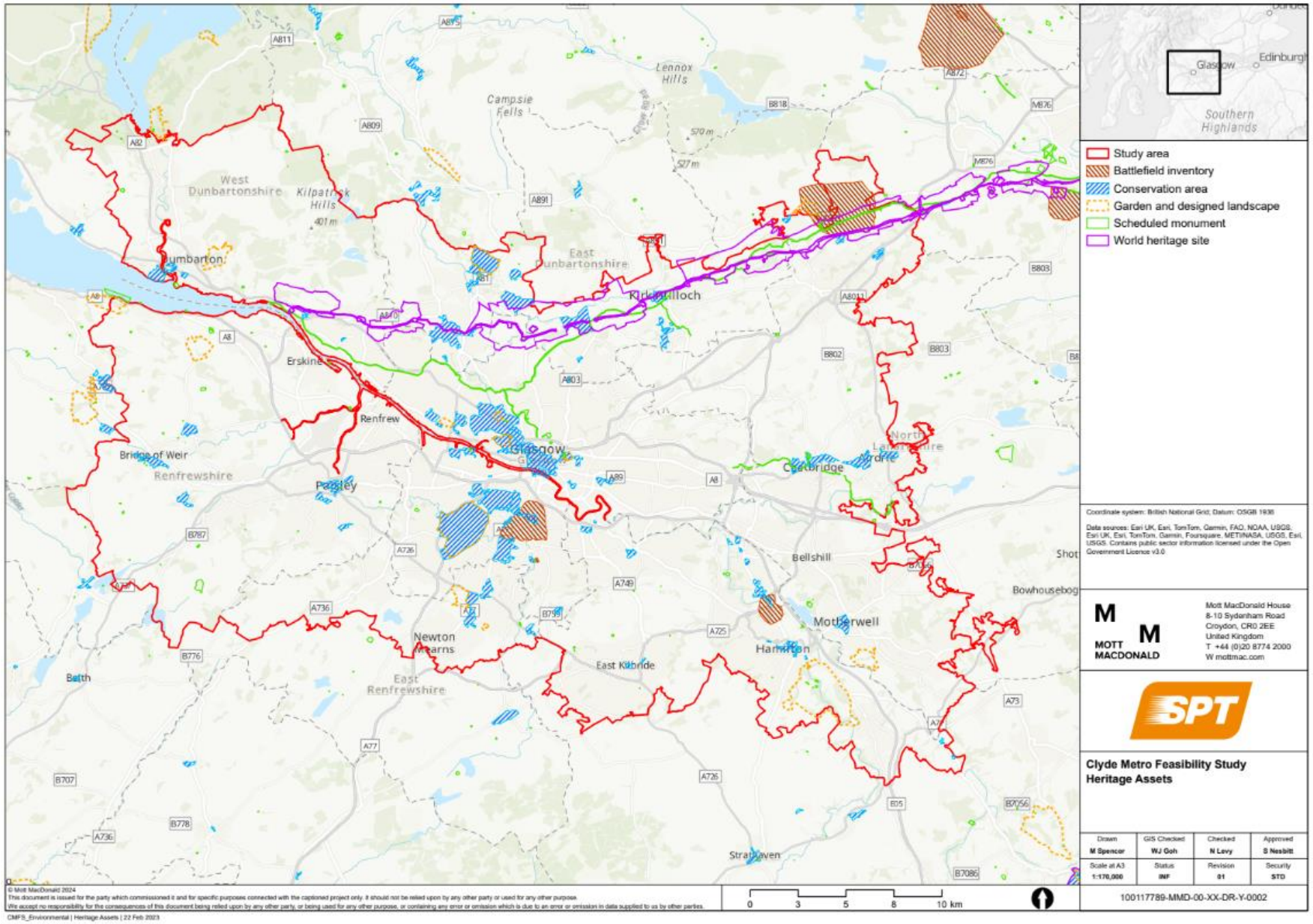
- There has been an increase in rainfall over Scotland in the past few decades and the annual average rainfall in the last decade was 9% wetter than the 1961-1990 average, with winters 19% wetter. The mean sea level around the UK has risen by approximately 1.4mm/year from the start of the 20th century.
- Transport is now the largest contributor (38%) to domestic greenhouse gas emissions and has grown in percentage terms as other significant sectors have declined. Absolute emissions from transport have, except during COVID-19 pandemic lockdowns, remained static for the last decade, i.e. any gains in vehicle efficiency have been offset by wider changes in travel behaviour and demand.
- In response to the climate emergency and Net Zero targets, the Scottish Government has a 20% car-kms reduction target between 2019 and 2030.
- The Strathclyde Regional Transport Strategy (RTS) analysed the potential mode share implications, with a decrease in the 'car driver' mode share of (-)9% required by 2030.
- The 'just transition' phases recognise that shifts in behaviour will help achieve greater equality, with low income, people with a long-term disability or health problem, certain ethnic minorities.
- Changes in mode shares and ownership levels will also provide economic and social benefits, reducing car dependency and road traffic congestion, contributing to place-making priorities.
- More transformational, mode shifts will be required post-2030 to achieve national targets.
- The study area contains 12 Air Quality Management Areas (AQMA), mainly declared due to NO_2 and/or PM_{10}, with a transport-related source. Local emissions have a significant long-

Key takeaways

term detrimental effect on health and wellbeing, diminishing quality, and sense of place.

- A Low Emission Zone (LEZ) has been implemented in Glasgow City Centre, with charges for non-compliant vehicles.
- The study area contains over 6,500 listed buildings, 139 scheduled monuments, and 79 conservation areas (see Map 5.2 overleaf). Protection and enhancement of built and archaeological assets is a key priority for all local authorities, preserving and enhancing to support ‘sense of place’. The study area has a mixture of ‘special areas’, SSSIs, and 50 nature reserves.
- Designated and informal green spaces are essential for quality of life priorities, providing health and wellbeing benefits and also contributing to ‘sense of place’. Transport provides access to these opportunities, but infrastructure can, without careful design, generate adverse impacts for both the natural and built environment.

Map 5.2: Heritage assets



6 The challenges explored

The Clyde Metro programme aims to address the existing connectivity gaps in the study area, relieve stress on existing networks, and drive better socio-economic, environmental, and transport outcomes. Overall, deficits in connectivity and accessibility constrain the effective density of the region. They also detract from inward investment and the potential for physical densification. The lack of connectivity, accessibility and density all promote car dependency for those who can afford one.

After introducing the transport network, this section focuses on 'problems' with existing supply across the GCR and how this contributes to observed socio-economic and environmental outcomes.

6.1 The GCR transport network today

The GCR is currently served by an extensive transport system (see Map 6.1 overleaf). The orientation and extent of the existing transport connections vary across the region. The following summarises the key transport hubs and connections by each mode providing an overview of the system and where challenges exist:

6.1.1 Strategic Road Network

The Region is served by several motorways which provide radial access to the Glasgow City as well as orbital routes serving the outer suburban areas and providing intra and cross regional connections. The key motorways and trunk roads in the region include:

- M8: East-West motorway connecting Glasgow and Edinburgh. Serves the city centre and other large communities in the region including Coatbridge, Paisley and Erskine. Provides the main surface access to Glasgow International Airport.
- M74: North-South motorway providing the main connection from Glasgow City Centre (and the M8) to England where it becomes the M6. Serves other large communities, particularly in North and South Lanarkshire including Hamilton, Motherwell and Rutherglen.
- M77: North-South motorway which serves the south west of Glasgow City and connects to the M8 in the Kinning Park area (south of the M8 Clyde River crossing). Alignment is through the west side of Pollok Country Park and Newton Mearns after which the corridor runs through rural East Renfrewshire before reaching Kilmarnock.
- M73: North-South motorway linking the M74, M8 and M80 in the east of the city. Provides a critical orbital connection and serves future development sites around Gartcosh and Glenboig.

Other motorways and trunk roads of note include: M80, A82, A737, A725/A726.

Due to Glasgow's shipping heritage, there are limited motor vehicle crossings of the Clyde downstream (westward) of the city centre. The lack of crossings presents a barrier for north-south trips in the west of the GCR for both private car trips as well as orbital bus routes. The three 'strategic' crossings are:

- Erskine Bridge: most westerly crossing connecting Erskine in Renfrewshire to Old Kilpatrick in West Dunbartonshire;
- Clyde Tunnel: crossing beneath the River connecting Govan to Whiteinch and Jordanhill beyond; and
- Kingston Bridge: carrying the M8 Motorway through the city centre.

Prior to the Covid-19 pandemic, in 2018 and 2019 there were approximately 13 billion vehicle-kms travelled by car, van, or other goods vehicle across the GCR (see Chart 6.1 overleaf). This volume had steadily increased from 2012 to 2018.

Map 6.1: Glasgow City Region Transport Network(s)

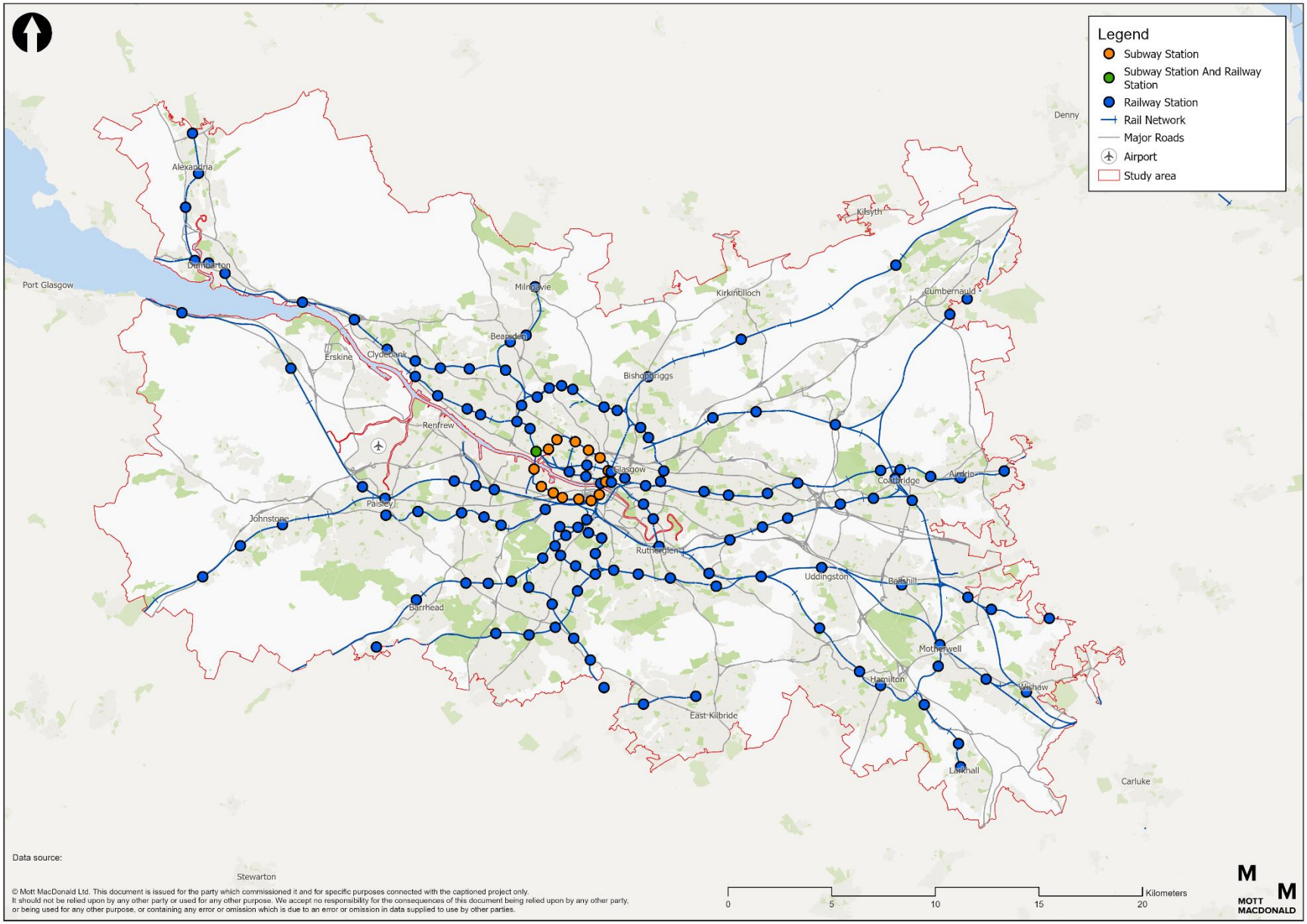
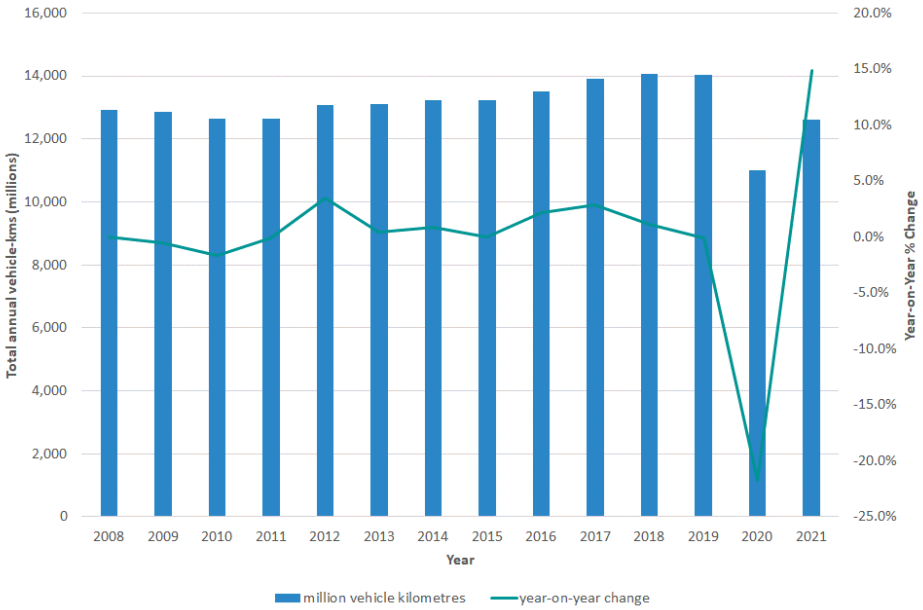


Chart 6.1: Glasgow City Region Total Vehicle-km Trend



Source: 2018 Scottish Transport Statistics

Road traffic congestion is covered in more detail in Section 6.7.

6.1.2 Bus

Annual statistics for the region's bus networks cover the full GCR plus several neighbouring authorities[13]. Data coverage therefore extends well beyond the study area for Clyde Metro:

- Annual vehicle-kms declined by nearly 20% from 2009-10 to 2010-11[14] as the financial support available from local and regional authorities diminished and demand reduced as bus journey times and car ownership increase. Since 2012-13, annual-kms have, until the end of 2019 and the Covid-19 pandemic, stabilised at approximately 140 million across the full region.
- Demand naturally declined with the corresponding reduction in supply during the early 2010s. From 2012-13 to 2018-19 there was decline in annual bus passenger journeys from 184 million to 159 million (-14%). Following the Covid-19 pandemic, bus demand had recovered to approximately 100 million journeys into 2021-22.

Glasgow City Region is primarily served by three private bus operators, collectively providing 80% of vehicle-kms, which are:

- First Glasgow – Largest bus company serving the Glasgow City Region. Coverage includes most of Glasgow City with high frequency radial routes to/from the south and west of the city centre. Operates Route 500/Glasgow Airport Express serving Glasgow International Airport.
- McGill's bus services – Operates a network of routes across the region primarily serving the west side of Glasgow City, Renfrewshire and Inverclyde including the communities of Paisley, Renfrew and Braehead.
- Stagecoach West Scotland – Operates a network primarily covering Ayrshire with routes into Glasgow City. A key route also serves Cumbernauld.

Competition between the operators is somewhat diminished by most local authorities having a dominant operator. Engagement with the bus operators and other stakeholders suggests that increased car use and congestion on the road network is the number one challenge facing operators. These factors were noted as significantly impacting reliability of service and operating costs, limiting the ability to expand network coverage and improve efficiencies. This results in a "Circle of Decline".

[13] Dumfries & Galloway, East Ayrshire, North Ayrshire, South Ayrshire.

[14] See: Chapter 2: Bus and Coach Travel | Transport Scotland

As with most of the UK (outside of London) bus operators are de-regulated and are therefore free to run any service and set own fares. Following the publication of the Strathclyde Regional Bus Strategy in March 2024, SPT is currently consulting on its recommended options for bus reform which include; local services franchising, Bus Service Improvement Partnerships and a municipal bus company, made possible through the powers in the 2019 Transport (Scotland) Act[15].

Buchanan Street Bus Station, within Glasgow City Centre and adjacent to Glasgow Queen Street Station, is the major hub for local and long distance bus and coach services, with circa 1,700 departures every day.

6.1.3 National Rail

The Glasgow City Region is served by an extensive heavy rail network and is the densest in the UK outside of London. There are 131 'National Rail' stations that fall within the GCR (as defined for this study and excluding subway stations) with varying levels of service. Section 6.4 contains more detail on connectivity. The rail network is centred around two principal terminus stations in the Glasgow City Centre, which are:

- Glasgow Central Station: located next to the River Clyde in the south of the City Centre. It is the busiest station in Scotland with just under 23 million passengers in 2022/23 (ORR). The station is split into:
  - High level platforms (platforms 1-15): Northern terminus of the West Coast Mainline (WCML) while also serving the southern suburbs of Glasgow and beyond.
  - Low level platforms (16 – 17): Served by the east – west Argyle Line providing a cross-region link connecting towns from West Dunbartonshire to North and South Lanarkshire.
- Glasgow Queen Street Station: located in the centre of Glasgow City Centre. It catered for 13.5 million passengers in 2022/23. Station split into:
  - High level platforms (platforms 1 – 7): Served by the Glasgow – Edinburgh via Falkirk line (principal route connecting these two cities) as well as other routes north of the central belt.
  - Low level platforms (platforms 8 – 9): Served by the east – west North Clyde Line ('North Electrics') proving a cross-region link connecting towns from North Lanarkshire to West Dunbartonshire. The line also provides a link to Edinburgh via Airdrie.

Both stations are owned and managed by Network Rail. There are no direct rail services[16] between the two termini, and they are separated by half a km.

Table 6.1 (overleaf) presents a summary of the busiest heavy rail stations in the GCR and then those that are least used in Table 6.2 (also overleaf) – indicative of poor levels of service, accessibility and/or location relative to populations, services, and opportunities, and/or competition from alternative modes or stations. Trains per Hour (TpH) to the central Glasgow termini is shown given the correlation with annual passenger journeys. Data is shown for 2018/19 and 2022/23, before and after the Covid-19 pandemic, with the latter still during the period of demand and supply recovery – long term impacts of the pandemic on travel behaviour and demand are still uncertain during 2024 Q1 until longer time-series of data becomes available.

[15] See: Transport (Scotland) Act 2019 (legislation.gov.uk)

[16] A shuttle bus is provided.

Table 6.1: Most used GCR stations (Annual Entries/Exits & Interchanges)

GCR Rank (Scottish Rank)	Station	Sub - area	Trains per Hour[17]	2019/20	2022/23
1 (1)	Glasgow Central	Glasgow City - City Centre	n.a.	36,550,000	22,990,000
2 (3)	Glasgow Queen Street	Glasgow City - City Centre	n.a.	19,250,000	13,570,000
3 (5)	Paisley Gilmour St	Renfrewshire	12	4,150,000	2,680,000
4 (6)	Partick	Glasgow City - West	8	3,430,000	2,330,000
5 (9)	Hyndland	Glasgow City - West	14	2,470,000	1,720,000
6 (11)	Charing Cross	Glasgow City - City Centre	8	2,230,000	1,310,000
7 (12)	Exhibition Centre	Glasgow City - West	6	1,940,000	1,120,000
8 (13)	Croy	North Lanarkshire Inner	4	1,410,000	1,060,000
9 (15)	Mount Florida	Glasgow City - South	4	1,340,000	940,000
10 (17)	Johnstone	Renfrewshire Inner	7	1,330,000	820,000

Source: Office of Rail and Road Station Usage Statistics

Chart 6.2 shows the top individual station-to-station demand. Outside of the two-way interurban flows between Glasgow and Edinburgh stations, the dominance of the Glasgow termini as attractions becomes apparent. The most significant flows excluding these termini are shown overleaf in Chart 6.3, with Chart 6.4 showing the aggregate split of National Rail demand to, from, and within the GCR (64% of demand is within the region).

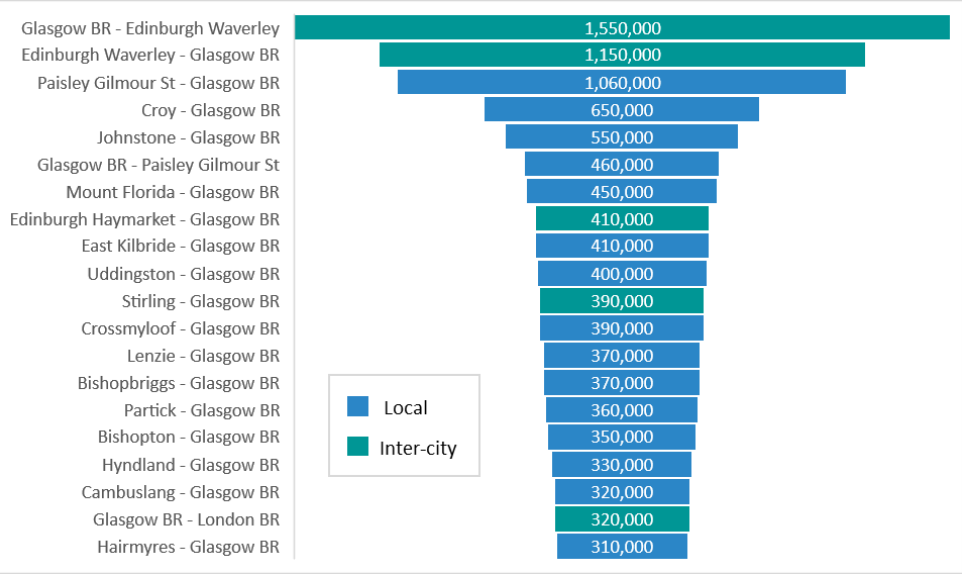
[17] To Glasgow Central or Glasgow Queen Street

Table 6.2: Least used GCR stations (Annual Entries/Exits & Interchanges)

Rank	Station	Sub - area	Trains per Hour[18]	2019/20	2022/23
1	Bowling	West Dunbartonshire - Inner	2	61,000	25,000
2	Coatbridge Central	North Lanarkshire	1	48,000	34,000
3	Mount Vernon	Glasgow City - East	2	58,000	44,000
4	Kelvindale	Glasgow City - West	4	85,000	46,000
5	Ashfield	Glasgow City - North	2	84,000	52,000

Source: Office of Rail and Road Station Usage Statistics

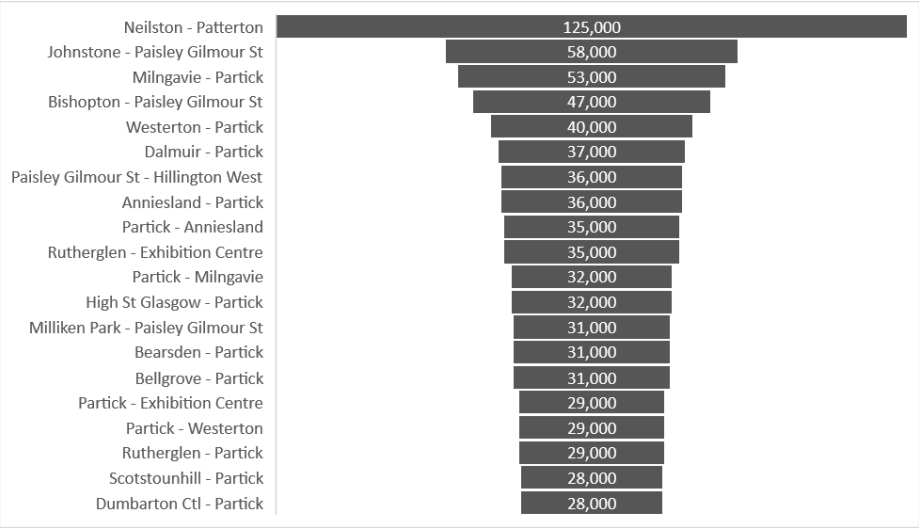
Chart 6.2: GCR Top 20 Rail Flows (Year to September 2023)



[18] To Glasgow Central or Glasgow Queen Street

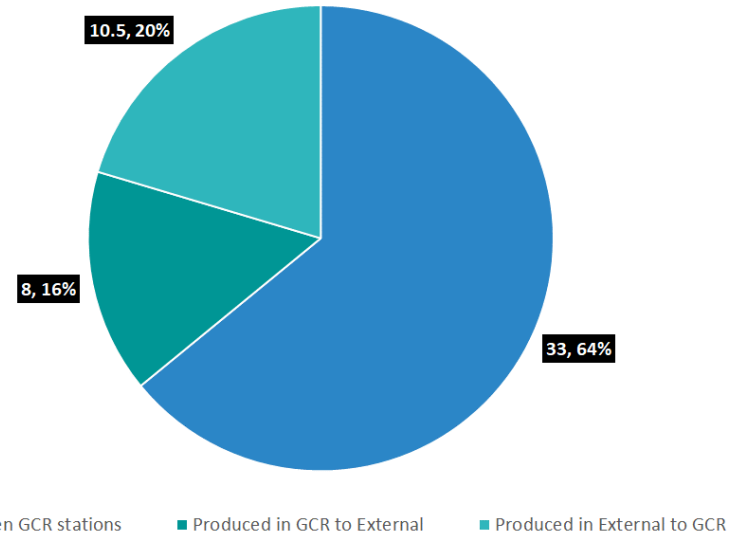
Source: MOIRA, OR81

Chart 6.3: GCR Top 20 Local Rail Flows (Year to September 2023) – excluding city centre stations



Source: MOIRA, OR81

Chart 6.4: GCR National Rail Demand Split



Source: MOIRA, OR81

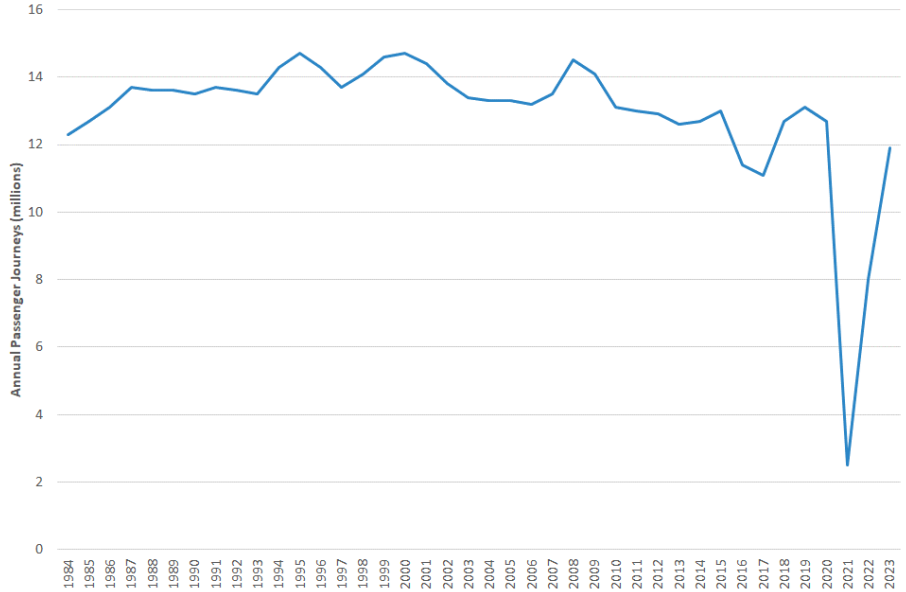
6.1.4 Subway

The Glasgow Subway is a 11km circular route through the City Centre, West End, and south side of the River Clyde ('Inner Glasgow') connects 15 stations with the most significant interchanges with other modes at Buchanan Street Bus Station and (Queen Street) rail station and Partick.

During peak periods services operate at four minute intervals, with the orbital nature meaning up to 30 tph can be available for specific trips. A 41 car fleet is in place to operate the service. A full orbital trip takes 24 minutes. A modernisation programme, including new driverless rolling stock, is underway (see Section 7.3.3).

Demand, shown in Chart 6.5, has peaked at approximately 14.5 million journeys per annum in the mid 1990s, 2000, and 2008. The financial downturn of the late 2000s coincided with a reduction to circa 13 million annual journeys throughout the 2010s. 2022-23 saw an almost complete demand recovery following the Covid-19 pandemic, with 12 million journeys recorded despite there still likely to have been a significant disruption to behaviour and demand during this year (see Section 7.3.3 for the current modernisation).

Chart 6.5: Glasgow Subway Annual Demand (millions)

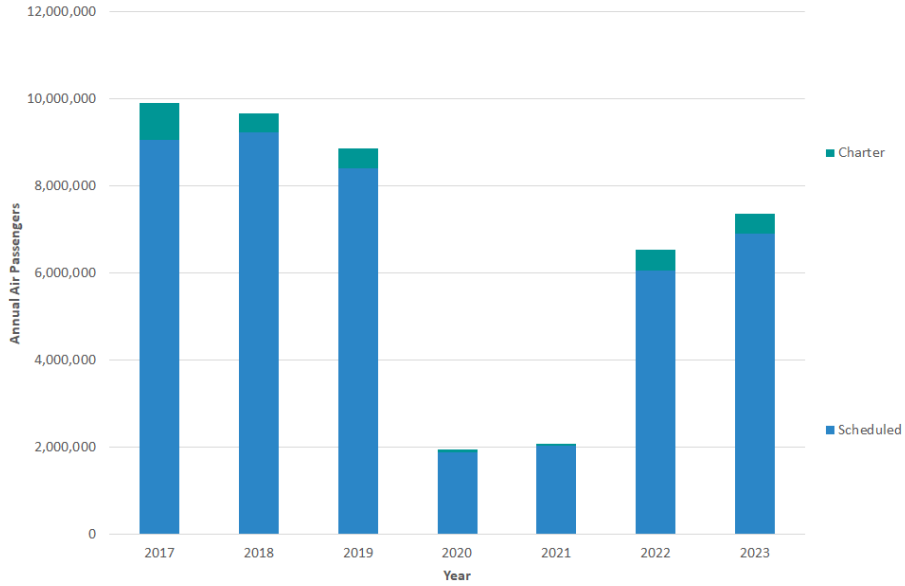


Source: DfT Light Rail Statistics

6.1.5 Glasgow Airport

Glasgow Airport is located approximately 11km west of the city centre in Renfrewshire local authority. 75,000 flights per annum operate, an average of 200 per day. Chart 6.6 shows annual passenger usage of the Airport, with 7.4 million users during 2023, reduced from the pre-Covid-19 pandemic peak of close to 10 million in 2017 and 2018.

Chart 6.6: Glasgow Airport Annual Air Passengers



Source: Civil Aviation Authority

The Airport is located adjacent to the M8 motorway, for which it is heavily dependent for access/egress. Public transport connectivity is provided by the 77 and 500 bus services which operate at 15 and 10 minute intervals respectively on weekdays between 07:00 and 19:00. The current mix of access modes contributes to the mode shares for access/egress seen in Table 6.3 (overleaf), where the combined mode share for car and taxi is approaching 90% - a significant factor greater than airports of a comparable size. The mode shares for public transport are greater at Edinburgh

(connected by tram), Birmingham, and Luton (both connected by National Rail with intermediary shuttle services).

Table 6.3: Surface access main mode of transport (% split)

Mode	Glasgow	Edinburgh	Birmingham	Luton
Private Car	**55%**	38%	51%	47%
Taxi etc	**33%**	22%	27%	16%
Public Transport	**12%**	40%	22%	36%
Other	**1%**	0%	1%	0%

Source: CAA 2018 Passenger Survey Report Files

6.1.6 Governance

Network(s) are administered and operated by multiple authorities which results in a complex and fragmented transport system. This includes:

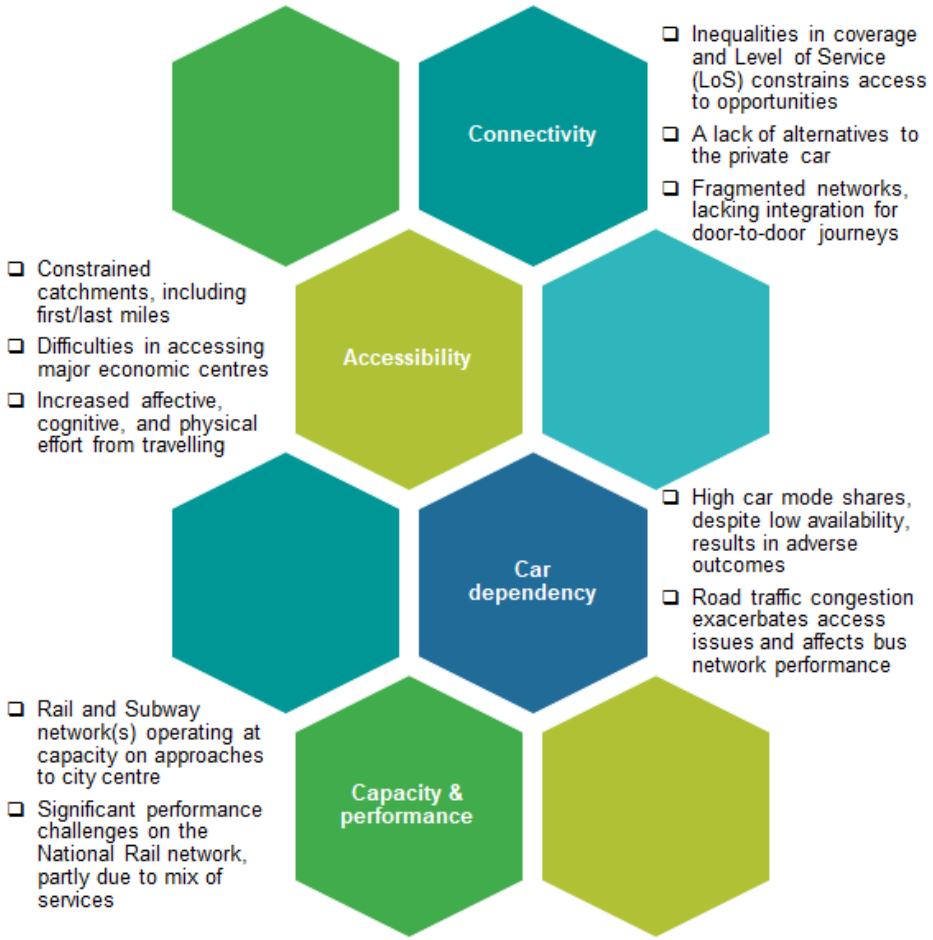
- Transport Scotland (trunk Roads and motorways)
- Glasgow City Council and other GCR LAs (local roads)
- Strathclyde Partnership for Transport (SPT), who:
  - Manage, own, and operate the Subway and six regional bus stations;
  - Manage socially necessary bus services, including the Demand Responsive Transport (DRT) services MyBus/MyBus Rural;
  - Manage and maintain bus stop and shelter infrastructure
  - Arrange school transport on behalf of councils;
  - Provide travel information, including the bus Real-Time Passenger Information (RTI) system;
  - Provide the secretariat for the Strathclyde Concessionary Travel Scheme on behalf of councils and administer the multi-modal ZoneCard ticket on behalf of participating transport operators; and
  - Deliver smartcard ticketing, through our joint venture, Nevis Technologies Limited, the major supplier of commercial smart ticketing in Scotland.
- ScotRail, the national rail service operator
- Network Rail, the owner of national rail assets
- Private bus operators

6.2 Challenges

Challenge areas are those with both connectivity and socio-economic problems. Building on the evidence base in Sections 3 to 5, this section analyses connectivity across the GCR to identify the links to observed outcomes:

- Urban density is lower than national and international comparators;
- There is a significant volume of brownfield, vacant, and derelict land which diminishes density and is detrimental to 'sense of place';
- Deficits in connectivity and accessibility constrain the effective density of the region and detract from inward investment and the potential for physical densification
- The lack of connectivity, accessibility, and density all promote car dependency for those who can afford one
- There are significant challenges for enhancing existing networks, and
- There are significant multiplier effects from integrated transport and land use which can help realise transformational change across economy, environment, and societal outcomes.

These problems are explored in subsequent sub-sections.



6.3 Urban density

A programme of research by Harvard Kennedy School, King's College London, and the Gatsby Foundation, with the cooperation of HM Treasury[19] confirmed the criticality of (effective) density to productivity outcomes:

"broader productivity gains could come from housing and transport reform to "thicken" sub-regional labour markets. That will probably mean focusing on city-regions (city centres and their surrounding towns) as the locus of growth; and given the size of the UK compared to other "road rich" countries probably means investing more heavily in public transport alongside planning reforms to encourage increased housing density in cities."

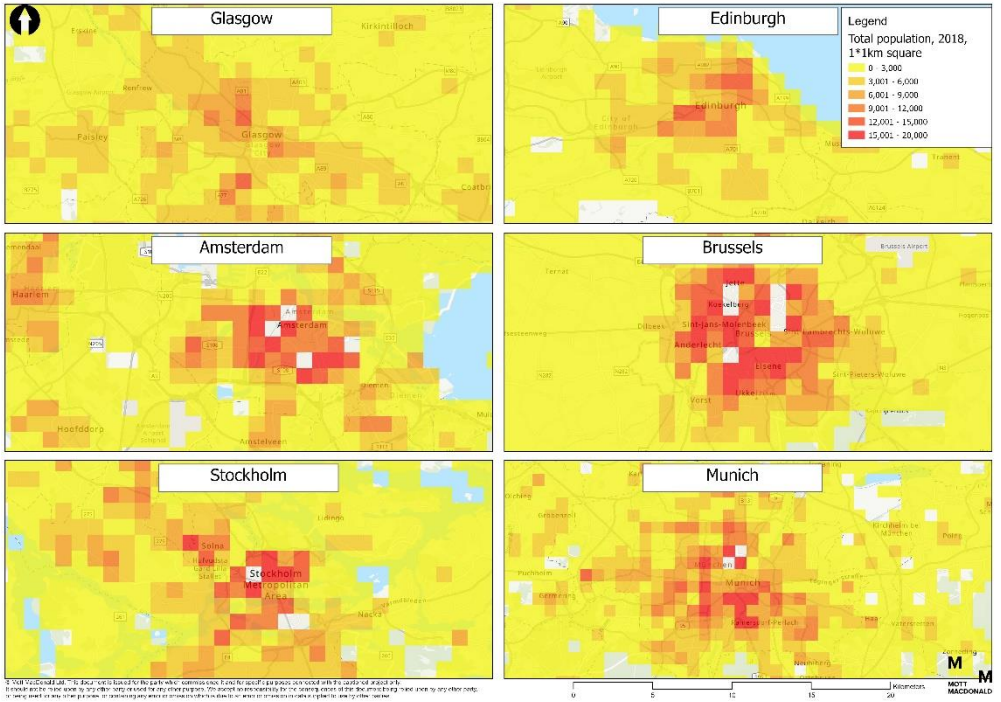
Centre for Cities research[20] demonstrates that a lack of physical density and poorer public transport accessibility go hand in hand, creating an unvirtuous circle which manifests itself in lower productivity and higher car dependency (with associated adverse outcomes through externalities):

"In large British cities, fewer people live in neighbourhoods that can easily access the city centre by public transport than in their Western European counterparts. As European cities get larger, the areas that fall within 30 minutes of the city centre by public transport become denser. This is not the case for UK's largest cities, with the exception of London, which is still less dense than Paris."

6.3.1 Comparison with other European cities

Glasgow's low density is not only evident nationally but also internationally. Map 6.2 compares density in Glasgow to other similar European cities. The percentage of people living in areas of high density (greater than 6,000 residents per square km) in the GCR is lower than Edinburgh, and much lower than European comparators. These counterparts also observe better economic outcomes.

Map 6.2: Cross-city population density comparison



Source: Eurostat, GEOSTAT 1km2 population grid, 2018

[19] See: Britain's growing regional divides (harvard.edu)

[20] See: Measuring up: Comparing public transport in the UK and Europe's biggest cities | Centre for Cities

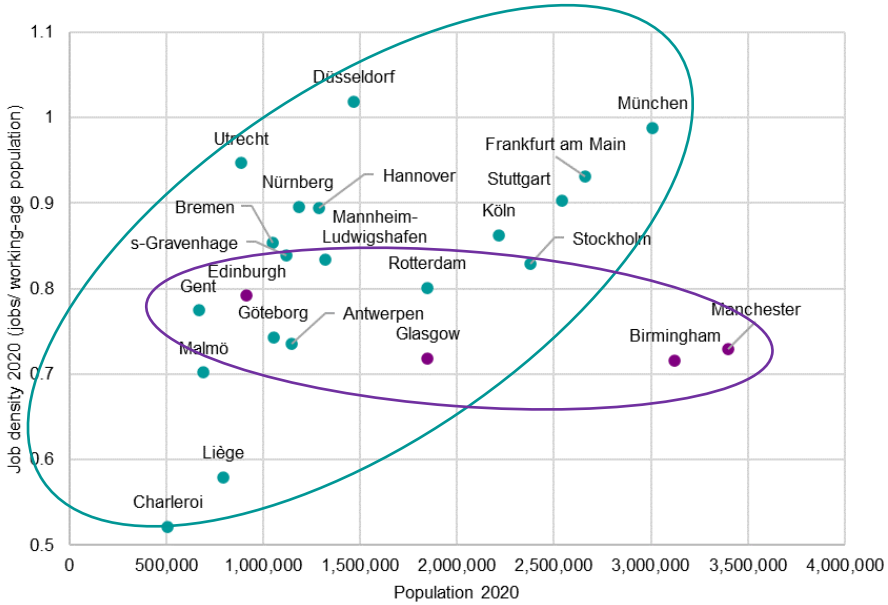
What does this mean for the Clyde Metro programme?

If the GCR wants to attract inward investment, and concurrently grow its labour supply, it would benefit from greater density in inner urban areas. This process will require efficient and attractive connections to major economic centres combined with complementary development and place-making.

6.3.2 Employment density

Underdevelopment in Glasgow is a shared challenge with other UK cities. As shown in Chart 6.7, unlike European comparators, job density in the major British cities does not increase with city size. This weak correlation leads to lower city productivity levels and reduces inward investment. Gaps in connectivity likely contribute to the problem.

Chart 6.7: Cross-city job density versus population

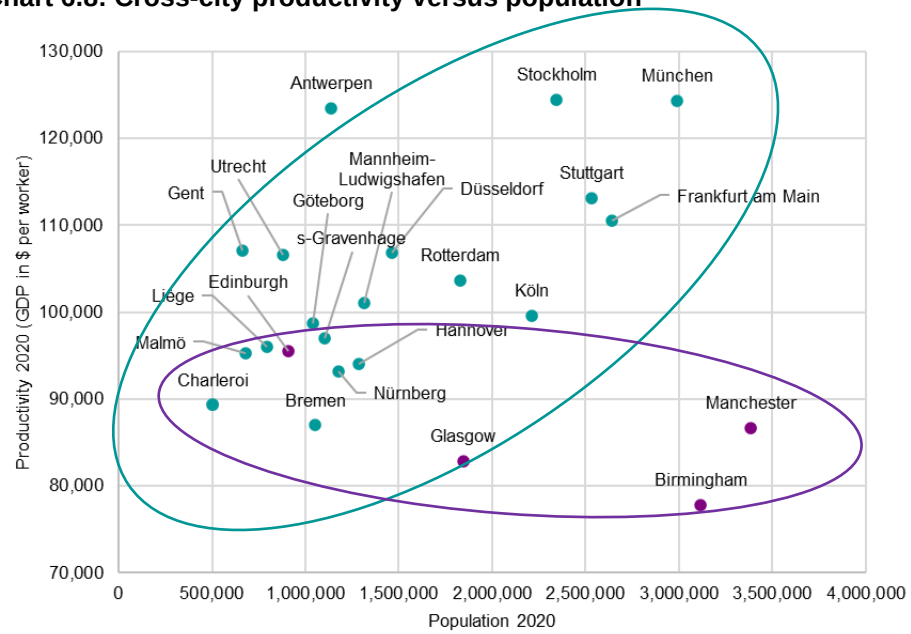


Source: Organisation for Economic Co-operation and Development

6.3.3 Productivity and city size

Low job density correlates to lower productivity. As shown in Chart 6.8 (overleaf), British cities have much lower productivity per worker, with increased size again failing to support increased output. Glasgow ranks second to last among the cities compared.

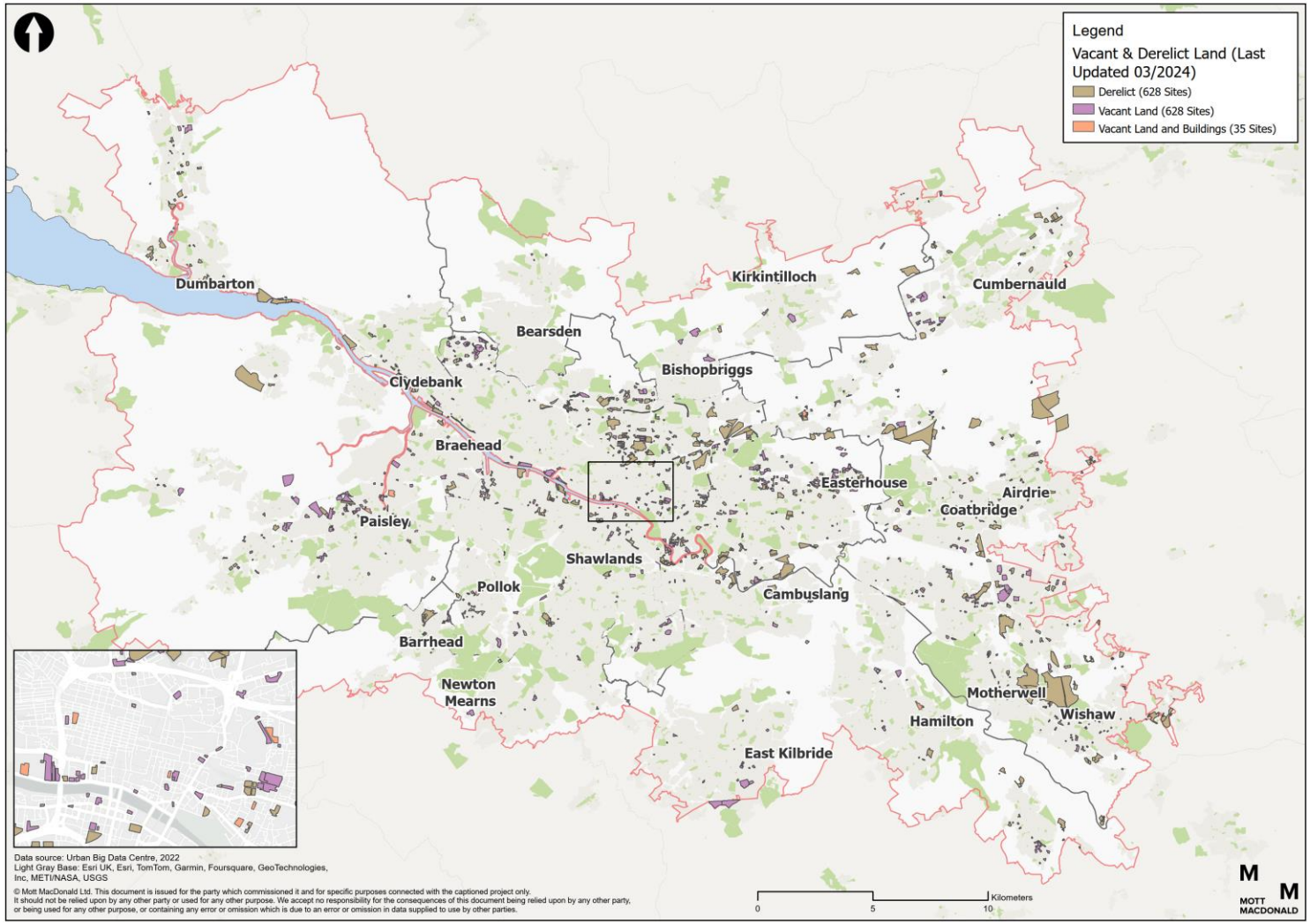
Chart 6.8: Cross-city productivity versus population



Source: Organisation for Economic Co-operation and Development

Map 6.3 (overleaf) shows the existing brownfield and vacant land register. In addition to these 'known' opportunities to provide higher value, denser, new development, it is apparent that the Clyde Metro programme will need to encourage a wider portfolio of, transformational, land use change, regenerating and densifying the existing built environment to help deliver desired outcomes.

Map 6.3: Vacant and derelict land register



VACANT & DERELICT LAND KEY FINDINGS:

ACROSS **1,291 SITES** THERE IS **25.43KM2** OF **TOTAL VACANT OR DERELICT LAND** WITHIN THE STUDY AREA

2/3 OF ALL VACANT & DERELICT LAND AREA DEEMED DEVELOPABLE WITHIN SHORT / MEDIUM TERM. CORRESPONDINGLY, 2/3 OF ALL VACANT & DERELICT SITES ARE DEEMED DEVELOPABLE WITHIN SAME TIME FRAME.
JUST 9% OF TOTAL LAND (KM2) IS DEEMED UNECONOMIC TO DEVELOP / SOFT END USE ONLY.

ALMOST **¼ OF ALL VACANT & DERLICT LAND (6.2KM2)** IS WITHIN **LOCAL AUTHORITY OWNERSHIP.**

ALMOST **40% OF ALL VACANT & DERLICT LAND (9.8KM2)** IS WITHIN CONCENTRATED WITHIN **N.LANARKSHIRE.**

N.LANARKSHIRE ALSO CONTAINS **FOUR OF THE FIVE LARGEST SITES** IN THE STUDY AREA (THREE OF WHICH ARE **CLUSTERED AROUND CLELAND; NEAR MOTHERWELL / WILSHAW**). **THE FOUR SITES ACCOUNT 28%** OF N.LANARKSHIRE'S TOTAL VACANT & DERELICT LAND OFFER.

What does this mean for the Clyde Metro programme?

Outside of Edinburgh, in the large British cities, a lack of density diminishes the effects of city size and leads to low productivity. In the GCR, land use and car dependency have both contributed to the observed outcomes, with industrial legacy, leaving significant brownfield land, also a factor. Inward investment will want, depending on land availability, to cluster around existing economic centres and/or designed growth sites with a coherent programme to support them.

6.4 Connectivity gaps

Map 6.4 (overleaf) shows the trains per hour (tph) to Glasgow city centre across the study area's National Rail and Subway stations. Less connected places face greater difficulty in access to opportunity and attracting inward investment. Significant gaps exist in areas including:

- Glasgow City North and East sectors;
- Glasgow City South West sector; and
- And then on peripheries where more densely populated areas have only low frequencies of service.

6.4.1 High frequency bus routes

High-quality bus routes can fill some of these gaps, but their strength will always be on shorter distance (<5 to 8km) journeys. In 2019 the median bus trip in Scotland was 5.4km[21]. Gaps remain in the bus connectivity in the study area, as shown in Map 6.5 (overleaf). High-frequency bus routes (6+ per hour) are concentrated on the main radials into and out of Glasgow City centre, and on corridors connecting Paisley and Motherwell to surrounding centres. The routes are concentrated in the west and east. Gaps are still evident to the northeast and through Glasgow City southwest to East Renfrewshire. The Scottish Household Survey[22] (SHS) contains questions on why bus services are not used more often at the national level, including, but not limited to:

- "Takes too long" (10% to 20%);
- "Inconvenient" (5% to 10%);
- "No direct route" (5% to 15%);
- "Public transport unreliable" (2% to 5%);
- "Lack of service" (5% to 15%); and
- "Too infrequent" (4% to 6%).

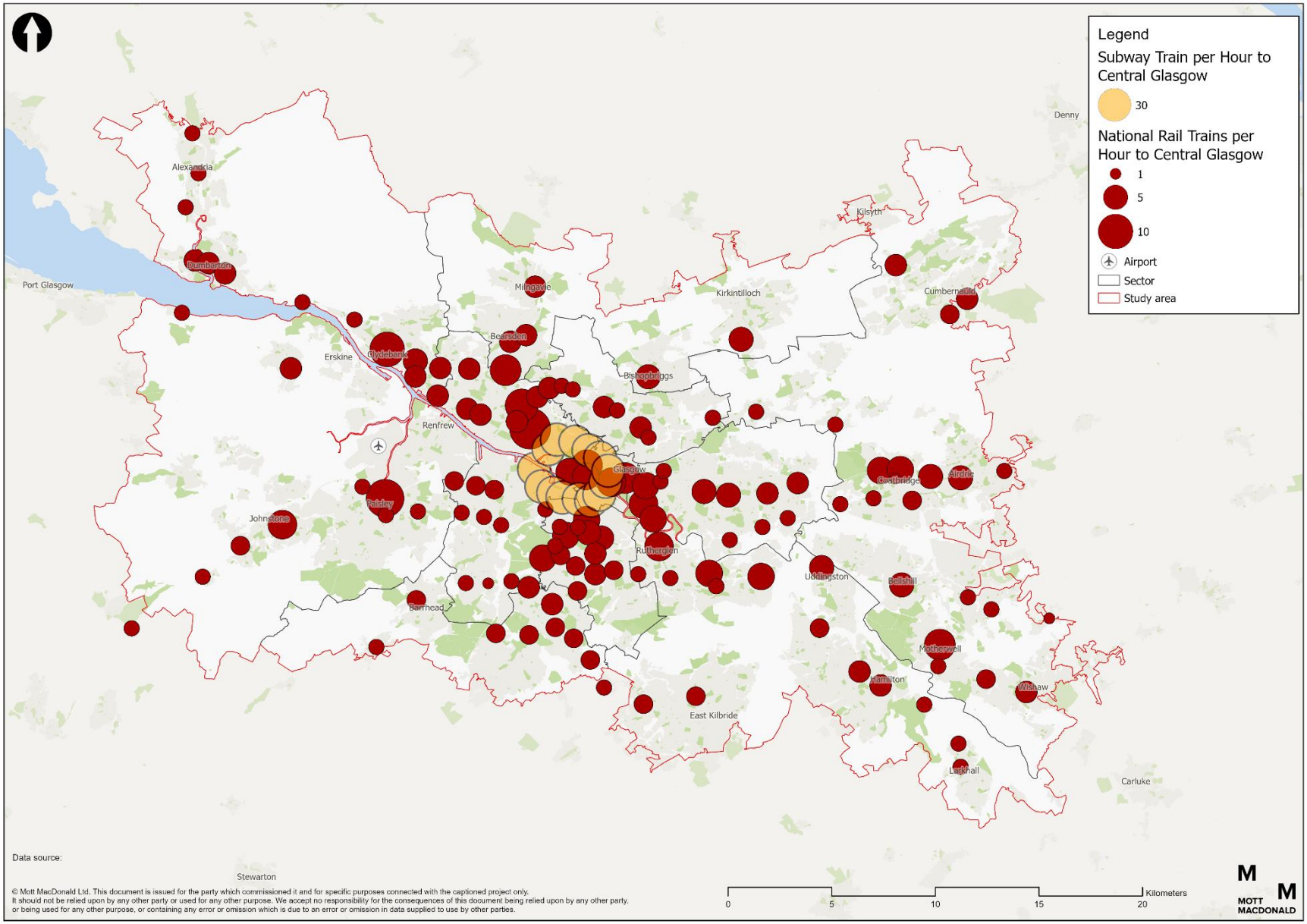
What does this mean for the Clyde Metro programme?

The GCR is seeking to sustain and grow its bus network, including a proposed programme of 'reform' (see Section 7.3.3) to allow greater regional control over bus service specifications. They are a valuable option for trips of up to 8 to 10km, but road traffic congestion and regular stops elongate journey times and create variability and uncertainty.

[21] Transport and Travel in Scotland 2020, Transport Scotland. Available at: <https://www.transport.gov.scot/media/50980/transport-and-travel-in-scotland-2020-results-from-the-scottish-household-survey-pdf-version.pdf>

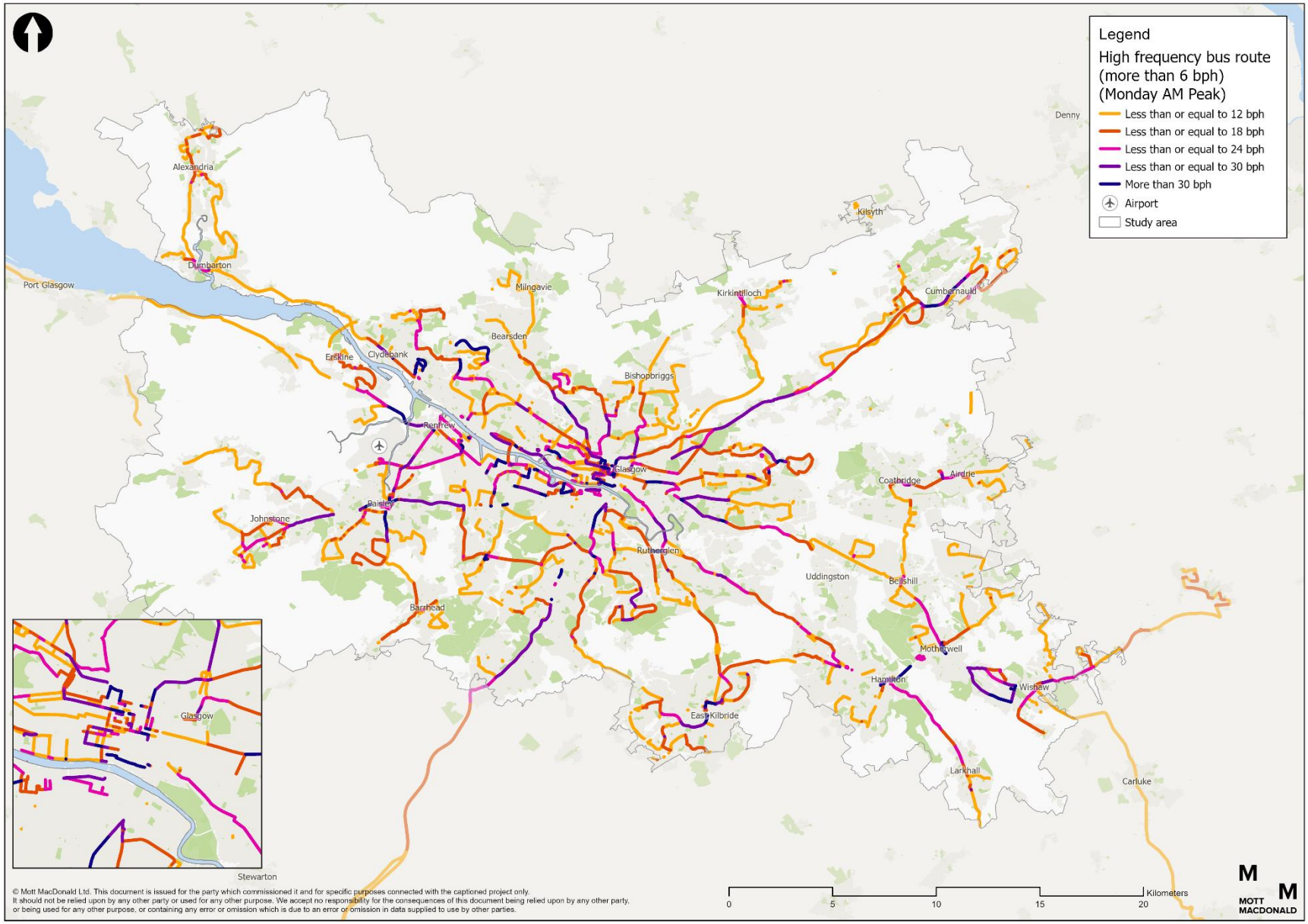
[22] See: Transport and Travel in Scotland 2022 | Transport Scotland. Multiple responses permitted.

Map 6.4: Inequality in connectivity



Source: OS OpenMap and MOIRA OR81

Map 6.5: Bus connectivity



Source: Basemap (Q1, 2024)

6.4.2 First and last mile connectivity

As shown in Map 6.6 (also overleaf), the attractiveness of the rail and subway network is impacted by first/last mile connectivity, including the quality of these routes and severance effects from manmade and natural features. The most significant gaps (>1.2km access/egress), compared to population density, can be observed:

- Renfrew, Inchinnan, and Erskine;
- Southwest of Paisley (Renfrewshire);
- Parts of Roughmussel and Crookston (Glasgow city southwest);
- Newton Mearns (East Renfrewshire);
- Northeast of Glasgow City Centre (Barmulloch and Brookfield); and
- For southern communities in East Kilbride.

What does this mean for the Clyde Metro programme?

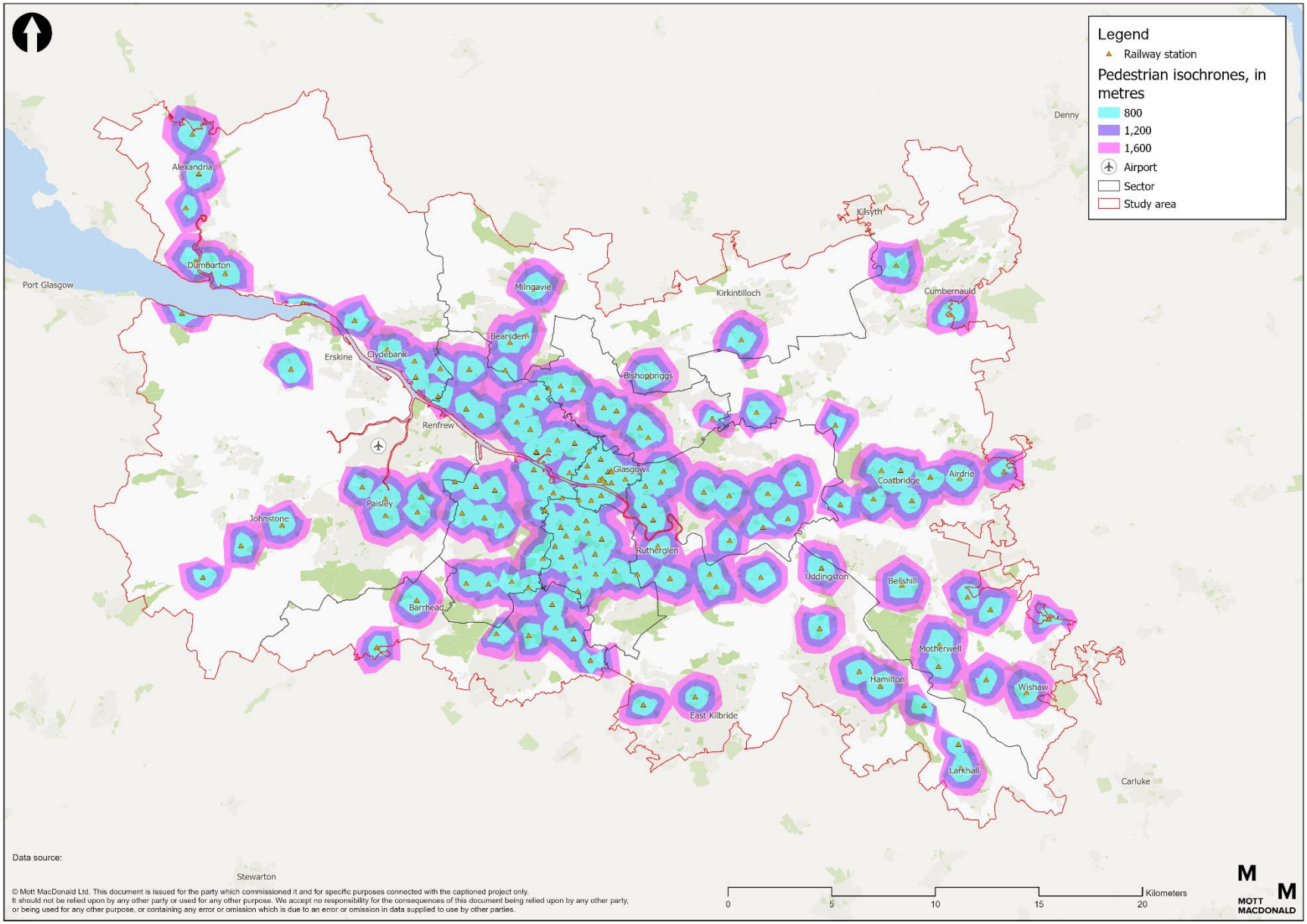
There are significant constraints on access to the major economic opportunities. The benefits of good rail provision at several of the outer urban centres such as Paisley Gilmour Street, Dumbarton, Clydebank, Hamilton, Motherwell, and Coatbridge is apparent. By contrast, large swathes of the urban area have total journey times of 30 minutes plus to access any of the main economic locations. The accessibility gaps are largest in the southern fringe of the urban area, in the southwest quadrant, to the east, and also along the northern fringe where there are gaps in the suburban national rail network.

6.5 Access to opportunities

Map 6.7 (overleaf) shows accessibility to (the nearest[23]) key employment hubs identified throughout the study area. Identification of these hubs was informed by a review of GVA (Total) data (2019 & 2021, DZ) cross-referenced against total employees by Data Zone (2022). This enabled identification of key clusters of both metrics in tandem, and in isolation. Pockets of 'good' accessibility from places served by fast or semi-fast National Rail services can be observed towards the boundary of the study area. More detail on accessibility to Glasgow City Centre is available in Appendix D.

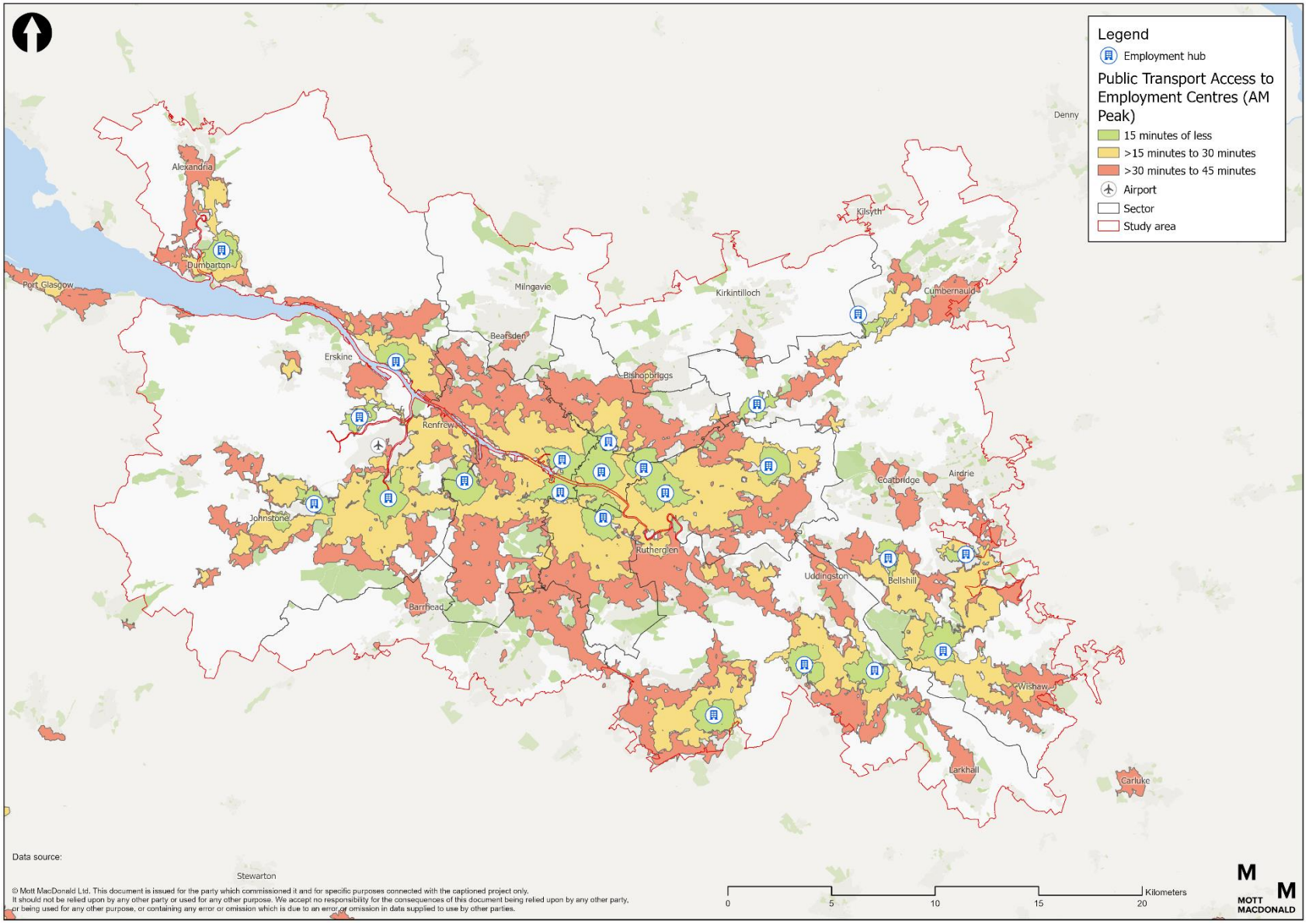
[23] The journey time shown in the mapping indicates access to the most accessible employment hub by public transport.

Map 6.6: First and last mile connectivity to National Rail and Subway stations



Source: OS OpenMap

Map 6.7: Accessibility to Main Economic Centres

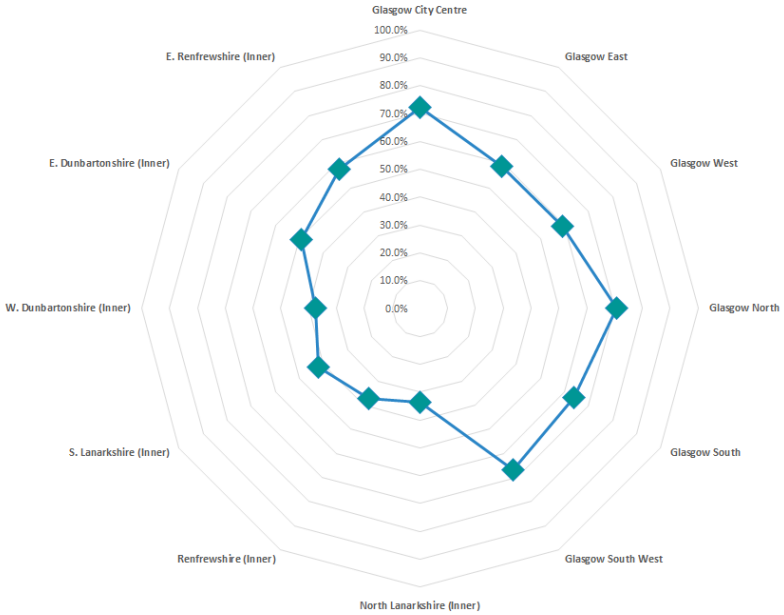


Source: Basemap (Q1, 2024) & Podaris, 2024

6.6 Current travel demand

Chart 6.9 shows the percentage to, from, or within each sub-area which start or end in another sector; for example, 72% of trips which start or end in Glasgow City Centre have the alternative 'trip end' in another sub-area. The City Centre and 'Glasgow City north' have the highest percentages. By contrast, North Lanarkshire, Renfrewshire, and West Dunbartonshire have the lowest, indicative that a high volume of travel demand is internal, i.e. both starting and ending, within that sub-area. Demand, is, naturally, linked to population (see Section 3) and opportunities (see Sections 4 and 7.2) within each sub-area.

Chart 6.9: Percentage of trips to/from other sub-areas



Source: Glasgow Urban Big Data Centre (2022 data)

Chart 6.10, overleaf, summarises total travel demand, as a percentage of all trips observed wholly within the GCR[24]. The most significant volumes can be observed along the internal sub-area axis, i.e. where a trip both starts or ends in the same sub-area:

- North Lanarkshire is greatest at 14%; and
- Renfrewshire and South Lanarkshire both have 9% of all GCR demand both starting and ending within them.

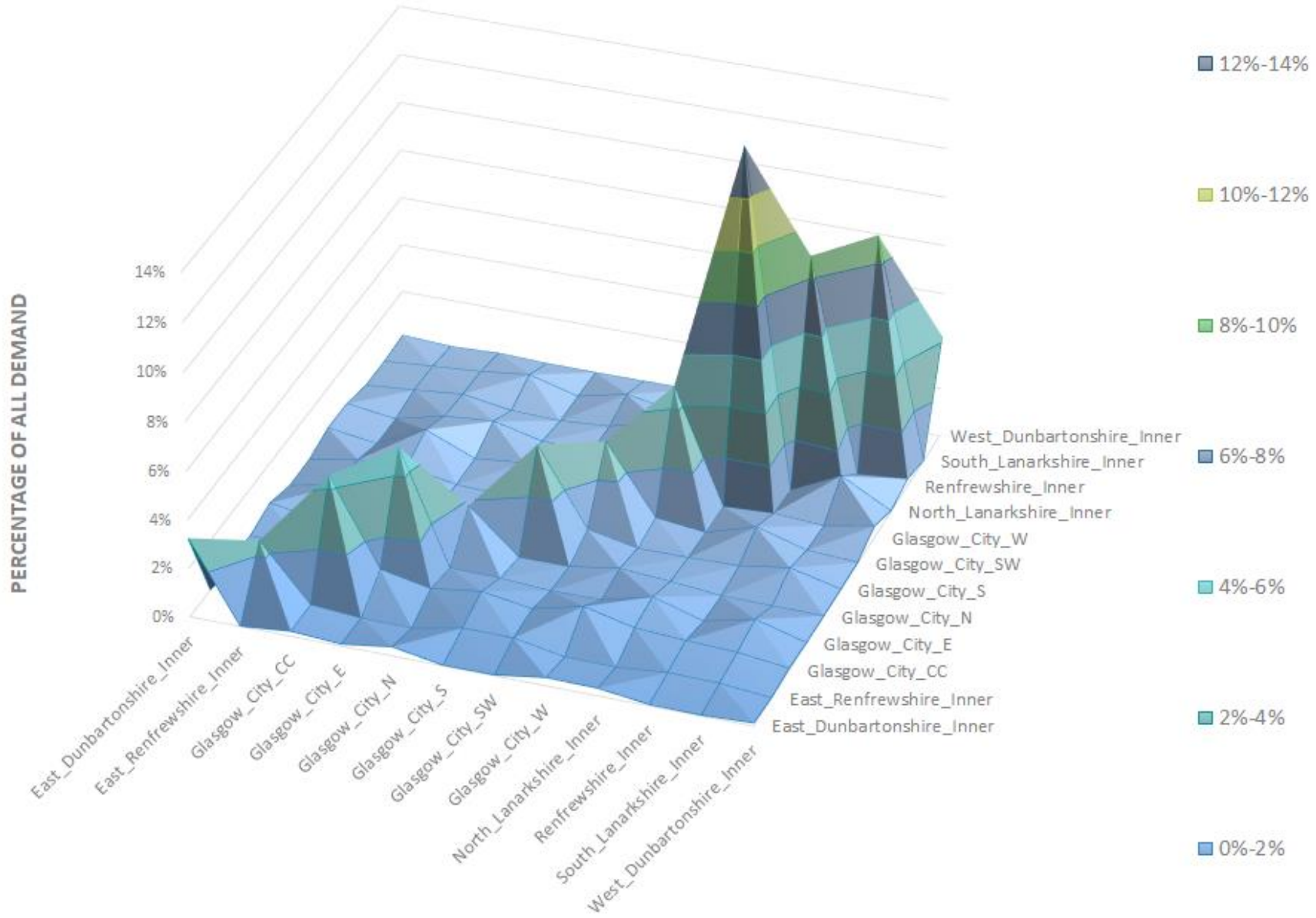
Appendix D contains further analysis of current travel demand.

What does this mean for the Clyde Metro programme?

Travel demand patterns are multi-faceted, combining influences from the volume of resident people, relative attractiveness of places for different journey purposes (with not travelling at all an option), the willingness or ability of people to travel (including constraints from socio-economic or demographic factors), and the relative connectivity between places and the attractiveness of making a trip for the 'reward' it provides. Ultimately, individual and groups will make a trade off of whether there is sufficient value to be gained from making a trip compared to the time, cost etc (and/or effort) it entails. As an example, an individual can be encouraged to take a higher value job further away if travel times and costs to that opportunity are reduced to make it "worth their while". The patterns of travel behaviour observed in GCR will, as elsewhere, therefore be a function of both the attractiveness of existing opportunities and the 'deterrence' from travelling due to the constraints on connectivity and accessibility the current network(s) impose.

[24] This analysis excludes trips to/from places outside of the study area.

Chart 6.10: Total Travel Demand



Source: Glasgow Urban Big Data Centre (2022 data)

The spatial distribution of total demand, shown in Chart 6.10 (all modes and time periods), reflects population, employment, and other opportunities, but is not reflective of the total size of each sub-area (see Section 1.3). Table 6.4 shows average daily[25] (2018) trips from the Strathclyde Regional Transport Model (SRTM), summed across trips both starting and ending in the sub-area[26]. Totals exclude active mode trips. The spatial distribution of trips is consistent with Chart 6.10, but the concentration of demand, given size, in Glasgow City Centre is apparent, with trips per km^2 more than four times greater than the neighbouring west and southern sub-areas of the city (which are also substantially greater than many other sub-areas).

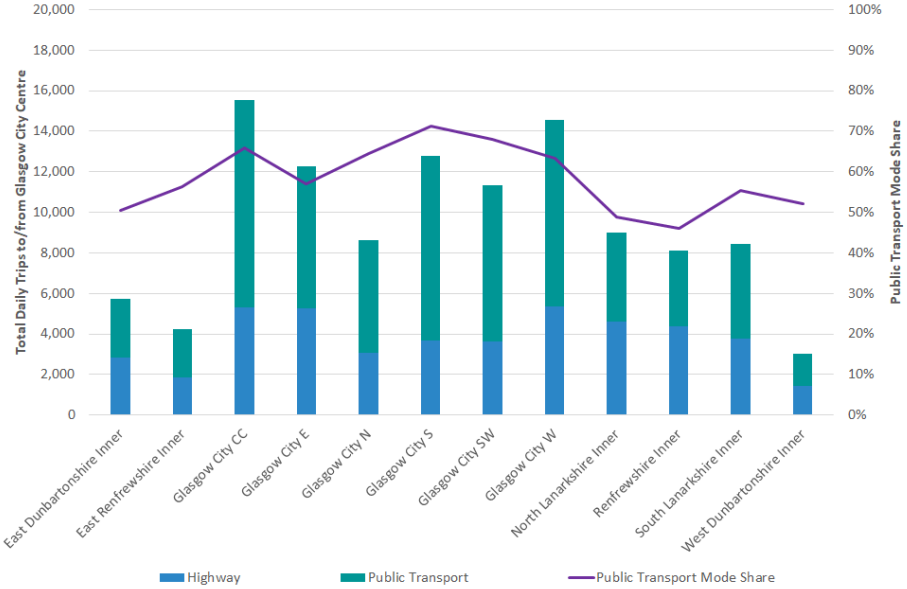
Table 6.4: Average Daily Trips by Sub-Area

Sub-Area	Total Daily Trips	Area (km^2)	Trips per km^2
East Dunbartonshire Inner	50,000	96.2	519
East Renfrewshire Inner	35,000	55.2	635
Glasgow City Centre	115,000	7.1	16,104
Glasgow City East	75,000	48.0	1,563
Glasgow City North	45,000	31.6	1,424
Glasgow City South	65,000	26.5	2,452
Glasgow City Southwest	75,000	35.3	2,127
Glasgow City West	95,000	26.5	3,584
North Lanarkshire Inner	145,000	218.5	663
Renfrewshire Inner	95,000	207.0	459
South Lanarkshire Inner	120,000	139.4	861
West Dunbartonshire Inner	40,000	128.3	312
TOTAL	**955,000**	**1019.7**	**937**

Source: Mott MacDonald from Strathclyde Regional Transport Model Demand Matrices (2018 base year)

Chart 6.11 shows the total daily demand split between road and public transport, and the corresponding mode share for the latter. Total volumes reflect resident populations and proximity to Glasgow City Centre; noting that the absence of active mode trips from the demand dataset will, all else being equal, diminish the total demand for those inner area closer to the centre and also mean the mode shares for highways and public transport are lower in practice.

Chart 6.11: Total Daily Trips and Public Transport Mode Share to/from Glasgow City Centre



Source: Mott MacDonald from Strathclyde Regional Transport Model Demand Matrices (2018 base year)

[25] Demand matrices are limited to the AM peak, Lunchtime PM peak, covering 07:00 to 13:00 and 16:00 to 19:00 only.

[26] Trips which start in one sub-area and end in another, or vice versa, are therefore counted twice in this demand. Trips to/from places outside the study area are excluded.

The greatest volumes of public transport demand are to/from the western, southern, and southwestern sub-areas of Glasgow local authority. These areas also have the highest public transport mode shares, between 60% and 70%. The eastern sub-area of Glasgow has the lowest public transport mode share (57%), and the inner areas of the neighbouring local authorities all have a markedly lower mode share for public transport, at between 45% (Renfrewshire) and 56% (East Renfrewshire). Total demand, despite significant resident populations which are comparable to the Glasgow sub-areas, also diminishes rapidly; for example, the inner parts of Renfrewshire included in the analysis have only half the trips per capita as the 'Glasgow South West' sub-area, and only a quarter of the public transport networks. These results are indicative of constraints on access to opportunity, partly imposed by the current transport network(s).

What does this mean for the Clyde Metro programme?

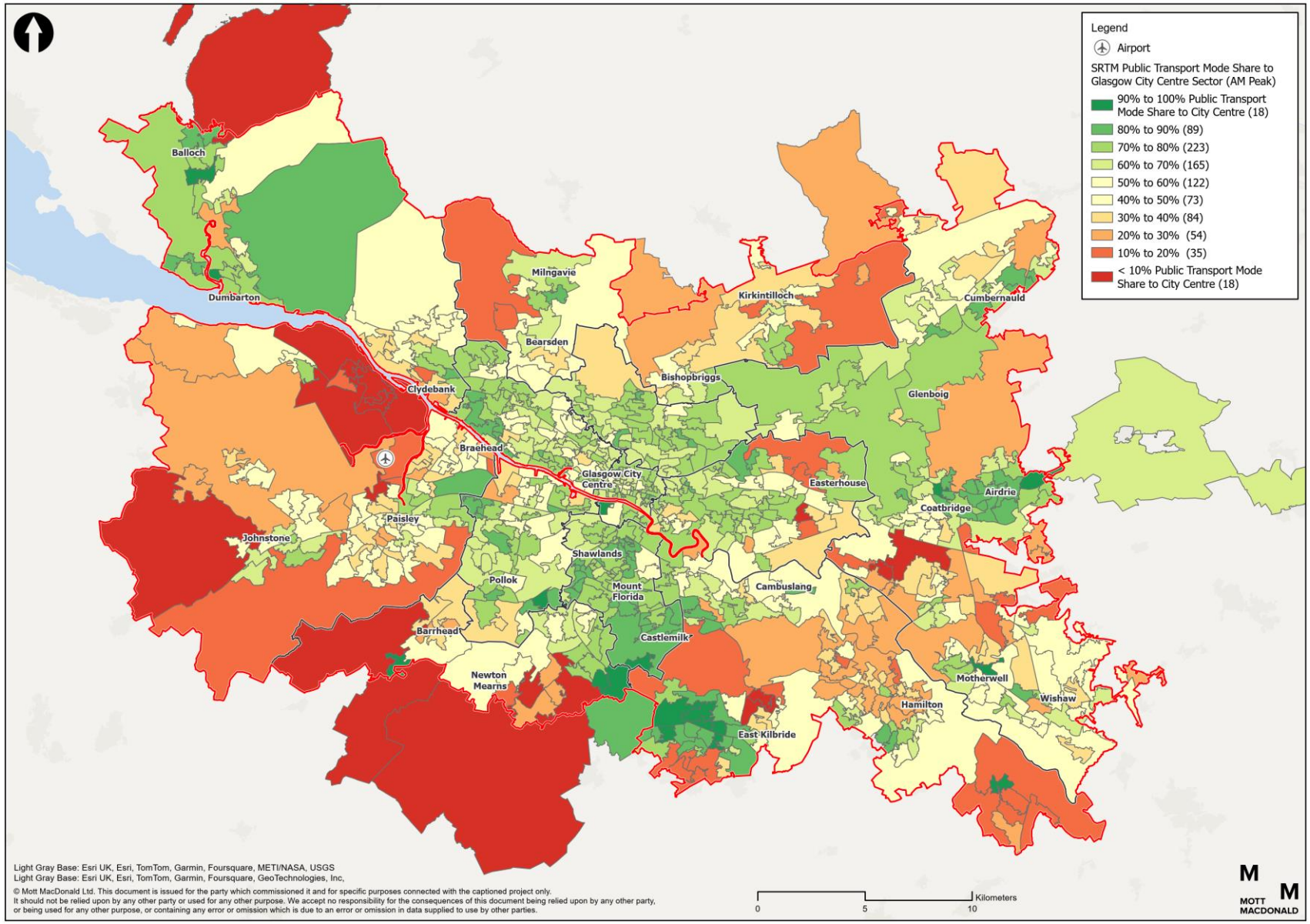
Public transport demand is dependent on high concentrations of trips, reflective of densities of activity which means it can be an efficient and attractive solution. In turn, it also helps support those denser land uses as it can move more people to/from the area than highway alternatives (which require more space for roads and vehicle parking). Analysis shows the dispersed nature of total travel demand, with many trips being relatively short in nature and starting and ending within the same local authority. Considering the trips per km^2, to reflect the role of density, shows concentrations of demand, and where high road mode shares generate adverse externalities due to a lack of alternatives. Demand and mode share analysis also reveals where there are constraints on access to opportunities, and, vice versa, the labour supply available to GCR businesses.

Map 6.8 (overleaf) shows the cluster of higher demand by public transport to Glasgow City Centre in the AM peak (07:00 to 10:00), and the high correlation with the National Rail and Subway networks, and their LoS, shown in Map 6.4, particularly:

- South of the City Centre through Shawlands and Mount Florida, and, with some clear gaps, out to East Kilbride; and
- Northwest and east along the northern bank of the River Clyde, and, again, with some clear gaps, out to Dumbarton, Easterhouses and Airdrie.

Conversely, the places which are underserved, and therefore more car dependent, when people do choose to travel, are also readily apparent, i.e. where the public transport mode share is shown at 60% or less.

Map 6.8: 2018 SRTM AM Peak Public Transport Mode Share to Glasgow City Centre



Source: Mott MacDonald from Strathclyde Regional Transport Model Demand Matrices (2018 base year)

6.7 Car dependency

6.7.1 Car use

Due to the gaps in public transport connectivity, reliance on cars remains high, increasing with distance to the city centre, as shown in Map 6.9 (overleaf), and reductions in density. This is despite low levels of car availability in Map 6.10 (also overleaf). Ribbons of lower car mode shares, seen in Map 6.9, correlate with National Rail routes.

What does this mean for the Clyde Metro programme?

Car dependency creates adverse economic (congestion and de-densification), environmental, and social outcomes. Improving connectivity and increasing the number of opportunities in accessible places will both be vital to addressing car dependency and adverse socio-economic outcomes.

6.7.2 Car availability

Car ownership results from the availability of alternatives, the affordability of owning and operating a vehicle for households and individuals, combined with personal aspirations and lifestyle choices. As shown in Map 6.10, areas of low car availability are correlated with deprivation and household income and/or reduced 'need.' Car dependency results in all areas when alternatives are not sufficiently attractive and efficient.

Access to opportunities is constrained when there is both a lack of alternatives and low incomes/affordability – several distinct areas can be observed where these conditions intersect. A higher need for car availability and use results in reduced densities and negative impacts on 'sense of place'

6.8 Road congestion

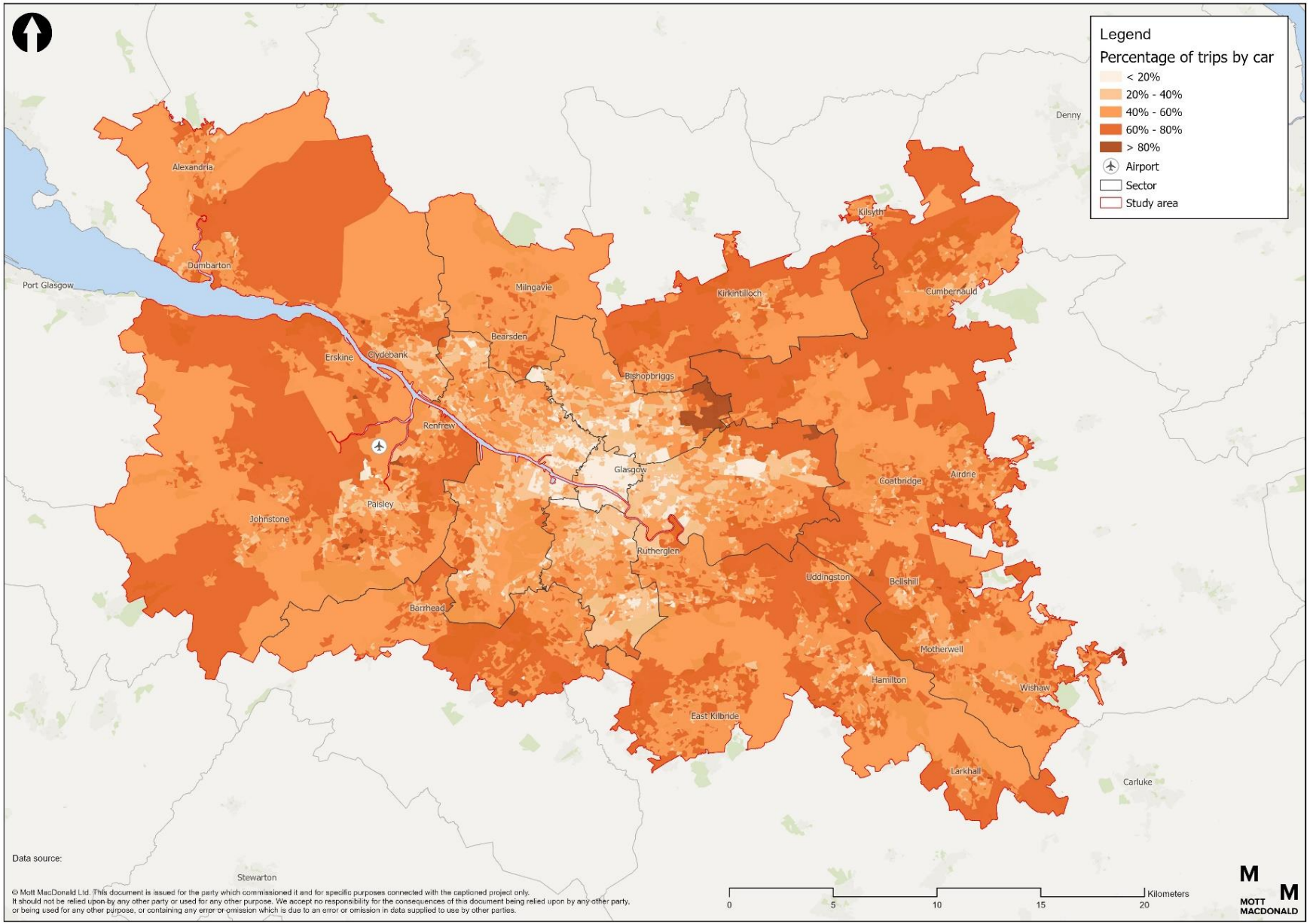
As shown in Chart 6.1, car-kms were, prior to the Covid-19 pandemic, steadily increasing across the GCR, with an expected return, or exceedance, of 2018-19 levels in 2023-24. Analysis of road traffic volumes against available road network capacity is available from the Strathclyde Regional Transport Model (SRTM). Base year, 2018, data is shown in Map 6.11 overleaf. Locations with greatest stress include:

- Radial routes into Glasgow City Centre, including all the motorways, which provide a substantial proportion of all road network capacity, and the A82 through Clydebank and Dumbarton;
- Crossings of the River Clyde identifiable as 'pinch points' along its extent from |Erskine to the M74 east of Glasgow City Centre; and
- Orbital connections on the local A road networks, with the most significant issues identifiable on the:
  - M73 motorway (east of Easterhouse); and
  - A725, linking Airdrie and Coatbridge with Hamilton/Motherwell, East Kilbride and the M77 motorway around the southeastern arc of the GCR.

What does this mean for the Clyde Metro programme?

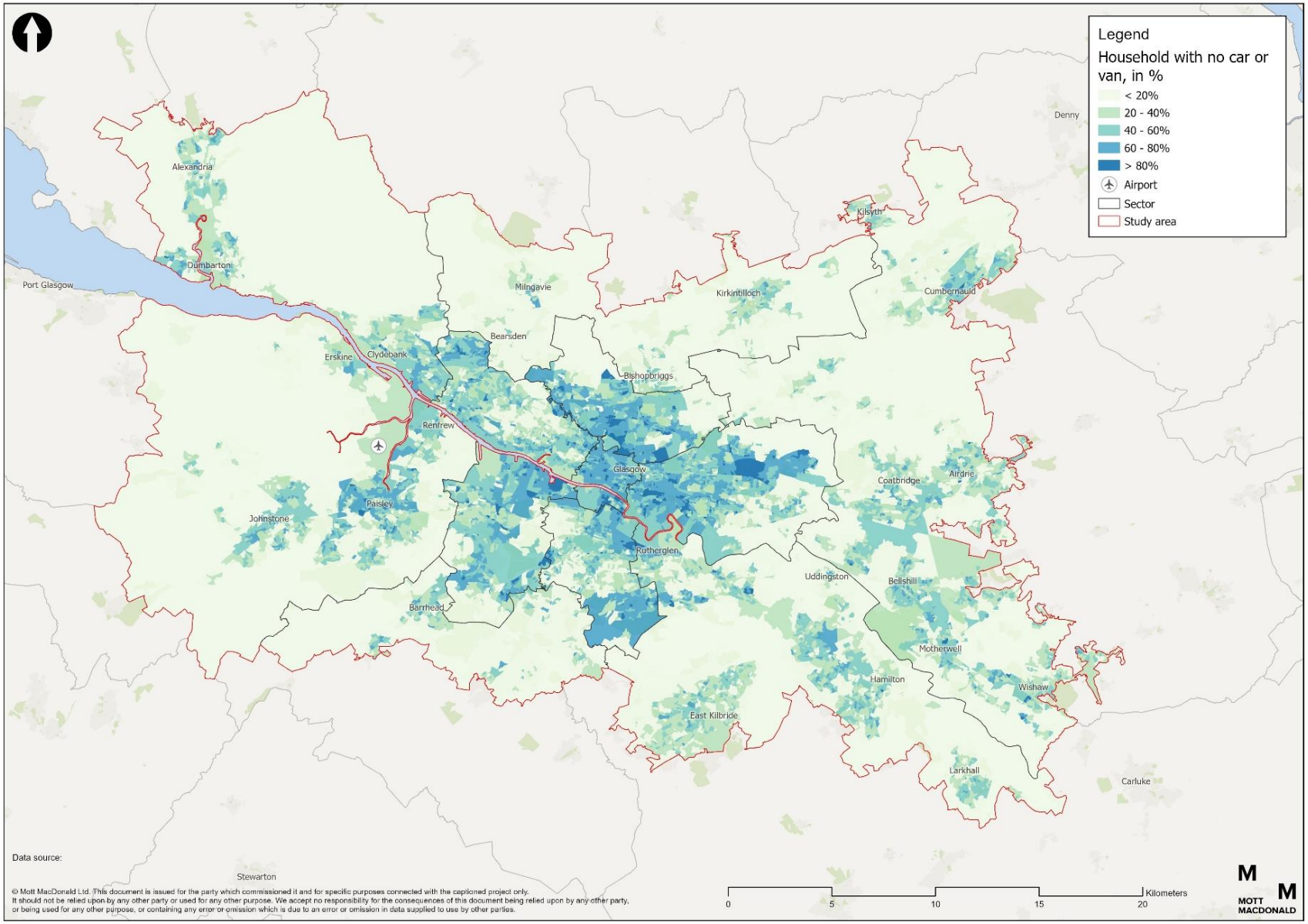
The GCR road network had significant investment during the latter half of the 20th century, with five radial motorway routes providing significant capacity to, from, and through its heart. These links, and other main radial and orbital routes have been operating at capacity for several decades, stymieing the economic potential of the GCR. With a lack of alternatives, a culture of car dependency has arisen, which, in turn, leads to multiple adverse economic, environmental, and social outcomes.

Map 6.9: Percentage of trips by car



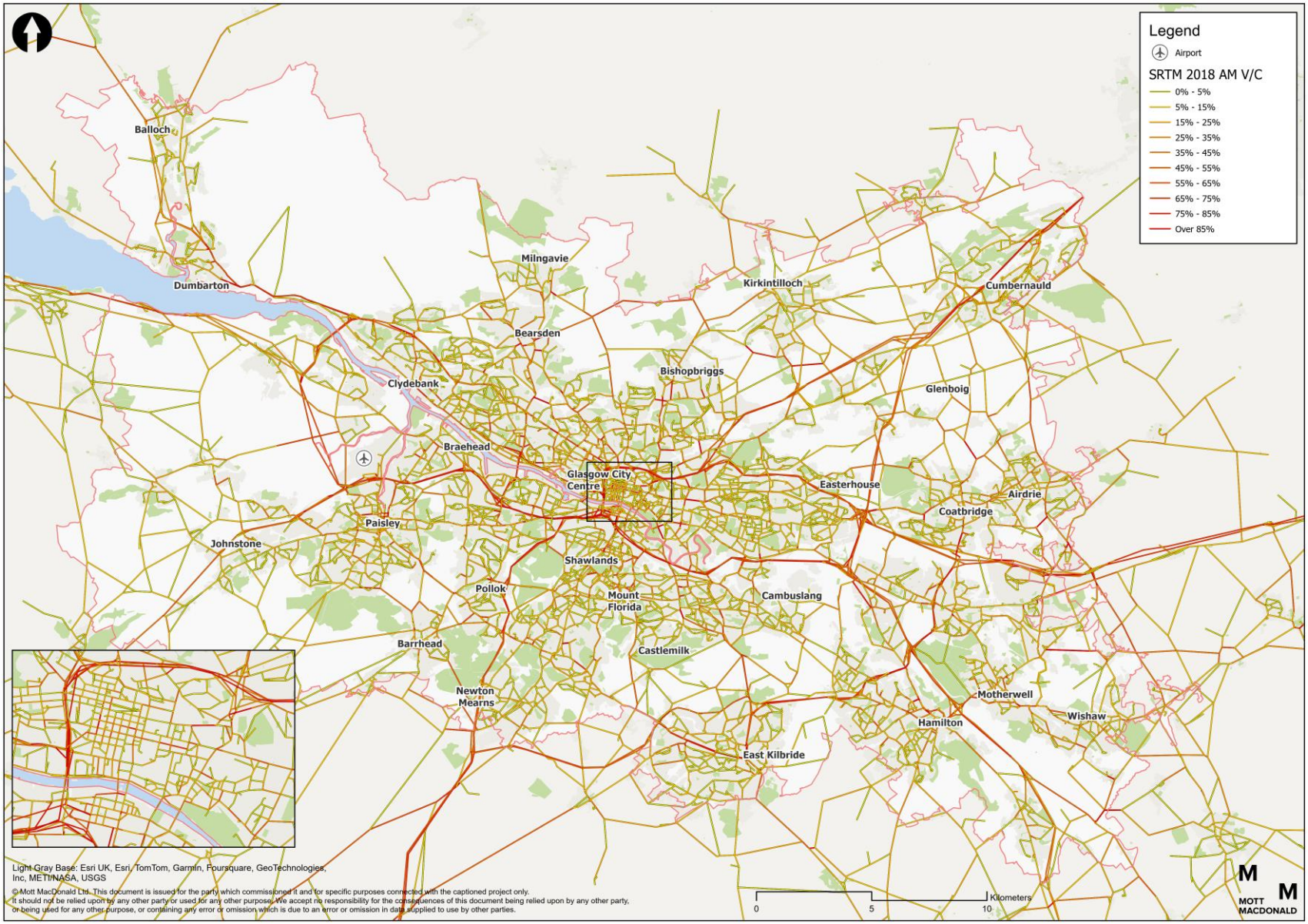
Source: ONS, Census, 2011

Map 6.10: Car availability



Source: ONS, Census, 2011

Map 6.11: Glasgow City Region Road Network Congestion Challenges



Source: Strathclyde Regional Transport Model (Transport Scotland)

6.9 National rail network constraints

6.9.1 Network capacity

Scarce capacity on the National Rail network creates performance issues. As shown in Figure 6.1 (overleaf), there are significant capacity constraints on the approaches to both Glasgow Central and Queen Street (High Level) and at platforms within the stations themselves. Other significant constraints through Partick, Pollokshields, and Rutherglen limit the availability of the existing network to provide a more attractive alternative. Opportunities may, though, be available if alternative city centre provisions can help to release capacity on the existing network.

What does this mean for the Clyde Metro programme?

Without significant investment in infrastructure, providing additional capacity both on tracks and at stations, there is limited scope for increases in National Rail levels of service to and from central Glasgow. Opportunities to enhance provision may exist if some services can be diverted to other routes to, from, and through the city centre, releasing the necessary capacity at the major termini.

6.9.2 Network performance

Chart 6.12 (overleaf) shows the percentage of trains which arrive on time (within one minute of their timetabled arrival) and the absolute number of cancellations at Glasgow Central and Queen Street, split by the termini and through platforms, and at Partick, where many suburban rail services converge on the northwestern bank of the River Clyde.

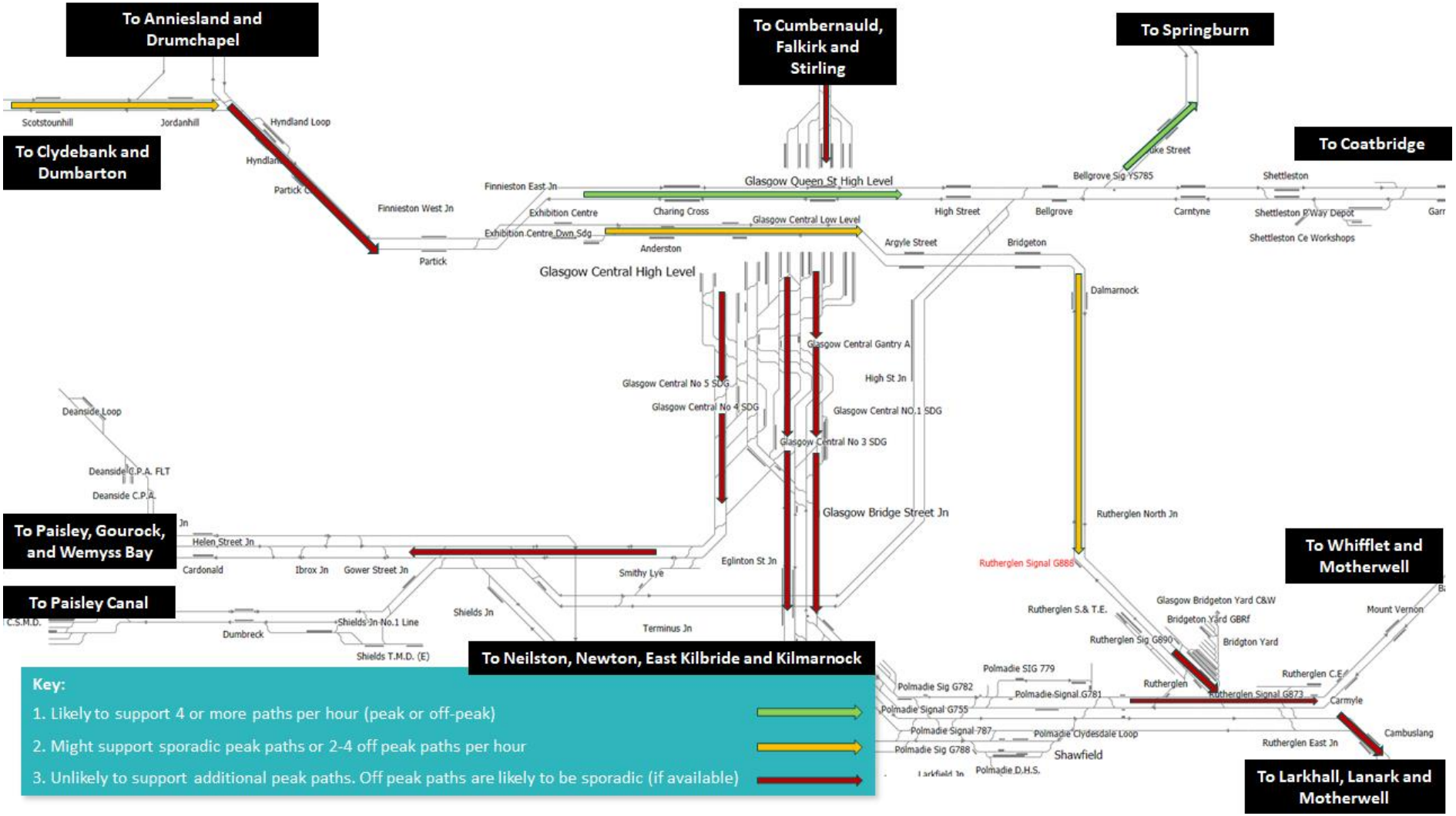
Challenges around punctuality (on time) are, over time, consistent across the GCR network. Performance peaked at the onset of the Covid-19 pandemic, reflecting reductions in demand and supply. Seasonality is prevalent, with performance continually dipping in Period 8 of each financial year (the autumn). Glasgow Queen Street High Level, which allows through services between the northwest and east of the GCR is consistently the lowest performing location.

Partick has the highest number of trains and cancellations, with approximately 5% cancelled, on average, in any period. A similar percentage are cancelled at Glasgow Queen Street Low Level (terminating services from the north of GCR and Scotland).

What does this mean for the Clyde Metro programme?

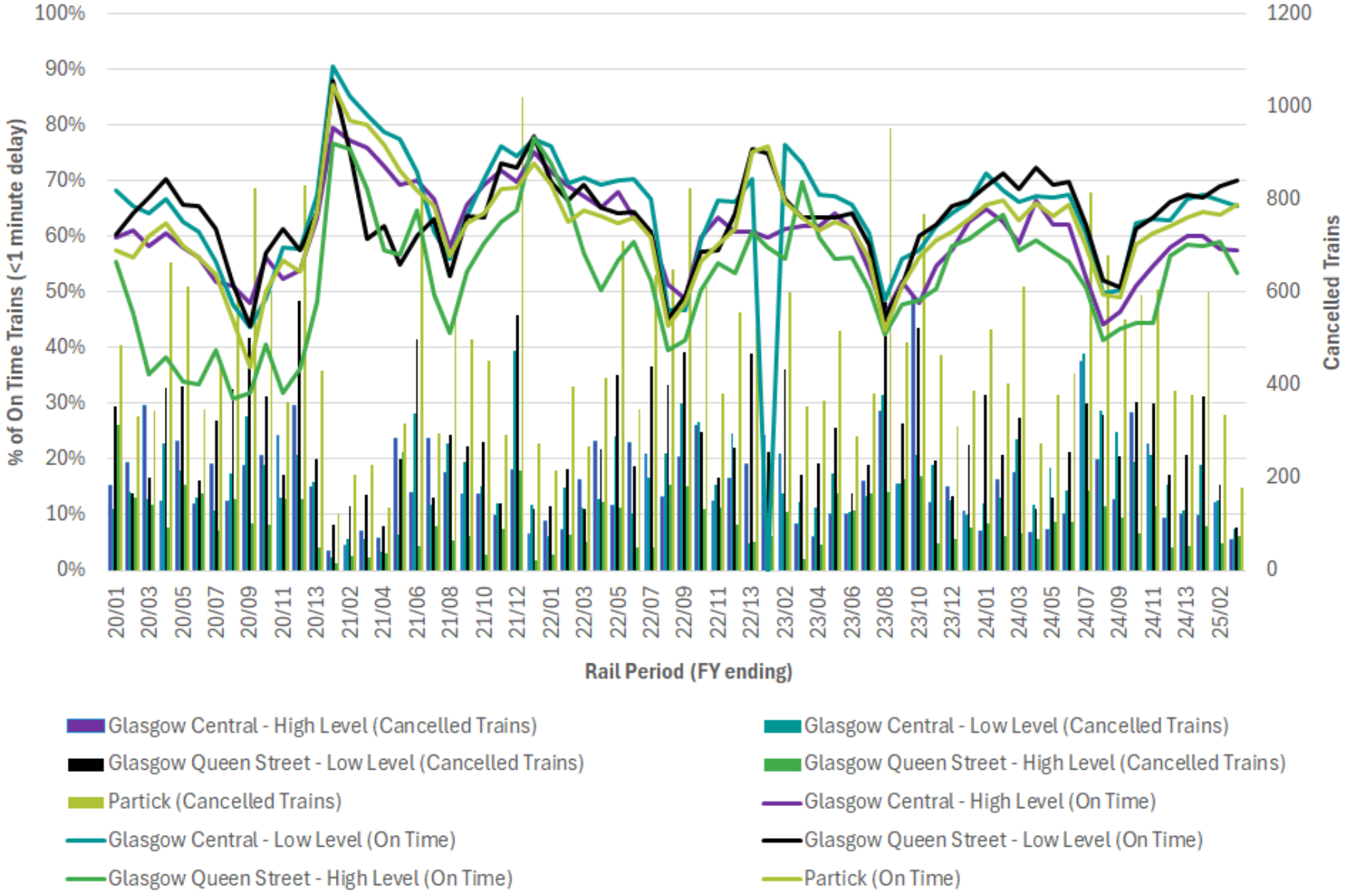
The GCR National Rail network provides an attractive LoS for most places it serves, but the network is stressed with little spare capacity. Combined with infrastructure issues, this results in poor performance. Adverse rail performance indicates on the ability of people to access opportunities, is detrimental to inward investment, and limits rail demand (reinforcing car dependency). There will be opportunities to enhance performance from converting some suburban routes to alternative modes, removing services from the most congested locations while releasing capacity for routes that remain as National Rail operations. Freight and interurban services, plus the need to maintain diversionary routes, will affect this potential opportunity.

Figure 6.1: Capacity constraints on the National Rail networks



Source: Mott MacDonald from Network Rail inputs

Chart 6.12: Glasgow Area Rail Network Performance (2019 to 2024) – ScotRail Services Only



Source: ScotRail

6.10 Integration of networks

As evident in Map 6.12 (overleaf) and Table 6.5, 13% of all rail stations within the study area are not within 200m of a bus stop or are not served by any buses during the AM Peak. There are few dedicated bus station across the GCR, with Buchanan Street, East Kilbride, Govan, Greenock, Hamilton, and Partick being the principal dedicated locations. Almost 2/3 of all Rail Stations which are served by 30 buses per hour (bph) or more in the AM Peak are located within Glasgow City. Key local centre stations such as Clydebank (171bph), Hamilton Central (97bph), Motherwell (74bph) and Paisley Gilmour St. (47bph) / Canal (35bph) benefit from strong integration with the local bus network.

Table 6.5: 10 Rail Stations with Highest Number of Buses Stopping within 200m Radii p/h Buses at Stops p/h

Rank (& Map Label)	Rail Station	Sector	Total bph within 200m Radii
1	Argyle Street	Glasgow City CC	215
2	Buchanan Street	Glasgow City CC	210
3	*Clydebank*	*West Dunbartonshire (Inner)*	171
4	St Enoch	Glasgow City CC	163
5	Glasgow Queen Street	Glasgow City CC	156
6	Glasgow Central	Glasgow City CC	120
7	Bridge Street	Glasgow City CC	107
8	*Singer*	*West Dunbartonshire (Inner)*	99
9	*Hamilton Central*	*South Lanarkshire (Inner)*	92
10	Kelvinhall	Glasgow City (West)	89

Source: Podaris, 2024, Analysis by Mott MacDonald

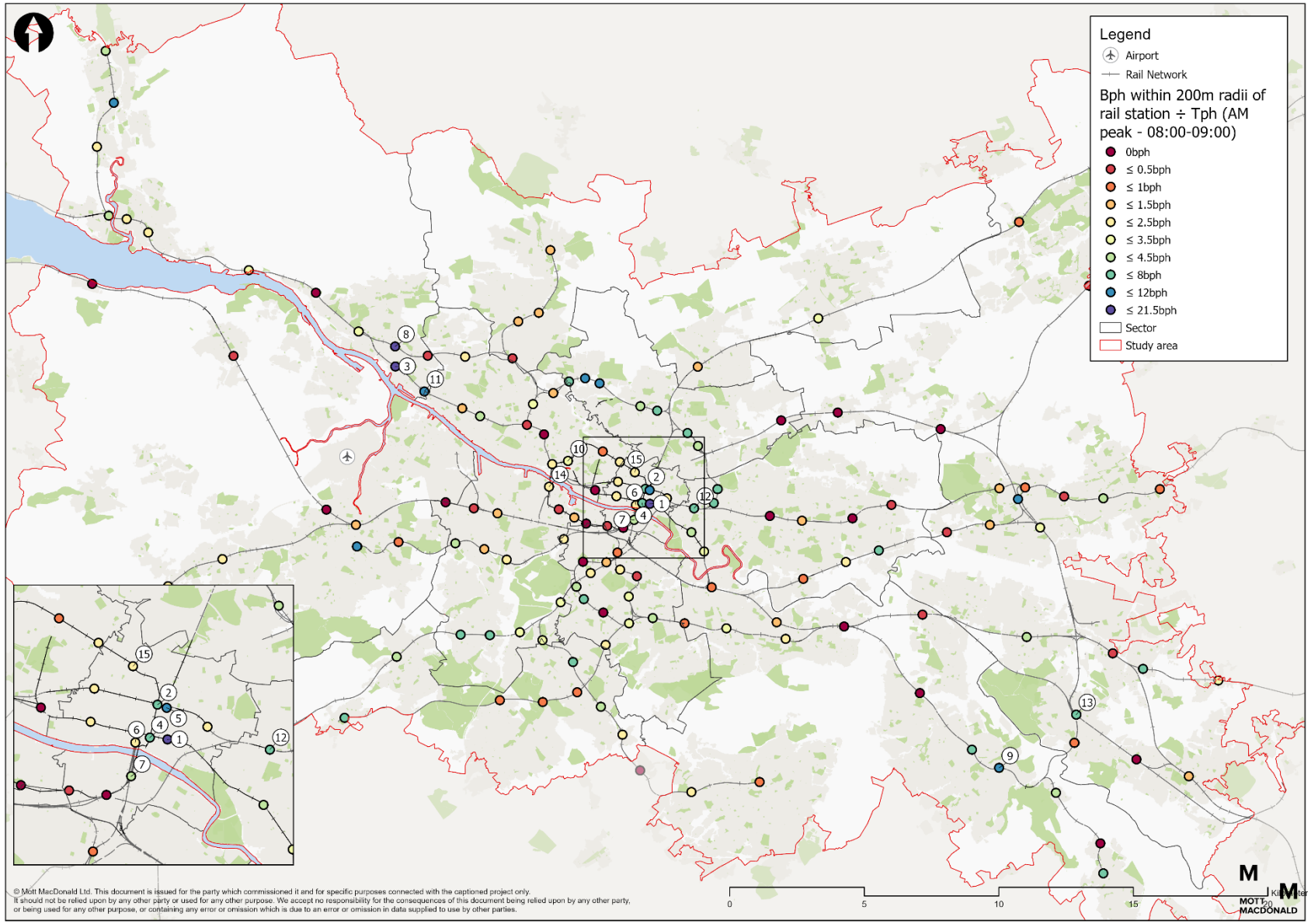
6.11 Physical accessibility

As shown in Map 6.13 (also overleaf), just 30% of stations within the network are fully accessible to persons with restricted mobility. 25% of stations across the six Glasgow City Centre sectors are fully accessible. South Lanarkshire (inner) is the only sector with over 50% of its stations fully accessible (53%). Detailed data on rail accessibility per sector is available in Appendix D.

What does this mean for the Clyde Metro programme?

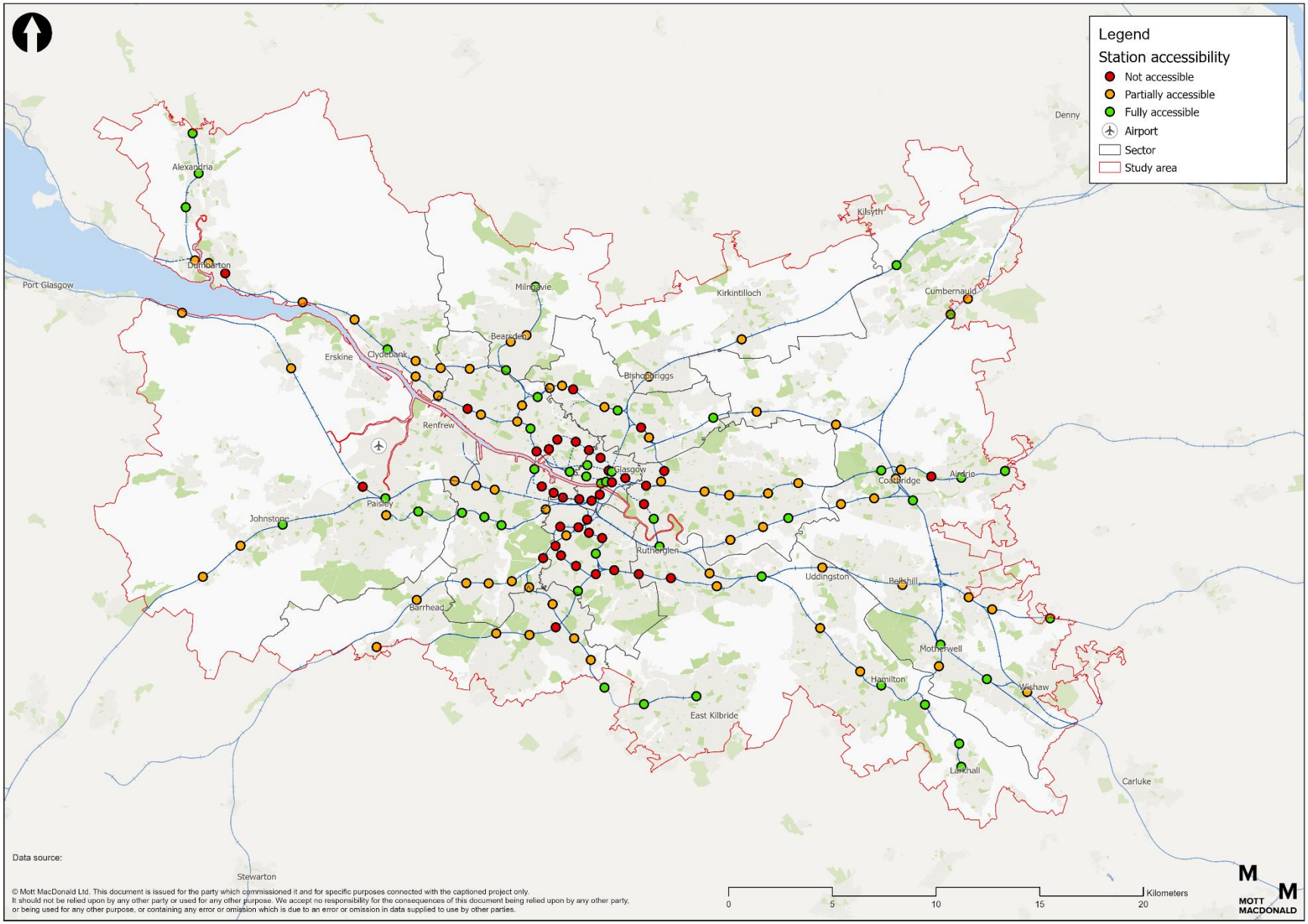
The effort involved in using public transport can be a significant barrier. Cognitive effort involves the planning of the trip, physical effort the ability to complete the trip through first/last miles, stops/stations, and onboard, and affective effort the stress and anxiety which can arise from multiple facets of the network and service. Physical barriers to travel are the most visual constraint, affecting more than just persons of restricted mobility, but many more barriers from the cognitive and affective effort involved which can preclude or limit people's ability to use the network(s). These must also be considered to realise the intended benefits, including integration with the wider transport portfolio.

Map 6.12: Isolated networks



Source: Basemap (Q1, 2024) & Podaris, 2024

Map 6.13: Rail transport inequalities

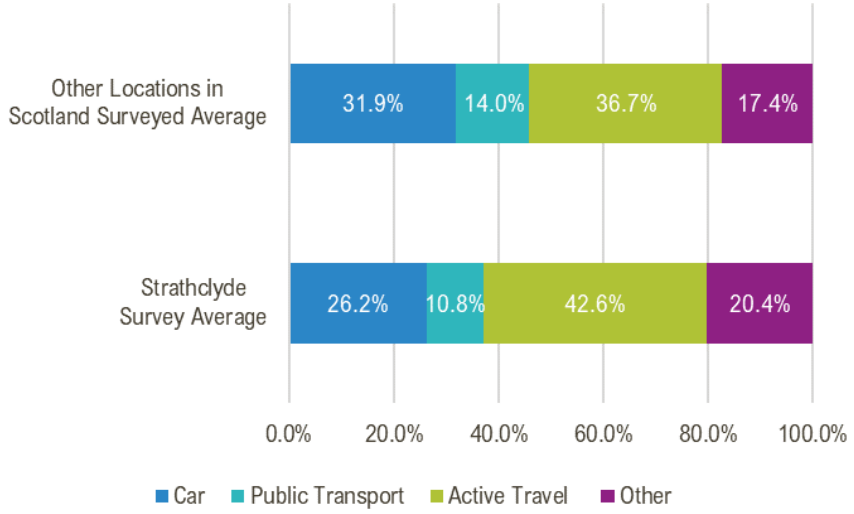


Source: National Rail Accessibility Map, Adapted by Mott MacDonald

6.12 Method of Travel to Station Survey Data

Chart 6.13 illustrates findings of a method of travel to station survey data from Autumn 2023. It can be seen when separating Study Area stations (21) from all other stations included in the survey across Scotland (47) car and public transport usage is higher in the former, and active travel usage lower (i.e. higher in Strathclyde).

Chart 6.13: Method of Travel to Station Survey (Autumn 2023)



Source: ScotRail Market Insights Team

What does this mean for the Clyde Metro programme?

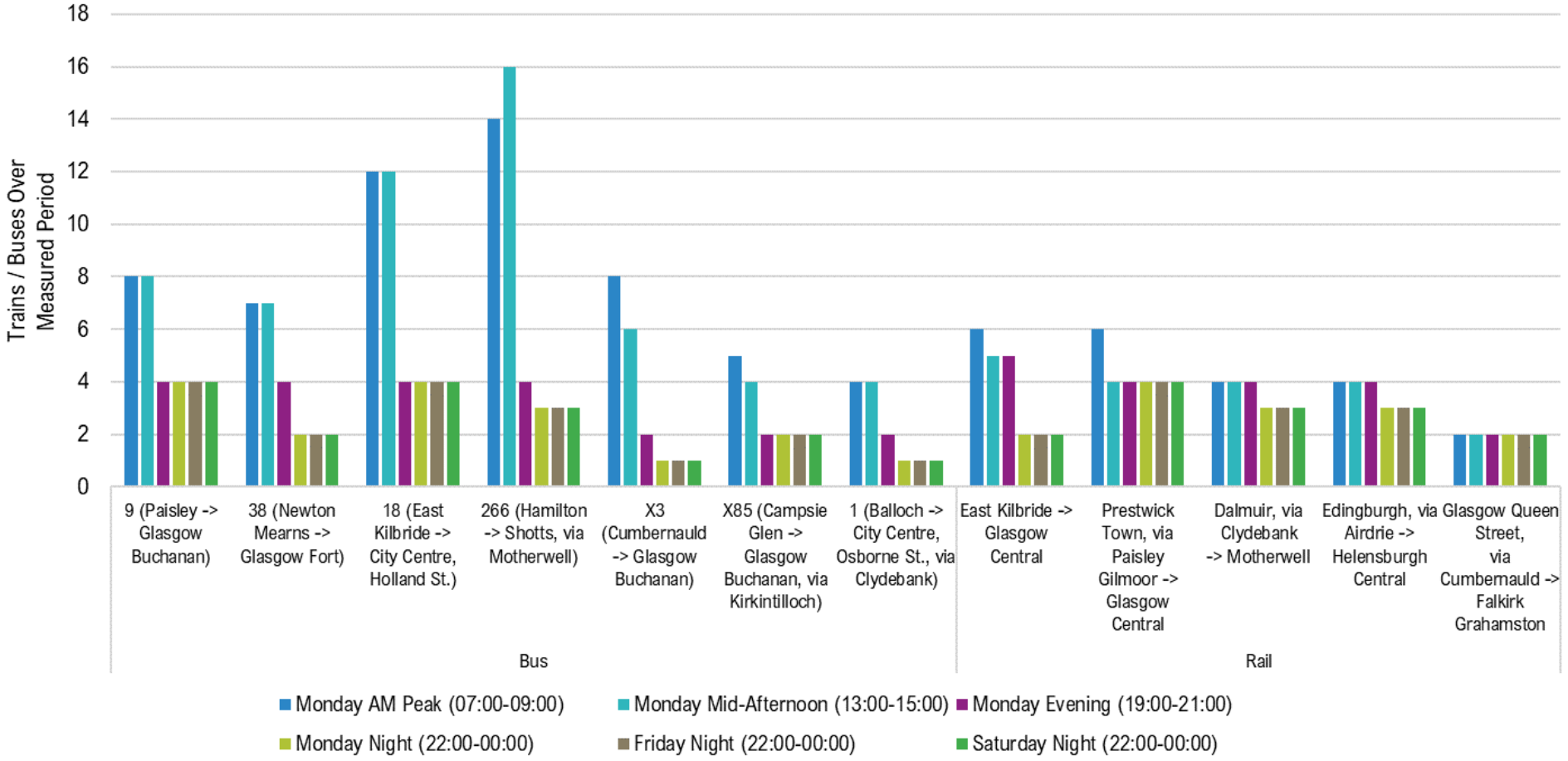
Although over half (25) of stations in other parts of Scotland included in the survey were defined as 'rural', public transport usage to access stations outside the study area was, on average, higher. This indicates both a greater density in the study area, and an associated propensity to walk, but also poorer levels of public transport integration between rail and other modes of public transport at stations.

6.13 Variations in level of service

Chart 6.14 (overleaf) provides an overview of the changes in frequency of selected services across the study area at various times of day / days of the week. The most significant drop offs in service frequency occur with bus as all services (except the 38) experience a 50% or more drop off in service frequencies between the Monday mid-afternoon and a Monday evening. Frequencies reduce by more than two-thirds for the 18, 266 and X3. Notably, the X3 and the 1 also have no services running after 23:00.

It can be seen the only location which sees a marked drop off from daytime frequencies for rail services is East Kilbride, however it is worth noting of services reviewed this is the only service which continues past midnight. In addition, it can be seen even during peak operating times the Glasgow Queen St. – Falkirk service operates at just 2tph.

Chart 6.14: Service levels for selected rail and bus services at different times of day



Source: bustimes.org and RealTrainTimes

6.14 Key takeaways

Key takeaways

- Glasgow's low density is evident nationally and internationally. The percentage of people living in areas of high density (greater than 6,000 residents per square km) in the GCR is lower than Edinburgh, and much lower than European comparators. These counterparts also observe better economic outcomes.
- Outside of Edinburgh, in the large British cities, a lack of density diminishes the effects of city size and leads to low productivity.
- In the GCR, land use and car dependency have both contributed to the observed outcomes, with industrial legacy, leaving significant brownfield land, also a factor.
- Inward investment will want, depending on land availability, to cluster around existing economic centres and/or designed growth sites with a coherent programme to support them.
- High-quality bus routes can fill some gaps in access, but their strength will always be on shorter distance (<5 to 8km) journeys. Gaps remain in the study area. High-frequency bus routes (6+ per hour) are concentrated on the main radials into and out of Glasgow City centre, and on corridors connecting Paisley and Motherwell to surrounding centres. The routes are concentrated in the west and east. Gaps are still evident to the northeast and through Glasgow City southwest to East Renfrewshire
- The attractiveness of the rail and subway network is impacted by first/last mile connectivity, including the quality of these routes and severance effects from manmade and natural features. The most significant gaps (>1.2km access/egress), compared to population density, can be observed:
  - Renfrew, Inchinnan, and Erskine
  - Southwest of Paisley (Renfrewshire)
  - Parts of Nitshill and Crookston (Glasgow city southwest)
  - Newton Mearns (East Renfrewshire)

Key takeaways

  - Northeast of Glasgow City Centre (Barmulloch and Brookfield)
  - For southern communities in East Kilbride
- There are significant constraints on access to the major economic opportunities. The benefits of good rail provision at several of the outer urban centres such as Paisley Gilmour Street, Dumbarton, Clydebank, Hamilton, Motherwell, and Coatbridge is apparent.
- By contrast, large swathes of the urban area have total journey times of 30 minutes plus to access any of the main economic locations. The accessibility gaps are largest in the southern fringe of the urban area, in the southwest quadrant, to the east, and also along the northern fringe where there are gaps in the suburban national rail network.
- Travel demand patterns are multi-faceted, combining influences from the volume of resident people, relative attractiveness of places for different journey purposes (with not travelling at all an option), the willingness or ability of people to travel (including constraints from socio-economic or demographic factors), and the relative connectivity between places and the attractiveness of making a trip for the 'reward' it provides.
- Ultimately, individual and groups will make a trade off of whether there is sufficient value to be gained from making a trip compared to the time, cost etc (and/or effort) it entails. As an example, an individual can be encouraged to take a higher value job further away if travel times and costs to that opportunity are reduced to make it "worth their while".
- The patterns of travel behaviour observed in GCR will, as elsewhere, therefore be a function of both the attractiveness of existing opportunities and the 'deterrence' from travelling due to the constraints on connectivity and accessibility the current network(s) impose.

Key takeaways

- There are clear patterns of total travel demand and mode shares which show both reduced access to opportunities and services, also diminishing labour supply for businesses, and a lack of alternative generating high dependency on the car. Total demand (and per capita), and public transport mode shares, to/from Glasgow City Centre diminish in the east of Glasgow local authority and the inner areas of all neighbouring local authorities. There are multiple clusters where public transport mode share is below 60% across the Glasgow sub-areas and the inner urban areas of the neighbouring areas which are indicative of being underserved.
- Due to gaps in public transport connectivity, reliance on cars remains high, increasing with distance to the city centre and reductions in density. This is despite low overall levels of car availability. Ribbons of lower car mode shares correlate with National Rail routes.
- Car dependency creates adverse economic (congestion and de-densification), environmental, and social outcomes. Improving connectivity and increasing the number of opportunities in accessible places will both be vital to addressing car dependency and adverse socio-economic outcomes.
- Without significant investment in infrastructure, providing additional capacity both on tracks and at stations, there is limited scope for increases in National Rail levels of service to and from central Glasgow.
- Opportunities to enhance provision may exist if some services can be diverted to other routes to, from, and through the city centre, releasing the necessary capacity at the major termini.
- The effort involved in using public transport can be a significant barrier. Cognitive effort involves the planning of the trip, physical effort the ability to complete the trip through first/last miles, stops/stations, and onboard, and affective effort the stress and anxiety which can arise from multiple facets of the network and service. Physical barriers to travel are the most visual constraint, affecting more than just persons of restricted mobility, but many more barriers from the cognitive and affective effort involved which can preclude or limit people's ability to use the network(s). These must also be considered to realise the intended benefits, including integration with the wider transport portfolio.

7 The opportunities explored

This section explores the opportunities that may be unlocked or supported by the Clyde Metro programme. The review of opportunities covers three main areas of focus where opportunities are concentrated:

- Development areas. These are the areas where most future development is projected to happen, as outlined in development policies. Future development will result in increased pressure on public transport both locally and across GCR. At the same time, investment in transport infrastructure in these areas will help enable and future-proof development.
- Place-based quality of life attractions. These are the cultural and educational areas that are strong attractors for visitors and short-term residents.
- Integration with the wider, complementary, transport investment portfolio to deliver multiplier effects from the Metro programme.

7.1 Development areas

The Clyde Plan[27] allocated over 90,000 new dwellings in the next 10+ years, with over three quarters for delivery post-2026. These allocations will be superseded by the outputs of NPF4[28] and the Regional Spatial Strategy (RSS) and Local Development Plans (LDPs) are being updated accordingly (as of 2024 Q2) with new targets for each GCR authority. While quantums may change, the pattern of 'within plan' spatial development is unlikely to change. Significant clusters are around Glasgow City Centre, Bishopton, Clydebank, Drumchapel, Easterhouse, and Motherwell. As seen in Map 7.1 (overleaf) North Lanarkshire (Inner), Glasgow City (East) and Renfrewshire (Inner) are the sectors with the greatest volume of development forecast; collectively accommodating 47% of total development[29]. A detailed overview of total sub-area residential development capacities is shown in Chart 7.1 overleaf. Appendix A contains total area-by-area quantums.

What does this mean for the Clyde Metro programme?

The Clyde Plan and accompanying Clyde Mission have identified a significant programme of place-based regeneration. The discrete clusters of significant housing growth will require sustainable transport provision of they are to be realised in full while adhering to the wider GCR policy outcomes for people, places, and the environment. Economic development is more tightly clustered, and, as well as Glasgow City Centre and large sites around the edge of the urban area, there is a concentrated 'ribbon' of opportunity on the south bank of the River Clyde.

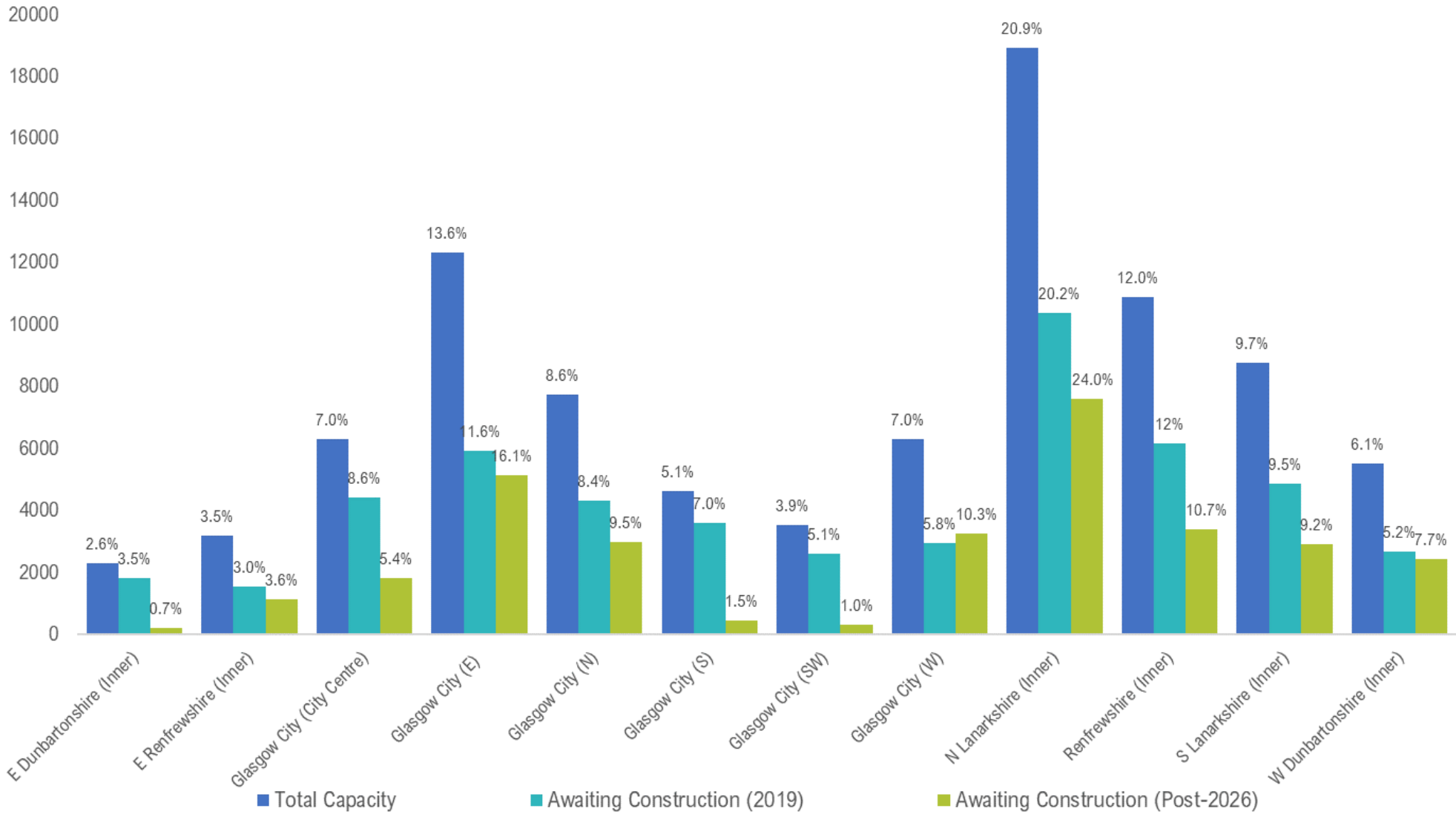
The Clyde Plan also designated areas for economic development in Map 7.2 (overleaf). Over 1,000 hectares are zoned for employment across over 300 sites. Denser, lower-hectare, development clustered around the main inner Economic Development Areas. The Clyde Mission area extends along the river to the west of Glasgow City Centre and is a focus area for growth. There are significant volumes of sites on the northeast and southeast (Rutherglen to Cambuslang) corridors. Several sites are located outside of the main urban area. Most sites can help areas with lower employment density. Overall, this map sets out the development areas in the GCR. The focus on these may lend itself to transformational change in some districts. Supporting development growth with additional transport links would help to bolster the viability and value of land.

[27] Available at: <https://www.clydeplan-sdpa.gov.uk/>

[28] See: Draft NPF4: Housing Land Requirement - Explanatory Report (www.gov.scot)

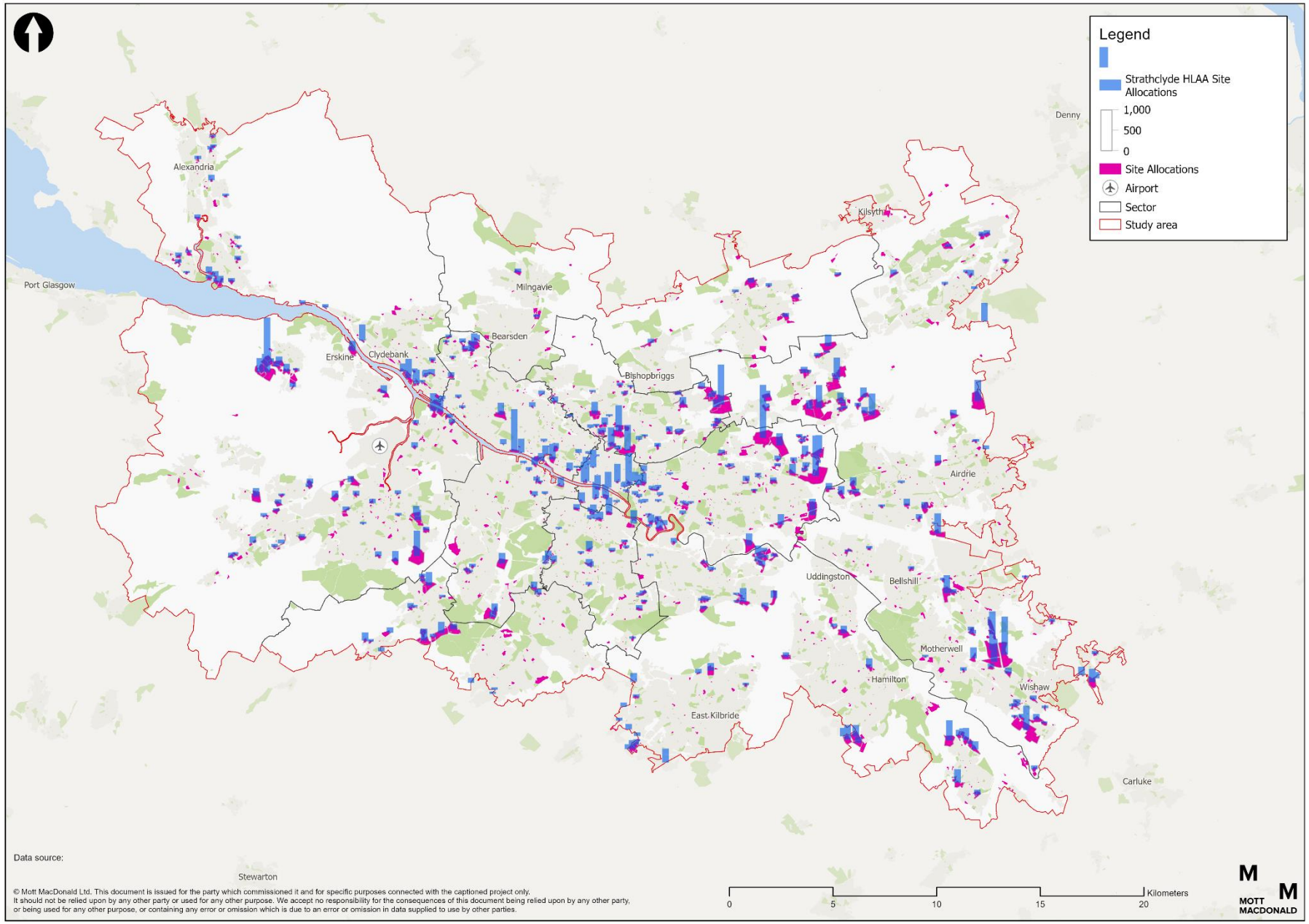
[29] 42,153 of the 90,503 residential units forecasted across the 12 sectors are concentrated in North Lanarkshire (Inner), Glasgow City (East) and Renfrewshire (Inner).

Chart 7.1: Total Capacity of HLAA Sites Across Sectors by Estimated Delivery Timeframe

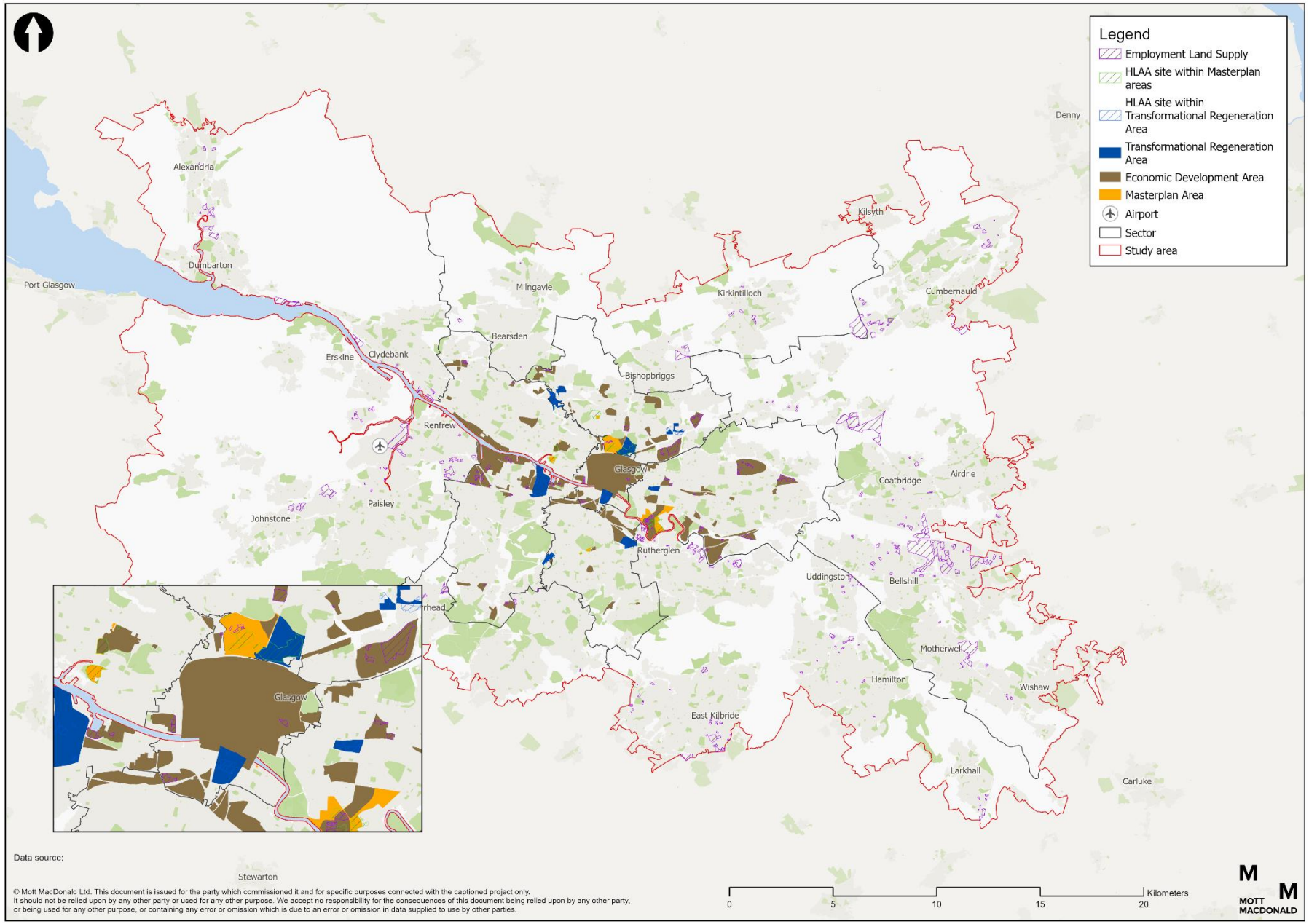


Source: Clydeplan, adapted by Mott MacDonald ***N.B.: Percentages show proportion of units being delivered within sector within applicable timeframe per key***

Map 7.1: Clyde Plan Housing Allocation



Map 7.2: Clyde Plan Employment Land and Economic Growth Area Allocation



7.2 Place-based quality of life attractions

7.2.1 Leisure, culture, and recreation facilities

The GCR is home to a wide variety of culture, leisure, and recreation venues, supporting 'sense of place' and economic sectors such as 'accommodation and food services' – as shown in Map 7.3 (overleaf). Galleries, theatres, museums, and concert halls are predominantly clustered in Glasgow City Centre and supporting businesses throughout their neighbourhoods and the wider GCR through supply chain activity. These attractions, major international events and the wider GCR offer, including links to neighbouring places such as Loch Lomond & Trossachs National Park, helped attract over 3.6 million overnight visits per annum. There was an estimated £1.6 billion visitor spend in Glasgow City during 2022 supporting 28,000 jobs. A more detailed breakdown of the cultural facilities in the study can be is shown in Appendix B.

What does this mean for the Clyde Metro programme?

Quality of life and sense of place are essential components of wellbeing, complementing the ability to access a wide range of opportunities and services in a sustainable manner. Alongside connectivity and housing/labour supply, they are the third fundamental pillar of attracting and retaining inward investment and skilled workers. The Clyde Metro programme will have an important role in sustaining and growing the GCR's offer to both residents and visitors, efficiently connecting people to the locations of leisure, culture, and recreation events and spaces.

7.2.2 Town, local, and commercial centres

NPF4 established the principle to:

"Encourage, promote and facilitate development in our city and town centres, recognising they are a national asset. This will be achieved by applying the Town Centre First approach to help centres adapt positively to long-term economic, environmental and societal changes, and by encouraging town centre living."

Promoting footfall and vibrancy through mixed uses are at the heart of the policy, combined with addressing V&D land (see Map 6.3). In addition to retail and commercial offers, the centres will cover a range of additional public services, and collectively, across multiple uses, a mix of employment and training opportunities. The network of centres in the study area is shown overleaf in Map 7.3.

What does this mean for the Clyde Metro programme?

Enhanced connectivity and accessibility to the designated centres will directly support increased footfall, helping sustain and grow their role in the places they serve, and also, indirectly, the viability of development and the ability to transform land uses and add activity, vibrancy, and resilience in a sustainable manner.

7.2.3 Educational facilities

Further and higher education facilities represent another key component of the attractiveness of areas, as illustrated in Map 7.5 (overleaf, showing accessibility to the nearest facility based on total journey time). Access to further/higher education is critical to providing a suitably skilled workforce and ensuring equality of access to opportunity.

What does this mean for the Clyde Metro programme?

There is a large student population[30] which can contribute to specific sectors and needs to be retained through joined-up housing, transport, quality of life, and economic policy and strategy. Equality of access to establishments is mixed across the GCR, and heavily dependent on the regional centre cluster.

7.3 Other complementary investment

7.3.1 Glasgow City Region Deal

The GCR's City Deal is one of the largest in the UK, with a £500 million contribution from both the UK and Scottish Governments, supported by local authority contributions totalling £130 million. Map 7.4 (overleaf) shows the planned investment programme, comprising major infrastructure projects to:

- Create thousands of new jobs, including help to establish world class research and development of life sciences;
- Assist the unemployed back to work, targeted at young and vulnerable residents;
- Improve public transport and connectivity, focussed on key development and regeneration sites;
- Drive business innovation and growth, with incubator space for small and medium enterprises; and
- Unlock billions of pounds of private sector investment.

What does this mean for the Clyde Metro programme?

The GCR City Deal provides a bedrock for joint public and private investment to unlock new economic opportunities and ensure those most at risk of exclusion can access them. Clyde Metro will be an important enabler in assisting City Deal projects to advance in a timely manner and ultimately providing the connectivity and accessibility they need to thrive.

7.3.2 Heat Networks

As part of the statutory requirement to develop a Local Heat and Energy Efficiency Strategy[31] (LHESS), supporting the transition to Net Zero, GCC has identified Heat Networks as an important first step. Heat Networks match demand to supply, with a primary focus on the: city centre; the corridor along the north and south banks of the River Clyde to the west; and south of the River Clyde through Shawlands and Giffnock. Heat Networks supply heat from a central source to a wider area via underground pipes carrying hot water and are naturally suitable in higher density areas.

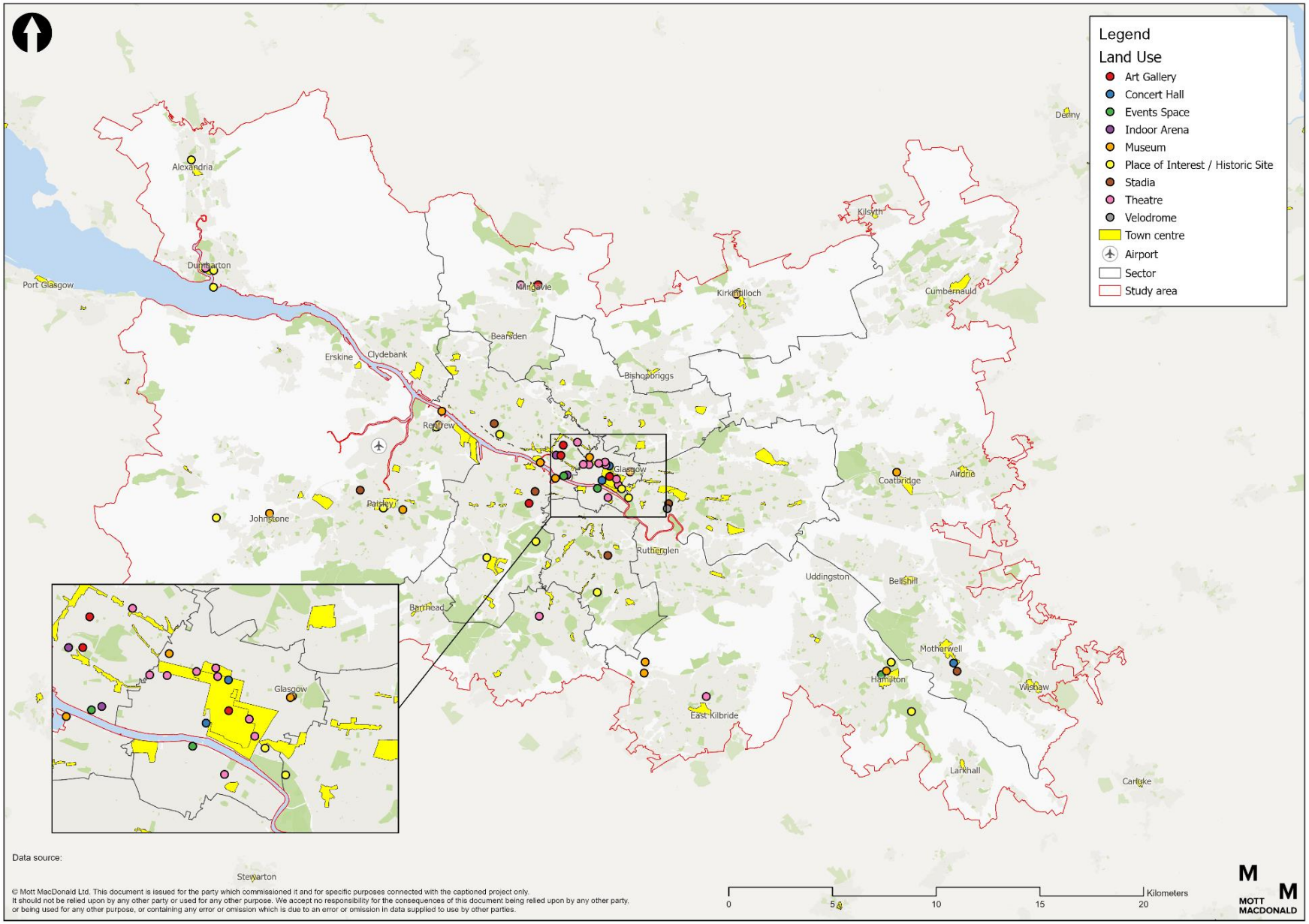
What does this mean for the Clyde Metro programme?

Installation of Heat Networks will create a period of disruption for streets and roads. On-street sections of the Clyde Metro would generate similar periods and it would be highly beneficial to deliver the two programmes in synergy wherever possible, recognising that both form part of the GCR decarbonisation portfolio.

[30] The GCR's four higher education establishments are home to over 66,000 students, an increase of approximately 20,000 since 2014/15.

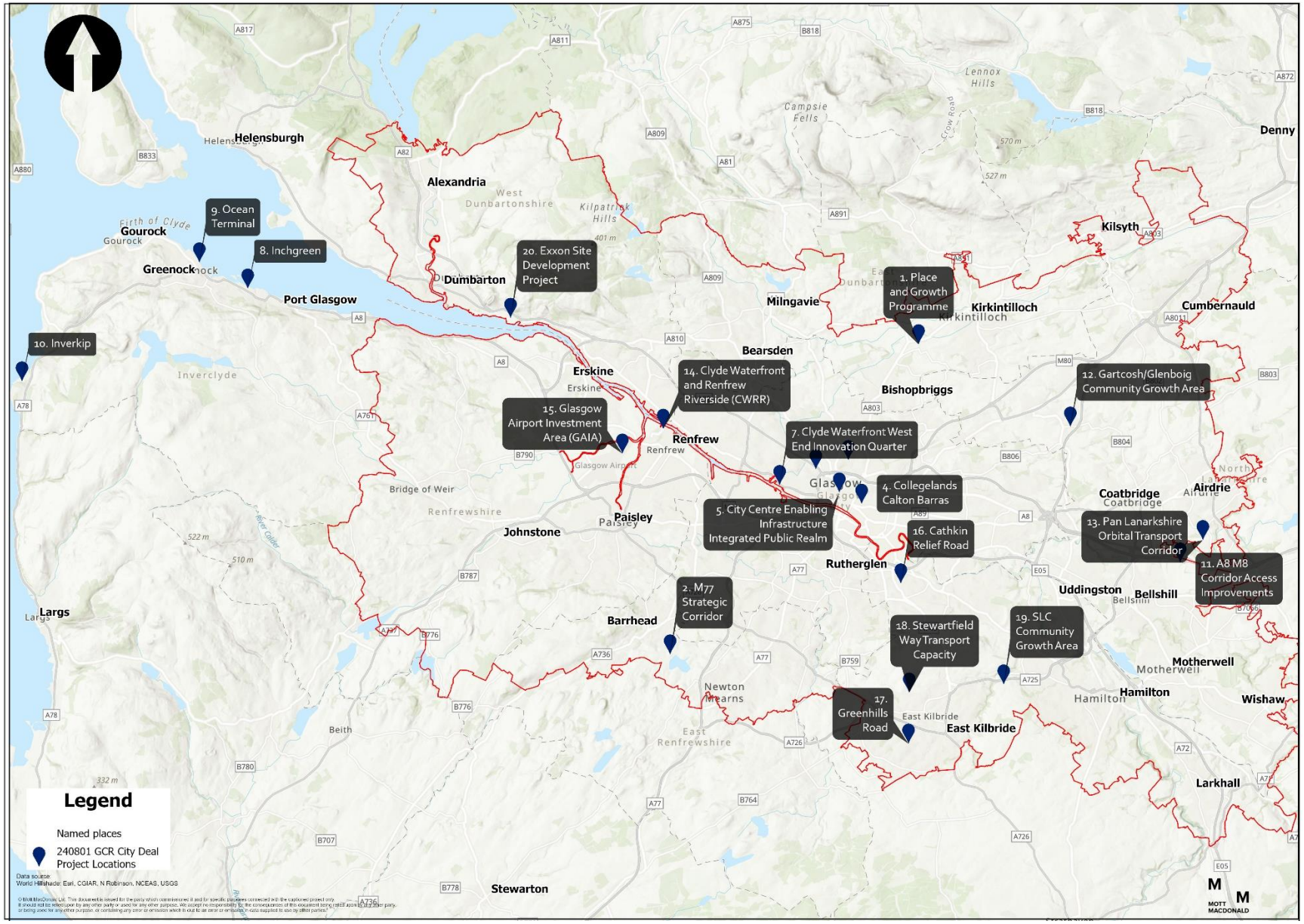
[31] See: Local Heat and Energy Efficiency Strategy - Glasgow City Council (gosshosted.com)

Map 7.3: Study area leisure and culture facilities



Source: Ordnance Survey, AddressBase, 2024

Map 7.4: Glasgow City Region City Deal Projects (August 2024)



Source: Glasgow City Region

7.3.3 Tall Buildings Strategy

Glasgow has established a Tall Buildings Strategy[32] (TBS) for the City Centre with complementary guidance for other NPF4 centres to follow. Recent development proposals have seen an increase in scale, driven by macro-economic conditions. The TBS sets out the role that this new development has to play in supporting densification (and liveable, thriving, neighbourhoods), regeneration, and enhancement of the built and natural environment. Figure 7.1 shows the draft locations for the development of tall buildings within the city centre, clustered around:

- The arc between the Exhibition Centre, Anderston, and Charing Cross on the north bank of the River Clyde;
- Cowcaddens and Glasgow Caledonian University on the northern fringe;
- South of the University of Strathclyde on the eastern fringe;
- South of St Enoch Shopping Centre; and
- On the south bank of the River Clyde opposite Glasgow Central Station.

What does this mean for the Clyde Metro programme?

Increased scale and density of activity supports more efficient and productive economic activity (see Section 6.3). It can also play a role in supporting the liveable neighbourhoods priority and enhancing the built and natural environment, particularly when V&D land is addressed. Serving the accessibility and connectivity needs of developments with this scale and density necessitates attractive, and high capacity, rapid transit infrastructure which avoid the need for car dependency and connect the wider GCR population to the new opportunities.

Figure 7.1: Glasgow City Centre Theoretical Areas for Tall Buildings - DRAFT

Source: Glasgow City Council

7.4 Complementary transport investment portfolio

To maximise beneficial outcomes and impacts, the Metro programme will need to work with the current pipeline of proposed transport investment across the GCR. This includes the:

- Subway modernisation[33], with a new fleet of driverless trains complemented by enhanced signalling and control systems, including a new operational control centre, and Platform Screen Doors (PSDs) for

[32] See: Tall Buildings Design Guide (glasgow.gov.uk)

[33] See: Modernisation | SPT | Strathclyde Partnership for Transport

improved safety and security. The new trains began to enter passenger service in 2023 Q4.

- Bus reform[34], with SPT approving recommendations in 2024 Q1 to develop options for a local bus franchising model consistent with the requirements of the Transport (Scotland) Act 2019. Franchising aims to deliver significant improvements to the network to achieve passenger growth, better accessibility for all, and help deliver wider policy outcomes. With franchising estimated to take 5 to 7 years to establish, Bus Service Improvement Partnerships (BSIPs) are also proposed for progression in the shorter term.
- Strategic bus corridor enhancement plan. The Glasgow and Strathclyde Strategic Bus Network Plan[35] (GSSBNP), and the forthcoming Strathclyde Regional Bus Strategy. The GSSBNP established a programme of investment in all the radial corridors into Glasgow City Centre, with enhancements to:
  - Frequency of service
  - Bus priority measures to reduce journey times and delays
  - New mobility hubs and designated interchanges
  - Park & Ride (P&R) opportunities linked to express provision

  The A82 (Hyndland), Argyle Street/Dumbarton Road, Paisley Road, and A77 (Shawlands), are now funded for initial delivery. All these corridors radiate to the west of the GCR, on both the north and south banks of the River Clyde.
- A GCR City Deal project, 'The Avenues' programme[36] is a £115 million investment to create an integrated network of continuous active mode routes across the city centre and its fringes, also improving the way public transport is accommodated. Specific enhancements include:
  - Green and blue urban realm;
  - Improved, wider, footways;
  - Better crossing points;
  - Segregated cycle lanes;
  - Reduced street clutter; and
  - Intelligent street lighting.
- Active travel strategy[37], to help more journeys to be made by walking or cycling across the area, with accompanying investment in infrastructure and 'softer' measures to support behavioural change.
- Rail investment, such as the:
  - Recent electrification of the route from Glasgow to Barrhead[38];
  - Proposed electrification, and wider enhancement of the route to East Kilbride[39], which includes potential relocation of Hairmyres station;
  - Accessibility enhancements at Anniesland[40] (Glasgow) and Uddingston[41] (South Lanarkshire);
  - A new station at Balgray[42] (East Renfrewshire) on the Glasgow to Neilston route.

Pipeline projects within the investment portfolio include:

- Redevelopment of the central Buchanan Street bus station; and
- Enhancements to interchange at West Street subway station.

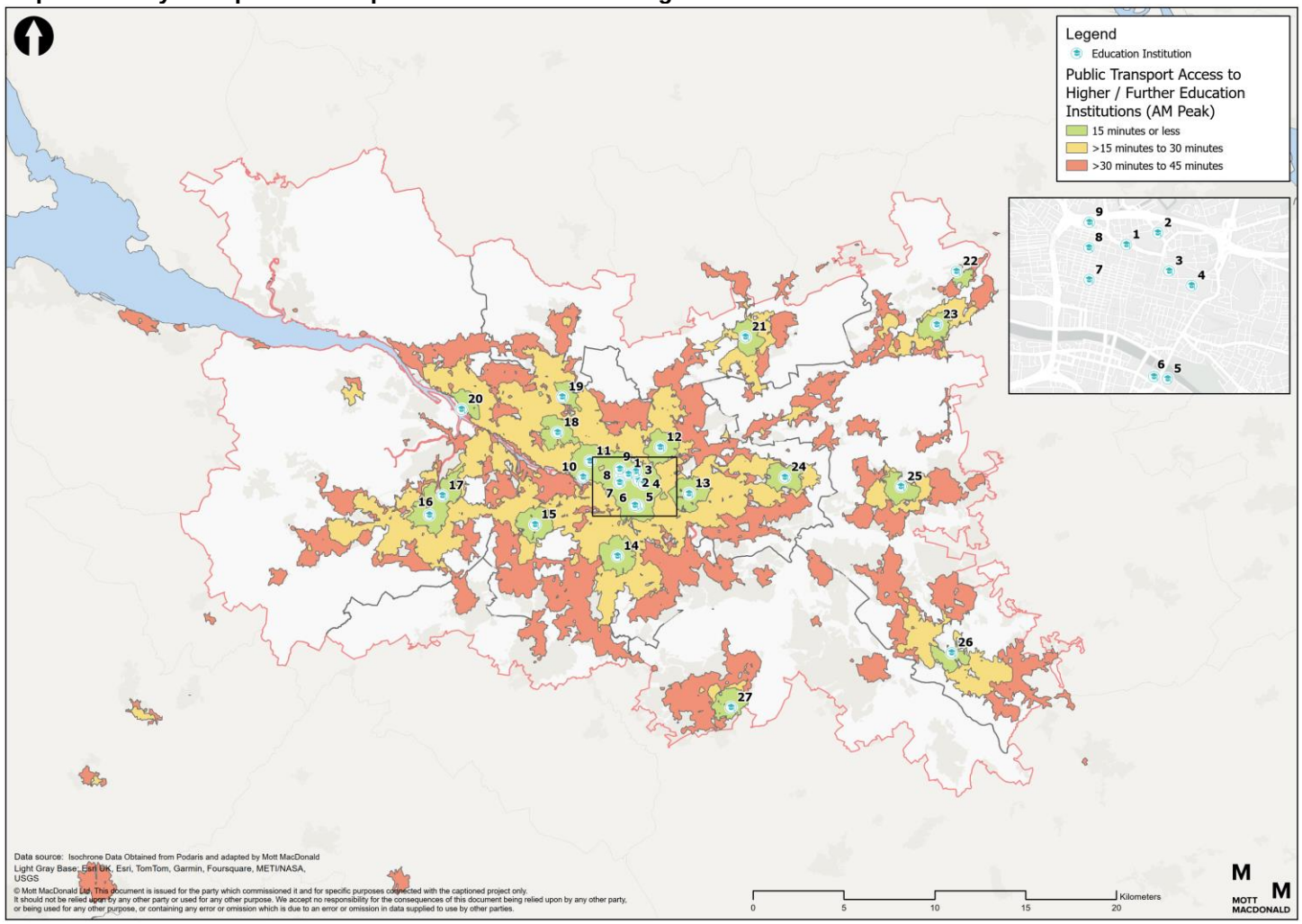
34 See: spt.co.uk/about-us/news/spt-partnership-approves-options-for-bus-reform/
35 See: Glasgow and Strathclyde Strategic Bus Network Plan – Summary
36 See: Avenues - Glasgow City Council
37 See: https://www.spt.co.uk/media/qmflopoo/activetravelstrategy_easyreadreport.pdf
38 See: Barrhead to Glasgow Electrification (scotlandsrailway.com)
39 See: East Kilbride rail electrification | Transport Scotland
40 See: Project to improve accessibility at Anniesland station nears new milestone (scotlandsrailway.com)
41 See: Uddingston Access for All (scotlandsrailway.com)
42 See: Balgray station (scotlandsrailway.com)

At a national level, the NTS and STPR2 retain aspirations for enhanced interurban rail connectivity across Scotland.

What does this mean for the Clyde Metro programme?

The Clyde Metro programme will not act in isolation. Delivering on the strategic objectives will require coordinated and complementary action with other transport investment and the non-transport portfolio, particularly around housing proposals, densification, economic development, provision of public services, and place-making/regeneration initiatives. Metro, bus, National Rail, and active modes will need to work as 'one network', rather than binary choices to achieve the desired outcomes, reducing dependency on the car while providing the capacity for growth and transformational change.

Map 7.5: Study area public transport access to further / higher education institutions



Source: Basemap (Q1, 2024) & Podaris, 2024

No.	Education Establishment
1	Royal Conservatoire of Scotland
2	Glasgow Caledonian University
3	City of Glasgow College
4	University of Strathclyde (Stenhouse)
5	Glasgow College of Building
6	City of Glasgow College (Riverside)
7	Royal College of Physicians and Surgeons
8	Glasgow School of Art
9	Stow College of Engineering
10	Kelvingrove College
11	University of Glasgow
12	North Glasgow College
13	Glasgow Kelvin College
14	Langside College
15	Glasgow Clyde College - Cardonald Campus
16	University of the West Scotland
17	West College (Paisley)
18	Glasgow Clyde College
19	Home Farm (University of Glasgow)
20	West College (Clydebank)
21	New College Lanarkshire
22	University of Strathclyde (Power Networks)
23	New College Lanarkshire (Cumbernauld)
24	Glasgow Kelvin College (Easterhouse)
25	New College Coatbridge
26	New College Lanarkshire (Motherwell)
27	South Lanarkshire College

7.5 Key takeaways

Key takeaways

- The Clyde Plan[43] has allocated over 90,000 new dwellings in the next 10+ years, with over three quarters for delivery post-2026. Significant clusters around Glasgow City Centre, Bishopton, Clydebank, Drumchapel, Easterhouse, and Motherwell.
- North Lanarkshire (Inner), Glasgow City (East) and Renfrewshire (Inner) are the sectors with the greatest volume of forecast housing development.
- The Clyde Plan also designates areas for economic development in with over 1,000 hectares zoned for employment across over 300 sites. Denser, lower-hectare, development clustered around the main inner Economic Development Areas. The Clyde Mission area extends along the river to the west of Glasgow City Centre and is a focus area for growth. There are significant volumes of sites on the northeast and southeast (Rutherglen to Cambuslang) corridors. Several sites are located outside of the main urban area.
- The Clyde Plan and accompanying Clyde Mission have identified a significant programme of place-based regeneration. The discrete clusters of significant housing growth will require sustainable transport provision of they are to be realised in full while adhering to the wider GCR policy outcomes for people, places, and the environment. Economic development is more tightly clustered, and, as well as Glasgow City Centre and large sites around the edge of the urban area, there is a concentrated 'ribbon' of opportunity on the south bank of the River Clyde.

Key takeaways

- Quality of life and sense of place are essential components of wellbeing, complementing the ability to access a wide range of opportunities and services in a sustainable manner. Alongside connectivity and housing/labour supply, they are the third fundamental pillar of attracting and retaining inward investment and skilled workers. The Clyde Metro programme will have an important role in sustaining and growing the GCR's offer to both residents and visitors, efficiently connecting people to the locations of leisure, culture, and recreation events and spaces.
- The Clyde Metro programme will not act in isolation. Delivering on the strategic objectives will require coordinated and complementary action with other transport investment and the non-transport portfolio, particularly around housing proposals, densification, economic development, provision of public services, and place-making/regeneration initiatives. Metro, bus, National Rail, and active modes will need to work as 'one network', rather than binary choices to achieve the desired outcomes, reducing dependency on the car while providing the capacity for growth and transformational change.

[43] Available at: <https://www.clydeplan-sdpa.gov.uk/>

8 The potential for change

The Clyde Metro programme aims to enhance connectivity in the GCR. Through better public transport access, it seeks to unlock wider economic, environmental, and social opportunities in the region. These aims are synchronised with the region's strategic agenda.

The most significant problems highlighted in Sections 3 to 7 are:

1. A lack of urban (effective) density leading to poor economic outcomes
2. Significant volume of brownfield, vacant, and derelict land, diminishing sense of place
3. Deficits in connectivity and accessibility, including unserved and underserved areas
4. A lack of alternatives promotes car dependency for those who have access to one
5. There are significant challenges in enhancing existing networks

The status quo of the GCR remains one of inequality and constraints on potential. Compared to both national and international counterparts, the GCR has lower labour availability, effective density, and economic growth. In the future, factors such as housing scarcity will limit the potential for the city to grow demographically and economically. Connectivity could encourage more density, housing, and economic development. The GCR, and Scotland as a whole, remains committed to ambitious climate targets. These commitments require an enhanced public transport system to help deliver mode shift and reduce road emissions.

Overall, GCR's public transport system still has significant gaps. Outside central Glasgow, rail and subway access remains unequal and limited in many places with a significant need. While bus services can provide crucial services to these challenge areas, they are more suited for short-to-medium-distance travel. Therefore, car dependency persists in these challenge areas. At the same time, existing rail systems face constraints, with network(s) operating at full capacity, with limited or very expensive scope for growth, and adverse impacts on performance. Many stations are not fully accessible for persons of restricted mobility.

Clyde Metro presents a significant opportunity for transformational change in the region. Enhanced connectivity can encourage housing delivery in previously inaccessible or inconvenient locations. These changes would encourage influx of both investment and labour as the amount of skilled workers available to businesses increases. These new stimuli can cause lasting positive changes in the development areas, and locations with upcoming regeneration efforts, ultimately enhancing 'sense of place' through integration of connectivity enhancements with the complementary investment portfolio. Development areas will see higher density and greater housing delivery.

Moreover, the GCR has a diverse range of draw factors, such as cultural facilities or educational institutions. Clyde Metro can complement these existing advantages to make the GCR a dynamic and liveable region. By connecting Glasgow Airport and surrounding area to the railway network, city centre, and wider mass transit network, Clyde Metro will improve links between international arrival points and key visitor facilities, boosting Glasgow's attractiveness. This will also support future bids for international conventions, entertainment, and sporting events. Hence, the programme will target long-term transformational changes in areas including inward investment, job creation, social wellbeing, place-making, and both national and local emission reductions. The opportunities highlighted in Section 7 are:

6. Multiplier effects from integrated transport and land use planning
7. Significant complementary investment portfolio, including development and place-making

Figure 8.1 (overleaf) confirms this golden thread for investment in the Clyde Metro to "connect people, create opportunities, and transform places".

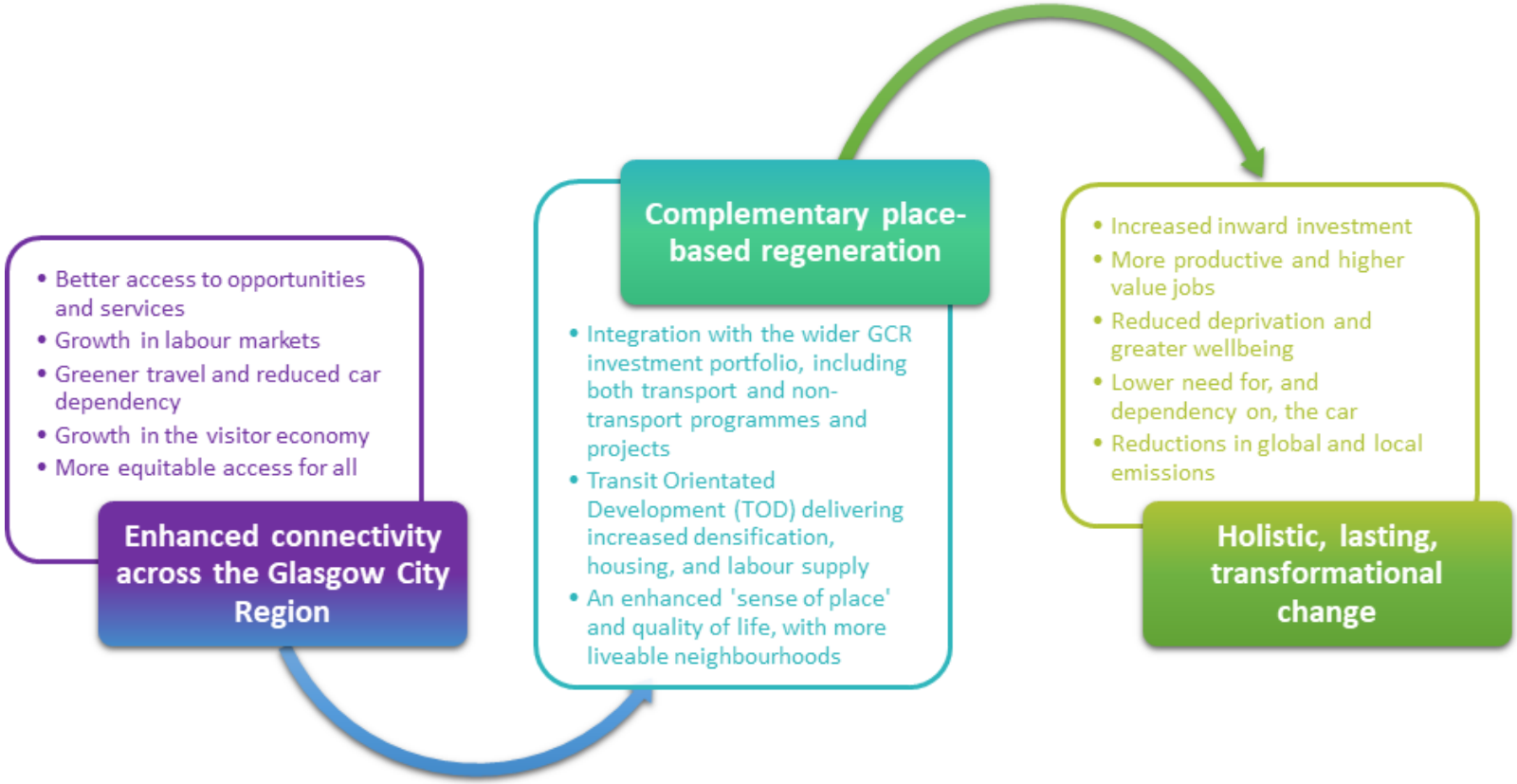
Figure 8.1: Clyde Metro Programme Golden Thread

Source: Mott MacDonald

8.1 Theory of change

To realise the identified opportunities, Clyde Metro should seek to institute lasting and transformational changes. Figure 8.2 shows the route from enhanced connectivity to these changes.

Figure 8.2: Lasting transformational change



Source: Mott MacDonald

8.2 Strategic objectives

Based on the vision (see Section 2.3), three themes and strategic objectives for the Clyde Metro programme were explored. These themes devolve further into transformational outcomes, which are ultimately SMART (specific, measurable, achievable, relevant, and time-bound) as part of the vision Clyde Metro aims to support. Appendix E confirms mapping of problems and opportunities in Sections 6 and 7 to the strategic objectives and subsequent transport planning objectives.

Table 8.1: Clyde Metro strategic objectives and transformational outcomes

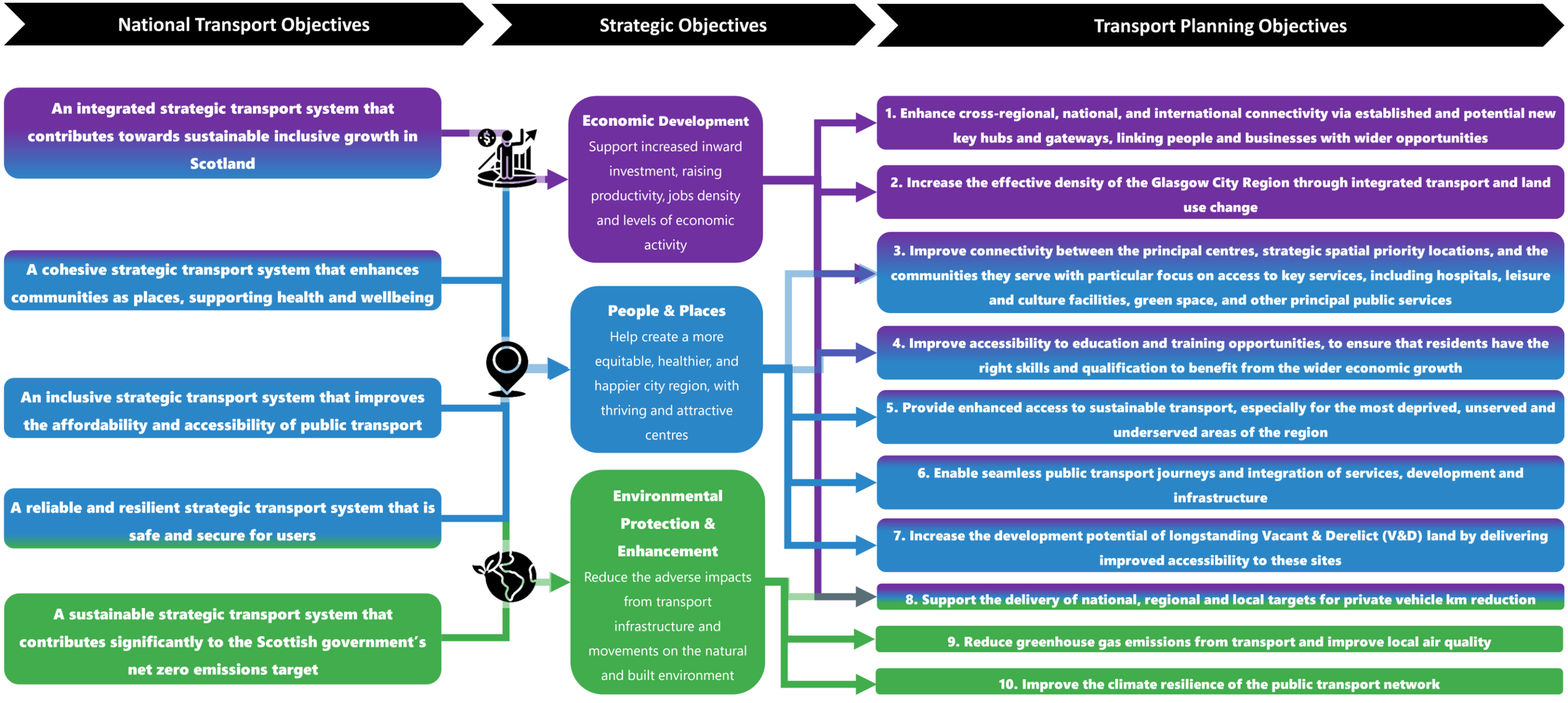
Theme		Objective is to…	Ref	Transformational Outcomes
	Economic Development	Support increased inward investment, raising productivity, jobs density and levels of economic activity	1	• Increased productivity with growth in jobs, activity, and output across higher value, target, sectors
			2	• Increased graduate retention/attraction, and increase in overall skills and qualification levels
			3	• Enhanced national and international connectivity via established gateways, linking people and businesses with wider opportunities
			4	• Support the delivery of housing targets to increase labour supply
	People & Places	Help create a more equitable, healthier, and happier city region, with thriving and attractive centres	5	• Address Vacant & Derelict (V&D) land, increase densities, and support liveable neighbourhoods
			6	• Assist the regeneration of the principal centres, increasing activity, vitality, and sense of place
			7	• Address social equality and inclusion through enhanced accessibility for all
			8	• Reductions in transport poverty to help diminish levels of deprivation
			9	• Increases in healthy life expectancy, wellbeing, and quality of life
	Environmental Protection & Enhancement	Reduce adverse impacts from transport infrastructure and movements on the natural and built environment	10	• Contribute to delivery of Net Zero targets
			11	• Decreases in local air pollutants

Source: Mott MacDonald

8.3 Transport planning objectives

To facilitate the delivery of the vision (see Section 2.3) and the strategic objectives, a set of linked Transport Planning Objectives (TPOs) have been derived. A priority of the Case for Change is ensuring alignment and continuity with the work undertaken as part of STPR2, which aligns with NTS2 and NPF4. Figure 8.3 below outlines the TPOs for Clyde Metro which evolve from the GCR level TPOs developed during STPR2, tailoring them to Clyde Metro and aligning them to the strategic objectives. As per Scottish Transport Appraisal Guidance (STAG), the TPOs will continue to be refined to the point that they are SMART (Specific, Measurable, Achievable, Relevant, Time-bound) as the programme progresses, and more information becomes available.

Figure 8.3: Clyde Metro transport planning objectives



Source: Mott MacDonald

8.4 Alignment between Problem Statements, Opportunities, and Objectives

Table 8.2 shows the mapping of 'problems' and 'opportunities', from Sections 3 to 7, and summarised at the start of this section to both the three strategic and ten transport planning objectives. Appendix E shows both:

- Mapping of the evidence (datasets) described in Sections 3 to 7 to the strategic and transport planning objectives; and
- Alignment between the transformation outcomes and the same evidence to be used as assessment criteria in later stages.

Table 8.2: Clyde Metro Problem Statements, Opportunities, and Objectives

			Problems					Opportunities	
			1. A lack of urban (effective) density leading to poor economic outcomes	**2. Significant volume of brownfield, vacant, and derelict land, diminishing sense of place**	**3. Deficits in connectivity and accessibility, including unserved and underserved areas**	**4. A lack of alternatives promotes car dependency for those who have access to one**	**5. There are significant challenges in enhancing existing networks**	**6. Multiplier effects from integrated transport and land use planning**	**7. Significant complementary investment portfolio, including development and place-making**
Strategic Objectives									
	Economic Development	Support increased inward investment, raising productivity, jobs density and levels of economic activity	✓	✓	✓	✓		✓	✓
	People & Places	Help create a more equitable, healthier, and happier city region, with thriving and attractive centres	✓	✓	✓	✓		✓	✓
	Environmental Protection & Enhancement	Reduce adverse impacts from transport infrastructure and movements on the natural and built environment		✓		✓	✓	✓	✓
Transport Planning Objectives									
1		Enhance cross-regional, national, and international connectivity via established and potential new key hubs and gateways, linking people and businesses with wider opportunities	✓		✓		✓		
2		Increase the effective density of the Glasgow City Region through integrated transport and land use change	✓	✓		✓		✓	✓
3		Improve connectivity between the principal centres, strategic spatial priority locations, and the communities they serve with particular focus on access to key services, including hospitals, leisure and culture facilities, green space, and other principal public services	✓	✓	✓	✓		✓	✓
4		Improve accessibility to education and training opportunities, to ensure that residents have the right skills and qualification to benefit from the wider economic growth			✓	✓			

		Problems					Opportunities	
		1. A lack of urban (effective) density leading to poor economic outcomes	**2. Significant volume of brownfield, vacant, and derelict land, diminishing sense of place**	**3. Deficits in connectivity and accessibility, including unserved and underserved areas**	**4. A lack of alternatives promotes car dependency for those who have access to one**	**5. There are significant challenges in enhancing existing networks**	**6. Multiplier effects from integrated transport and land use planning**	**7. Significant complementary investment portfolio, including development and place-making**
5	Provide enhanced access to sustainable transport, especially for the most deprived, unserved and underserved areas of the region			✓	✓			
6	Enable seamless public transport journeys and integration of services, development, and infrastructure	✓		✓	✓	✓	✓	✓
7	Increase the development potential of longstanding Vacant & Derelict (V&D) land by delivering improved accessibility to these sites	✓	✓	✓	✓	✓	✓	✓
8	Support the delivery of national, regional, and local targets for private vehicle km reduction	✓		✓	✓	✓	✓	
9	Reduce greenhouse gas emissions from transport and improve local air quality	✓		✓	✓	✓	✓	✓
10	Improve the climate resilience of the public transport network					✓	✓	✓

Source: Mott MacDonald

8.5 Outcomes

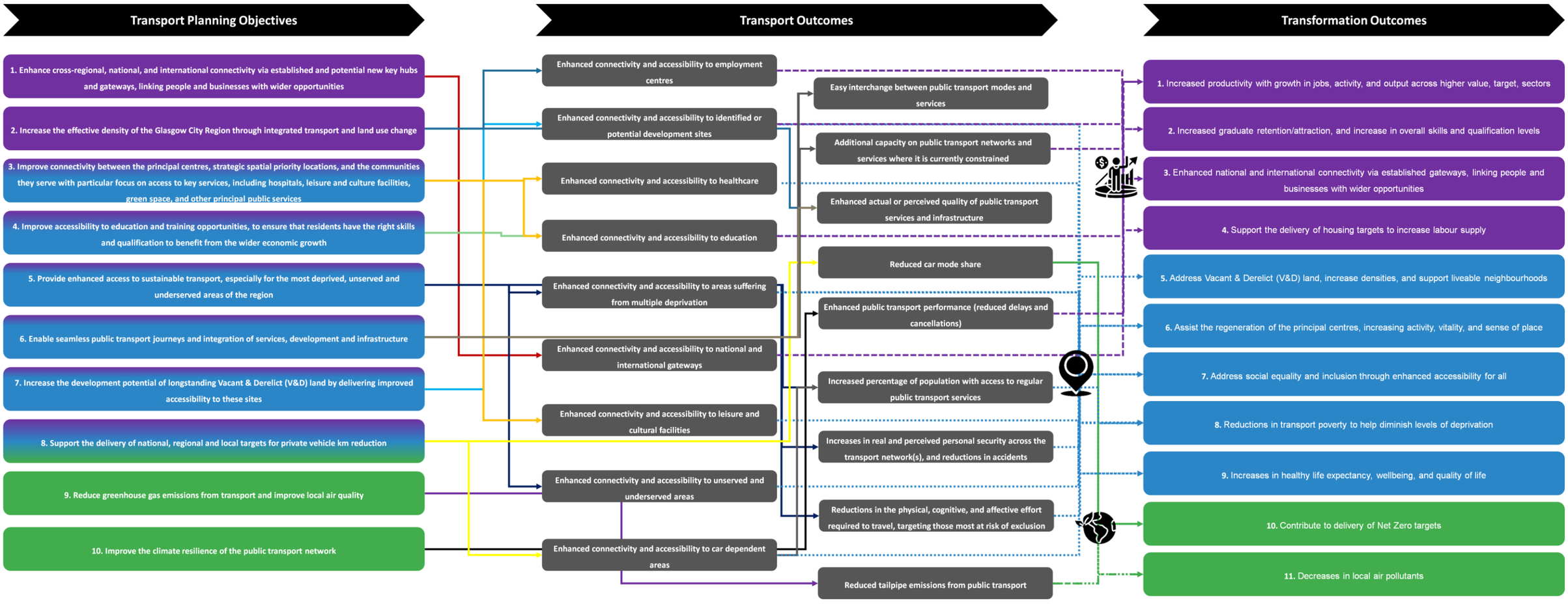
Transformation outcomes described in will be achieved by a holistic set of transport outcomes and complementary delivery principles (see Section 8.7).)Within Figure 8.4, showing the mapping between TPOs, transport outcomes, and transformation outcomes, the following terminology, consistent with the preceding evidence base, is used:

- Connectivity - the spatial extent of the network, station and stop locations, and the opportunities for interchange.
- Accessibility - the total journey time to access opportunities and services, inclusive of time spent waiting at stations/stops, onboard vehicles, and connection times when interchanging.
- Mode shares - for a given transport movement, e.g. between individual or groups of origins and destinations, the share between different modes of travel (including reduced car-kms).
- Performance - the punctuality and reliability provided (e.g. volumes of cancellations and delays).
- Quality - from the planning stage to arriving at the final destination, the ease and experience of travelling by a particular mode (over and above time-related elements in connectivity and accessibility), including safety and security.

What does this mean for the Clyde Metro programme?

Transport outcomes will be used to assess options as Clyde Metro develops beyond this initial programme phase. At this programme-level CfC stage, it is neither proportionate or appropriate to undertake detailed analysis using transport planning an/or journey planning software to understand the change in outcomes (e.g. the estimated reduction in journey time/enhanced accessibility to employment centres) each option delivers. This is, in part, because the next phase of option development will confirm the necessary detail on, for example, stop/station locations, frequencies (to align with demand and financial sustainability requirements), and journey times – impacted by routeing, levels of segregation, mode etc. Instead, baseline outcomes, using datasets (see Section A) which link to both places and existing transport outcomes are used to help prioritise those places which are most in need (e.g. unserved or underserved) and will benefit most from Metro delivery.

Figure 8.4: Clyde Metro transport outcomes

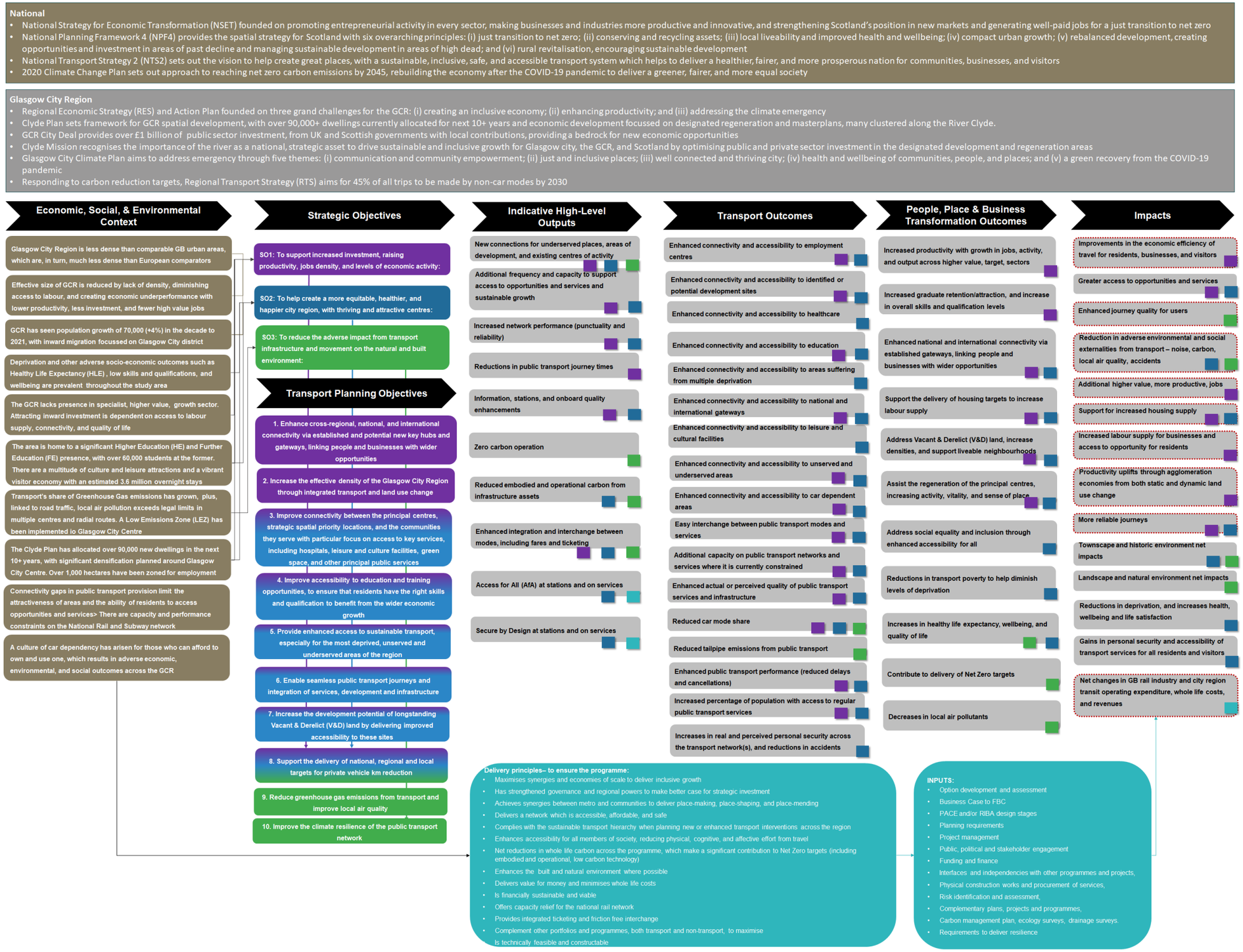


Source: Mott MacDonald

8.6 Logic mapping

A more detailed theory of change is presented below in Figure 8.5. Overall, the Clyde Metro programme has the potential to contribute to the strategic goals of the study area and institute significant positive changes.

Figure 8.5: Clyde Metro Programme Logic Map



Source: Mott MacDonald

8.7 Delivery principles

Achieving the strategic and transport planning objectives in Sections 8.2 and 8.3, and the outcomes in Section 8.5, will require the implementation of a set of 'delivery principles' outlined in . These are, as per the objectives, nested within the economic, environmental, and social themes, plus deliverability, and reflect practical implementation factors for Clyde Metro. Selected deliverability criteria are also transposed to the network assessment processes described in Section A.

Table 8.3: Clyde Metro Programme Delivery Principles

Theme		Ref	Delivery Principle
	Economic Development	A	• Maximise synergies and economies of scale to deliver inclusive economic growth
		B	• Stronger regional powers
	People & Places	C	• Synergy between metro and communities to deliver placemaking, placeshaping and placemending
		D	• A network which is accessible, affordable, and safe
		E	• Ensure compliance with the sustainable transport hierarchy when planning new or enhanced transport interventions across the region
		F	• Enhanced accessibility for all members of society, reducing physical, cognitive, and affective effort from travel
	Environmental Protection & Enhancement	G	• Net reductions in whole life carbon across the programme, which make a significant contribution to Net Zero targets
		H	• Minimise embodied carbon
		I	• Enhance the built and natural environment where possible
		J	• Apply low carbon technology
	Deliverability (Ensure the Metro network integrates with wider activity and the funding and finance environment)	K	• Deliver value for money and minimise whole life costs
		L	• Strengthened governance to make better case for strategic investment
		M	• Financially sustainable and viable
		N	• Offer capacity relief for the national rail network
		O	• Integrated ticketing and friction free interchange
		P	• Complement other portfolios and programmes, both transport and non-transport, to maximise
		Q	• Is technically feasible and constructable

Source: Mott MacDonald

8.8 Areas of special interest and need

Finally, areas of special Interest are outlined below. These amalgamate the outcomes listed within the Theory of Change into spatial themes and data. Localities in the study area categorised into one of these four areas could be considered as areas of need or special interest for consideration when developing network, route, and station location options.

1. **Development areas**: These are areas which we expect to see redevelopment. They are outlined as part of the HLAA and may lend to

transformational change in some districts. Supporting development growth with additional transport links would help to bolster sale prices of new homes developed.

   a. Key spatial data: HLAA, population growth projections, economic growth and employment land, V&D land.

2. **Challenge areas**: These areas have high deprivation, low average incomes, and no close access to rail or metro networks (rely on buses only). These areas could be candidates for new transport links which will reduce time between these areas, services, and employment opportunities.

   a. Key spatial data: deprivation, healthy life expectancy at birth, employment density, hospital access, inequality in connectivity.

3. **Visitor infrastructure**: These are international and national gateways (airports, long distance train station stops and ports), event venues and universities.

   a. Key spatial data: international transport gateways, high-capacity culture and leisure venues, higher education institutions, key heritage assets, key natural assets.

4. **Trending areas**: These are areas which are becoming more popular; with high rental value growth, population growth (particularly within the ages of 18-40), and clusters of independent businesses. Growing popularity requires a higher demand for transport. Links between these areas could foster further economic wins.

   a. Key spatial data: rent price change 2011-2023, population growth projections, historic population growth.

Figure 8.6 (overleaf) shows how the indicators of 'need' (for better connectivity and/or accessibility), as identified through key datasets in previous sections, are compiled to prioritise places for better connectivity and/or accessibility using the processes in Table 8.4.

Table 8.4: Place-Based Prioritisation of 'Need'

Step	Process
1	Key datasets (see Section A) from Case for Change adopted as measurable indicators for exercise (aligned with CfI strategic sub-objectives from Section 8.2).
2	Nodes "placed" in areas of high deprivation, regeneration, opportunity, poor accessibility, high population density etc. which current are unserved or underserved due to lower levels of connectivity and/or accessibility (see Section A)
3	Indicator value calculated for each node based on 750m buffer i.e. average SIMD decile, population density etc.
4	A node score of 1 (highest priority) to 4 (lowest priority) assigned for each indicator based on defined criteria.
5	Combined score calculated as the sum of the individual metric scores after weightings have been applied.
6	A producer score (residential areas) and attractor score (employment centres, hospitals etc) calculated separately based on agreed set of indicators.
7	Resulting high and medium priority nodes used to inform network generation exercise, but all identified places will be considered when identifying routes and network options.

Source: Mott MacDonald

Map 8.1 and Map 8.2 (also overleaf) show the initial assessment of accessibility and connectivity needs across the study area. Analysis is shown for 136 places with the greatest identified 'need' from the preceding analysis. It:

- Compiles quantifiable economic, social, and environmental evidence from earlier sections (see Section A and Appendix E for those datasets used in the assessment).
- Each assessed measure is converted into a 1 to 4 scale, with 1 being an indicator of greatest need, i.e., for example, where existing population density is greatest, GVA is highest, deprivation is most prevalent, car ownership is lowest, car mode share is greatest etc;

- Contains separate measures for ‘productions’, i.e. resident population based indicators, and ‘attractions’ focussed around workplace and the location of major cultural, leisure et al venues; and
- Combines the measures into a single indicator of production or attraction based need for each place.

What does this mean for the Clyde Metro programme?

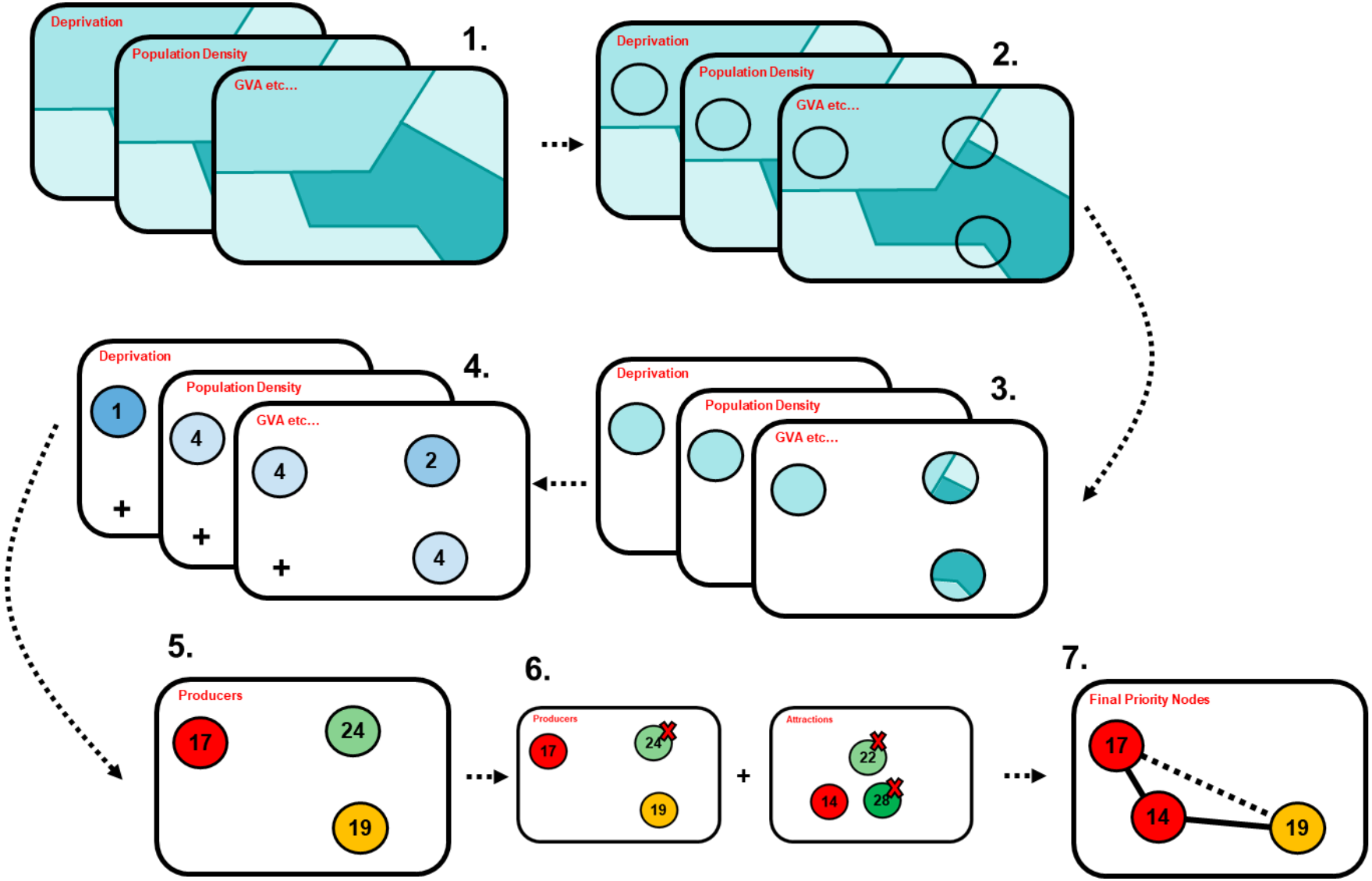
Clusters of needs are identified, with Appendix E containing the detailed underlying scoring by place and each indicator. Appendix E also shows how datasets described in preceding sections, and shown, in composite in the analysis, map to the strategic objectives, and it is these datasets which ultimate thread the strategic vision and objectives, through measurable evidence, to the prioritisation of places which will benefit most from the Clyde Metro investment (and therefore deliver the most beneficial outcomes and highest impact).

The two maps display an asymmetry, with predominantly residential based need being mutually exclusive from areas with a high degree of attraction based need – resident populations in these areas are already benefitting from their proximity to the opportunities available, largely evidenced in preceding socio-economic outcomes such as deprivation and skills and qualifications (see Section 3). As expected, attraction based need is more concentrated, being clustered along the River Clyde and corresponding to the growth potential seen in Map 7.2.

Figure 8.7 (also overleaf) combines the preceding maps to define this need according to:

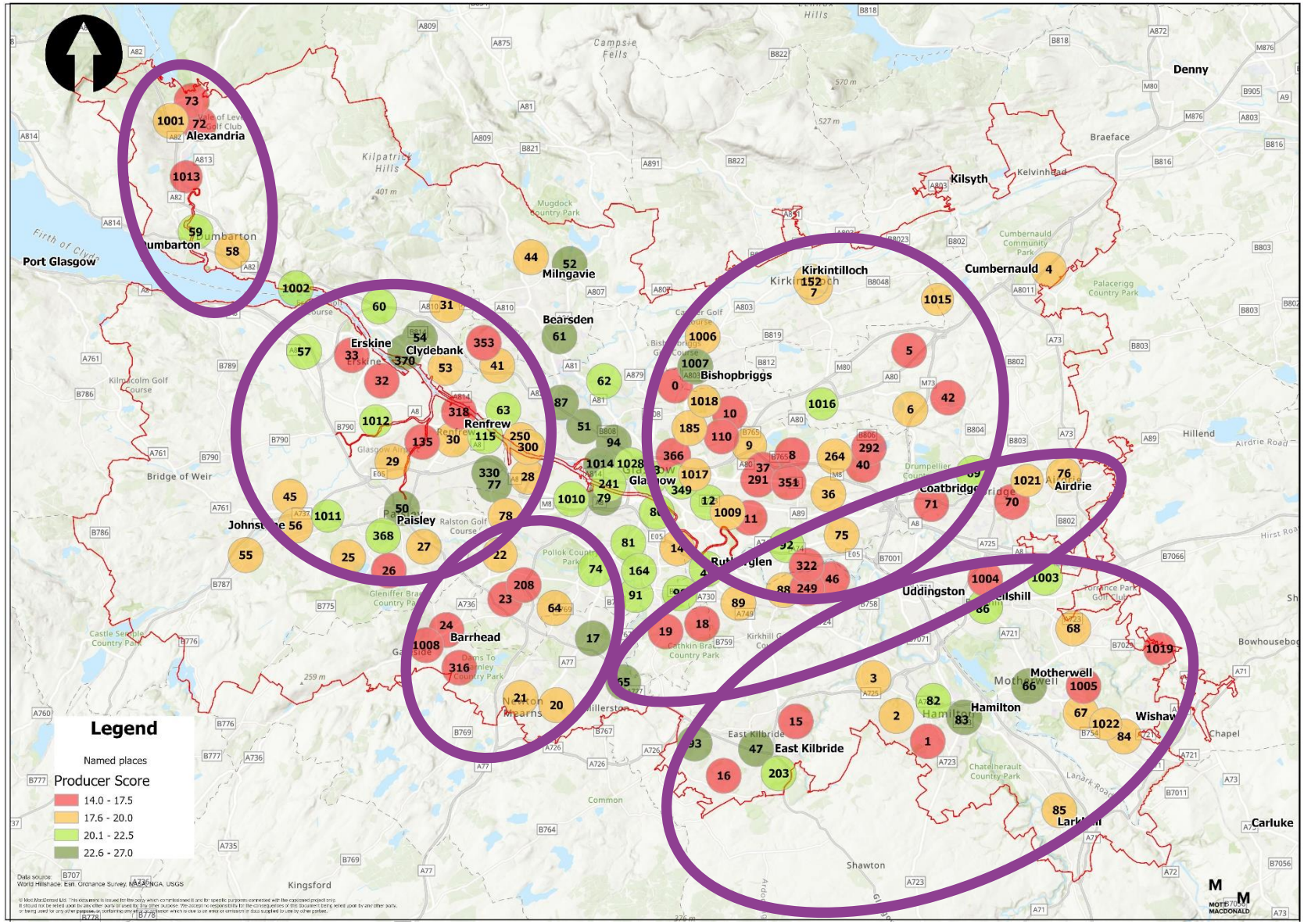
- Place typologies:
  - Trip generators, i.e. areas which are predominantly residential which will produce trips to other places;
  - Employment areas, i.e. areas with high concentrations of employment, retail, services, and industry which will attract trips from residential areas and further afield;
  - Hospitals – key healthcare sites (and employers); and
  - Visitor attractions, which are ‘special attractors’ and often promote clusters of other related activity.
- Strategic rationale for connectivity:
  - Integrated transport – the location offers connections to other transport modes, e.g. rail, subway, bus interchange, of the airport;
  - Inclusive growth – the location provides connectivity for the most deprived areas in the GCR;
  - Car dependency – the location provides connectivity for areas with a greater than average degree of car dependency; and
  - Regeneration – the location has been identified as a future growth and/or regeneration area (housing and/or employment).

Figure 8.6: Prioritisation of Places



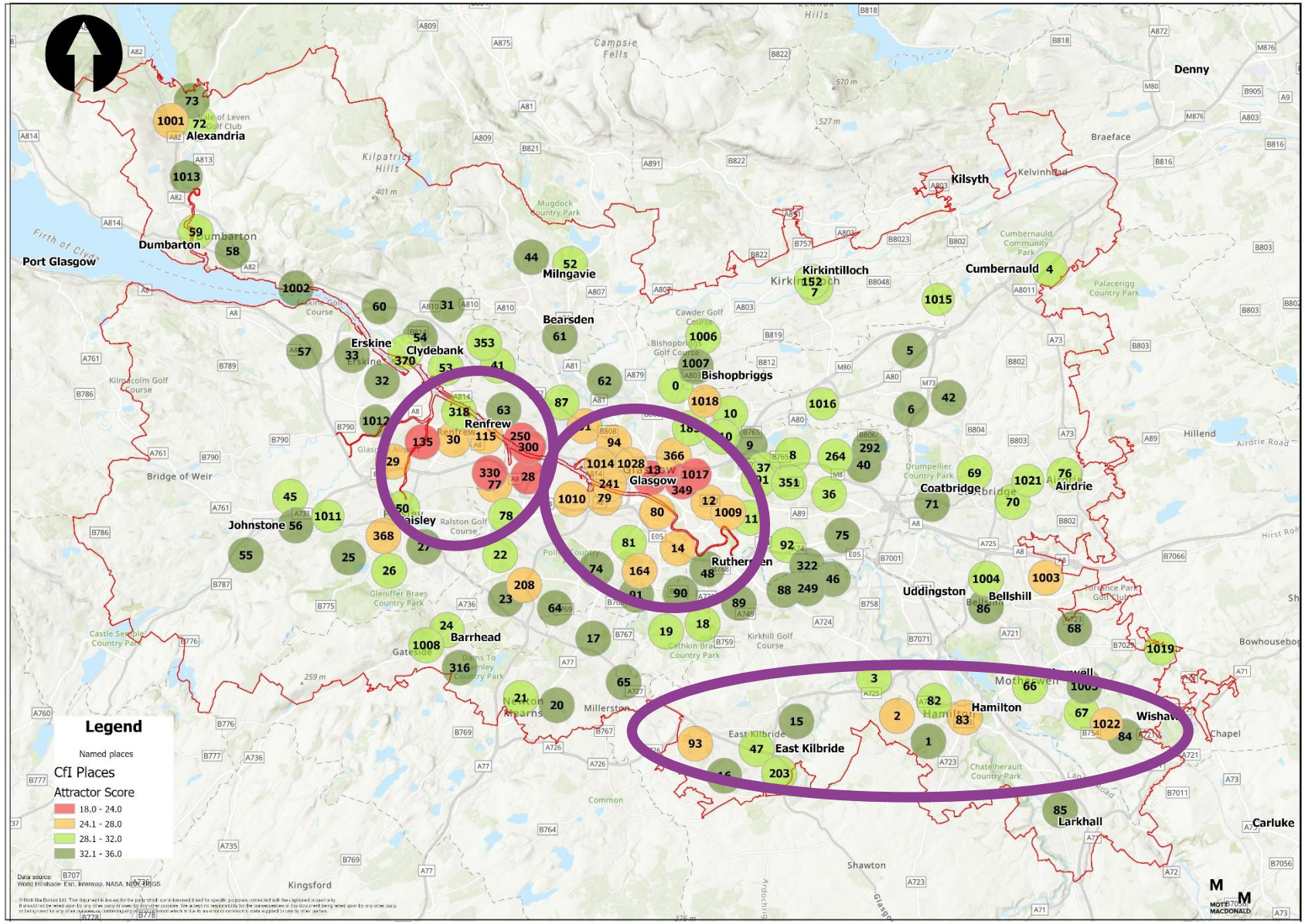
Source: Mott MacDonald

Map 8.1: Places – 'Productions' Assessment of Need



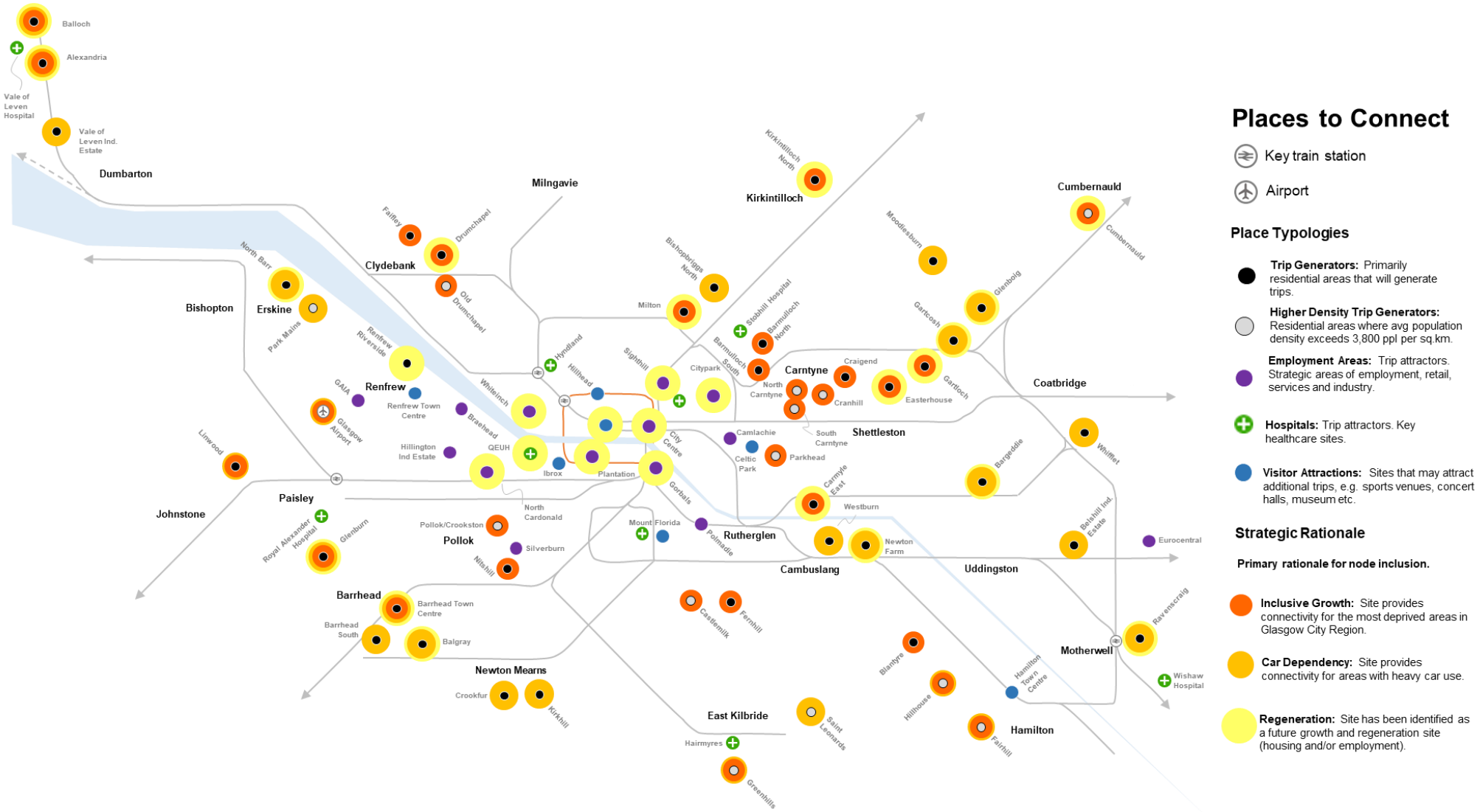
Source: Mott MacDonald from available datasets

Map 8.2: Places – 'Attractions' Assessment of Need



Source: Mott MacDonald from available datasets

Figure 8.7: Clyde Metro - Rationale for Connectivity



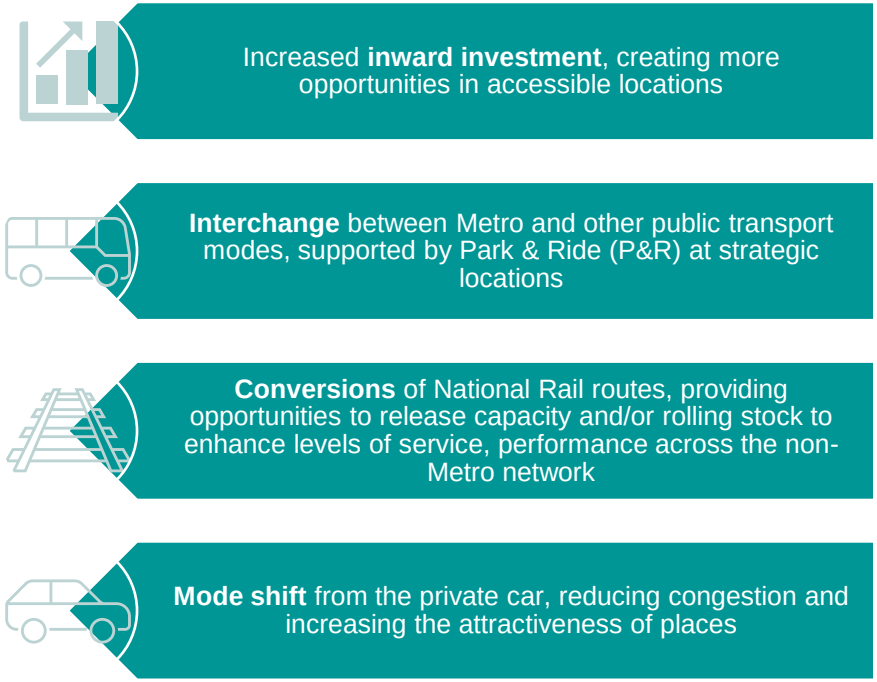
Source: Mott MacDonald

8.9 Non-Network Development

Potential Clyde Metro networks, by themselves, cannot deliver the desired transformational change in transport, socio-economic and environmental outcomes for the GCR and the wider functional urban area. This will require Metro to be integrated with complementary investment across the transport portfolio and with cross-sector public and private programmes and projects.

There are several direct and indirect mechanisms through which the Clyde Metro programme will generate benefits beyond the immediate corridors it serves, with the principal mechanisms shown in Figure 8.8:

Figure 8.8: Clyde Metro – Wider Geographic Impacts

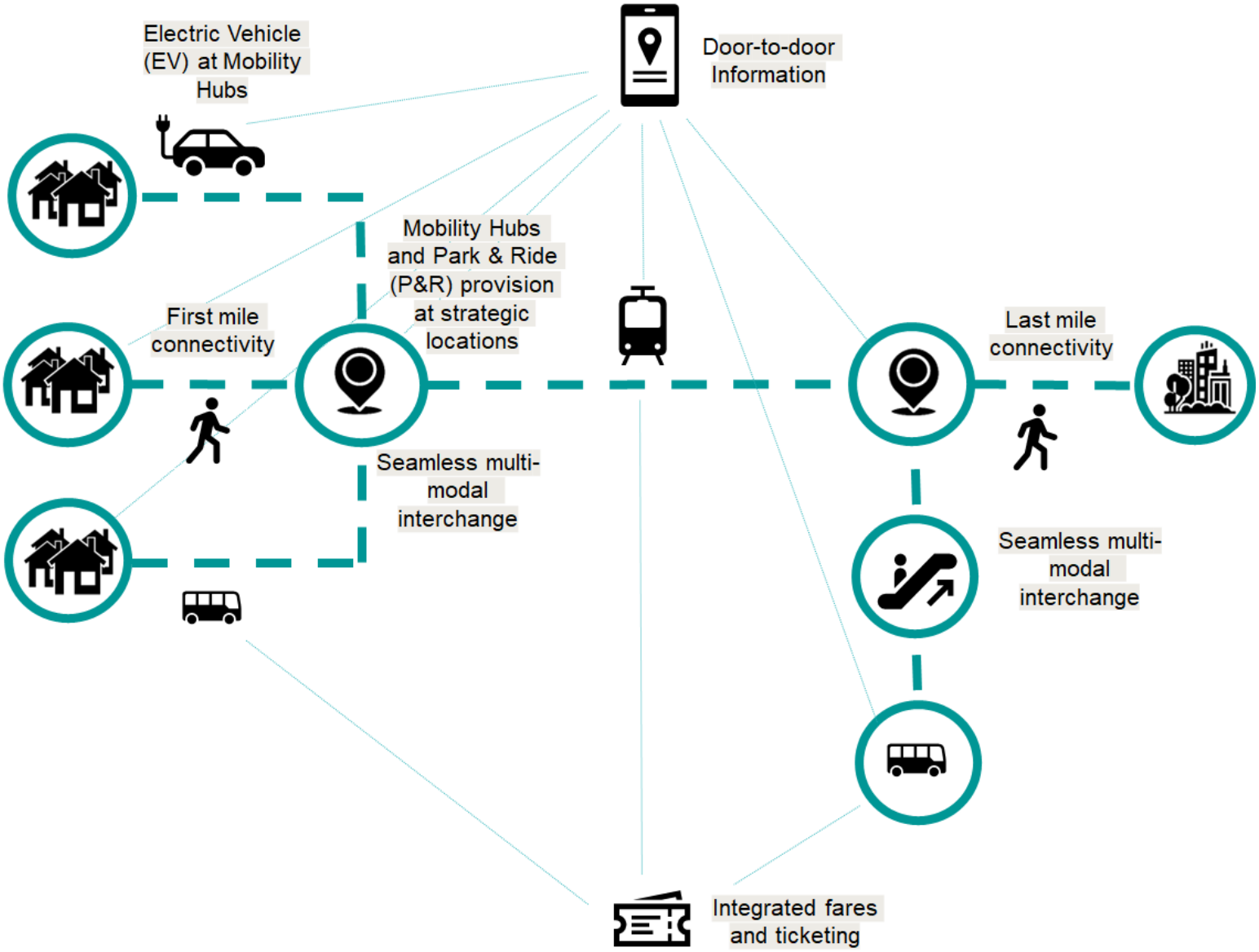


Source: Mott MacDonald

Appendix F contains further detail on the mechanisms and how they will generate additional, multiplier, impacts across the wider GCR and beyond.

Metro will need to be part of a seamless door-to-door experience, integrating physically and digitally with other modes. Figure 8.9 (overleaf) then describes the main additional components of the programme across these stages which will form part of later development and design phases. P&R provision at strategic locations would focus on stations in less built-up areas, at the edge of the urban geography, which are easily accessible from the strategic road network. They would be focussed on corridors beyond the GCR which are not well served by the national rail network and/or express regional bus services

Figure 8.9: Clyde Metro as part of a seamless door-to-door journey



Source: Mott MacDonald

8.10 Next steps

The assessments of need are the first step in identifying places to be connected into the Clyde Metro programme. Places, routes, and potential modes are then developed iteratively as a shortlist of network options for further assessment and appraisal beyond the CfI. Subsequent assessment processes within the CfI Stage 1a include:

- Completion of a network and route agnostic modal review for the study area which considers strengths, weaknesses, opportunities, and threats for alternative 'Metro' modes in the GCR. This will identify a shortlist of candidate modes which could form part of the proposed network(s), in tandem or isolation;
- From the place-based assessment of need summarised in Section A (derived from the datasets in Section A, also shown in Sections 3 to 7), identify a set of connections to form indicative 'corridors' in the network – these will be mode agnostic and not consider the detailed routeing;
- Potential GCR 'Metro' modes will then be considered for each corridor, sifting out alternatives which will be unfeasible while considering the routeing options in more detail. This will produce a set of mode and routeing options for each corridor;
- Each remaining mode and route 'corridor' combination will then be subject to Multi-Criteria Decision Analysis (MCDA) which assesses each, independently, against criteria derived from the CfI evidence base described in Sections A (datasets 'for assessment') and delivery principles in Section A;
- Potential network options are then developed from the route (and mode) assessments, iterating as appropriate when the combination of corridor options provides synergies. This includes options which could propose either:
  - Re-purposing of existing National Rail corridors to Metro operation (potentially releasing capacity); and/or
  - Making use of released capacity, from other options in the network, to enhance the National Rail offer (which could also include Metro conversion if deemed sufficiently beneficial and symbiotic).
- A 'long list' of network options are then subject to the same MCDA analysis as the earlier mode and route combinations, using updated composite scores across the constituent modes and routes. Three shortlisted network options are proposed for further development, assessment, and appraisal in the next CfI stages, with individual routes developed from the emerging preferred network option. Longlisted network options combine considerations of uni-modal versus multi-modal networks, combined with different emphases on the three themes and strategic objectives ((i) Economic development; (ii) People & Places; and (iii) Environmental Protection & Enhancement) plus deliverability:
- Within these processes, opportunities, where deemed net beneficial, are identified for:
  - Interchange, both between new and existing routes and/or multiple new routes; and
  - Use of released capacity (as per above). This could be to enhance levels of services on exiting public transport routes, accommodate new stations/stops, and/or deliver enhanced performance.

A. Policy Documents

ID	Document	Body	Link
National			
1	National Transport Strategy	Transport Scotland	National Transport Strategy | Transport Scotland
2	Strategic Transport Projects Review 2 (STPR2)	Transport Scotland	Strategic Transport Projects Review 2 | Transport Scotland
3	National Planning Framework 4 (NPF4)	Scottish Government	National Planning Framework 4 - gov.scot (www.gov.scot)
4	Scotland's National Strategy for Economic Transformation	Scottish Government	Scotland's National Strategy for Economic Transformation - gov.scot (www.gov.scot)
5	Climate Change Plan 2018 – 2032	Scottish Government	Securing a green recovery on a path to net zero: climate change plan 2018–2032 - update - gov.scot (www.gov.scot)
6	Transport poverty: a public health issue	Public Health Scotland	Transport poverty: a public health issue - Transport poverty: a public health issue - Publications - Public Health Scotland
Regional			
1	Glasgow City Region Economic Strategy	Glasgow City Region	Regional Economic Strategy - Glasgow City Region
2	The Regional Transport Strategy for the west of Scotland 2023 – 2038	Strathclyde Partnership for Transport	Regional Transport Strategy | SPT | Strathclyde Partnership for Transport
3	Glasgow Tourism Strategy	VisitGlasgow	Glasgow 2030 Tourism Strategy (visitglasgow.org.uk)
4	Glasgow City Region City Deal	Glasgow City Region	City Deal - Glasgow City Region
5	Clyde Mission	Glasgow City Region	Clyde Mission - Glasgow City Region
Local			
1	Glasgow Strategic Plan	Glasgow City Council	Strategic Plan - Glasgow City Council
2	Glasgow Climate Adaptation Plan	Glasgow City Council	Glasgow Climate Adaptation Plan 2022-2030 - Glasgow City Council
3	Glasgow City Centre Transport Plan	Glasgow City Council	City Centre Transport Plan - Glasgow City Council
4	Glasgow Transport Strategy	Glasgow City Council	Glasgow Transport Strategy - Glasgow City Council
5	Renfrewshire Local Transport Strategy	Renfrewshire Council	Local Transport Strategy - Renfrewshire Website
6	East Renfrewshire Local Transport Strategy Case for Change	East Renfrewshire Council	Local Transport Strategy - East Renfrewshire Council

ID	Document	Body	Link
7	West Dunbartonshire Local Transport Strategy	West Dunbartonshire Council	Background and Scope of New Plans – Sustainable Transport in West Dunbartonshire (connectingwestdunbartonshire.info)
8	East Dunbartonshire Local Transport Strategy	East Dunbartonshire Council	Local Transport Strategy | East Dunbartonshire Council
9	North Lanarkshire Local Transport Strategy	North Lanarkshire Council	northlanarkshire.gov.uk/sites/default/files/2020-06/Local Transport Strategy 2010.pdf
10	South Lanarkshire Local Transport Strategy	South Lanarkshire Council	Local Transport Strategy 2024-2034 - South Lanarkshire Council
11	Inverclyde Local Transport Strategy	Inverclyde Council	Local Transport Strategy - Inverclyde
12	Renfrewshire Council Plan	Renfrewshire Council	Renfrewshire Council Plan 2022-2027 - Renfrewshire Website
13	East Renfrewshire Local Development Plan	East Renfrewshire Council	Local Development Plan - East Renfrewshire Council
14	West Dunbartonshire Strategic Plan	West Dunbartonshire Council	Strategic Plan 2022-2027 | West Dunbartonshire Council (west-dunbarton.gov.uk)
15	East Dunbartonshire Local Development Plan	East Dunbartonshire Council	Local Development Plan 2 | East Dunbartonshire Council
16	The Plan for North Lanarkshire	North Lanarkshire Council	The Plan for North Lanarkshire | North Lanarkshire Council
17	South Lanarkshire Local Development Plan	South Lanarkshire Council	South Lanarkshire Local Development Plan 2 - South Lanarkshire Council
18	Inverclyde Local Plan	Inverclyde Council	Adopted Local Development Plan - 2019 - Inverclyde Council

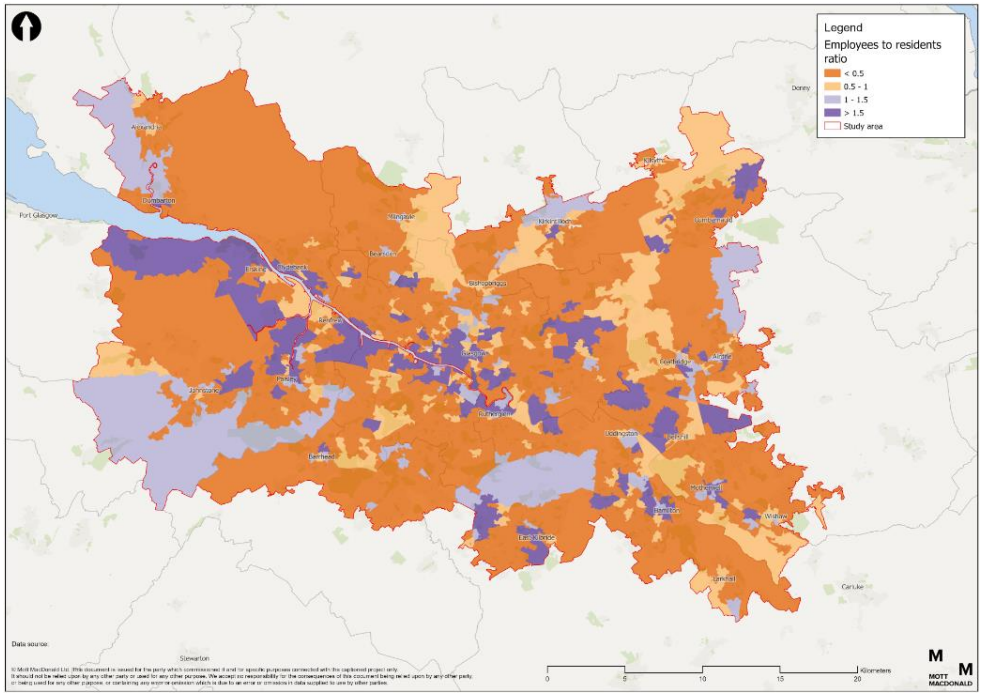
B. Socio-economic Indicators

Several additional indicators can provide useful indicators to GCR's economic baseline.

B.1 Job density

Map B.1 provides further context to the job density in the GCR study area and shows consistent pattern of better employment density in central Glasgow and better-connected periphery areas.

Map B.1: Study area employment-to-resident ratio



Source: 2011 Census

B.2 Housing construction

Table B.1 summarises the largest residential site allocations within the study area and number of units awaiting construction at each site.

Table B.1: Housing construction by sectors

Site	Sector	Total Units Awaiting Construction (2019)	Total Units Awaiting Construction (Post-2026)	Within 800m of existing station
Rof (Programmed But No Allocated Builder)	Renfrewshire Inner	1,345	939	
Gartloch CGA	Glasgow City (E)	1,300	1,300	
Glasgow Harbour (Remainder)	Glasgow City (W)	1,030	1,030	
Heathery Knowe CGA	Glasgow City (E)	1,000	1,000	Yes
Robroyston CGA	Glasgow City (N)	984	777	Yes
Ravencraig P Phase (Nether Johntson)	N Lanarkshire (Inner)	952	704	
Ravenscraig W Phase (Meadowhead)	N Lanarkshire (Inner)	938	938	
170 High St (College Goods Yard)	Glasgow City (CC)	727	0	Yes
Cowlairs/ East Keppoch	Glasgow City (N)	650	570	Yes
Sighthill TRA, Pinkston Rd/Dr	Glasgow City (N)	628	211	Yes

Source: Spatial Hub Scotland – Clydeplan RSS HLAA Housing Land Supply

Table B.2 summarises the number of units awaiting construction by Sector in the development pipeline.

Table B.2: Total residential units allocated by sector

Sector	Total Capacity	%	Not Built	C. 2019-2026	Post C. 2026	Disputed / Caveat
E Dunbartonshire (Inner)	2308	**2.6%**	**2038**	1822	216	0
E Renfrewshire (Inner)	3197	**3.5%**	**2715**	1565	1150	0
Glasgow City (City Centre)	6314	**7.0%**	**6264**	4430	1834	0
Glasgow City (E)	12335	**13.6%**	**11072**	5939	5133	0
Glasgow City (N)	7757	**8.6%**	**7335**	4329	3006	0
Glasgow City (S)	4626	**5.1%**	**4090**	3612	478	0
Glasgow City (SW)	3549	**3.9%**	**2939**	2619	320	0
Glasgow City (W)	6321	**7.0%**	**6238**	2975	3263	0
N Lanarkshire (Inner)	18921	**20.9%**	**18004**	10380	7624	1798
Renfrewshire (Inner)	10897	**12.0%**	**9567**	6160	3407	70
S Lanarkshire (Inner)	8767	**9.7%**	**7791**	4869	2922	0
W Dunbartonshire (Inner)	5511	**6.1%**	**5114**	2670	2444	0
Grand Total	**90503**	**100.0%**	**83167**	**51370**	**31797**	**1868**

B.3 Cultural venues

Tables B.3 and B.4 detail the main cultural venues in the study area.

Table B.3: High-capacity venues

15-Highest Capacity Venues	Type	Capacity
Celtic Park	Stadia	60,411
Hampden Park	Stadia	51,866
Ibrox Stadium	Stadia	50,987
Scottish Event Campus (Centre & Armadillo)	Event Space	18,000 Total: 3,000 (SEC Armadillo) 10,000 (Concert Hall 4) 5,000 (Concert Hall 3)
Fir Park (Motherwell F.C.)	Stadia	13,677
The OVO Hydro	Indoor Arena	12,500
St. Mirren Park Stadium	Stadia	7,937
Emirates Arena / Sir Chris Hoy Velodrome	Velodrome	6,500 (Arena) / 2,500 (Velodrome)
Scotstoun Stadium	Stadia	4,765
Glasgow Royal Concert Hall	Concert Hall	2,475
Kings Theatre	Theatre	1,785
Theatre Royal Glasgow	Theatre	1,541
Oakburn Park Pavilion	Theatre	1,449
The Pavilion Theatre	Theatre	1,449
Kelvin Hall Sports Arena	Indoor Arena	1,200
Hamilton Townhouse	Event Space	718

Source: Ordnance Survey, AddressBase, 2024

Table B.4: Study area cultural facilities by sector

Sector	Art Gallery	Concert Hall	Events Space	Indoor Arena	Museum	Place of Interest / Historic Site	Stadia	Theatre	Velodrome	Grand Total
East Dunbartonshire Inner	2				1			1		4
East Renfrewshire Inner								1		1
Glasgow City Centre	1	2	1		3	1		8		16
Glasgow City (East)					1	1	1		1	4
Glasgow City (South)						1	1			2
Glasgow City (South West)	1				1	2	1			5
Glasgow City (West)	2		1	2	1	1	1	1		9
North Lanarkshire Inner		1			3		1			5
Renfrewshire Inner					4	3	1			8
South Lanarkshire Inner			1		3	2		1		7
West Dunbartonshire Inner						4		1		5
Grand Total	**6**	**3**	**3**	**2**	**17**	**15**	**5**	**13**	**1**	**65**

Source: Ordnance Survey, AddressBase, 2024

B.4 Education

Table B.5 summarises the number of students in higher education institutions. The Glasgow Caledonian University and the University of Glasgow represent the biggest cohort of students for higher education in the GCR.

Table B.5: Student numbers in higher education institutions

Institution	2014/15 Total students	2021/22 Total students	2021/22 Total UK students	2021/22 Total non-UK students
Glasgow Caledonian University	16,930	20,050	16,480	3,570
Glasgow School of Art	1,840	2,440	1,580	860
The University of Glasgow	26,815	42,985	25,595	17,390
Royal Conservatoire of Scotland	985	1,245	860	385
TOTAL	46,570	66,720	44,515	22,205

Source: Higher Education Statistics Agency - Higher Education Student Statistics: UK, 2021/22, 2023

C. Natural and Built Environments

C.1 Natural environment

C.1.1 Biodiversity

The Clyde Metro study area contains European sites including a Special Area of Conservation (SAC) and Special Protection Areas (SPAs). SPAs are protected areas for birds and SACs are protected areas for natural habitats and certain species of interest. Wetlands of International Importance, also known as Ramsar Sites, are not European sites but often overlap with these areas and are protected in their own right. The study area also contains numerous national and local designated ecological sites including (see Map C.2):

- One Special Area of Conservation - Clyde Valley Woods covers an area of 432.89ha and is designated for the Annex I habitat, Tilio-Acerion forest of slopes, screes and ravines. It represents the most extensive complex of woodland gorges with Tilio-Acerion forests in Scotland. The site also contains the Annex II species, otters, *Lutra lutra*, which is also a qualifying feature of the site. Threats and pressures on the site are from grazing, invasive non-native species, and interspecific floral relations.
- Two Special Protection Areas - Black Cart SPA and Inner Clyde Estuary SPA. Black Cart SPA covers an area of 55.5ha and is largely improved grassland habitat and inland water bodies. In winter, the site supports internationally important numbers of Whooper Swan, *Cygnus cygnus*. Threats and pressures on the site are from utility and service lines, hunting and collection of wild animals, other forms of pollution, and changes in biotic conditions. Inner Clyde Estuary SPA covers an area of 1,813.72ha. It is a long narrow, heavily industrialized estuary near Glasgow, consisting mostly of tidal mudflat with a shoreline of unmanaged semi-natural coastal vegetation; saltmarsh is also present. In winter, the site supports internationally important numbers of redshank, *Tringa totanus*. Sport fishing and hunting, in addition to navigation, are practiced in the area. Dredging and pollution from domestic sewage and oil are considered to be adverse factors.
- One Ramsar Site - Inner Clyde Estuary Ramsar Site covers the same area as the Inner Clyde Estuary SPA and is designated for Redshank.
- 41 Sites of Special Scientific Interest (SSSI)
- One National Nature Reserve (NNR) – Clyde Valley Woodlands NNR is made up of six of the best ancient woodlands in the Clyde Valley. These rich deciduous woods cling to the sides of steep gorges. In spring colourful wildflowers carpet the woodland. NatureScot, the Scottish Wildlife Trust (SWT) and South Lanarkshire Council (SLC) manage this NNR.
- 49 Local Nature Reserves (LNR). Proposed new LNRs and LNR extensions in Local Development Plans.
- Glasgow city-wide Site of Importance for Nature Conservation (SINC) and local SINCs
- Tree preservation orders are present
- The study area has a mix of different landscapes that support a wealth of different habitats including some of those on the Scottish Biodiversity List. The Scottish Biodiversity List is a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland.
- Ancient woodland is classed as irreplaceable habitat. 3.67% of the total study area is classed as ancient woodland.

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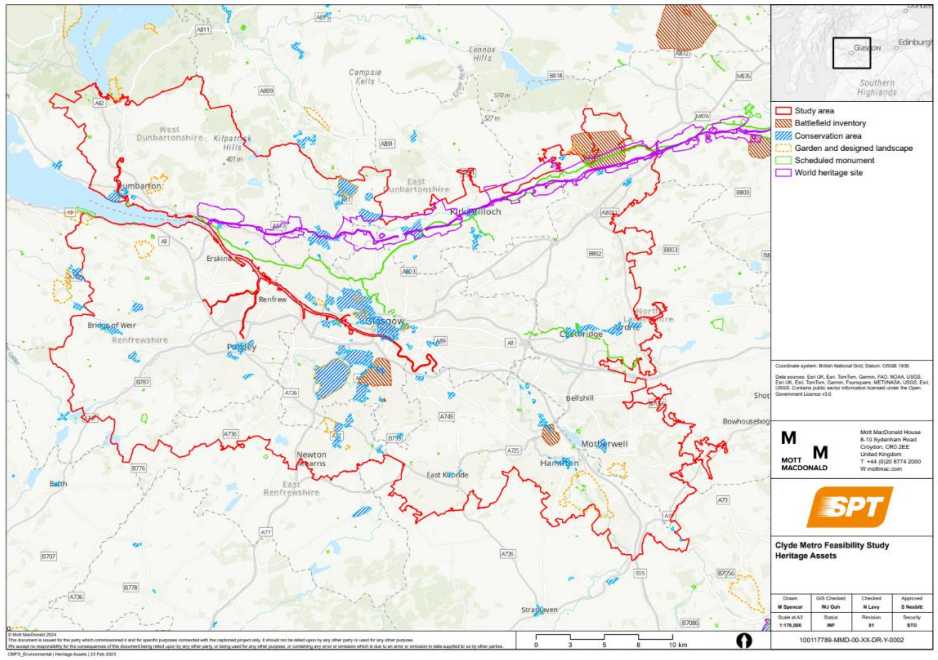
Map C.2: Study area natural assets



Source: Historic Environment Scotland, 2024

Development pressure, climate change and pollution can have effects on these international, national and local wildlife sites and their qualifying features. Transport has a key role to play in ensuring these sites are protected to support nature recovery. Ecological sites and the species they support will need to be carefully considered and protected through planning and development of Clyde Metro, seeking to avoid fragmentation of habitat networks. There is also potential for effects outside the study area through hydrological connections to sites, effects on functionally linked habitats and effects on mobile species e.g. bats.

Clyde Metro also presents nature positive opportunities through habitat creation, green infrastructure and linking wildlife networks. It may also support greater access to nature. The Scotland Biodiversity Strategy to 2045 sets out an ambition for Scotland to be Nature Positive by 2030 and to have restored and regenerated biodiversity across the country by 2045.

C.1.2 Landscape

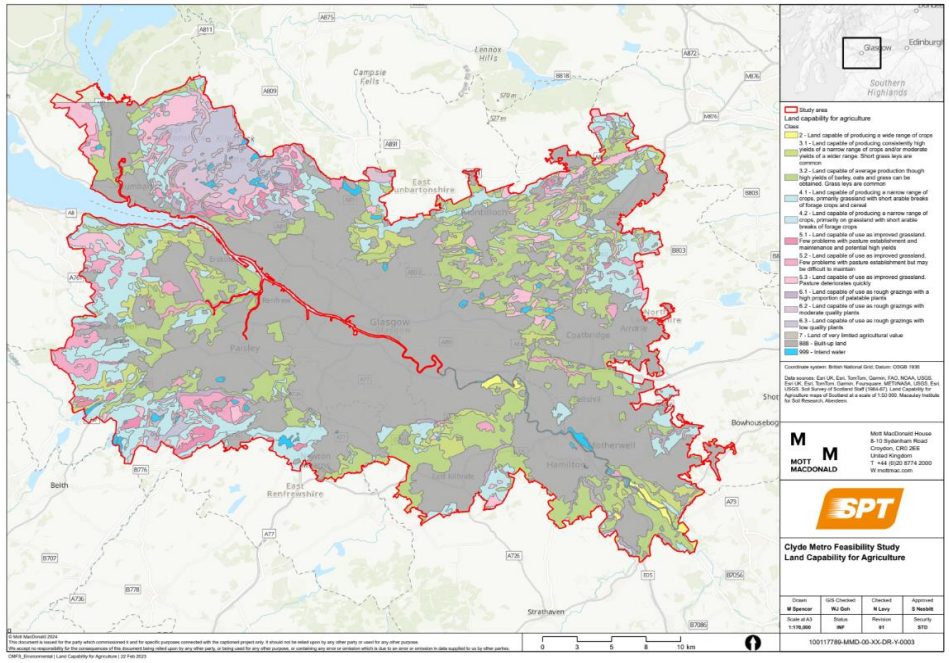
Landscape character assessments have been carried out for Scotland and landscape character types and areas have been mapped. The study area contains a variety of different landscape types including urban, plateau farmland, rolling farmland, urban fringe farmland, broad urban valley, incised river valleys, broad valley lowland.

The study area is a mix of urban and rural landscapes, and agricultural land makes a significant contribution to the character of the region. The Land Capacity for Agricultural map has been used to estimate the percentage agricultural land by class within the study area (see Map C.3):

- 22% Class 1 - 3 agricultural land (classed as prime agricultural land)
- 28% Class 4 - 6 agricultural land
- 50% classed as built-up land

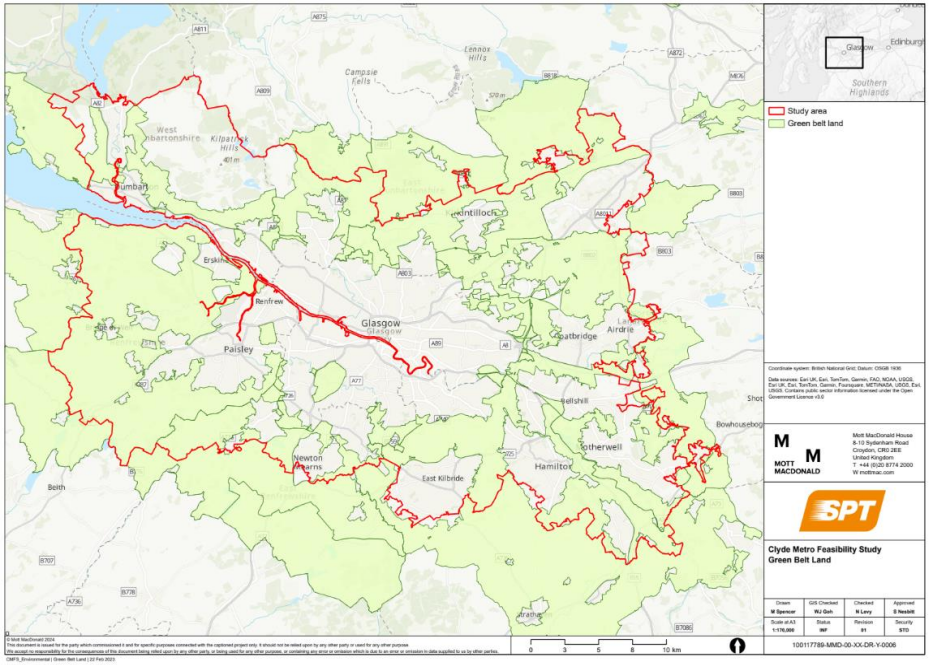
There are small, scattered areas of peat within the study area which are nationally important carbon-rich soils and priority peatland habitat. These areas are likely to be of high conservation value and restoration potential.

Map C.3: Land capacity for agricultural land



Source: The James Hutton Institute, Land Capability for Agriculture, 2016

Map C.4: Green Belt land



Source: Scottish Government, Green Belts – Scotland, 2024

A small part of the study area at the north west boundary is within the Loch Lomond and The Trossachs National Park, and the study area is just outside the Loch Lomond National Scenic Area. There are also numerous Local Landscape Areas (LLAs) in the study area. These areas are designated by a local authority in their Local Development Plan due to their local value.

Green Belt land often surrounds larger cities and is classed as protected open space. Its purpose is to help prevent urban sprawl, protect native wildlife and retain the character of rural communities. Map C.4 shows the Green Belt land within the study area.

Clyde Metro should aim to protect high-quality agricultural land and important landscape areas, avoid fragmentation of green spaces and networks, and protect hedgerows and woodland areas. There may be opportunities to maximise use of existing infrastructure and brownfield land for transport development, improve public transport access to green spaces, and provide landscaping to support green corridors.

C.1.3 Water

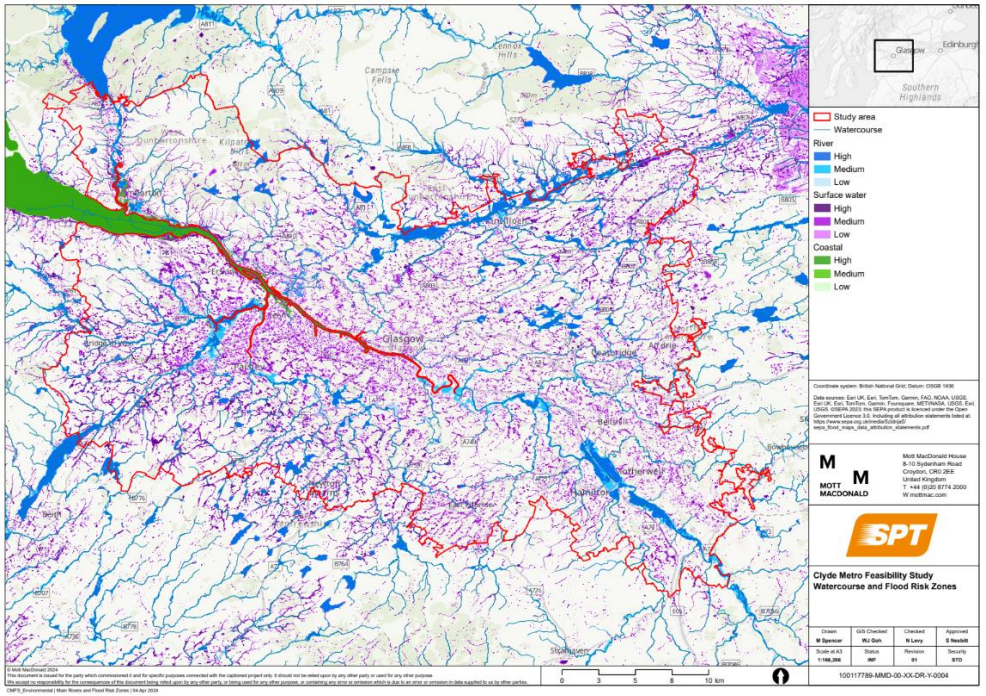
The study area contains surface water bodies and groundwater bodies. The overall status of waterbodies in the study area varies but is largely between

Good, Moderate and Poor status. At present 63% of water bodies in Scotland are at 'good' or better status, with the aim of 87% of water bodies are at 'good' status by 2027. The river and coastal catchments within the study area include:

- River Clyde
- White Cart Water
- Glasgow Coastal
- River Kelvin

Flood risk within the study area can occur from a variety of sources including river, surface and coastal flooding. Map C.5 presents the flood risk areas from these sources across the study area. Flooding is predicted to increase in the future with climate change causing more severe storms, wetter winters and heavier rainfall events.

Map C.5: Flood risk



Source: Insert Notes or Source

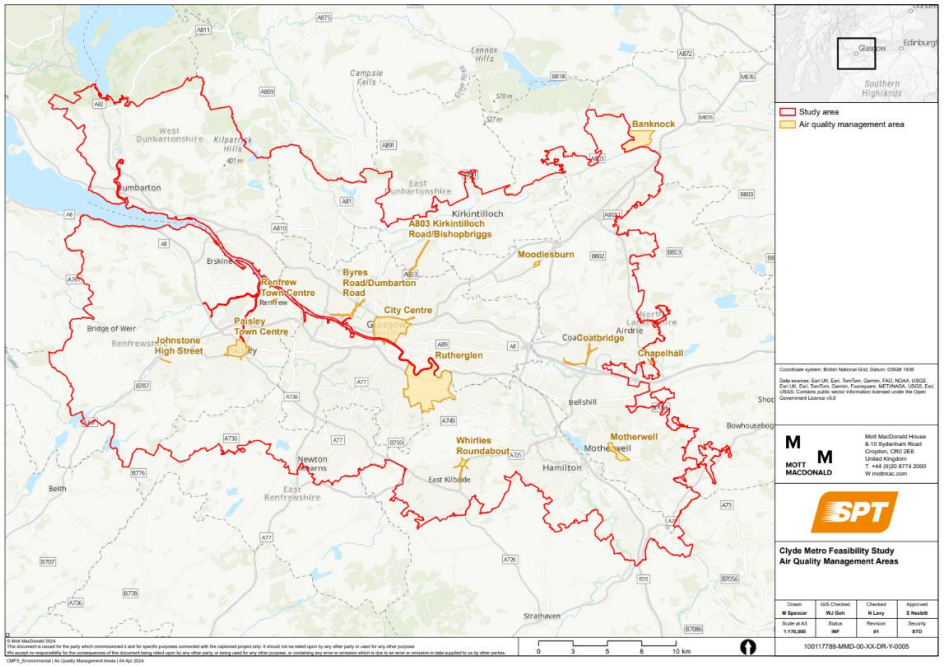
Clyde Metro should aim to avoid floodplains and high flood risk areas if possible. Design should take future climate effects on flooding into account. Clyde Metro presents an opportunity to reduce pollution through modal shift away from the private car, and use of SuDS and other nature-based solutions for drainage and flood risk reduction.

C.1.4 Air quality

The main air pollutants of concern in the study area are nitrogen dioxide (NO_2) and particulate matter (PM_{10}) from road transport. There are 12 Air Quality Management Areas (AQMAs) declared in the study area as shown in Map C.6

and Table C.6. Glasgow implemented a Low Emission Zone (LEZ) in June 2023 to help reduce levels of vehicle emissions in the city centre.

Map C.6: Air Quality Management Area



Source: Scottish Government, AQMA – Scotland, 2024
Note: Banknock a & Haggs AQMA in Falkirk on the boundary of the study area was revoked in 2021

Table C.6: Air Quality Management Area Details

Council Area	AQMA Name	Pollutants Declared
East Dunbartonshire Council	A803 Kirkintilloch Road / Bishopbriggs	Declared in 2005 for PM10 and NO2 annual mean objectives
Glasgow City Council	Byres Road/Dumbarton Road	Declared in 2007 for NO2 (annual mean), amended in 2016 to also include PM10 (annual mean), and the amended in 2020 to just include NO2 (annual mean)
	City Centre	Declared in 2002 for NO2 (annual mean) and amended in 2007 to also include PM10 (annual mean)
North Lanarkshire Council	Chapelhall	Declared in 2005 for PM10 (annual mean)
	Coatbridge	Declared in 2005 for PM10 (annual mean)
	N Lanarkshire AQMA Moodiesburn	Declared in 2011 for PM10 (annual mean)
	Motherwell	Declared in 2005 for PM10 (annual mean)
Renfrewshire Council	Johnstone High Street	Declared in 2016 for NO2 (annual mean)
	Paisley	Declared in 2006 for NO2 (1-Hour mean) and amended in 2009 to also include PM10 (annual mean) and NO2 (1-Hour and annual mean)
	Renfrew Town Centre	Declared in 2016 for NO2 (1-Hour and annual mean)
South Lanarkshire Council	Rutherglen	Declared in 2016 for PM10 (annual mean)
	Whirlies Roundabout	Declared in 2008 for PM10 (annual mean)

Source: Insert Notes or Source

Clyde Metro provides opportunities to improve air quality due to modal shift, providing integrated travel planning and onward journeys to promote public transport and active modes, and integration of electric vehicle infrastructure at key hub locations. Landscape planting can help to support air quality, carbon sequestration and wider nature positive and blue/green infrastructure benefits to align with NPF4.

C.2 Built environment

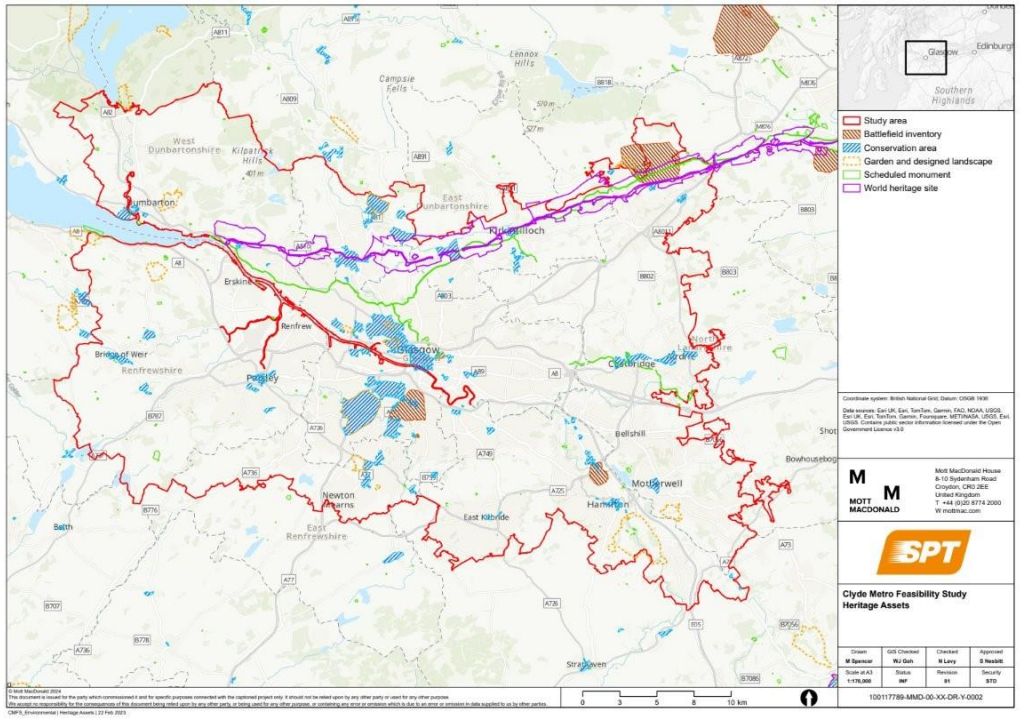
C.2.1 Heritage

The study area is rich in heritage and archaeological assets with listed buildings, scheduled monuments, conservation areas, garden and designed landscapes, registered battlefields and a World Heritage Site. These are shown in Map C.7: Heritage assets

. There is potential for effects outside the study area such as the setting and character of surrounding heritage assets and landscapes which will need to be considered. Map C.7: Heritage assets

also shows heritage assets outside the study area.

Map C.7: Heritage assets



Source: Scottish Government

Heritage assets include:

- There is one World Heritage Site, Antonine Wall in the north of the study area. The Antonine Wall was built in the years following AD 142 on the orders of the Roman Emperor Antoninus Pius. It followed a 60km line from modern Old Kilpatrick on the north side of the River Clyde to Bo'ness of the Firth of Forth. It was the Roman Empire's most northerly frontier and a sophisticated military construction. Unlike Hadrian's Wall which was built from stone, the Antonine Wall was composed of ramparts built from layers

of turf and fronted by a wide and deep ditch to deter attackers. A Roman Road, the Military Way, ran behind it allowing delivery of supplies, troops and news from across the territory.

- There are around 6,682 listed buildings across the study area, 906 of these are Category A, 4,392 are Category B, and 1,384 are Category C.
- There are 79 Conservation Areas. Conservation Areas play a key role in ensuring new development preserves or enhances the features of special historical or architectural interest within the area designated.
- There are 139 scheduled monuments, 16 Garden and Designed Landscapes, and 3 Registered Battlefields.

The National Record of the Historic Environment is available through the online catalogue Canmore. It contains a vast range of archaeological, industrial and maritime sites and buildings across Scotland including locally important assets not covered by national designations. As part of the route development for Clyde Metro, Canmore will be reviewed to identify any risks or opportunities for these assets.

The Buildings at Risk Register includes listed buildings and buildings in conservation areas that are at risk of loss through neglect, decay or development, or are vulnerable to becoming so. As part of the route development for Clyde Metro the Buildings at Risk Register will be reviewed to identify any risks or opportunities for these buildings.

Heritage assets will need to be protected through planning and development, including their setting. Clyde Metro provides opportunities to reduce transport-related pollution effects on heritage assets through modal shifts and improve public transport access to heritage sites.

C.2.2 Noise

The main receptors of noise pollution include schools, hospitals, community facilities, dwellings, and designated sites. Transport infrastructure (road networks and railway tracks) are a key source of noise pollution which can impact human health. The Environmental Noise Directive requires, on a five yearly cycle, the Scottish Government to produce strategic noise maps from which Candidate Noise Management Areas (CNMAs) are defined, with subsequent Noise Management Areas agreed and Noise Action Plans developed. In Glasgow, there are 80 CNMAs for roads, 19 CNMAs for rail, and 71 Candidate Quiet Areas[45]. Noise exposure statistics have been estimated by the Scottish Government and are summarised in Table C.7. The noise maps will be utilised when developing route corridor options for Clyde Metro to identify any risk or opportunity areas.

[45] Scottish government (2019) Action Planning – Round three. Available at: Round three | Action planning | Scotland's noise (environment.gov.scot)

Table C.7: Population exposure – number of people exposed to the different noise levels from each source

Noise source	Noise Level					
	L_{den} > = 55 (dB)	L_{den} > = 65 (dB)	L_{den} > = 75 (dB)	L_{night} > = 50 (dB)	L_{night} > = 60 (dB)	L_{night} > = 70 (dB)
All mapped roads in Glasgow	570,900	86,000	3,100	375,500	21,000	1,400
Major roads Glasgow	275,600	57,000	3,100	179,400	19,100	1,400
All mapped railways Glasgow	60,400	11,700	100	38,200	3,900	0
Major railways Glasgow	54,600	10,900	100	35,100	3,500	0
Industry Glasgow	1,990	0	0	1,000	0	0
Consolidated Glasgow	661,500	101,900	3,300	461,100	29,100	1,500

Source: Scotland's noise, Round 3 noise exposure statistics, 2012

D. Transport indicators

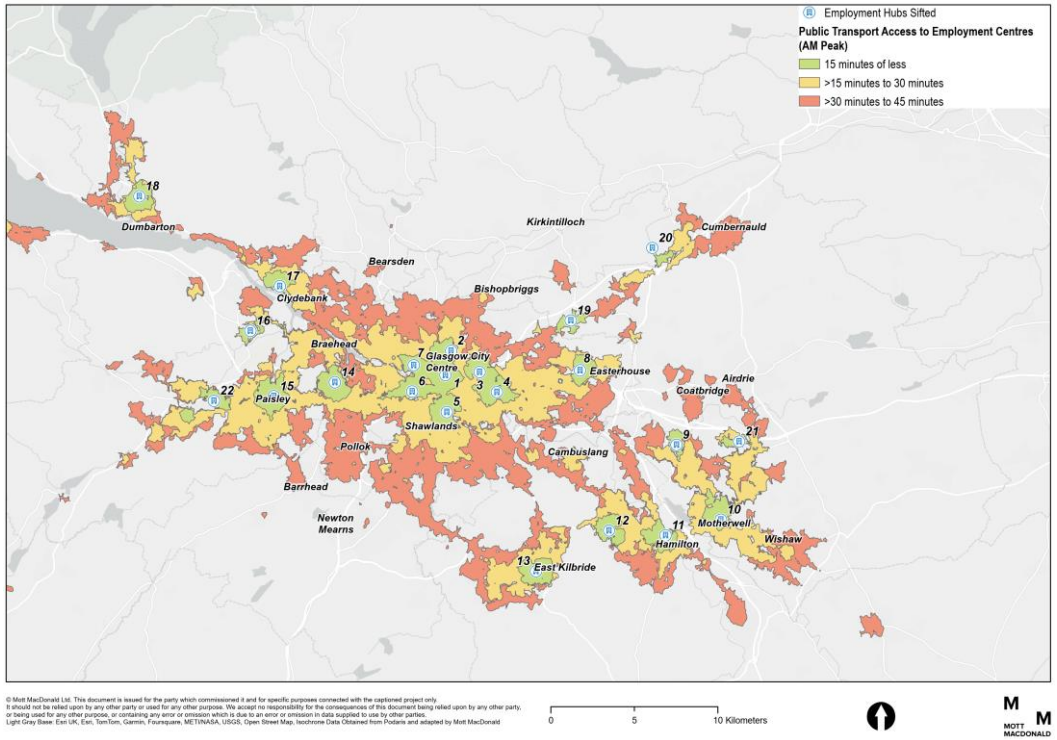
Several additional transport indicators are valuable to understanding the connectivity gaps in GCR.

D.1 Public transport employment centre access

Map D.8 shows accessibility to key employment hubs identified throughout the study area. Identification of these hubs was informed by a robust review of GVA (Total) data (2019 & 2021, DZ) cross-referenced against total employees by Data Zone (2022). This enabled identification of key clusters of both metrics in tandem, and in isolation. Upon review, it was concluded the City Centre sector should stand as an economic hub. As well as providing robust accessibility analysis, this exercise provided comprehensive insight into where economic activity is clustered throughout Glasgow; thus enabling better quantification of the level of social isolation endured by locations which are poorly served by identified key economic hubs in Map D.8.

No.	Employment Centre	No.	Employment Centre
1	Glasgow City Centre	12	Hamilton Intl. Park & Blantyre Industrial Estate
2	Craighall Business Park, Port Dundas	13	Scottish Enterprise Tech. Park, Stroud Business Park & Kelvin Ind. Est.
3	Citypark Glasgow	14	Hillington Park, Braehead Shopping Centre
4	Parkhead, The Forge, Celtic Stadium, Emirates Arena	15	Paisley Town Centre & Glasgow Airport
5	St Andrews Industrial Est., Crown Street Retail Park, Caledonia House	16	Inchinnan Business Park
6	Ibrox And Kinning Park	17	Clydebank Business Park & Town Centre
7	The West End	18	Vale Of Leven Industrial Estate
8	Queenslie Industrial Estate & The Fort Glasgow	19	Buchanan Gate & Buchanan Park
9	Strathclyde Business Park, Bellshill North Ind. Park, Righead Ind. Est.	20	Hunt Hill, Drum Mains Park, Orchardton Road & Westfield Park
10	Motherwell Centre	21	Maxim Park, Eurocentral, Newhouse Industrial Estate
11	Hamilton Centre	22	The Phoenix, St. James Business Centre, Imperial Park

Map D.8: Public transport access to employment centres

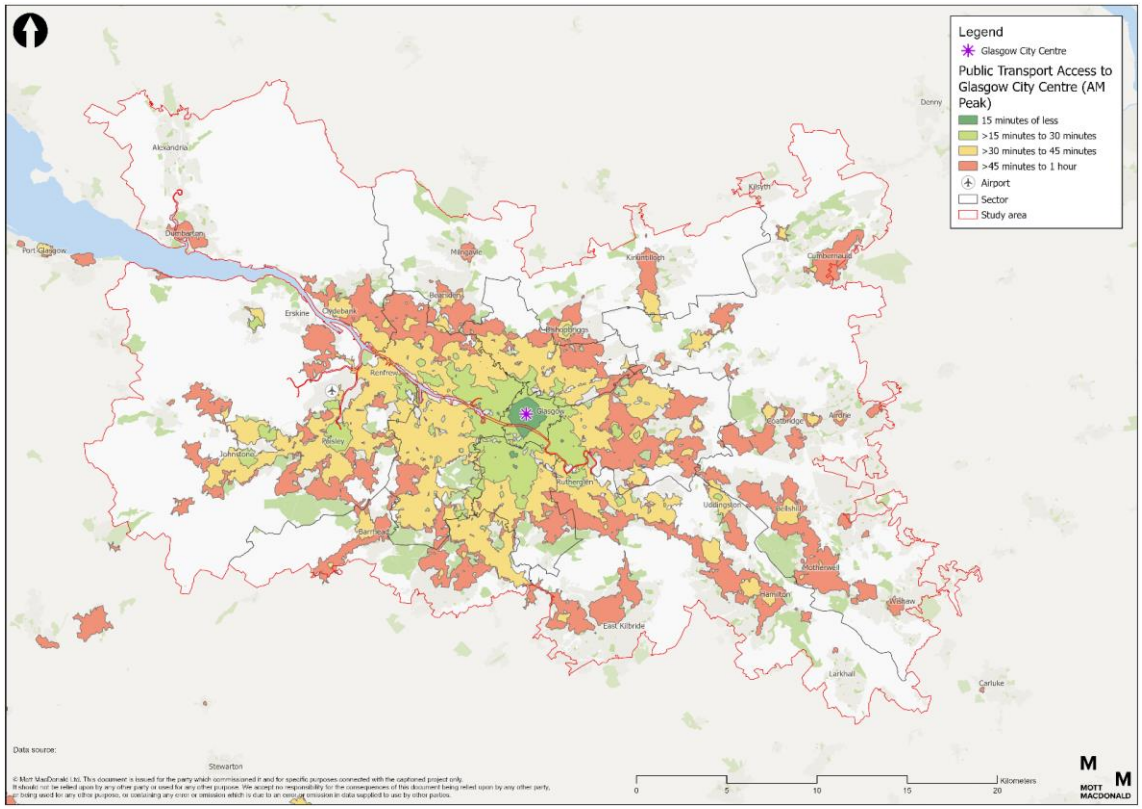


Source: Basemap (Q1, 2024) & Podaris, 2024

Building upon this, direct public transport access to Glasgow City Centre has been reviewed. Whilst much of Glasgow district can access the city centre within 30 minutes; with the exception of several pockets (predominantly in proximity to rail stations e.g. Paisley, Bishopbriggs), most other locations suffer long journey times. The accessibility assessment factors in a 600-metre walking limit to / from rail stations / bus stops. Pockets of 'good' accessibility from places served by fast or semi-fast National Rail services can be observed towards the boundary of the study area. East Kilbride, Dumbarton

and Cumbernauld are all examples of locations which larger built-up areas which are over an hour from Glasgow City Centre by public transport.

Map D.9: Public transport access to employment centres



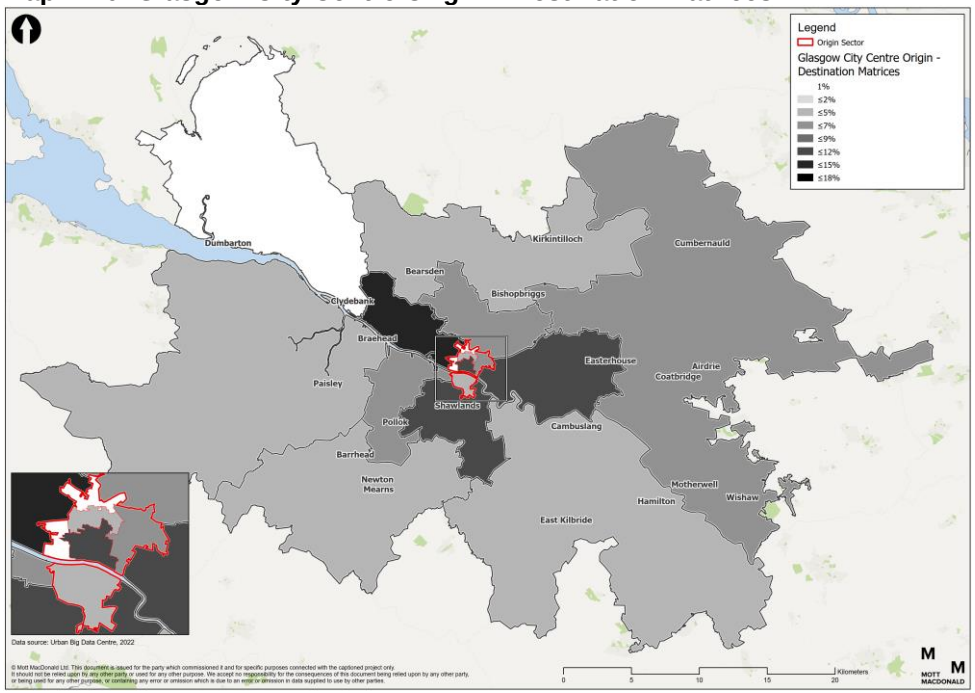
Source: Basemap (Q1, 2024) & Podaris, 2024

Origin -> Destination		Journey Time Bus (Routes Utilised)	Journey Time Rail - Total from node to St. Vincent St. / Hope St. (Boarding Time -> Arrival)
Pollok (Corkerhill)	***City Centre***	c. 38 mins (38A route)	c. 11 mins (08:41 -> 08:49)
Barrhead		c. 62 mins (3 Switch route)	c. 21 mins (08:32 -> 08:50)
Paisley (Gilmour St.)		c. 46 mins (38A Switch route)	c. 14 mins (08:45 -> 08:59)
Newton Mearns		c. 38 mins (4 route)	null (no nearby station)
East Kilbride		c. 58 mins	c. 36 mins (08:12 -> 08:49)
Hamilton (Hamilton West)		c. 75 mins (267 route)	c. 30 mins (08:28 -> 08:53)
Motherwell		c. 41 mins (240X -> 38 routes)	c. 22 mins (08:35 -> 08:54)
Cambuslang		null	c. 19 mins (08:39 -> 08:53)
Easterhouse		c. 49 mins (X19 route)	c. 23 mins (08:26 -> 08:41)
Coatbridge (Sunnyside)		c. 54 mins (902 route)	c. 27 mins (08:32 -> 08:51)
Airdrie		c. 57 mins (902 route)	c. 33 mins (08:28 -> 08:51)
Kirkintilloch (Lenzie)		c. 37 mins (X85 -> 19 routes)	c. 18 mins (08:24 -> 08:35)
Bishopbriggs		c. 38 mins (88 route)	c. 14 mins (08:28 -> 08:35)
Clydebank		c. 39 mins (1A route)	c. 28 mins (08:29 -> 08:52)
Dumbarton (Central)		C. 77 mins (1A route)	c. 35 mins (08:10 -> 08:52)

D.2 Current Travel Demand

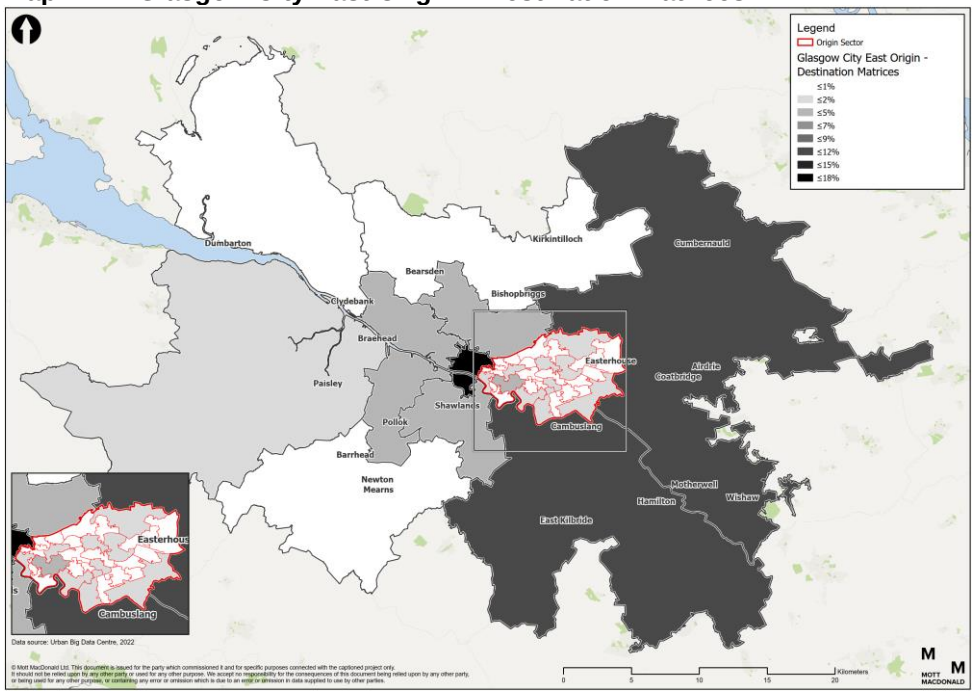
Map D.10 to Map D.21 provide a detailed overview of current travel demand from and within each sector within each sector.

Map D.10: Glasgow City Centre Origin – Destination Matrices



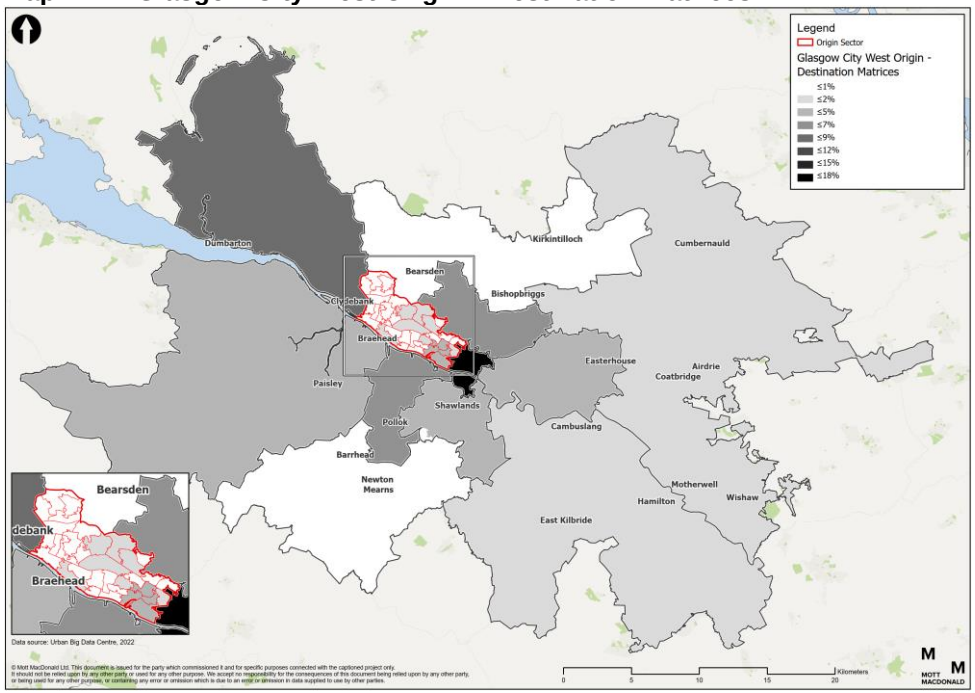
Source: Urban Big Data Centre, 2022

Map D.11: Glasgow City East Origin – Destination Matrices



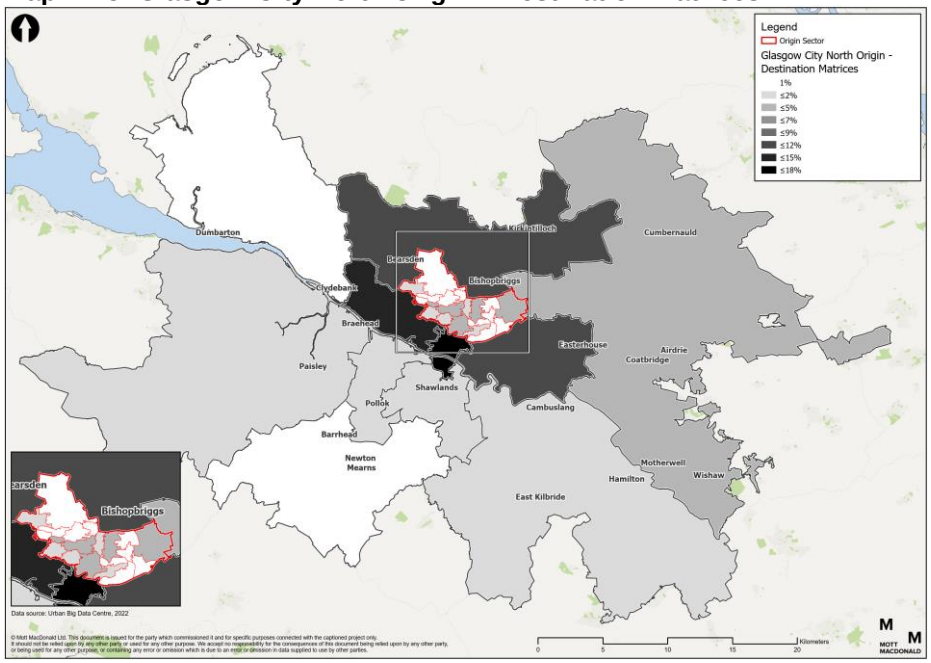
Source: Urban Big Data Centre, 2022

Map D.12: Glasgow City West Origin – Destination Matrices



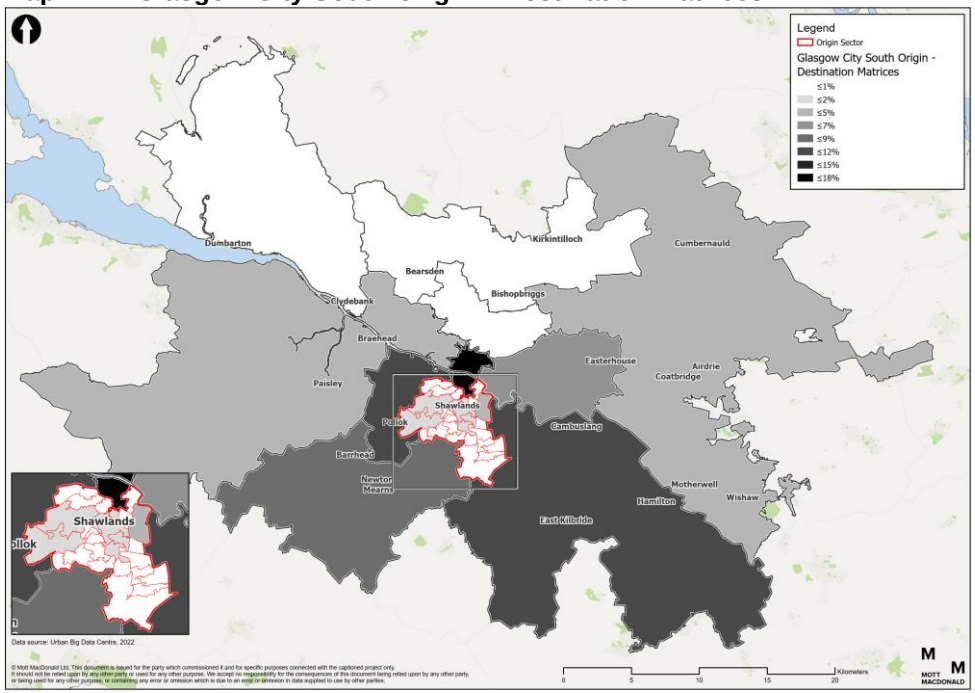
Source: Urban Big Data Centre, 2022

Map D.13: Glasgow City North Origin – Destination Matrices



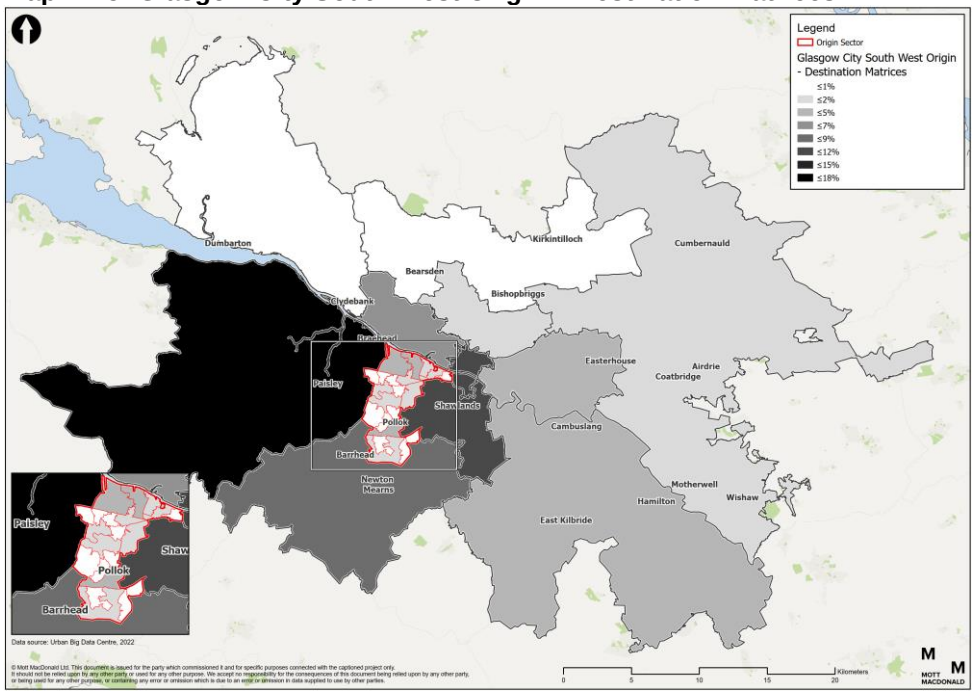
Source: Urban Big Data Centre, 2022

Map D.14: Glasgow City South Origin – Destination Matrices



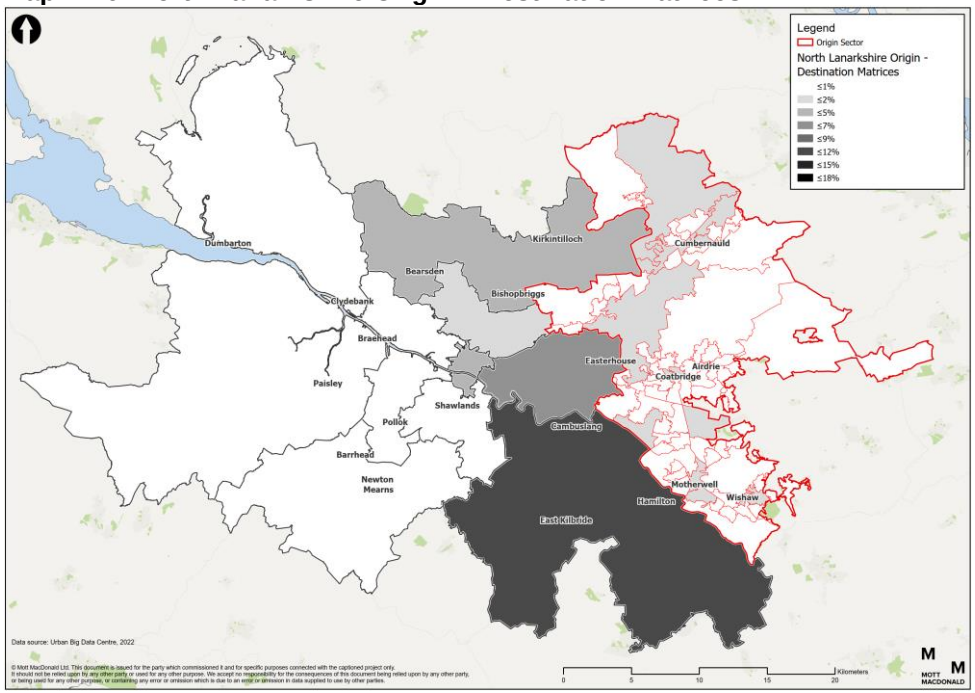
Source: Urban Big Data Centre, 2022

Map D.15: Glasgow City South West Origin – Destination Matrices



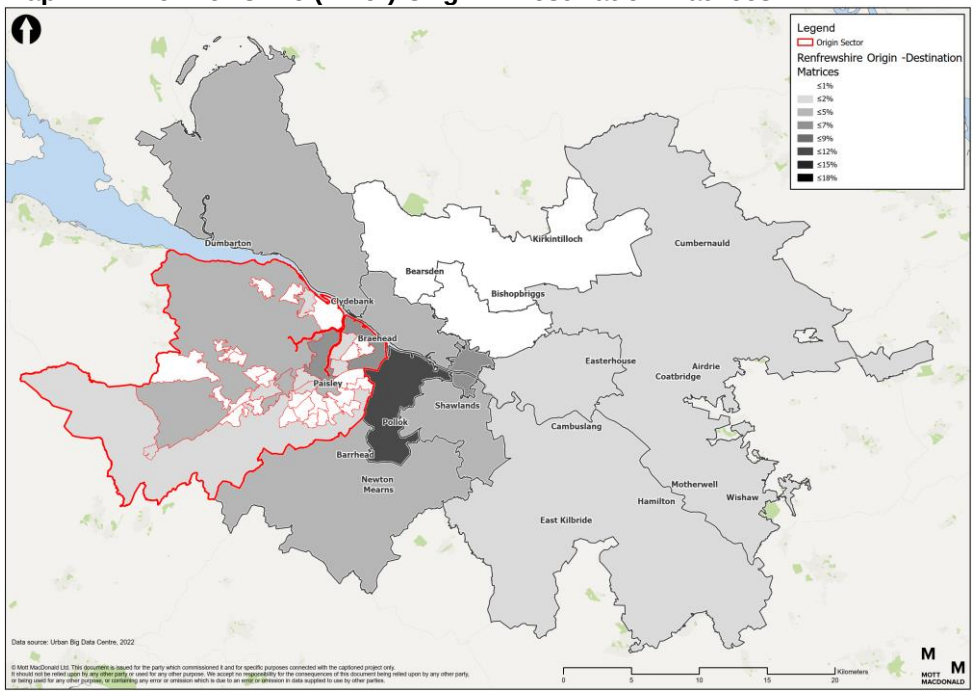
Source: Urban Big Data Centre, 2022

Map D.16: North Lanarkshire Origin – Destination Matrices



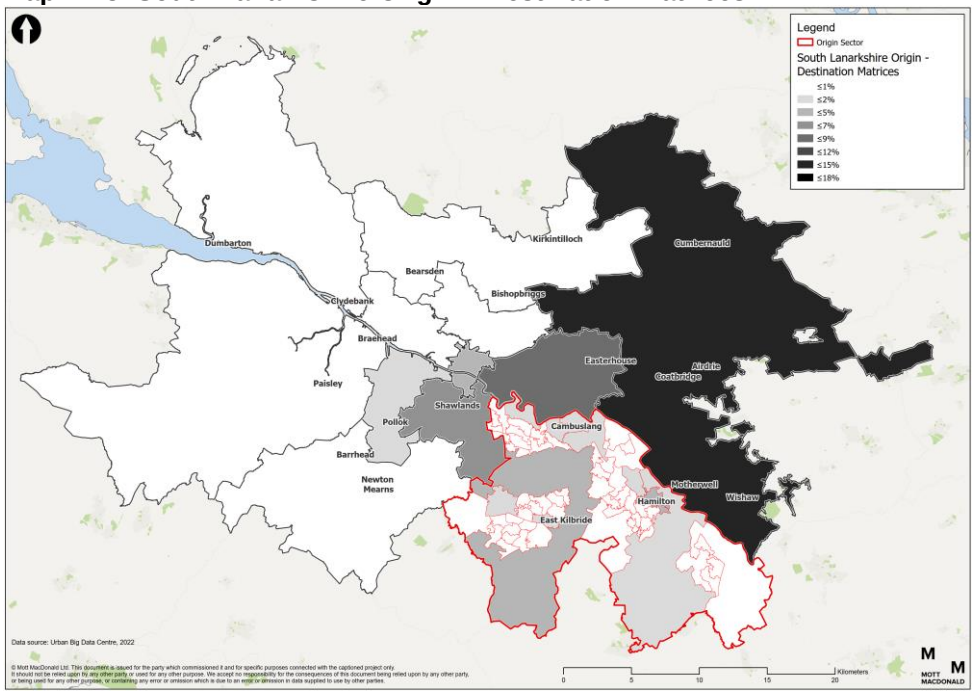
Source: Urban Big Data Centre, 2022

Map D.17: Renfrewshire (Inner) Origin – Destination Matrices



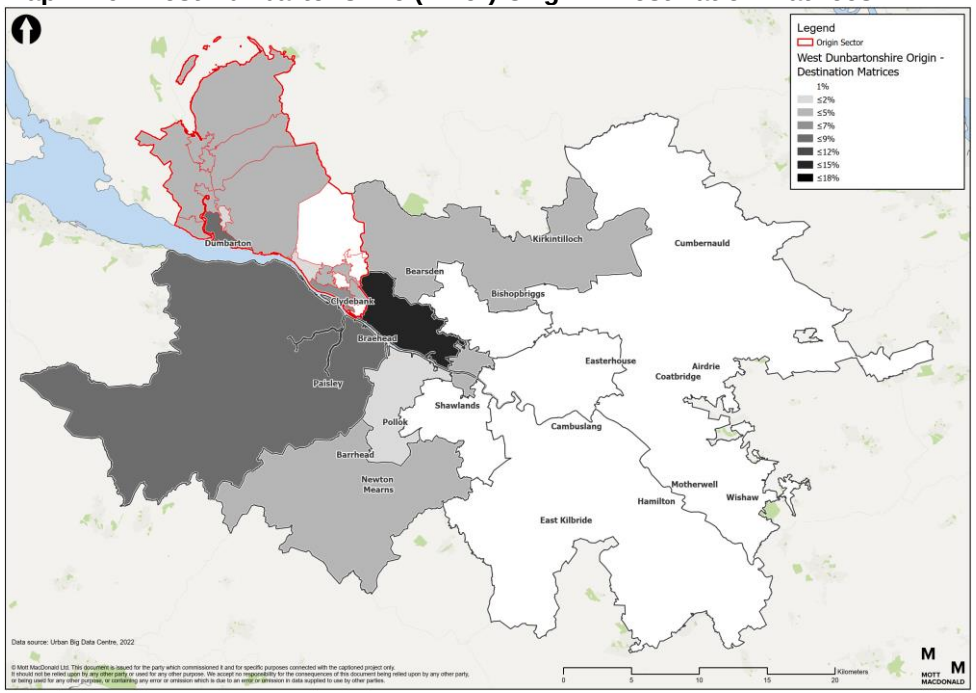
Source: Urban Big Data Centre, 2022

Map D.18: South Lanarkshire Origin – Destination Matrices



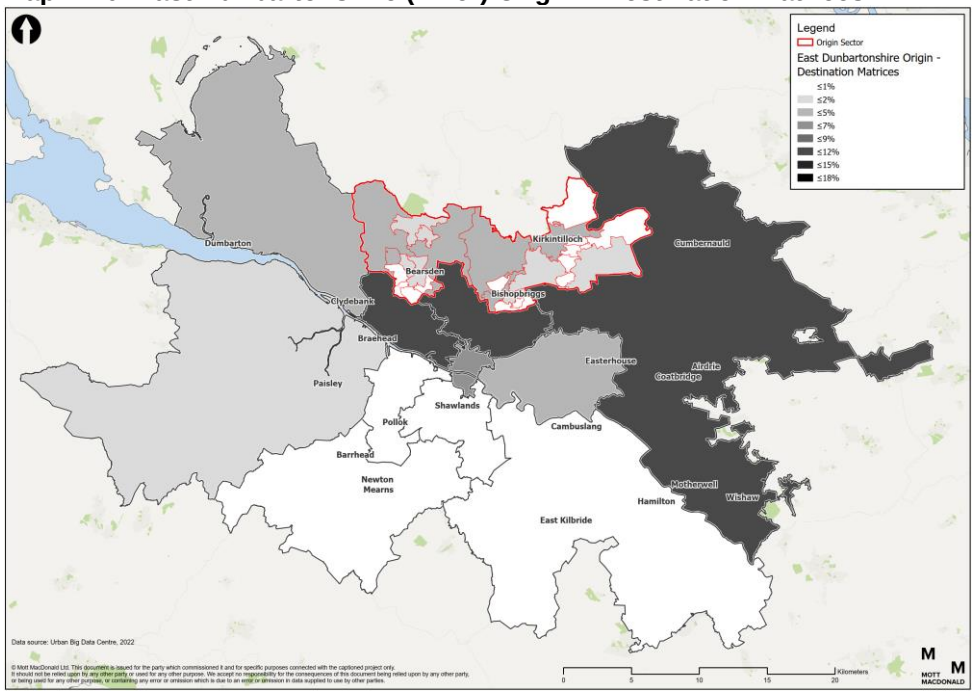
Source: Urban Big Data Centre, 2022

Map D.19: West Dunbartonshire (Inner) Origin – Destination Matrices



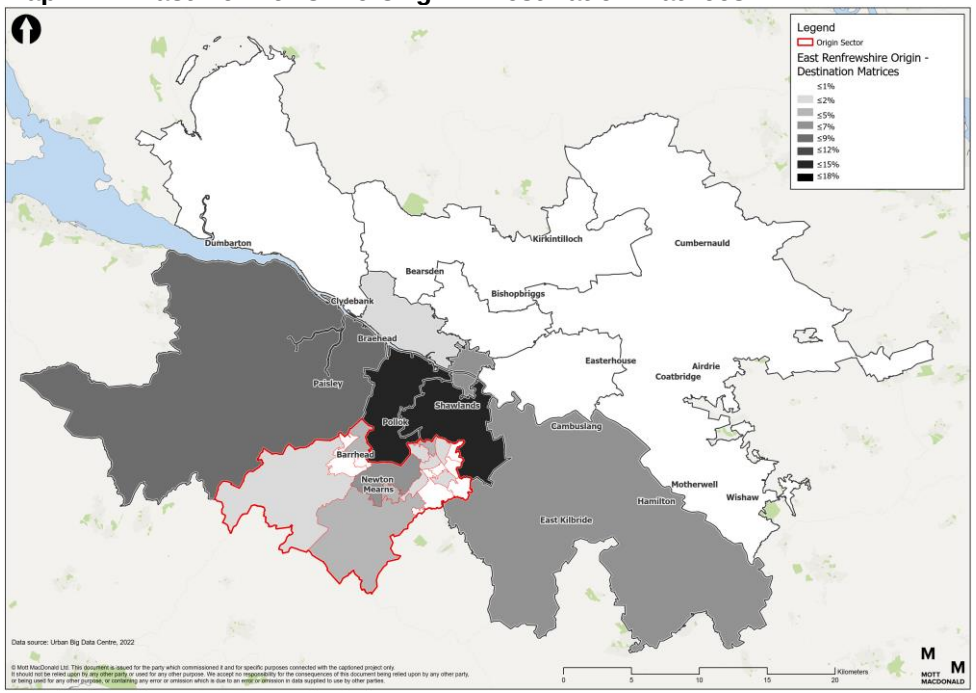
Source: Urban Big Data Centre, 2022

Map D.20: East Dunbartonshire (Inner) Origin – Destination Matrices



Source: Urban Big Data Centre, 2022

Map D.21: East Renfrewshire Origin – Destination Matrices



Source: Urban Big Data Centre, 2022

D.3 Road analysis

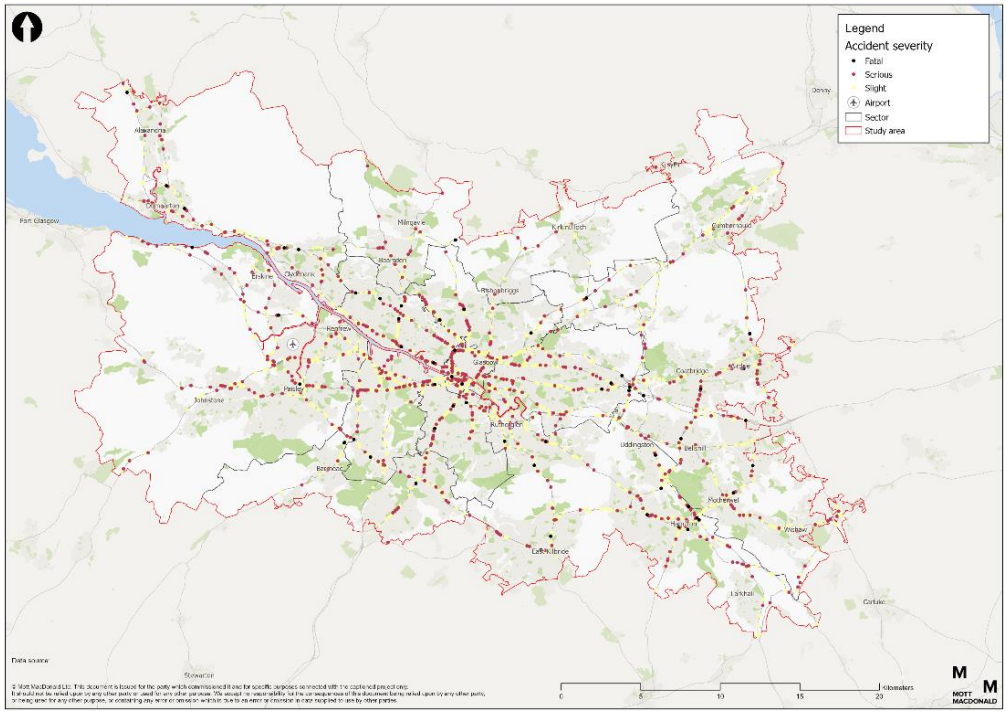
23,936 total accidents took place on the Scottish Road Network (2018-2022), 28% of which took place inside the Study Area (6,835). 3,104 of these accidents took place on major roads throughout the Study Area (45.4%).

Map D.22 summarises the distribution of accidents (2018-2022) across the Major Roads within the Study Area (all Motorways, A-Roads and Primary Roads). This is supported by Table D.8, which provides an overview of all SRN roads included in Map D.22, on which a total of 50 or more accidents took place. Collectively, the 22 roads in Table D.8 account for 81% of all

major road accidents within the study area and over one-third of total study area accidents. For reference, there are 50 total major roads within the Study Area.

Four (almost five) roads account for just over one-third (33.7%) of total major road accidents within the Study Area. Moreover, the four locations where accidents are most common are each the key arterial routes to the northwest and south west of the Study Area respectively. A8 has almost twice as many collisions as any one major road when discounting motorways. This is likely attributed to it being significantly longer than any other major road as it spans the east-west axis of the study area. In contrast, routes such as the A814, A82 and A89 span approximately half this.

Map D.22: Study area road accident severity



Source: DfT Road Safety Data (2023)

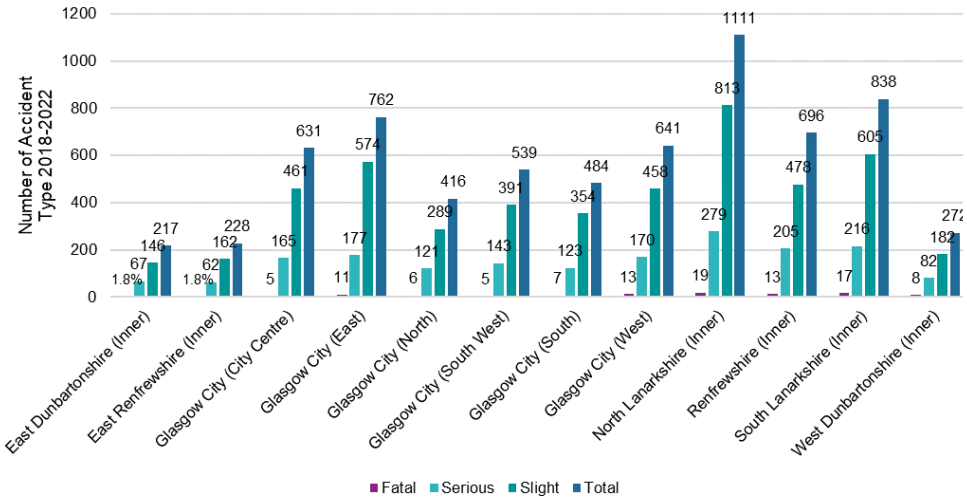
Table D.8: Major Roads with Over 50 Total Accidents 2018-2022

Gla	Fatal	% of Total	Serious	% of Total	Slight	% of Total	Grand Total	Proportion of Total Major Road Accidents	Proportion of Total Study Area Accidents
A8	2	0.7%	73	24.3%	226	75.1%	**301**	9.7%	4.4%
M8	8	2.8%	52	18.5%	221	78.6%	**281**	9.1%	4.1%
A814	2	1.3%	48	31.0%	105	67.7%	**155**	5.0%	2.3%
A82	7	4.5%	46	29.7%	102	65.8%	**155**	5.0%	2.3%
A89	2	1.3%	30	19.7%	120	78.9%	**152**	4.9%	2.2%
A77	4	2.8%	37	26.1%	101	71.1%	**142**	4.6%	2.1%
A726	4	2.9%	35	25.5%	98	71.5%	**137**	4.4%	2.0%
A761	0	0.0%	41	31.8%	88	68.2%	**129**	4.2%	1.9%
M74	4	3.2%	33	26.4%	88	70.4%	**125**	4.0%	1.8%
A725	4	3.7%	27	25.2%	76	71.0%	**107**	3.4%	1.6%
A804	0	0.0%	19	20.0%	76	80.0%	**95**	3.1%	1.4%
A81	1	1.1%	24	27.6%	62	71.3%	**87**	2.8%	1.3%
A721	0	0.0%	19	24.4%	59	75.6%	**78**	2.5%	1.1%
A724	3	4.0%	18	24.0%	54	72.0%	**75**	2.4%	1.1%
A749	1	1.4%	17	23.6%	54	75.0%	**72**	2.3%	1.1%
M80	1	1.4%	13	18.8%	55	79.7%	**69**	2.2%	1.0%
A739	2	3.1%	13	20.0%	50	76.9%	**65**	2.1%	1.0%
A803	1	1.6%	18	28.6%	44	69.8%	**63**	2.0%	0.9%
A723	2	3.3%	11	18.0%	48	78.7%	**61**	2.0%	0.9%
A736	2	3.3%	14	23.3%	44	73.3%	**60**	1.9%	0.9%
A879	1	1.8%	16	28.1%	40	70.2%	**57**	1.8%	0.8%
A73	1	1.9%	16	30.2%	36	67.9%	**53**	1.7%	0.8%
Grand Total	52	2.1%	620	24.6%	1847	73.3%	**2519**	**81.2%**	36.9%

Source: DfT Road Safety Data (2023)

Figure D.1 provides an overview of the distribution of accidents and their type across sectors. It is clear Lanarkshire has the greatest proportion. it is clear North Lanarkshire by far exhibits the most accidents, with a sizable proportion being concentrated around Airdrie and Coatbridge are each served by the A89 (see prev. slide). However, it is also worth highlighting the extensivity of the Sector combined with it containing 3 motorways could also be contributing factors M80, M8, M74).

Figure D.1: Distribution of Accidents Across Sectors & Severity of Incidents by Sector 2018-2022

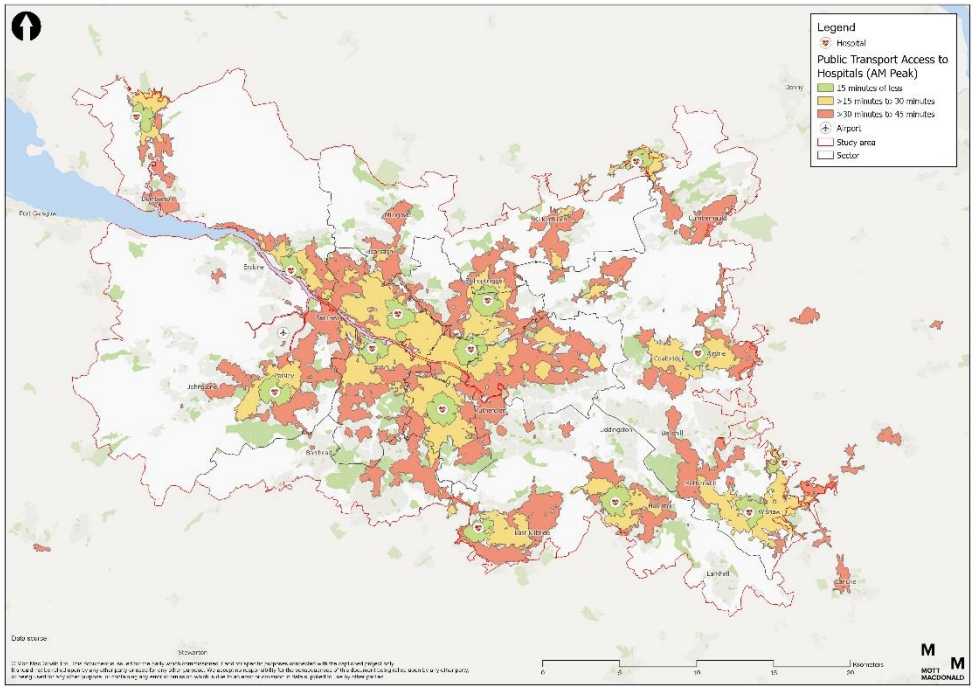


Source: Department for Transport

D.4 Hospital access

Access to hospitals is a necessity for public services. In total, the GCR study area has 14 hospitals. Their locations are shown in Map D.23. The central areas remain the best served. The East has relatively good access to hospitals despite some gaps. The West fares the worst in access to hospitals. Due to the low number of hospitals in the area, connectivity to hospitals in the centre should be a priority for the West.

Map D.23: Study area hospital access



Source: Basemap (Q1, 2024) & Podaris, 2024

D.5 Rail accessibility

Table D.9 details the distribution of station accessibility across the sectors.

Table D.9: Rail accessibility by study area sectors

Sector	Not Access.	Partially Access.	Fully Access.
East Dunbartonshire Inner	0	4	2
East Renfrewshire Inner	1	8	1
Glasgow City Centre	7	0	5
Glasgow City (East)	3	7	2
Glasgow City (North)	2	4	2
Glasgow City (South)	10	2	2
Glasgow City (South West)	4	6	4
Glasgow City (West)	6	4	3
North Lanarkshire Inner	1	12	9
Renfrewshire Inner	1	5	3
South Lanarkshire Inner	2	5	8
West Dunbartonshire Inner	1	8	4
Grand Total	**38**	**65**	**45**

Source: National Rail Accessibility Map, Adapted by Mott MacDonald

D.6 Accessibility to Glasgow City Centre

Table D.10 summarises the accessibility to Glasgow City Centre from origin points across the GCR.

Table D.10: Accessibility to Glasgow City Centre

Origin	Destination	Journey Time Bus (Routes Utilised)	Journey Time Rail - Total from node to St. Vincent St. / Hope St. (Boarding Time -> Arrival)
Pollok (Corkerhill)	*City Centre*	c. 38 mins (38A route)	c. 11 mins (08:41 -> 08:49)
Barrhead		c. 62 mins (3 Switch route)	c. 21 mins (08:32 -> 08:50)
Paisley (Gilmour St.)		c. 46 mins (38A Switch route)	c. 14 mins (08:45 -> 08:59)
Newton Mearns		c. 38 mins (4 route)	null (no nearby station)
East Kilbride		c. 58 mins	c. 36 mins (08:12 -> 08:49)
Hamilton (Hamilton West)		c. 75 mins (267 route)	c. 30 mins (08:28 -> 08:53)
Motherwell		c. 41 mins (240X -> 38 routes)	c. 22 mins (08:35 -> 08:54)
Cambuslang		null	c. 19 mins (08:39 -> 08:53)
Easterhouse		c. 49 mins (X19 route)	c. 23 mins (08:26 -> 08:41)
Coatbridge (Sunnyside)		c. 54 mins (902 route)	c. 27 mins (08:32 -> 08:51)
Airdrie		c. 57 mins (902 route)	c. 33 mins (08:28 -> 08:51)
Kirkintilloch (Lenzie)		c. 37 mins (X85 -> 19 routes)	c. 18 mins (08:24 -> 08:35)
Bishopbriggs		c. 38 mins (88 route)	c. 14 mins (08:28 -> 08:35)
Clydebank		c. 39 mins (1A route)	c. 28 mins (08:29 -> 08:52)
Dumbarton (Central)		C. 77 mins (1A route)	c. 35 mins (08:10 -> 08:52)

Source: Google Journey Times Planner & Mott MacDonald

E. Place-Based Analysis of Need

E.1 Evidence base

Sections 3 to 7 analysed a set of datasets linked to the themes, strategic objectives, TPOs, and transformational outcomes. Selected datasets are then transposed to the initial network assessment criteria and processes described in Section 8.9 – those which have sufficient level of spatial detail and link to the: themes; strategic objectives; TPOs; transport outcomes; and transformational outcomes. Several datasets relate to 'production-based' measures, i.e. characteristics of places and the people who live there, while other are 'attraction-based' measures which reflect prevailing, non-residential, land uses, key destinations, and economic activity. Additional transport outcomes, e.g. quality and interchange, are reflected through deliverability criteria.

Table 8.5: Case for Change Datasets

ID	Dataset	Source	Evidence	For information	For assessment	Outcome-Based Rationale
People & Places (see Section 3) – TPOs 3 to 8 (see Figure 8.3Figure 8.3)						
1	Population density	ONS 2021 Census	Map 3.1		✓	Identify densely populated areas which are **underserved** on **connectivity** and/or **accessibility**
2	Population growth	National Records of Scotland, 2011 and 2021	Map 3.2	✓		
3	Deprivation	Scottish Government, 2019 Index of Multiple Deprivation	Map 3.3		✓	Identify **deprived areas** which would benefit from enhanced **connectivity** and/or **accessibility**
4	Healthy life expectancies	National Records of Statistics	Chart 3.2	✓		
5	Skills and qualifications	ONS 2011 Census	Map 3.4	✓		
6	House price index	Land Registry	Chart 3.3	✓		
7	Rent price changes	Glasgow Open Data	Map 3.5	✓		
Economy (see Section 4) – TPOs 1 to 8 (see Figure 8.3Figure 8.3)						
8	Economic structure	Business Register & Employment Survey	Table 4.1 and Chart 4.1	✓		
9	GVA	ONS 2024 estimates	Map 4.1		✓	Enhance **connectivity and/or accessibility** to **employment centres**

ID	Dataset	Source	Evidence	For information	For assessment	Outcome-Based Rationale
10	Employment density	Business Register & Employment Survey	Map 4.2		✓	Enhance **connectivity and/or accessibility** to **employment centres**
Environment (see Section 5) – TPOs 8 to 10 (see Figure 8.3Figure 8.3)						
11	Greenhouse gas emissions	Department for Energy Security & Net Zero	Chart 5.1	✓		
12	GCR mode share targets	Strathclyde Partnership for Transport	Chart 5.2	✓		
13	Air quality management areas	Scottish Government	Map 5.1	✓		Indirectly addressed by targeting places with higher **car mode shares**
14	Heritage assets	Scottish Government	Map 5.2		✓	Consideration in **deliverability**
Transport problems (see Section 6)						
15	Strategic network(s)	Ordnance Survey	Map 6.1		✓	Places containing **national and international gateways** included
16	GCR vehicle-km trend	Transport Scotland	Chart 6.1	✓		
17	Glasgow Subway Demand	UK Department for Transport	Chart 6.5	✓		
18	Glasgow Airport Air Passengers	Civil Aviation Authority	Chart 6.6	✓		
19	Glasgow Airport Surface Access Mode Shares	Civil Aviation Authority	Table 6.3	✓		
20	Cross-city population density	Eurostat; GEOSTAT	Map 6.2	✓		
21	Cross-city job density versus population	Organisation for Economic Co-Operation and Development	Chart 6.7	✓		
22	Cross-city productivity versus population	Organisation for Economic Co-Operation and Development	Chart 6.8	✓		
23	Vacant & Derelict (V&D) land register	Scottish Government	Map 6.3		✓	Used to assess **deliverability** and **additional potential development sites** not in other plans

ID	Dataset	Source	Evidence	For information	For assessment	Outcome-Based Rationale
24	Connectivity by National Rail and Subway	OS Open Map and MOIRA OR81	Map 6.4		✓	Identifies areas with lower levels of **connectivity** in combination with other production and attraction-based indicators, e.g. population density et al
25	Bus connectivity and accessibility	Basemap (2024 Q1)	Map 6.5	✓		
26	First and last mile connectivity to National Rail and Subway Stations	OS OpenMap	Map 6.6	✓		
27	Accessibility to main economic centres	Basemap (2024 Q1) and Podaris	Map 6.7		✓	**Enhance accessibility and connectivity to the main economic centres**
28	Total trips and mode shares to/from Glasgow City Centre	Strathclyde Regional Transport Model	Chart 6.11	✓		
29	AM Peak mode share to Glasgow City Centre	Strathclyde Regional Transport Model	Map 6.8	✓		
30	Travel-to-Work car mode share	2011 ONS Census	Map 6.9		✓	Identify **car dependent areas**
31	Car availability	2011 ONS Census	Map 6.10		✓	Identify **unserved or underserved areas** who will depend on **regular public transport services and are at risk of transport poverty / social exclusion**
32	Glasgow City Region congestion	Strathclyde Regional Transport Model	Map 6.11	✓		
33	Glasgow National Rail network capacity constraints	Network Rail	Figure 6.1	✓		
34	Glasgow area rail network performance	ScotRail	Chart 6.12	✓		
35	Public transport integration	Basemap (2024 Q1) and Podaris	Map 6.12	✓		
36	Rail and Subway Station physical accessibility	National Rail Enquiries	Map 6.13	✓		

ID	Dataset	Source	Evidence	For information	For assessment	Outcome-Based Rationale
Future opportunities (see Section 7)						
37	Housing sites by sub-area	Clyde Plan	Chart 7.1	✓		
38	Housing site allocations	Clyde Plan	Map 7.1		✓	Enhance **connectivity and/or accessibility** to identified or potential **development sites**
39	Employment land and economic growth site allocations	Clyde Plan	Map 7.2		✓	Enhance **connectivity and/or accessibility** to identified or potential **development sites**
40	Principal cultural and leisure attractions and NPF4 town centre hierarchy	OS AddressBase	Map 7.3		✓	Enhance **connectivity and/or accessibility** to **culture and leisure facilities,** and **assist the regeneration of designated centres**
41	Access to further and higher education	Basemap (2024 Q1) and Podaris	Map 7.5		✓	Enhance **connectivity and/or accessibility** to **education**
42	Access to major healthcare sites & Location of Major Hospitals	Basemap (2024 Q1) and Podaris	Map D.23		✓	Enhance **connectivity and/or accessibility** to **healthcare**

Source: Mott MacDonald

E.2 Transformation Outcomes and Assessment Criteria

Table E.2: Transformation Outcomes and Measurable Assessment Criteria

	Productions										Attractions								
Transformation Outcomes (Smart Sub-Objectives)	**Population Density**	**Car Availability**	**Deprivation**	**Employment Centre Access**	**Hospital Access**	**Education Access**	**Car mode share for t-t-w**	**Future ' within plan' housing supply**	**Current Connectivity (TpH)**	**Bus Accessibility**	**Job Density**	**Economic Output**	**Future Employment Land Supply**	**Economic Growth Area**	**Special Attractors**	**Train Frequency to City Centre**	**Hospital**	**NPF4 Town Centre Hierarchy**	**National and International Gateways**
Economic Development																			
❑ **Growth in jobs, activity, and output across higher value, target, sectors**	✓			✓							✓	✓	✓	✓					✓
❑ **Increased graduate retention/attraction, and increase in overall skills and qualification levels**			✓	✓		✓													

	Productions										Attractions								
Transformation Outcomes (Smart Sub-Objectives)	**Population Density**	**Car Availability**	**Deprivation**	**Employment Centre Access**	**Hospital Access**	**Education Access**	**Car mode share for t-t-w**	**Future ' within plan' housing supply**	**Current Connectivity (TpH)**	**Bus Accessibility**	**Job Density**	**Economic Output**	**Future Employment Land Supply**	**Economic Growth Area**	**Special Attractors**	**Train Frequency to City Centre**	**Hospital**	**NPF4 Town Centre Hierarchy**	**National and International Gateways**
❑ **Enhanced national and international connectivity via established gateways, linking people and businesses with wider opportunities**	✓								✓					✓	✓				✓
❑ **Support the delivery of housing targets to increase labour supply**	✓			✓				✓						✓					

	Productions										Attractions								
Transformation Outcomes (Smart Sub-Objectives)	**Population Density**	**Car Availability**	**Deprivation**	**Employment Centre Access**	**Hospital Access**	**Education Access**	**Car mode share for t-t-w**	**Future ' within plan' housing supply**	**Current Connectivity (TpH)**	**Bus Accessibility**	**Job Density**	**Economic Output**	**Future Employment Land Supply**	**Economic Growth Area**	**Special Attractors**	**Train Frequency to City Centre**	**Hospital**	**NPF4 Town Centre Hierarchy**	**National and International Gateways**
People and Places																			
❑ **Address Vacant & Derelict (V&D) land, increase densities, and support liveable neighbourhoods**	✓			✓				✓	✓		✓		✓	✓	✓			✓	
❑ **Assist the regeneration of the principal centres, increasing activity, vitality, and sense of place**								✓						✓	✓			✓	
❑ **Address social equality and inclusion through enhanced accessibility for all**		✓	✓	✓	✓	✓			✓	✓						✓	✓		

Transformation Outcomes (Smart Sub-Objectives)	Productions										Attractions								
	Population Density	Car Availability	Deprivation	Employment Centre Access	Hospital Access	Education Access	Car mode share for t-t-w	Future ' within plan' housing supply	Current Connectivity (TpH)	Bus Accessibility	Job Density	Economic Output	Future Employment Land Supply	Economic Growth Area	Special Attractors	Train Frequency to City Centre	Hospital	NPF4 Town Centre Hierarchy	National and International Gateways
❑ Reductions in transport poverty to help diminish levels of deprivation		✓	✓	✓	✓	✓		✓		✓	✓	✓	✓			✓			
❑ Increases in healthy life expectancy, wellbeing, and quality of life			✓																
Environmental Protection & Enhancement																			
❑ Contribute to delivery of Net Zero targets		✓		✓	✓	✓	✓			✓						✓			
❑ Decreases in local air pollutants		✓		✓	✓	✓	✓			✓						✓			

Table E.1: Place-based production assessment of need (1 = greatest need)

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
East Dunbartonshire										
Bearsden East	3	4	4	1	2	3	1	4	4	**23.5**
Bishopbriggs Centre	3	4	4	3	3	3	2	4	4	**27.0**
Bishopbriggs North	3	4	4	1	2	2	1	2	1	**18.0**
Kirkintilloch	3	3	2	1	2	4	3	2	1	**18.0**
Kirkintilloch Town Centre	2	3	2	1	2	4	3	4	1	**19.0**
Milngavie Town Centre	3	4	4	1	2	3	2	4	3	**23.5**
Milngavie West	4	4	3	1	1	1	2	4	1	**20.0**
East Renfrewshire										
Balgray	4	3	2	1	1	1	1	1	1	**14.0**
Barrhead South	4	3	2	1	1	1	1	2	1	**15.0**
Barrhead Town Centre	2	3	2	2	1	2	2	2	3	**17.5**
Clarkston/Busby	3	4	4	2	2	2	2	4	4	**25.0**
Gifnock, Orchard Hill	2	4	4	2	2	2	2	4	4	**24.0**
Newton Mearns, Crookfur	2	4	4	1	1	1	1	4	1	**18.0**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
Newton Mearns, Kirkhill	2	4	4	1	1	1	1	4	1	**18.0**
Glasgow City Centre										
Cathedral	1	1	2	4	4	4	4	1	4	**21.0**
City Centre	1	1	3	4	3	4	4	1	4	**21.5**
Glasgow School of Art	1	1	3	4	3	4	4	1	4	**21.5**
Gorbals	1	1	2	4	3	4	4	1	4	**20.5**
Glasgow East										
Barlanark/ Wellhouse	2	2	1	3	2	3	4	2	3	**19.5**
Carmyle East	4	3	2	1	1	1	3	2	1	**17.0**
Carntyne North	1	2	1	2	2	3	3	4	1	**16.5**
Tollcross Fullarton/Carmyle	4	3	2	2	1	2	2	4	2	**20.5**
Celtic Park	2	1	1	4	2	4	4	2	1	**18.0**
Citypark	1	1	2	4	4	3	4	2	1	**18.5**
Cranhill East	1	2	1	3	2	3	4	2	1	**16.5**
Easterhouse	4	1	1	3	1	4	4	1	1	**17.5**
Gallowgate/Camlachie	1	1	2	4	3	3	4	2	4	**21.0**
Gartcraig	1	2	1	3	2	3	3	4	1	**17.5**
Gartloch	4	2	2	1	1	1	3	2	1	**16.0**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
Mount Vernon/ Baillieston	3	3	2	2	1	1	3	2	3	**19.0**
Parkhead/ Liliybank	1	1	1	3	2	3	4	2	1	**15.5**
Ruchazie/ Craigend	2	2	1	3	3	3	3	2	1	**17.0**
Glasgow Fort North	4	2	1	4	2	4	4	1	1	**20.0**
Glasgow North										
Barmulloch North	2	2	1	1	3	2	4	2	1	**15.5**
Barmulloch South	2	2	1	2	3	3	4	2	1	**17.0**
Blackhill	3	2	2	2	2	3	3	4	1	**19.5**
Milton	2	2	2	2	3	2	3	2	1	**16.5**
Sighthill North	2	1	2	3	2	3	4	1	1	**16.5**
Springburn	1	1	1	3	3	4	4	2	4	**19.5**
Stobhill Hospital	3	2	1	1	4	3	3	4	1	**18.5**
Summerston Station	1	2	2	2	2	3	3	4	4	**20.5**
Glasgow South										
Castlemilk West	1	1	1	1	2	4	4	4	1	**16.0**
Fernhill	2	1	1	1	1	4	4	2	1	**14.5**
Cathcart	1	3	3	3	3	4	3	2	3	**21.5**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
Mount Florida	1	2	3	3	4	4	4	1	3	**21.0**
Polmadie/ Shawfield	4	1	1	3	2	3	4	2	1	**18.5**
Strathbungo/ Govanhill	1	2	2	4	3	3	4	2	4	**22.0**
King's Park/ Croftfoot	1	3	3	3	3	3	3	4	2	**22.0**
Waverley Park	1	3	3	2	3	3	4	2	4	**22.0**
Glasgow South West										
Carnwadric	2	2	2	3	2	2	3	2	4	**20.0**
Crookston/ Pollok	1	3	2	2	2	2	3	4	1	**18.0**
Ibrox	3	1	1	3	2	3	4	2	4	**20.5**
North Cardonald	4	2	2	4	2	2	3	4	4	**25.0**
Plantation	2	2	2	4	3	3	4	2	4	**23.0**
Priesthill/ Nitshill/Darnley	2	2	1	2	2	2	3	2	3	**17.0**
QEUH	3	2	1	2	4	2	4	4	1	**20.0**
Silverburn	3	2	1	2	1	2	4	2	1	**16.5**
South Cardonald	1	2	2	3	3	3	3	4	2	**20.0**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
Glasgow West										
Anniesland/ Kelvindale	1	3	4	2	4	4	3	2	4	**23.0**
Drumchapel Centre	2	1	1	2	2	2	4	1	1	**14.0**
Exhibition Centre	1	2	3	4	3	3	4	1	4	**22.0**
Garscadden/ Scotstounhill	1	2	2	3	3	3	4	3	4	**22.0**
Hillhead/ Kelvinbridge	1	2	3	3	3	4	4	3	4	**23.5**
Hyndland	1	3	4	3	3	4	4	4	1	**23.5**
Old Drumchapel	1	2	2	1	2	2	3	4	3	**18.0**
West End / Kelvingrove	1	2	4	4	3	4	4	1	4	**23.5**
Whiteinch East	2	2	2	3	3	3	3	2	1	**18.0**
Whiteinch West	2	2	2	3	3	3	4	2	1	**19.0**
North Lanarkshire										
Airdrie Rawyards	2	3	2	1	2	2	2	4	4	**20.0**
Bargeddie East	4	3	2	1	1	1	1	1	1	**14.0**
Belshill Industrial Estate	3	3	2	3	1	2	1	3	1	**17.5**
Belshill Station	2	2	2	3	2	2	2	4	4	**21.0**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
Bunchan Gate & Bunchan Park	4	4	4	4	1	2	1	2	2	**22.5**
Cleland Hospital	4	4	2	1	1	1	1	3	1	**17.0**
Coatbridge Gartsherrie	3	3	2	1	2	2	2	4	4	**21.0**
Coatbridge Greenend/ Whifflet	3	2	2	1	3	1	1	3	3	**17.0**
Cumbernauld	1	2	2	2	2	4	3	2	3	**18.0**
Eurocentral	4	3	3	4	1	1	1	4	1	**21.0**
Gartcosh	4	4	3	2	1	2	1	1	2	**18.5**
Hunt Hill, Drum Mains Park	4	4	4	1	1	1	1	4	1	**20.0**
Marnock/ Glenboig	4	3	3	1	1	2	1	1	1	**15.5**
Monklands Hospital	3	3	2	1	4	3	1	2	4	**19.5**
Moodiesburn	3	3	3	2	2	2	1	2	1	**17.0**
Motherwell South	3	3	3	4	3	3	2	4	4	**26.0**
New Stevenson /Carfin	2	3	2	2	1	2	1	4	3	**18.5**
Ravenscraig	4	3	2	1	1	1	1	1	1	**14.0**
Shieldmuir	2	3	2	3	3	3	2	2	3	**20.0**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
Wishaw General Hospital	3	3	2	2	4	3	2	2	1	**18.5**
Wishaw Pather	3	3	2	3	3	2	1	2	3	**19.5**
Renfrewshire										
Bishopston East	4	4	4	2	1	2	1	3	3	**22.5**
Braehead Strategic Centre	4	3	3	3	3	3	2	3	1	**22.0**
Erskine North Barr	3	3	3	1	1	1	2	2	1	**16.0**
Erskine Park Mains	1	4	3	2	1	1	1	3	1	**16.0**
Glasgow Airport Investment Area	4	3	3	1	1	1	2	2	1	**17.0**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
Hillington Ind. Estate West	4	3	2	1	1	1	2	4	1	**18.0**
Glasgow Airport	4	4	3	4	2	2	1	4	1	**23.0**
Imperial Park, Elderslie	4	4	3	4	2	3	1	3	1	**22.5**
Inchinnan Business Park	4	4	3	4	1	1	1	4	1	**22.0**
Johnstone East	3	3	2	1	1	1	2	4	4	**20.0**
Linwood	2	2	2	3	1	2	3	4	1	**18.5**
Milliken Park Station	3	2	2	3	1	2	3	2	3	**19.5**
Paisley Brediland	2	3	2	3	3	3	2	4	1	**20.0**
Paisley Glenburn	2	3	2	3	2	3	2	2	1	**17.5**
Paisley Hunter Hill	2	3	2	3	2	1	3	4	1	**19.5**
Paisley Town Centre	2	2	2	4	3	4	4	2	4	**23.5**
Renfrew Riverside	3	3	2	2	2	3	2	1	1	**16.5**
Renfrew Town Centre	1	3	2	3	2	3	2	4	1	**18.5**
Royal Alexandra Hospital	2	3	3	3	4	3	2	3	1	**20.5**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
South Lanarkshire										
Blantyre, High Blantyre	2	2	1	4	3	1	2	4	1	**18.0**
Burnside East	2	3	3	2	1	2	2	4	2	**19.5**
Cambuslang Town Centre	3	3	2	2	1	2	2	2	4	**19.5**
East Kilbride, Greenhills	1	3	2	1	1	1	2	4	1	**15.0**
East Kilbride, St Leonards	1	3	3	3	2	2	1	3	1	**17.0**
East Kilbride, Town Centre	3	3	2	4	3	3	3	4	3	**25.0**
Hairmyres	4	4	3	2	4	2	1	3	3	**23.0**
Hamilton, Fairhill	1	3	2	2	2	1	2	4	1	**16.5**
Hamilton, Hillhouse	1	3	2	3	4	1	2	4	1	**18.5**
Hamilton, Town Centre	3	3	3	4	2	2	2	4	3	**24.0**
Hamilton West / Whitehill	3	3	2	4	3	1	3	2	3	**22.0**
Kelvin East	4	3	2	3	2	4	2	4	1	**22.0**
Larkhall North	3	3	3	2	1	1	1	4	2	**19.0**
Newton Farm	4	4	3	1	1	1	1	1	1	**16.0**
Rutherglen	2	2	2	3	2	3	3	3	4	**21.5**

Place	Population density	Car availability	Deprivation	Access to employment centres	Access to hospitals	Access to further and higher education	Car mode share for travel-to-work	Future 'within plan' housing supply	Rail & Subway frequency to Glasgow city centre	Score
	People per square kilometre	% of households without access to a car	Average decile	Journey time in minutes	Journey time in minutes	Journey time in minutes	% of trips by car	Number of dwellings	Trains per Hour	Composite
Westburn	3	3	2	3	1	1	1	2	1	**16.0**
West Dunbartonshire										
Alexandria West	4	3	2	1	4	1	2	4	1	**19.5**
Alexandria North	3	3	2	1	2	1	2	2	1	**15.5**
Balloch	3	3	2	1	3	1	2	2	2	**17.0**
Bowling - Exxon	4	4	3	2	2	1	1	3	2	**20.5**
Clydebank, Faifley	3	2	2	2	1	2	3	4	1	**18.5**
Clydebank Town Centre	3	2	1	3	3	4	3	1	3	**19.5**
Dalmuir	2	2	2	4	3	3	3	4	4	**24.0**
Dumbarton Town Centre	4	2	2	1	1	1	3	4	4	**21.0**
Dumbarton East	2	3	3	3	2	1	1	2	3	**18.5**
Golden Jubilee Hospital	4	2	2	4	4	3	3	4	4	**26.5**
Old Kirkpatrick/ Mountblow	4	4	3	2	2	2	1	4	2	**22.0**
Vale of Leven Industrial Estate	4	3	2	2	1	1	1	2	2	**17.0**

Source: Mott MacDonald from available datasets

Table E.2: Place-based attraction assessment of need (1 = greatest need)

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
East Dunbartonshire										
Bearsden East	3	3	4	4	4	4	4	4	4	**34**
Bishopbriggs Centre	3	3	4	4	4	4	4	4	4	**34**
Bishopbriggs North	3	3	4	4	4	1	4	4	4	**31**
Kirkintilloch	2	3	4	4	3	1	4	4	4	**29**
Kirkintilloch Town Centre	2	3	4	4	4	1	4	4	4	**30**
Milngavie Town Centre	3	3	4	4	2	3	4	4	4	**31**
Milngavie West	4	4	4	4	4	1	4	4	4	**33**
East Renfrewshire										
Balgray	4	4	4	4	4	1	4	4	4	**33**
Barrhead South	3	3	4	4	4	1	4	4	4	**31**
Barrhead Town Centre	2	3	4	4	4	3	4	4	4	**32**
Clarkston/Busby	3	3	4	4	4	4	4	4	4	**34**
Gifnock, Orchard Hill	3	3	4	4	4	4	4	4	4	**34**
Newton Mearns, Crookfur	3	3	4	4	4	1	4	4	4	**31**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
Newton Mearns, Kirkhill	4	4	4	4	4	1	4	4	4	**33**
Glasgow City Centre										
Cathedral	1	1	4	1	2	4	1	4	4	**22**
City Centre	1	1	4	1	1	4	4	1	1	**18**
Glasgow School of Art	1	1	4	1	2	4	4	4	4	**25**
Gorbals	1	2	4	1	3	4	4	4	4	**27**
Glasgow East										
Barlanark /Wellhouse	2	3	4	4	4	3	4	4	4	**32**
Carmyle East	4	4	4	4	4	1	4	4	4	**33**
Carntyne North	3	3	4	4	4	1	4	4	4	**31**
Tollcross Fullarton/Carmyle	2	3	4	4	4	2	4	4	4	**31**
Celtic Park	1	3	4	4	2	1	4	3	4	**26**
Citypark	1	2	4	1	2	1	1	4	4	**20**
Cranhill East	3	3	4	4	4	1	4	4	4	**31**
Easterhouse	4	4	4	4	4	1	4	4	4	**33**
Gallowgate /Camlachie	1	2	4	2	4	4	4	3	4	**28**
Gartcraig	3	3	4	4	4	1	4	4	4	**31**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
Gartloch	4	4	4	4	4	1	4	4	4	**33**
Mount Vernon /Baillieston	4	4	4	4	4	3	4	4	4	**35**
Parkhead /Liliybank	3	3	4	4	4	1	4	4	4	**31**
Ruchazie /Craigend	3	3	4	4	4	1	4	4	4	**31**
Glasgow Fort North	2	3	4	4	4	1	4	3	4	**29**
Glasgow North										
Barmulloch North	3	3	4	4	4	1	4	4	4	**31**
Barmulloch South	2	3	4	4	4	1	4	4	4	**30**
Blackhill	4	4	4	4	4	1	4	4	4	**33**
Milton	3	3	4	4	4	1	4	4	4	**31**
Sighthill North	1	2	4	1	4	1	4	4	4	**25**
Springburn	1	3	4	4	4	4	4	4	4	**32**
Stobhill Hospital	2	3	4	4	4	1	1	4	4	**27**
Summerston Station	4	4	4	4	4	4	4	4	4	**36**
Glasgow South										
Castlemilk West	4	3	4	4	4	1	4	4	4	**32**
Fernhill	3	4	4	4	4	1	4	4	4	**32**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
Cathcart	3	3	4	4	4	3	4	4	4	**33**
Mount Florida	2	3	4	4	3	3	1	4	4	**28**
Polmadie/ Shawfield	1	3	4	2	4	1	4	4	4	**27**
Strathbungo/ Govanhill	1	3	4	4	4	4	4	4	4	**32**
King's Park/Croftfoot	4	4	4	4	4	2	4	4	4	**34**
Waverley Park	2	3	4	4	4	4	4	4	4	**33**
Glasgow South West										
Carnwadric	2	3	4	4	4	4	4	4	4	**33**
Crookston/ Pollok	3	3	4	4	4	1	4	4	4	**31**
Ibrox	1	2	4	1	2	4	4	4	4	**26**
North Cardonald	1	2	3	1	4	4	4	4	4	**27**
Plantation	1	2	4	1	2	4	4	4	4	**26**
Priesthill/ Nitshill/Darnley	3	3	4	4	4	3	4	4	4	**33**
QEUH	1	2	4	1	4	1	1	4	4	**22**
Silverburn	2	3	4	4	3	1	4	3	4	**28**
South Cardonald	3	3	4	4	4	2	4	4	4	**32**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
Glasgow West										
Anniesland/ Kelvindale	3	3	4	4	4	1	4	4	4	**31**
Drumchapel Centre	1	2	4	1	2	4	4	4	4	**26**
Exhibition Centre	1	2	3	1	4	4	4	4	4	**27**
Garscadden/ Scotstounhill	1	2	4	1	2	4	4	4	4	**26**
Hillhead/ Kelvinbridge	3	3	4	4	4	3	4	4	4	**33**
Hyndland	1	2	4	1	4	1	1	4	4	**22**
Old Drumchapel	2	3	4	4	3	1	4	3	4	**28**
West End / Kelvingrove	3	3	4	4	4	2	4	4	4	**32**
Whiteinch East	2	3	4	4	4	4	4	4	4	**33**
Whiteinch West	3	3	4	4	4	1	4	4	4	**31**
North Lanarkshire										
Airdrie Rawyards	2	3	4	4	4	4	4	3	4	**32**
Bargeddie East	4	4	4	4	4	1	4	4	4	**33**
Belshill Industrial Estate	2	3	4	4	4	1	4	4	4	**30**
Belshill Station	2	3	4	4	4	4	4	4	4	**33**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
Bunchan Gate & Bunchan Park	2	2	4	4	4	2	4	4	4	**30**
Cleland Hospital	4	4	4	4	4	1	1	4	4	**30**
Coatbridge Gartsherrie	2	3	4	4	2	4	4	4	4	**31**
Coatbridge Greenend/ Whifflet	2	3	4	4	4	3	4	4	4	**32**
Cumbernauld	1	2	4	4	4	3	4	3	4	**29**
Eurocentral	2	3	2	4	4	1	4	4	4	**28**
Gartcosh	4	4	4	4	4	2	4	4	4	**34**
Hunt Hill, Drum Mains Park	3	3	4	4	4	1	4	4	4	**31**
Marnock/ Glenboig	4	4	4	4	4	1	4	4	4	**33**
Monklands Hospital	1	3	4	4	4	4	1	4	4	**29**
Moodiesburn	4	4	4	4	4	1	4	4	4	**33**
Motherwell South	1	3	4	4	3	4	4	3	4	**30**
New Stevenson /Carfin	4	4	4	4	4	3	4	4	4	**35**
Ravenscraig	4	4	4	4	4	1	4	4	4	**33**
Shieldmuir	2	3	4	4	4	3	4	4	4	**32**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
Wishaw General Hospital	1	3	4	4	4	1	1	4	4	**26**
Wishaw Pather	3	3	4	4	4	3	4	4	4	**33**
Renfrewshire										
Bishopston East	4	4	4	4	4	3	4	4	4	**35**
Braehead Strategic Centre	1	2	4	3	4	1	4	3	4	**26**
Erskine North Barr	4	4	4	4	4	1	4	4	4	**33**
Erskine Park Mains	4	4	4	4	4	1	4	4	4	**33**
Glasgow Airport Investment Area	1	3	1	4	4	1	4	4	1	**23**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
Hillington Ind. Estate West	2	3	4	4	4	1	4	4	1	**27**
Glasgow Airport	1	2	2	2	4	1	4	4	4	**24**
Imperial Park, Elderslie	2	3	4	4	4	1	4	3	4	**29**
Inchinnan Business Park	4	4	4	4	4	1	4	4	4	**33**
Johnstone East	3	3	4	4	4	4	4	4	4	**34**
Linwood	3	4	4	4	4	1	4	4	4	**32**
Milliken Park Station	4	4	4	4	4	3	4	4	4	**35**
Paisley Brediland	4	4	4	4	4	1	4	4	4	**33**
Paisley Glenburn	3	3	4	4	4	1	4	4	4	**31**
Paisley Hunter Hill	4	4	4	4	4	1	4	4	4	**33**
Paisley Town Centre	1	2	4	4	3	4	4	3	4	**29**
Renfrew Riverside	3	3	4	4	2	1	4	4	4	**29**
Renfrew Town Centre	2	3	4	4	2	1	4	4	4	**28**
Royal Alexandra Hospital	1	3	4	4	4	1	1	4	4	**26**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
South Lanarkshire										
Blantyre, High Blantyre	2	3	4	4	4	1	4	4	4	**30**
Burnside East	3	4	4	4	4	2	4	4	4	**33**
Cambuslang Town Centre	2	3	4	4	4	4	4	4	4	**33**
East Kilbride, Greenhills	4	4	4	4	4	1	4	4	4	**33**
East Kilbride, St Leonards	4	4	4	4	4	1	4	4	4	**33**
East Kilbride, Town Centre	2	2	4	4	4	3	4	3	4	**30**
Hairmyres	1	2	4	4	4	3	1	4	4	**27**
Hamilton, Fairhill	4	4	4	4	4	1	4	4	4	**33**
Hamilton, Hillhouse	3	3	4	4	4	1	1	4	4	**28**
Hamilton, Town Centre	1	3	4	4	2	3	4	3	4	**28**
Hamilton West / Whitehill	1	2	4	4	4	3	4	4	4	**30**
Kelvin East	2	3	3	4	4	1	4	4	4	**29**
Larkhall North	3	4	4	4	4	2	4	4	4	**33**
Newton Farm	4	4	4	4	4	1	4	4	4	**33**

Place	Job density	Economic output	Future employment land supply	Economic growth area	Cultural facilities	Train frequency to city centre	Hospital	Town centre hierarchy	National or international gateway	Score
	jobs per sq.km	GVA	job estimate	job estimate	number of facilities	trains per hour	y/n	square kms	y/n	Composite
Rutherglen	2	3	4	4	4	4	4	4	4	**33**
Westburn	4	4	4	4	4	1	4	4	4	**33**
West Dunbartonshire										
Alexandria West	3	4	4	4	3	1	1	4	4	**28**
Alexandria North	3	3	4	4	3	1	4	4	4	**30**
Balloch	3	4	4	4	4	2	4	4	4	**33**
Bowling - Exxon	4	4	4	4	4	2	4	4	4	**34**
Clydebank, Faifley	4	4	4	4	4	1	4	4	4	**33**
Clydebank Town Centre	1	2	4	4	4	3	4	3	4	**29**
Dalmuir	2	3	4	4	4	4	4	4	4	**33**
Dumbarton Town Centre	2	3	4	4	3	4	4	4	4	**32**
Dumbarton East	3	3	4	4	4	3	4	4	4	**33**
Golden Jubilee Hospital	2	3	4	4	4	4	1	4	4	**30**
Old Kirkpatrick/ Mountblow	4	4	4	4	4	2	4	4	4	**34**
Vale of Leven Industrial Estate	4	4	4	4	4	2	4	4	4	**34**

Source: Mott MacDonald from available datasets

F. Wider Geographic Impact Mechanisms

Table F.1: Clyde Metro Wider Geographic Impact Mechanisms

ID	Mechanism
1	**Inward investment** ● Clyde Metro seeks to enhance the attractiveness of the GCR as a place to live, work, and invest ● If successful, this will increase the number of, higher value / more productive, opportunities available across the GCR, particularly in denser, more accessible, locations ● These opportunities will be accessible to a wider population, including those with good existing accessibility and connectivity and those who can benefit from the interchange and released capacity opportunities described below
2	**Interchange** ● Clyde Metro will be designed to help deliver seamless interchange with the bus, subway, and national rail networks ● This will enhance the accessibility and connectivity of the places it serves across a much wider area, and, vice versa, increase the volume of opportunities available to residents of those areas
3	**National Rail Conversions** ● Selected options will convert existing national rail routes to tram-train operation and remove services from congested parts of the network which are operating at, or over, capacity ● This will release capacity and rolling stock and provide opportunities to: ○ Provide additional services on other regional and national routes ○ Enhance performance, i.e. punctuality and reliability of operations ○ Create capacity to deliver new stations ○ Cascade rolling stock to add additional capacity on current services
4	**Mode shift** ● Clyde Metro seeks, through an integrated approach to transport and land use planning, to reduce car dependency and therefore kms across the GCR ● The mode shift from car to public transport will support decongestion of the highway network, improving the journey times and level of service for people, businesses, and places where there are fewer alternatives ● This will increase the accessibility of opportunities for residents with a car available, and the access to customers, labour, and suppliers for businesses ● The efficiency and reliability of travel time will be increased across the GCR, strengthening attractiveness for inward investment

Source: Mott MacDonald Ltd, 2024.