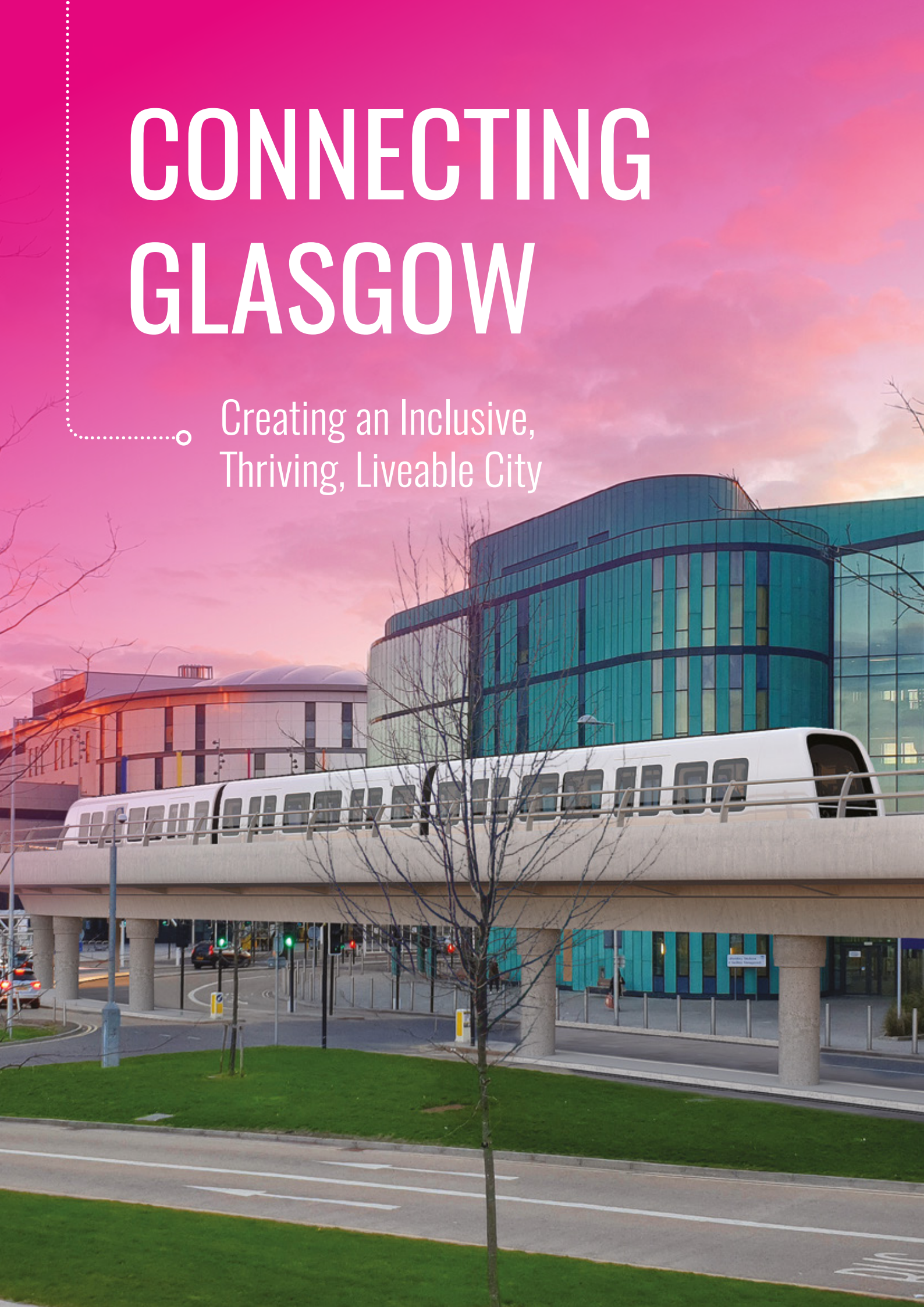
CONNECTING GLASGOW

Creating an Inclusive, Thriving, Liveable City




Edinburgh Road

FOREWORD

When I was asked to chair the independent Glasgow Connectivity Commission by Council Leader Councillor Susan Aitken in November 2017, I planned to produce one report covering all the strategic transport issues the city region faces.

But the range and complexity of the issues we encountered and the time required to consider adequate solutions led us to publish two. In our first report, published last November, we argued for one of the most significant reshaping of Glasgow's streetscapes in the post-war period, measures to reverse a steep decline in bus use – unparalleled anywhere else in the UK – which has had a severely detrimental effect on poorer communities without access to train or private car, and a reprioritisation of modes to favour healthy forms of travel such as walking and cycling, helping Glasgow to become a more liveable, breathable city. These are no small undertakings. We are delighted with the positive response to these proposals, principally from Glasgow City Council but also from the wider community of stakeholders interested in seeing Glasgow flourish, and look forward to seeing how our recommendations are implemented.

In the second report, which focusses on matters outwith the control of Glasgow City Council, we have tackled some similarly big issues. Following very strong investment in Glasgow's motorway network, we argue that we now need to look at how some of our strategic roads are being used and have proposed measures which would better prioritise bus use, cut congestion and eventually consider new charging models for road use. On rail, we have seen enviable levels of investment, improvement and passenger growth, helping to support Glasgow's strong economic performance. But, as we outline, our largely inherited Victorian network includes some significant gaps, most notably in the area to the south west of the city including Glasgow Airport, where economic development has recently been concentrated, and in the lack of provision for large areas of the city which are underperforming economically. It is now time to consider strategic changes which not merely add to our already congested network but reshape its purpose in order to support future growth for the decades ahead, including connecting to new HS2 services.

Our proposals to develop a Glasgow Metro, connect the city's two main city rail terminals and prepare Glasgow Central Station for HS2 do just that. We have also looked at the different agencies with responsibility for transport in Glasgow and considered whether this complex web of governance was working efficiently. We think not, and have recommended an evolution of existing institutions, with a particular focus on strengthening regional governance. While we believe this will address some of the structural governance problems, a cultural shift is also required to ensure the relevant agencies collaborate better.

Lastly, we considered how to pay for one of the biggest infrastructure interventions Glasgow has seen in the last half-century. It would be easy to baulk at their scale. But we were persuaded by evidence that this could deliver a step-change in the performance of Scotland's economic powerhouse, delivering a more prosperous, sustainable and inclusive city region at the heart of a thriving national economy. We need to raise Glasgow's levels of ambition if such a transformation is to be achieved.

I would like to thank my fellow commissioners for giving up their time on a pro-bono basis. I should stress that contributions have been made as individuals rather than as representatives of any organisation. I would also like to thank those who gave verbal and written evidence to the Commission, which was an extremely high calibre.

We do not underestimate the challenges required to implement this report's ambitious proposals. But we also believe they are affordable, deliverable and necessary if Scotland wants to achieve its goal of fostering sustainable and inclusive economic growth. We urge all agencies concerned with the future of this great city to work together to achieve these aims.

PROFESSOR DAVID BEGG
CHAIR, GLASGOW'S CONNECTIVITY COMMISSION

CONNECTIVITY COMMISSION

PROFESSOR DAVID BEGG, CHIEF EXECUTIVE, TRANSPORT TIMES

Prof David Begg is Chief Executive of Portobello Partnership Ltd which specialises in strategic advice to clients in the transport sector; publishes Transport Times online blog; and runs a series of transport best practice awards in conjunction with the Department for Transport, Transport Scotland and Transport for London.

PROFESSOR IAIN DOCHERTY, DEAN, INSTITUTE FOR ADVANCED STUDIES, UNIVERSITY OF STIRLING

Iain Docherty has been researching the transport sector for 20 years, working with governments and public agencies in the UK, US, Australia, Canada, The Netherlands and Sweden. He is currently Non-Executive Director of the ScotRail Operating Board.

ROSS MARTIN, INDEPENDENT ADVISER ON REGIONAL ECONOMIES

Working with local and national governments Ross Martin seeks to create the conditions for inclusive growth, developing projects to effect sustainable, transformative change. He recognises the need for a signal shift to the use of low carbon infrastructure, and an accelerating use of digital technology.

STUART PATRICK, CHIEF EXECUTIVE, GLASGOW CHAMBER OF COMMERCE

Stuart Patrick is committed to the business success of Chamber members and championing the economic growth of the Glasgow city region. Stuart was previously at Scottish Enterprise, specialising in urban economic development and the transformation of Glasgow. He qualified as a Chartered Accountant, has an MBA from Strathclyde University and an accountancy degree from Glasgow University.

ANNE LEDGERWOOD, GENERAL MANAGER, ST. ENOCH SHOPPING CENTRE

As general manager of St. Enoch Centre and Chair of the City Centre Retail Association, Anne Ledgerwood is one of the city's most influential retail figures with over 15 years in shopping centre management. She continues to drive St. Enoch Centre as a leading retail destination as it enters its 30th year with further investment and the introduction of a new leisure offering to the city centre.

DAMIEN HENDERSON, SCOTTISH AFFAIRS AND MEDIA MANAGER, VIRGIN TRAINS

Damien Henderson is Scottish Affairs and Media Manager for Virgin Trains. Prior to joining Virgin Trains in 2013, he worked as a journalist at The Herald for 10 years, latterly as Transport Correspondent. Damien is on the board of sustainable transport charity Transform Scotland and steering committee of the Release Scotland partnership.

GARETH WILLIAMS, HEAD OF POLICY, SCOTTISH COUNCIL FOR DEVELOPMENT AND INDUSTRY

As Head of Policy, Gareth Williams develops SCDI's major policy reports, including From Fragile to Agile: A Blueprint for Growth & Prosperity; Automatic…For The People? How Scotland can harness the technologies of the Fourth Industrial Revolution to increase economic and social prosperity; and Scotland's Big Mo: Industrial Strategy, Inclusive Growth and the Future of Mobility.

BILL REEVE (OBSERVER), DIRECTOR OF RAIL, TRANSPORT SCOTLAND

Bill Reeve joined Transport Scotland to establish its new rail team, following the devolution of rail powers to the Scottish Parliament in 2005. He is also the Independent Chair of the Rail North Partnership Board, the partnership between DfT and Rail North responsible for the Northern and Trans Pennine Express franchises.

ALISON IRVINE (OBSERVER)
DIRECTOR OF TRANSPORT STRATEGY AND ANALYSIS, TRANSPORT SCOTLAND

Alison Irvine has worked in Transport Scotland for 10 years and is responsible for development of the new National Transport Strategy, setting the investment priorities for transport across Scotland through the second Strategic Transport Projects Review, overseeing analysis and research and providing transport planning advice to Scottish Ministers. She is a Chartered Civil Engineer and previously worked in the consultancy sector as a transport planner.

A CITY OF CONNECTIVITY CONTRADICTIONS

Glasgow is a city of connectivity contradictions and contrasts. It has the UK's best suburban rail network outside London, where passenger numbers have grown exponentially over the last decade, creating a crisis of growth as even strong levels of national investment struggle to keep pace with relentlessly rising demand.

On the other hand, its bus network, responsible for carrying a far greater number of passengers, has experienced the steepest decline of any UK city over that same decade, creating a crisis to decline, isolating communities from the city's economic, social and cultural core.

Glasgow has also seen strong investment in its strategic road network, with the recent completion of the M74 and infrastructure improvements on the M8, M73 & M74. Yet it has one of the lowest levels of car ownership in Britain, and these contrasts, coupled with relatively weak traffic restraint, create the potential for a rapid rise in car use and congestion.

These connectivity contrasts are reflected in, and contribute to, an economically divided city, where, in broad terms, two thirds of the population are benefiting from and contributing to growth and a third are simply being left behind. If you live near a train station or own a car you are far more likely to be connected – and contributing to – Glasgow's increasingly strong economy, which is being driven by highly-skilled, productive workers.

Glaswegians who don't own a car currently contribute least to the air pollution but suffer the most from it.[1] If you do not have access to a car and rely on the bus network, the barriers to participation in Scotland's economic powerhouse can be significant. For instance, a quarter of people living on the periphery of the city have to catch at least two buses to get to work.[2] People with disabilities also face significant hurdles, particularly if they don't own a car, as much of the public transport network is currently inaccessible. This is not only socially inequitable but, as companies in Glasgow struggle to address an acute skills shortage, also places a barrier on the ability of the city region to generate growth.

Along with other successful major cities, Glasgow is facing the key urban challenge of our times – how to repurpose transport networks built for the unsustainable, high carbon economy in order to prioritise pedestrians and create attractive, people-centred places supporting thriving populations in a clean and healthy city centre environment.

As Glasgow has such a disproportionately high amount of its city centre space devoted to roads and parking, Glasgow City Council can make a large impact even with its limited powers to act. As temporarily demonstrated during the Commonwealth Games, Glasgow can rebalance its use of street space, reallocating roads dedicated to traffic, allowing the city centre to breathe, and creating spaces where people do not want to simply visit and pass through but spend time.

The city has shown how to get more people walking, cycling and able to linger in a cleaner, more pleasant environment. Pedestrian-friendly streets linking active places and usable spaces, where people safely enjoy a range of activities, can give Glasgow a more cosmopolitan feel.

In step with an increasing number of global cities, Glasgow has begun to rebalance the use of its streetscape through its Avenues project, its award-winning cycling programmes and the recently announced quality bus partnership. These are laudable initiatives which, together with the introduction of Scotland's first Low Emission Zone will help create an agile, connected, liveable city. But they are not enough. Tough, strategic decisions about the priorities in how we use limited land space are now required if Glasgow's potential is to be fulfilled.

PHASE 1 RECOMMENDATIONS:

As a matter of policy principle we recommend that Glasgow City Council adopts and adheres to the recognised transport hierarchy for street space prioritizing the movement of people, cyclists, public transport use and private vehicles, in that order.

- The acceleration of the Avenues project and its extension into other parts of the city centre such as George Square, Argyle Street, Cathedral Street and High Street
- Glasgow City Council presses ahead with plans to build a roof over the M8 at Charing Cross, creating a new pedestrian space outside the Mitchell Library
- A strategic repurposing of the road network to prioritise people-friendly public spaces and the transport hierarchy and repurposing the inefficient grid system to a smart grid
- Glasgow City Council actively engages with the Vacant and Derelict Land Commission to bring back dead spaces back into productive use.
- The repurposing of Glasgow's roads grid to prioritise pedestrians, active travel and public transport should be aligned with and support the council's policy to repopulate the city centre
- The completion of a network of safe, high quality, segregated cycling arterial routes connecting the city centre to suburbs and peripheral neighbourhoods
- The creation of safe, high quality, segregated cycling corridors through the city centre which connect to these arterial routes, undertaken as part of the repurposing of Glasgow's road grid
- A partnership is created between Glasgow City Council and taxi associations which drives improvements in service standards and better strategic placement of taxi ranks
- The new partnership between Glasgow City Council and bus operators should:

  Accelerate journey times and provide journey certainty through the rapid roll-out of bus priority measures and reducing dwell times at bus stops

  Improve the quality of the fleet, meeting Glasgow's LEZ requirements and driving up service standards

  Improve ticketing and customer information for all bus services, introduction of multi-operator 'Cheapest Day Saver' tickets across the city, and half-price fares for Apprentices and the Under-19s

  Better enforcement of existing bus lanes to deliver faster, more reliable journeys

  Deliver patronage growth of 25% in the first 5 years

- Better monitoring of traffic volumes and speeds on Glasgow's local road network
- Local authorities in Scotland should be given the powers in the Scottish Transport Bill to introduce non-residential parking charges
- Glasgow City Council should propose the transport projects that could be funded from this revenue stream and assess the economic, social and environmental case for using these powers
- A particular emphasis should however be placed on supporting city centre retail and leisure at a time of intense pressure from online platforms and appreciating the impact policy can have by creating an uneven playing field against both online and out of town alternatives
- Glasgow City Council should lead by example and review whether council workers should be given free or subsidised car parking
- Better use of strategic bus terminals and car parks to reduce journeys through the city centre

PHASE 2 RECOMMENDATIONS:

Scottish Ministers to enact primary legislation for:

Creation of a *Glasgow City Region Development Agency* to plan and coordinate transport infrastructure at the city region level. This would:

- Expand the role of the City Region Cabinet
- Take on the powers of Strathclyde Partnership for Transport and Clydeplan
- Have precept powers of funding
- Acquire the necessary powers to assemble and develop land to benefit from the uplift in land values from transport projects
- Develop a single, holistic development plan for the city region focussed on its transport system

Transport Scotland to take lead responsibility for the development of the Glasgow Metro, Glasgow Central HS2 terminus and Queen Street/Central Station tunnel. This would include:

- Creating a rail link between Paisley Gilmour Street and Glasgow Airport using currently identified City Deal funding by 2025
- Utilising technology that would enable this to be extended to become the first leg of the Glasgow Metro, serving the South Clyde Growth Corridor

Scottish and UK Governments to consider how to change the way we pay for road use to accommodate the shift towards electric and autonomous vehicles. This should consider:

- How national, regional and road charging models could operate
- A national conversation to build and identify public support for changes to the charging model
- The regulatory, fiscal and legislative changes that may be required

Transport Scotland should consider options for bus priority measures on Glasgow's motorway network

The Scottish Government and regional authorities should identify a funding package over 20 years to pay for the interventions recommended in this report. This should include:

- An equitable split between Scottish Government, UK Government (through Barnett consequentials of HS2 spend) and regional authorities
- Collaboration with the regional authorities to identify funding through land value capture and, where necessary, alternative sources of funding

CONNECTING GLASGOW

PHASE 1:
Rejuvenating the city centre


PEDESTRIAN
ZONE
No vehicles
Except for
loading by
and
permit holders
out with
Mon - Sat
10 am - 5 pm
Sun
12 noon - 4 pm

WHY CONNECTIVITY MATTERS

Connectivity is the life blood of any socio-economic system – carrying goods, services and people around the places where we live, work and play. But the transport systems we create do more than simply join these dots, they influence a city's quality of life, shape its urban fabric and determine the type of economic activity it supports.

Connectivity is the life blood of any socio-economic system – carrying goods, services and people around the places where we live, work and play. But the transport systems we create do more than simply join these dots, they influence a city's quality of life, shape its urban fabric and determine the type of economic activity it supports.

Over the last half century, as the role and importance of cities has changed, so too have the demands we make on our transport networks. In the 1960s, as city planners confronted declining urban populations and jobs and the rapid rise of the motor car, investment decisions prioritized car use and the need to reduce journey times [3], often with negative consequences for the urban environment. This corresponded with a dispersal of population away from town centres to peripheral suburbs and estates, increasing the demands on commuter networks.

In recent decades, this focus has shifted as cities have increasingly become the focal point of investment, skills, population growth and productive work. Today's successful cities create clean, people-friendly environments that support a diverse population mix, connect their citizens with economic opportunities, and attract investment and highly skilled workers. As such, the unintended consequences of prioritizing car use have come into sharper focus: urban dwellers are now less tolerant of polluted, congested streets where pedestrians are the lowest priority; better public health requires us to prioritise active forms of travel (walking and cycling); and decarbonising transport is an essential component of meeting meet our climate change targets.

Together, these economic, social and environmental imperatives create an urgent challenge to our inherited planning mindset.

Accommodating this changed set of priorities requires a profound rewiring of urban transport networks. This process is well understood at a European level and was recently summarised the CREATE (Congestion Reduction in Europe: Advancing Transport Efficiency) project as a three-stage historical evolution from a car-oriented city to a sustainable mobility city and finally a city of places. The priorities of each stage are described in the graphic opposite **(How policy perspectives change cities)**. Though not inevitable, this repurposing tends to start in the centres of cities – which have better public transport, the most historic buildings and high quality public areas – and then spread outwards to the outskirts of the city and eventually more peripheral areas.

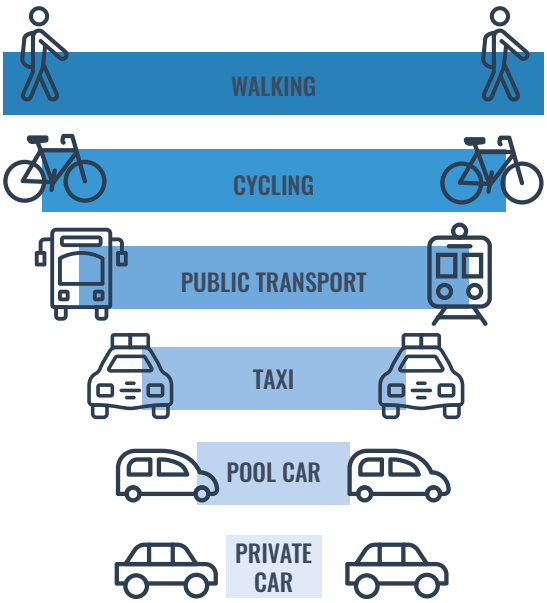
While there is no one recipe for orchestrating this change, we can identify a few key ingredients in the process. One is creating a hierarchy in favour of healthy forms of travel – walking and cycling – followed by public transport and, finally, car use. A related factor is modal shift from car to high quality, comprehensive mass transit systems capable of transporting large numbers of people into and around city centres whilst reducing emissions. As demonstrated in the chart opposite **(Transport capacity of a 4m wide lane per hour)**, mass transit systems provide the most efficient use of land space and so offer the only means of delivering growth without increasing congestion. In turn, both these approaches facilitate the creation of high quality public spaces where pedestrians are properly catered for.

Recommendation:

As a matter of policy principle we recommend that Glasgow City Council adopts and adheres to the recognised transport hierarchy for street space prioritising the movement of people, cyclists, public transport use and private vehicles, in that order

WHY CONNECTIVITY MATTERS

The transport hierarchy



How policy perspectives shape cities [4]

C — Car-oriented city

- Road building
- Car parking
- Lower density
- Dispersion

M — Sustainable mobility city

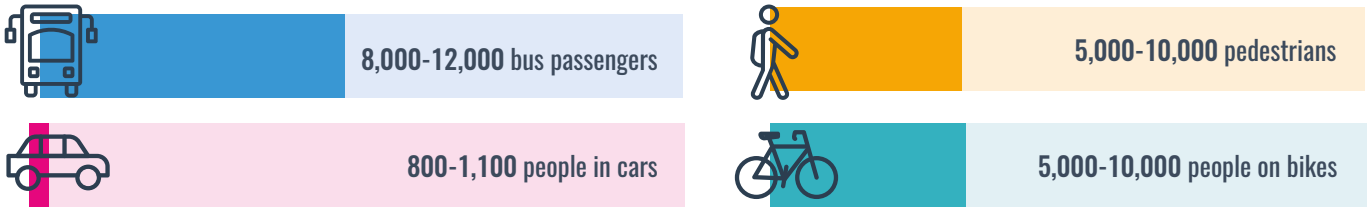
- Public transport
- Cycle networks
- Roadspace reallocation

P — City of places

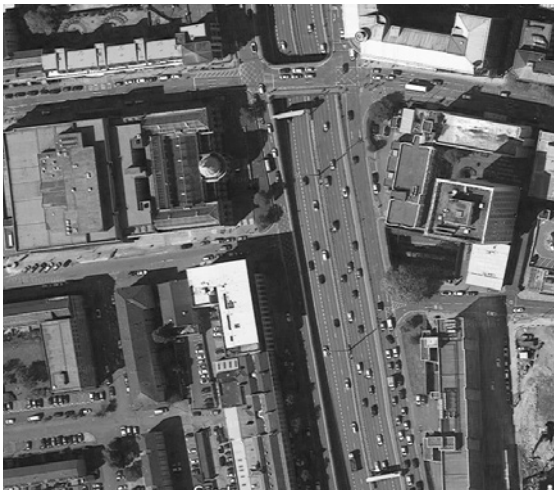
- Public realm
- Street activities
- Traffic restraint
- Transport on Demand / mixed use developments

Cars use road space far less efficiently than buses, cyclists and pedestrians [5]

TRANSPORT CAPACITY OF A 4M WIDE LANE PER HOUR



The current road-dominated space outside Mitchell Library and plans to open the area up to pedestrians by building a roof over the M8 [6]



CREATING PLACES IN WHICH TO INVEST TIME, AND MONEY

In common with other major cities in the developed world that have moved from post-industrial decline to renewed growth, Glasgow faces the challenge of rewiring its transport network to support the demands of a revitalized and growing economy. At the heart of this transformation is a vibrant city centre anchored around clean, well-designed, people-friendly public spaces.

On this front, Glasgow faces particularly strong challenges. Using the simple metric of allocated land, Glasgow has a far lower proportion of space in the city centre for pedestrians and a far higher proportion of roads than comparator cities (see the **Land use in Glasgow** chart below). Compared to Edinburgh, for instance, Glasgow has twice the proportion of space devoted to roads and parking and significantly less open space. Though famed for its "dear green" spaces, it is notable that these all sit outwith the city centre itself.

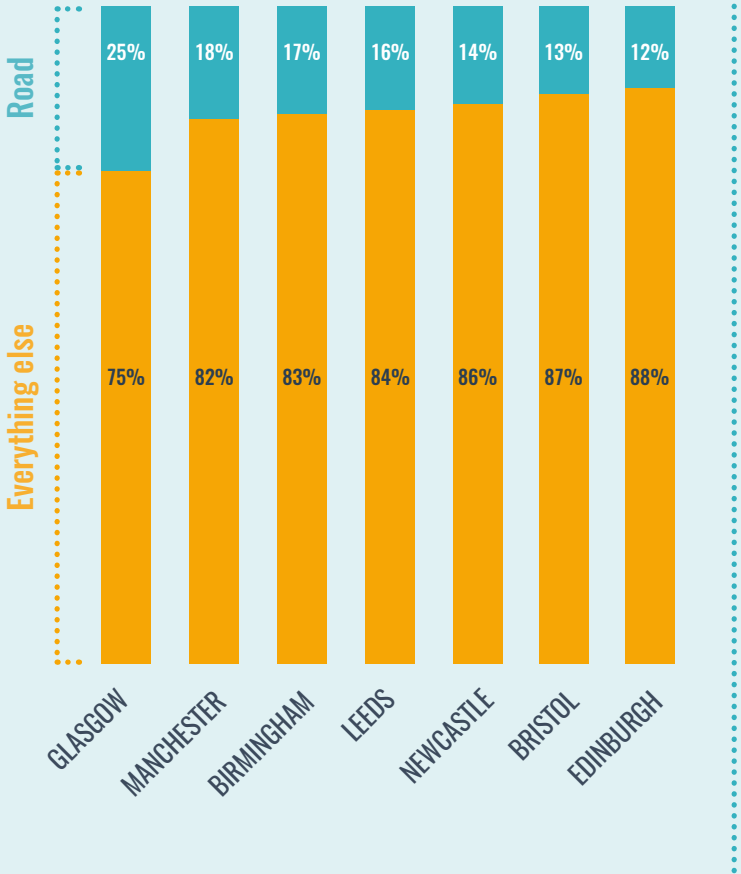
Moreover, Glasgow's grid system not only de-prioritises the needs of pedestrians and cyclists over vehicle movements, it also creates a vastly inefficient use of space, with cars, buses, pedestrians and cyclists mostly funnelled along the same corridors. A better mix is both possible and desirable, moving to a "smart" grid that separates out these different modes by providing dedicated space for each (see **Shift from inefficient grid system to "smart" grid** graphic).

We know that, when space has been given back to people, Glasgow has flourished. The last significant shift away from traffic to trade in the 1970s helped to turn Buchanan Street into one of the world's greatest streets and helped push Glasgow to become the UK's second most popular retail destination. More recently, the Avenues project has begun a process of transforming car-dominated corridors into areas that support pedestrian uses and gives people reason to visit – a challenge exacerbated by the shift to online retail. This marks an encouraging start in the process of transformation that Glasgow requires. But more needs to be done, including an accelerated roll-out of the Avenues project to other areas of the city centre and a systematic review of how the grid system can be repurposed.

Recommendations:

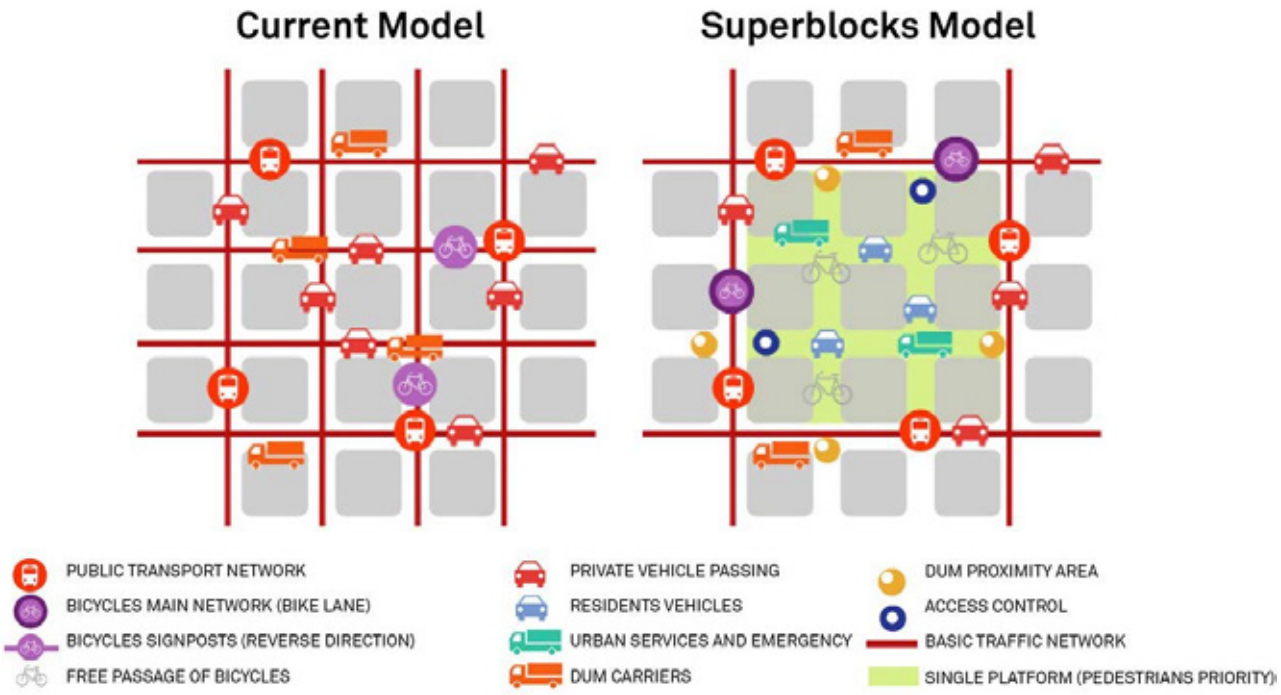
- The acceleration of the Avenues project and its extension into other parts of the city centre such as George Square, Argyle Street, Cathedral Street and High Street
- Glasgow City Council presses ahead with plans to build a roof over the M8 at Charing Cross, creating a new pedestrian space outside the Mitchell Library
- A strategic repurposing of the road network to prioritise people-friendly public spaces and the transport hierarchy and repurposing the inefficient grid system to a smart grid
- Glasgow City Council actively engages with the Vacant and Derelict Land Commission to bring back dead spaces back into productive use

Land use in Glasgow compared to comparator cities



CREATING PLACES IN WHICH TO INVEST TIME, AND MONEY

Shift from inefficient grid system to "smart" grid



Before and after example of Sauchiehall St and Avenues project

"Dead space" vs productive place [7]

GLASGOW'S CONNECTIVITY CONTRIBUTORS

A cycling city

Successful, connected cities have recognised the enhanced role that cycling can play in the transport mix, with obvious benefits to health, the environment and the urban realm. But providing cyclists with safe, fast and consistent routes in cities built around car use can be a difficult task involving re-engineering existing roads, providing new, dedicated cycle lanes and at times making politically difficult decisions about sharing road space between motorists and cyclists.

Glasgow has made an encouraging start in this transformation. The introduction of the Next Bike scheme and establishment of segregated cycle ways have helped drive an 86% increase in ridership over five years, albeit from a low base. These are being followed with a programme to have 1,000 bikes located at 100 bike stations for inter-modal connectivity.

But much more needs to be done to provide cyclists with the same journey quality and consistency as motorists enjoy. One of the biggest remaining obstacles is to provide safe, dedicated cycle routes through the city centre, connecting up arterial routes that often end at the city limits or lead to a confused mix of vehicle and cycling traffic.

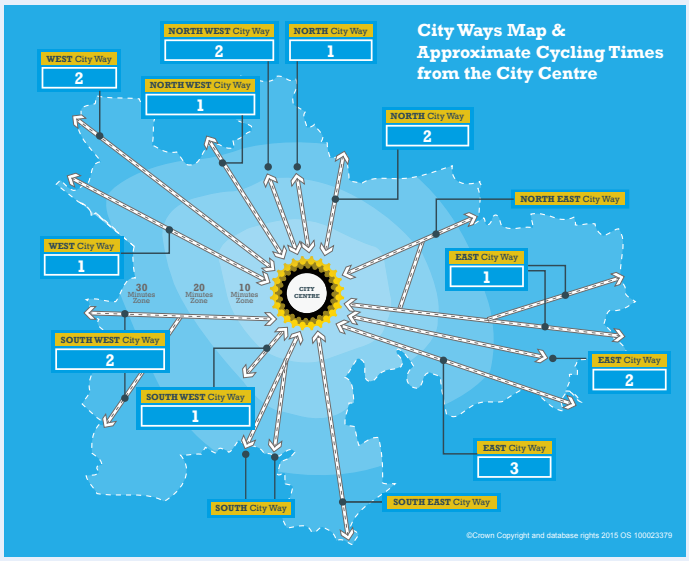
Recommendations:

- The completion of a network of safe, high quality, segregated cycling arterial routes connecting the city centre to suburbs and peripheral neighbourhoods
- The creation of safe, high quality, segregated cycling corridors through the city centre which connect to these arterial routes, undertaken as part of the repurposing of Glasgow's road grid

Glasgow has been praised for its high quality, segregated cycle paths, such as the recently-built South City Way, pictured.

But cyclists still have to endure poorly-designed, unsafe routes with poor segregation, particularly in the city centre, such as this route on Cambridge Street.

Illustration of the cycle to work commuting area



GLASGOW'S CONNECTIVITY CONTRIBUTORS

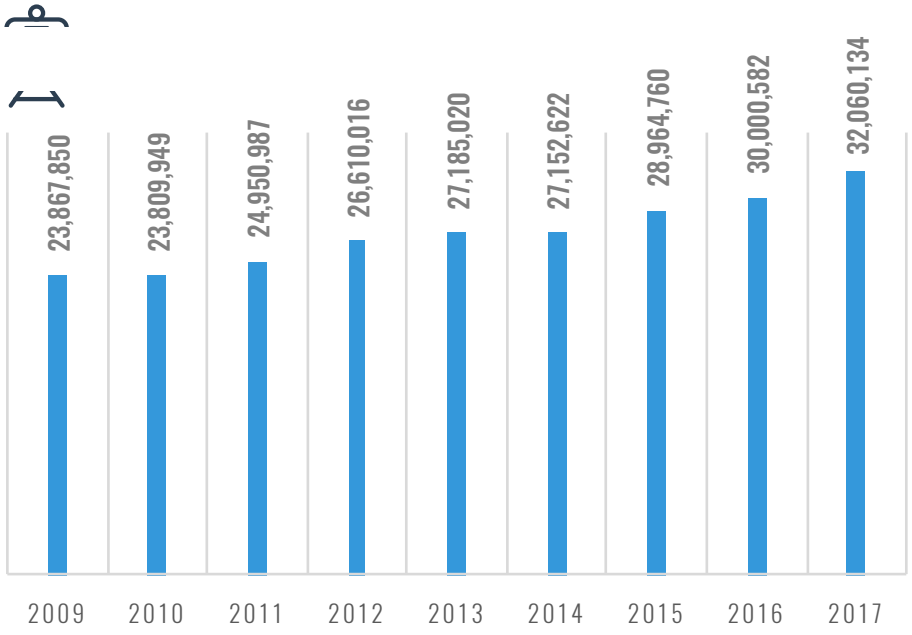
Train takes the strain

The growth in rail travel in Scotland has been phenomenal. And with the largest suburban rail network outside London, it is perhaps not surprising that Glasgow has benefited from this historic level of growth, with the numbers using Glasgow Central Station alone growing by 10 million over the last decade.

Strong government investment in rail services and infrastructure has helped respond to and accelerate this growth, with Glasgow benefiting over the last decade from a new route connecting Glasgow to Edinburgh via Airdrie, the electrification of main line between the cities via Falkirk and the ongoing development of Queen Street Station.

This growth is enormously encouraging. But it has limits: even the historic levels of investment in the rail network are not enough to cater for the growing level of demand. Scotland's railway is facing a crisis of growth – which will be addressed in detail in the Connectivity Commission's second report due to be published early in 2019.

Figures for rail passenger growth at Glasgow Central



Taxis are integral too

Glasgow's taxis are an integral part of this public transport mix, often plugging gaps in provision when other modes are either not favourable, such as in cold, wet weather, or not operating, such as early morning, late evening or indeed through the night. However, basic challenges of properly connecting the city's taxi fleet into the public transport network need addressed, such as their permeability into its railway stations. Other cities do this better, with seamless connectivity at all key transport nodes.

There is room to improve the service on offer by providing better-located ranks and ensuring that taxis do not double park or sit with their engines running, both of which are common. These improvements should be undertaken through a partnership between the industry and Glasgow City Council as part of the strategic redesign of the city centre, taking into account the significant disruption to the industry through the growth of Uber and potential for other such technology-driven services.

Recommendation:

A partnership is created between Glasgow Government and taxi associations which drives improvements in service standards and better strategic placement of taxi ranks

PEOPLE MAKE GLASGOW

Growing, vibrant city centre populations are an important ingredient in urban renewal. Research by the Centre for Cities has found a strong correlation between increasing urban population and real jobs growth, with Manchester and Leeds, for example, seeing 84% and 34% increases in city centre employment between 1998 and 2005, allied to population growth of 149% and 151% respectively.[8]

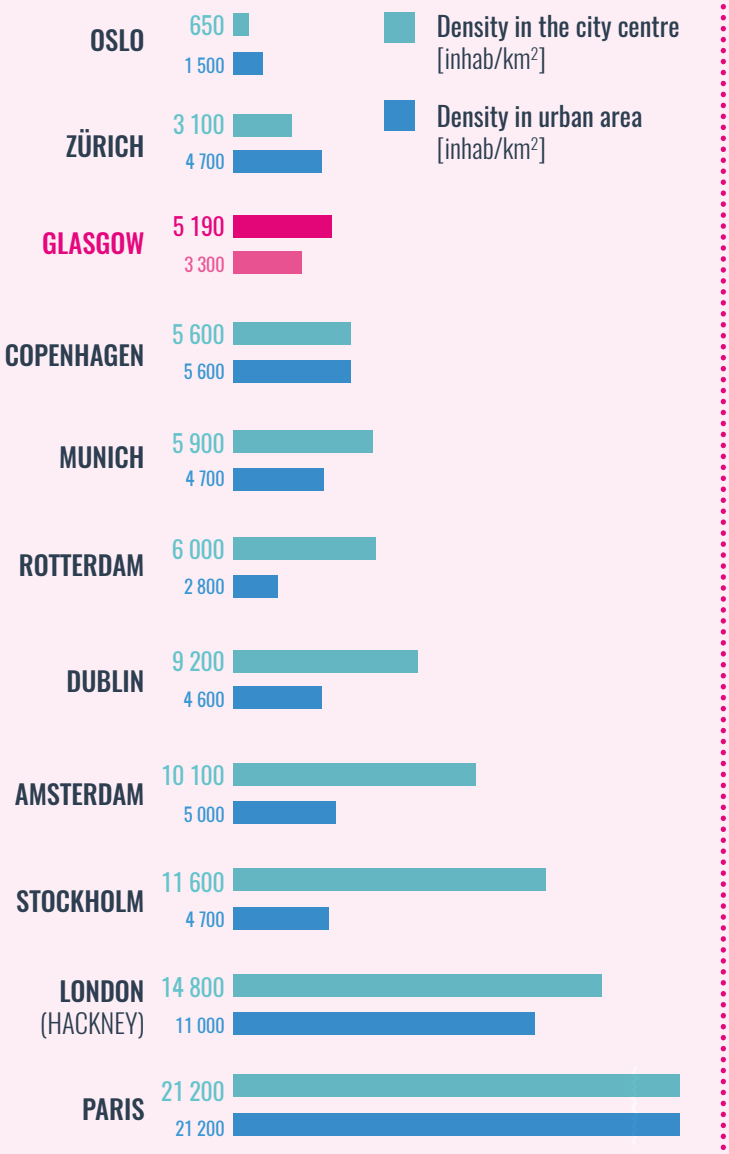
A strong city centre population strengthens the workforce in the area where highly productive, well-paid jobs are being created and reduces strains on travel-to-work networks by reducing the need to commute. This also creates a stronger population mix where residents, workers, visitors, tourists and students use the city effectively, making more efficient use of socioeconomic infrastructure.

The challenge of growing and sustaining an urban population in Glasgow is acute. Decades of poor planning decisions have pushed people out to peripheral estates, suburbs and New Towns – many poorly connected – creating a doughnut population. In the second half of last century, Glasgow lost 100,000 residents from its city centre, enough to populate any two of Scotland's New Towns, and it now has a lower population density than its comparator cities.

Glasgow's population has recently returned to growth, with an increase of 37,000 in the past 10 years and its population now projected to grow 44,000 over the next 25 years.[9] It is vital that this growth is both encouraged and concentrated within Glasgow's boundaries and helps reverse the planning legacy of the previous half century rather than creating more unsustainable, poorly connected peripheral estates.

While connectivity alone cannot achieve this, it can create the conditions for it. Making an attractive pedestrian-friendly environment is a pre-requisite to inclusive growth, ensuring that the city centre is characterised by clean air, safe streets and walkable, workable places. An agile economy needs mobility.

Comparison inhabitants per square kilometre in the city centre



Recommendation:

The repurposing of Glasgow's roads grid to prioritise pedestrians, active travel and public transport should be aligned with and support Glasgow City Council's policy to repopulate the city centre

P

CITY CENTRE ROADS AND PARKING

As we saw earlier, the allocation of road space in Glasgow's city centre prioritises vehicle movements over those of pedestrians and cyclists – relative to successful comparator cities. Evidence on whether this has created a congestion problem, in the sense of slowing vehicle traffic movements, is mixed. Bus speeds have slowed dramatically – with congestion likely to be the primary if not only cause – however overall vehicle numbers within the city centre have declined slightly in recent years.

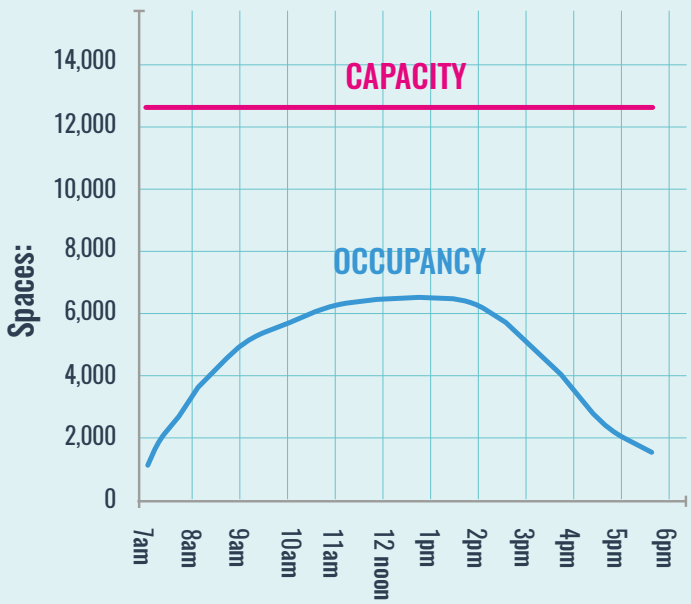
Better monitoring of traffic movements is needed to inform robust policy decisions This includes the merits of introducing a congestion charge: whilst congestion charging has worked well in other cities, the evidence in Glasgow does not currently justify such a move and there are concerns over how it would impact on Glasgow's complex mix of "strategic" motorway routes and local roads, potentially worsening congestion on the former.

What is clear, however, is that the number of vehicle movements through the city centre has had a severely detrimental impact on people's health and quality of life. While Glasgow City Council's commendable move to introduce a Low Emission Zone (LEZ) will substantially ameliorate the former by reducing harmful vehicle pollution, it will not solve the problem of vehicle traffic in the city centre and its dominance over other modes. Some form of vehicle restraint is required.

Moreover, there is convincing evidence that terminating more bus and private vehicle journeys at strategic interchanges and car parks will not only reduce traffic levels in the city centre but also will not adversely affect its connectivity. The majority of bus journeys are made to and from – rather than through – the city centre and there is evidence that these would be adequately served by better use of terminals. Glasgow has one of the highest number of car parking spaces per capita of any UK city but its car parks are under-utilised, suggesting there is ample space to relocate parking from on-street provision to car parks.

In addition, Glasgow should gain the same powers as its English neighbours have to introduce a non-residential parking levy, through an amendment to the Transport Bill. Evidence from Nottingham has shown that such a move can help raise revenue which was then used to fund development of its tram system.

There is sufficient space in Glasgow's under-utilised car parks to accommodate a consolidation from on-street parking in the city centre



Recommendations:

- **Better use of strategic bus terminals and car parks to reduce journeys through the city centre**
- **Glasgow City Council should lead by example and review whether council workers should be given free or subsidised car parking**

BETTER FOR BUS

Glasgow needs better buses if it is to grow and prosper. There is simply no other transport mode capable of transporting people in high volumes that connects all areas of the city. And given the greater dependence on bus services by people from socioeconomically deprived areas and the historically low level of car ownership in Glasgow, bus is a particularly important element in enabling inclusive economic growth.

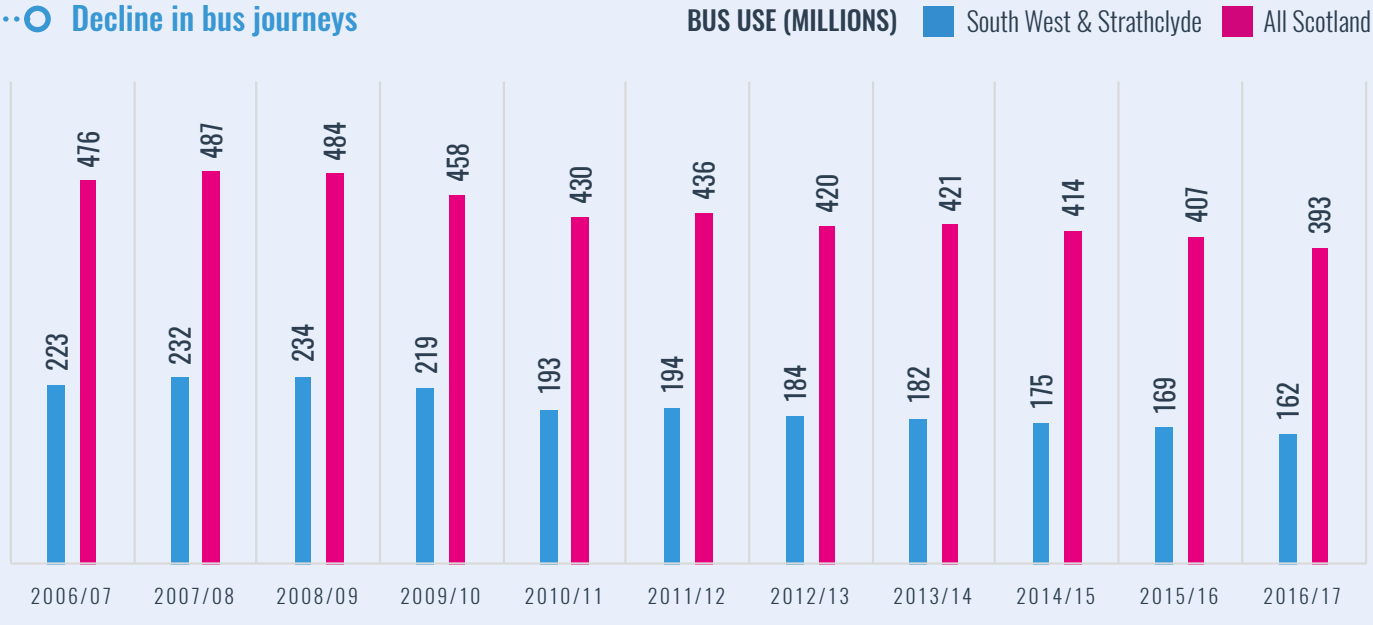
Given this centrality in the transport mix, the crisis afflicting bus provision in and around Glasgow should give us serious cause for concern. Glasgow has experienced the steepest decline in bus patronage in any UK city – with a loss of more than 70 million passengers per year in less than a decade across the SPT area, more than a quarter of the annual total. If the same decline had affected railways, the loss would be the equivalent of closing all of Glasgow's five major stations – and the outcry would be deafening. Glasgow cannot succeed as an inclusive, sustainable and economically thriving city unless this crisis is reversed.

The drivers of this crisis are both complex and collective: bus service quality and passenger information are poor, the bus fleet is one of the oldest in the UK, journey times are declining, ticket prices are prohibitive for many passengers and the partnership of public and private organisations that oversees bus provision has foundered. The frequency of services is declining, with parts of the city effectively cut off as the network has shrunk. One of the few recent major investments in bus infrastructure, Fastlink, built at a cost to the public purse of £40m, is woefully under-utilised, with service frequency between 10 and 20 minutes.

However, evidence from other UK cities shows what can be achieved when the right partnership is in place to deliver improved services, bus priority measures which accelerate journeys and investment. In Leeds, for example, a four-year deal between City Council and bus operators has seen £173m of infrastructure investment being matched by £71m in new buses and a target to double patronage over a 10 year period.

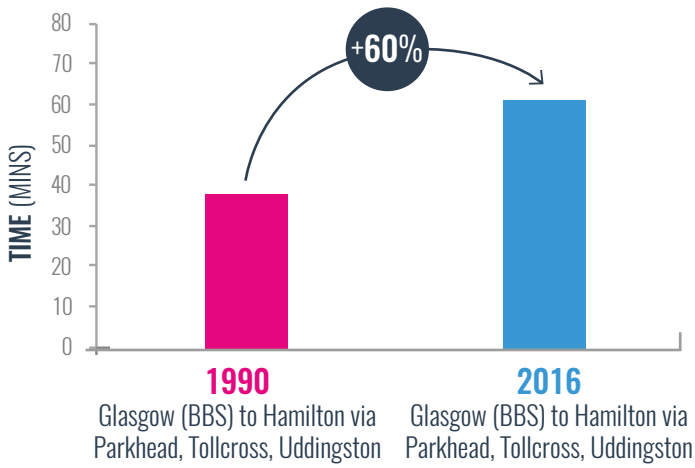
Much political debate is focused on whether regulation is required to deliver such a step change – but it is worth recording that the evidence on this is mixed, as not all publicly-owned bus companies are performing well and some privately-managed networks are delivering. The fresh partnership approach deployed by Glasgow City Council and operators should be given one last chance to succeed. But if it continues to perform poorly on bus patronage compared with other UK cities, the Commission's firm view is the powers in the new Scottish Transport Bill should be deployed to regulate the bus network.

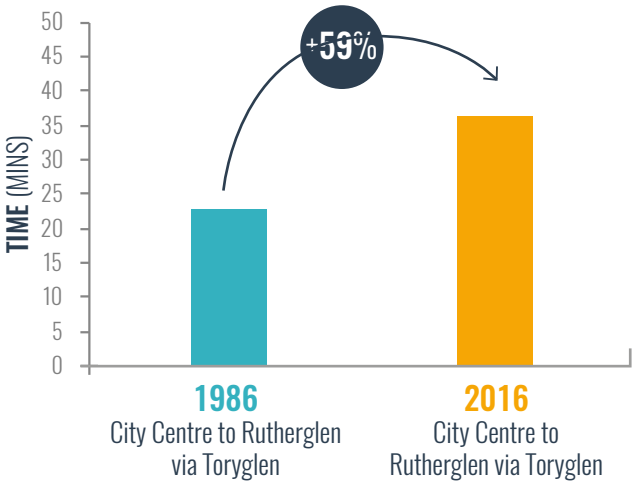
Decline in bus journeys



BETTER FOR BUS

How bus journey speeds have slowed





Decline in bus use has highest impact on people from poorest communities

People in the **lowest quintile** make:

- **58% fewer** trips as a **car** driver
- **75% fewer** trips by **rail**
- **50% more** trips on **foot**
- **206% more** trips by **bus** and **coach**

Compared to people in the **highest income quintile.**

Recommendations:

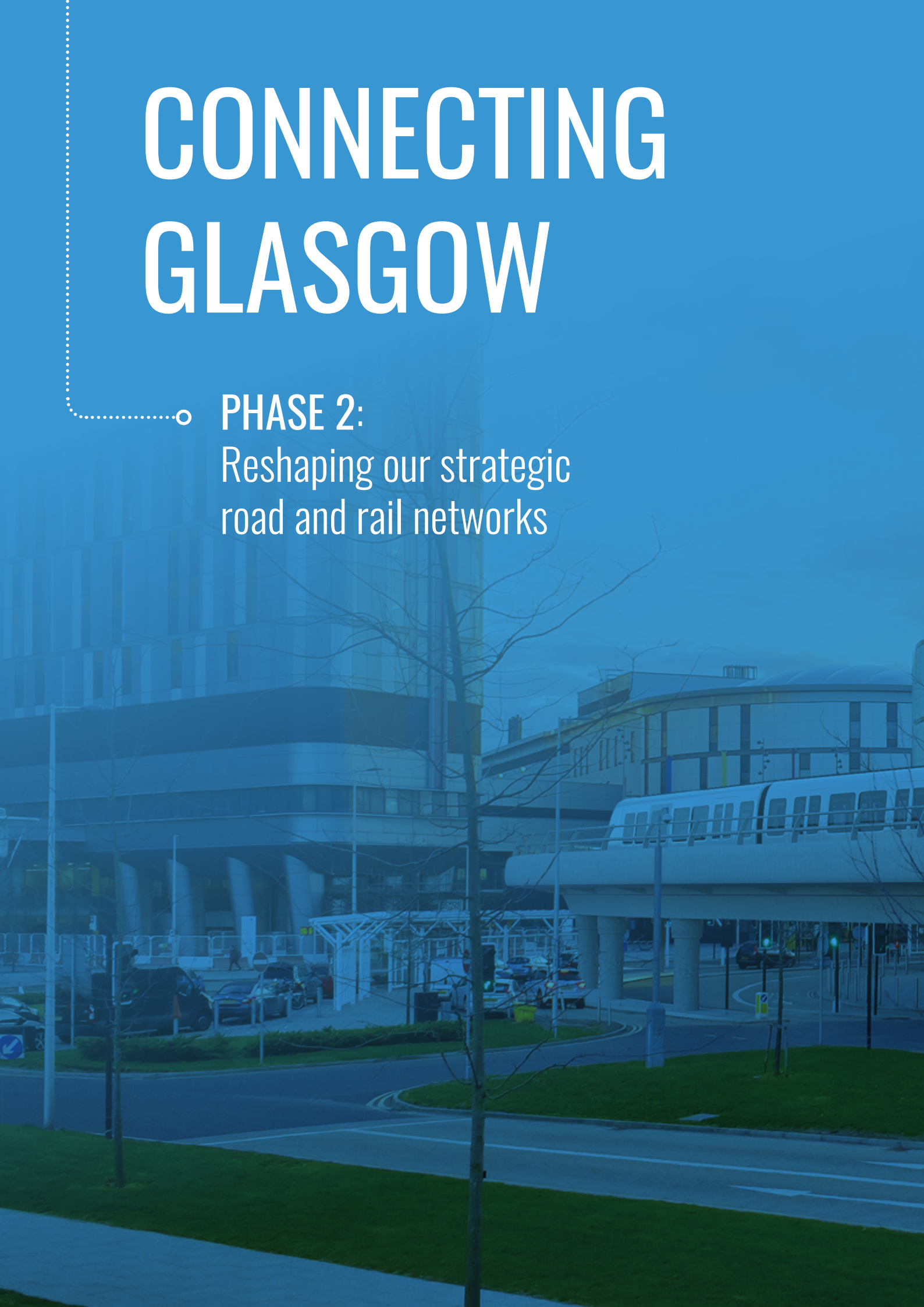
The new partnership between Glasgow Government and bus operators should:

- Accelerate journey times and provide journey certainty through the rapid roll-out of bus priority measures and reducing dwell times at bus stops
- Improve the quality of the fleet, meeting Glasgow's LEZ requirements and driving up service standards
- Improve ticketing and customer information for all bus services, introduction of multi-operator 'Cheapest Day Saver' tickets across the city, and half-price fares for Apprentices and the Under-19s
- Better enforcement of existing bus lanes to deliver faster, more reliable journeys
- Deliver patronage growth of 25% in the first 5 years

Fastlink cost £40m but passengers have to wait at least 10 minutes for a bus

CONNECTING GLASGOW

PHASE 2:
Reshaping our strategic road and rail networks



GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

The Glasgow of today has a (very) good transport network overall by UK standards. But comparison with those cities across Europe and beyond that Glaswegians like to think of as their peers reveals that the city falls substantially short of what has been achieved elsewhere.

Making substantial improvements to the fixed public transport network is fundamental to Glasgow's competitiveness so that it both offers the economic opportunities and quality of life that its citizens deserve, and that the city makes the full contribution to Scotland's prosperity that the country needs. There are urban, regional and long distance considerations that need to be addressed, as we illustrate throughout this report. However, one thing is clear: **transforming the fixed public transport network so that it meets the standards expected of thriving contemporary cities is Glasgow's strategic transport challenge.**

The most glaringly obvious omission from Glasgow's current transport system is the absence of the kind of comprehensive, **modern rapid transit system** serving inner urban destinations that just nearly all of Glasgow's comparator cities have been busy building for the last 30-40 years. Whilst the Subway does this job admirably for the very few parts of the city it serves, too many Glaswegians, particularly in the north and east of the city and the post-war housing estates, do not have the kind of reliable, quick, turn-up-and-go service that rapid transit offers. That all but one of Glasgow's major hospitals, its airport and several key urban regeneration areas are removed from the fixed public transport network makes getting to those places people want to be more difficult than it should be, and constrains the economy as a result. Linking the city's residential neighbourhoods more effectively to critical public services and areas of economic opportunity is imperative if Glasgow is to achieve its ambitions for inclusive growth.

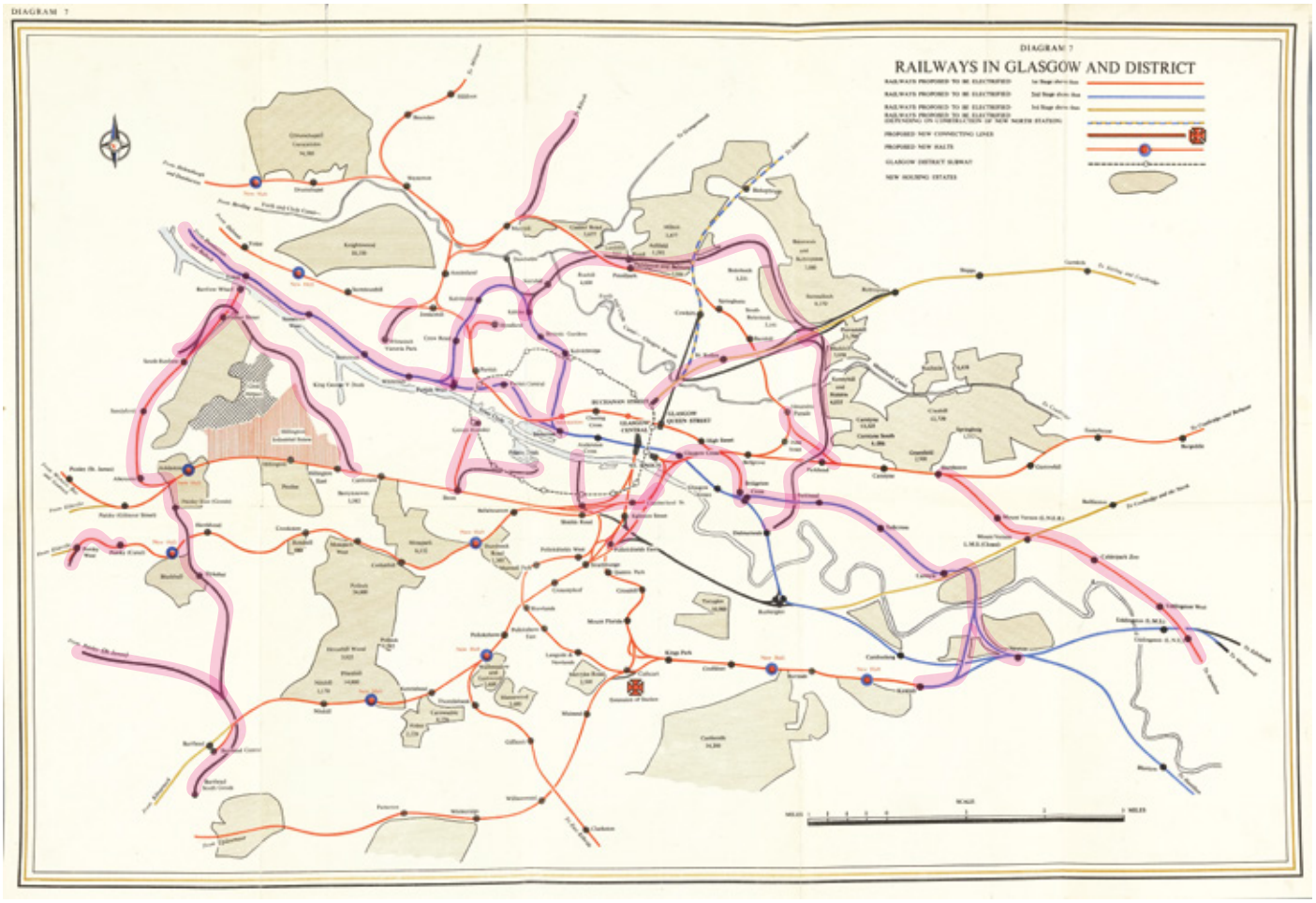
The inherited network

Other than its one Subway line, Glasgow's fixed public transport network is comprised entirely of heavy rail routes. This network first emerged as a means to link industry to the quaysides of the River Clyde. When passenger transport by rail started to grow, the Caledonian and North British railway companies each built their own lines and major city centre stations. This competition brought both costs and benefits that remain to this day: the separation of Central and Queen Street stations is problematic for through journeys, but Glasgow ended up with more infrastructure than it might otherwise have had. For example, because each company built its own east-west sub-surface line to serve its own major terminal – today's Queen Street Low Level and Argyle Lines – Glasgow today benefits from two high capacity cross-city routes carrying tens of thousands of people every day.

But today's railway network is significantly smaller than it could have been. The first station closures began more than 100 years ago as part of wartime economy measures, with further closures commonplace until the 1980s. Although some of the closed routes have been lost to development, many remain intact and ready to be reused, including a substantial number of tunnels once part of the Central Low Level network. **The asset value of this dormant infrastructure could be measured in the billions of pounds,** and therefore Glasgow has a ready-made basis for enhanced rapid transit that most cities can only dream about.

The asset value of this dormant infrastructure could be measured in the billions of pounds.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE



Glasgow's railways: closed routes in pink

Pre-war Glasgow also developed one of the most comprehensive tramway networks in the UK, reaching far beyond the city into Dunbartonshire, Lanarkshire and Renfrewshire. Major interwar developments were planned with wide boulevard-style roads to accommodate the tramway. In addition, the City Corporation had well developed plans for a Subway Eastern Circle and north-south line before the second world war and set out a broader plan for a metro network based on existing rail lines and a new north-south route in 1948. But the move to centralisation and nationalisation of transport provision after the war meant that control shifted away from the city authorities themselves to national government. It is no coincidence that this loss of local control is reflected in the fact that the Subway remains the only underground of any age in the world never to be extended, and that the Glasgow tramway closed completely in 1962 as the dash to accommodate the private car, led by national policy, accelerated.

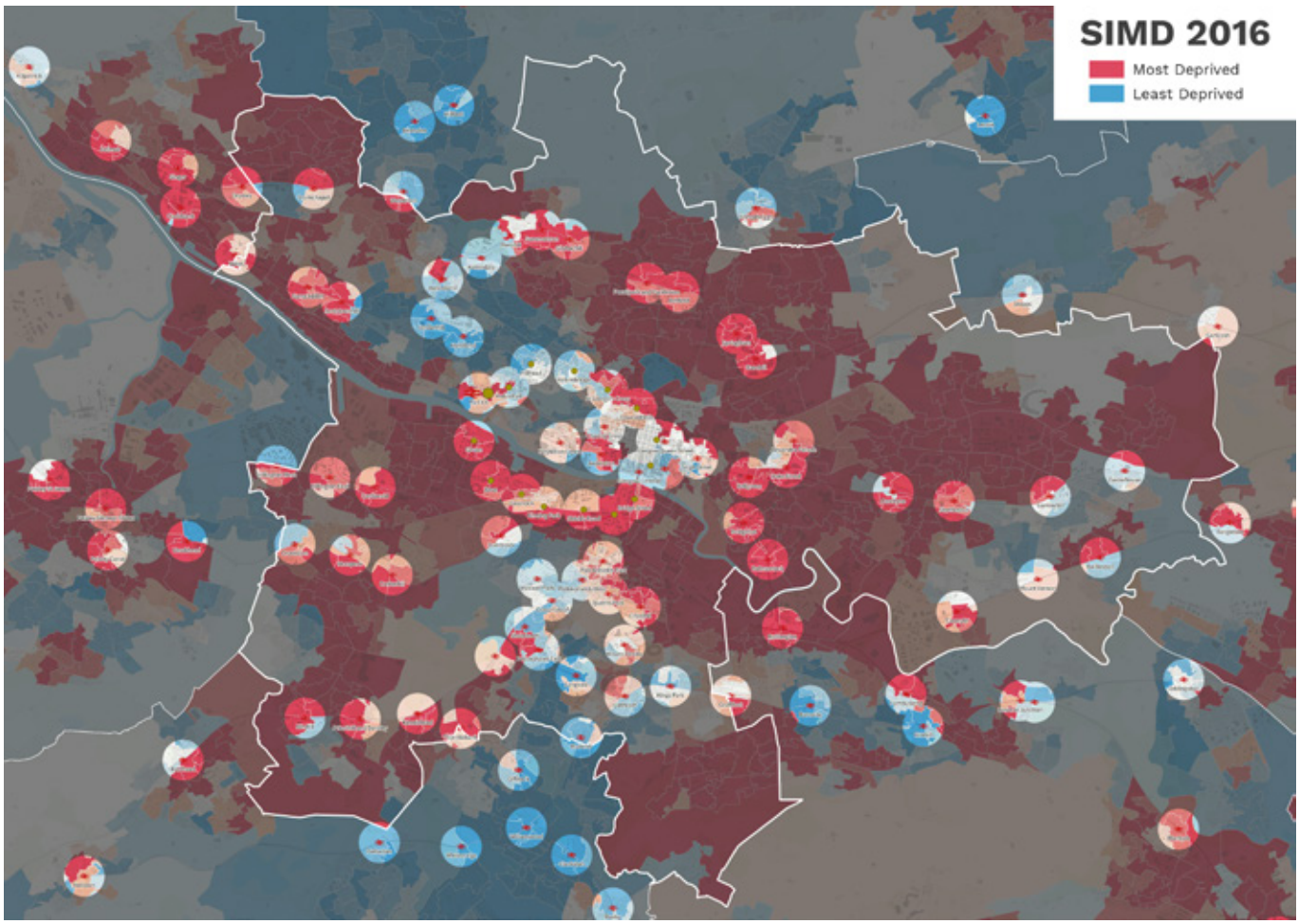
This history is important because it helps explain the strengths and weaknesses of today's rail network. The network's key strengths lie in the level of **regional** connectivity it offers: Glasgow city centre has maintained a high employment density and attracted many new well-paying jobs in recent years precisely because the **rail system gives it a very wide regional labour market catchment.** But the network performs much less well in term of **urban** connectivity: it does not have the network density, service frequency or high capacity rolling stock required for it to function as the kind of rapid transit metro network that the city needs in the 21st century.

History is important because it helps explain the strengths and weaknesses of today's rail network.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

Inequalities of travel opportunity

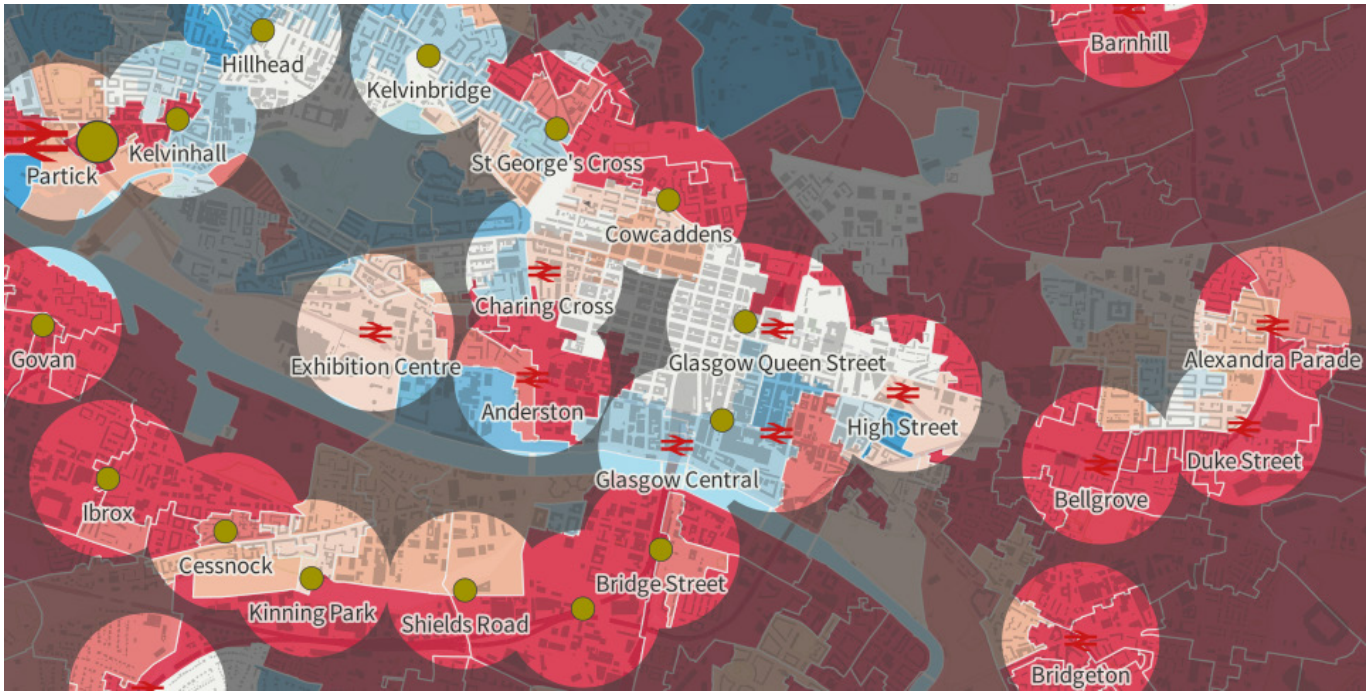
One of the ironies of the history of Glasgow's rail network is that many of the closed routes in the city are where better transport opportunities are most urgently needed. The figure below illustrates the 400m walking catchment of every rail and subway station against the least and most deprived areas of the city according to the 2016 Scottish Index of Multiple Deprivation (SIMD). The map clearly shows how large parts of the most deprived areas of city are poorly served by the rail network (Source: Professor Alasdair Rae, University of Sheffield). In contrast, most of the richest areas, especially the West End (which benefits from the Subway), and the north western and south western suburbs are well served by rail. This disparity means that **the time taken to travel to work, education and healthcare varies enormously across the city,** and can be very substantial for people in poorer communities reliant on the bus. As we showed in our first report, it often requires two buses for people in these places to get to work, which is a much more complicated, unreliable and inconvenient journey than that available to those able to access the train.



Access to rail network mapped against areas of multiple deprivation [10]

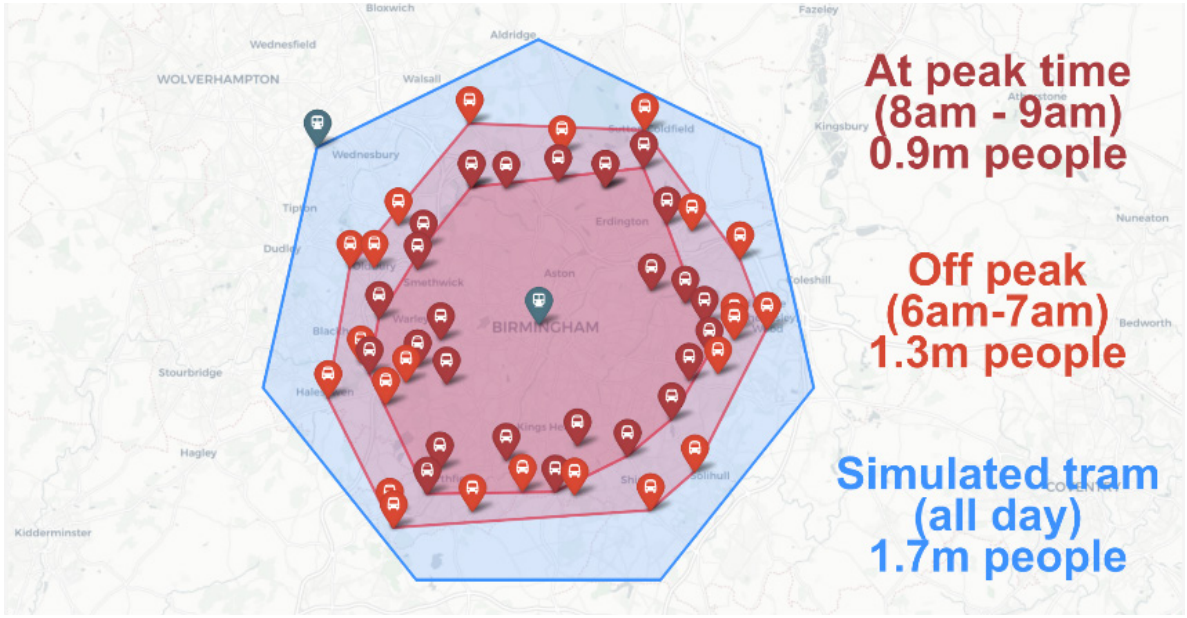
Even within and around the city centre, access by rail is mixed. Important areas to the east such as Strathclyde University, the Cathedral Precinct, Glasgow Royal Infirmary, Glasgow Cross and Glasgow Green are a significant distance from any station. The latter two locations both have disused stations on the existing Argyle Line that could be reopened. Within the city centre grid itself, the area around Blythswood Hill is the only one to fall outside the 400m walking catchment of any station: a station on the Queen Street Low Level line was proposed here in the early 1970s but never pursued. The vibrant inner areas west of Charing Cross such as those around Kelvingrove Park and Finnieston also lie beyond this walking catchment: the disused Central Low Level line towards the Botanics passes under the former, and there have been various proposals for a station on the existing Queen Street Low Level line to better serve the latter.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE



Large areas of the city centre are not connected to the rail network [10]

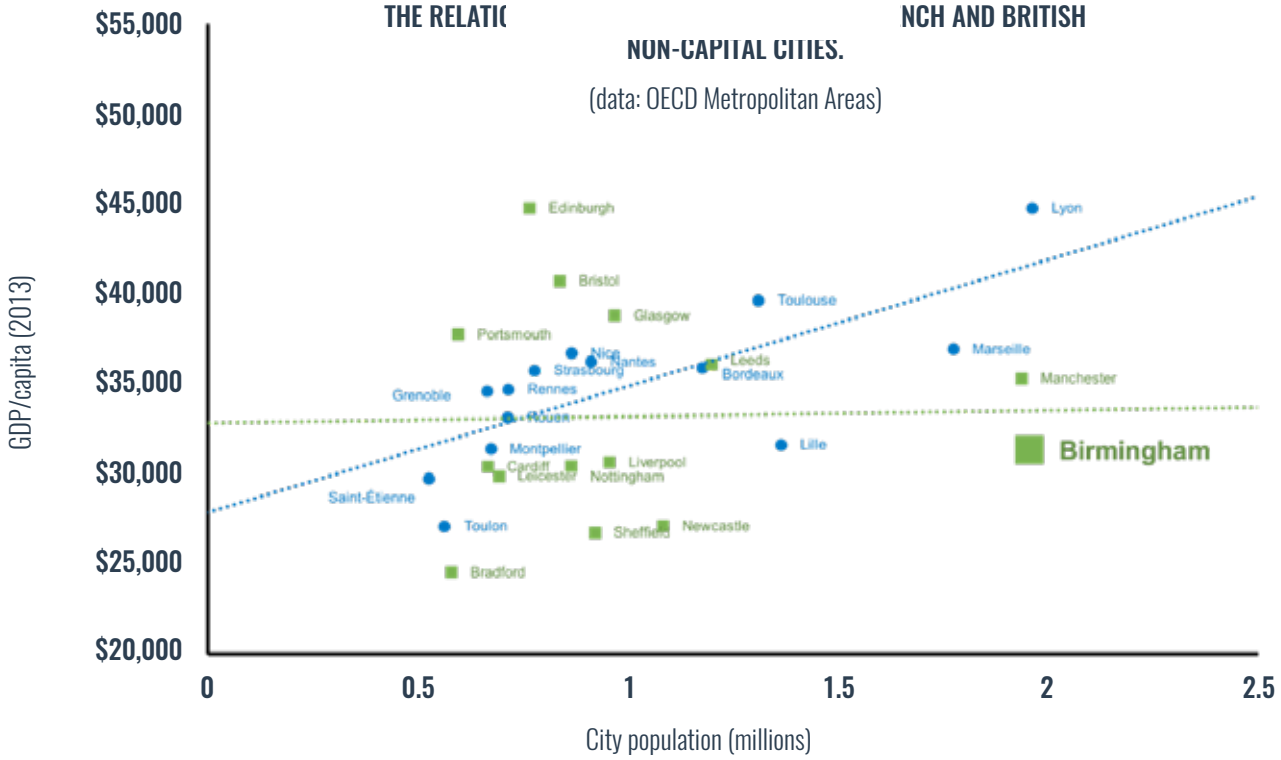
Maximising the number of people that have access to the fixed public transport network is crucial not just for reasons of social inclusion, but also for economic growth. Recent research[11] has demonstrated how many large British cities are in fact economically 'smaller' than they might seem, simply because the underdevelopment of their fixed public transport networks in contrast to European competitors means that it takes too long for people to travel to jobs in the city centre. This has been vividly illustrated in the case of Birmingham, where the 'effective' size of the city, measured by the number of people who can access the city centre within 30 minutes, is only 1.3m, compared to the city's population of 1.9m. During peak hours, when bus journeys are slowed by congestion, the 'effective' size of the city is even smaller, at 0.9m. Having a comprehensive tram network (which Birmingham is in the process of developing) would enlarge the size of the 30-minute work catchment area to 1.7m, close to the city's actual population.



The "real" size of Birmingham, measured by 30m journey to city centre

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

This analysis has shed new light on the 'productivity puzzle' that has bedevilled economists over the last decade when trying to explain the UK's sustained low levels of productivity. While larger cities in countries such as the USA, France, Germany and the Netherlands display higher rates of productivity than smaller cities, this equation doesn't apply in the UK, where large cities such as Birmingham do not show the expected higher levels of productivity. As the graph below shows, Glasgow's productivity and economic performance has been rather better than many other British conurbations. The implication is that this is in large part due to the scale of the rail network, which has enabled Glasgow to grow the density of jobs in the city centre and capture what economists refer to as the 'agglomeration benefits' of concentrated employment more than other larger cities.



Big cities are more productive! In France (and Germany and the USA). But not in the UK

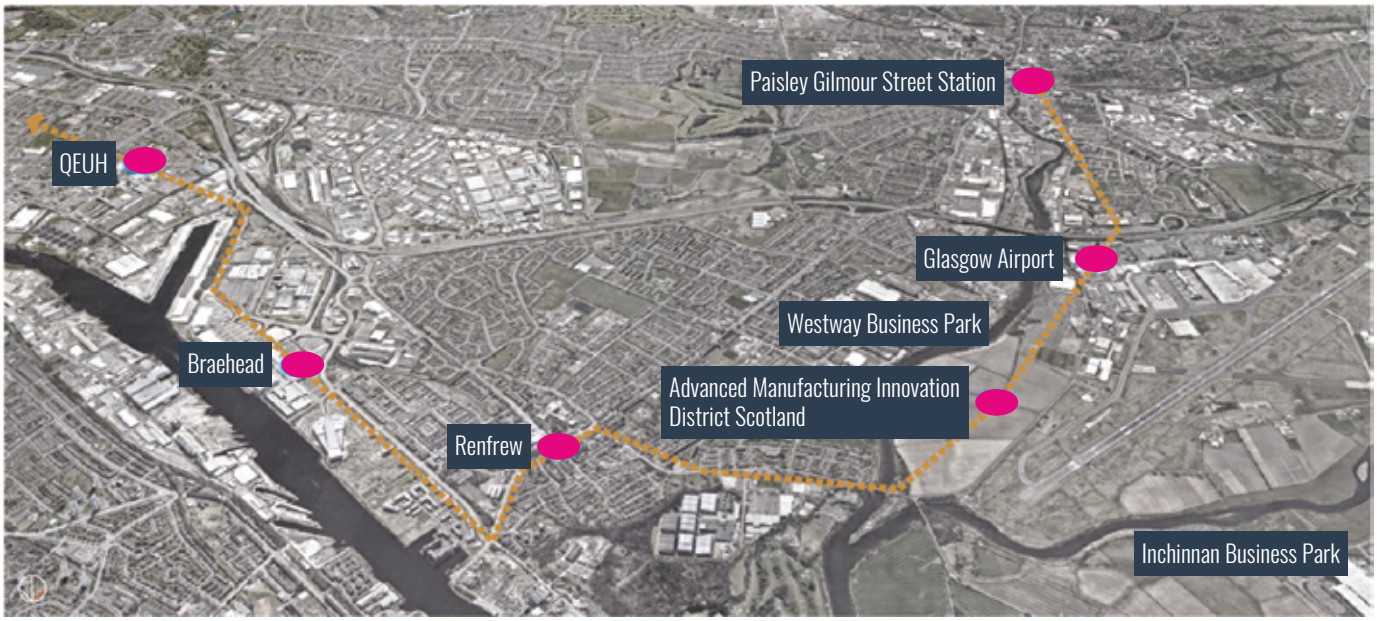
While Glasgow is performing far better than Birmingham on this analysis, a similar case can be made for achieving the kind of productivity improvements that are likely to flow from further expanding its travel-to-work catchment area, given the gaps identified earlier. Moreover, given the cross-over of areas that are ill-served by Glasgow's rail network and also suffer high rates of deprivation, this is an obvious means of **creating the kind of inclusive growth advocated by Scottish Government policy that will help repair some of the city's deeply ingrained economic and social divisions.**

The South Clyde Growth Corridor

There is one prime example in the city where the successive development of a series of areas of economic activity presents the opportunity to create a **wholly new fixed public transport corridor.** This South Clyde Growth Corridor runs from the city centre into Renfrewshire and includes Pacific Quay, the Subway and bus interchange at Govan, the Queen Elizabeth University Hospital and Royal Hospital for Children, Braehead, Renfrew (the largest town in Scotland with no rail connection), Glasgow Airport and the new National Manufacturing Institute for Scotland. **Not only does this corridor comprise some of the biggest traffic generators and strategic economic assets in the city region, but it also parallels the most congested section of the M8.** The creation of a new high capacity and frequency fixed public transport route on this corridor would therefore enhance the growth potential of these key developments, open up their new employment and other opportunities located there to people from across the city, and reduce traffic and congestion on the M8 making remaining bus and car journeys more reliable.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

Such a fixed public transport connection is vital to the continued growth of Glasgow Airport, which generates in excess of £1.44 billion (GVA) annually and supports more than 30,000 jobs across Scotland, according to a study published by York Aviation in January 2019. The report outlined that if Glasgow continues to grow as forecast in its Master Plan the airport would contribute £2.54 billion (GVA), support over 43,000 jobs and welcome 17 million passengers annually by 2040. Effective surface access links were highlighted by York Aviation as critical in enabling greater agglomeration effects by linking companies based at the Airport and City Centre.



The South Clyde Growth Corridor [12]

The geography of this corridor within the city and wider region also highlights two recurring issues that have been at the centre of the wider debate about development of the rail network in Glasgow for several decades, and which are crucial to the recommendations of this report.

First is the issue of the rail connection to Glasgow Airport. Delivering a rail link to the airport has been a key objective of the city's stakeholders for many years, and the history and politics of successive aborted proposals is well known.

But the emergence and increasing importance of the South Clyde Growth Corridor makes clear that it is **no longer appropriate to conceive a rail link to the airport as a freestanding project:** rather, it is imperative that it is developed as **the first stage of a wider strategy to transform the fixed public transport network for the city and region as a whole.**

The disparity in access to the rail network means that the time taken to travel to work, education and healthcare varies enormously across the city, and can be very substantial for people in poorer communities reliant on the bus.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

Glasgow Metro

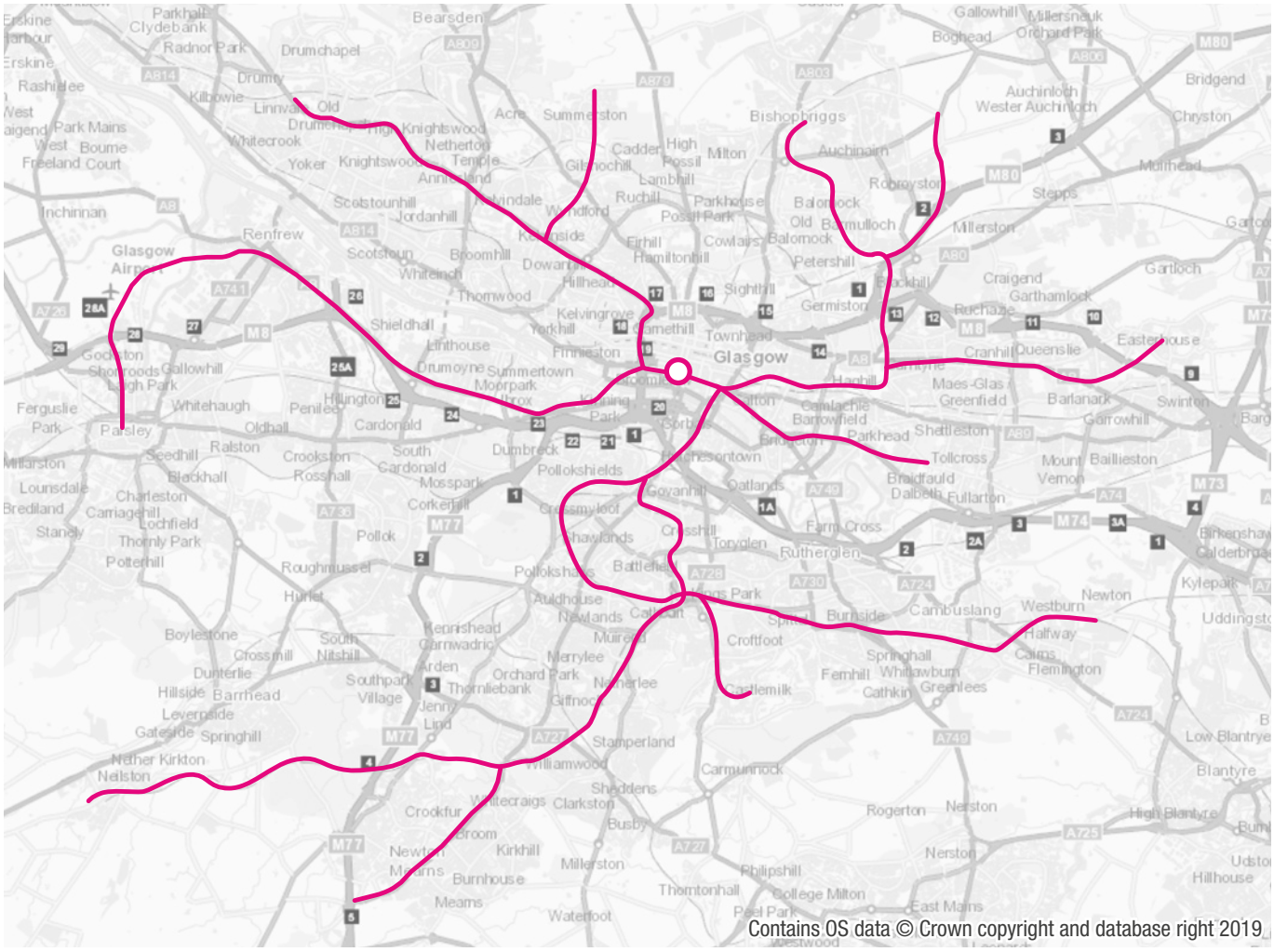
The first priority of such a wider strategy to transform the fixed public network should be the creation of a comprehensive **Glasgow Metro** for the city. The Glasgow Metro would be a network of high capacity rapid transit lines serving as much of the city as possible so that the fixed transport system plays the fullest possible role in ensuring inclusive growth across the city's communities, sustaining the international competitiveness of the key employment concentrations in and around the city centre. The Glasgow Metro network could be created from:

- **PARTS OF THE EXISTING HEAVY RAIL NETWORK** (such as the Cathcart Circle and the Central Low Level Line) that would be better suited to operation by high density metro service with trains capable of accommodating much higher passenger capacity, and better acceleration profiles that would permit the creation of new stations in between existing ones;
- **REOPENED SECTIONS OF DORMANT INFRASTRUCTURE** such as the former Central Low Level Line via the Botanics to Maryhill, and the London Road tunnel to the sports and events cluster at Parkhead and Tollcross, together with new spur lines to areas never before served by rail near these corridors especially in the north east of the city;
- **WHOLLY NEW SECTIONS OF ROUTE** such as a line from the city centre via each of the key nodes on the South Clyde Growth Corridor to Glasgow Airport; and a Subway Eastern Circle
- **STREET RUNNING SECTIONS** on wide boulevard-type roads such as Edinburgh Road and Great Western Road.

The Commission does not take a view on which particular rapid transit technologies will be suitable for each of these routes. Indeed, it is likely that different lines will have different technological solutions that are most appropriate. For example, a completely new route such as that along the South Clyde Growth Corridor to the Airport could be a candidate for the kind of automatic metro currently being extended in Copenhagen.

Those routes to be converted from heavy rail could use standard metro vehicles of the kind in use in many cities around the world capable of accommodating higher passenger loads than current heavy rail rolling stock. A combination of segregated and street running would be possible by using the kinds of light rail vehicles used on the Porto Metro, which was designed to integrate disused rail corridors with street running from the outset.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE



Glasgow Central Metro – potential routes

The first priority of such a wider strategy to transform the fixed public network should be the creation of a comprehensive Glasgow Metro for the city.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

It will be for the bodies responsible for transport governance in the city to identify a phased delivery plan for the Glasgow Metro across the potential routes, and to make decisions about which technologies are appropriate for each route. The key is to agree a plan capable of phased delivery and to begin that delivery as soon as possible. However, **the Commission recommends that the first route to be constructed should be that between Paisley Gilmour Street and Glasgow Airport.** This first leg should be completed by 2025, in line with the existing timeframe for the Glasgow Airport Access Project. Notwithstanding our comments on technological choices for the wider Glasgow Metro network above, we are clear that the link between the heavy rail interchange at Paisley and the Airport should be of a kind that is capable of being extended to the city centre along the South Clyde Growth Corridor as a full Glasgow Metro line.

This quite clearly means that **autonomous pods are not an appropriate solution for the Airport connection.** Furthermore, we understand the term 'People Mover' to mean an automatic shuttle type train of the kind used at Gatwick Airport for the inter-terminal link. Whilst this would provide a good connection between Paisley and the Airport, it would be difficult to extend this kind of system over any significant distance towards the city. We therefore envisage that the connection between Paisley and the Airport and onwards to the city centre via the South Glasgow Growth Corridor nodes to be either an automatic metro of a type similar to that in Copenhagen or a hybrid segregated/street running LRT solution like that in place in Porto.

Glasgow Metro at Queen Elizabeth University Hospital (visualisation)

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

Glasgow metro on Edinburgh Road (visualisation)

Metro in Glasgow Airport (visualisation)

The High Speed Opportunity

The last 20 years has seen an incredible renaissance in many of the UK's largest cities. Indeed, Glasgow has been one of the most successful in achieving renewal and growth, and Glasgow City Council has an ambitious plan to accelerate this progress in the years ahead. The development of High Speed 2 presents both a threat but also an opportunity to Glasgow in the coming decades. The threat arises because Birmingham, Manchester and Leeds – **cities that compete with Glasgow for economic investment** – will gain greatly enhanced connectivity with the world city of London, and the development of the brand new stations required to accommodate the European loading gauge high speed trains used on HS2 will provide an enormous stimulus to regeneration and property development in each of their city centres.

Developing infrastructure to support a sub-three hour rail journey between Glasgow and London is critical, but this is only one part of the investment package that will be required. To compete effectively, **Glasgow will need to be smart.** It will need to maximise the labour market catchment of the city centre to remain an attractive inward investment location, which will require further enhancing the regional rail network and the creation of rapid transit links to areas currently poorly served. It will need to make sure that the airport is much better connected to the city centre so that the total journey time between Glasgow and London remains comparable with Manchester and Leeds for those trips where this is essential, albeit by plane rather than train. And it will need to undertake the same kind of **strategic redevelopment of its intercity terminal station to accommodate HS2.**

Although European loading gauge high speed trains will be limited to the new HS2 infrastructure itself, from day one of operation, 'classic compatible' trains will run north from London over HS2 and then on the existing West Coast Main Line to Glasgow. These trains are 400m long, and there is **no existing station in Glasgow that is able to accommodate them.** Some form of strategic intervention is therefore required to make Glasgow ready for HS2, and to capture its benefits from the beginning.

This will not be an easy task. There are three principal requirements for any high speed rail terminal in Glasgow:

- **FIRST,** it needs to be physically capable of accommodating the high speed trains themselves – both 'classic' and European gauge – and provide the capacity for growth as the service matures and further sections of new line are built north of those currently planned;
- **SECOND,** it needs to be sufficiently well connected to the urban public transport network so that people can access high speed rail services effectively, and that visitors arriving in Glasgow are able to travel around easily;
- **THIRD,** it needs to be sufficiently centrally located in the city so that it stimulates property development and employment creation, and that a substantive proportion of travel to the terminal can be accommodated by walking and cycling.

The Commission is of the view that there is only one credible option for a high speed rail terminal in Glasgow. This is to redesign **Glasgow Central to accommodate HS2 trains.** This would require at the very least the extension of the station over the River Clyde including the reinstatement of the former additional bridge and tracks over the river to the east of the station approach, and the creation of a new southern entrance and concourse roughly on the site of the former Bridge Street station. The **advantages** of such a project are:

- It could stimulate significant regeneration to the south of the city centre around the new Barclays development at Buchanan Wharf and in the existing International Financial Services District to the north;
- It would be very well connected to the existing regional rail network via Central High Level and Low Level;
- There would be potential to create a bus station integrated with the new southern concourse of the station which would provide the kind of integrated transport hub for the south of the city that we identified in our first report;
- There could even be a dedicated junction on the M74 giving access only to a new car park at the southern end of the expanded station which would create a 'parkway' station for the region but adjacent to the city centre, so that the benefits of economic agglomeration in the region's most central and sustainable location are maximised.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

There are some significant challenges to be overcome in redesigning Glasgow Central to accommodate HS2 however:

- The station is effectively full and so existing train services will need to be somehow diverted away from the station to create capacity;
- The Glasgow Central / Queen Street gap means that there would be no direct access to high speed services at Central from the north, north east and Edinburgh unless this gap is plugged by new infrastructure;
- The Central site is constrained and finding space for additional platforms (rather than longer platforms) is very difficult;
- An expanded Central would not be the kind of wholly 'new' station that other cities are planning around with the symbolic benefits this is argued to bring.

Glasgow City Council has previously indicated that a site at Collegelands to the east of the city centre was its preferred location for a high speed rail terminus. The attractiveness of this option is based on its potential to regenerate comprehensively an area of the city that has long suffered from physical and economic decline. However, **the Commission does not regard Collegelands as the optimal location for a high speed rail station.** This is because it is on the periphery of the city centre, and although it would undoubtedly offer significant regeneration benefits in its immediate location, it is not sufficiently centrally located to capture the potential agglomeration benefits of providing high speed rail access directly to the main employment core, where regeneration efforts have been and should continue to be focused over the long term. The Collegelands site is also more difficult to connect to a large number of existing public transport routes than Central, which is a key consideration in the planning of any HSR station. There are also other feasible sites in the city centre where a wholly-new station could in theory be constructed, but these are either, like Collegelands, too far from the main concentration of economic activity and/or would require highly disruptive demolition and risk imposing significant blight in the years leading up to construction, and should therefore not be pursued.

Strategic intervention is therefore required to make Glasgow ready for HS2, and to capture its benefits from the beginning.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

Plugging the Central / Queen Street Gap... properly

One of the most important **barriers to connectivity at the city- and city regional level is that imposed by the separation of the city's two main railway stations.** The lack of a connection between Glasgow Central and Glasgow Queen Street is an issue of strategic importance for the city and the west of Scotland as a whole. For the city, it means that **the economic opportunities in the South Clyde Growth corridor are difficult to access from the north and east of the city where improved access to employment is critical.** For the wider region, particularly areas such as Renfrewshire, Inverclyde and North Ayrshire, effective access across Glasgow city centre such that commuting to employment in the Edinburgh area becomes a realistic prospect is essential if population decline is to be arrested.

The 'Crossrail' project – the reopening for passenger use of the City Union rail link via the bridge over the Clyde east of St Enoch – has been put forward on numerous occasions as a means to address the Central / Queen Street gap. However, there is a reason why Crossrail has been rejected when subject to formal analysis: the project not only has some severe limitations, but it would in fact make the rail system worse in several respects: it does **not** in fact serve Central Station; it would require some difficult engineering and possibly significant demolition to provide even a low quality, low speed junction to access Queen Street; such a constrained junction would likely have severe performance and reliability impacts on the whole of the Queen Street Low Level network; and any realistic service pattern for the line actually diverts trains away from Central Station leaving most people further from where they want to be creating longer rather than shorter journey times, and thus imposing an economic cost on the city rather than providing economic uplift. **The Commission therefore believes that Crossrail should be rejected and that a more ambitious solution is required to address the Central / Queen Street gap** appropriate for Glasgow's growth potential.

The last decade has seen the pursuit of several strategies to increase the capacity of Central and Queen Street stations. Two new platforms have been provided at Central High Level, some services have been swapped between high and low level lines, and currently Queen Street High Level is being significantly upgraded and expanded. But such is the rate of growth in rail travel, even with these measures in place Central Station is saturated, and the new upgraded Queen Street is expected to be full around the middle of the next decade. The exact timing of this capacity crunch is unclear and other interventions recommended in this report may provide some short to medium-term relief. **However, failing to address this rail capacity crunch will act as a ceiling on growth aspirations for Glasgow and the wider region.**

It is therefore time to plan for dealing with this capacity crunch now, and to do so in such a way that both **radically increases rail capacity to support the long term economic vitality of the city centre, and also plugs the Central / Queen Street gap... properly.** Plugging the gap properly will require delivering on longstanding proposals to construct a new tunnel linking the existing rail networks either side of the River Clyde. The idea of such a tunnel has been studied by British Rail, SPT and Transport Scotland over the last 30 years. On each occasion, the project has been found to be viable, but until now there have always been other cheaper options to increase capacity in the short to medium term, such as the current Queen Street Station redevelopment, and so these have been pursued first. But the list of such interventions to increase city centre rail capacity is now almost exhausted, and so it is time to plan for the kind of transformational change the tunnel would bring so that it will be ready when needed.

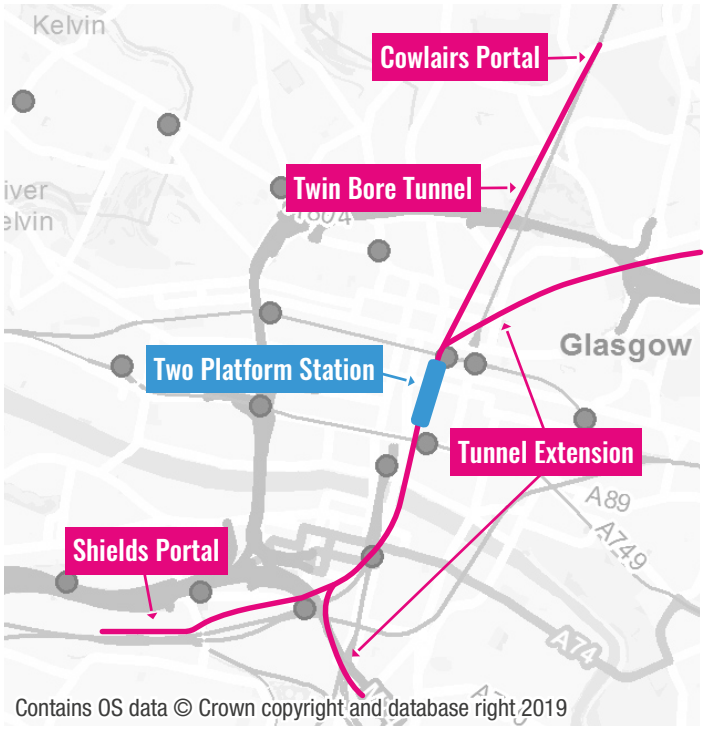
Many cities across Europe, from Munich to Turin, Leipzig to Oslo and Stockholm to Zurich have constructed such cross-city tunnel routes in recent decades. The design principle is to vastly increase the capacity of the rail system by running through trains instead of those that have to stop and reverse at terminal stations. In Glasgow's case, now that the main routes north out of Queen Street have been electrified, the necessary infrastructure is in place for the tunnel connection to come to fruition. There are several different potential tunnel options.

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

Stockholm City Rail Tunnel

The most straightforward option is for the tunnel to run from a southern portal on the Ayrshire and Inverclyde lines in the vicinity of Shields Junction via a single underground station in the city centre located in between Central and Queen Street so that the escalators from each end of the station meet the surface inside or immediately adjacent to the two existing high level stations. From the city centre, the tunnel would then continue north paralleling the tunnel from Queen Street high level station, rejoining the existing network near Cowlairs Junction.

Even in this iteration, the tunnel would significantly increase the rail capacity of the network around Glasgow, potentially providing around 20 trains (around 11,000 seats assuming 8 car trains) in each direction across the city every hour.



Glasgow Central/Queen Street tunnel

GLASGOW'S STRATEGIC TRANSPORT CHALLENGE

It would be possible to combine the Edinburgh and Ayrshire express services giving the whole of the central belt a world class regional express network making Glasgow city centre unambiguously the most accessible place in Scotland and at the same time vastly increasing the accessibility of those areas south and west of the city to the wider central Scotland jobs market, which could have transformative impacts on fragile post industrial communities reliant on commuting for work opportunities. Several through services per hour from Paisley to Edinburgh via the city centre would also transform the accessibility of Glasgow Airport in a similar way to what the Elizabeth Line will do for Heathrow. A new station near the northern tunnel portal at Cowlairs could be the centrepiece of an extended major redevelopment area building on the current project at Sighthill, which is the kind of strategic intervention of that the re-energised governance arrangements we propose could pursue.

More ambitious options include building the tunnel for 12 car trains and providing tunnelled junctions either side of the city centre, giving access to more routes such as the Kilmarnock/East Kilbride lines and the dormant tunnel towards Springburn and Cumbernauld that served the old Buchanan Street station. With this kind of infrastructure, it would be possible to create a truly comprehensive regional express rail network providing all kinds of cross-city journey opportunities unavailable today, and achieving significant modal shift away from the car. Potential matched train pairs from today include Ayr – Glasgow – Falkirk High – Edinburgh, Kilmarnock – Glasgow – Dunblane and Alloa, and East Kilbride – Glasgow – Cumbernauld - Falkirk Grahamston. But whatever service pattern is chosen, this option would transform the capacity, quality and flexibility rail in the city and beyond.

Each of our three core recommendations for the strategic development of rail in the city – the creation of the Glasgow Metro, the Central Station High Speed Rail terminal and the Central-Queen Street tunnel – would make a major contribution to achieving the step change in the capacity and quality of transport that Glasgow needs. **But as a package they are transformational for the city and central Scotland as a whole**, given the level of additional capacity they offer, the potential for significant modal shift they represent and the flexibility they open up in planning the rail network to meet future demand. Therefore, **although the Commission has identified the development of the Glasgow Metro as the first priority** given its potential to be implemented in phases beginning quickly, **it is imperative that our recommendations are taken forward as an integrated 20-year strategy to transform transport in Glasgow.** We return to this in the section on paying for the future below.

It would be possible to combine the Edinburgh and Ayrshire express services giving the whole of the central belt a world class regional express network making Glasgow city centre unambiguously the most accessible place in Scotland.

THE STRATEGIC ROAD NETWORK

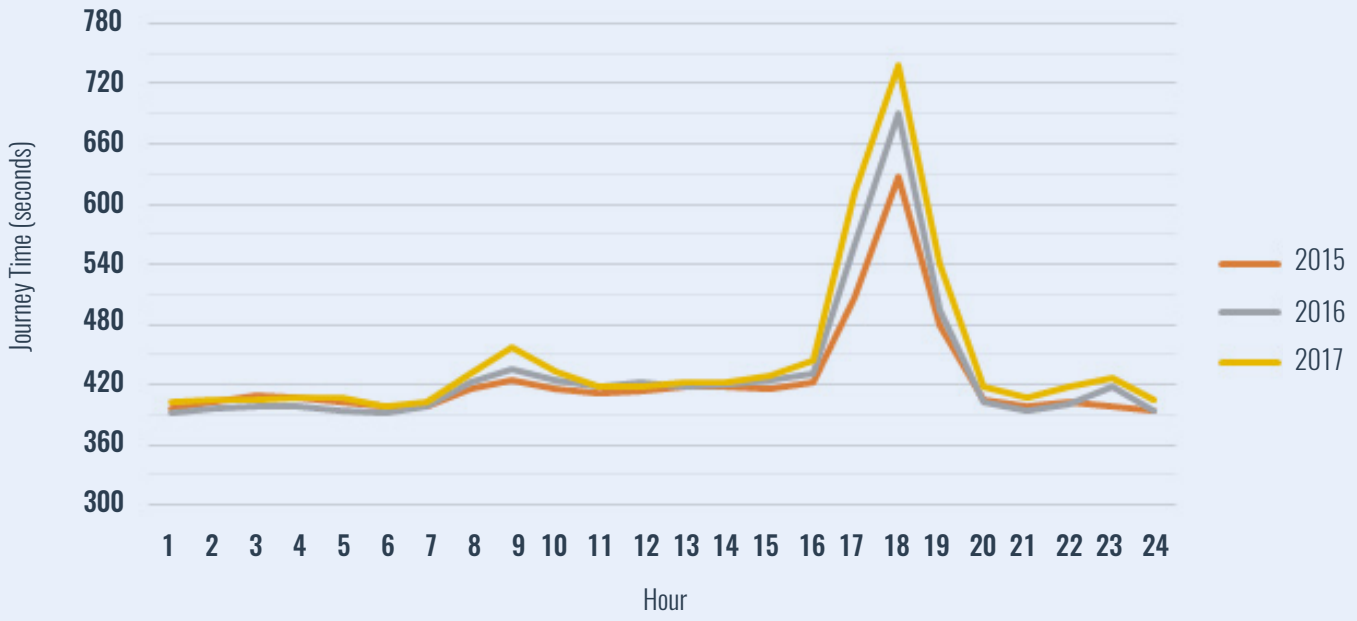
A fifth of Scotland's motorway traffic is in the Glasgow City region[12]. As we outlined earlier, while the picture regarding congestion in the city centre is mixed, a clearer picture is available on the motorway network, where traffic is increasing and accounting for a bigger share of journeys, relative to local roads.

Since 1975, the volume of traffic on major roads (motorways and A-roads) has doubled across Scotland and, while there was some evidence prior to the Great Recession that traffic volumes were plateauing, more recent experience in Scotland has shown otherwise, with motorway volumes, measured by vehicle kilometres, increasing by 22% (from 6,577 to 8,054) over the decade to 2017.

In particular, the Western section of the M8, between junctions 22 & 29, is experiencing significant traffic growth, and it is this which is having the most dramatic and detrimental impact on journey times across Glasgow's city region.

This is especially pronounced during the evening peak, with the competing demands of commuters, airport travellers, visitors to the QEUH, shoppers heading to Braehead and general through traffic all funnelled along this transport corridor.

This most critical section of Scotland's motorway network has seen an increase in traffic volumes of between 17 – 22% over the last decade and this has greatly contributed to increased journey times (up 18% over the last 3 years) and levels of connectivity uncertainty.



Daily Journey Time Profile for Westbound Traffic between Junction 22 and 29 [13]

The Eastern section of the M8 (junction 8 – 13) displays a mirror image of this growth pattern, with traffic volumes decreasing by 20%, (a reduction in daily traffic of 12,000 vehicles) and journey times improving proportionately. This is largely due to the completion of the M74 extension and the displacement of traffic through that new corridor, running along the city's southern boundary rather than through it. The central section of the M8 hasn't experienced any major changes, in either direction, although the peak periods are extending and congestion levels continue to increase both in terms of time and extent.

THE STRATEGIC ROAD NETWORK

Kingston Bridge at peak [14]

Other sections of Glasgow's motorway also show worsening congestion. For example, the X77 bus service operated by Stagecoach from Ayr to Glasgow City Centre has experienced a 5% decline in journey time over the last year alone and off-peak punctuality has declined by 7.5%. Since opening in 1997, and despite M8/M77 junction enhancements in the mid 2000s, the M77 has demonstrated how new roads fill up with traffic, and is now a clogged-up corridor where congestion is such that morning peak traffic is now often queuing from beyond junction 5 by 7:30am. These problems persist for all services accessing that critical corridor, e.g. the X76 from Kilmarnock to Glasgow has a running time differential where peak morning journeys are 57% longer than the same journey during off-peak running.

Although Glasgow's motorway network suffers much less from congestion than motorways in and around other major cities in the UK such as Birmingham, or the M25 around London, these trends are worrying. This emerging evidence of increasing journey time and reliability at peak times has the potential to constrain Glasgow's growth. Moreover, while future trends are notoriously difficult to predict[15] there are reasonable grounds to expect that these trends could continue and potentially accelerate without adequate policy interventions.

There are several drivers for this. For instance, across the whole of Scotland there were three million vehicles licensed in 2017, a record level and 13% increase on 2007. By 2037, Transport Scotland predicts an increase in vehicle kilometres of between 25-50% and a 20% increase in the size of the vehicle fleet, relative to 2010. This is more pronounced in the Glasgow and Clyde Valley area where a relatively low level of car ownership today allows for greater growth and a 30-55% growth in vehicle kilometres and a 30% growth in car ownership.[16]

The record recent investment in Glasgow's motorway network, including M74 extension and improvements to the M8 and M73, has considerably improved journeys. But this investment is double edged as it creates long-term incentives for car use and ownership. Lastly, the expected shift towards electric vehicles and vehicle automation, while offering significant and potentially revolutionary consumer benefits, could significantly boost demand for car travel far beyond the physical capacity of our existing road network. As has been long recognized in the shift from the "predict and provide" planning model, we are no longer able to build our way out of this demand problem.

The uncertain nature of all these factors should be stressed

– and there are contrary predictions of trends that could potentially stem traffic growth. But, taken together, they provide strong grounds for developing a policy framework that provides resilience against such unconstrained traffic growth and the negative impact this would have both on journeys and on wider social and economic impacts.

Doing something about traffic

Part of the solution to increasing traffic volumes and motorway congestion is to provide public transport alternatives, as discussed in the previous chapter. But these are unlikely to deliver a sufficient policy response in their own right. Moreover, there is evidence that incentivising car journeys through lower motoring costs (and, we might add, better road infrastructure) damages the business case for investment in public transport.[17] A more balanced policy response is required.

Pricing

The most effective way to tackle congestion is by changing how we pay for road use. A study by the UK Commission for Integrated Transport[18] showed that replacing fuel duty with road pricing and not charging road users anymore in aggregate would lead to a 48% reduction in traffic across the UK. Such a change in pricing would incentivise road users to change behaviours, including adjusting the time of day at which many of them travel.

Well-designed road pricing schemes can succeed not only in reducing congestion but driving public support. Three years after the introduction of London's congestion charge in 2003, congestion levels had dropped by 26% in central London; within a year, health-harming pollutants reduced by around a fifth and bus patronage grew by 37%. Despite initial public opposition, the clear benefits of the scheme soon succeeded in winning popular support.[19] Similarly, in Stockholm, public support for road charging went from 25% to 55% when it was first introduced, leading to a 25% drop in traffic levels at peak times. Once the wider benefits of the scheme became apparent, including funding for public transport, cycling and public realm improvements, public support increased to 75%.[20]

There is little reason to think that a similar scheme could generate the necessary levels of public and political support in Scotland at this time. The failure of referendums over road charging schemes in Edinburgh and Manchester have dented the appetite of politicians to take on such measures – and it would be futile to recommend such interventions without a shift in public and political appetite for them. Moreover, the mix of motorway and local roads in Glasgow poses a particular challenge to creating a well-designed road charging scheme, with potential for a badly-designed scheme simply to disperse traffic from motorways to local roads and from the city centre to out-of-town alternatives, rather than tackling congestion (conversely, we raised the risk in Phase 1 of this report of a charging scheme on local roads dispersing traffic onto the already-congested motorway network. Whether a national or local scheme was pursued, the problem of dispersal/avoidance would have to be tackled). While this is potentially surmountable, it requires detailed work to understand the mechanics of how a road charging scheme could work at a national, regional and local level and the impacts on other types of traffic.

In the longer term, changing the way we pay for road use is not simply necessary, it is inevitable. There are two drivers for this. One is the shift to electric vehicles, which will eventually lead to a steep reduction or elimination of fuel duty receipts, currently worth £28bn to the UK Exchequer.[21] Such a reduction in public income is not feasible and requires a radical redesign of how car and road-use are paid for. Secondly, the development of autonomous vehicle technology and car-sharing culture could lead to a rapid and unsustainable increase in car use, with the OECD estimating that, under some scenarios, car use could double.[22] As this could rapidly overwhelm existing capacity, a policy lever is required that can effectively allocate limited road space during busy periods and better account for the external costs of motoring, such as congestion.

Scotland should lead the way in these developments rather than wait until they eventually become unavoidable. This is an area where both the Scottish and UK Governments, having laid out their policy aspirations to embrace electric and autonomous vehicles, now need to create a regulatory and fiscal regime, backed up by legislation where required, that creates the conditions for this switch before the market creates unmanageable congestion across the network. Recent research by the Institute of Civil Engineers indicates that the public would support such a shift in charging models if it was linked to a shift from petrol and diesel to electric-powered vehicles.[23] Detailed work could start now on the options for road charging models and consideration of how they might work at national, regional and local levels. A national conversation is also required which recognizes the need for this long-term shift, moves beyond the failed congestion proposals of more than a decade ago and reflects growing public concerns over increasing congestion, pollution and their negative effects on health.

THE STRATEGIC ROAD NETWORK

Bus priority on the motorway network

Motorway bus priority measures are an effective means of making the most efficient use of limited road capacity. Improving bus journey times and reliability, particularly during peak hours, can encourage a modal shift from private car and given that buses provide a greater efficiency in moving people) so reduce overall traffic volumes. But unlike other cities in Scotland and across the UK, Glasgow has no such bus priority measures or bus-based park and ride facilities at key interchanges (a key component of making the bus priority measures successful).

There are encouraging examples of where bus priority measures have been rolled out on Scotland's motorways. These include a section of the M90 opened up as a bus lane in 2012, allowing faster and more predictable journey times from Fife to Edinburgh for bus passengers. This was followed in 2013 by a second section was opened on the M90 again allowing faster and more predictable journey times from Fife to Edinburgh for bus passengers. In 2018 the Forth Road Bridge was designated as a dedicated public transport corridor, following the opening of the Forth Replacement Crossing (Queensferry Crossing) and has led to improved journey punctuality and increased bus patronage: journey times have on average improved by 8% since the opening of the Forth Road Bridge and punctuality has also improved. Stripping out all other variables, year-on-year patronage growth in the region of 6% has been achieved.

Several options appear viable for Glasgow. These include dedicated lane running on key sections of the motorway network at peak hours; controlling motorway on-ramps to prioritise buses during peak hours; and using managed/ smart motorways, utilizing active traffic management (ATM) techniques to increase capacity by use of variable speed limits and hard shoulder running at busy times. Benefits of this include smoother traffic flow, more reliable journey times, fewer road traffic collisions, and reduced noise and harmful vehicle emissions.

None of these options are straightforward and, as with road pricing, they have the potential to run into technical difficulties (particularly given the complex web of motorway routes and junctions around Glasgow) and significant public opposition. But given the benefits these measures could deliver, further investigation is warranted to explore their viability on each of Glasgow's radial motorway routes.

In the longer term, changing the way we pay for road use is not simply necessary, it is inevitable.

GETTING THE DECISIONS (AND DECISION-MAKERS) RIGHT

Responsibility for Glasgow's transport and transport planning is split between national, regional and local agencies as well as across different departments within Glasgow City Council and between eight regional local authorities. Diffusion of responsibility is inevitable in any structure of governance but the degree of complexity and overlap between agencies in Glasgow is out of step with how successful comparator cities have prioritised and delivered effective transport strategies.[24]

Some confusion arises from the peculiarities of Glasgow's transport network while other issues have crept in as a result of successive institutional reforms. Two of the city's key strategic assets – its dense rail system and strategic road network – are managed by the national transport agency, Transport Scotland; regional transport planning is formally the responsibility of Strathclyde Partnership for Transport, although following progressive reorganisations SPT's everyday role in the complex multi-level governance structure for transport has effectively been reduced to running the Subway, Buchanan Bus Station and subsidising bus services; roads are the responsibility of Glasgow City Council but strategy and management of these are split between Neighbourhoods and Sustainability and Development and Regeneration Services whilst regional planning is split between GCC and seven other local authorities. Railway infrastructure including track and signalling is managed by Network Rail, which is funded by Transport Scotland but managed at GB-level, while train operations are managed by ScotRail, five cross-border passenger operators and freight operators.

ORGANISATION	RESPONSIBILITIES
Strathclyde's eight local authorities	Roads; bus partnerships; oversight of City Deal projects
Strathclyde Partnership for Transport	Subsidised bus routes; Glasgow Subway; Buchanan Bus Station
Transport Scotland	Strategic roads; funding and oversight of rail; major transport projects; joint funding City Deal projects
Network Rail	Maintenance and planning for rail
Train and freight operators	Operating train/freight services

AREAS OF RESPONSIBILITY	OVERSEEN BY
Local road network	**Strathclyde councils**
Strategic road network	**Transport Scotland**
Rail network	**Network Rail**
Strategic transport projects	**Transport Scotland**
City Deal transport projects	**Strathclyde local authorities**
Regional transport planning	**SPT/Strathclyde local authorities**

GETTING THE DECISIONS (AND DECISION-MAKERS) RIGHT

This mix of roles and responsibilities makes it challenging to integrate transport provision or take a holistic view of how the transport network functions and supports wider socio-economic aims. Unlike in England, the move towards City Deal funding has not materially addressed these regional governance issues, resulting in a fragmented list of (mostly roads) projects subdivided to meet local political demands and lacking cohesion. This is not an optimal system of governance to deliver the step-change in connectivity we call for in this report.

The key question relevant in the context of this report and our ambitions to transform transport in Glasgow is how we need to organise to plan and actually deliver significant projects that will bring benefits at local, regional and national scales. Given Transport Scotland's expertise and track record in delivering major transport infrastructure projects successfully, there is a clear role for it to play in projects of similar scope and complexity within the city region, especially given that we need to move to delivery of our recommendations as quickly as possible. But to do so will require a redefinition of its focus and a fresh negotiation of how it interacts with regional government and key stakeholders.

Our recommendations to develop a Glasgow Metro, transforming the rail network by plugging the Central/Queen Street gap and capturing the benefits of HS2 also necessitate a shift from the current planning function carried out by Network Rail, which focuses on predicted growth within the existing rail network. Whilst this function will still be necessary, it does not meet the demands of integrated planning, land use and different transport modes within the Greater Glasgow region – all of which overlap with the responsibilities of GCC and other agencies.

Lastly, there is a need to identify and encourage private-sector investment, and in particular to ensure that the land around key transport nodes is made as productive as possible, coordinating individual developments so that they support the strategic redevelopment of Glasgow city centre in particular. Experience of other cities impacted by HS2 has demonstrated that planning for new station capacity can have a strong impact on improving land value and act as a catalyst for private sector investment. Whilst the recommendations outlined in this report will require a significant amount of public funding, it is unrealistic to expect the public purse to shoulder their entire cost. There is a clear opportunity, particularly given the relatively large amount of derelict and under-utilised land in Glasgow, to utilise the land value uplift to finance some of the infrastructure expenditure identified by the Commission.

Achieving these objectives will require a strengthening of governance at the regional level. We believe this can be achieved by further evolution of the City Region Cabinet, so that it becomes an entity similar to the Combined Authorities formed in the major English conurbations (and indeed metropolitan authorities across Europe). **The Commission recommends that the Scottish Government legislates for this new coordinating body – which we have called the Glasgow City Region Development Agency** – either within the current Planning and/or Transport Bills or as soon as possible thereafter, transferring to it the powers of SPT and Clydeplan, ensuring that the Agency acquires precept powers of funding from its constituent local authorities, and the necessary functions and powers to assemble and develop land, to capture land value uplift to recycle into future development, and to introduce other revenue streams for transport as considered appropriate. We believe that the explicit fusing of transport and land development powers into a powerful agency will unlock the scale of economic development that Glasgow is now capable of, and that Scotland needs it to deliver. To achieve this, the agency must end the current fragmentation of effort and ensure the creation of **one, single and holistic development plan for the city region focused on its transport system.**

In order to deliver the strategic projects we identify in this report, the Commission further recommends that Transport Scotland – which has become a recognised centre of excellence in project delivery – should become responsible for the implementation of the Glasgow Metro, Glasgow Central HS2 terminus and Queen Street/Central Station tunnel as well as the strategic road network. We note the ongoing governance review element of the new National Transport Strategy and suggest this might consider the potential gains from a more regionally-focussed structure for Transport Scotland in line with our recommendations.

There is a clear opportunity, particularly given the relatively large amount of derelict and under-utilised land in Glasgow, to utilise the land value uplift to finance some of the infrastructure expenditure identified by the Commission.

PAYING FOR GLASGOW'S FUTURE

The package of measures recommended in this report offer the opportunity to radically transform Glasgow's economic potential and help close the productivity gap between Scotland and competitor economies.

Whilst undoubtedly ambitious, it is important to emphasise that **these interventions are deliverable, affordable and on a par with transport infrastructure investments that are increasingly commonplace in major European cities** (see 'What other cities are doing', p.45). We believe they can be delivered if the costs are shared equitably between the UK Government, Scottish Government and Glasgow's regional authorities.

The scale of this economic opportunity and critical role played by the Glasgow region in driving sustainable and inclusive economic growth in Scotland should not be understated. Glasgow City Region is by far the largest in Scotland and is an engine room of the Scottish economy, with 32% of Scotland's GVA, 33% of Scottish jobs and 29% of Scotland's businesses. Over the last decade, Glasgow has recorded the second-highest increase in productivity of any of the UK Core Cities, but GVA per hour is 86.4% of the UK average whereas both Aberdeen and Edinburgh are well above the UK average. Productivity in areas such as North Lanarkshire, South Lanarkshire, and East Ayrshire and North Ayrshire is lower still.

Given the already powerful contribution of Glasgow City Region to the Scottish economy, raising Glasgow's productivity towards the UK average would have a transformative impact of the regional and national economy, contributing an additional £4.6bn a year GVA per annum[25]. If Glasgow were to improve beyond the relatively weak levels of UK productivity and closer to successful European comparator cities, the boost to GVA would be even higher.

This requires prioritisation for capital spending, in line with the economic opportunity presented by the Glasgow region, by UK and Scottish governments. We believe there is ample evidence to justify this. It is also clear that this level of **investment can be accommodated by existing capital spending profiles of both governments and is not out of step with recent or ongoing major infrastructure projects.** Taken together, based on outline costs produced for the Scottish Government's last Strategic Transport Projects Review, the Glasgow Metro, development of Glasgow Central Station for High Speed Rail and the Queen Street/Central Station tunnel account for around £10bn expenditure. Over two decades, this would represent spending of around £500m per annum. The Scottish Government element of this expenditure is in line with existing commitments to dual both the A9 and A96, each of which are expected to cost around £3bn and be completed by 2025 and 2030 respectively[26] recent projects to build the Queensferry Crossing, AWPR, electrification of the Glasgow-Edinburgh rail line and extension of the M74. **Given the Scottish Government's commitment to increase infrastructure spending by 1% of GDP by 2025/6, we believe there is sufficient headroom to fund its share of the projects identified here**[27]. Some of this funding is likely to be allocated through the Network Rail settlement for CP6 in order to remodel Central Station to meet existing demand, though this will not be sufficient to pay for the transformative changes identified here.

Likewise, the significant contribution required by the UK Government is achievable within expenditure already earmarked for Scotland. As a direct result of funding for HS2, the Barnett consequentials for Scotland from the project would be worth nearly £6bn. Although remote from the first phases of HS2 line, it is imperative that Glasgow captures as many urban regeneration opportunities created by the introduction of HS2 services as possible. **The Commission therefore recommends that a significant proportion of this Barnett consequential spend from HS2, at least half, is ring-fenced for development of Glasgow Central Station and the first phase of high speed line in Scotland to serve it** consistent with the vision of achieving a sub-three hour journey time to/from London.

Lastly, with a commitment by UK and Scottish Governments to fund around a third of the cost of our package of schemes each, an equal share of these projects, there will also be a requirement for Glasgow's regional authorities to identify new funding streams. There is a palette of options available for this which

PAYING FOR GLASGOW'S FUTURE

are commonly used to pay for transport infrastructure across Europe (See 'Funding transport projects', p.46), some combination of which can play an important role in Glasgow. As outlined earlier, the regeneration of land around Glasgow Central and on the routes of the Glasgow Metro are another source of potential revenue where private sector investment can be harnessed. We believe such funding should be identified. However, **it is vital that any new revenue streams are directly linked to transport infrastructure investment and seen in the context of increasing productivity rather than a tax on existing travel patterns**. Given a clear choice about funding radically improved transport infrastructure, we believe public support can be won.

Lastly, the schemes proposed here are deliverable. In fact, none of them is new. **Each of the major projects the Commission recommends in this report has been examined at length by Transport Scotland, found to have a positive business case, but rejected on the basis of competing priorities at the time**. Having now completed strategic interventions to complete Glasgow's motorway network and electrify its main rail route to Edinburgh, the focus of UK and Scottish governments as well as regional authorities now needs to turn to Glasgow's urban and regional connectivity. We need to collectively raise the level of ambition and turn proposals into deliverable actions. Better connecting people in all parts of the city and the wider city region to new job opportunities in Glasgow and beyond is key to inclusive and sustainable growth.

Given the already powerful contribution of Glasgow City Region to the Scottish economy, raising Glasgow's productivity towards the UK average would have a transformative impact of the regional and national economy, contributing an additional £4.6bn a year GVA per annum.

Porto Metro

PAYING FOR GLASGOW'S FUTURE

What are other cities doing?

The transport issues identified in this report have been tackled by a number of successful comparator European cities, who are pursuing similar strategic interventions we recommend.

Copenhagen Metro

COPENHAGEN

The first two lines of the Copenhagen Metro opened in phases from 2002 - 2007, running on a mixture of brand new route and converted heavy rail lines. The Metro was conceived as a means of stimulating and supporting the development of the Ørestad urban redevelopment zone, and better connecting the inner areas of the city and the airport. A segregated automatic system was chosen capable of running 24/7. The current two routes form a Y-shaped network, and carry more than four times as many passengers as the Glasgow Subway, despite only having twice as many stations. In 2019 a brand new 17 station ring line is due open at a cost of around £2.5bn which will double the number of passengers carried by Metro.

DUBLIN

Following on from the success of its LUAS tram network, which now carries over 40 million passengers per annum and is growing at around 10% per year, Dublin is now planning a new metro line from the city centre to the airport and northern commuter towns. The automated MetroLink is due to open in 2027 and cost around €3bn, with additional plans to convert part of the existing tram route in the south of the city to full metro in due course. The route is comparable to the South Clyde Growth Corridor in that it will serve major hospitals and provide a city-airport travel time of around 20 minutes for up to 20,000 passengers per hour.

GOTHENBURG

Following similar projects opened in Malmö (2010) and Stockholm (2018), work on the Gothenburg West Link heavy rail tunnel began in spring 2018. West Link is a €2.5bn, 8km route loop line including a 6km tunnel connecting the rail networks north and south of the city which will relieve the existing Gothenburg Central terminal station. Incorporating three new stations, the core planning economic objective of the project is to maximise the labour market catchment of central Gothenburg whilst ensuring rail and active travel become the preferred modes for commuting.

MANCHESTER

The Greater Manchester Transport Strategy to 2040 aims to build on the success of the city region' Metrolink light rail system that has been progressively expanded since opening in 1992. Using a mixture of heavy rail conversion and street running, Metrolink has grown to carry over 40 million passengers per year. Manchester faces many of the same growth pressures as Glasgow, and the strategy envisages the redevelopment of the key intercity rail hub at Piccadilly, further enhancement and extension of light rail and the construction of a new cross-city rail tunnel.

PAYING FOR GLASGOW'S FUTURE

Funding transport projects

A range of options for funding transport investment are available and regularly used in comparable cities around the developed world. These were recently summarised by Ian Taylor and Lynn Sloman[28] as follows:

POSSIBLE LOCAL FUNDING SOURCES FOR BUSES AND OTHER PUBLIC TRANSPORT

Development charges	Widely used. In Britain, the Community Infrastructure Levy and Section 106 agreements fund public transport capital upgrades but offer little for subsequent operating costs.
Local payroll tax	Widespread in France. In Oregon, the cities of Portland and Eugene levy 0.6% for public transport. New York levies 0.34% for public transport.
Local income tax	Cincinnati levies 0.3% local income tax to support public transport.
Local corporation tax	New York partly funds public transport from a local surcharge on corporation tax. Local sales tax The most common dedicated source of public transport funding in USA. Los Angeles levies 0.5% for public transport and some road schemes.
Business property tax	Widely used to support public transport in USA. Being used to expand the Metro in Paris. The Crossrail project in London raised £4 billion from a temporary supplement to business rates. Residential property tax Widely used to support public transport in USA. Being used to expand the Metro in Paris.
Land value capture levy (additional property tax levied on areas benefiting from major public transport upgrades)	Miami, Los Angeles, and Denver defined 'transit benefit districts' to capture land value uplift. Tax Increment Financing borrows to build public transport on the basis of future increases in property taxes (Atlanta is an example).
Property sales tax	New York partly funds public transport from a local tax on property transactions.
Visitor lodging tax	Local authorities throughout Switzerland levy taxes at various rates for each night of accommodation. Funds are partly used to support public transport, on which visitors who have paid the tax get free local travel. Paris also has a visitor levy to support public transport improvements.
Charges for parking on-street and on public land	A widespread source of income in UK and elsewhere, some of which is used for public transport.
Levy on commercial car parks	Chicago levies $0.75-$2.00 per day as a surcharge on parking.
Levy on workplace parking	Nottingham levies a workplace parking levy, which it uses to help fund its tram. Melbourne, Perth and Sydney use workplace parking levies to fund public transport.
Road user charges	London, Singapore and Stockholm apply congestion charges. San Francisco is using bridge tolls for public transport improvements. Lorries in Germany pay a fee per km, but this is not locally controlled.
Local vehicle tax	33 states and 27 local governments in USA use a vehicle tax to fund public transport. Toronto collects $60/vehicle/yr.
Local fuel tax	Vancouver levies 15c/litre for public transport.


Glasgow Airport

Sources:

PHASE 1

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