Glasgow Bus Partnership Fund – Corridor Improvements Business Case - Case for Change

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Executive summary

The Scottish Government committed in its 2019 Programme for Government to provide a long-term investment of over £500m in the form of a Bus Partnership Fund (BPF), to deliver targeted bus priority measures on local and trunk roads to address the issue of increasing congestion and patronage decline. This formed part of Scotland's response to the climate emergency.

Jacobs and Steer have been appointed by Glasgow City Council (GCC) on behalf of the Glasgow Bus Partnership (GBP) to undertake specific analysis and assessment work to help the partnership access BPF funds in order to deliver effective, appropriate bus priority solutions. These will be focused on the five key bus corridors within the Glasgow City Region which were identified as priorities in the initial Glasgow BPF bid:

1. Maryhill Road (from Bearsden Cross and Boclair Road in East Dunbartonshire to Glasgow City Centre)
2. Great Western Road (from Kilbowie Roundabout in West Dunbartonshire to Glasgow City Centre)
3. Dumbarton Road (from Clydebank railway station in West Dunbartonshire to Glasgow City Centre)
4. Paisley Road West (from Paisley Gilmour Street in Renfrewshire to Glasgow City Centre)
5. Pollokshaws Road (from Thornliebank and Eastwood Toll in East Renfrewshire to Glasgow City Centre)

This report represents the first stage in the development of a Strategic Business Case (SBC) for bus priority improvements on these corridors. The Case for Change report sets out the specific problems and opportunities associated with bus infrastructure on each corridor and uses these to develop Transport Planning Objectives (TPOs) that will guide the development and assessment of potential improvement options.

The key problem of declining bus patronage in recent years has been caused in part by longer bus journey times than necessary and by journey time unreliability. This in turn is caused on these corridors by the delay experienced by buses on approach to and through junctions, on-street parking and loading activity and insufficient access to bus stops (by buses and passengers). This has led to a lack of continuous and reliable bus priority and reduced effectiveness of the measures that have been added to these corridors over the years, adding to the poor perception of bus travel that many have across the city.

Opportunities exist to improve this perception, through reallocation of space in favour of more continuous bus priority, greater restrictions and enforcement of parking and loading activity and enhanced forms of bus detection at traffic signals. Combined with wider opportunities on smarter, more integrated ticketing and the improvements being made to existing bus fleets, these have the opportunity to improve bus reliability and the overall perception of bus travel, helping to reverse patronage decline.

Evidence of how these problems and opportunities apply to each corridor is presented in this report and its appendices, including data collected from bus operators, observations from extensive site visits, and interviews with key stakeholders. From this, the following TPOs have been identified:

1. To provide bus priority measures capable of reducing journey times on each corridor.
2. To improve journey time reliability on each corridor in order to improve passenger confidence and reduce operating costs.
3. To contribute to safer, less congested streets to facilitate the delivery of high-quality public spaces and more attractive bus services.
4. To ensure that bus stop infrastructure is fully accessible by passengers (boarding/alighting) and by buses (access/egress) and is integrated with the wider sustainable transport network.
5. To provide operational and socio-economic benefits that contribute to a financially sustainable bus network and that demonstrate the value in proceeding to Final Business Case for each corridor.

The report sets out how these TPOs are aligned to the broader objectives already established by the GBP, to the problems and opportunities identified, and to the wider transport objectives for the city.

The report also sets out how options to meet these objectives are being developed to include options for new bus lanes, junction improvements, greater control of kerbside activity, and improvements to local traffic management.

These options will then be appraised in accordance with Scottish Transport Appraisal Guidance (STAG) to identify preferred options for each corridor. This Case for Change report and subsequent appraisal reports will then be used to form the Strategic Business Case for these five corridors which will be subject to Gateway Review by Transport Scotland, to allow the development of an Outline Business Case to commence.

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1. Introduction

1.1 Background

The Scottish Government committed in its 2019 Programme for Government to provide a long-term investment of over £500m in the form of a Bus Partnership Fund (BPF)[1], to deliver targeted bus priority measures on local and trunk roads to address the issue of increasing congestion and patronage decline. This formed part of Scotland's response to the climate emergency.

Jacobs UK Ltd and Steer have been appointed by Glasgow City Council (GCC) on behalf of the Glasgow Bus Partnership (GBP)[2] to undertake specific analysis and assessment work to help GCC and its partners access BPF funds in order to deliver effective, appropriate bus priority solutions. These will be focused on the five key bus corridors within the Glasgow City Region[3] which were identified as priorities in the initial Glasgow BPF bid:

C1. Maryhill Road (BPF Ref: BBF005-005);

C2. Great Western Road (BPF Ref: BBF005-004);

C3. Dumbarton Road (BPF Ref: BBF005-006);

C4. Paisley Road West (BPF Ref: BBF005-008); and

C5. Pollokshaws Road (BPF Ref: BBF005-007).

The Glasgow Bus Partnership was convened in 2018, initially by GCC for the City. The Council's aim was a voluntary partnership which would reduce journey times on arterial routes by 20% and by 50% at peak times in the City Centre. By 2020 and given the City's regional status, the Partnership was broadened to work with the purpose of effecting a Voluntary Bus Partnership Agreement between Glasgow City Council, neighbouring Councils, Strathclyde Partnership for Transport (SPT) and bus operators in the Glasgow City Region. The main issues the Partnership is aiming to overcome are:

- Improving bus priority mechanisms and addressing congestion hotspots with the aim of reducing journey times and providing journey time reliability;
- Ensuring buses are given higher priority in any future city planning;
- Improving the accuracy of real time passenger information and exploring options to introduce an integrated ticketing system; and
- Assisting bus operators to meet Low Emission Zone standards, leading to better air quality and reduced pollution.

Following the publication of the Transport (Scotland) Act 2019[4], the Partnership is now moving towards a Bus Service Improvement Partnership (BSIP), using the new powers introduced by the Act.

A 'GlasGo Bus Alliance' of bus operators across the Glasgow City Region was formed in 2021 to coordinate activity between operators in "creating seamless bus travel across the city region by delivering a simple to use, fast, smart and integrated bus network". The Alliance has published a manifesto[5] setting out its shared aims and commitments.

[1] https://www.transport.gov.scot/public-transport/buses/bus-partnership-fund/

[2] https://www.glasgow.gov.uk/glasgowbuspartnership

[3] Comprising Glasgow City; East Dunbartonshire; East Renfrewshire; Inverclyde; North Lanarkshire; Renfrewshire; South Lanarkshire and West Dunbartonshire

[4] https://www.legislation.gov.uk/asp/2019/17/contents/enacted

[5] https://glasgobus.com/wp-content/uploads/2021/10/GlasGo-Bus-Alliance-Manifesto-2021.pdf

An early stage of this commission is to undertake an appraisal in accordance with Scottish Transport Appraisal Guidance (STAG). The study, which is funded by the BPF, provides an appraisal of options for improving transport connections for all users, paying particular attention to bus movements. Whilst the study focusses mainly on the five identified corridors, this work has the potential to deliver benefits to a large proportion of the bus services operating in the city and the wider City Region. STAG is a framework to assess evidence-based transport problems and opportunities, with the principle of being an objective-led approach, rather than a solutions-led approach, and guides our methodology.

This Case for Change report (the first stage of the STAG appraisal) sets out the context to the study, relevant problems and opportunities, and sets Transport Planning Objectives (TPOs). It then documents the process which will be followed in the generation and sifting of options which may contribute to achieving the TPOs. Later stages of the study will include the development of preliminary design concepts for preferred options and the development of a supporting Outline Business Case, with the aim of securing funding to progress each corridor to a Full Business Case.

The GBP Steering Group and its Working Group structure will be used to help in the management of this project. These groups are formed of representatives from GCC, SPT and Transport Scotland and Chaired by Joan Aitken OBE, former Traffic Commissioner for Scotland, with this project falling under the remit of Working Group A (bus corridor infrastructure)

1.2 Context and Scope

The distance travelled on Scotland's roads reached its highest level ever recorded in 2019/20, but the distance travelled on local bus services in Scotland fell by 11% between 2009/10 and 2019/20[6]. The number of passenger journeys made on local bus services in Scotland fell by 21% over the same period[7].

While Scotland as a whole has experienced a decline in bus use, the situation in Glasgow and the Glasgow City Region is worse than many other areas of Scotland, with a long-term trend of reducing passenger numbers and increasing operating costs. The report from the Glasgow Connectivity Commission[8], published in 2019, reported that Glasgow had experienced the steepest decline in bus patronage of any UK city over the previous decade, isolating communities from the city's economic, social and cultural core. In the decade from 2008/09 to 2018/19, passenger numbers across the South West and Strathclyde region[9] dropped by over 30%[10]. The Impact of Congestion on Bus Passengers, published in 2016, reported that bus speeds over the previous 30 years had fallen faster in Glasgow (1.5% per annum) compared with the UK average (1.0%) and that this alone would result in around 15% fewer passengers every decade.

The COVID-19 pandemic has had a major further impact on demand for bus travel. A combination of restrictions on movements and reluctance to be in shared spaces reduced bus demand by more than half[11], whilst not significantly reducing operators' costs, which has resulted in the requirement for an on-going Network Support Grant. Although demand is now increasing, a proactive policy response is required to support recovery to pre-COVID-19 levels, adding to the commercial challenges for an industry that had previously been in long-term decline.

Without action, much of Glasgow's bus network could be at risk. Any service withdrawals would exacerbate problems of poor accessibility for many of the city's communities, of inequity between people that do and do

[6] Scottish Transport Statistics No 39, 2020 Edition, https://www.transport.gov.scot/publication/scottish-transport-statistics-no-39-2020-edition-pdf-only/

[7] *ibid*

[8] Connecting Glasgow, Glasgow's Connectivity Commission (2019), https://www.glasgow.gov.uk/CHttpHandler.ashx?id=45064&p=0

[9] Comprising Glasgow City Region, Dumfries & Galloway; East Ayrshire; North Ayrshire and South Ayrshire

[10] Scottish Transport Statistics No 39, 2020 Edition

[11] Transport Scotland, COVID-19: Scotland's transport and travel trends during the first year of the pandemic, 2021, https://www.transport.gov.scot/media/50410/covid-19-trends-in-transport-and-travel-in-scotland-during-the-first-year-of-the-pandemic.pdf

not have access to a car, and further encourage an unsustainable, carbon-intensive transport system. All these factors are in direct conflict with the city's aims, especially post-COP26, to be a more sustainable, inclusive and attractive place to live, work and visit.

These progressive aspirations are set out in ever-strengthening local and regional policy commitments, which are positively affecting transport decisions, most notably through the recent publication of the Active Travel Strategy and Action Plan, and the emerging Glasgow Transport Strategy. Further details of the wider policy context for this study can be found in **Appendix A**.

Enabling improved bus priority is one of the actions that can help reverse the circle of decline in bus use. The BPF package of improvements has the opportunity to deliver these outcomes through improving bus reliability and journey times, especially in relation to car. As a result, operators should benefit from the 'double-win' of both increased passenger revenue and reduced operating costs. This will improve network viability and, as a result

- Deliver a more sustainable, inclusive transport system, meeting local aspirations as well as regional and national policies; and
- Reduce traffic congestion, and resulting air pollution and carbon emissions, by attracting more people to bus from car.

Bus priority improvements will be a key programme for the GBP to deliver together, helping to meet its aims and develop the strong joint working required for the effective creation of a BSIP or an alternative governance model.

Scope of this Commission

The primary scope of this commission is to develop Strategic Business Cases by November 2022 for improvements to the five initial bus corridors being taken forward by the GBP and, upon approval to proceed by Transport Scotland's Gateway Review process, to take each corridor forward to Outline Business Case by April 2023 to support future funding applications.

Each Business Case stage will adopt an evidence-based approach to develop credible, deliverable, effective packages of measures to improve bus priority, making the case for BPF funding on the five priority bus corridors shown in the Figure below.

The corridors were identified by the GBP's funding submission in 2021, in which several bus corridors across the region were assessed according to a set of agreed criteria and prioritised for future funding and delivery. The five highest priority corridors were provided with funding to progress to the Strategic and Outline Business Case stages are:

C1. Maryhill Road (Bearsden Cross and From Boclair Road via Canniesburn Toll to Glasgow Central Station), within Glasgow City Council and East Dunbartonshire Council areas

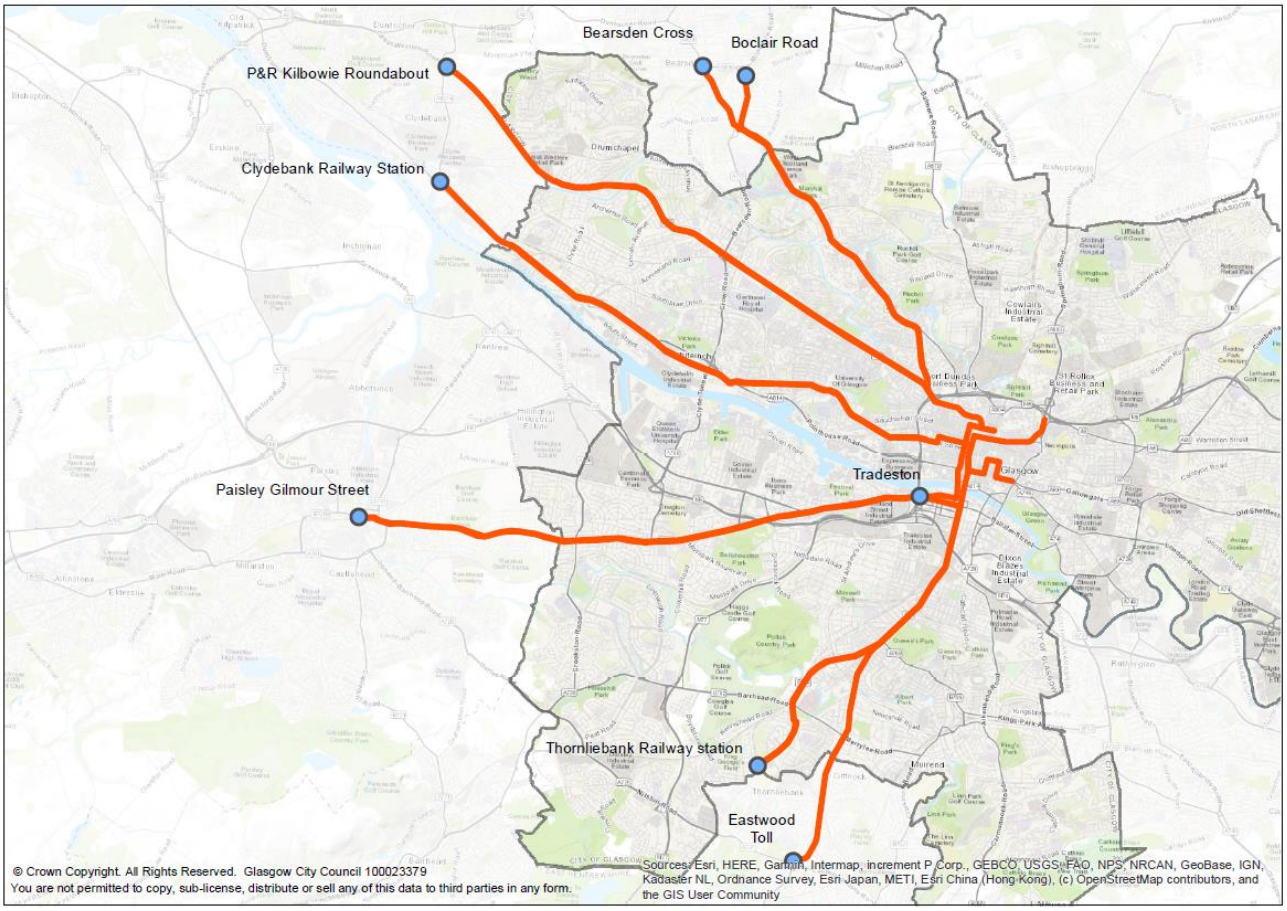
C2. Great Western Road (Kilbowie Roundabout to High Street), within Glasgow City Council and West Dunbartonshire Council areas

C3. Dumbarton Road (Clydebank Railway Station to High St Station), within Glasgow City Council and West Dunbartonshire Council areas

C4. Paisley Road West (Paisley Gilmour Street Station to Central Station), within Glasgow City Council and Renfrewshire Council areas

C5. Pollokshaws Road (Thornliebank Railway Station to Pollokshaws Road and Eastwood Toll to Kilmarnock Road, then Shawlands to Central Station), within Glasgow City Council and East Renfrewshire Council areas.

Study Area



This commission will need to consider the objectives and priorities of GCC, of the other four authority areas to which the corridors connect (East Dunbartonshire, West Dunbartonshire, Renfrewshire and East Renfrewshire), and of the other partners in the GBP, to identify the right package of bus priority measures for each corridor.

Packages of measures must consider the trade-offs between aspirations for transformational change in bus journey times (as set out in GBPs objectives for BPF) with the requirements for delivery within the five-year funding window for BPF and opportunities for 'quick-win' deliverables. The recommendations must work within the constraints of current and proposed future governance arrangements and support the GBP in meeting its long term aims.

Focused consultation and engagement with stakeholders and members of the public that would be affected by the proposals will be at the heart of all tasks, helping ensure that the recommendations are built on a detailed understanding of local people's aspirations and priorities.

A related but parallel task of developing a Streetspace Allocation Framework for Glasgow will also be delivered by this commission. This framework will develop detailed criteria for how scarce space on Glasgow's streets can be best apportioned between the often-conflicting demands for it, and although it will be reported separately to the development of the Business Case work for the five corridors above, the outputs of that work will help to inform options for appraisal.

Purpose of this Report

Once the Case for Change has been established, a Preliminary Appraisal will be carried out for each corridor, followed by a Detailed Options Appraisal. These will inform the development of the Strategic Business Case

(SBC). The purpose of this report is therefore to set out the Case for Change as the first step of the SBC process.

Structure of this Report

Following this introduction, the report contains the following chapters:

Chapter 2: Summary of Problems and Opportunities – these are summarised in the report chapter for each corridor, along with those which are common to all corridors, with detailed information set out in appendices for ease of reference.

Chapter 3: Transport Planning Objectives – these express the outcomes sought for the study.

Chapter 4: Option Generation, Sifting and Development - this outlines the process that will be followed in the appraisal and the development of the business cases.

Chapter 5: Next Steps

2. Summary of Problems and Opportunities

2.1 Approach

An extensive review of the policy context, of relevant datasets, and previous public and stakeholder engagement exercises has been used to assemble evidence of problems and opportunities that are relevant to the five BPF corridors.

This has been supplemented by extensive site walkovers of each corridor, conducted by members of the study team along with key members of the GBP, to gather evidence of how current bus and traffic operations on each street contribute to these overall problems and opportunities. Initial stakeholder and public engagement has also gathered input to support this process.

The evidence base is provided in appendices to this report. The main points are summarised in the tables below, disaggregated according to whether they are considered to be common to all corridors or only relevant to one or more individual corridors. The evidence is categorised as problems, opportunities or constraints.

2.2 Common to All Corridors

Problems

The following problems apply to all five corridors in the study area.

Problem	Description	Evidence	Corridor 1 Maryhill Road	Corridor 2 Great Western Road	Corridor 3 Dumbarton Road	Corridor 4 Paisley Road West	Corridor 5 Pollokshaws Road
Declining bus patronage (caused in part by problems noted below)	Steady decline in bus patronage over recent years (pre COVID-19), with passenger numbers reduced by over 30% across the South West and Strathclyde region in the decade 2008/09 to 2018/19[12]	Patronage data (referenced in Glasgow Bus Partnership Fund Bid 2021)	✓	✓	✓	✓	✓
Longer bus journey time than necessary / journey time unreliability	Delays due to traffic congestion and inefficient operation of streetspace, especially during AM/PM peaks	Bus company journey time data (referenced in Glasgow Bus Partnership Fund Bid 2021) Bus operator journey time information (Appendix C) Traffic flow data (Appendix E)	Points of significant delay near Raeberry St junction and between Queen Margaret Drive and Lochburn Road junctions	Points of significant delay near Kelvinbridge and through Kelvinside	Points of significant delay through Partick and Scotstoun	Points of significant delay through Kingston and Cardonald	Points of significant delay through Shawlands and between Strathbungo and Laurieston
	Lack of bus effective priority measures along the corridor and at key junctions and pinchpoints, particularly where buses experience delay	Observations during site visits (Appendix D)	E.g canal bridge (near Lochburn Road junction)	E.g through Kelvinbridge	E.g through Yoker approaching Kingsway	E.g. near Berryknowes Road junction	E.g. approaches to Shawlands Cross
	Road layout creates bottleneck for bus and other traffic, made worse by on-street parking	Observations during site visits (Appendix D)	Canal bridge (near Lochburn Road junction)		E.g. Whiteinch roundabout		
	Traffic calming measures cause pinch point	Observations during site visits (Appendix D)			E.g. East Barns Street		
Delay through junctions	Right turn blocking can occur due to proximity of parking to junction, forcing buses to use outside lane	Observations during site visits (Appendix D)	E.g. by St Mary's Primary School and Lochburn Road junction	E.g. near Park Road junction	E.g. Kingsway junction	E.g. Berryknowes Road junction	E.g. Albert Drive junction
	Heavy left turn movements can impede bus progression by vehicles blocking back into bus lane in advance of junction	Observations during site visits (Appendix D)		E.g. near Byres Road junction	E.g. Queen Victoria Drive junction		
	Lack of right-turning lane blocks forward bus movements	Observations during site visits (Appendix D)				E.g. junction with Mosspark Drive	E.g. junctions with Nithsdale Drive and Albert Drive
	Bus delay due to number of stages in junction signal cycle and/or lack of priority for buses within the method of control	Observations during site visits (Appendix D)	E.g. near Bilsland Drive junction	E.g. near Kirklee Road junction		E.g. near junctions with Springfield Quay and Morrison Street	
	Co-ordination between several closely spaced traffic signals may not always favour bus progression due to dwell time at bus stops between these signals	Observations during site visits (Appendix D)	E.g. through Maryhill close to Tesco superstore	E.g. through Kelvinbridge	E.g. through Partick		E.g. on approach to Nelson Street junction
	Significant dwell time at traffic signals	Observations during site visits (Appendix D)		E.g. near Hyndland Road junction	E.g. Argyle Street		E.g. Kilmarnock Road / Nether Auldhouse Road junction and Fenwick Road / Braidholm Road junction

[12] Scottish Transport Statistics No 39, 2020 Edition

Problem	Description	Evidence	Corridor 1 Maryhill Road	Corridor 2 Great Western Road	Corridor 3 Dumbarton Road	Corridor 4 Paisley Road West	Corridor 5 Pollokshaws Road
	Parking reduces capacity of junction and increases bus delay	Observations during site visits (Appendix D)	E.g. Queen's Cross	E.g. Park Road junction and Crow Road junction	E.g. Kingsway and Crow Road junctions, Whiteinch roundabout		E.g. junctions at Minard Road and Pollokshaws Road / Kilmarnock Road
	Delays to buses on approach and through junction	Observations during site visits (Appendix D)	E.g. Queen's Cross		E.g. Queen Victoria Drive junction		e.g. Thornliebank Road / Pollokshaws Road / Barrhead Road / Nether Auldhouse Road junction
	Swept path for right-turning buses can be difficult to accommodate in current layout	Observations during site visits (Appendix D)					E.g. near Pollokshaws Road / Haggs Road junction
On-street parking and loading can significantly affect bus progression	Parking and loading on nearside lane when off-street parking is available (including illegal parking and loading during bus lane operational times)	Observations during site visits (Appendix D)	E.g. near Esso Kelvinside filling station	E.g. through Kelvinbridge	E.g. through Scotstoun	E.g. through Cardonald	E.g. through Shawlands Cross
	Delay due to manoeuvres in and out of on-street parking spaces	Observations during site visits (Appendix D)	E.g. near Bilsland Drive junction	E.g. east of Byres Road junction			E.g. near Nithsdale Street junction
	Parking in or immediately alongside bus stops	Observations during site visits (Appendix D)	E.g. near Bisland Drive junction	E.g. near Anniesland railway station	E.g. through Partick	E.g. through Cardonald	E.g. Pollokshaws Road / Kilmarnock Road junction and close to Pollokshaws East station
	Parking inhibits access to bus lane / restricting bus movement	Observations during site visits (Appendix D)	E.g. by Avenuepark St junction	E.g. near Byres Road junction and Anniesland Kwik-Fit	E.g. exit from Partick Bus Station		
	Illegal parking in bus lane during operational hours renders bus lane redundant in places	Observations during site visits (Appendix D)	E.g. by Avenuepark St junction	E.g. near Kelvinbridge	E.g. near Dyke Road junction		
	Parking spaces too close to bus stop, impeding access and egress	Observations during site visits (Appendix D)	E.g. by Avenuepark St junction	E.g. near Napiershall Street junction	E.g. near Dyke Road and Kingsway junctions	E.g. near Springfield Quay and Sandwood Road junctions	E.g. near Fenwick Road / Church Road junction
	Delay due to deliveries/loading	Observations during site visits (Appendix D)	E.g. near Bisland Drive junction		E.g. near Queen Victoria Drive and Kelso Street junctions		E.g. through Eglinton Toll
	Delays due to loading and double parking, coupled with presence of central reserve	Observations during site visits (Appendix D)			E.g. Whiteinch roundabout	E.g. approaching Helen Street roundabout and near Lacy Street junction	
	Significant amount of short-term parking	Observations during site visits (Appendix D)			E.g. Whiteinch roundabout	E.g. near Tweedsmuir Road junction	
No pedestrian crossing at interchange of bus routes	No pedestrian crossing at point where interchange required between bus routes	Observations during site visits (Appendix D)			E.g. near Thornwood Drive junction		
Poor air quality due to inefficient traffic operation	Less efficient traffic operation, contributing to poor air quality and increasing greenhouse gas emissions	Glasgow Bus Partnership Fund Bid 2021	✓	✓	✓	✓	✓

Problem	Description	Evidence	Corridor 1 Maryhill Road	Corridor 2 Great Western Road	Corridor 3 Dumbarton Road	Corridor 4 Paisley Road West	Corridor 5 Pollokshaws Road
Declining bus patronage due to COVID-19 pandemic	Over 50% decline in bus patronage as a result of changing work and travel patterns during and after the COVID-19 pandemic	COVID-19: Scotland's transport and travel trends during the first year of the pandemic[11]	✓	✓	✓	✓	✓
Lack of integration	Lack of integration in the public transport network, including lack of integrated ticketing	Glasgow Transport Strategy Draft Case for Change report[13]	✓	✓	✓	✓	✓
	Convoluted routeing and need for interchange may be discouraging potential bus passengers	GCC's 'Public Conversation' consultation[14]	✓	✓	✓	✓	✓
Many people have poor perceptions of buses	User perception of buses is worse in Glasgow City Region than in Scotland overall, by approx. 10 percentage points in reported survey responses	Attitudinal surveys (referenced in Glasgow Bus Partnership Fund Bid 2021)	✓	✓	✓	✓	✓
	Lack of public understanding of the bus network	GBP Working Group Workshops	✓	✓	✓	✓	✓
Limited access to employment, healthcare, education and services	Reductions in service provision limit sustainable access to employment, healthcare, education and services	STPR2 Glasgow City Region Case for Change report[15] and Appendix G	✓	✓	✓	✓	✓
Reducing service frequency	Reductions in service frequency limit sustainable accessibility	The Impact of Congestion on Bus Passengers report[16]	✓	✓	✓	✓	✓
Personal security concerns	Personal security, particularly from young people, people from different ethnic groups and people from the LGBTQ+ communities	Glasgow Transport Strategy Draft Case for Change report[13]	✓	✓	✓	✓	✓
Social exclusion	Unaffordable and unreliable local public transport is limiting access to job opportunities for residents of low-income neighbourhoods including areas with relatively low car ownership	Joseph Rowntree Foundation research (cited in STPR2 Glasgow City Region Case for Change report[15]**Error! Bookmark not defined.**)	✓	✓	✓	✓	✓
Routes susceptible to local flooding	Increasing risk of extreme weather events will put key parts of each route at greater risk of disruption and local re-routeing	Adaptation Scotland 'Climate Resilient Businesses' case study of First Group UK Bus (Scotland)[17]	✓	✓	✓	✓	✓
Routes susceptible to greater delay during sporting events	Traffic management during events at Ibrox and Hampden can impact bus progression to a greater extent than normal peak periods	Stakeholder interviews (Appendix I)				✓	✓

[13] Glasgow Transport Strategy, Case for Change report, 2021 https://www.glasgow.gov.uk/CHttpHandler.ashx?id=54988&p=0

[14] Glasgow City Council, Public Conversation on Glasgow's Transport Future – Main Report of Findings, 2021, https://www.glasgow.gov.uk/CHttpHandler.ashx?id=52389&p=0

[15] STPR2 Glasgow City Region Case for Change report, 2021, https://www.transport.gov.scot/media/49124/initial-appraisal-case-for-change-glasgow-region-report.pdf

[16] The Impact of Congestion on Bus Passengers, Greener Journeys, 2016, https://greenertransportsolutions.com/wp-content/uploads/2016/06/Prof-David-Begg-The-Impact-of-Congestion-on-Bus-Passengers-Digital-FINAL.pdf

[17] Adaptation Scotland 'Climate Resilient Businesses' case study of First Group UK Bus (Scotland), 2017, https://www.adaptationscotland.org.uk/how-adapt/case-studies/first-bus-climate-resilient-business

Opportunities

The following opportunities apply to all five corridors in the study area.

Opportunity	Description	Evidence	Corridor 1 Maryhill Road	Corridor 2 Great Western Road	Corridor 3 Dumbarton Road	Corridor 4 Paisley Road West	Corridor 5 Pollokshaws Road
Improve economic vitality and sense of place in local centres and city centre	Improve economic vitality and sense of place in local centres and city centre by reducing traffic dominance and congestion	Observations during site visits (Appendix D)	✓	✓	✓	✓	✓
Simplified ticketing to reduce dwell time at stops	Simplified ticketing to reduce dwell time at stops and improve customer experience	STPR2 stakeholder consultation reported in Glasgow City Region Case for Change report**Error! Bookmark not defined.**	✓	✓	✓	✓	✓
Reduce traffic conflicts in city centre	Consideration of dedicated routes to enable bus prioritisation through city centre	GBP Working Group Workshops / City Centre Transformation Study	✓	✓	✓	✓	✓
Bus stop rationalisation	Bus stop rationalisation / Review of Interchanges	GBP Working Group Workshops / Site visit notes (Appendix D)	✓	✓	✓	✓	✓
Enable better access to employment, healthcare, education and services	Review network and service provision to improve bus access to main centres of employment, healthcare, education and services	STPR2 Glasgow City Region Case for Change report**Error! Bookmark not defined.**	✓	✓	✓	✓	✓
Use of smart technology to aid accessibility for all users	Use of smart technology to activate announcements for partially sighted people	GBP Working Group Workshops	✓	✓	✓	✓	✓
Integrate bus priority measures with other ongoing projects	Integrate bus priority measures with other ongoing projects, including City Cycle Network, City Centre Transformation and Clyde Metro in the longer term	Not applicable	✓	✓	✓	✓	✓
Improve parking enforcement	Parking enforcement supported by on-bus camera technology	Glasgow Bus Partnership Fund Bid 2021	✓	✓	✓	✓	✓
Streetspace reallocation to increase space for bus	Streetspace reallocation to ensure nearside lane is available for bus	Observations during site visits (Appendix D)	E.g. near Maryhill Locks and Lochburn Road junction	E.g. near Anniesland Kwik Fit and Bank Street	Argyle Street and/or Sauchiehall Street to improve bus flow through Finnieston	E.g. eastbound approach to Helen Street roundabout	E.g. near Fenwick Road / Dalmeny Avenue junction and alongside Pollok Park
	Remove on-street parking and loading at points of greatest delay, and identify alternative parking/loading arrangements	Observations during site visits (Appendix D)	E.g near Lochburn Road junction	E.g. near Anniesland station and Burnbank Terrace junction, west of Kelvinbridge	E.g. between junctions with Kingsway and Queen Victoria Drive	E.g. near junctions with Kilnside Road, Penilee Road and Corkerhill Road	E.g. near Nithsdale Street junction and Shell filling station
	Remove parking to enable continuation of bus lane	Observations during site visits (Appendix D)			E. g. near Larchfield Place junction		E.g. Pollokshaws Road / Eglinton Street junction
	Reduce width of central reserve and/or footway to create more space for buses	Observations during site visits (Appendix D)				E.g. near junctions with Kilnside Road and Berryknowes Road	E.g. Albert Drive junction

Opportunity	Description	Evidence	Corridor 1 Maryhill Road	Corridor 2 Great Western Road	Corridor 3 Dumbarton Road	Corridor 4 Paisley Road West	Corridor 5 Pollokshaws Road
	Use available space adjacent to carriageway to create bus priority on approach to signalised junction	Observations during site visits (Appendix D)					E.g. on approach to Nelson Street junction
Revise junction signals to improve bus priority	Revise junction signals to give bus priority over general traffic	Observations during site visits (Appendix D)	E.g. approach to canal bridge near Lochburn Road junction			E.g. near Corkerhill Road junction	E.g. junctions of Kilmarnock Road / Nether Auldhouse Road, Fenwick Road / Braidholm Road and Pollokshaws Road / Haggs Road
	Revise junction signals to give more time to mainline traffic	Observations during site visits (Appendix D)				E.g. near junctions with Springfield Quay and Morrison Street - see Appendix D	
Junction improvements to provide bus priority	Junction improvements to provide bus priority	Observations during site visits (Appendix D)	E.g. near Bilsland Drive junction and Queen's Cross	E.g. Park Road junction and Crow Road junction	E.g. Kingsway and Crow Road junctions, Whiteinch roundabout	E.g. A736 Sandwood Road junction	E.g. Pollokshaws Road / Kilmarnock Road junctions
Relocate bus stops to improve traffic flow	Relocate bus stops to improve traffic flow and avoid blocking through traffic	Observations during site visits (Appendix D)	E.g. relocate bus stop and parking away from canal bridge				E.g. close to Pollokshaws East station to improve interchange with rail
Improve bus detection	Extend bus lanes to junction stop line and improve detection at signals	Observations during site visits (Appendix D)	E.g. near Bilsland Drive junction	E.g. near Kirklee Road junction			E.g. at Minard Road and Nithsdale Street junctions
Traffic reduction	Reduce volume of traffic conflicting with bus movements by creating areas for local access only	**Observations during site visits (Appendix D)** Glasgow Transport Strategy		E.g. between Park Road and Byres Road	E.g. through Partick and Finnieston		
Improve transport integration	Improve integration with Subway	Observations during site visits (Appendix D)	E.g. St George's Cross	E.g. Kelvinbridge	E.g. Partick	E.g. Bridge Street	E.g. Bridge Street
Low emission buses	New fleet of buses already contributing to less polluting street environment, which can be further enhanced by complementary infrastructure improvements	Not applicable	✓	✓	✓	✓	✓

Constraints

The following contraints apply to all five corridors in the study area.

Constraint	Description	Evidence	Corridor 1 Maryhill Road	Corridor 2 Great Western Road	Corridor 3 Dumbarton Road	Corridor 4 Paisley Road West	Corridor 5 Pollokshaws Road
Constrained adopted road boundary	In some places on the corridors and on some side roads, narrow carriageway width and other constraints (e.g. narrow bridges or mature trees) limits scope for bus priority interventions	Observations during site visits (Appendix D)	✓	✓	✓	✓	✓
Lane improvements may be constrained by utilities	Lane improvements may be constrained by utilities present at kerbside and in central reserve	Observations during site visits (Appendix D)	E.g. near Kelvindale Road junction	✓	✓	✓	✓
Competition for streetspace	Competition for streetspace with other transport needs and public space aspirations, including City Cycle Network	Observations during site visits (Appendix D) GCC Active Travel Strategy	✓	✓	✓	✓	✓
Parking enforcement limitations	Parking enforcement limited by current legislation which does not permit camera-enforcement of stationary offences	Glasgow Bus Partnership Fund Bid 2021	✓	✓	✓	✓	✓
Traffic signal operation co-ordinated for overall efficiency	Although opportunities exist for bus priority through traffic signals, they may be constrained by the need to co-ordinate signals for the overall efficiency of other road users	Discussions with GCC 'TraffCom' (traffic communications) team	✓	✓	✓	✓	✓

2.3 C1 Maryhill Road

The Maryhill Road corridor connects the city centre with the lower density suburb of Bearsden in East Dunbartonshire, passing through areas of higher density including Maryhill. The route is used by high frequency bus services including First 60 and 61 and West Coast Motors 17, connecting areas including Summerston and Clydebank to the corridor. Although it does contain some section of peak-time bus lanes, the provision is non-continuous and quite often interrupted by parking and loading activity that diminishes the effectiveness of the current bus infrastructure.

The outer sections of the corridor (northwest of Maryhill railway station) do not generally contribute to significant bus delay problems, as evidenced by data collected from bus operators to date (Appendix C), site walkovers (Appendix D) and stakeholder engagement (Appendix I), though there can be some delay experienced locally at key junctions in East Dunbartonshire, including Canniesburn Toll and Bearsden Cross.

Where the corridor passes through areas of higher density, the evidence confirms that bus journey times and passenger delays increase. On the Maryhill Road corridor, this applies particularly to the areas around the local centre of Maryhill and around the Forth and Clyde Canal bridge pinchpoint and nearby junctions (Appendix C). Evidence from site visits (Appendix D) and stakeholder interviews (Appendix I) indicates that many of the problems noted in Section 2.2 above contribute to this delay, including non-continuous bus priority infrastructure (for example at Queen's Cross), traffic signal co-ordination not optimised for bus movements (for example between Shakespeare Street and Garrioch Road) and conflicts between bus movements and on-street parking and loading (for example between Bisland Drive and Shakespeare Street).

With fewer active frontages on the section between Queen's Cross and St George's Cross, there is less pronounced passenger delay (Appendix C), but similar conflicts do still exist which result in a lack of continuous bus priority approaching the city centre.

Opportunities to improve journey times and reliability as well as to improve integration with other public transport services (particularly at St George's Cross) have been identified through the site visit review (Appendix D) and stakeholder interviews (Appendix I).

2.4 C2 Great Western Road

The Great Western Road corridor connects the city centre with the lower density suburb of Kilbowie in West Dunbartonshire, passing through areas of higher density including Drumchapel and Anniesland. The route is used by high frequency bus services including First 6 (which branches south at Anniesland Cross) and 6A, connecting areas including Scotstounhill, Yoker and Clydebank to the corridor. It is also used for long distance coach services continuing along the A82 to western and northern Scotland.

The outer sections of the corridor (west of Anniesland Cross) do not generally contribute to significant bus delay problems, as evidenced by data collected from bus operators to date (Appendix C), site walkovers (Appendix D) and stakeholder engagement (Appendix I), though there can be some delay experienced locally at Drumry and Kilbowie roundabouts in West Dunbartonshire, including for bus services that cross the corridor at these locations.

At Anniesland Cross and through the local centre of Anniesland, bus services can experience some delay due to the number of bus and traffic movements to be accommodated through this part of the network, which is also an important interchange location for bus and rail services. Parking and loading through the local centre of Anniesland contributes to bus progression and to bus access to bus stops.

Problems are also encountered at the signal-controlled junctions along Great Western Road, including at Gartnavel hospital, Hyndland Road and Kirklee Road, which can be attributed to the separate signal phasing of these junctions. The most significant section for delay on this corridor is east of Byres Road, where the corridor passes through the busy and high-density area of Kelvinbridge (Appendix C). Evidence from site visits (Appendix D) and stakeholder interviews (Appendix I) indicates that many of the problems noted in

Section 2.2 above contribute to this delay, including non-continuous bus priority infrastructure and conflicts between bus movements and on-street parking and loading.

Sections of Great Western Road are also prone to local flooding during more extreme weather events, particularly at Gartnavel hospital and through Drumchapel.

Opportunities to improve journey times and reliability as well as to improve integration with other public transport services (particularly at St George's Cross, Kelvinbridge and Anniesland) have been identified through the site visit review (Appendix D) and stakeholder interviews (Appendix I).

2.5 C3 Dumbarton Road

The Dumbarton Road corridor connects the city centre with the town of Clydebank in West Dunbartonshire, passing through areas of higher density including Yoker, Scotstoun, Partick and Finnieston. The route is used by high frequency bus services including First 1, 2 and 3, connecting areas including Drumchapel to the corridor. This mixture of services includes express services which use the Clydeside Expressway for quicker access to the city centre, as well as lower frequency services providing important connections across the west of the city, connections to the south of the city, and services which continue through the city centre to the east of the city.

Unlike the previous corridors, most of the corridor passes through areas of relatively high density and/or constrained road space. In Clydebank, the residential neighbourhood of Barns Street experiences a very high volume of bus services on relatively quiet, traffic calmed residential streets. The most significant passenger delay occurs through the high-density and constrained corridors of Yoker, Scotstoun and Partick (Appendix C). Evidence from site visits (Appendix D) and stakeholder interviews (Appendix I) indicates that many of the problems noted in Section 2.2 above contribute to this delay, including non-continuous bus priority infrastructure and conflicts between bus movements and on-street parking and loading. The eastbound approach to the Kingsway junction through Yoker creates one of the greatest delay points on the route for these reasons (whereas the westbound approach to the same junction has more continuous and successful bus priority measures).

The bus station and rail/subway interchange at Partick is an important node on this corridor and in the wider context of the Glasgow public transport network. This experiences many operational problems as buses on this corridor access and egress the interchange and pass through the busy local centre of Partick, which are caused in part by many local traffic movements and parking and loading operations.

2.6 C4 Paisley Road West

The Paisley Road West corridor connects the city centre with the town of Paisley in Renfrewshire, passing through areas of higher density including Cardonald and Cessnock. The route is used by high frequency bus services including McGill's 38 and First 9 and 10, connecting areas including Pollok and Silverburn to the corridor.

Buses can experience delay approaching and exiting Paisley, where complementary bus infrastructure improvements are currently being developed for the town centre. Fewer issues are experienced alongside Barshaw Park, but significant delay is experienced (Appendix C) as the route passes through Halfway and Cardonald. Evidence from site visits (Appendix D) and stakeholder interviews (Appendix I) indicates that many of the problems noted in Section 2.2 above contribute to this delay, including non-continuous bus priority infrastructure and conflicts between bus movements and on-street parking and loading.

Problems also occur on the approach to Glasgow City Centre through Tradeston, where inefficient signal-controlled junctions (Appendix D) and high traffic volumes during peak periods make bus progression less efficient than it could be.

Another significant problem on this corridor is the uncertainty of bus operation during events at Ibrox Stadium. Evidence from stakeholder interviews (Appendix I) indicates that traffic management during these periods can significantly affect bus services passing through the area, particularly with the requirements to manage traffic entering and exiting the M8 in close proximity.

Work undertaken by bus operators (Appendix C) indicates that significant journey time savings (in the order of 11%) could be achieved on this corridor, if the delay experienced by bus interaction with traffic was removed (optimised journey times achieved during night-time running).

2.7 C5 Pollokshaws Road

The Pollokshaws Road corridor connects the city centre with the lower density suburbs of Giffnock and Thornliebank in East Renfrewshire, passing through areas of higher density including Shawlands. The route is used by high frequency bus services including First 38 and 57, McGills 3 and Stagecoach 4 , connecting areas including Nitshill and Newton Mearns to the corridor. Some of these services continue into the northeast of the city, with the 57 serving Balornock and Westerhill, and the 38 serving Dennistoun and Riddrie, as well as Chryston and Stepps in North Lanarkshire.

The outer sections of the corridor (south of Pollokshaws) do not generally contribute to significant bus delay problems, as evidenced by data collected from bus operators to date (Appendix C), site walkovers (Appendix D) and stakeholder engagement (Appendix I).

Significant problems for bus progression are experienced on all approaches to Shawlands Cross, throughout the local centre of Shawlands, and through Strathbungo and Pollokshields. Evidence from site visits (Appendix D) and stakeholder interviews (Appendix I) indicates that many of the problems noted in Section 2.2 above contribute to this delay, including non-continuous bus priority infrastructure (for example at Shawlands Cross), traffic signal co-ordination not optimised for bus movements (for example between Calder Street and Alison Street) and conflicts between bus movements and on-street parking and loading (for example Shawlands Cross and Eglinton Toll).

Another significant problem on this corridor is the uncertainty of bus operation during events at Hampden Stadium. Evidence from stakeholder interviews (Appendix I) indicates that heavy traffic during these periods can significantly affect bus services passing through the area.

Work undertaken by bus operators (Appendix C) indicates that significant journey time savings (up to 20%) could be achieved on this corridor if the delay experienced by bus interaction with traffic was removed (optimised journey times achieved during night-time running).

2.8 Resulting Issues

The information presented above demonstrates that bus progression on all five corridors is adversely affected by conflicts with other traffic, especially at junctions, by on-street parking and loading activity and by the operation of signal-controlled junctions. This increases bus journey times and causes unreliability, with passenger confidence effected as a consequence, bus travel becoming less attractive and patronage declining. Many of these problems have been in place for years with the bus priority measures that are in place becoming less effective as traffic and parking conflicts arise, though recent changes in travel behaviour due to the COVID-19 pandemic have increased the rate of patronage decline. Action is required to address the problems and reverse the patronage decline. Doing nothing will see many of these problems worsen, with a continuing circle of decline.

A number of opportunities have been identified to help address the problems, including reallocating streetspace to increase space for buses and accommodate new bus lanes, and identifying alternative parking/loading arrangements to remove on-street parking and loading at points of greatest delay. Junction and signal improvements could improve bus priority and the volume of traffic which conflicts with bus movements could be reduced through wider solutions. Routes and service times could be optimised to enable

better access to employment, education, healthcare and other services, with dedicated routes through the city centre to reduce delay.

Some options will be constrained by road boundaries, physical constraints such as mature trees and narrow bridges and by the presence of statutory utilities. Changes to traffic signals may be constrained by the need for these to be optimised for the overall efficiency of all traffic. The scope for parking enforcement is limited by current legislation which does not permit camera-enforcement of stationary offences.

3. Transport Planning Objectives

3.1 Derivation of Objectives

The Glasgow Bus Partnership Fund Bid 2021 included a set of 11 objectives. Following consideration of these objectives, the problems, opportunities and constraints identified above and the wider evidence base appended, a set of Transport Planning Objectives (TPOs) has been established for this project, to appraise options to improve provision on the five priority corridors. In accordance with STAG guidance, the TPOs are focussed on the outcomes sought in the study area, as opposed to any of the activities planned to achieve them.

The following TPOs have been established for this project:

1. To provide bus priority measures capable of reducing journey times on each corridor.
2. To improve journey time reliability on each corridor in order to improve passenger confidence and reduce operating costs.
3. To contribute to safer, less congested streets to facilitate the delivery of high-quality public spaces and more attractive bus services.
4. To ensure that bus stop infrastructure is fully accessible by passengers (boarding/alighting) and by buses (access/egress) and is integrated with the wider sustainable transport network.
5. To provide operational and socio-economic benefits that contribute to a financially sustainable bus network and that demonstrate the value in proceeding to Final Business Case for each corridor.

The table below shows the original objectives from the Fund Bid and how they map to the TPOs:

Bid Objectives	TPO1	TPO2	TPO3	TPO4	TPO5
As a priority, to secure for the City of Glasgow, the Glasgow City Region and the bounding Council areas Scottish Government Bus Partnership Funds, including the Fund launched in November 2020 and any successor funds or funding opportunities					✓
To secure for the City of Glasgow, the Glasgow City Region and the bounding Council areas a network of public transport bus services that improves connectivity and enhances the opportunities, safety and wellbeing of those who live in, visit or work in the region	✓	✓	✓	✓	
To secure quality public transport bus services for passengers and those others who could benefit from bus service use, including reviewing current networks, frequencies, fares, facilities and customer feedback	✓	✓	✓		
To restore confidence in and the resilience of bus services following the impact of COVID-19 and review changing transport needs and patterns	✓	✓	✓	✓	
To secure commitment to decision making on road use, place making, safer streets, sustainable transport modes, location of services and facilities having regard to the			✓		

Bid Objectives	TPO1	TPO2	TPO3	TPO4	TPO5
relevance of bus travel and its place in the reduction of congestion, noise and air pollution and enhancing wellbeing					
To promote recognition of bus services as a prime means of passenger transport and thereby work to a target of passenger growth of 25% from 2022-2027 from a baseline of 2019	✓	✓	✓	✓	✓
To secure bus priority measures in the management of local roads, trunk roads and motorways as essential to increasing bus patronage, the connectivity of the City Region, reduction of congestion and of noise and air pollution	✓	✓	✓		
To promote the use and development of bus services as a necessary adjunct to achieving air quality improvement and control, including within formal Low Emission Zone initiatives	✓	✓	✓	✓	
To identify and promote the aspirations and differing needs of passengers (not a homogenous group), with particular regard to accessibility	✓	✓		✓	
To promote a Passengers Charter (or equivalent) to support the objectives of the partnership	✓	✓	✓	✓	
To have cognisance of the statutory framework set out for schemes and partnerships in the Transport (Scotland) Act 2019 and that such statutory framework has as its purpose the enhancement of bus services for the public with obligations on local transport authorities and operators	✓	✓	✓	✓	

3.2 SMART Objectives

STAG calls for TPOs to be made specific, measurable, attainable, relevant and timely (SMART). The table below SMARTens the five TPOs.

TPO	Specific	Measurable	Attainable	Relevant	Timely
1. To provide bus priority measures capable of reducing journey times on each corridor.	TPO identifies the need to reduce delays on each corridor. The initial bid set journey time reduction targets of 20% on each corridor, and 50% within the city centre during peak periods.	Reduced delays to bus journeys along each corridor, as measured by bus companies' tracker data	Initial option identification work suggests that solutions exist	The TPO is supported by technical analysis and engagement findings	To be delivered by 2026
2. To improve journey time reliability on each corridor in order to improve passenger confidence and reduce operating costs.	TPO identifies the need to improve journey time reliability on each corridor as a measure of the variation in journey time.	Improved journey time reliability on each corridor, as measured by bus companies' tracker data	Initial option identification work suggests that solutions exist	The TPO is supported by technical analysis and engagement findings	To be delivered by 2026
3. To contribute to safer, less congested streets to facilitate the delivery of high-quality public spaces and more attractive bus services.	TPO identifies the need to contribute to improvements in travel safety and reduced congestion (as a defined by the number of vehicle on a street/section and the speed these vehicles can pass through the section).	The number and severity of road accidents, as measured on STATS19[18] returns, is lower per vehicle-km on each corridor (as measured by proxy by traffic counters) than the 2014-2019 baseline Reduced congestion as measured by traffic counters and bus companies' tracker data	Initial option identification work suggests that solutions exist	The TPO is supported by technical analysis and engagement findings	To be delivered by 2026

[18] The STATS19 database is a collection of all road traffic accidents that resulted in a personal injury and were reported to the police within 30 days of the accident. The data are collected by the police at the roadside or when the accident is reported to them by a member of the public in a police station. The variables and fields collected are defined by the Department for Transport (DfT) and these have been agreed by the Standing Committee for Road Accident Statistics (SCRAS) and Association of Chief Police Officers ACPO). The data are either sent directly to DfT or to the relevant local authorities (or groups of local authorities). LAs validate any data they receive and pass the records on to DfT. The latest publicly available data is published via data.gov.uk: https://data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data

TPO	Specific	Measurable	Attainable	Relevant	Timely
4. To ensure that bus stop infrastructure is fully accessible by passengers (boarding/alighting) and by buses (access/egress) and is integrated with the wider sustainable transport network.	TPO identifies the need to ensure bus stops are accessible to all travellers and to buses	Accessibility of bus stops by passengers as assessed by accessibility audits. Accessibility of bus stops by vehicles as assessed by swept path analysis and driver feedback	Initial option identification work suggests that solutions exist	The TPO is supported by technical analysis and engagement findings	To be delivered by 2026
5. To provide operational and socio-economic benefits that contribute to a financially sustainable bus network and that demonstrate the value in proceeding to Final Business Case for each corridor.	TPO identifies the need for options to provide operational and economic benefits that contribute to value-for-money services	Operational improvements which contribute to the delivery of cost savings and increased patronage	Initial option identification work suggests that solutions exist	The TPO is supported by technical analysis and engagement findings	To be delivered by 2026

3.3 Objectives Mapping

The tables below map the problems, opportunities and constraints from the tables above to the TPOs, demonstrating that the TPOs cover the full range of relevant issues.

Problem Type	Related to TPOs
Declining bus patronage	1, 2, 3, 4, 5
Longer bus journey time than necessary / journey time unreliability	1, 2, 4
Declining bus patronage due to COVID-19 pandemic	1, 2, 3, 4, 5
Delay through junctions and other pinch points	1, 2, 3
Conflicts between bus movements and on-street parking/loading	1, 2, 3
Lack of integration	3
No pedestrian crossing at interchange of bus routes	3, 4
Perception of buses	1, 2, 3, 4
Personal security concerns	3
Limited access to employment, healthcare, education and services	1, 2, 4
Reducing service frequency	1, 2, 5
Routes susceptible to local flooding	2
Social exclusion	4, 5

Opportunity Type	Related to TPOs
Simplified ticketing to reduce dwell time at stops	1, 2
Reduce traffic conflicts in city centre	1, 2
Bus Stop Rationalisation	1, 2, 3
Enable better access to employment, healthcare, education and services	4, 5
Use of smart technology to aid accessibility for all users	3, 4
Integrate bus priority measures with other ongoing projects	3
Improve parking enforcement	2, 3
Streetspace reallocation to accommodate new bus lanes	1, 2, 3

Opportunity Type	Related to TPOs
Revise junction signals to give bus priority	1, 2
Junction improvements to provide bus priority	1, 2
Improve bus detection	2
Revise parking provision and regulation	1, 2, 3
Reduce volume of traffic conflicting with bus movements by creating areas for local access only	2, 3
Improve integration with other modes (e.g. Subway)	4

Constraint Type	Related to TPOs
Constrained adopted road boundary	1, 2, 3
Lane improvements may be constrained by utilities	1, 2, 3
Competition for streetspace with other transport needs and public space aspirations	1, 2, 3
Parking enforcement limitations	2, 3
Traffic signal operation co-ordinated for overall efficiency	1, 2

Alignment with Glasgow Transport Strategy

The TPOs are also aligned with relevant objectives from the Glasgow Transport Strategy, as set out in the Policy Framework[19], which in turn is aligned to SPT's emerging Regional Transport Strategy, demonstrating that the options identified by this GBP work will be assessed to ensure their contribution to the wider strategy context of the City Region.

The final set of objectives for the Glasgow Transport Strategy are as follows:

1. To promote low carbon movement of people and goods in a resilient transport system that can adapt sustainably in the future
2. To achieve clean air through sustainable transport investment and decision-making
3. To encourage and enable physical activity and improved health & wellbeing through active travel
4. To promote an affordable, inclusive and equitable sustainable travel system
5. To improve reliability, integration and convenience of sustainable travel modes for people and goods
6. To ensure the transport system is accessible by all
7. To improve the safety and personal security of all transport users and the public spaces that they use
8. To deliver spaces for people first and foremost, with high quality public spaces which respect and respond to the natural and built environment, and an effective sustainable travel hierarchy.

[19] Glasgow Transport Strategy: Policy Framework, https://www.glasgow.gov.uk/CHttpHandler.ashx?id=55054&p=0

The table below shows the alignment between these objectives and the TPOs:

TPO	Alignment with Glasgow Transport Strategy Objectives
1. To provide bus priority measures capable of reducing journey times on each corridor (Contributing to targets of 20% journey time reductions on each corridor, and 50% journey time reductions within the city centre during peak periods)	1. To promote low carbon movement of people and goods in a resilient transport system that can adapt sustainably in the future 5. To improve reliability, integration and convenience of sustainable travel modes for people and goods
2. To improve bus journey time reliability on each corridor	1. To promote low carbon movement of people and goods in a resilient transport system that can adapt sustainably in the future 5. To improve reliability, integration and convenience of sustainable travel modes for people and goods
3. To contribute to safer, less congested streets facilitating the delivery of high-quality public spaces and more attractive bus services	1. To promote low carbon movement of people and goods in a resilient transport system that can adapt sustainably in the future 8. To deliver spaces for people first and foremost, with high quality public spaces which respect and respond to the natural and built environment, and an effective sustainable travel hierarchy
4. To ensure that bus stop infrastructure is fully accessible by passengers (boarding/alighting) and by buses (access/egress) and is integrated with the wider sustainable transport network.	1. To promote low carbon movement of people and goods in a resilient transport system that can adapt sustainably in the future 4. To promote an affordable, inclusive and equitable sustainable travel system 6. To ensure the transport system is accessible by all
5. To provide operational and socio-economic benefits that contribute to a financially sustainable bus network and that demonstrate the value in proceeding to Final Business Case for each corridor.	1. To promote low carbon movement of people and goods in a resilient transport system that can adapt sustainably in the future 4. To promote an affordable, inclusive and equitable sustainable travel system 5. To improve reliability, integration and convenience of sustainable travel modes for people and goods

The information presented in the table above indicates that the TPOs are appropriately aligned with those of the Glasgow Transport Strategy.

4. Option Generation, Sifting and Development

This section details the process that is being used to generate, sift and develop options identified for this study which will continue in the Preliminary and Detailed Appraisal stages, as well as the development of the Strategic and Outline Business Cases.

Following the analysis of data, consideration of the views of key stakeholders and the public, and the development of TPOs for our study area, a list of potential intervention types was established. The long list of intervention options will be derived through internal Jacobs optioneering, options identified from the stakeholder consultation, and taking cognisance of previous and ongoing studies. Options will then be grouped within several categories for sifting and further development. Options will be retained until there is clear evidence that the option will not deliver against the TPOs and STAG criteria. Options that do not deliver the intended outcomes of the study will be eliminated, along with options that are more appropriate as part of a wider study.

The following types of options are under development for each corridor:

Bus Priority on Links

1. Bus gates and bus only streets
2. Segregated bus lanes
3. Bus lanes
4. 'Virtual' bus lanes (allowing less intrusive infrastructure and opportunities for placemaking improvements)

Junction Improvements

5. Amend carriageway/ junction geometry
6. Bus priority at junctions, including bus lanes to the stop line
7. SCOOT[20] optimisation
8. Reallocate traffic signals time within current configurations
9. Remove/ rationalise signals

Kerbside operation

10. Parking/ loading restrictions
11. Bus layby removal
12. Removal of bus stops
13. Bus stop accessibility improvements (at bus boarders and on approach)

Network solutions

14. Closure/ restriction of side roads or banned turns
15. Re-route buses and/or traffic
16. One-way traffic operation or bus contraflow arrangements

[20] Real time adaptive traffic control system for the coordination and control of traffic signals across an urban road network

5. Next Steps

This Case for Change report represents the first step towards a Strategic Business Case for bus priority improvements on the five corridors identified. Improvement options will now be identified and developed for each corridor and will then be subject to preliminary and detailed appraisal in line with STAG.

This process will continue to be informed by public and stakeholder engagement and will be governed by the Steering Group and Working Group arrangements established by the GBP. The Partnership will also continue to invite technical discussions with Transport Scotland as the process progresses, to ensure full alignment between all parties in advance of formal Gateway Review submissions.

The first Gateway Review for the SBC is programmed for November 2022, during which the GBP will present the findings of the appraisal process and the emerging preferred options for each corridor, for review and approval to proceed to Outline Business Case.

Appendix A. Policy

National Policies

- National Planning Framework 4
- National Transport Strategy 2
- Strategic Transport Projects Review 2
- Climate Change Plan Update (2018-2032)

Regional

- Clydeplan (2017)
- SPT Regional Transport Strategy
- Glasgow City Region's Economic Recovery Plan (2020)

Local

- Glasgow Transport Strategy
- City Centre Transformation Plan
- Liveable Neighbourhoods Plan
- Active Travel Strategy
- City Centre Living Strategy
- Glasgow Connectivity Commission
- East Dunbartonshire Local Transport Strategy 2020-2025
- East Renfrewshire Local Transport Strategy
- Renfrewshire Local Transport Strategy
- West Dunbartonshire Local Transport Strategy
- Glasgow City Development Plan (CDP), Supplementary Guidance 11: Sustainable Transport
- Glasgow Strategic Plan for Cycling 2016-2025
- Glasgow Climate Emergency Implementation Plan

Other Projects

- Glasgow Low Emission Zone (LEZ)
- The Avenues Programme
- George Square Redevelopment
- Spaces for People and Places for Everyone
- A803 Bus Improvements
- Managed Motorways

National Policy

National Planning Framework 4

The policy statement for Scotland's National Planning Framework 4 (NPF4) sets the scene for a Spatial Strategy that embeds the United Nations (UN) Sustainable Development Goals, with the 'Place Principle' being a key driver for ensuring that planning focusses on what is special about a place. The Outcomes for this strategy are Net-Zero Emissions, a Wellbeing Economy, Resilient Communities and Better, Greener Places. The NPF4 offers measures that support sustainable travel including public transport and identifies a key opportunity in the development of 20-minute neighbourhoods. This brings together everyday local services and infrastructure such as education, retail and healthcare with the need to reduce short car journeys. A high-quality bus service integrated with first choice active travel will assist in achieving the necessary shift from private vehicles to create a multi-modal neighbourhood that can choose the most sustainable, accessible, and convenient way to travel.

National Transport Strategy 2 (NTS2)

The second National Transport Strategy (NTS2) sets out an ambitious vision for Scotland's transport system. The Strategy recognises that the delivery of high-quality bus services will play a key role in delivering its four priorities *to reduce inequality, take climate action, help deliver inclusive growth and improve health and well-being*. Competitive and reliable public transport is highlighted in the NTS2 as a critical element to achieve the overarching vision for Scotland's transport system. This project will contribute to improving bus journey times, reversing the decline of bus usage, aiming to deliver the NTS2 priorities.

Strategic Transport Projects Review 2

The second Strategic Transport Projects Review (STPR2) aims to deliver the vision, priorities and outcomes that are set out in NTS2. STPR2 includes a number of recommendations relevant for consideration in the context of the BPF, namely *Project 10: reallocation of roadspace for buses*, where it is noted that, based on evidence of existing conditions for bus users, Transport Scotland is advancing the reallocation of roadspace on the motorway through Glasgow, as committed within the Programme for Government 2019. In this context, it recommends that consideration is given to interventions to improve access from the local road network onto the motorway. Other recommendations of relevance include Project 4: transport's contribution to placemaking principles in neighbourhoods, Project 5: guidance and framework for the delivery of mobility hubs, and Project 9a: development of Glasgow Metro Strategy. Interventions to be considered by STPR2 during Phase 2 include:

- Bus Priority Infrastructure;
- Decarbonisation of the Bus Network;
- Public Transport Network Coverage, Frequency and Service Integration;
- Mobility Hubs and Multi-modal Interchanges;
- Regional Passenger Facilities/Station Enhancements;
- Integrated Public Transport Ticketing; and
- Glasgow Metro.

As recognised within the BPF Guidance, improving bus services as viable alternatives to car use would also support seven of the seventeen **UN Sustainable Development Goals**, including goals around affordable and clean energy; sustainable cities and communities; decent work and economic growth; industry, innovation and infrastructure; climate action; good health and well-being; and partnerships for the goals.

Climate Change Plan Update (2018-2032)

The Climate Change Plan sets out the Scottish Government's approach to delivering a green recovery and a pathway to new and ambitious targets of net zero emissions of all greenhouse gases by 2045, set by the Climate Change Act 2019. The policy aims to transition Scotland to net zero emissions for the benefit of the environment, people, and prosperity. The plan highlights the importance of bus priority interventions to a just transition to net zero. This project will work towards the aims of the Climate Change Plan by addressing key opportunities to increase the attractiveness of bus and reduce car use.

Regional Policy

Clydeplan

The 2017 Clydeplan sets out the Strategic Development plan for the Glasgow City Region. This strategy sets the framework for the City and Local Development Plans and deals with region-wide issues that cross the boundaries of council areas, for example, the scale of housing and the transport and connections needed. The Clydeplan has similar themes to the NPF4 and NTS2 with the most relevant driver to this bid being the *City Region as a Connected Place*. Clydeplan details several potential options to support modal shift from private to public transport whilst supporting the moves towards a low carbon economy. It is highlighted that to support and achieve sustainable transport options, there is a need to change the way people move both internally and externally from the city region, which requires:

- Improving the level and quality of public transport provision including frequency and reliability
- A focus on rail and bus hub interchanges including park and ride
- Integrated multi-modal ticketing systems.

This project looks to support the Clydeplan by increasing the attractiveness of bus and providing a better alternative to the private car.

SPT Regional Transport Strategy

The Regional Transport Strategy (RTS) currently in development has several strategic objectives that aim to provide safe, environmentally friendly, efficient and inclusive travel options throughout the Strathclyde region. The RTS includes a strategic priority to *plan and provide a "step-change" for bus services, standards and infrastructure*; which this project would support. Strategic outcomes which include improved connectivity, attractive, seamless, reliable travel, access for all and reduced emissions would also be supported by bus infrastructure investment.

Glasgow City Region's Economic Recovery Plan 2020

The Economic Recovery Plan aims to provide a vision for the Glasgow City Region for investment to enhance economic development. The plan recognises the role of providing efficient, reliable and attractive public transport options to support commuters and residents within the Region post COVID-19. The document also highlights the importance of the Bus Partnership Fund, and *the role of buses as an essential tool to aid in the short-term recovery* for the regional economy.

Local Policy

Glasgow Transport Strategy

The Glasgow Transport Strategy is Glasgow's updated local transport strategy which will set out a Policy Framework and a Spatial Delivery Framework to help guide decision-making on transport up to 2030. The strategy has four overarching outcomes:

- Transport contributes to a successful and just transition to a net-zero carbon, clean and sustainable city.
- Transport has a positive role in tackling poverty, improving health and reducing inequalities.
- Transport contributes to continued and inclusive economic success and a dynamic, world class city.
- Places are created where we can all thrive, regardless of mobility or income, through liveable neighbourhoods and an inclusive City Centre.

Work is currently being undertaken on phase 2 of the Transport Strategy which outlines the spatial delivery framework of the strategy. The strategy will be guided by national, regional and local transport policy, and will rely on input from members of the public and stakeholders to ensure it reflects the needs of people. It will also take into consideration the impact that transport has on the economy, environment and health.

This project aligns with the aims of the Glasgow Transport Strategy highlighting the importance of bus priority to improve journey times and experience for passengers on several corridors in the region, city and city centre.

City Centre Transformation Plan

Work is ongoing to produce a City Centre Transformation Plan to support existing goals to reduce car journeys in the city centre by 30% (as set out in the City Centre Strategic Development Framework), while enabling the residential population to double by 2035 (as proposed in the City Centre Living Strategy). The key aims of the plan are:

- Reallocate road space in Glasgow City Centre for active travel and green infrastructure;
- Deliver improved public transport and support/encourage a shift to more sustainable modes, particularly walking, cycling and public transport;
- Improve access for the mobility impaired;
- Achieve a 30-40% reduction in peak-hour private car traffic in Glasgow City Centre by 2030;
- Deliver improvements for servicing (e.g. goods, deliveries and waste collection) to improve the vitality of Glasgow City Centre;
- Support a doubling of Glasgow City Centre's population by 2035; and
- Support Glasgow's aim to be carbon neutral by 2030

The plan highlights the importance of the Glasgow Bus Partnership to improve public transport in the region to encourage foreign investment to allow the economy to flourish.

Liveable Neighbourhoods Plan

The Liveable Neighbourhoods Plan will see the development of 20-minute neighbourhood areas across the city with the focus on a network of centres, open school streets, active travel and streets for people; being connected to and from each other and the city centre with the creation of a city-wide active travel network. A convenient, attractive public transport offering will be crucial to supporting these objectives, by reducing traffic dominance and car dependency to create a healthier, cleaner and climate resilient city.

Active Travel Strategy

The Glasgow Active Travel Strategy sets out a vision to make active travel the natural first choice for everyday journeys and describes through the three themes:

- Connectivity, people and place: rebalancing our streets and spaces

- Unlocking change: enabling everyone to walk, wheel or cycle
- Thinking differently: encouraging, motivating and sustaining change

The strategy outlines the importance of developing active travel infrastructure and policies alongside prioritising public transport, creating a modern, resilient and sustainable transport system for Glasgow.

City Centre Living Strategy

The City Centre Living Strategy presents a vision of enabling a sustainable, inclusive and diverse city centre population. To achieve this, six key objectives have been adopted in order to double the current population of around 20,000 by 2035.

- Population: To increase the city centre population from its baseline of 20,245 in 2018 to 40,000 by 2035.
- Vacant commercial space: To find productive outcomes for vacant commercial space, with particular focus on upper floors
- Environment: To provide a quality city centre environment that is cleaner, greener, safer, more sustainable, and better connected
- Investment: To offer a responsive, innovative approach to investment opportunities that support this strategy.
- Quality in Design: To deliver quality in design
- Resilient Neighbourhoods: To enable resilient, empowered and socially cohesive neighbourhoods

The strategy highlights the need to provide linkages where public transport, walking or cycling can become the preferred choice in order to put pedestrians first.

Glasgow Connectivity Commission

The **Glasgow Connectivity Commission** is also particularly relevant in the context of the BPF, with the report highlighting the worrying decline in bus patronage and the increase in journey times across the city. Recognising that *'a quarter of people living on the periphery of the city have to catch at least two buses to get to work'*, the Commission's report recommended that to reverse the declining trend a rapid roll-out of bus priority measures and infrastructure should be implemented as soon as possible. The report promotes adoption of a sustainable transport hierarchy for streetspace, prioritising the movement of people, cyclists, public transport use and private vehicles, in that order. Also proposed is the strategic repurposing of the road network to prioritise people-friendly public spaces, with the transport hierarchy used to repurpose the inefficient city centre grid system to a 'smart' grid. In relation to bus, the Commission recommends development of a bus partnership, focusing on:

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

East Dunbartonshire Local Transport Strategy 2020-2025

The East Dunbartonshire Local Transport Strategy presents a vision of delivering a more sustainable and accessible transport network for the area. The strategy aims to enhance the transport network as a key driver for: improving the local economy, improving the environment, increasing social inclusion, and delivering health benefits for all residents and visitors of East Dunbartonshire. The document highlights the high car ownership and low bus usage present in East Dunbartonshire and emphasises the need to improve the attractiveness of bus journeys across the region. The A81 corridor has been identified as an area of opportunity to enhance bus priority interventions including bus detection points and priority signals to improve connections locally and regionally supporting economic and environmental objectives.

East Renfrewshire Local Development Plan

The Local Development Plan is the Council's key strategic land use planning document and aligns with and supports the vision and objectives of the Council's Corporate and Community Plans.

Renfrewshire Local Transport Strategy

The Renfrewshire Local Transport Strategy outlines the vision for transport, regionally and locally to support wider economic, environmental and social objectives. The Strategy will provide a framework to deliver an affordable, sustainable and effective travel and transport network which is seamless in serving all local community needs. The document highlights the key role that investing in enhancing bus services across the region plays in delivering strategic and cross boundary links, ensuring travel mode choice and connectivity for all, which will support the regeneration and growth of Renfrewshire's economy whilst helping tackle pollution by reducing emissions.

West Dunbartonshire Local Transport Strategy

The West Dunbartonshire Local Transport Strategy outlines the vision to create places for people, spaces for investment and destinations to enjoy. The Plan aligns with the council's strategic priorities which enable the Plan for Place:

- Economy: to support a vibrant and sustainable local economy that stimulates business development and economic growth;
- Environment: to support West Dunbartonshire as an attractive and sustainable place to live, work and visit;
- Integration: to enhance integration and efficiency of transport networks, infrastructure and services;
- Accessibility & Social: to facilitate access to services and opportunities, promote physical and mental well-being, prevent ill health and reduce inequality;
- Safety: to support communities in which people feel safe to live, work and enjoy their leisure time; and
- Maintenance: to maintain the transport network to a high standard that ensures it is safe and fit for purpose.

City Development Plan, Supplementary Guidance 11: Sustainable Transport

The Glasgow City Development Plan Supplementary Guidance 11 supports the Strategic vision of achieving sustainable economic growth towards a low carbon economy. The Plan aims to ensure that Glasgow is a connected City by:

- supporting better connectivity by public transport;
- discouraging non-essential car journeys;

- encouraging opportunities for active travel;
- reducing pollution and other negative effects associated with vehicular travel; and
- optimising the sustainable use of transport infrastructure, including the River Clyde and Forth and Clyde Canal, and the route of the Rail Link to Glasgow Airport and supporting economic development.

Glasgow Strategic Plan for Cycling 2016-2025

The Strategic Plan for Cycling 2016-2025 sets out Glasgow's vision, objectives, targets and actions for increasing levels of cycling – for leisure, as a mode of transport and for sport. The plan aligns with the National Planning Framework and the Climate Change (Scotland) Act 2009 to support the ambitious targets of reduce greenhouse gas emissions and enhancing the transport network for all.

The plan states that working with public transport operators to improve cycling integration is key to increasing the attractiveness of active travel. This will include investigation of options for increased cycle parking facilities at public transport locations, installation of cycle hire stations near to key transport interchanges and assessing the feasibility of developing 'cycling hubs'.

Glasgow Climate Emergency Implementation Plan

The Glasgow Climate Emergency Implementation Plan was undertaken across the city to determine how it can address the recommendations and how best it can exercise a leadership role for the city in drawing together the collective action of other agencies, businesses, and communities across the city.

Prioritising public transport and deprioritising the private car have key roles in addressing the climate emergency in Glasgow. The Plan highlights a number of measures which will work towards reducing transport emissions including; support rapid transition to cleaner public transport, enhanced bus gates and investigate the use of the 'franchising' the bus network.

Other Projects

Glasgow Low Emission Zone (LEZ)

Scotland's first ever Low Emission Zone (LEZ) came into effect in Glasgow city centre in December 2018. Phase 1 applies to local buses only, while the eventual rollout of Phase 2 will mean that all vehicles entering the zone will have to meet specified exhaust emission standards. The zone represents an area where vehicles which do not meet specified emission standards are prohibited and as a result, the goal is to reduce pollution levels and improve air quality in areas where standards are not being met. LEZs are based on a penalty notice approach to effectively ban non-compliant vehicles.

The Avenues Programme

As part of the Glasgow City Region City Deal funding, approximately £115 million is being invested in Glasgow city centre to deliver the "Avenues" programme, which will result in a transformation of the city centre's streetscape and public realm, making it more "people-friendly", more attractive, greener, more sustainable and more economically competitive. The programme is currently ongoing and will deliver specific improvements including:

- Green/blue infrastructure (such as street trees, planting and 'Rain Gardens')
- Enhanced and widened footways
- Single surface crossing points
- Segregated cycle lanes
- Reduced street clutter
- Intelligent Street Lighting (ISL) and improved lighting features

George Square Redevelopment

The development of proposals to redesign George Square is currently underway. This will be in two phases, with the first phase having been implemented as part of the Council's Space for People programme, which has seen both the east and west side of the Square closed to vehicular traffic and 7am to 7pm bus priority measures implemented on the south side of George Square, with phase 2 looking at improvements within the existing footprint of the square.

Spaces for People and Places for Everyone

As part of facilitating safe walking and cycling in light of the COVID-19 pandemic, footways have been widened at key pinch points across the City Region to support access to services. This is part of a wider drive to promote active travel over car use in the city and includes a 'low traffic neighbourhood' at Dennistoun, which aims to make streets calmer and more people-friendly. Other work includes the development of school car free zones, prohibiting cars and other vehicles from school gates at drop off/pick up times. There are also a series of future plans, ranging from pop-up cycle lanes to increased pedestrian priority at junctions.

A803 Corridor Improvements

Bus improvements on the A803 Corridor are currently being developed as part of East Dunbartonshire's Place & Growth programme through the City Deal. The project seeks to improve bus travel on this key corridor from Bishopbriggs into Glasgow through improvements in journey time (including bus priority measures), improved service reliability, better quality infrastructure and information (including real-time), and improved integration with other modes, including active travel and Park & Ride. This project, which is currently moving through the City Deal approvals process, will complement other bus priority proposals.

Managed Motorways

Transport Scotland is progressing reallocation of roadspace on the motorway network through Glasgow, as committed within the Programme for Government in 2019. A number of measures are being considered in detail on the M8 through Glasgow and the M77 and M80 approaches to Glasgow, including the potential for Actively Managed Hard Shoulder (AMHS) running. With the potential to deliver priority for buses on the trunk road network into Glasgow, options to complement the managed motorway proposals with strategic bus priority for access to and egress from the city centre have been considered through the option development process.

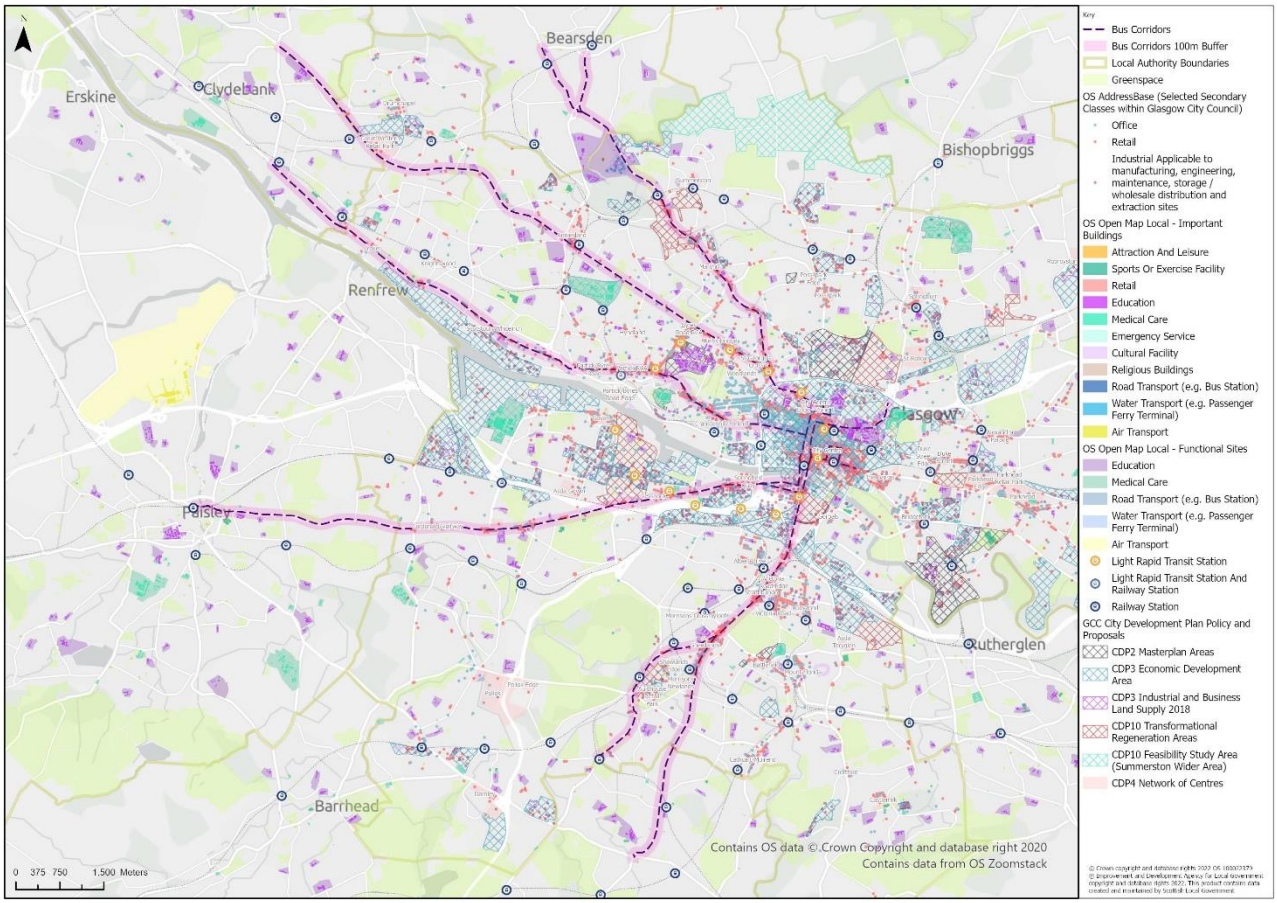
Appendix B. Travel Demand

Appendix B provides an overview of travel demand for the study area corridors considering Census 2011 travel to work data and 2019 Tamoco[21,22] origin-destination travel demand data provided by the University of Glasgow Urban Big Data Centre (UBDC). Census 2011 travel to work data provides a snapshot of historic travel demand for the key peak period trip-generating activity and is supplemented by the Tamoco travel demand data which provide insights into the relative importance of local corridors to specific locations.

The travel characteristics for each corridor will be examined in greater detail as part of the preliminary and detailed appraisal process, with further analysis undertaken for additional datasets such as travel to study data and further disaggregated Tamoco travel demand data.

Trip Generators and Attractors

The figure below illustrates key trip generators and attractors in the study area, highlighting the differences in existing characteristics across each the corridors under consideration, in addition to potentially significant future trip generators, i.e. development sites identified in the City Development Plan adopted in 2017 and the latest available Housing Land Supply (HLS) data (HLS 2020).



Census 2011 Travel to Work Mode Share

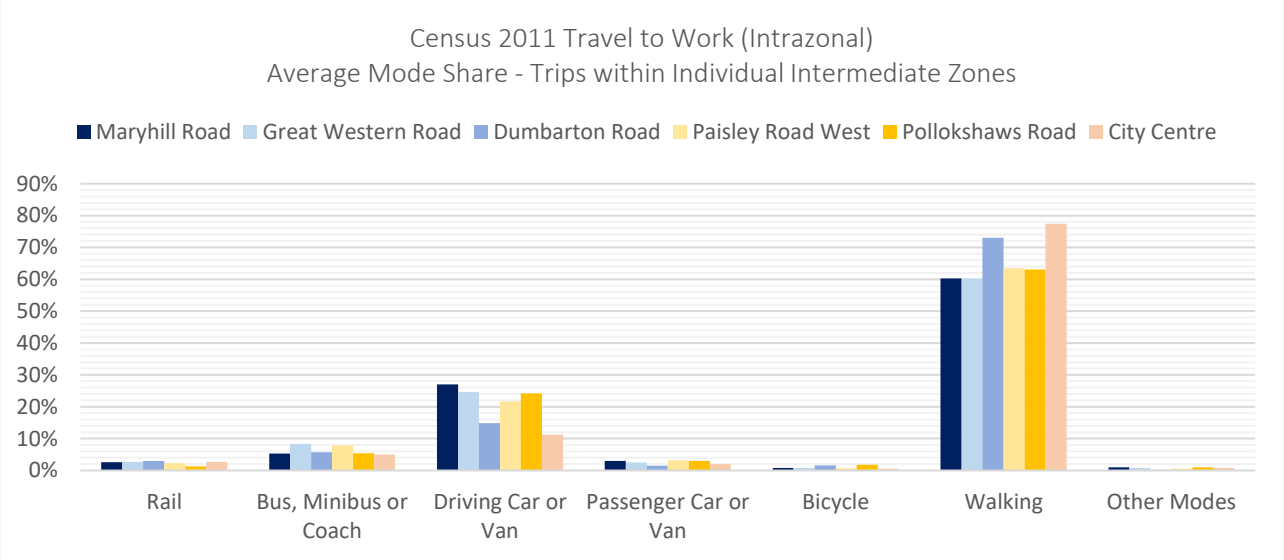
[21] Tamoco travel demand data provides trip origin-destination information processed from location data derived from mobile devices using a combination of GPS and Wi-Fi signals to generate high accuracy location information.

[22] In considering the use of this location data it should be noted that concerns have been raised publicly regarding how Tamoco has dealt with user content, as covered by the BBC (https://www.bbc.co.uk/news/technology-59063766). In response, Tamoco has advised that the UK data referred to by the BBC was obtained from old suppliers they no longer work with. This data has been deleted and it was never provided to UBDC. The issues pre-date any work Glasgow City Council have undertaken.

The following charts detail the travel-to-work mode share based on aggregated data for Census 2011 intermediate zones[23] within 400m of each corridor, as an average across all corridor intermediate zones. The data has been further split to provide data for the following types of trips:

- Intrazonal – Trips which start and end in the same zone.
- Interzonal Inbound – Trips from zones outside each corridor to the zones identified as comprising each corridor.
- Interzonal Outbound – Trips from the zones identified as comprising each corridor to zones outside each corridor.

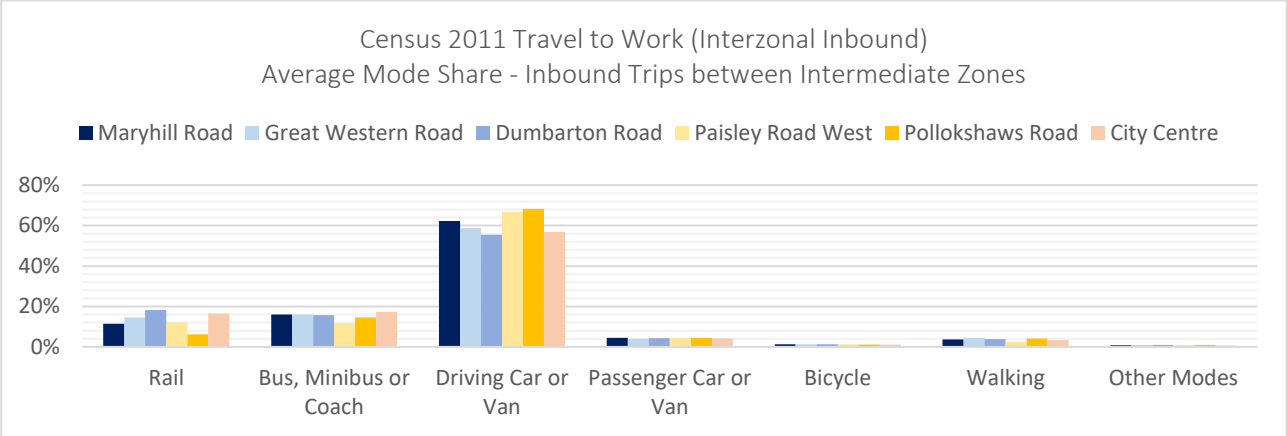
The data shows that walking is by far the dominant mode for intrazonal trips, as would be expected, but that Driving Car or Van trips are relatively significant, particularly for Maryhill Road, Great Western Road, Paisley Road West and Pollokshaws Road. Trips by Bus, Coach or Minibus are comparatively low but represent the third highest mode share for each corridor.

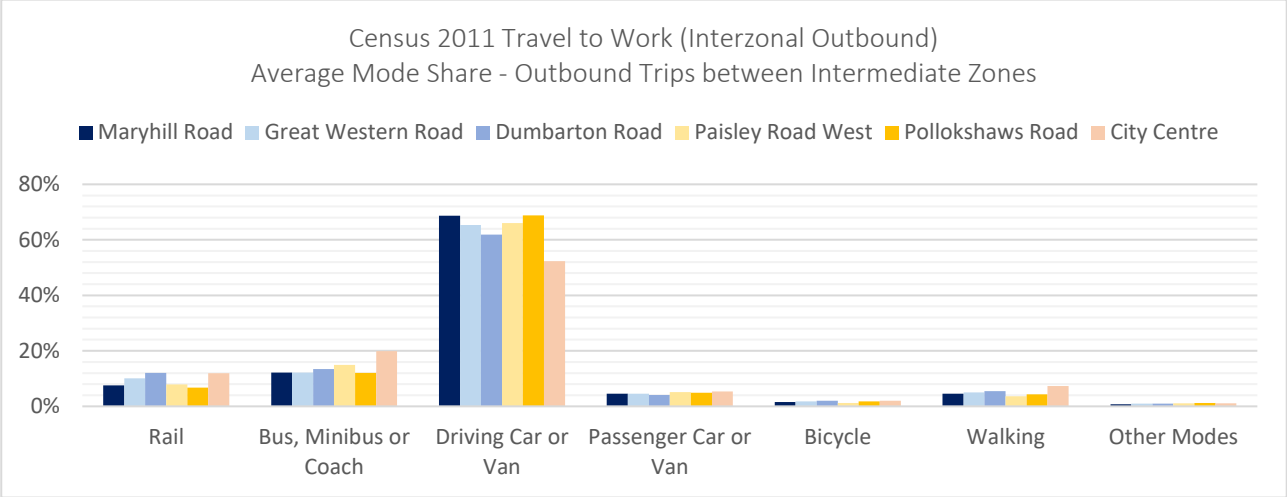


The mode share characteristics for each corridor are similar for inbound and outbound trips. Driving Car or Van is the dominant mode, with in excess of 50% of mode share. Bus, Minibus and Coach trips have a higher share than rail for all corridors for inbound and outbound trips, with the exception of inbound trips to the Dumbarton Road corridor, which are marginally lower for bus compared to rail.

Bus and rail have a higher mode share for interzonal inbound trips compared to outbound trips except for marginally higher outbound trips for rail for Pollokshaws Road intermediate zones (6% outbound, 7% inbound), outbound Paisley Road West bus trips (12% inbound, 15% outbound), and outbound City Centre bus trips (17% inbound, 20% outbound).

[23] Intermediate Zones (IZs) are a statistical geography that sit between Data Zones and Local Authority area boundaries. IZs were designed to meet constraints on population thresholds (2,500 - 6,000 household residents), to nest within Local Authority area boundaries, and to be built up from aggregates of data zones. IZs also represent a relatively stable geography that can be used to analyse change over time, with changes only occurring after a Census. Following the update to IZs using 2011 Census data, there are now 1,279 IZs covering the whole of Scotland, 136 of which comprise the Glasgow City Council Local Authority area.





Travel Demand Characteristics

Travel to work data has been examined in greater detail to consider flows between the intermediate zones identified as comprising each corridor (boundaries within 400m). The mapping provided for each corridor illustrates historic travel patterns based on Census 2011 travel to work data and Tamoco origin-destination travel demand data for 2019 (pre-Covid-19 flows).

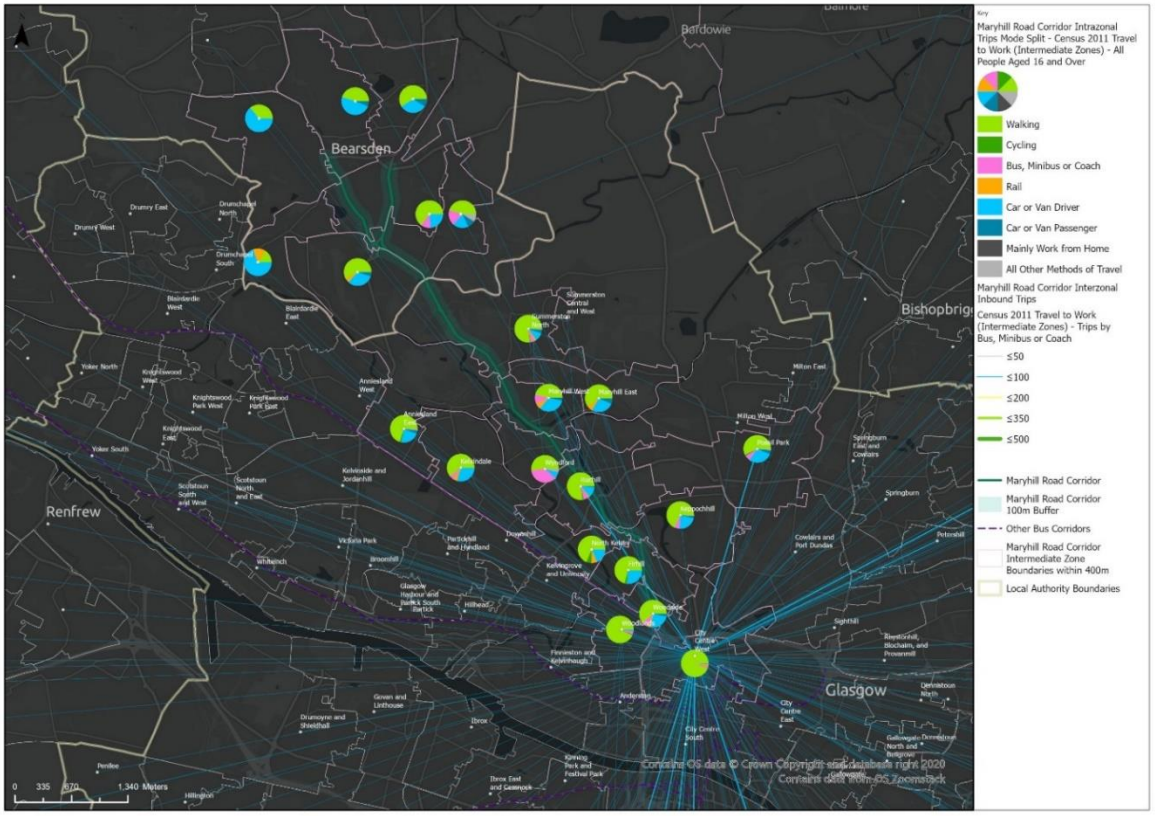
- Census 2011 travel to work data is presented to illustrate mode share for intrazonal trips (trips which start and end in the same zone) and inbound or outbound Bus, Minibus or Coach trips.
- Tamoco origin-destination travel demand data has been aggregated for the purposes of this analysis to intermediate zone full-week 24-hour flows.

Although the Tamoco derived origin-destination data provides broad coverage of time periods and trip purposes, it is limited in some respects as representative source of travel characteristics information. The data represents a sample of users and is limited in its coverage, i.e. the number of people using mobile devices / applications and providing permission for their data to be used. This limitation should be kept in mind when comparing data over time as the sample size and geographic coverage of users can vary. As such, it is important that absolute values are assessed with caution.

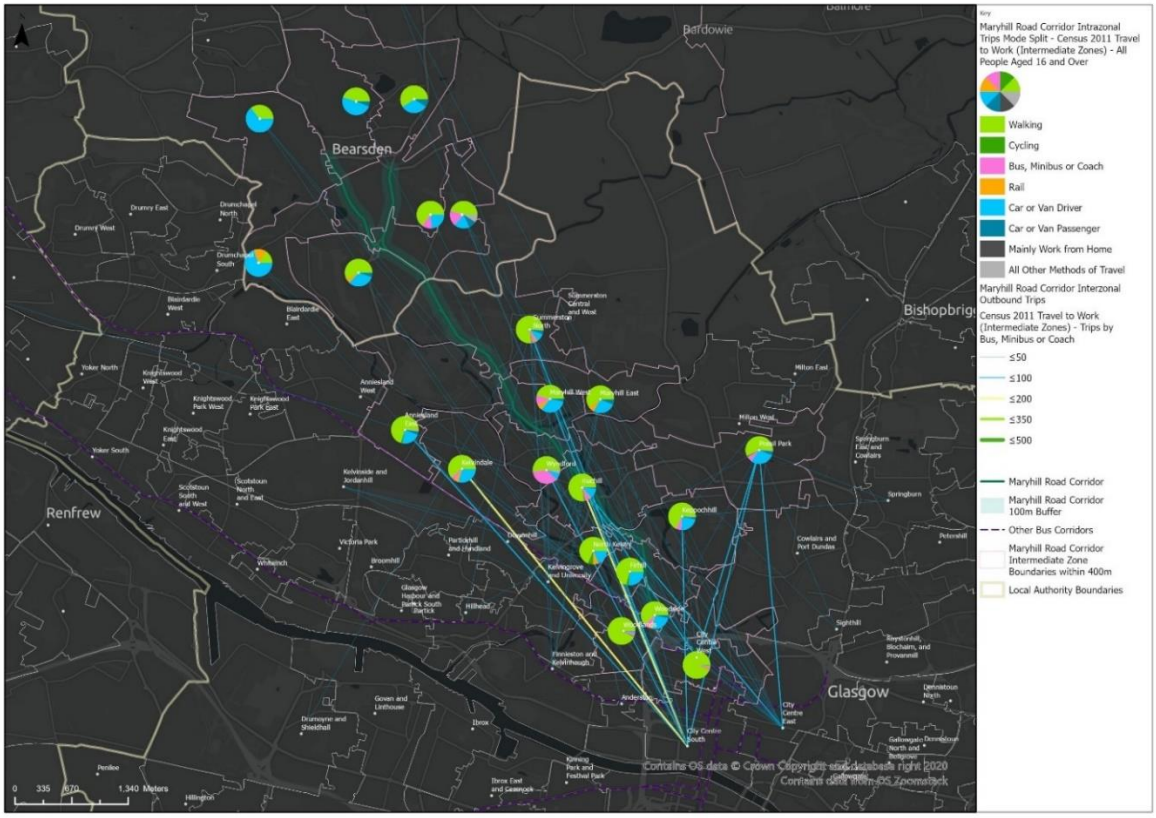
To account for this, the analysis only considers values for each intermediate zone origin destination pair as a percentage of the total flows from a given intermediate zone. Nevertheless, this is considered to represent a useful indication of travel demand characteristics across the city, particularly when supplemented with other data sources. Specifically, assessing the Tamoco location data on this basis assists in identifying of the relative importance of local corridors to specific areas/zones.

C1. Maryhill Road Corridor

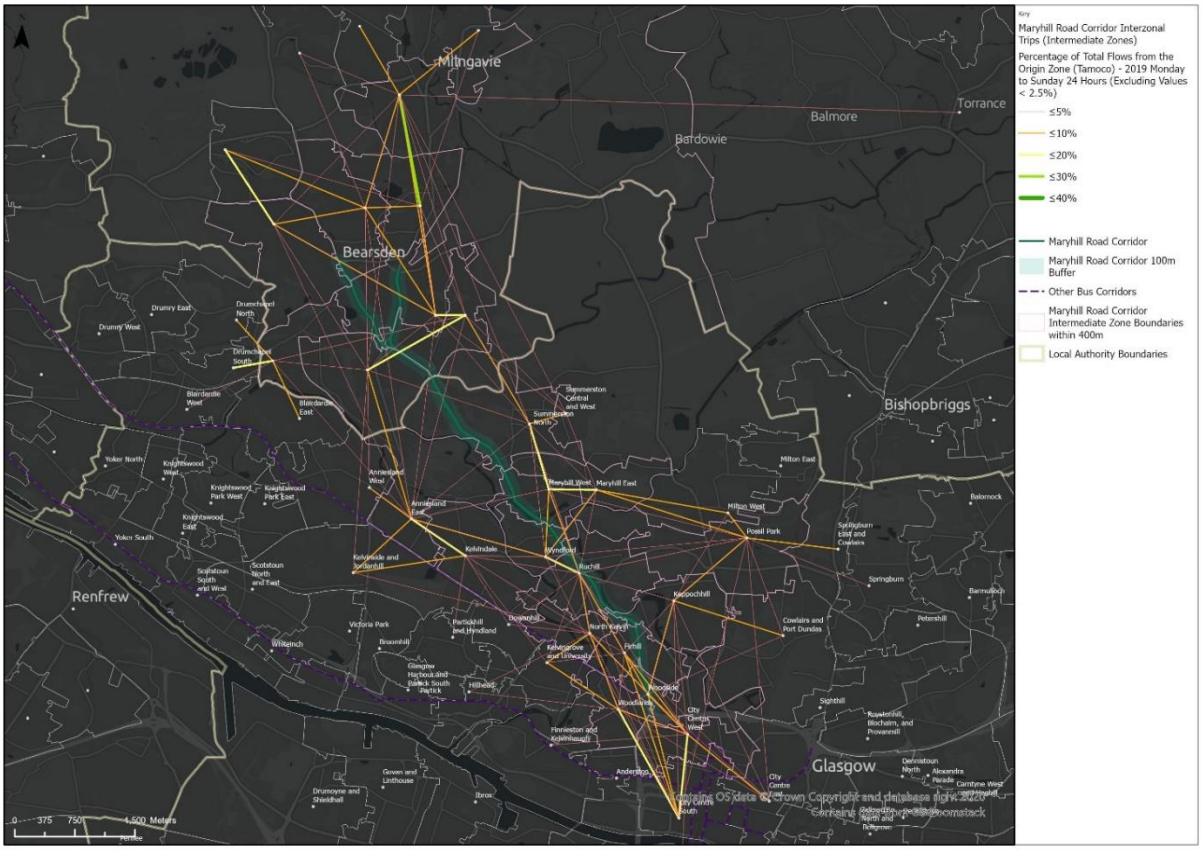
Census 2011 Travel to Work – Intrazonal Mode Share and Inbound Interzonal Trips by Bus, Minibus or Coach



Census 2011 Travel to Work – Intrazonal Mode Share and Outbound Interzonal Trips by Bus, Minibus or Coach.

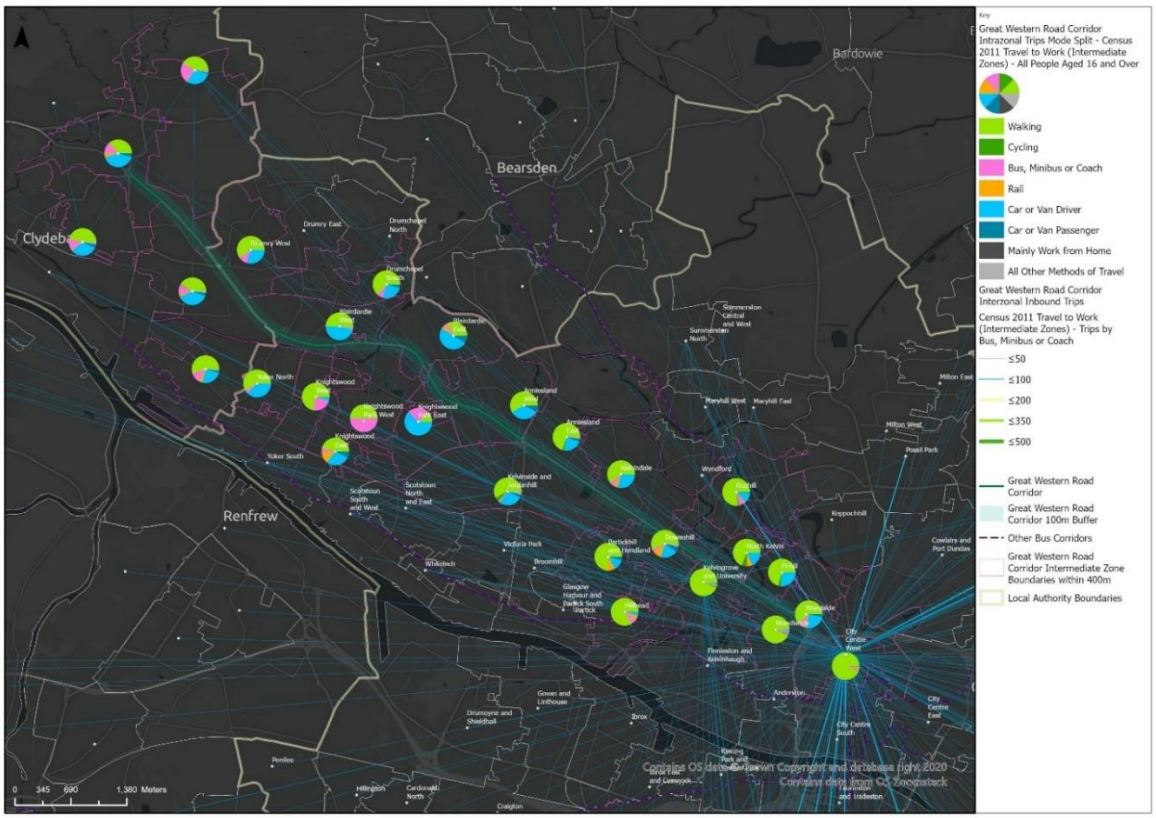


Tamoco Origin-Destination Travel Demand 2019 – Full Week (Monday to Sunday) 24 Hour Flows - Interzonal Trips from the Origin Zone as a Percentage of Total Flows from the Origin Zone

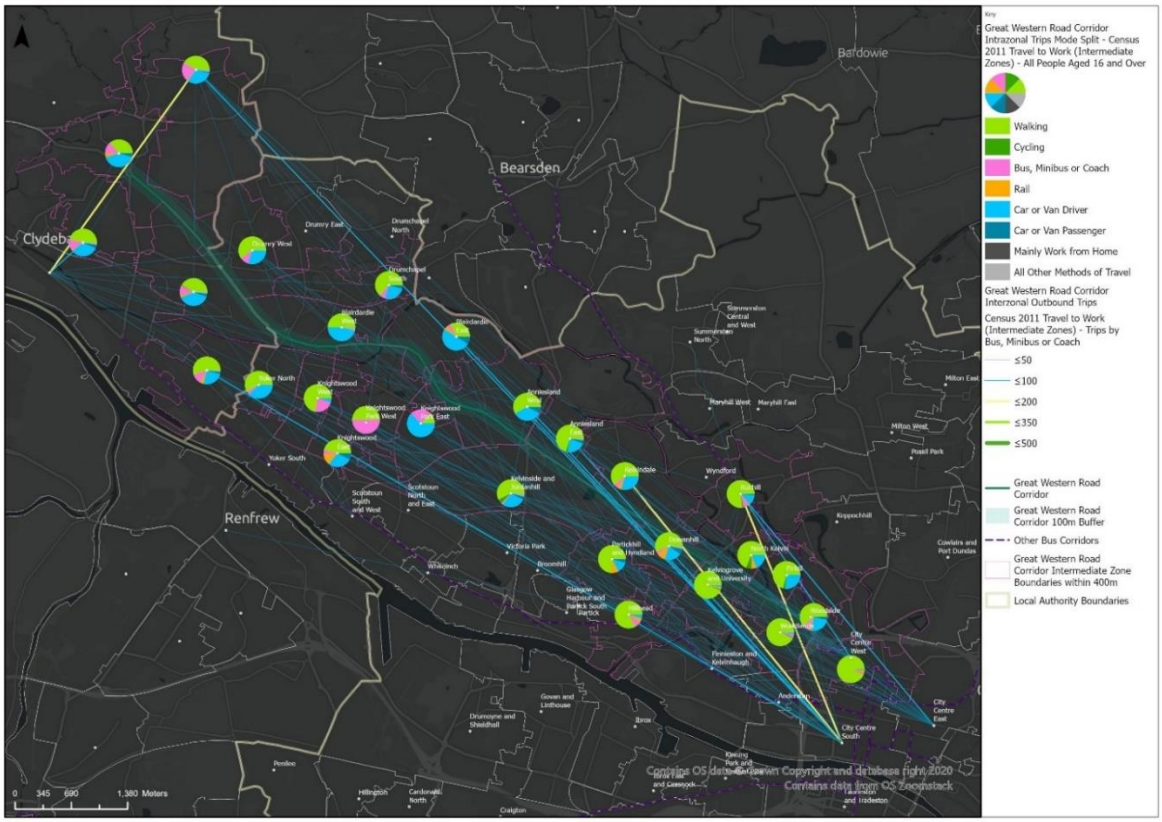


C2. Great Western Road Corridor

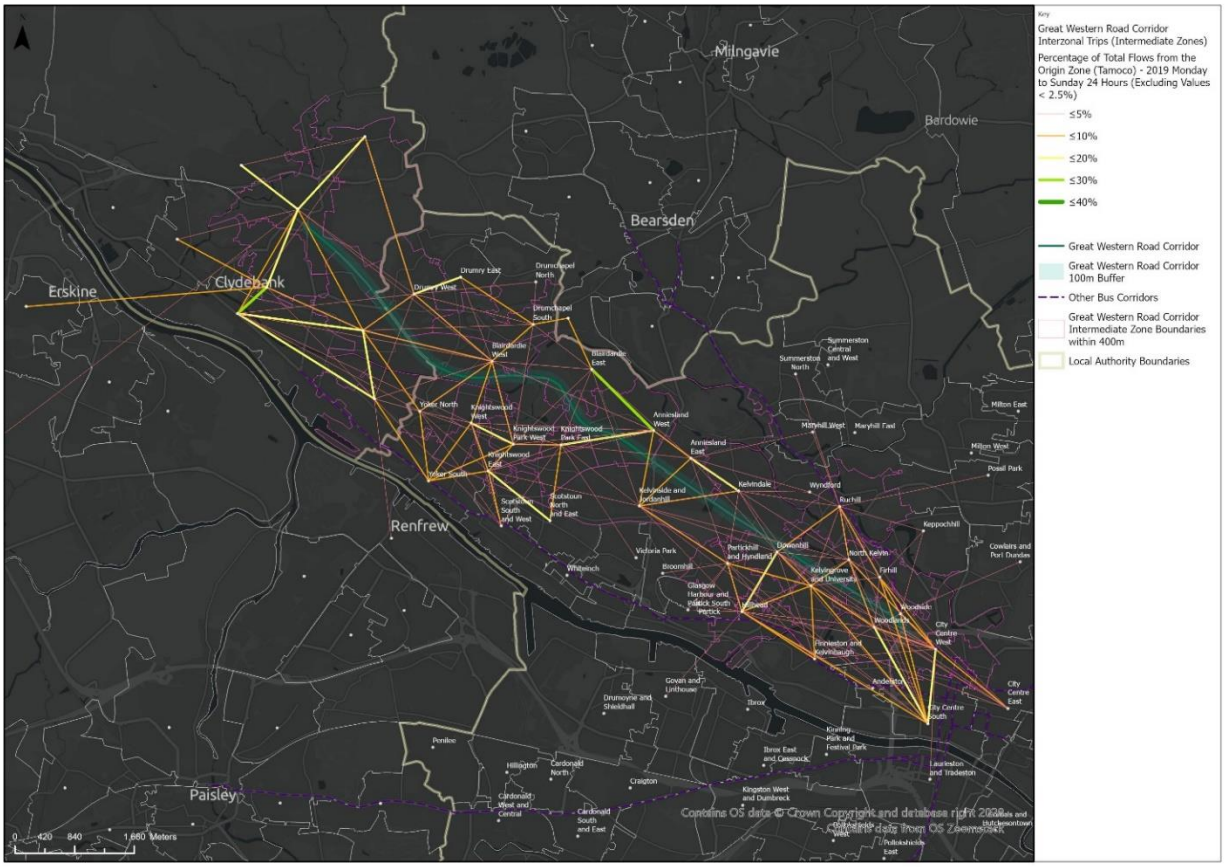
Census 2011 Travel to Work – Intrazonal Mode Share and Inbound Interzonal Trips by Bus, Minibus or Coach



Census 2011 Travel to Work – Intrazonal Mode Share and Outbound Interzonal Trips by Bus, Minibus or Coach.

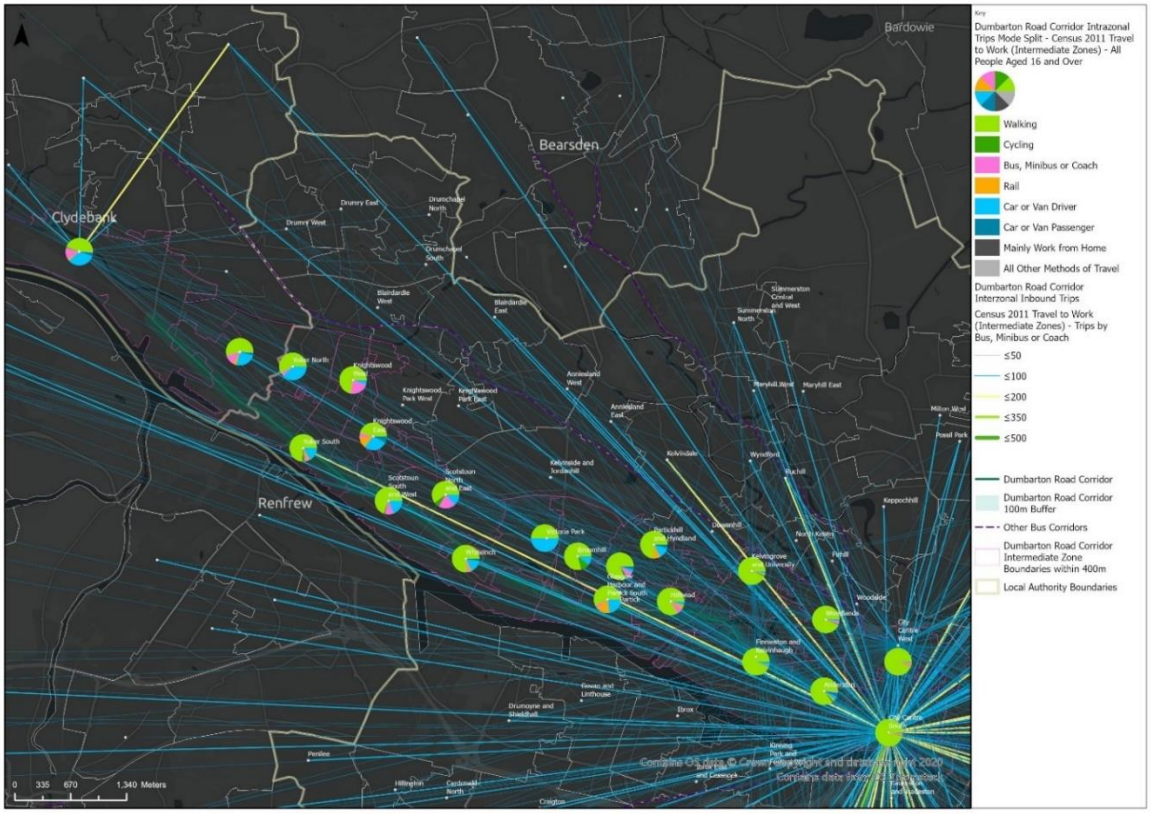


Tamoco Origin-Destination Travel Demand 2019 – Full Week (Monday to Sunday) 24 Hour Flows - Interzonal Trips from the Origin Zone as a Percentage of Total Flows from the Origin Zone

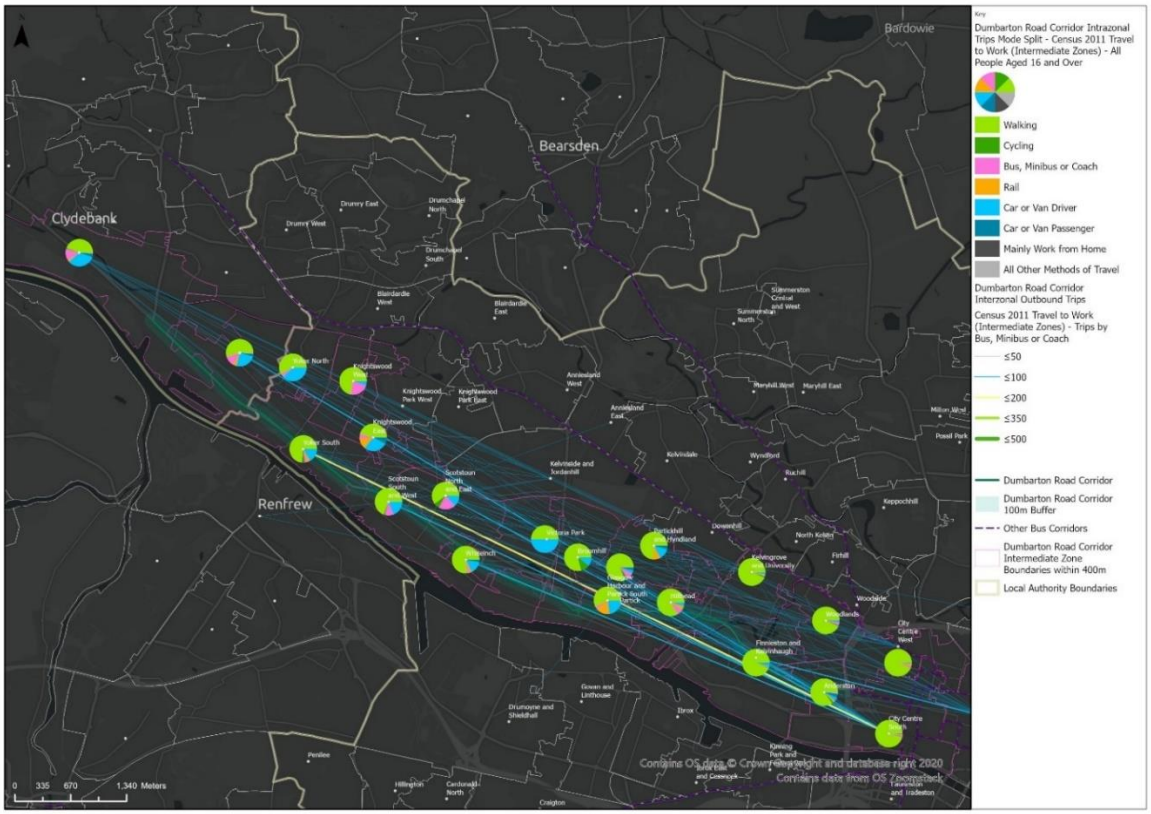


C3. Dumbarton Road Corridor

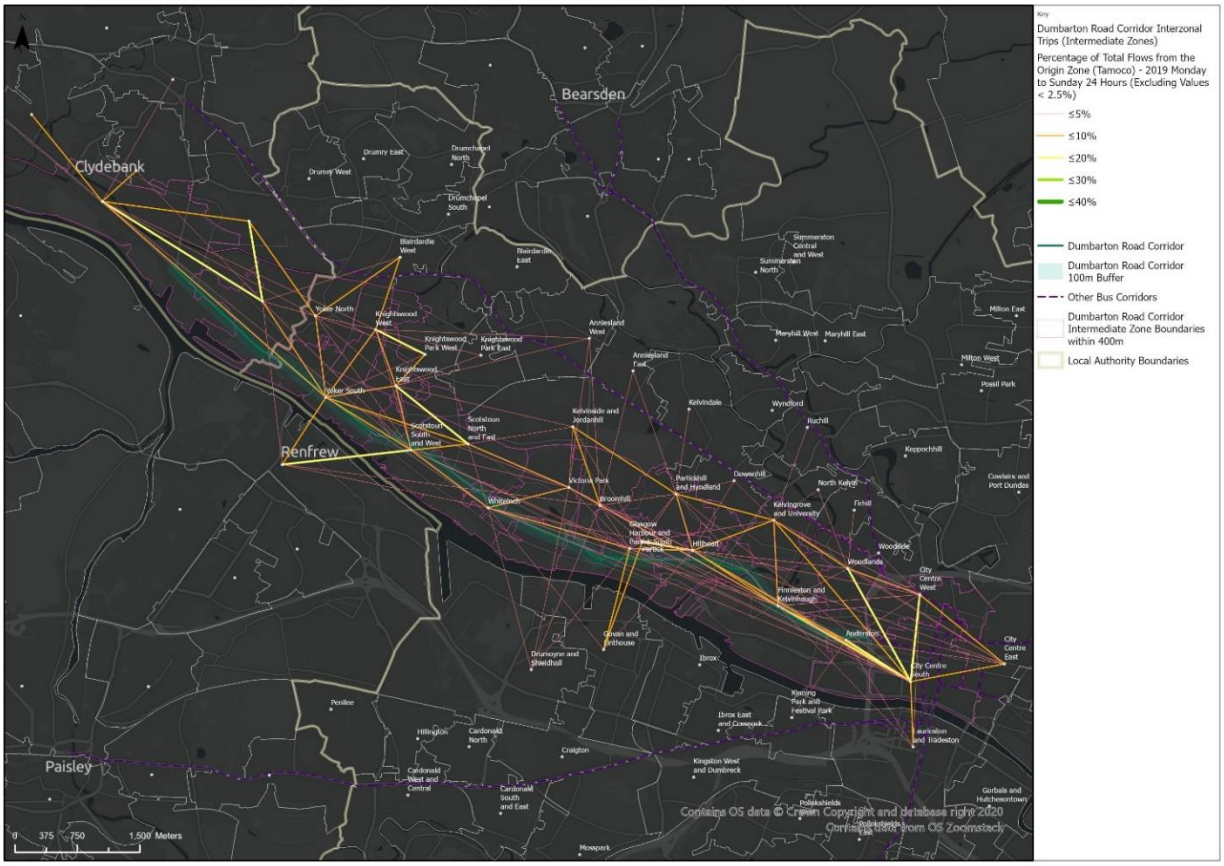
Census 2011 Travel to Work – Intrazonal Mode Share and Inbound Interzonal Trips by Bus, Minibus or Coach



Census 2011 Travel to Work – Intrazonal Mode Share and Outbound Interzonal Trips by Bus, Minibus or Coach.

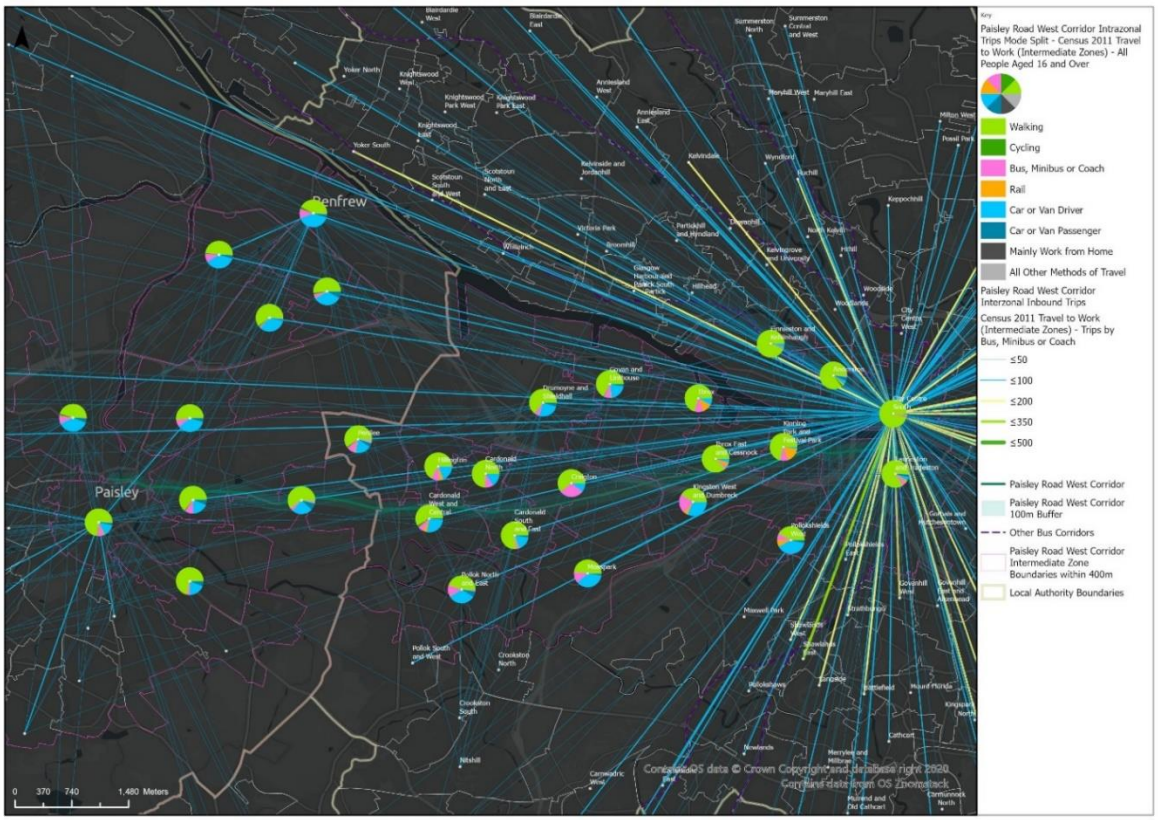


Tamoco Origin-Destination Travel Demand 2019 – Full Week (Monday to Sunday) 24 Hour Flows - Interzonal Trips from the Origin Zone as a Percentage of Total Flows from the Origin Zone

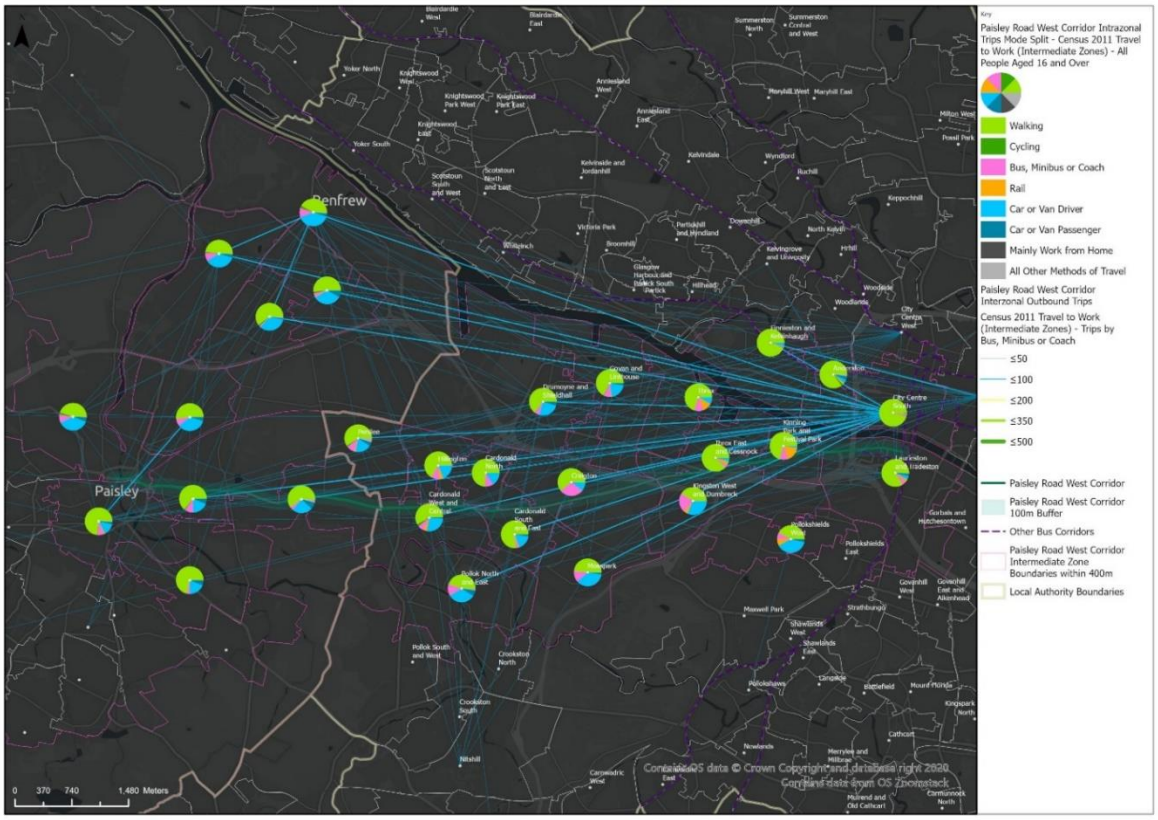


C4. Paisley Road West Corridor

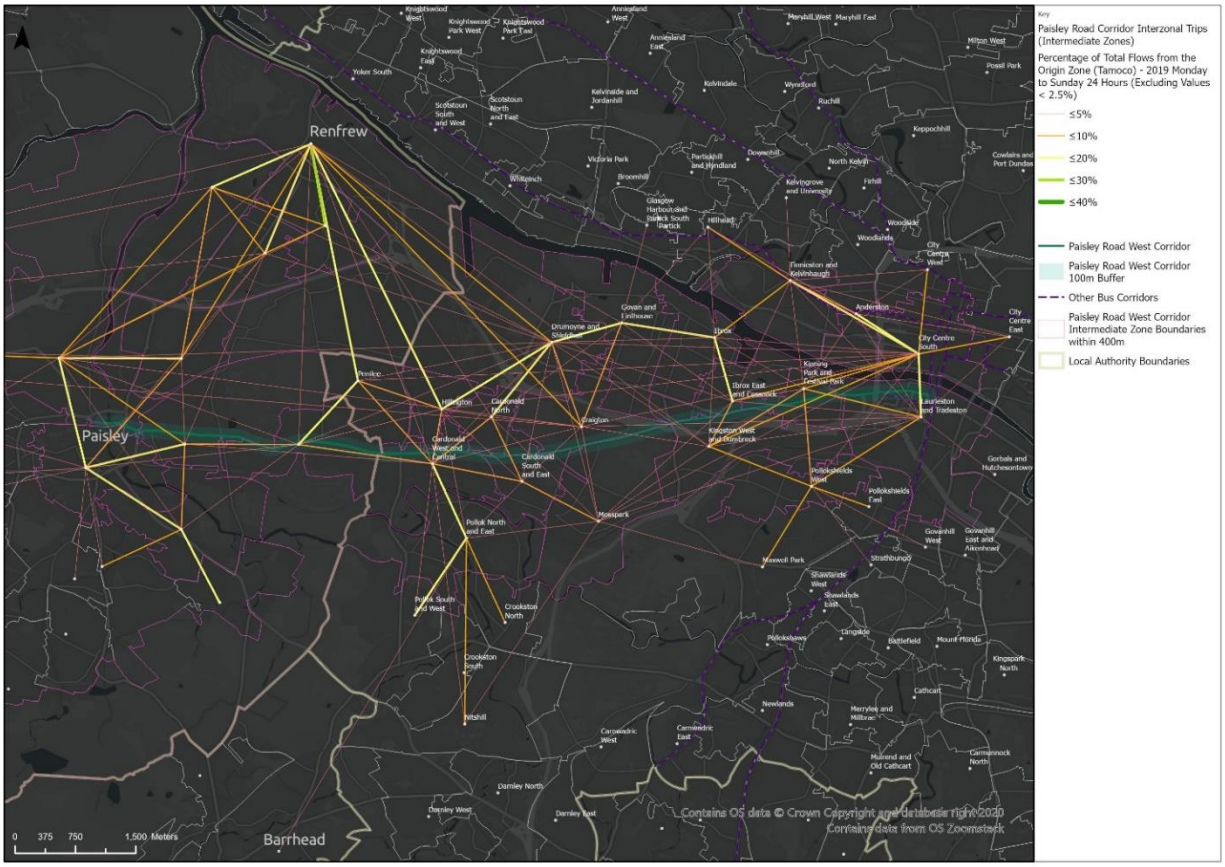
Census 2011 Travel to Work – Intrazonal Mode Share and Inbound Interzonal Trips by Bus, Minibus or Coach



Census 2011 Travel to Work – Intrazonal Mode Share and Outbound Interzonal Trips by Bus, Minibus or Coach.

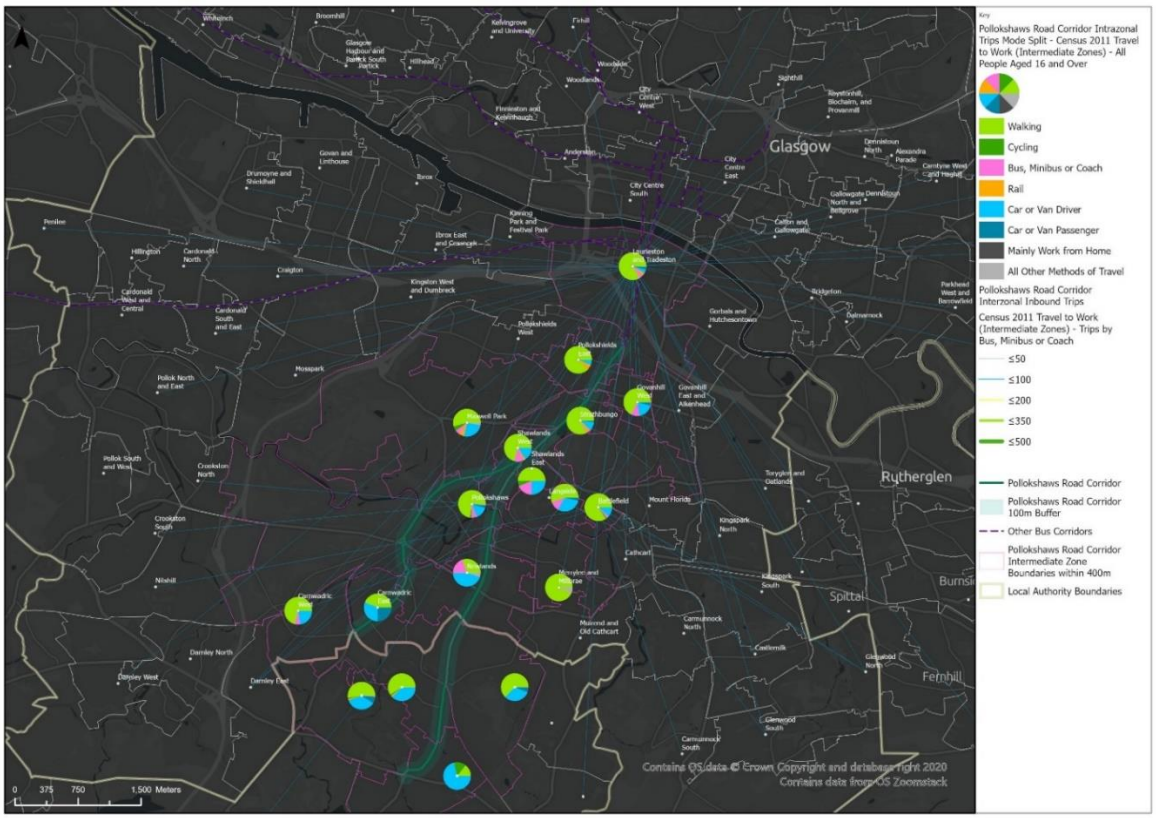


Tamoco Origin-Destination Travel Demand 2019 – Full Week (Monday to Sunday) 24 Hour Flows - Interzonal Trips from the Origin Zone as a Percentage of Total Flows from the Origin Zone

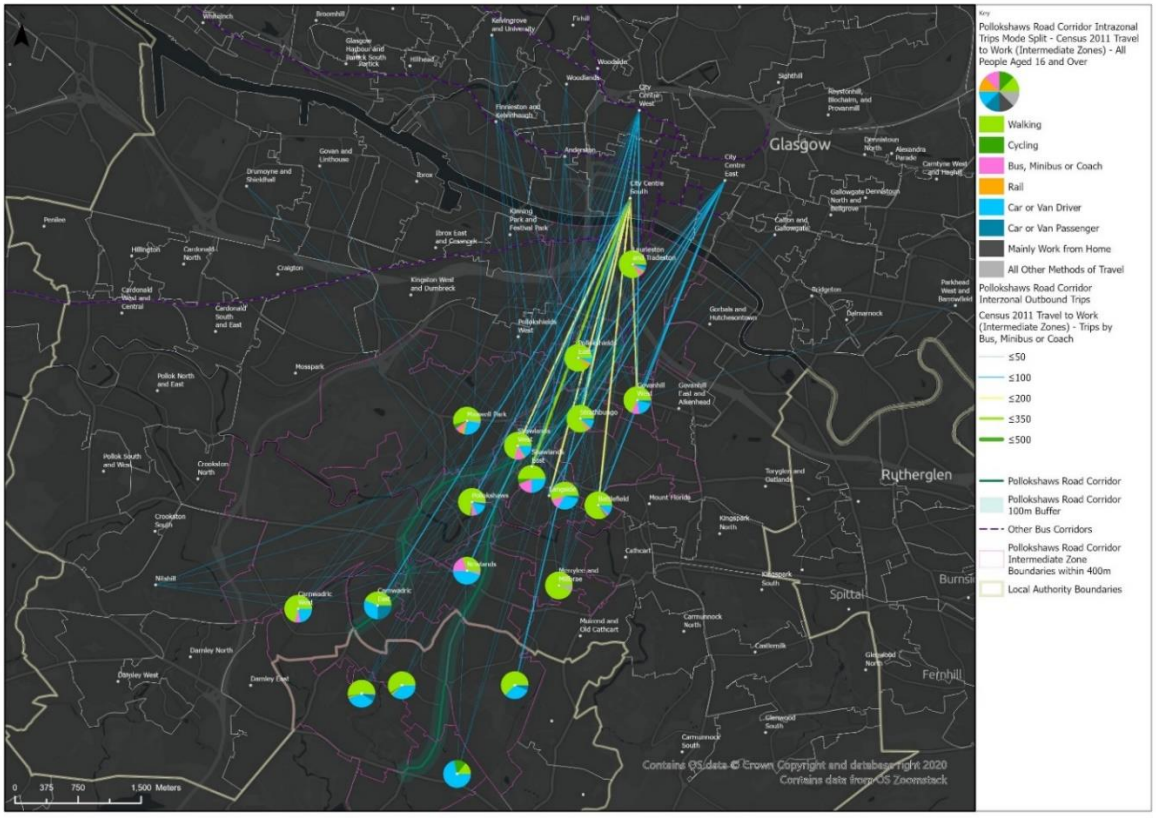


C5. Pollokshaws Road Corridor

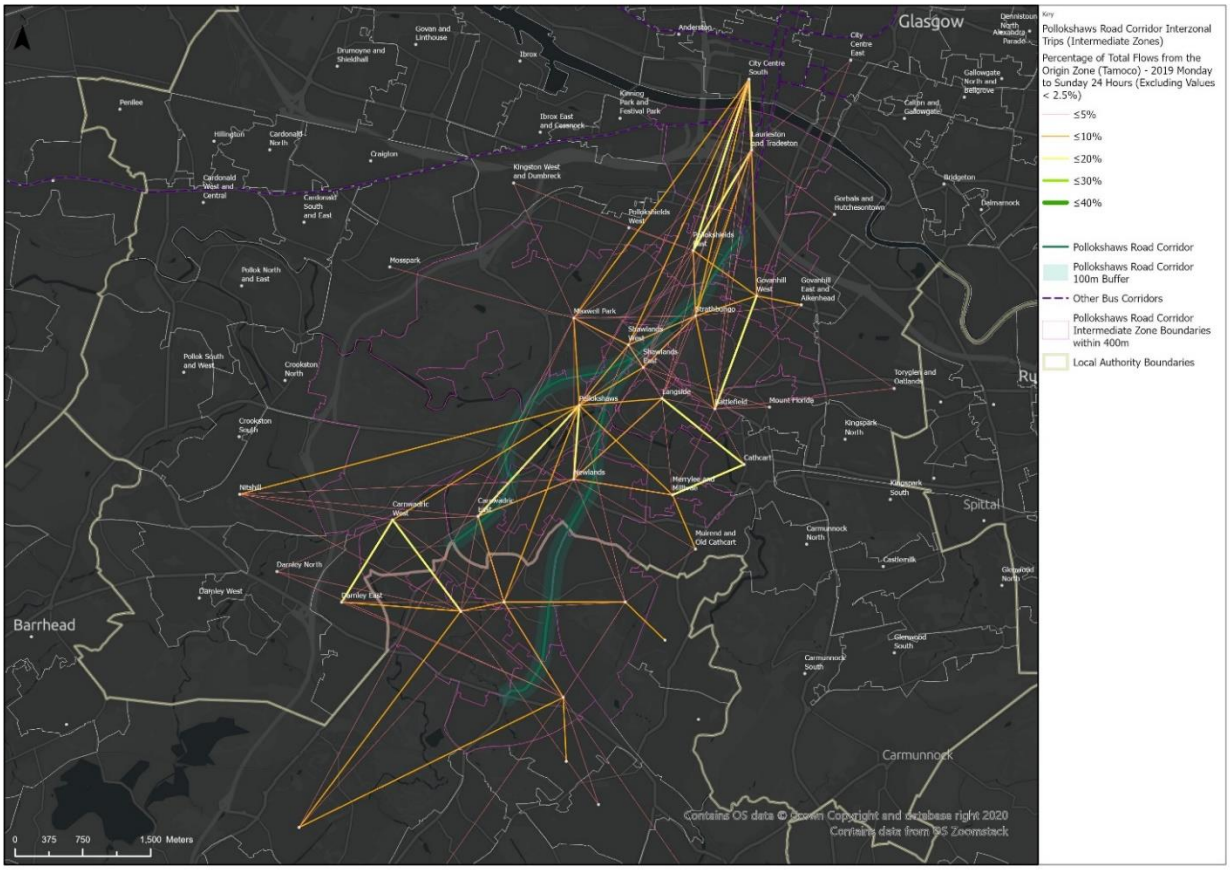
Census 2011 Travel to Work – Intrazonal Mode Share and Inbound Interzonal Trips by Bus, Minibus or Coach



Census 2011 Travel to Work – Intrazonal Mode Share and Outbound Interzonal Trips by Bus, Minibus or Coach.

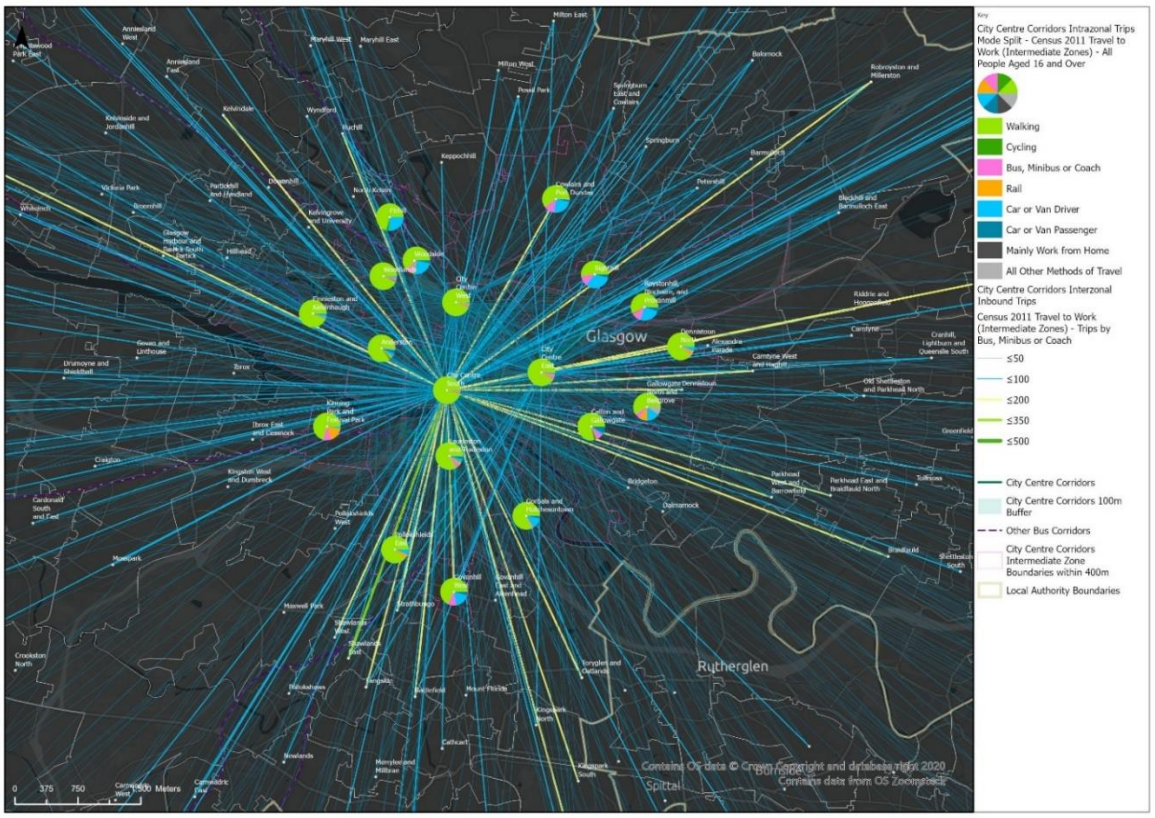


Tamoco Origin-Destination Travel Demand 2019 – Full Week (Monday to Sunday) 24 Hour Flows - Interzonal Trips from the Origin Zone as a Percentage of Total Flows from the Origin Zone

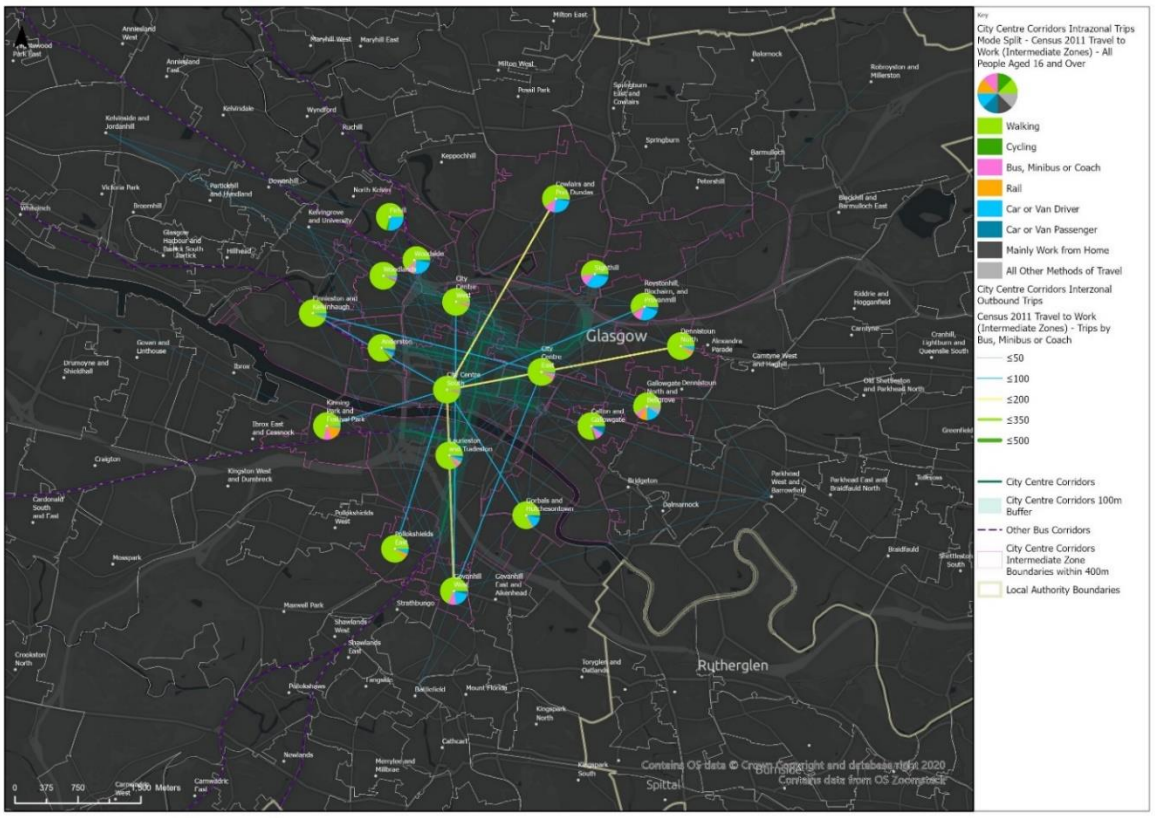


City Centre Corridors

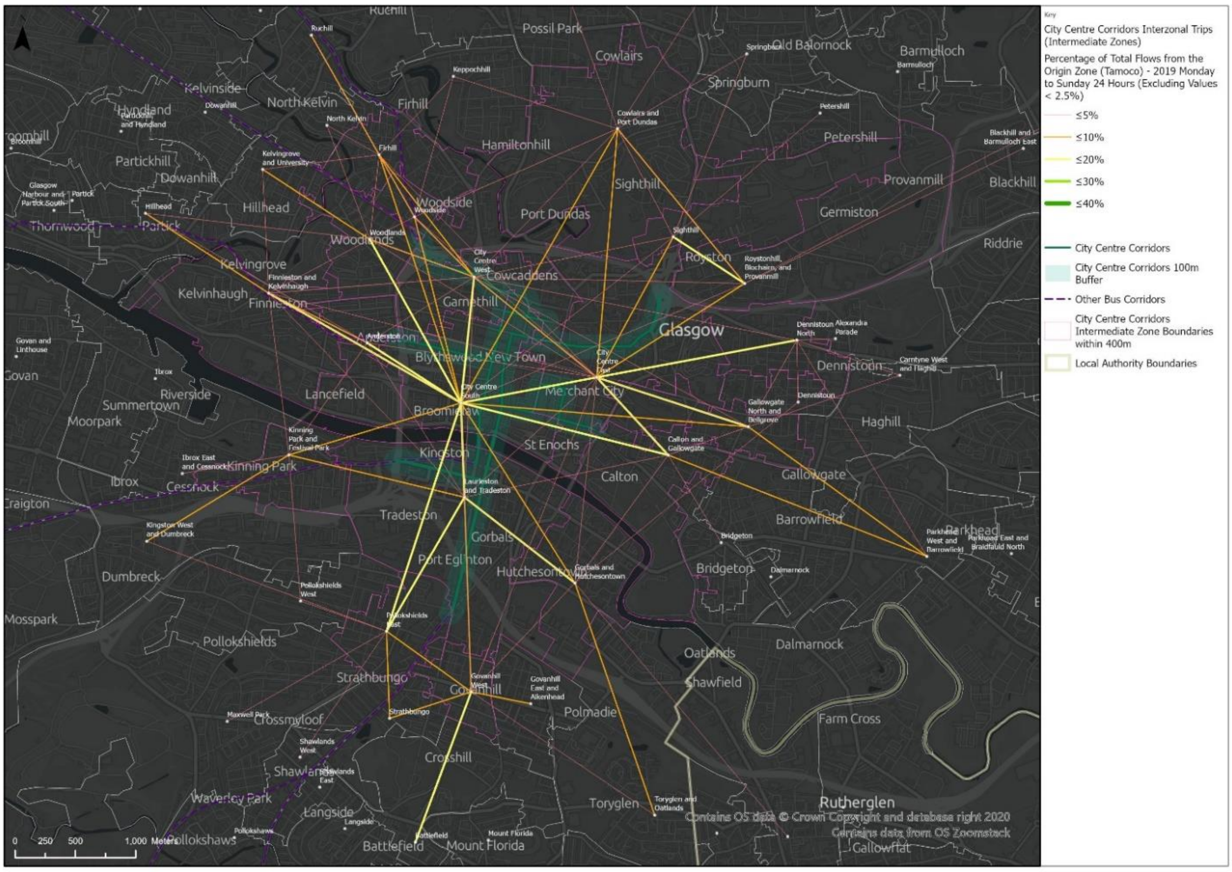
Census 2011 Travel to Work – Intrazonal Mode Share and Inbound Interzonal Trips by Bus, Minibus or Coach



Census 2011 Travel to Work – Intrazonal Mode Share and Outbound Interzonal Trips by Bus, Minibus or Coach.



Tamoco Origin-Destination Travel Demand 2019 – Full Week (Monday to Sunday) 24 Hour Flows - Interzonal Trips from the Origin Zone as a Percentage of Total Flows from the Origin Zone



Appendix C. Bus Network and Delay Information

The following sections provide details of the existing bus network and details of analysis undertaken previously to consider delay on the corridors under consideration.

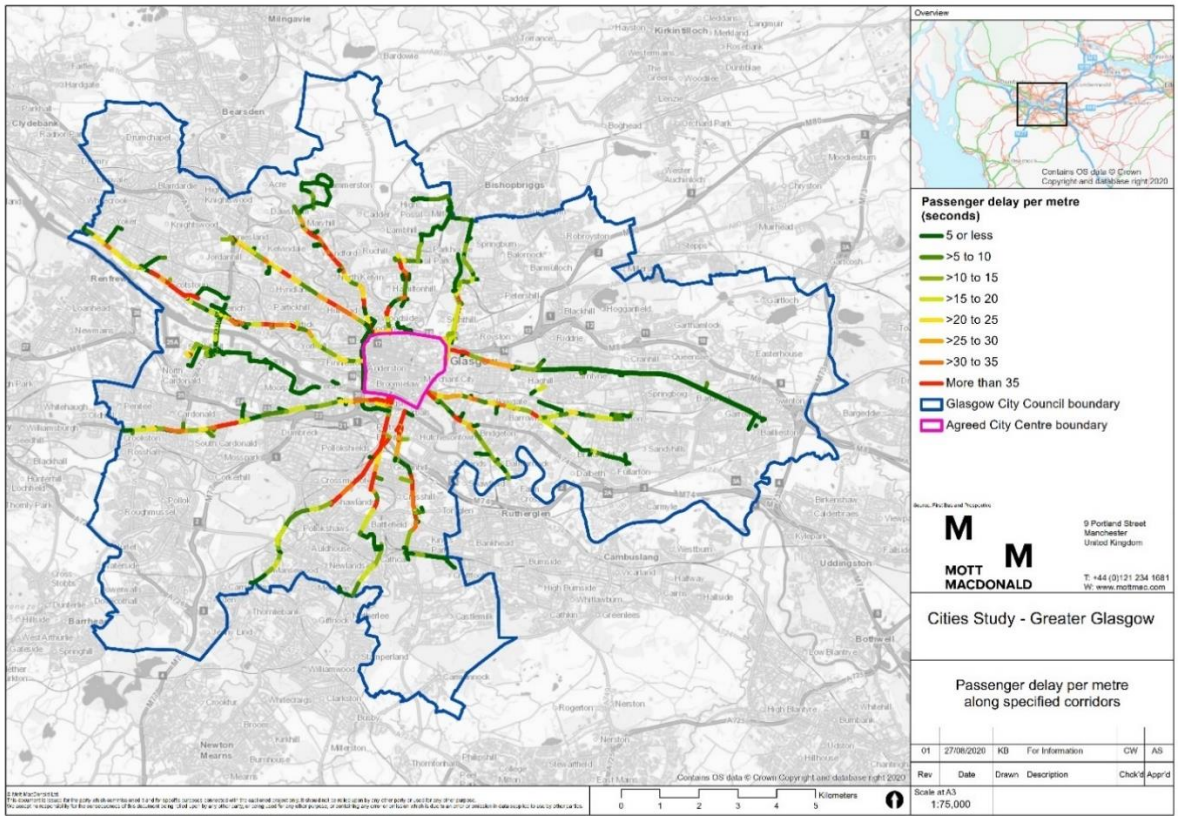
First Passenger Delay Analysis

As detailed in the Glasgow Bus Partnership Submission Report (April 2020) the First Bus Cities Study Glasgow (Prepared by Mott MacDonald on behalf of First) examined passenger delays across the Glasgow bus network in detail, identifying the most congested sections on key corridors.

The analysis included sections of the 5 corridors currently under examination and reported passenger weighted delay. In total, delay on these 5 corridors is reported as accounting for over 27% of delay as a proportion of total network delay on First entire Glasgow City Council network outside Glasgow city centre.

Corridor	Passenger Weighted Delay
Maryhill Road	4.7% of delay
Great Western Road	4.9% of delay
Baillieston-Faifley Way (Dumbarton Road)	6.3% of delay
Paisley Road West	5.2% of delay
Pollokshaws Road	6.5% of delay
Total	**27.6% of delay**

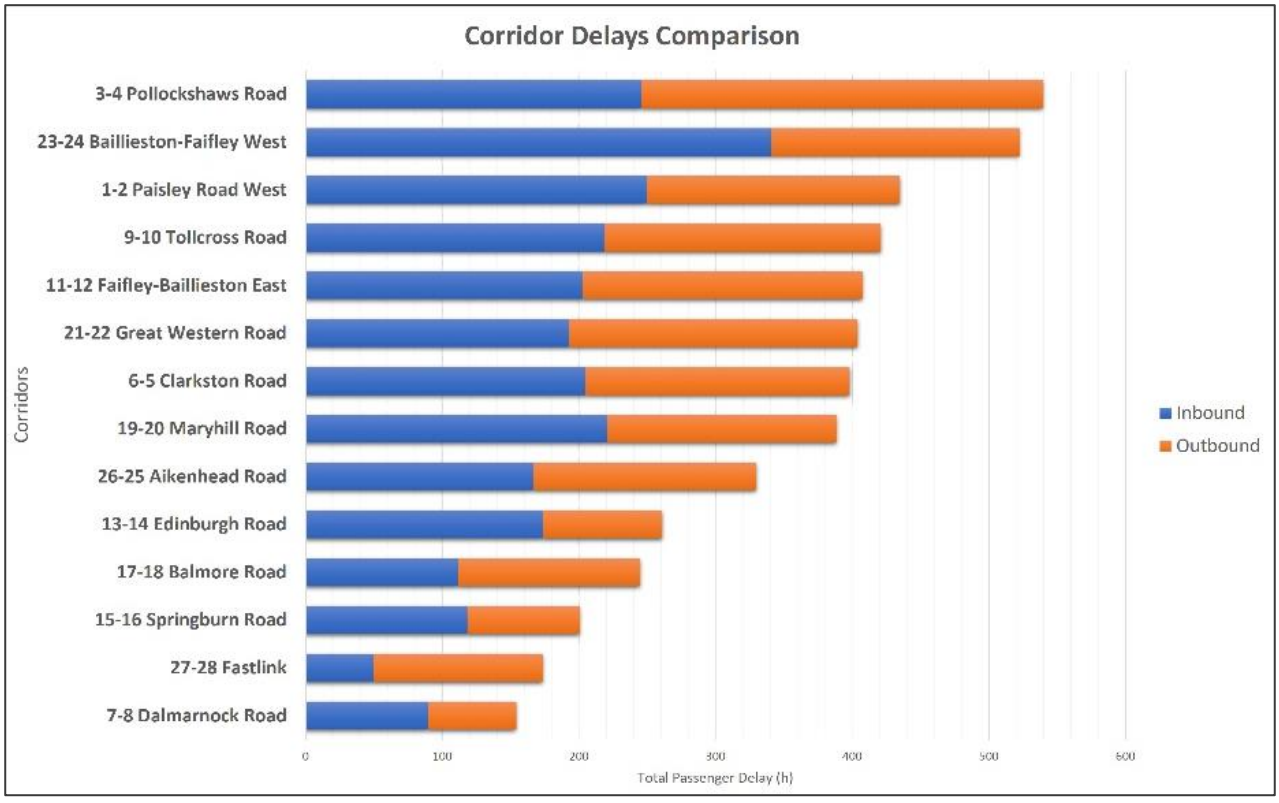
The outcomes of the analysis are illustrated in the figure below prepared by Mott MacDonald on behalf of First.



The reporting shows particularly significant areas of delay across the corridor extents assessed, including the following locations with delay of more than 35 seconds per metre:

- **Maryhill Road** – Several locations along A81 Maryhill Road between North Kelvinside and Cowal Road, and in the vicinity of the junction with Raeberry Street.
- **Great Western Road** – On the sections of the A82 Great Western Road between Bank Street and Byers Road, and in the vicinity of the junction with Hyndland Road and Cleveden Road.
- **Dumbarton Road** – Between the area around the A814 Dumbarton Road / A814 Victoria Park Drive South roundabout and the A814 Dumbarton Road / Kingsway Junction, as well sections of Dumbarton Road through Partick to the west of Byers Road.
- **Paisley Road West** – In the vicinity of Bellahouston Park between the junction with Helen Street and the junction with Mosspark Boulevard, and between the M8 underpass and the A77.
- **Pollokshaws Road** – Long sections of A77 Pollokshaws Road between the city centre and the junction with Kilmarnock Road.

The figure below, provided by First, compares inbound and outbound passenger delay across the corridors. This indicates that for Pollokshaws Road and Great Western Road, outbound delay is greater than inbound delay. The opposite is the case for Baillieston-Faifley West, Maryhill Road and Paisley Road West, while inbound and outbound delay is similar for Faifley-Baillieston East.



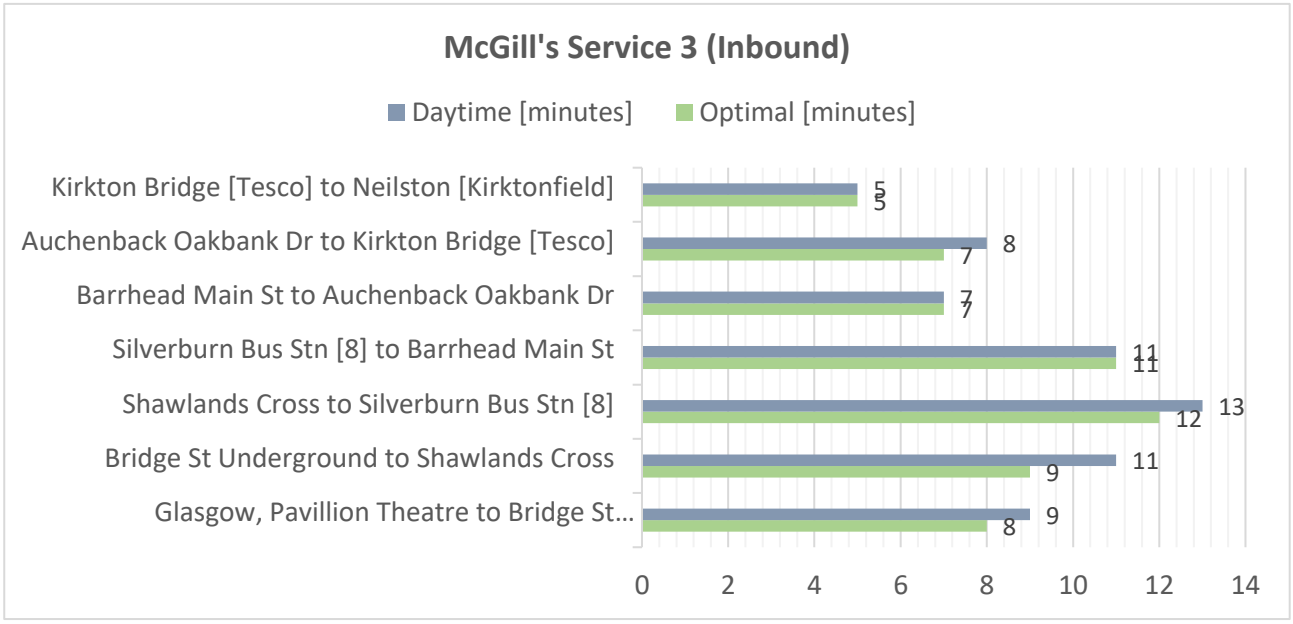
Supporting data from the analysis previously undertaken will be assessed in greater detail as part of the preliminary appraisal.

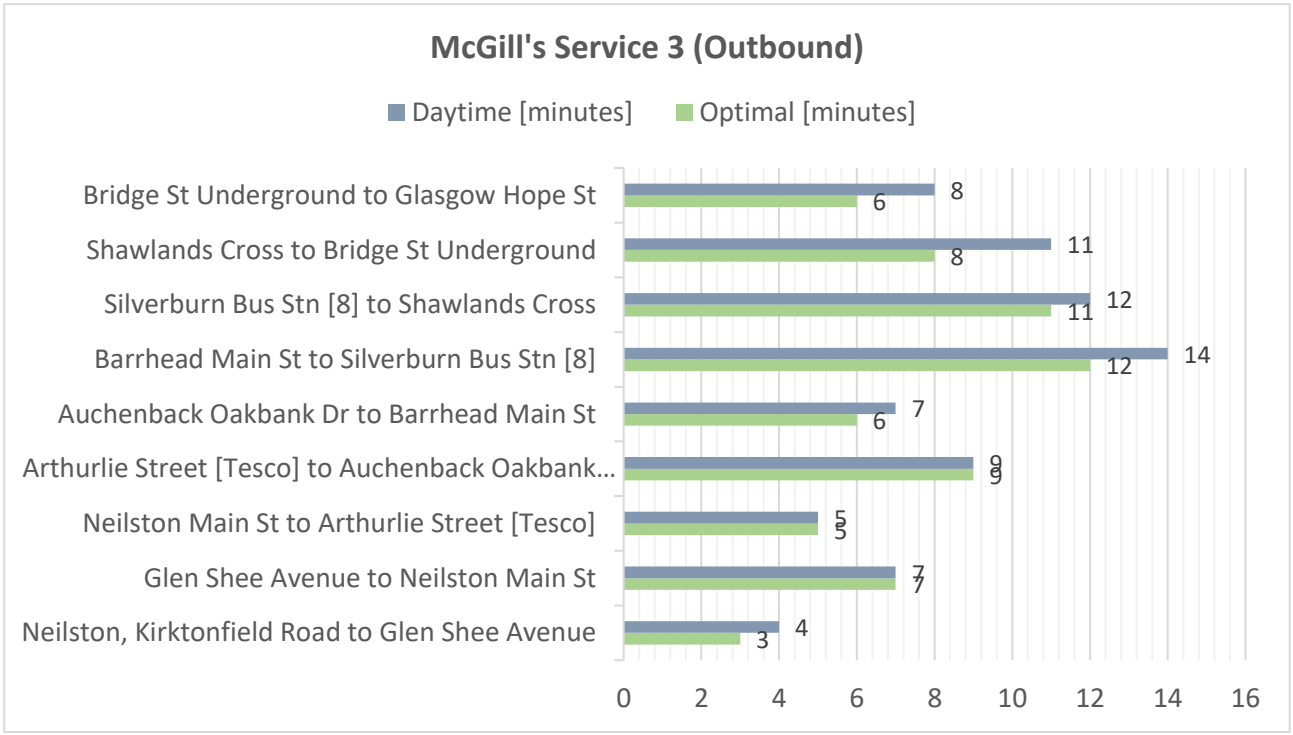
McGill's Buses Journey Time Savings Analysis

McGill's Buses have undertaken an analysis of journey times for services 3 and 38 to consider / quantify potential time savings on these routes.

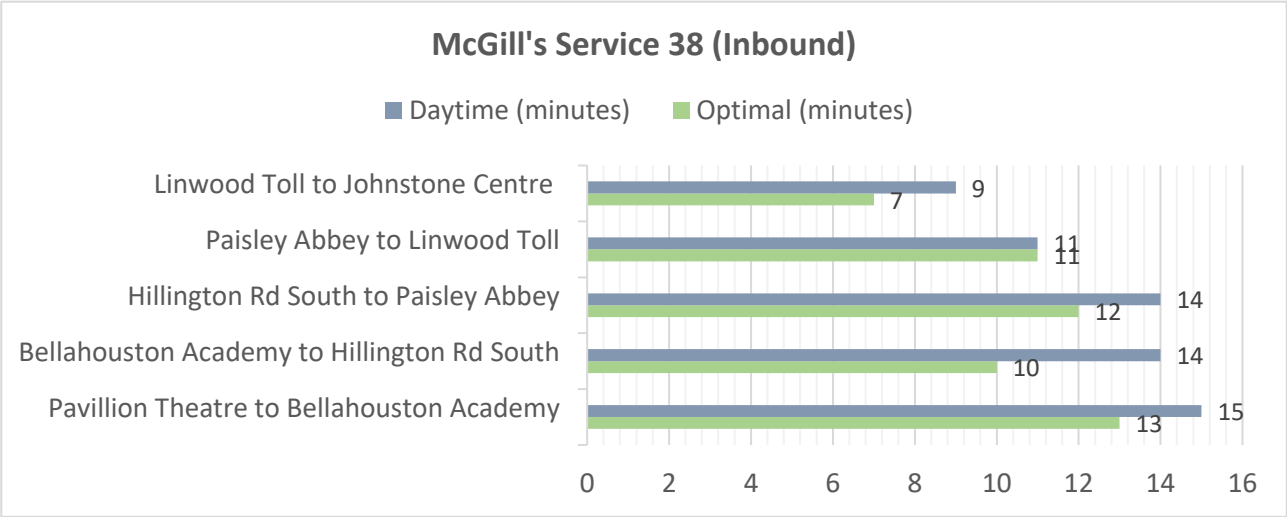
- Service 3 operates between Neilston and Glasgow. The route includes the section of the Pollokshaws Corridor between Glasgow city centre and Pollok Country Park, joining / exiting the corridor at the B769 Pollokshaws Road / B762 Barrhead Road / B769 Thornliebank Road / B762 Nether Auldhouse Road roundabout.
- Service 38 – Johnstone, Houston Square and Glasgow City Centre, runs along the full length of the Paisley Road West corridor

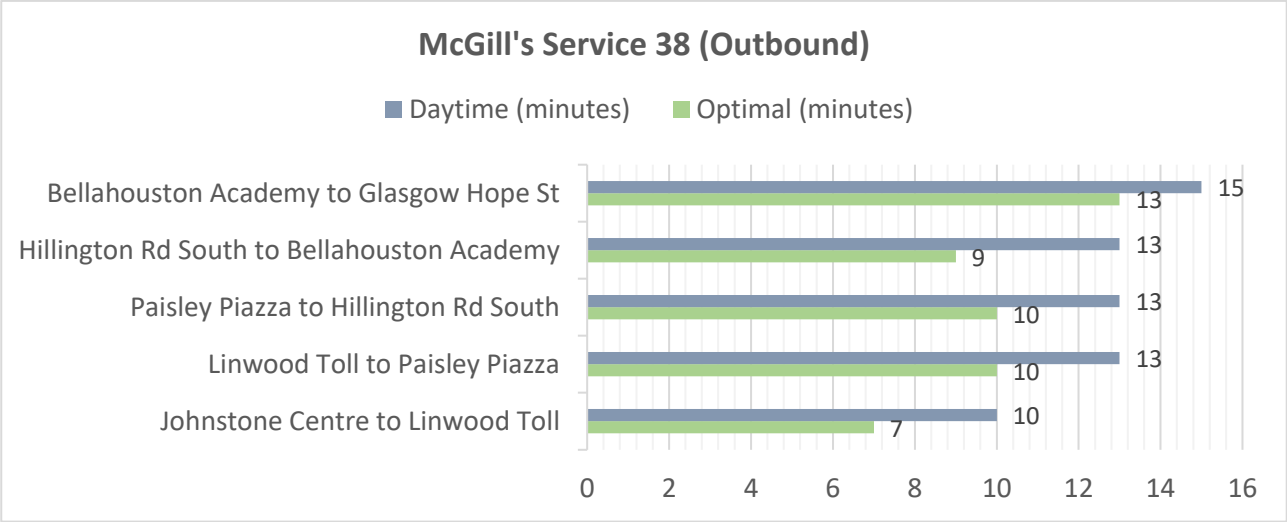
The analysis considers optimal journey times based on an exercise carried out in the early hours of the morning when congestion was minimal / non-existent. It compares these to scheduled journey times to determine potential journey time savings if the corridor functioned as efficiently as it should. The outcomes from the analysis are summarised in the following charts.





The analysis of optimal versus daytime running for McGill's Service 3 indicates that typical conditions result in a 13% increase in journey time compared to the optimal running scenario for inbound journeys. This equates to a 10-minute penalty in typical conditions. For outbound journeys, running under typical conditions incurs an 8% penalty compared to optimal conditions, which represents a 5-minute journey time increase. The combined inbound and outbound journey time saving in optimal conditions is 15 minutes, or 11%.



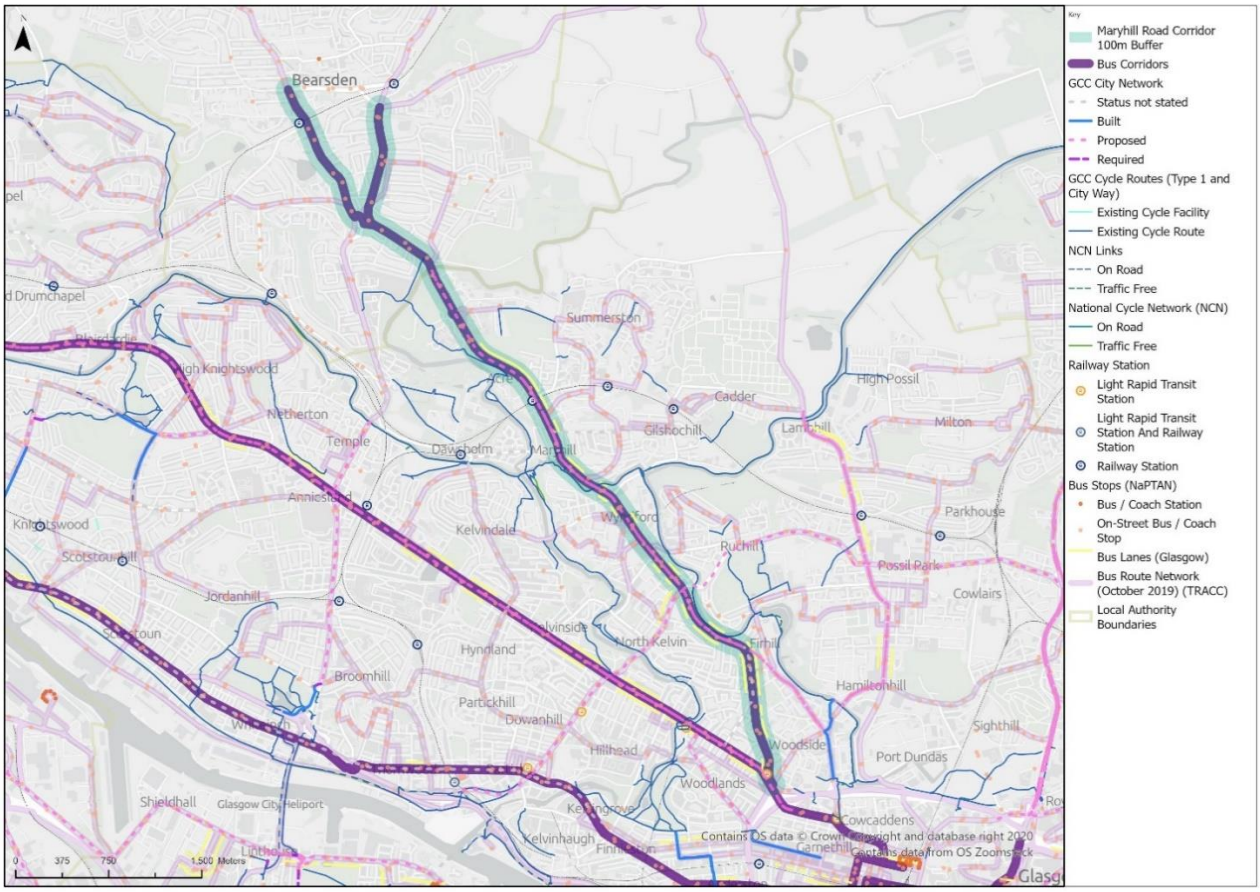


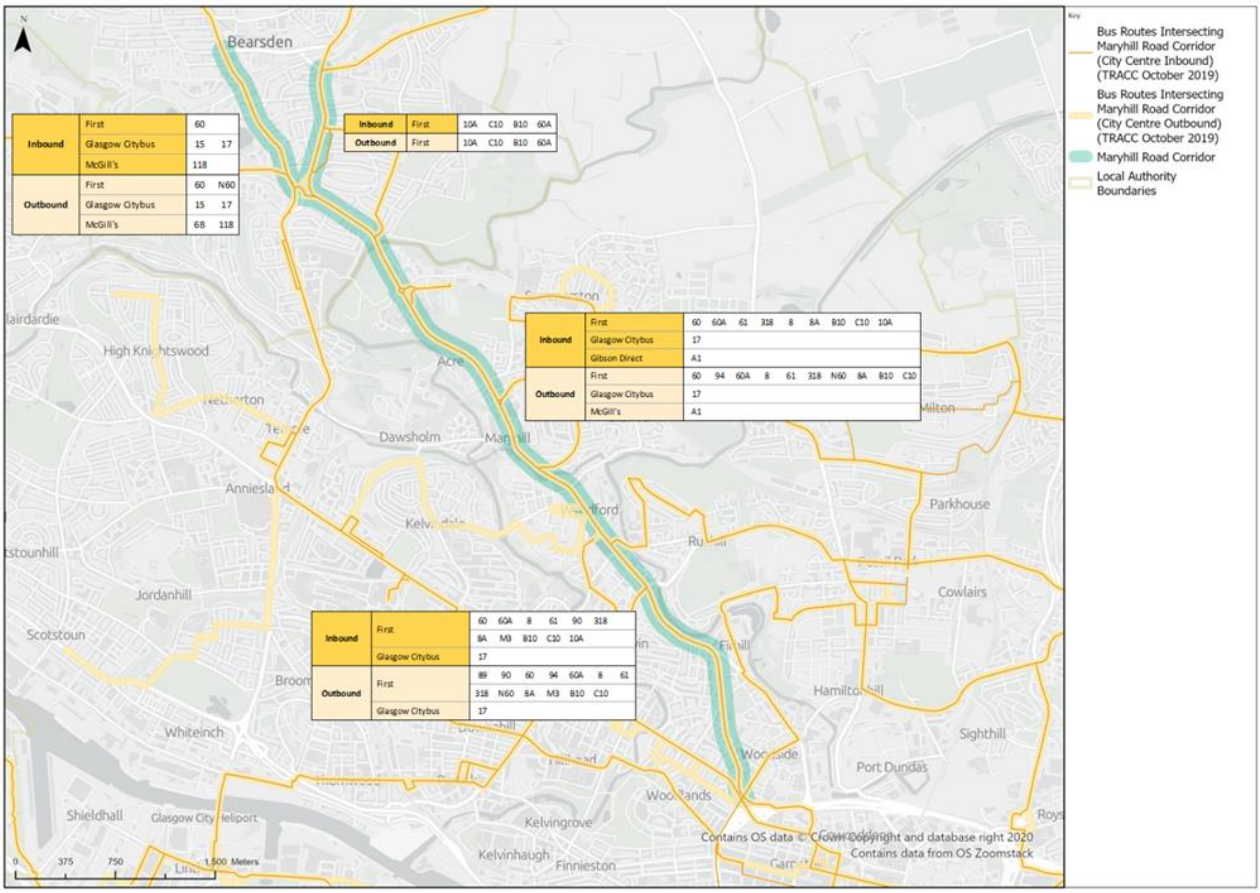
For McGill's Service 38, the difference between typical and optimal running is greater for both inbound and outbound journeys. Inbound journeys in daytime conditions show a 23% (15 minute) increase compared to optimal running, whereas daytime outbound journeys are 16% (10 minutes) longer. The combined inbound and outbound journey time penalty compared to optimal conditions is 25 minutes, or 20%.

The outcomes from this analysis highlight the challenges in achieving the target journey time savings of 20% on arterial routes and 50% on city centre routes. Examining the journey times for each route section shows that the penalty compared to optimal conditions is not uniform, with the differences much more pronounced in some sections. This may be due to various factors but indicates that there may be opportunities to address the observed differences. The analysis undertaken and supporting information will be reviewed in detail as part of the preliminary and detailed appraisal

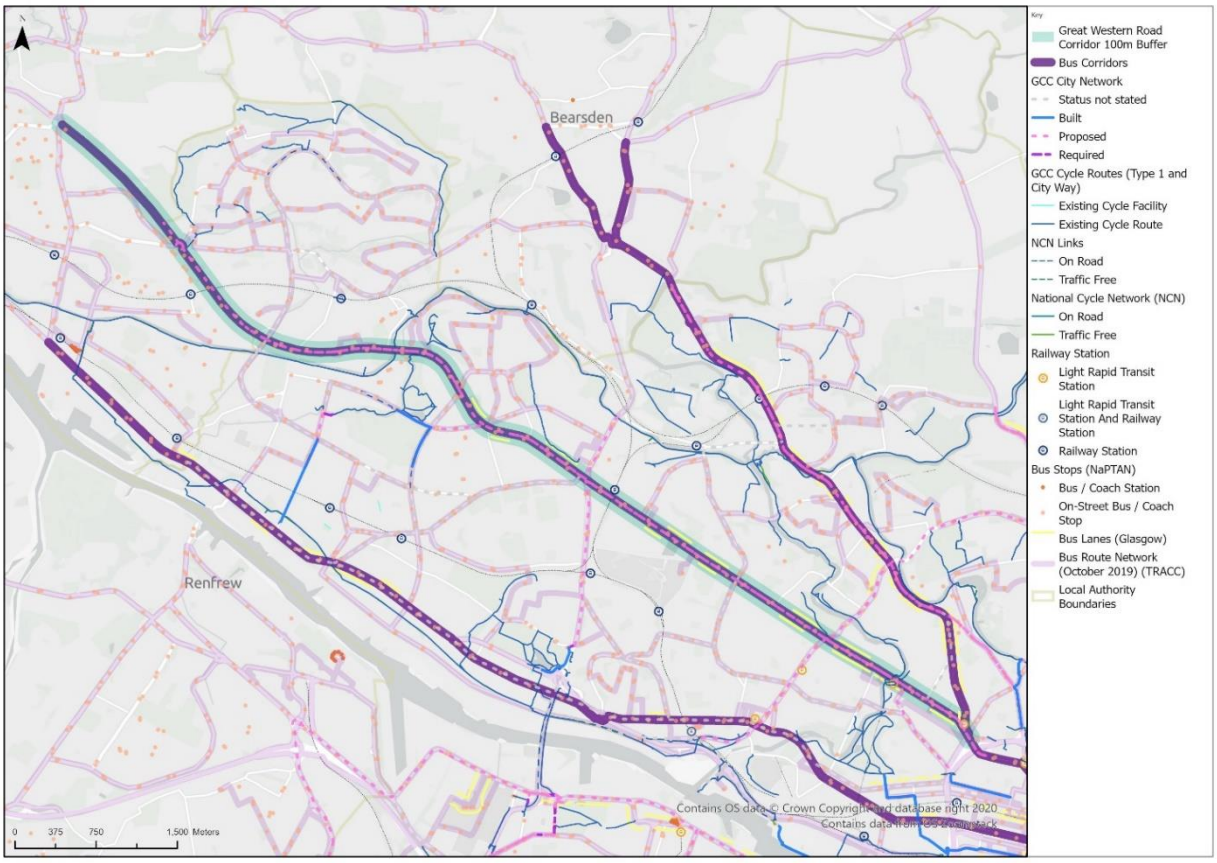
Bus Network and Service Provision

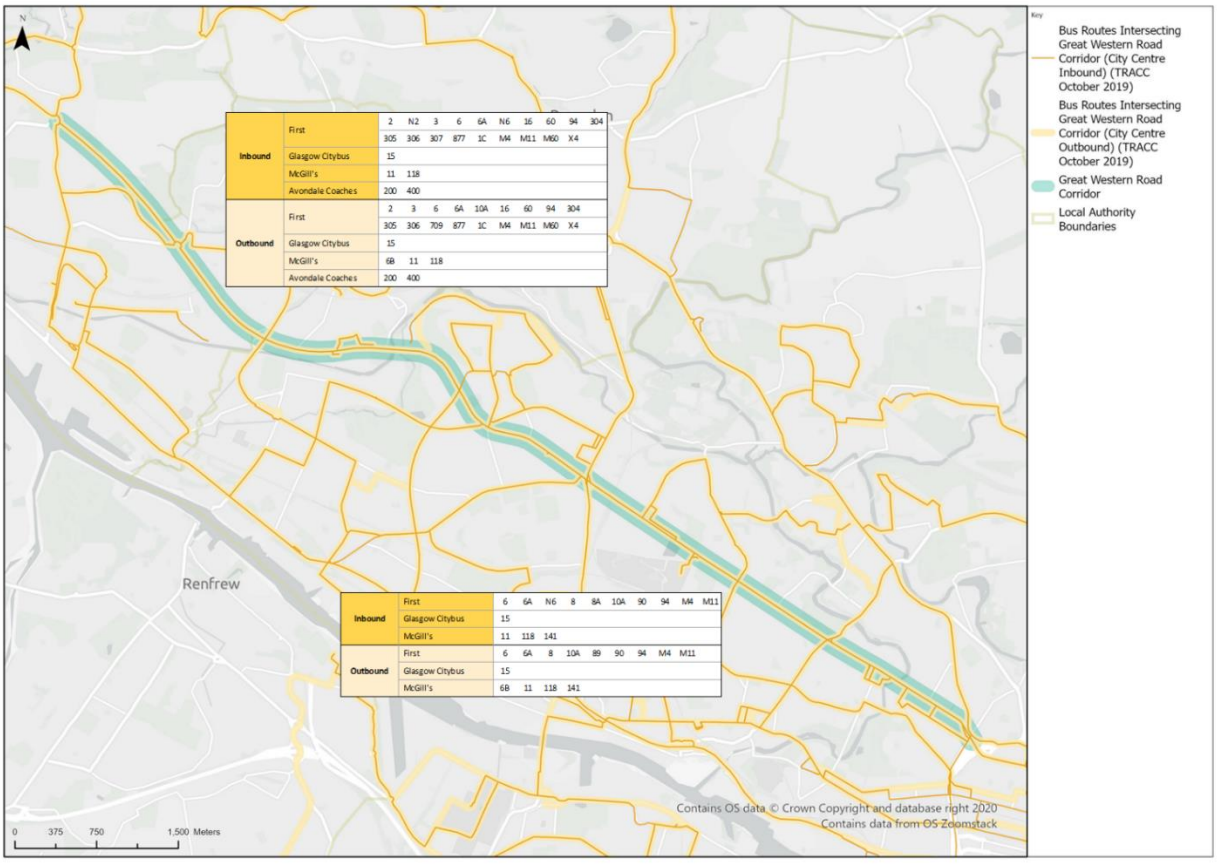
C1. Maryhill Road Corridor


Bearsden
Summerston
Cadder
High Possil
Milton
Gilshochill
Lambhill
Netherton
Temple
Dawsholm
Maryhill
Anniesland
Kelvindale
Wyndford
Ruchill
Parkhouse
Possil Park
Cowlairs
Scotstoun
Jordanhill
Hyndland
North Kelvin
Firhill
Broomhill
Partickhill
Dowanhill
Hillhead
Hamiltonhill
Woodside
Sighthill
Port Dundas
Woodlands
Shieldhall
Glasgow City Heliport
Kelvingrove
Kelvinhaugh
Finnieston
Cowcaddens
Garnethill
Contains OS data © Crown copyright and database right 2020
Contains data from OS Zoomstack
0 375 750 1,500 Meters
Key
Maryhill Road Corridor 100m Buffer
Bus Corridors
GCC City Network
Status not stated
Built
Proposed
Required
GCC Cycle Routes (Type 1 and City Way)
Existing Cycle Facility
Existing Cycle Route
NCN Links
On Road
Traffic Free
National Cycle Network (NCN)
On Road
Traffic Free
Railway Station
Light Rapid Transit Station
Light Rapid Transit Station And Railway Station
Railway Station
Bus Stops (NaPTAN)
Bus / Coach Station
On-Street Bus / Coach Stop
Bus Lanes (Glasgow)
Bus Route Network (October 2019) (TRACC)
Local Authority Boundaries


Bearsden
Inbound First 60
Glasgow Citybus 15 17
McGill's 118
Outbound First 60 N60
Glasgow Citybus 15 17
McGill's 68 118
Inbound First 10A C10 B10 60A
Outbound First 10A C10 B10 60A
Inbound First 60 60A 61 318 8 8A B10 C10 10A
Glasgow Citybus 17
Gibson Direct A1
Outbound First 60 94 60A 8 61 318 N60 8A B10 C10
Glasgow Citybus 17
McGill's A1
Inbound First 60 60A 8 61 90 318 8A M3 B10 C10 10A
Glasgow Citybus 17
Outbound First 89 90 60 94 60A 8 61 318 N60 8A M3 B10 C10
Glasgow Citybus 17
High Knightswood
Acre
Dawsholm
Parkhouse
Cowlairs
Jordanhill
Scotstoun
Whiteinch
Sighthill
Port Dundas
Shieldhall
Glasgow City Heliport
Kelvingrove
Kelvinhaugh
Finnieston
Contains OS data © Crown copyright and database right 2020
Contains data from OS Zoomstack
0 375 750 1,500 Meters
Key
Bus Routes Intersecting Maryhill Road Corridor (City Centre Inbound) (TRACC October 2019)
Bus Routes Intersecting Maryhill Road Corridor (City Centre Outbound) (TRACC October 2019)
Maryhill Road Corridor
Local Authority Boundaries

C2. Great Western Road Corridor

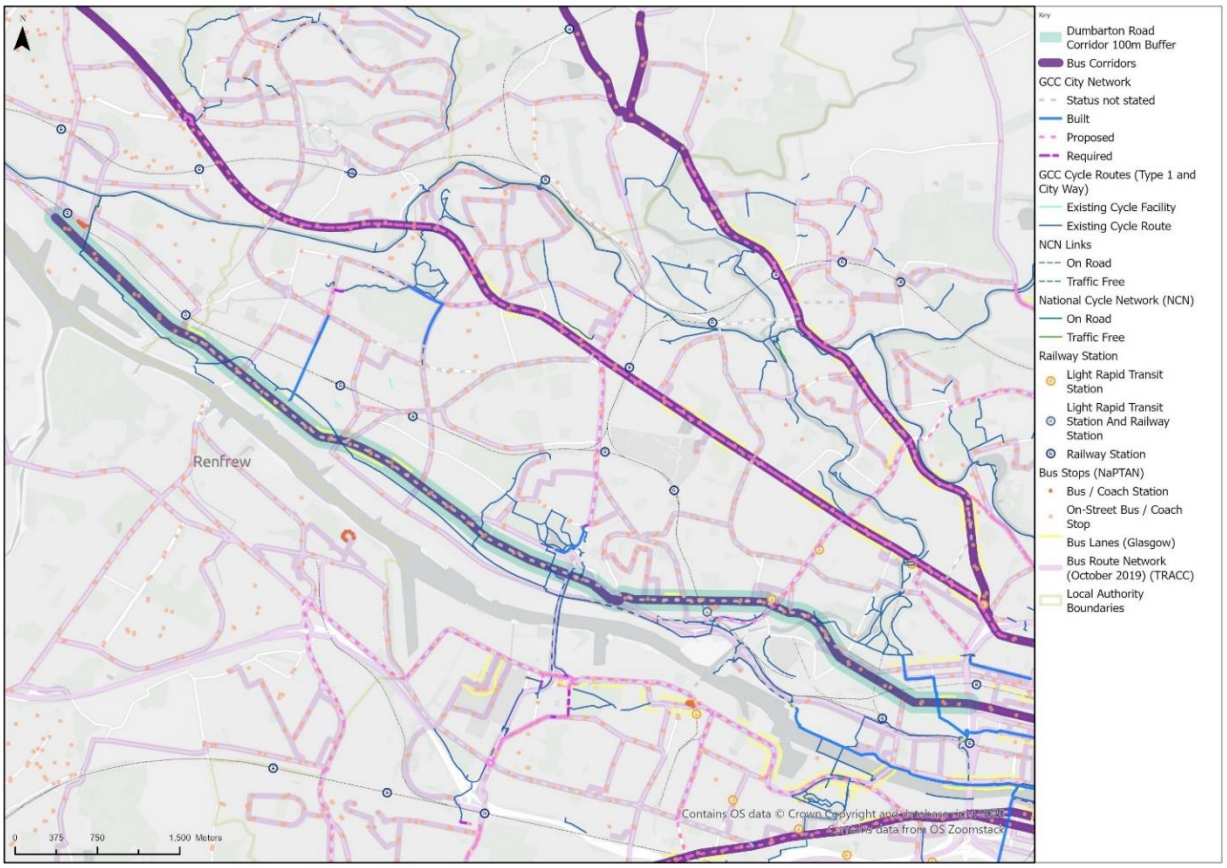


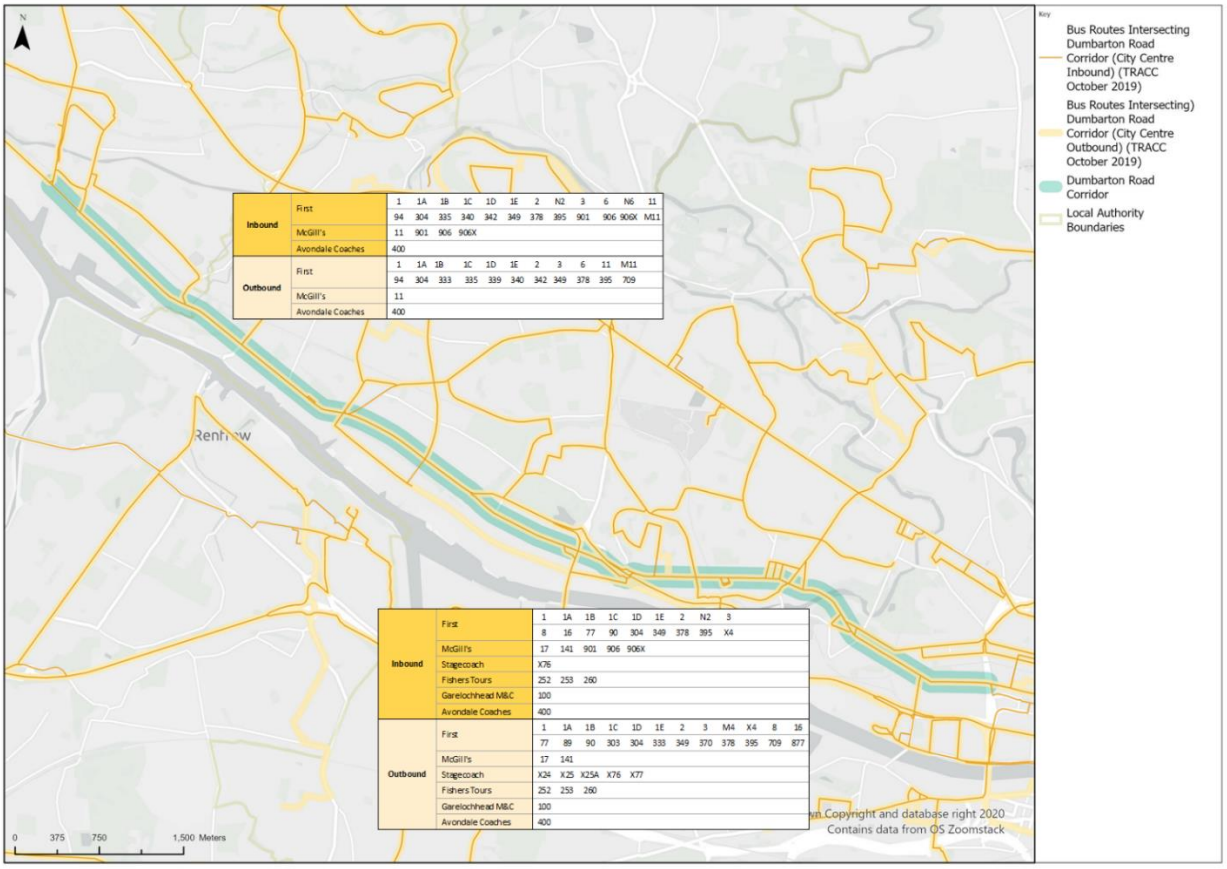


Inbound	First	2 N2 3 6 6A N6 16 60 94 304 305 306 307 877 1C M4 M11 M60 X4
	Glasgow Citybus	15
	McGill's	11 118
	Avondale Coaches	200 400
Outbound	First	2 3 6 6A 10A 16 60 94 304 305 306 709 877 1C M4 M11 M60 X4
	Glasgow Citybus	15
	McGill's	6B 11 118
	Avondale Coaches	200 400

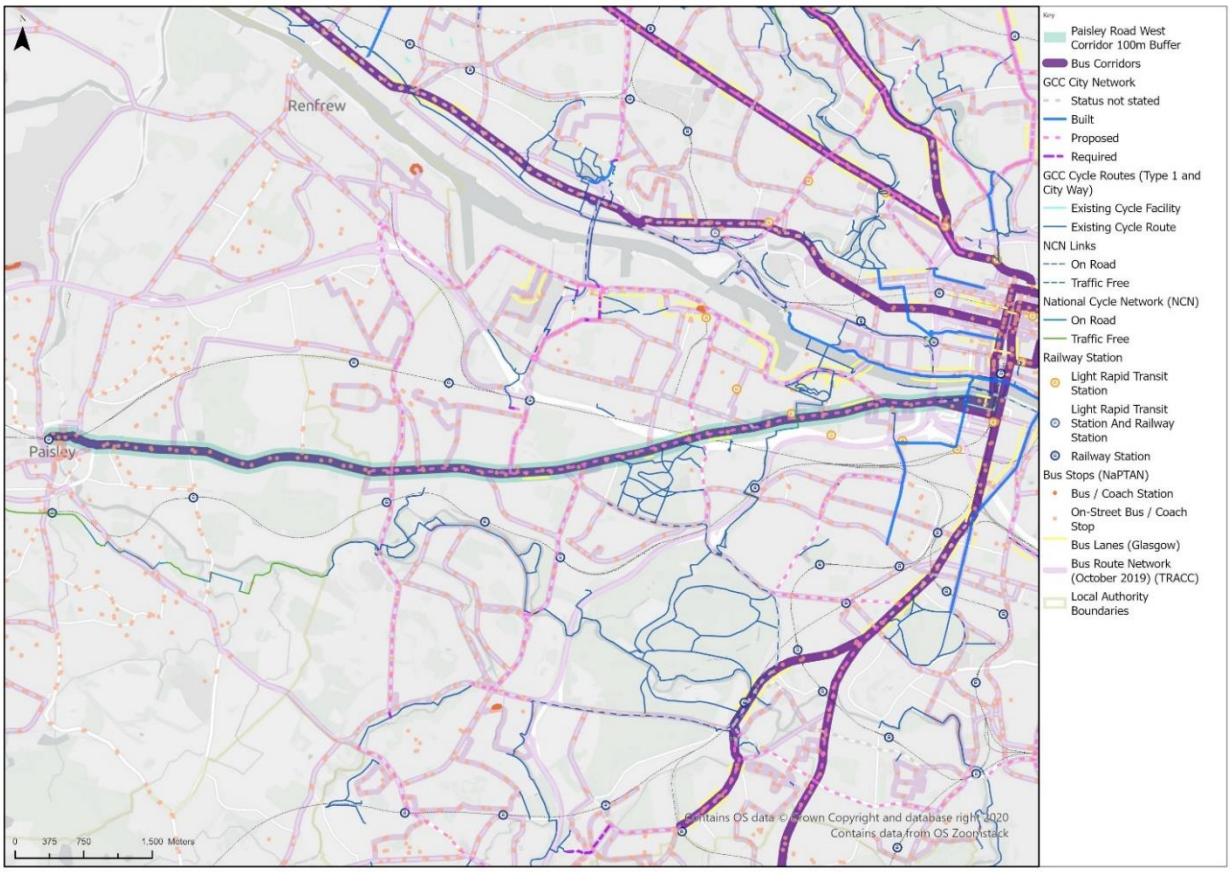
Inbound	First	6 6A N6 8 8A 10A 90 94 M4 M11
	Glasgow Citybus	15
	McGill's	11 118 141
Outbound	First	6 6A 8 10A 89 90 94 M4 M11
	Glasgow Citybus	15
	McGill's	6B 11 118 141

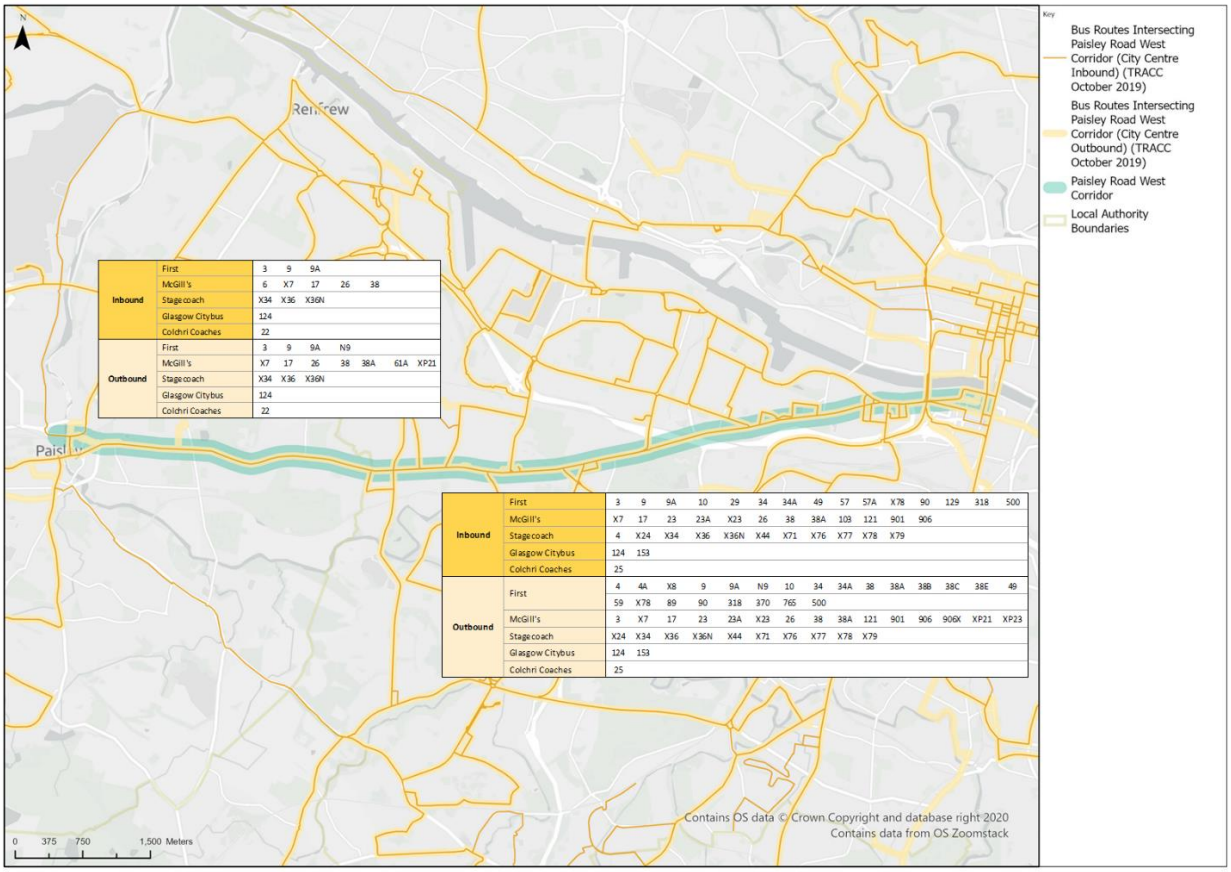
C3. Dumbarton Road Corridor





C4. Paisley Road West

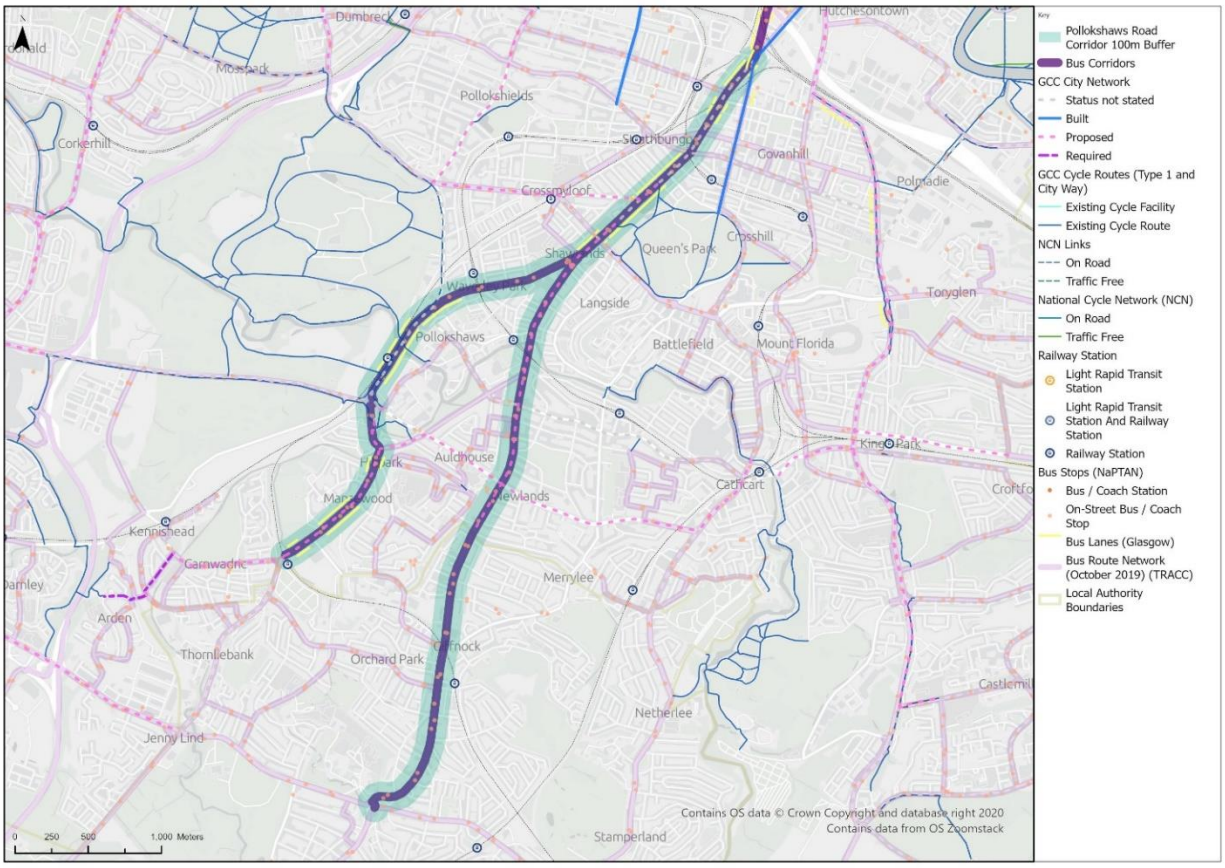


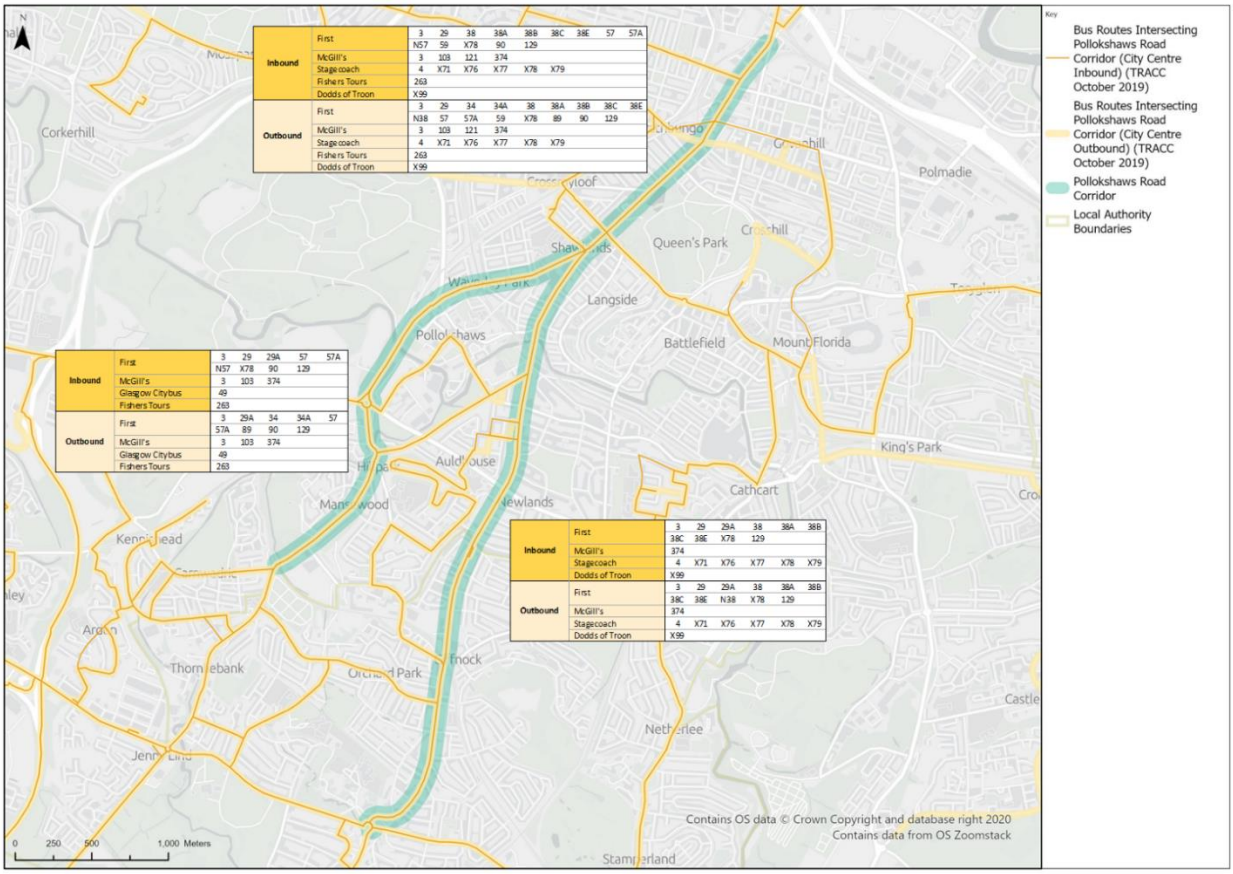


Inbound	First	3	9	9A			
	McGill's	6	X7	17	26	38	
	Stagecoach	X34	X36	X36N			
	Glasgow Citybus	124					
	Colchri Coaches	22					
Outbound	First	3	9	9A	N9		
	McGill's	X7	17	26	38	38A	61A XP21
	Stagecoach	X34	X36	X36N			
	Glasgow Citybus	124					
	Colchri Coaches	22					

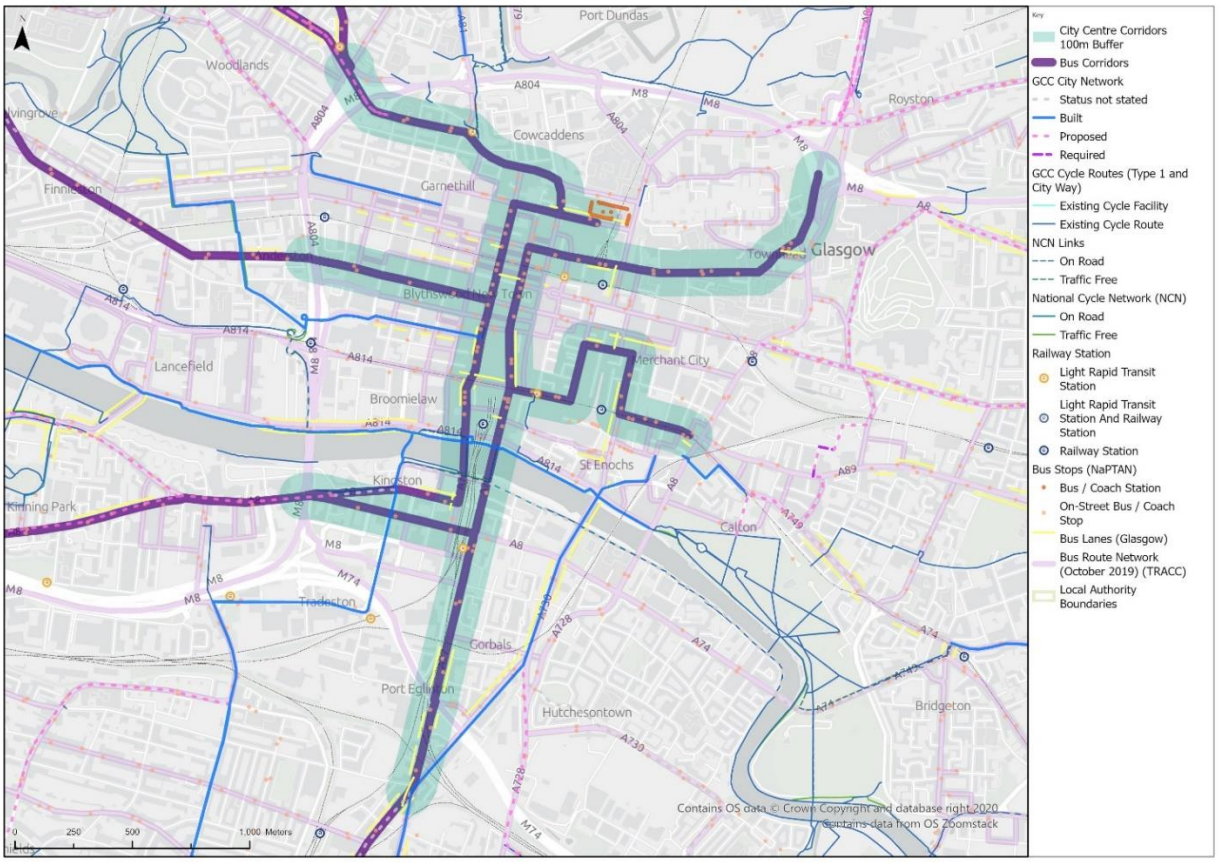
Inbound	First	3	9	9A	10	29	34	34A	49	57	57A	X78	90	129	318	500
	McGill's	X7	17	23	23A	X23	26	38	38A	103	121	901	906			
	Stagecoach	4	X24	X34	X36	X36N	X44	X71	X76	X77	X78	X79				
	Glasgow Citybus	124	153													
	Colchri Coaches	25														
Outbound	First	4	4A	X8	9	9A	N9	10	34	34A	38	38A	38B	38C	38E	49
		59	X78	89	90	318	370	765	500							
	McGill's	3	X7	17	23	23A	X23	26	38	38A	121	901	906	906X	XP21	XP23
	Stagecoach	X24	X34	X36	X36N	X44	X71	X76	X77	X78	X79					
	Glasgow Citybus	124	153													
	Colchri Coaches	25														

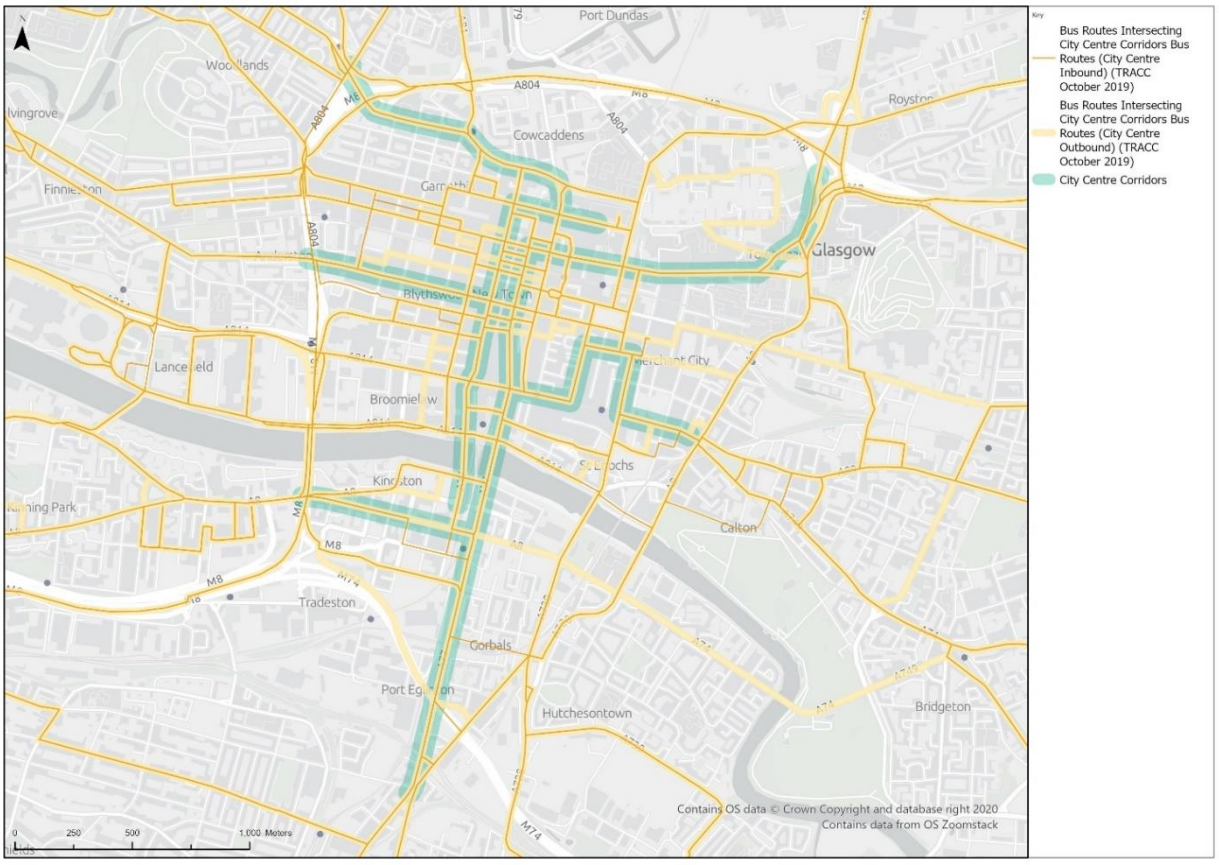
C5. Pollokshaws Road





City Centre Corridors



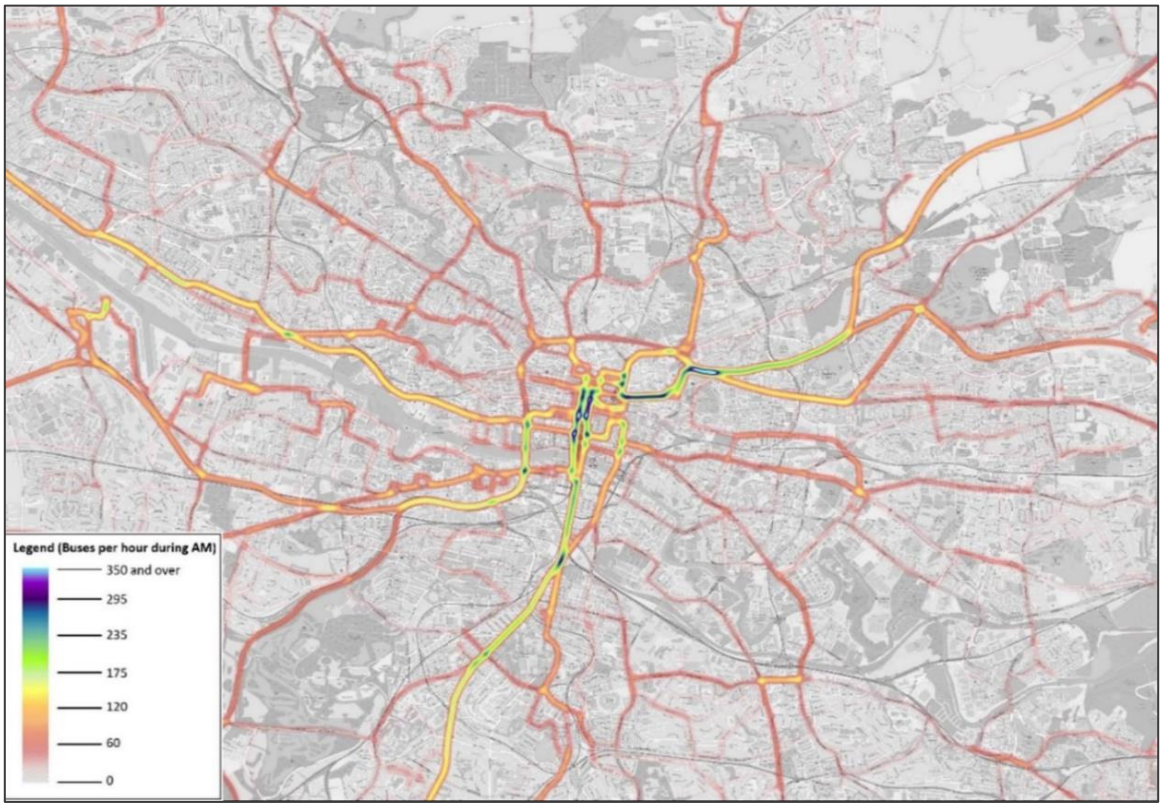


A significant number of services intersect the city centre corridors under consideration, these are detailed in the table below.

First																					
Inbound	1	2	3	4	6	7	9	10	18	19	21	29	38	57	59	60	61	64	75	77	
	129	240	255	263	267	314	318	378	395	500	877	19A	1A	1B	1C	1D	1E	38A	38B	38C	
	38E	4A	57A	60A	6A	7A	9A	M3	N2	N57	N6	X1	X11	X1A	X3	X4	X78	X85	X87	10A	
	B10	C10	X35	X36	X37																
Outbound	1	2	3	4	6	7	9	10	18	19	21	29	38	57	59	60	61	64	75	77	
	129	240	255	263	267	309	318	333	335	370	378	395	500	765	877	19A	1A	1B	1C	1D	
	1E	38A	38B	38C	38E	4A	57A	60A	6A	7A	9A	M3	N18	N2	N240	N267	N38	N6	N60	N9	
	X1	X11	X1A	X3	X4	X78	X8	X85	X87	10A	B10	C10	X35	X36	X37						
McGill's Bus Service																					
Inbound	3	17	23	26	38	64	68	72	103	901	906	23A	38A	71A	906X	X21	X23	X7			
Outbound	3	23	26	38	64	68	72	103	901	906	23A	38A	6B	71A	906X	X23	X7	XP21	XP23		
Stagecoach																					
Inbound	X24	4	X19	X25	X25A	X28	X34	X36	X36N	X44	X71	X74	X76	X77	X78	X79					
Outbound	X24	4	X19	X25	X25A	X28	X34	X36	X36N	X44	X71	X74	X76	X77	X78	X79					
Fishers Tours																					
Inbound	252	253	260	263																	
Outbound	252	253	260	263																	
Garelochhead Minibuses & Coaches																					
Inbound	100																				
Outbound	100																				
Glasgow Citybus																					
Inbound	15	17	153																		
Outbound	15	17	153	398																	
Stuart's Coaches																					
Inbound	240X	241X																			
Outbound	240X	241X																			
North Area Transport Association																					
Inbound																					
Outbound	CB1	CB4																			

Bus Service Frequencies

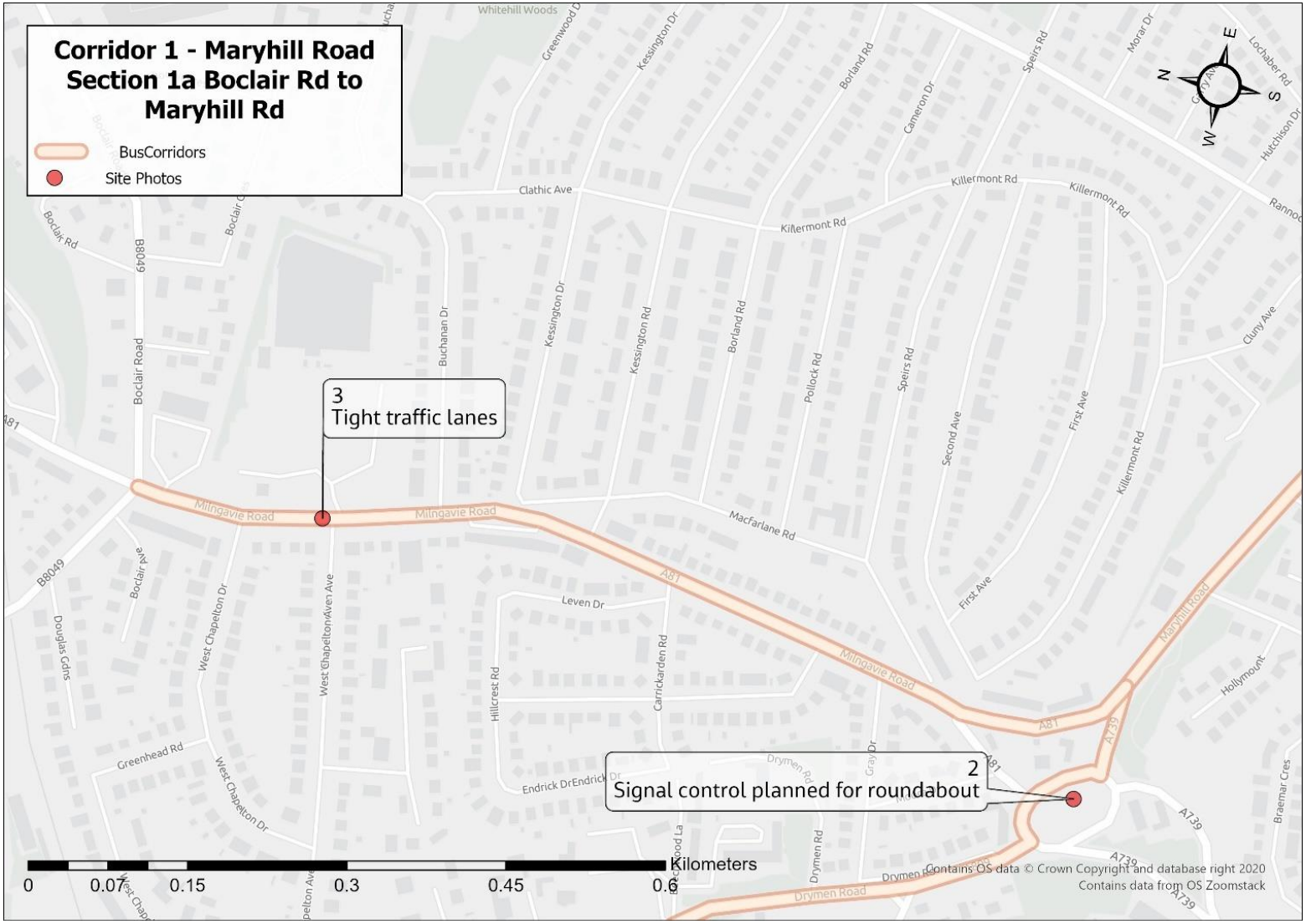
Figure 2.5 of Glasgow Bus Partnership Submission Report (April 2020), prepared by Aecom, represents bus volumes across key corridors as a heat map, illustrating that "the highest bus frequencies are in the city centre, with some route sections observing over 350 buses per hour (both directions). Arterial routes to the city also observe significant flows, some with over 120 buses per hour (i.e. at least 2 buses per minute).

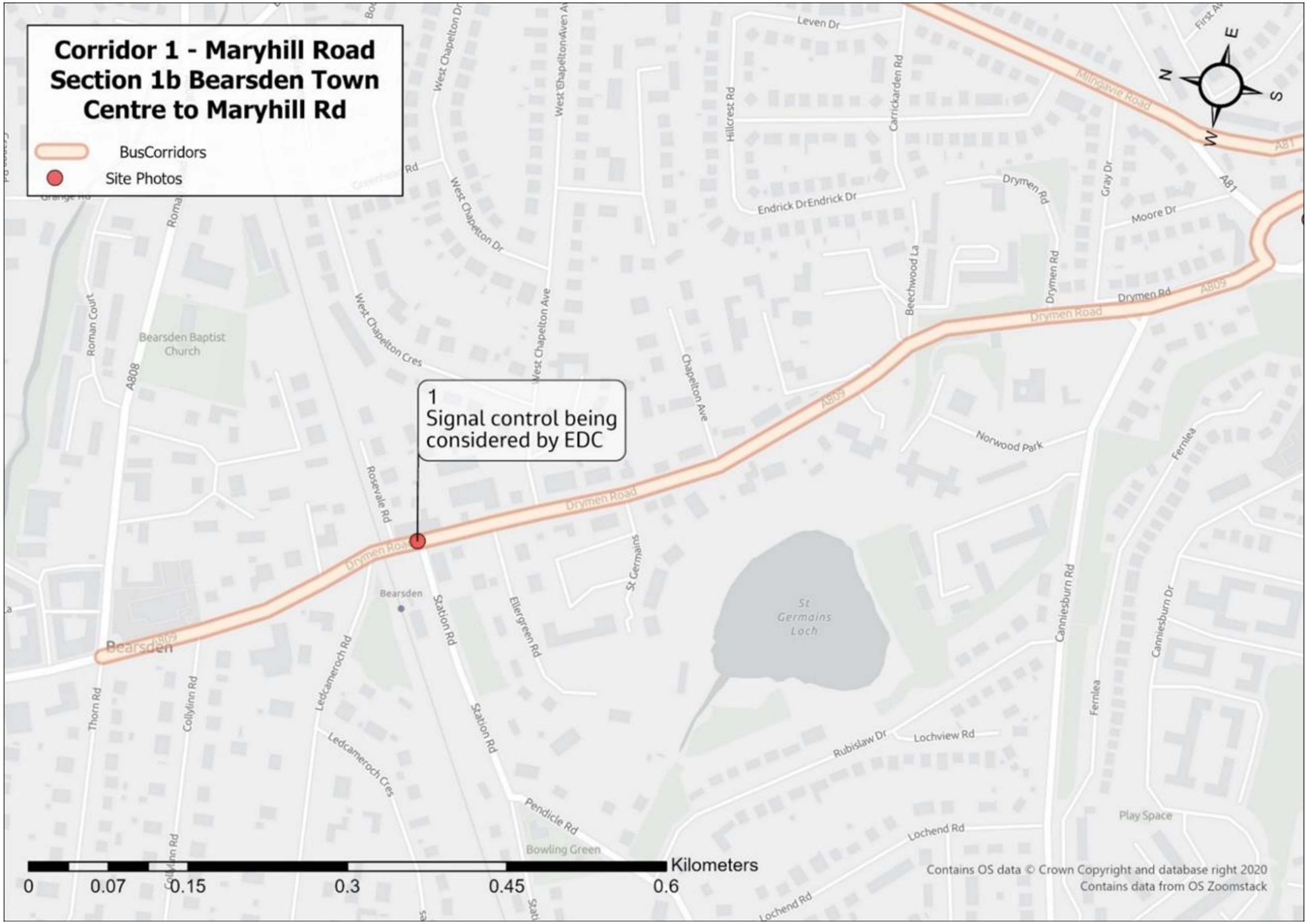


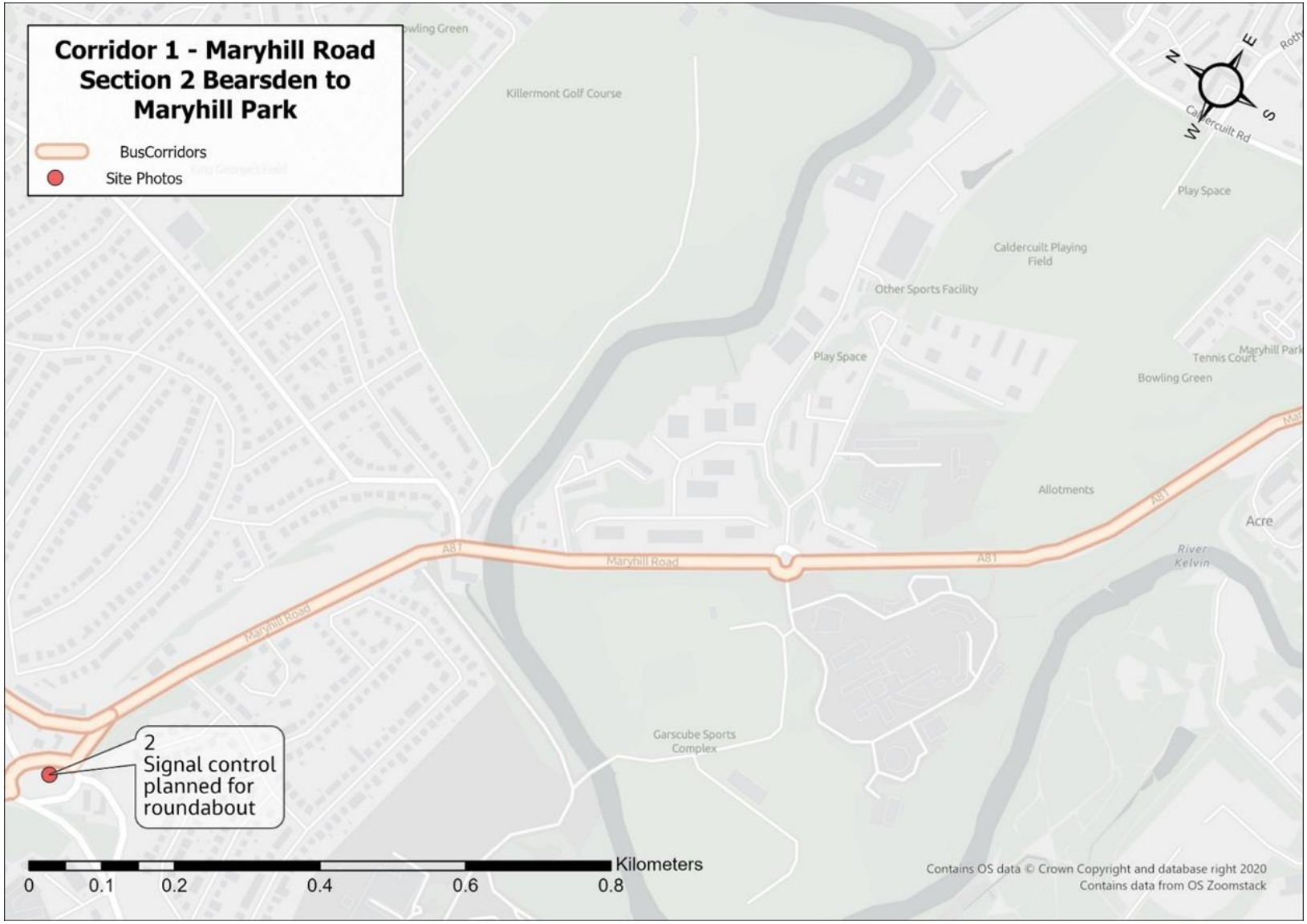
Appendix D. Existing Network Review

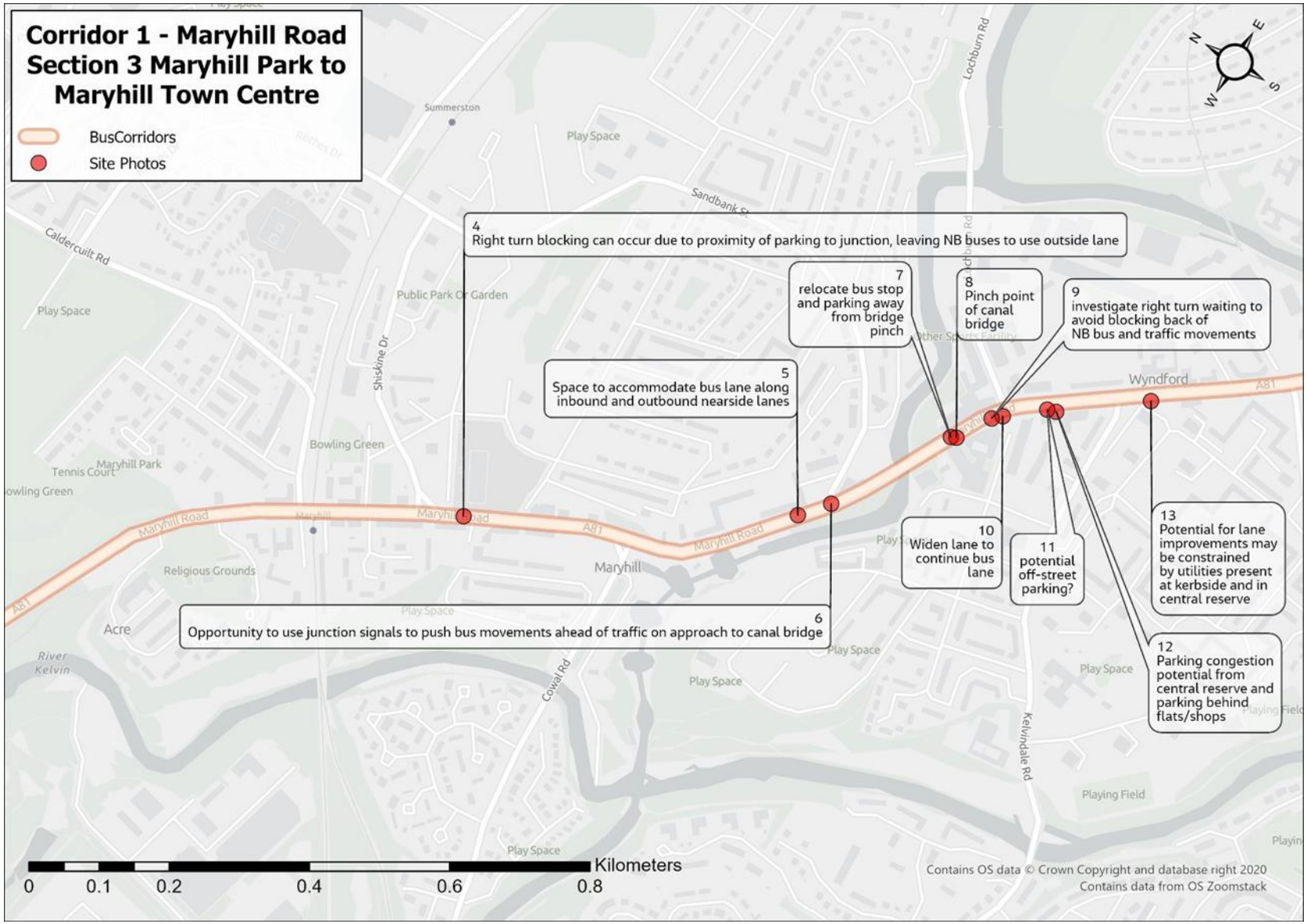
Appendix D details issues observed on each corridor which have been identified from extensive site visits.

Corridor 1 - Maryhill Road




Corridor 1 - Maryhill Road
Section 1b Bearsden Town Centre to Maryhill Rd
BusCorridors
Site Photos
1
Signal control being considered by EDC
Drymen Road
Station Rd
St Germains Loch
Bearsden
0 0.07 0.15 0.3 0.45 0.6 Kilometers
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack


Corridor 1 - Maryhill Road Section 2 Bearsden to Maryhill Park
BusCorridors
Site Photos
Killermont Golf Course
Play Space
Caldercuilt Playing Field
Other Sports Facility
Play Space
Tennis Court
Bowling Green
Allotments
Acre
River Kelvin
A81
Maryhill Road
Garscube Sports Complex
2
Signal control planned for roundabout
Kilometers
0
0.1
0.2
0.4
0.6
0.8
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack


Corridor 1 - Maryhill Road Section 3 Maryhill Park to Maryhill Town Centre
BusCorridors
Site Photos
4
Right turn blocking can occur due to proximity of parking to junction, leaving NB buses to use outside lane
5
Space to accommodate bus lane along inbound and outbound nearside lanes
6
Opportunity to use junction signals to push bus movements ahead of traffic on approach to canal bridge
7
relocate bus stop and parking away from bridge pinch
8
Pinch point of canal bridge
9
investigate right turn waiting to avoid blocking back of NB bus and traffic movements
10
Widen lane to continue bus lane
11
potential off-street parking?
12
Parking congestion potential from central reserve and parking behind flats/shops
13
Potential for lane improvements may be constrained by utilities present at kerbside and in central reserve
Maryhill Road
A81
Wyndford
Maryhill
Acre
Summerston
Bowling Green
Maryhill Park
Tennis Court
Religious Grounds
River Kelvin
Play Space
Playing Field
Lochburn Rd
Shiskine Dr
Cowal Rd
Kelvindale Rd
Caldercuilt Rd
Sandbank St
Kilometers
0
0.1
0.2
0.4
0.6
0.8
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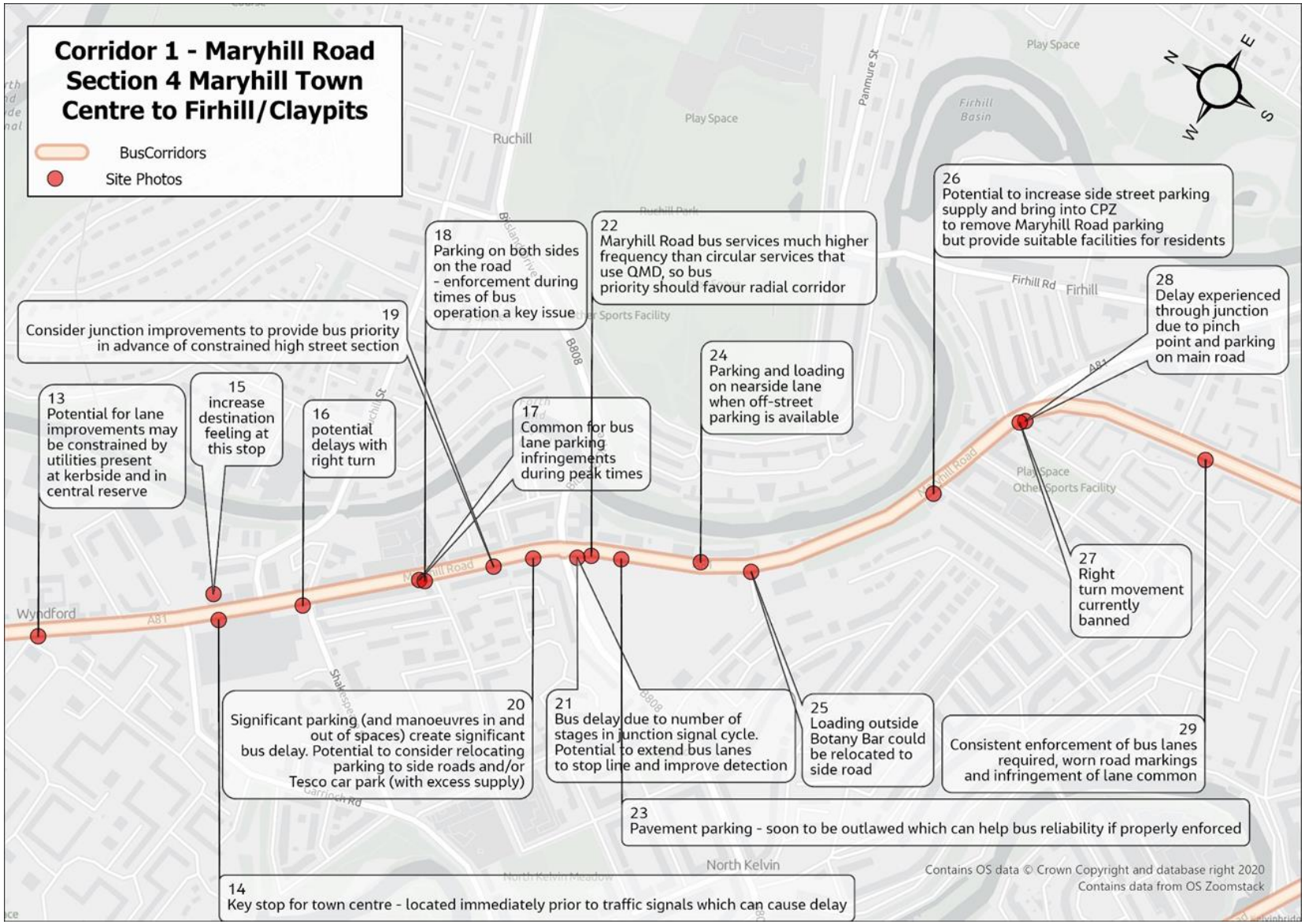
Ref	Comment	Image
4	Right turn blocking can occur due to proximity of parking to junction, leaving northbound buses to use outside lane.	
7	relocate bus stop and parking away from bridge pinch	
8	Pinch point of canal bridge	

Ref	Comment	Image
9	investigate right turn waiting to avoid blocking back of northbound bus and traffic movements	
11	potential off-street parking	
13	Potential for lane improvements may be constrained by utilities present at kerbside and in central reserve	


Corridor 1 - Maryhill Road
Section 4 Maryhill Town Centre to Firhill/Claypits
BusCorridors
Site Photos
13 Potential for lane improvements may be constrained by utilities present at kerbside and in central reserve
15 increase destination feeling at this stop
16 potential delays with right turn
17 Common for bus lane parking infringements during peak times
18 Parking on both sides on the road - enforcement during times of bus operation a key issue
19 Consider junction improvements to provide bus priority in advance of constrained high street section
20 Significant parking (and manoeuvres in and out of spaces) create significant bus delay. Potential to consider relocating parking to side roads and/or Tesco car park (with excess supply)
21 Bus delay due to number of stages in junction signal cycle. Potential to extend bus lanes to stop line and improve detection
22 Maryhill Road bus services much higher frequency than circular services that use QMD, so bus priority should favour radial corridor
23 Pavement parking - soon to be outlawed which can help bus reliability if properly enforced
24 Parking and loading on nearside lane when off-street parking is available
25 Loading outside Botany Bar could be relocated to side road
26 Potential to increase side street parking supply and bring into CPZ to remove Maryhill Road parking but provide suitable facilities for residents
27 Right turn movement currently banned
28 Delay experienced through junction due to pinch point and parking on main road
29 Consistent enforcement of bus lanes required, worn road markings and infringement of lane common
14 Key stop for town centre - located immediately prior to traffic signals which can cause delay
Wyndford
Ruchill
Firhill
North Kelvin
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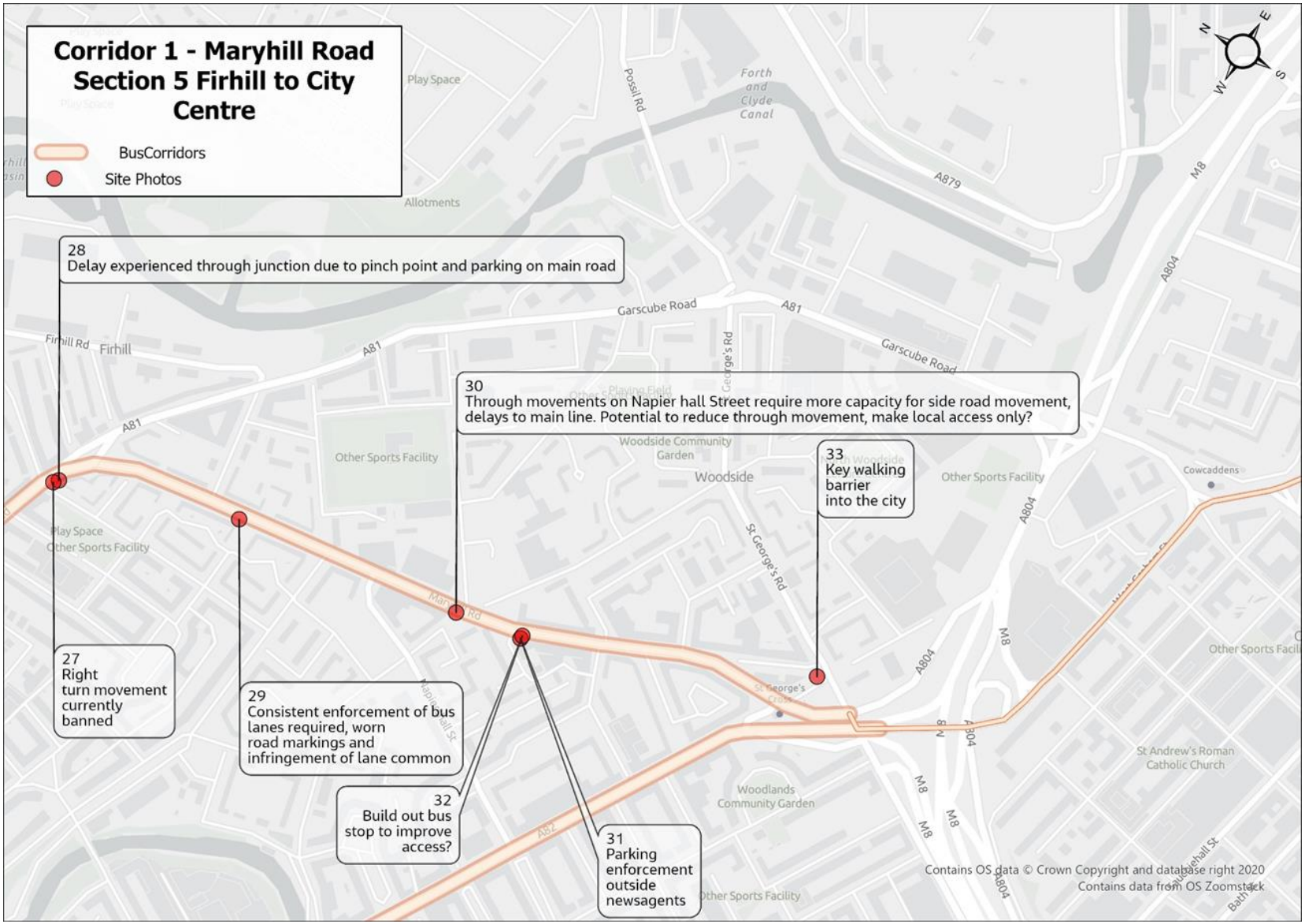
Ref	Comment	Image
14	Key stop for 'town centre' - located immediately prior to traffic signals which can cause delay	
15	Increase destination feeling at this stop	
16	Potential delays with right turn	

Ref	Comment	Image
17	Common for bus lane parking infringements during peak times	
18	Parking on both sides on the road - enforcement during times of bus operation a key issue	
19	Consider junction improvements to provide bus priority in advance of constrained high street section	

Ref	Comment	Image
20	Significant parking (and manoeuvres in and out of spaces) create significant bus delay. Potential to consider relocating parking to side roads and/or Tesco car park (with excess supply)	
21	Bus delay due to number of stages in junction signal cycle. Potential to extend bus lanes to stop line and improve detection	
22	Maryhill Road bus services much higher frequency than circular services that use Queen Margaret Drive, so bus priority should favour radial corridor	

Ref	Comment	Image
23	Pavement parking - soon to be outlawed which can help bus reliability if properly enforced	
24	Parking and loading on nearside lane when off-street parking is available	
25	Loading outside Botany Bar could be relocated to side road	

Ref	Comment	Image
26	Potential to increase side street parking supply and bring into Controlled Parking Zone (CPZ) to remove Maryhill Road parking but provide suitable facilities for residents	
27	Right turn movement currently banned	


Corridor 1 - Maryhill Road Section 5 Firhill to City Centre
BusCorridors
Site Photos
28
Delay experienced through junction due to pinch point and parking on main road
30
Through movements on Napier hall Street require more capacity for side road movement, delays to main line. Potential to reduce through movement, make local access only?
33
Key walking barrier into the city
27
Right turn movement currently banned
29
Consistent enforcement of bus lanes required, worn road markings and infringement of lane common
32
Build out bus stop to improve access?
31
Parking enforcement outside newsagents
Garscube Road
A81
Firhill Rd
Firhill
Woodside
Woodside Community Garden
Other Sports Facility
Play Space
Allotments
Possil Rd
Forth and Clyde Canal
A879
M8
A804
George's Rd
St George's Rd
Cowcaddens
Woodlands Community Garden
St Andrew's Roman Catholic Church
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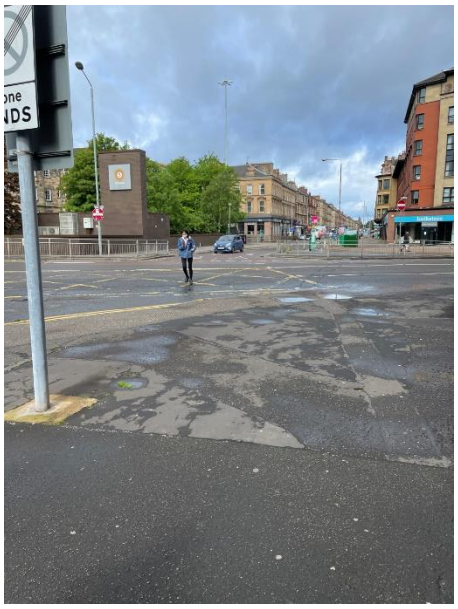
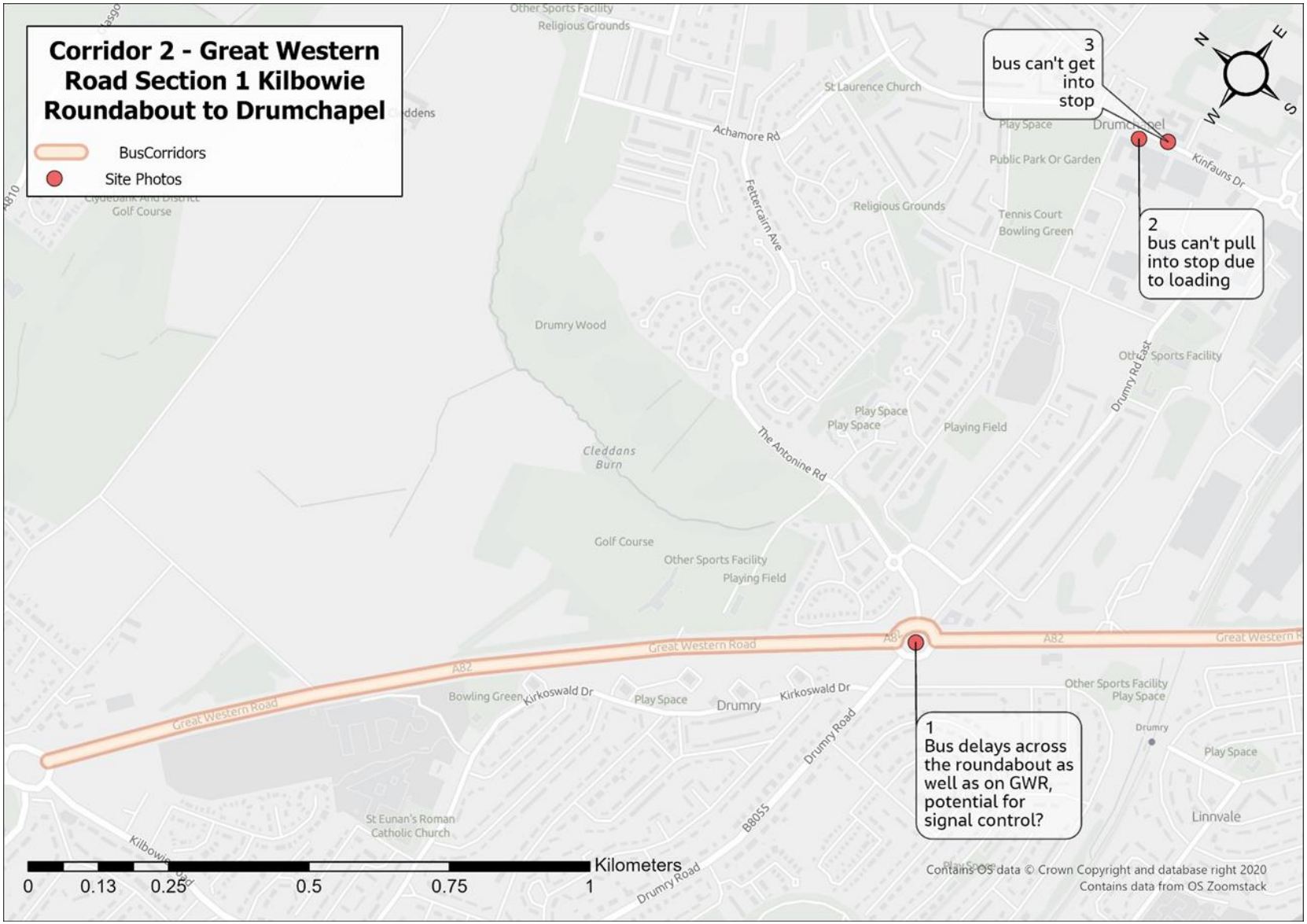
Contains data from OS Zoomstack

Ref	Comment	Image
32	Build out bus stop to improve access	
33	Key walking barrier into the city	


Corridor 2 - Great Western Road Section 1 Kilbowie Roundabout to Drumchapel
BusCorridors
Site Photos
3
bus can't get into stop
2
bus can't pull into stop due to loading
1
Bus delays across the roundabout as well as on GWR, potential for signal control?
Achamore Rd
St Laurence Church
Religious Grounds
Play Space
Public Park Or Garden
Kinfauns Dr
Fettercairn Ave
Tennis Court
Bowling Green
Drumry Wood
Drumry Rd East
Other Sports Facility
Play Space
Play Space
Playing Field
The Antonine Rd
Cleddans Burn
Golf Course
Other Sports Facility
Playing Field
Great Western Road
A82
Bowling Green
Kirkoswald Dr
Play Space
Drumry
Kirkoswald Dr
Drumry Road
B8055
St Eunan's Roman Catholic Church
Linnvale
Kilometers
0
0.13
0.25
0.5
0.75
1
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Contains data from OS Zoomstack

Ref	Comment	Image
2	Bus cannot pull into stop due to loading	
3	Bus cannot get into stop	


Corridor 2 - Great Western Road Section 2 Drumchapel to Knightswood
BusCorridors
Site Photos
St Benedict's Roman Catholic Church
Drumchapel
Garscadden Rd
Old Drumchapel
Playing Field
Other Sports Facility
Blairdardis
Play Space
Great Western Road
Duntreath Ave
A82
Forth and Clyde Canal
Archerhill Rd
Garscadden Burn
Kelso St
Dyke Rd
Kilometers
0 0.1 0.2 0.4 0.6 0.8
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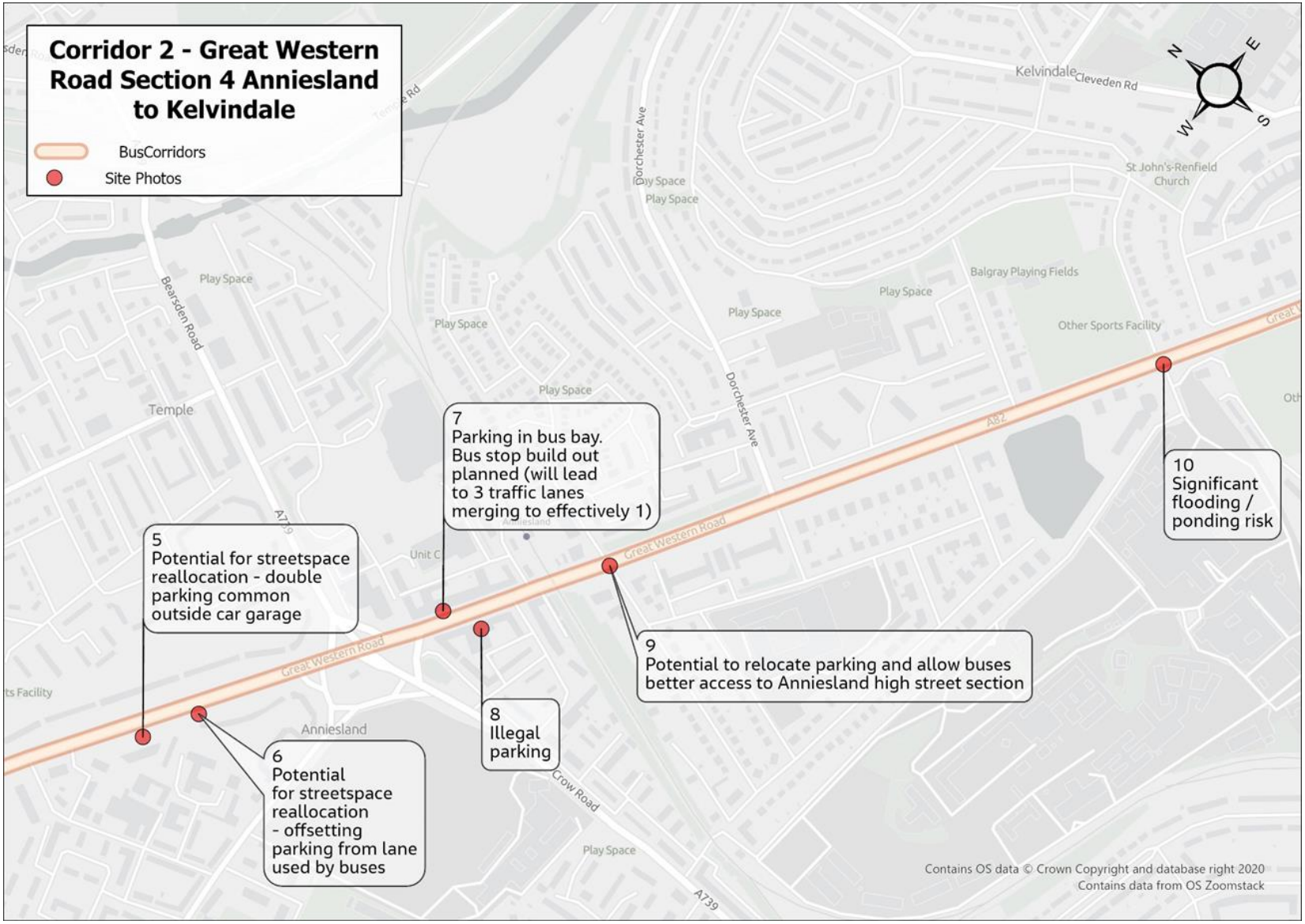
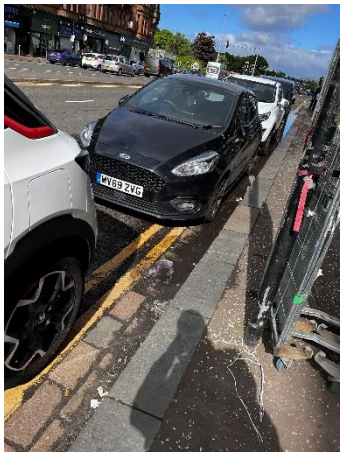
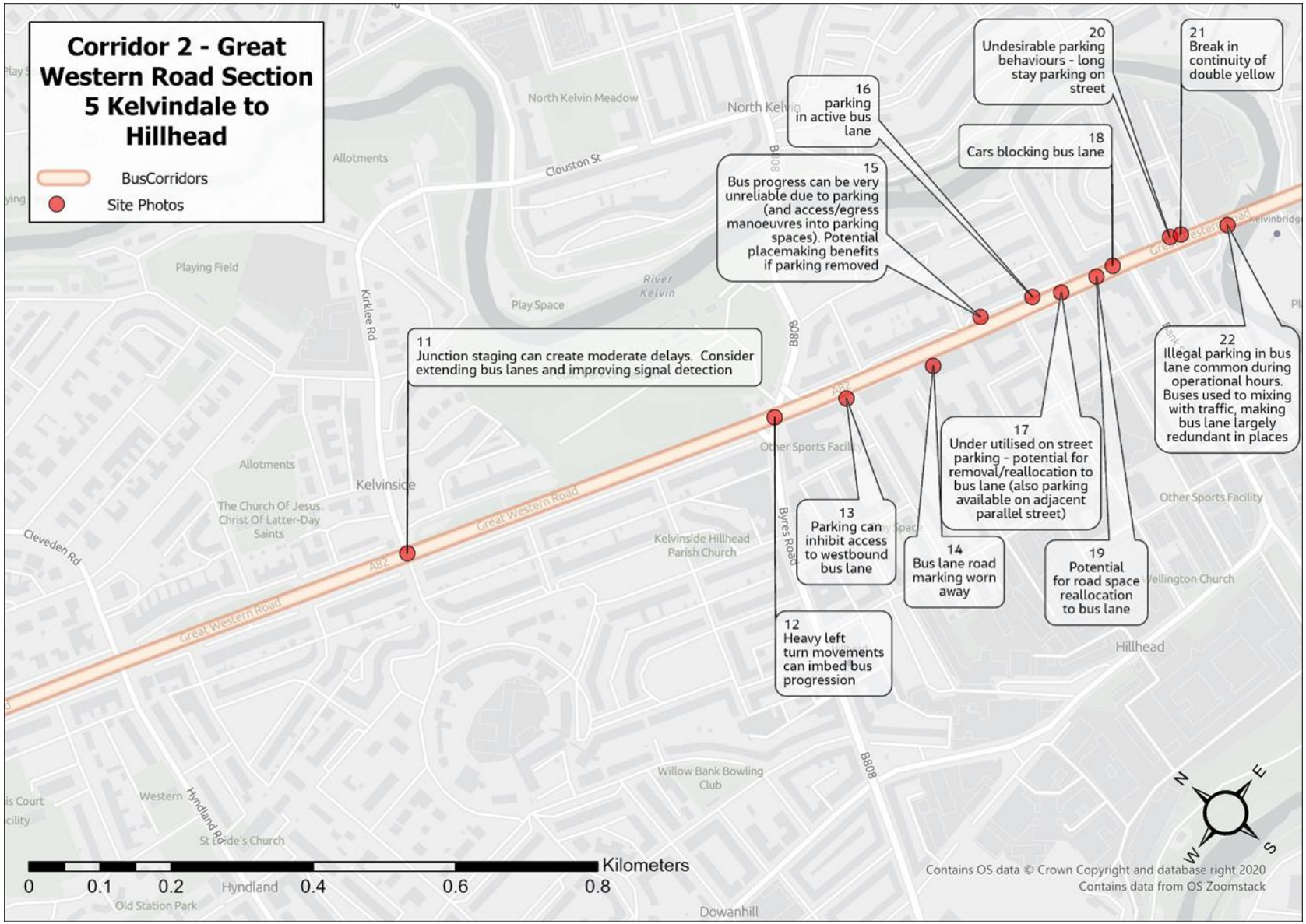
Contains data from OS Zoomstack


Corridor 2 - Great Western Road Section 3 Knightswood
BusCorridors
Site Photos
5
Potential for streetspace reallocation - double parking common outside car garage
6
Potential for streetspace reallocation - offsetting parking from lane used by buses
4
Spaces for People scheme potentially to remain on nearside lane
Netherton
Temple Recreation Ground
Play Space
Play Space
Other Sports Facility
Other Sports Facility
Knightscliffe Ave
Public Park Or Garden
High Knightswood
Allotments
A82
St Ninian's Roman Catholic Church
Great Western Road
Religious Grounds
Knightswood Rd
Anniesland Rd
Bowling Green
Glasgow Academical Athletic Ground
Tennis Court
Other Sports Facility
Tennis Court
Bowling Green
Play Space
Other Sports Facility
Kilometers
0
0.1
0.2
0.4
0.6
0.8
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
5	Potential for streetspace reallocation - double parking common outside car garage	
6	Potential for streetspace reallocation - offsetting parking from lane used by buses	


Corridor 2 - Great Western Road Section 4 Anniesland to Kelvindale
BusCorridors
Site Photos
5
Potential for streetspace reallocation - double parking common outside car garage
6
Potential for streetspace reallocation - offsetting parking from lane used by buses
7
Parking in bus bay. Bus stop build out planned (will lead to 3 traffic lanes merging to effectively 1)
8
Illegal parking
9
Potential to relocate parking and allow buses better access to Anniesland high street section
10
Significant flooding / ponding risk
Great Western Road
Anniesland
Temple
Kelvindale
Cleveden Rd
Bearsden Road
Dorchester Ave
Crow Road
A739
A82
St John's-Renfield Church
Balgray Playing Fields
Other Sports Facility
Play Space
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
7	Parking in bus bay. Bus stop build out planned (will lead to 3 traffic lanes merging to effectively 1)	
8	Illegal parking	


Corridor 2 - Great Western Road Section 5 Kelvindale to Hillhead
BusCorridors
Site Photos
11
Junction staging can create moderate delays. Consider extending bus lanes and improving signal detection
12
Heavy left turn movements can imbed bus progression
13
Parking can inhibit access to westbound bus lane
14
Bus lane road marking worn away
15
Bus progress can be very unreliable due to parking (and access/egress manoeuvres into parking spaces). Potential placemaking benefits if parking removed
16
parking in active bus lane
17
Under utilised on street parking - potential for removal/reallocation to bus lane (also parking available on adjacent parallel street)
18
Cars blocking bus lane
19
Potential for road space reallocation to bus lane
20
Undesirable parking behaviours - long stay parking on street
21
Break in continuity of double yellow
22
Illegal parking in bus lane common during operational hours. Buses used to mixing with traffic, making bus lane largely redundant in places
Kelvinside
Great Western Road
A82
B808
Byres Road
Kirklee Rd
Clouston St
Cleveden Rd
Hyndland Rd
North Kelvin Meadow
Allotments
Playing Field
Play Space
River Kelvin
The Church Of Jesus Christ Of Latter-Day Saints
Kelvinside Hillhead Parish Church
Other Sports Facility
Willow Bank Bowling Club
Hillhead
Dowanhill
Hyndland
Old Station Park
St Bride's Church
Kilometers
0
0.1
0.2
0.4
0.6
0.8
N
E
S
W
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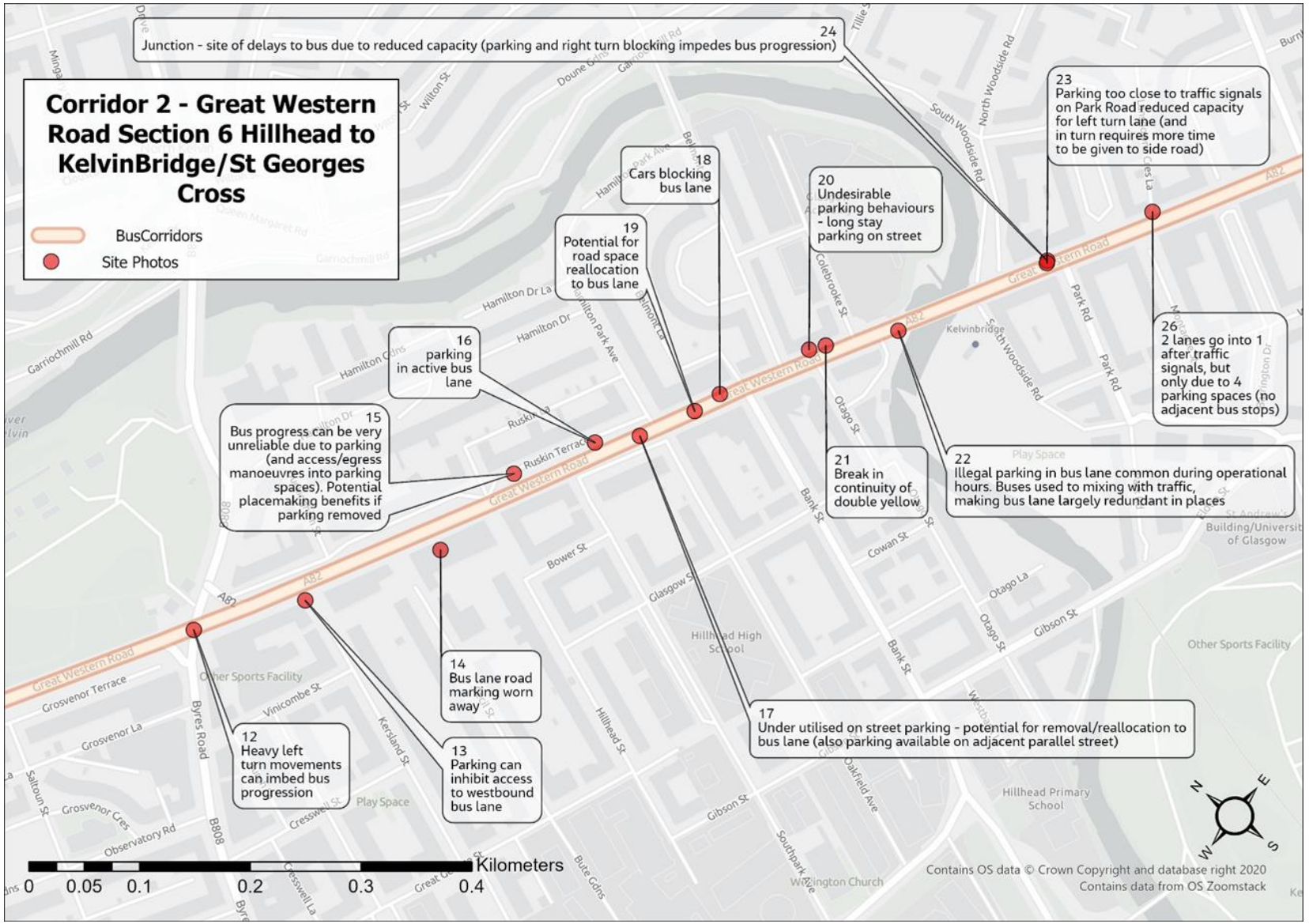
Contains data from OS Zoomstack

Ref	Comment	Image
13	Parking can inhibit access to westbound bus lane	
14	Bus lane road marking worn away	
15	Bus progress can be very unreliable due to parking (and access/egress manoeuvres into parking spaces). Potential placemaking benefits if parking removed	

Ref	Comment	Image
16	Parking in active bus lane	
17	Under-utilised on street parking - potential for removal/reallocation to bus lane (also parking available on adjacent parallel street)	
18	Cars blocking bus lane	

Ref	Comment	Image
19	Potential for road space reallocation to bus lane	
20	Undesirable parking behaviours - long stay parking on street	
21	Break in continuity of double yellow lines	

Ref	Comment	Image
22	Illegal parking in bus lane common during operational hours. Buses used to mixing with traffic, making bus lane largely redundant in places	


Corridor 2 - Great Western Road Section 6 Hillhead to KelvinBridge/St Georges Cross
BusCorridors
Site Photos
24
Junction - site of delays to bus due to reduced capacity (parking and right turn blocking impedes bus progression)
23
Parking too close to traffic signals on Park Road reduced capacity for left turn lane (and in turn requires more time to be given to side road)
18
Cars blocking bus lane
19
Potential for road space reallocation to bus lane
20
Undesirable parking behaviours - long stay parking on street
26
2 lanes go into 1 after traffic signals, but only due to 4 parking spaces (no adjacent bus stops)
16
parking in active bus lane
15
Bus progress can be very unreliable due to parking (and access/egress manoeuvres into parking spaces). Potential placemaking benefits if parking removed
21
Break in continuity of double yellow
22
Illegal parking in bus lane common during operational hours. Buses used to mixing with traffic, making bus lane largely redundant in places
14
Bus lane road marking worn away
12
Heavy left turn movements can imbed bus progression
13
Parking can inhibit access to westbound bus lane
17
Under utilised on street parking - potential for removal/reallocation to bus lane (also parking available on adjacent parallel street)
Kilometers
0 0.05 0.1 0.2 0.3 0.4
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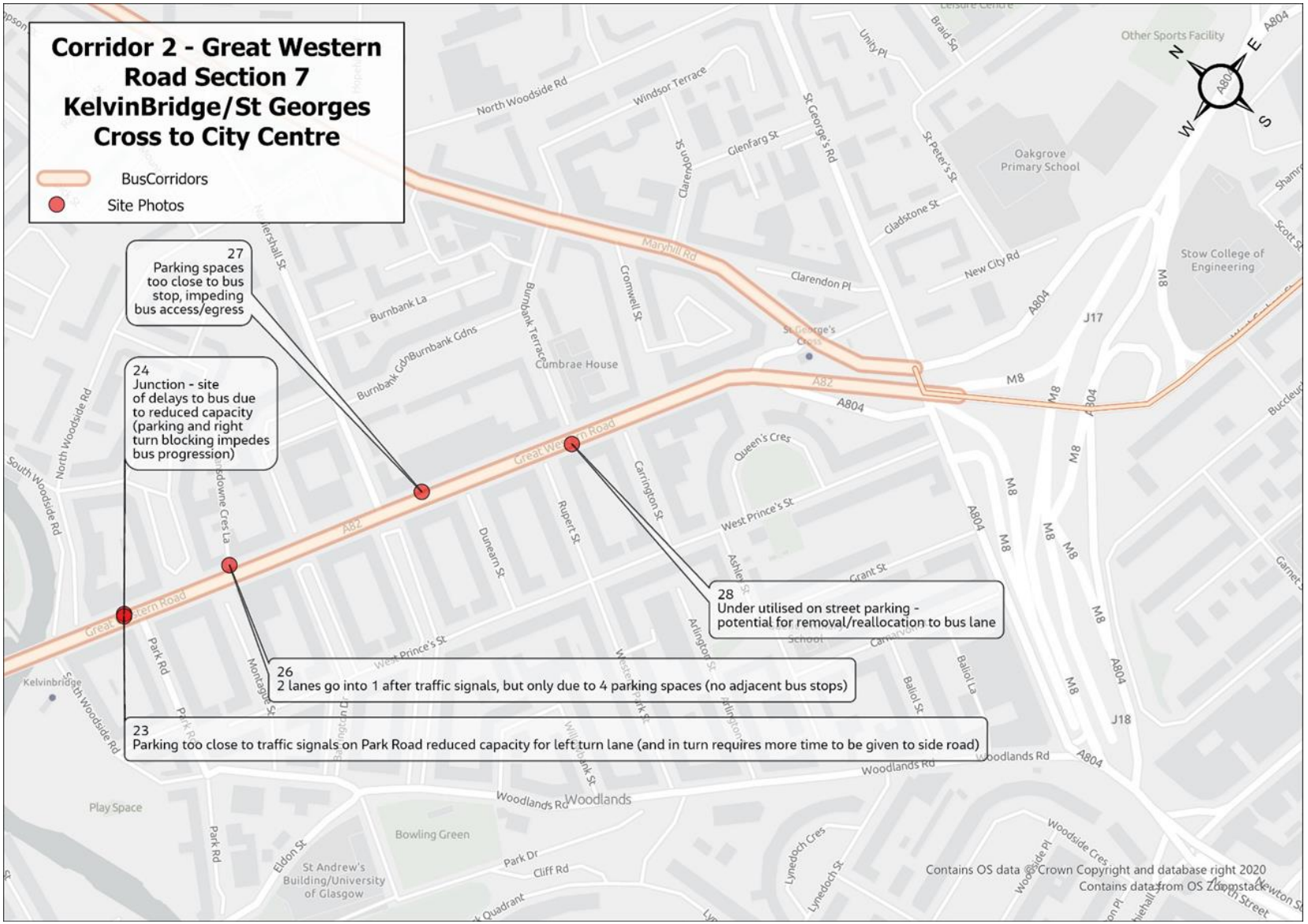
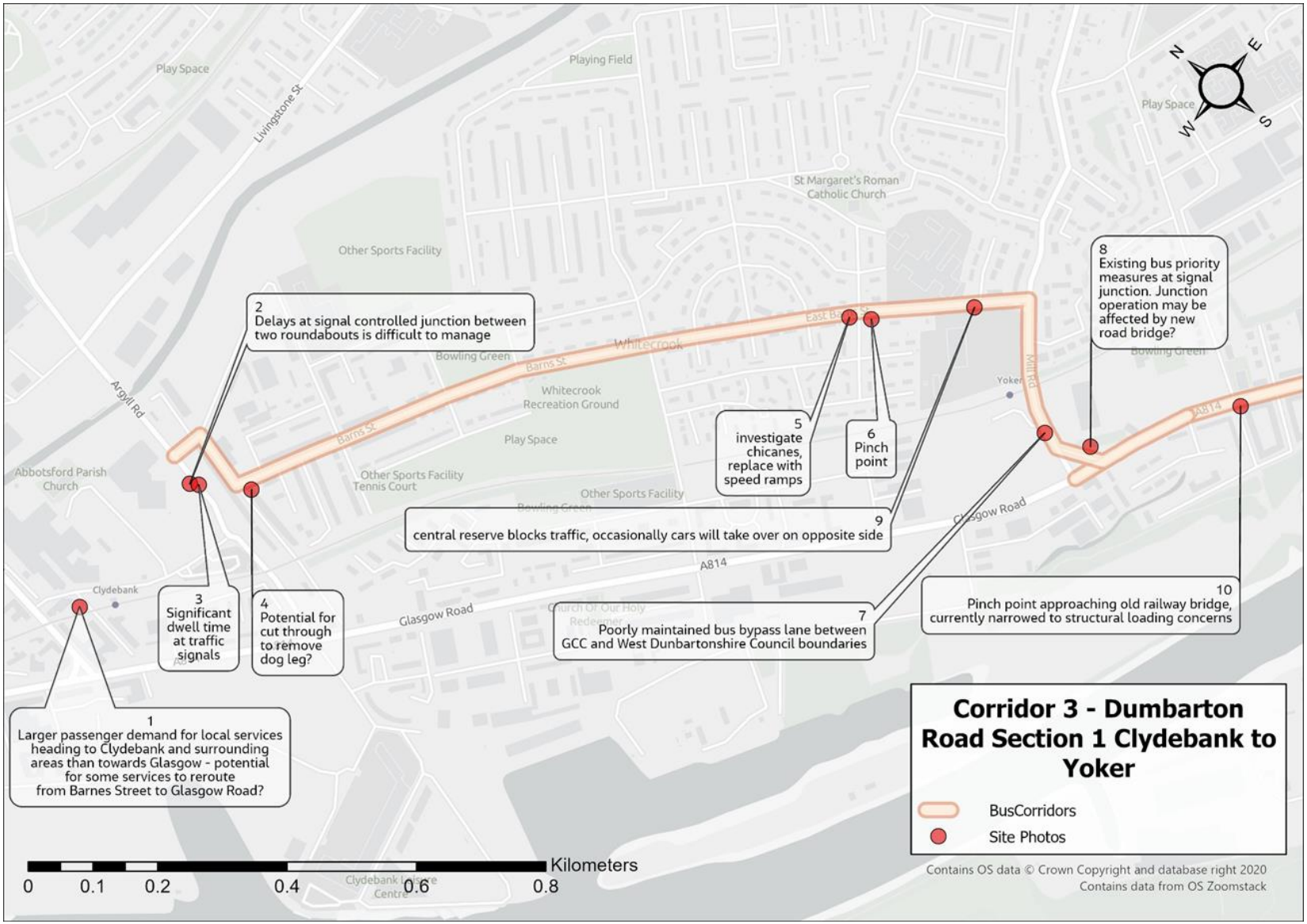
Ref	Comment	Image
23	Parking too close to traffic signals on Park Road reduced capacity for left turn lane (and in turn requires more time to be given to side road)	
24	Junction - site of delays to bus due to reduced capacity (parking and right turn blocking impedes bus progression)	
26	2 lanes go into 1 after traffic signals, but only due to 4 parking spaces (no adjacent bus stops)	


Corridor 2 - Great Western Road Section 7 KelvinBridge/St Georges Cross to City Centre
BusCorridors
Site Photos
27
Parking spaces too close to bus stop, impeding bus access/egress
24
Junction - site of delays to bus due to reduced capacity (parking and right turn blocking impedes bus progression)
28
Under utilised on street parking - potential for removal/reallocation to bus lane
26
2 lanes go into 1 after traffic signals, but only due to 4 parking spaces (no adjacent bus stops)
23
Parking too close to traffic signals on Park Road reduced capacity for left turn lane (and in turn requires more time to be given to side road)
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
27	Parking spaces too close to bus stop, impeding bus access/egress	
28	Under-utilised on street parking - potential for removal/reallocation to bus lane	


Play Space
Livingstone St
Playing Field
St Margaret's Roman Catholic Church
Other Sports Facility
Whitecrook
Bowling Green
Barns St
Whitecrook Recreation Ground
Play Space
Argyll Rd
Abbotsford Parish Church
Other Sports Facility Tennis Court
Other Sports Facility
Bowling Green
Clydebank
Glasgow Road
A814
Church Of Our Holy Redeemer
Yoker
Mill Rd
Clydebank Leisure Centre
2
Delays at signal controlled junction between two roundabouts is difficult to manage
3
Significant dwell time at traffic signals
4
Potential for cut through to remove dog leg?
5
investigate chicanes, replace with speed ramps
6
Pinch point
7
Poorly maintained bus bypass lane between GCC and West Dunbartonshire Council boundaries
8
Existing bus priority measures at signal junction. Junction operation may be affected by new road bridge?
9
central reserve blocks traffic, occasionally cars will take over on opposite side
10
Pinch point approaching old railway bridge, currently narrowed to structural loading concerns
1
Larger passenger demand for local services heading to Clydebank and surrounding areas than towards Glasgow - potential for some services to reroute from Barnes Street to Glasgow Road?
N
E
S
W
Kilometers
0
0.1
0.2
0.4
0.6
0.8
Corridor 3 - Dumbarton Road Section 1 Clydebank to Yoker
BusCorridors
Site Photos
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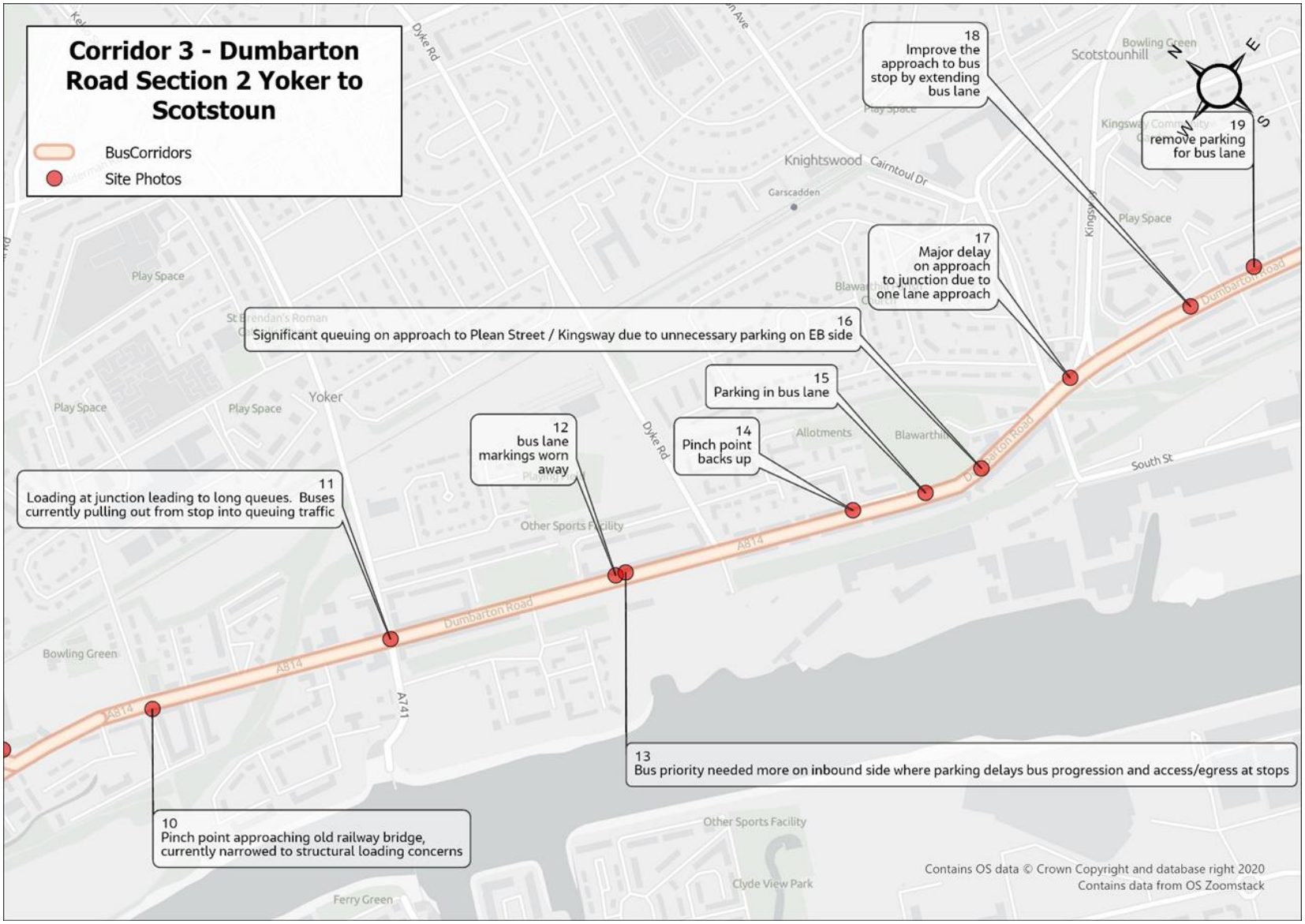
Contains data from OS Zoomstack

Ref	Comment	Image
1	Larger passenger demand for local services heading to Clydebank and surrounding areas than towards Glasgow - potential for some services to reroute from Barns Street to Glasgow Road?	
2	Delays at signal-controlled junction between two roundabouts is difficult to manage	
3	Significant dwell time at traffic signals	

Ref	Comment	Image
4	Potential for cut through to remove dog leg?	
5	investigate chicanes, replace with speed ramps	
6	Pinch point	

Ref	Comment	Image
7	Poorly maintained bus bypass lane between Glasgow City Council and West Dunbartonshire Council boundaries	
9	Central reserve blocks traffic, occasionally cars will overtake on opposite side	
10	Pinch point approaching old railway bridge, currently narrowed due to structural loading concerns	


Corridor 3 - Dumbarton Road Section 2 Yoker to Scotstoun
BusCorridors
Site Photos
18
Improve the approach to bus stop by extending bus lane
19
remove parking for bus lane
17
Major delay on approach to junction due to one lane approach
16
Significant queuing on approach to Plean Street / Kingsway due to unnecessary parking on EB side
15
Parking in bus lane
14
Pinch point backs up
12
bus lane markings worn away
11
Loading at junction leading to long queues. Buses currently pulling out from stop into queuing traffic
13
Bus priority needed more on inbound side where parking delays bus progression and access/egress at stops
10
Pinch point approaching old railway bridge, currently narrowed to structural loading concerns
Scotstounhill
Knightswood
Garscadden
Yoker
Dumbarton Road
A814
A741
Dyke Rd
Cairntoul Dr
Play Space
Allotments
Bowling Green
Other Sports Facility
Clyde View Park
Ferry Green
South St
Contains OS data © Crown Copyright and database right 2020
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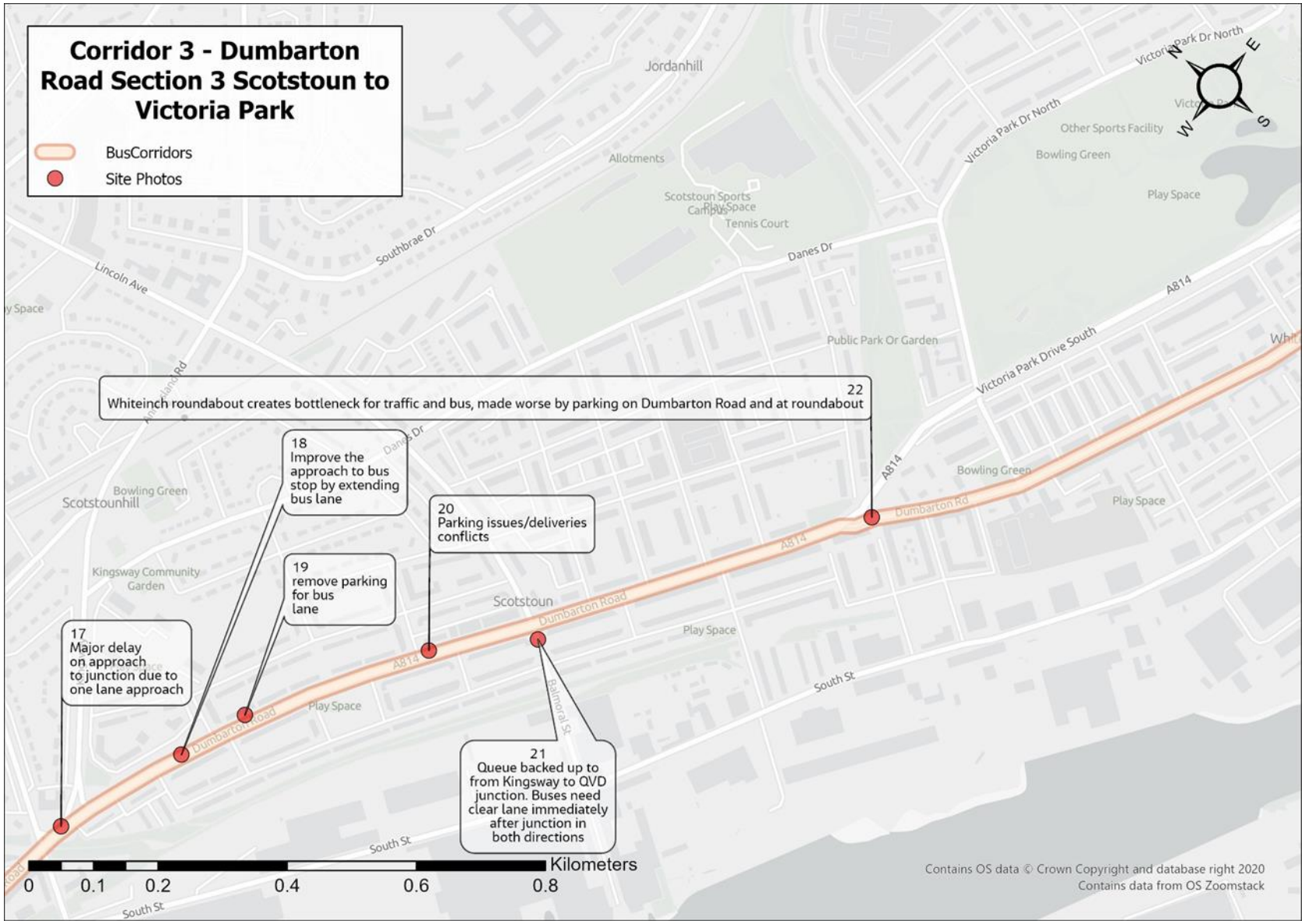
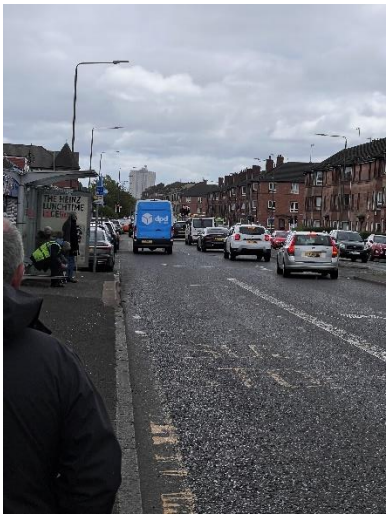
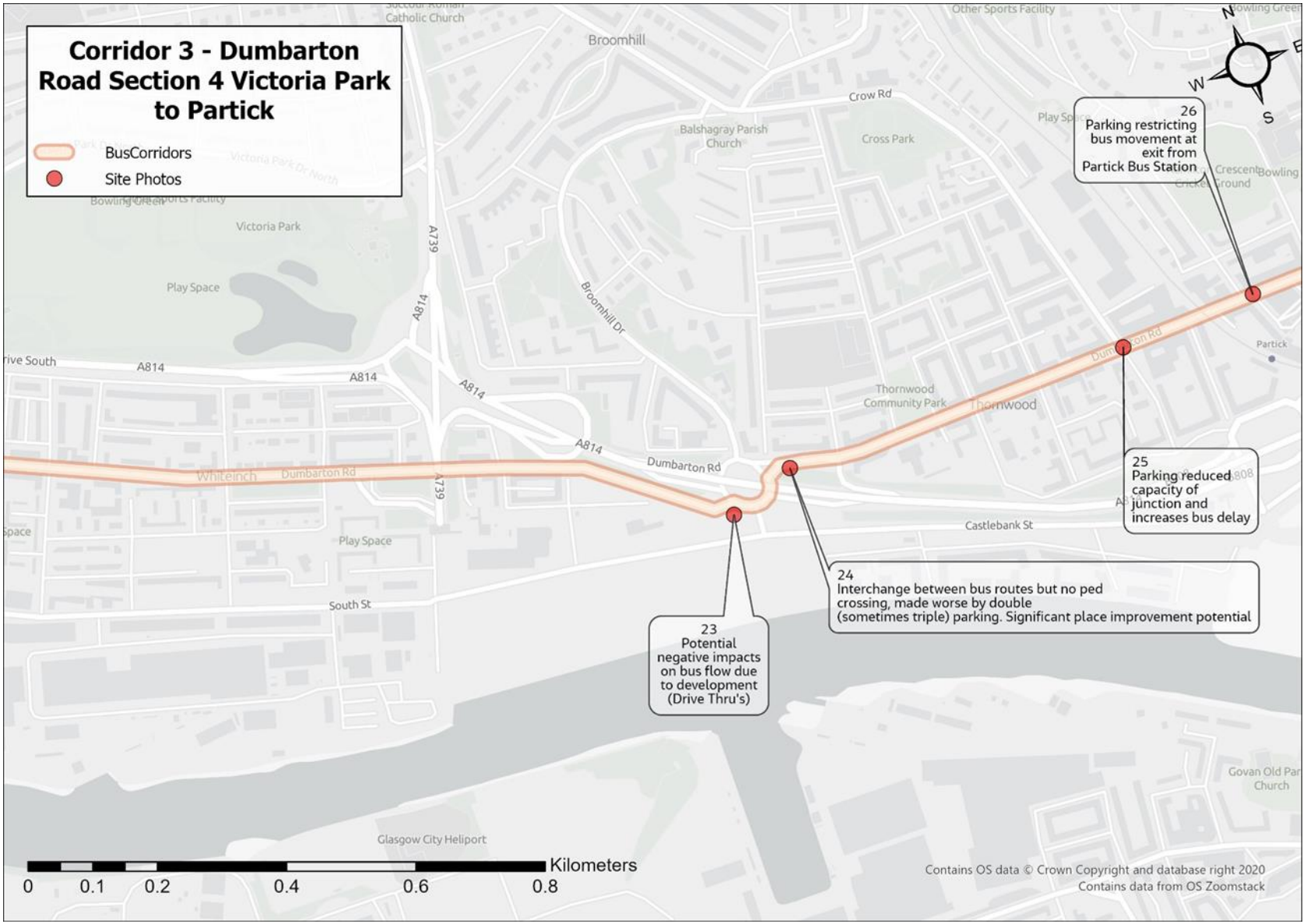
Ref	Comment	Image
11	Loading at junction leading to long queues. Buses currently pulling out from stop into queueing traffic	No Photo
12	Bus lane markings worn away	
13	Bus priority needed more on inbound side where parking delays bus progression and access/egress at stops	
14	Pinch point backs up	

Ref	Comment	Image
15	Parking in bus lane	
16	Significant queuing on approach to Plean Street / Kingsway due to unnecessary parking on eastbound side	
17	Major delay on approach to junction due to one lane approach	

Ref	Comment	Image
18	Improve the approach to bus stop by extending bus lane	
19	Remove parking for bus lane	


Corridor 3 - Dumbarton Road Section 3 Scotstoun to Victoria Park
BusCorridors
Site Photos
22
Whiteinch roundabout creates bottleneck for traffic and bus, made worse by parking on Dumbarton Road and at roundabout
18
Improve the approach to bus stop by extending bus lane
20
Parking issues/deliveries conflicts
19
remove parking for bus lane
17
Major delay on approach to junction due to one lane approach
21
Queue backed up to from Kingsway to QVD junction. Buses need clear lane immediately after junction in both directions
Jordanhill
Scotstoun
Scotstounhill
Kingsway Community Garden
Allotments
Scotstoun Sports Campus
Tennis Court
Other Sports Facility
Bowling Green
Play Space
Public Park Or Garden
Victoria Park Dr North
Victoria Park Drive South
Dumbarton Road
Dumbarton Rd
A814
Southbrae Dr
Danes Dr
Lincoln Ave
Balmoral St
South St
N
E
S
W
0
0.1
0.2
0.4
0.6
0.8
Kilometers
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
20	Parking issues/deliveries conflicts	
21	Queue backed up to from Kingsway to Queen Victoria Drive junction. Buses need clear lane immediately after junction in both directions	
22	Whiteinch roundabout creates bottleneck for traffic and bus, made worse by parking on Dumbarton Road and at roundabout.	


Corridor 3 - Dumbarton Road Section 4 Victoria Park to Partick
BusCorridors
Site Photos
26
Parking restricting bus movement at exit from Partick Bus Station
25
Parking reduced capacity of junction and increases bus delay
24
Interchange between bus routes but no ped crossing, made worse by double (sometimes triple) parking. Significant place improvement potential
23
Potential negative impacts on bus flow due to development (Drive Thru's)
Broomhill
Victoria Park
Play Space
Balshagray Parish Church
Cross Park
Thornwood Community Park
Thornwood
Partick
Castlebank St
South St
Glasgow City Heliport
Govan Old Par Church
A814
A739
Dumbarton Rd
Broomhill Dr
Crow Rd
Whiteinch
Kilometers
0 0.1 0.2 0.4 0.6 0.8
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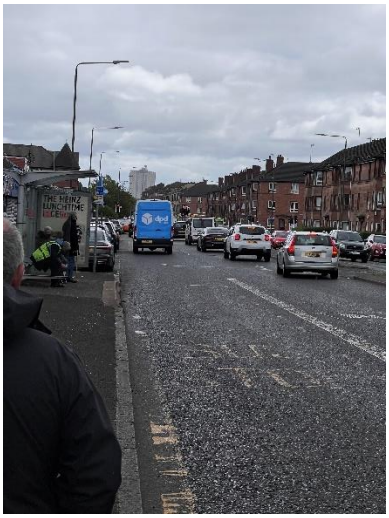
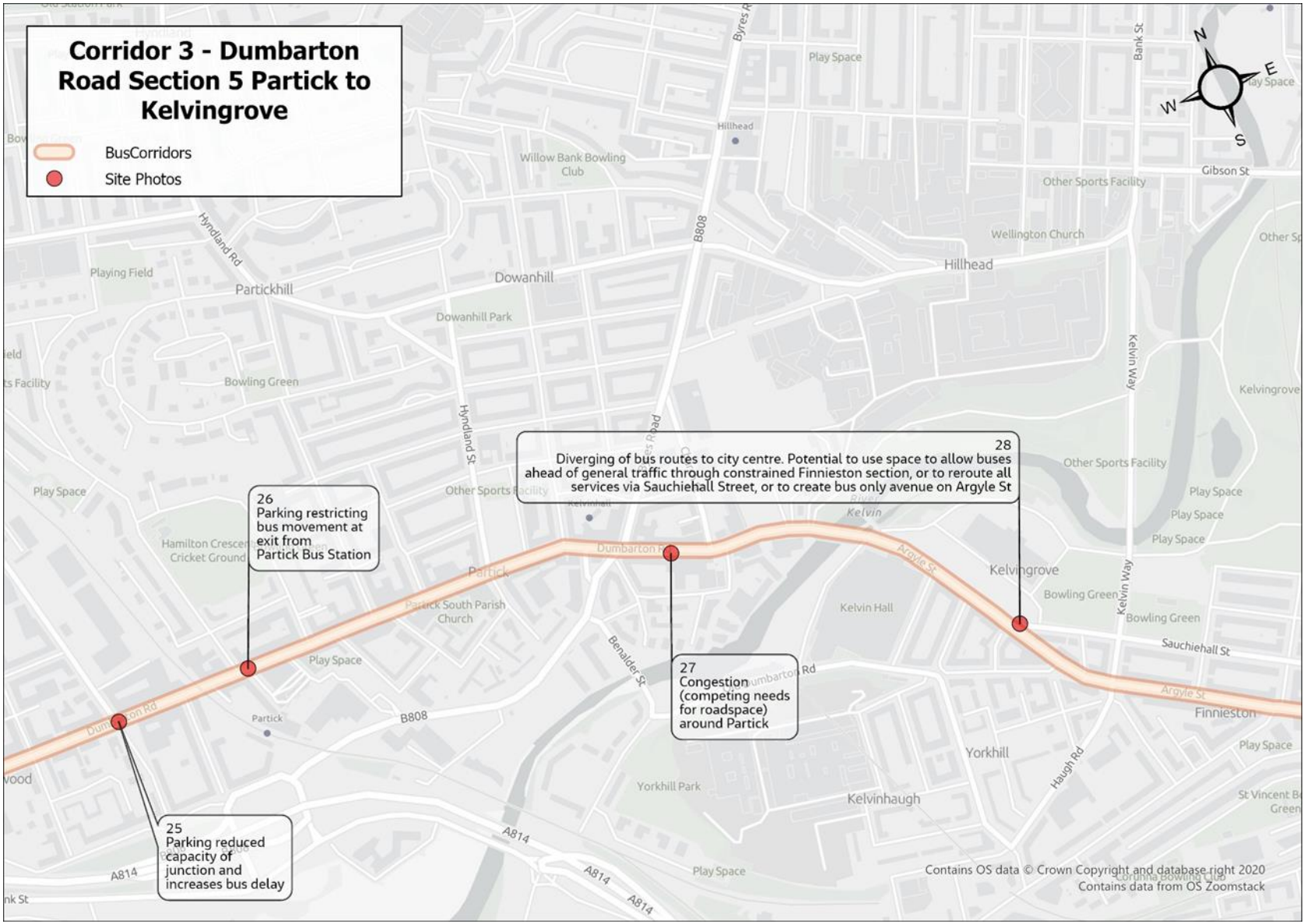
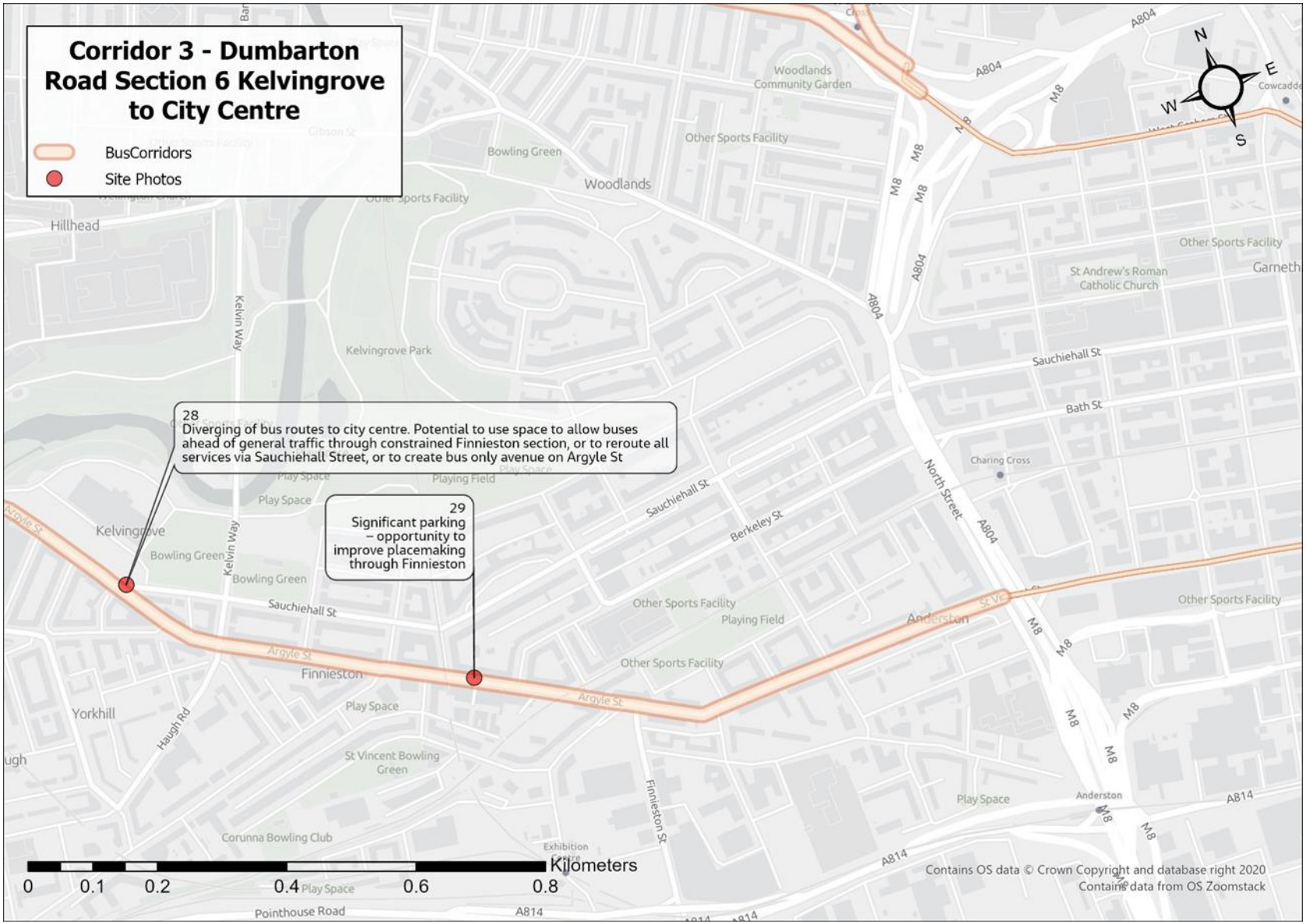
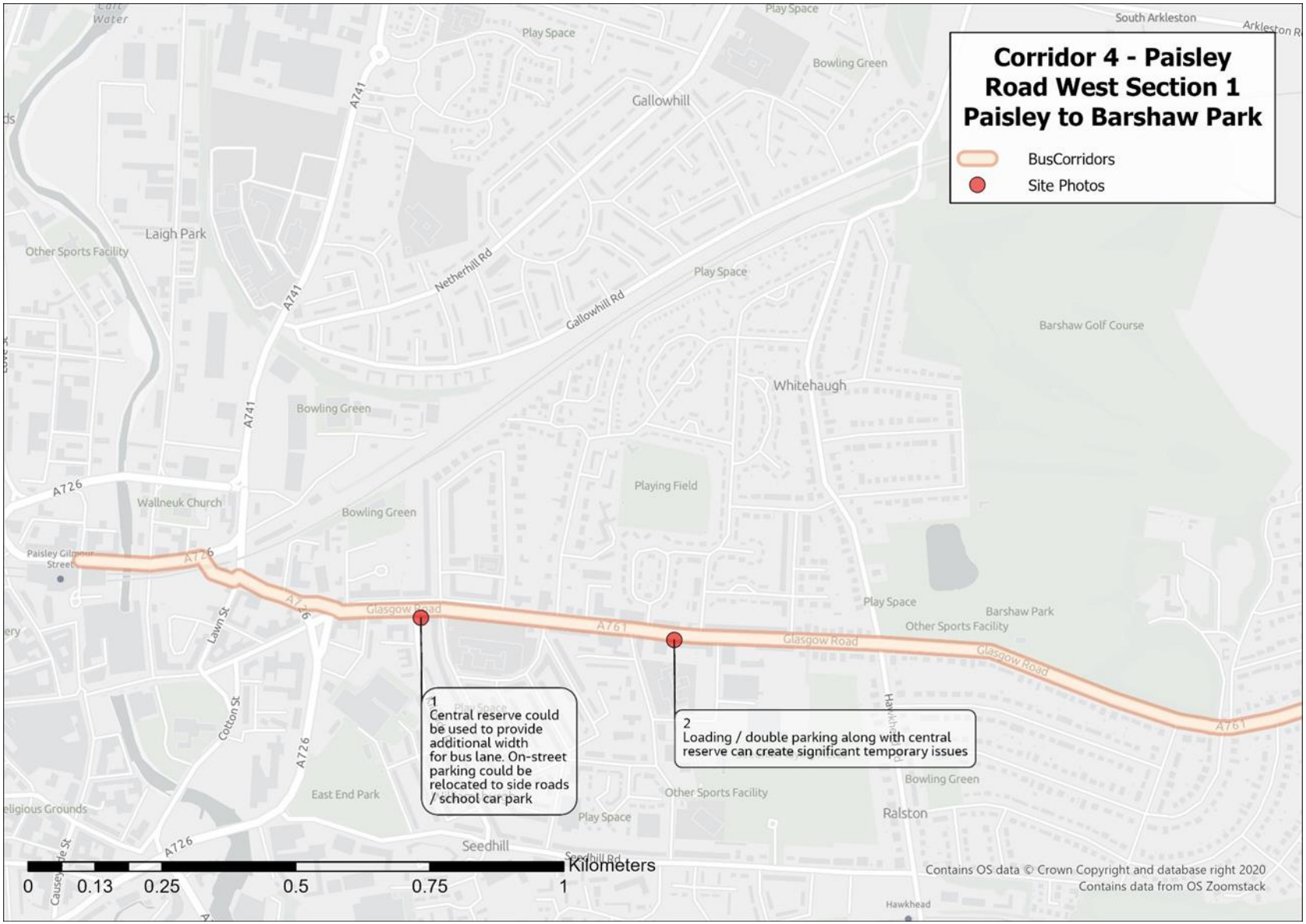
Contains data from OS Zoomstack

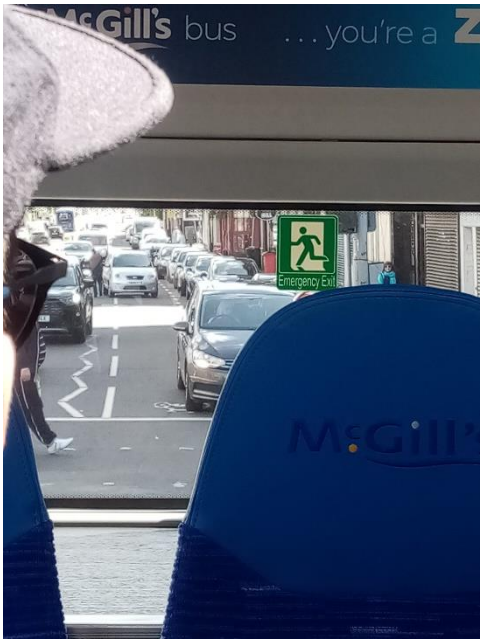
Ref	Comment	Image
23	Potential negative impacts on bus flow due to development (Drive Thru's)	
24	Interchange between bus routes but no ped crossing, made worse by double (sometimes triple) parking. Significant place improvement potential	
26	Parking restricting bus movement at exit from Partick Bus Station	

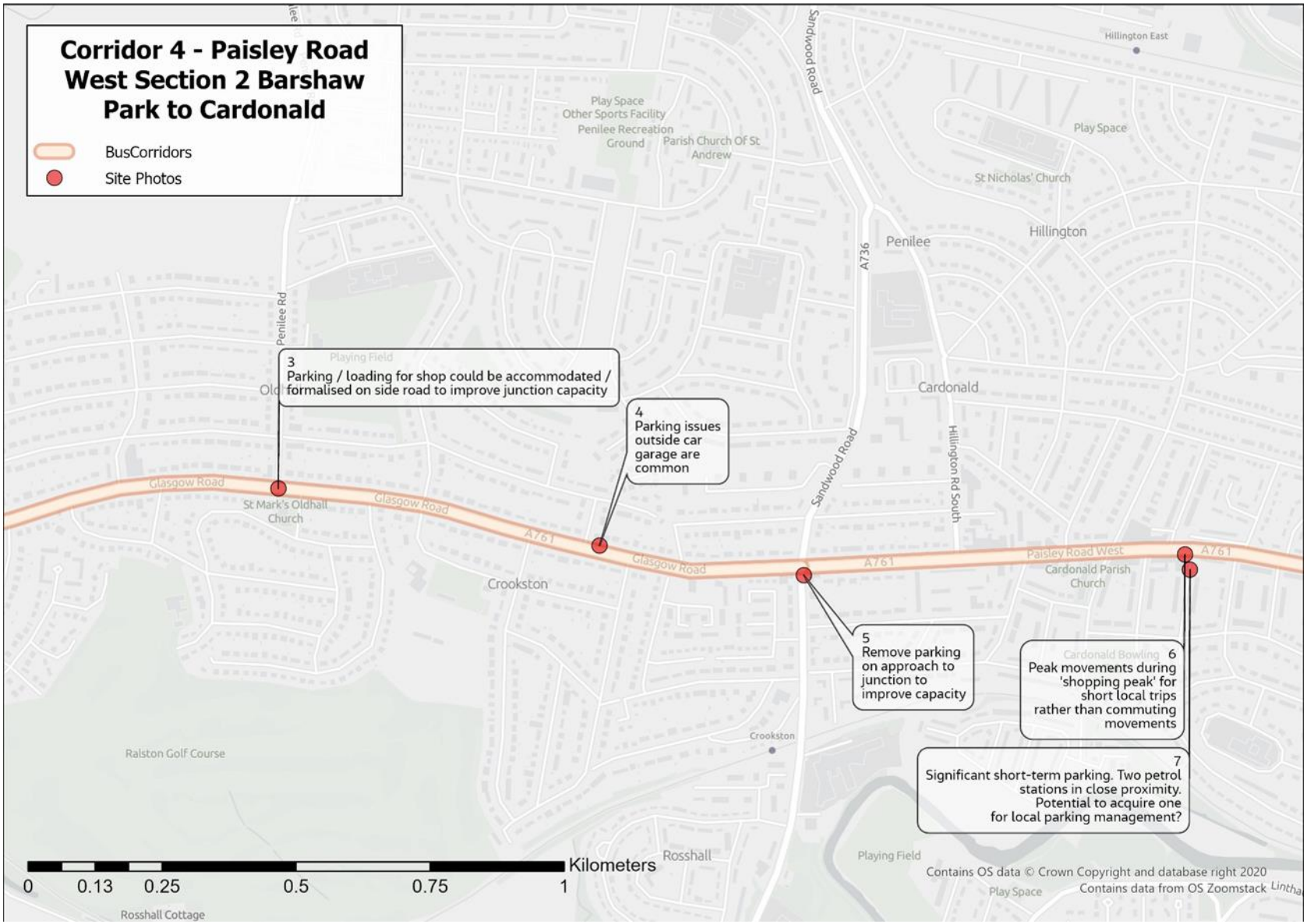

Corridor 3 - Dumbarton Road Section 5 Partick to Kelvingrove
BusCorridors
Site Photos
N
E
S
W
26
Parking restricting bus movement at exit from Partick Bus Station
28
Diverging of bus routes to city centre. Potential to use space to allow buses ahead of general traffic through constrained Finnieston section, or to reroute all services via Sauchiehall Street, or to create bus only avenue on Argyle St
27
Congestion (competing needs for roadspace) around Partick
25
Parking reduced capacity of junction and increases bus delay
Partick
Dowanhill
Hillhead
Kelvingrove
Finnieston
Yorkhill
Kelvinhaugh
Partickhill
Dowanhill Park
Yorkhill Park
Kelvin Hall
Willow Bank Bowling Club
Wellington Church
Other Sports Facility
Bowling Green
Play Space
Playing Field
Hamilton Crescent Cricket Ground
Partick South Parish Church
Hyndland Rd
Hyndland St
Byres Road
Dumbarton Rd
Argyle St
Sauchiehall St
Kelvin Way
Bank St
Gibson St
Benalder St
Haugh Rd
B808
A814
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
27	Congestion (competing needs for roadspace) around Partick	
28	Diverging of bus routes to city centre. Potential to use space to allow buses ahead of general traffic through constrained Finnieston section, or to reroute all services via Sauchiehall Street, or to create bus only avenue on Argyle St	


Corridor 3 - Dumbarton Road Section 6 Kelvingrove to City Centre
BusCorridors
Site Photos
28
Diverging of bus routes to city centre. Potential to use space to allow buses ahead of general traffic through constrained Finnieston section, or to reroute all services via Sauchiehall Street, or to create bus only avenue on Argyle St
29
Significant parking – opportunity to improve placemaking through Finnieston
Kilometers
0
0.1
0.2
0.4
0.6
0.8
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack
Woodlands
Hillhead
Kelvingrove Park
Finnieston
Yorkhill
Anderston
Charing Cross
Sauchiehall St
Argyle St
Bath St
Berkeley St
North Street
Kelvin Way
Haugh Rd
Finnieston St
Pointhouse Road
A814
A804
M8


Corridor 4 - Paisley Road West Section 1 Paisley to Barshaw Park
BusCorridors
Site Photos
1
Central reserve could be used to provide additional width for bus lane. On-street parking could be relocated to side roads / school car park
2
Loading / double parking along with central reserve can create significant temporary issues
Gallowhill
Whitehaugh
Ralston
Seedhill
Laigh Park
Barshaw Golf Course
Barshaw Park
Wallneuk Church
East End Park
Glasgow Road
A726
A741
A761
Netherhill Rd
Gallowhill Rd
Lawn St
Cotton St
Play Space
Bowling Green
Playing Field
Other Sports Facility
South Arkleston
Hawkhead
0 0.13 0.25 0.5 0.75 1 Kilometers
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

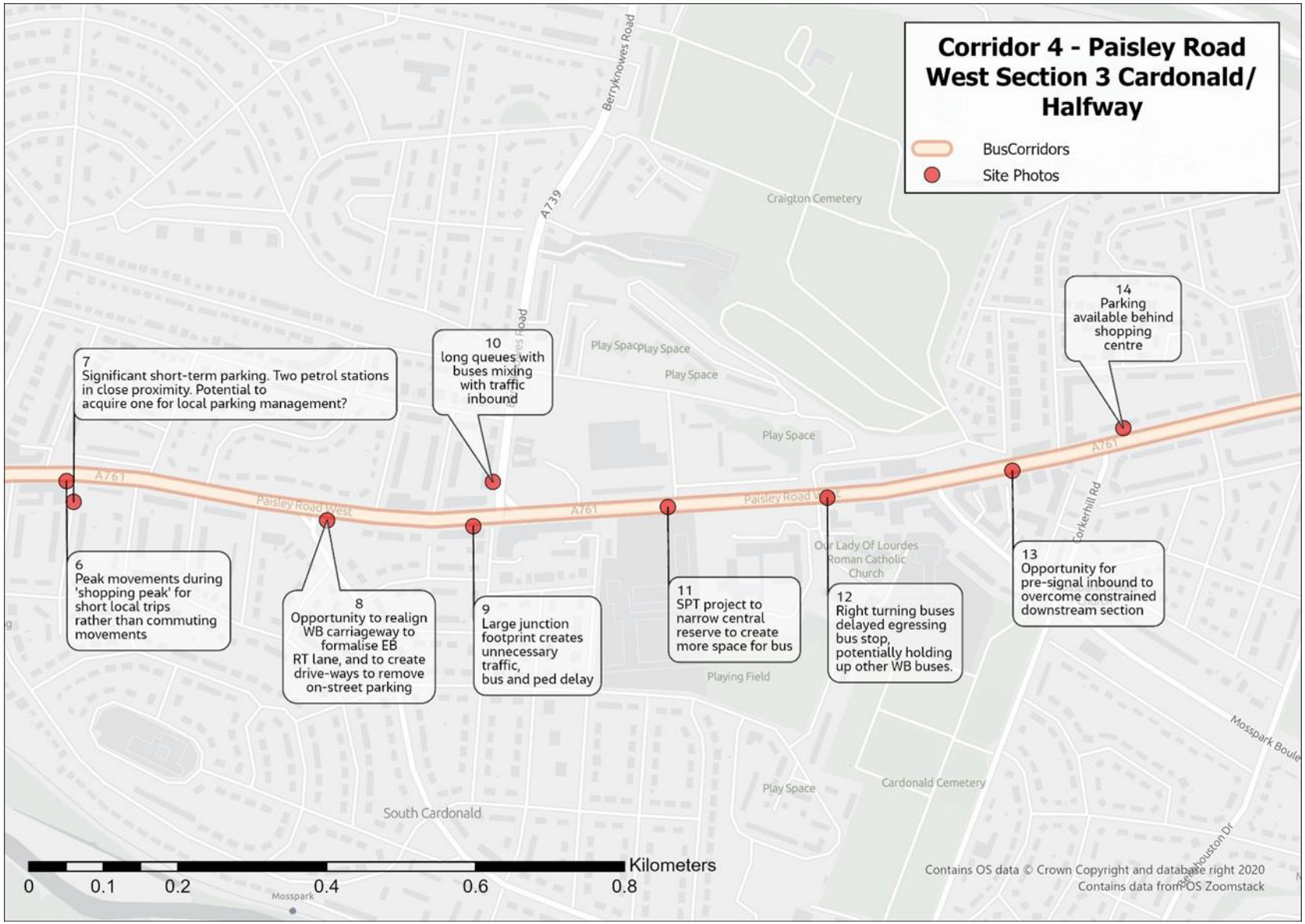
Ref	Comment	Image
1	Central reserve could be used to provide additional width for bus lane. On-street parking could be relocated to side roads / school car park	
2	Loading / double parking along with central reserve can create significant temporary issues	


Corridor 4 - Paisley Road West Section 2 Barshaw Park to Cardonald
BusCorridors
Site Photos
3
Parking / loading for shop could be accommodated / formalised on side road to improve junction capacity
4
Parking issues outside car garage are common
5
Remove parking on approach to junction to improve capacity
6
Peak movements during 'shopping peak' for short local trips rather than commuting movements
7
Significant short-term parking. Two petrol stations in close proximity. Potential to acquire one for local parking management?
Glasgow Road
A761
Penilee Rd
Sandwood Road
A736
Hillington Rd South
Paisley Road West
Hillington East
Play Space
Other Sports Facility
Penilee Recreation Ground
Parish Church Of St Andrew
St Nicholas' Church
Hillington
Penilee
Cardonald
St Mark's Oldhall Church
Cardonald Parish Church
Crookston
Ralston Golf Course
Rosshall
Rosshall Cottage
Playing Field
Cardonald Bowling
Kilometers
0
0.13
0.25
0.5
0.75
1
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
3	Parking / loading for shop could be accommodated / formalised on side road to improve junction capacity	
4	Parking issues outside car garage are common	

Ref	Comment	Image
5	Remove parking on approach to junction to improve capacity	
6	Peak movements during 'shopping peak' for short local trips rather than commuting movements	

Ref	Comment	Image
7	Significant short-term parking. Two petrol stations in close proximity. Potential to acquire one for local parking management?	


Corridor 4 - Paisley Road West Section 3 Cardonald/ Halfway
BusCorridors
Site Photos
7
Significant short-term parking. Two petrol stations in close proximity. Potential to acquire one for local parking management?
10
long queues with buses mixing with traffic inbound
14
Parking available behind shopping centre
6
Peak movements during 'shopping peak' for short local trips rather than commuting movements
8
Opportunity to realign WB carriageway to formalise EB RT lane, and to create drive-ways to remove on-street parking
9
Large junction footprint creates unnecessary traffic, bus and ped delay
11
SPT project to narrow central reserve to create more space for bus
12
Right turning buses delayed egressing bus stop, potentially holding up other WB buses.
13
Opportunity for pre-signal inbound to overcome constrained downstream section
A761
Paisley Road West
Berryknowes Road
A739
Craigton Cemetery
Play Space
Our Lady Of Lourdes Roman Catholic Church
Playing Field
Cardonald Cemetery
South Cardonald
Mosspark
Kilometers
0
0.1
0.2
0.4
0.6
0.8
Contains OS data © Crown Copyright and database right 2020
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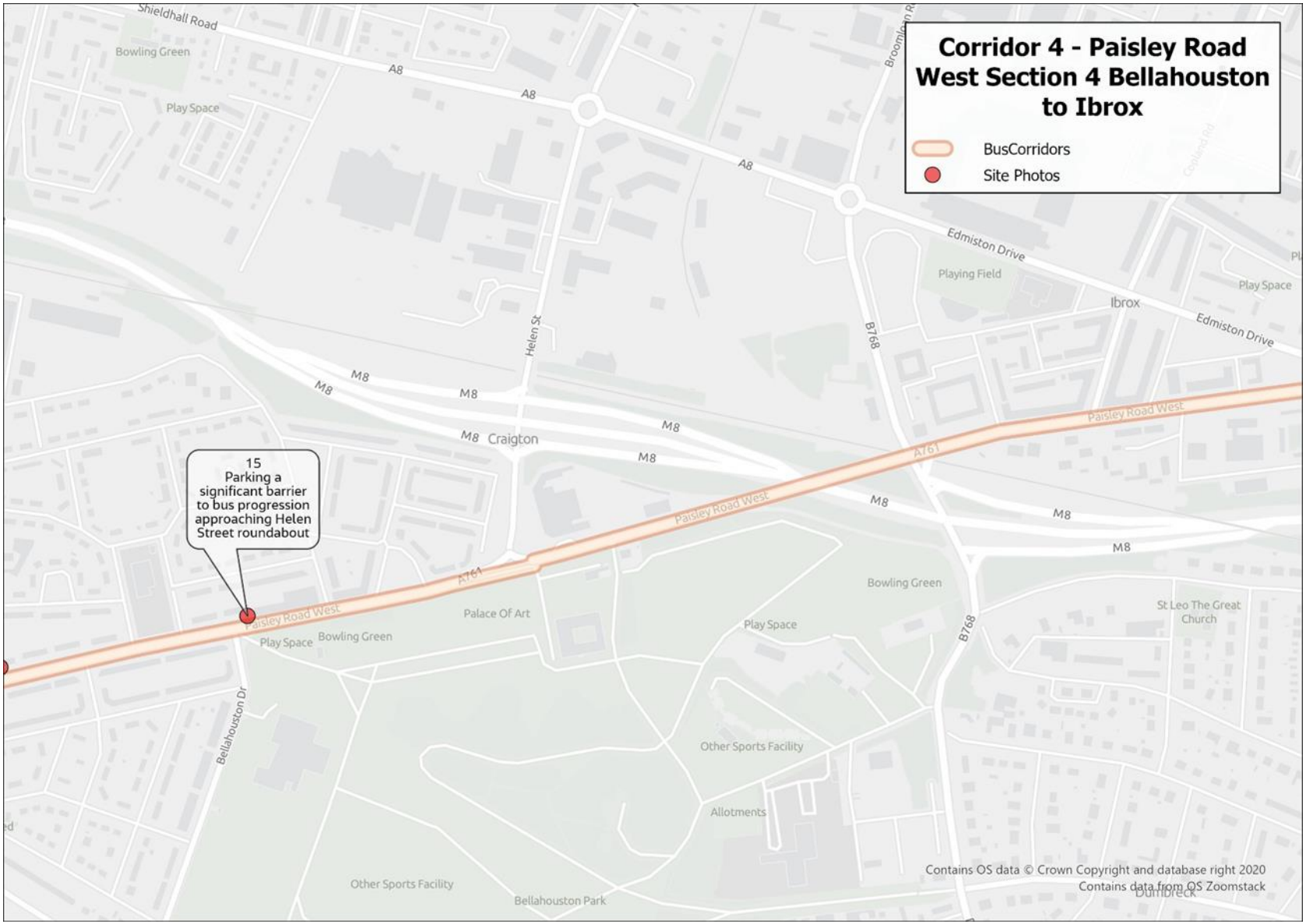
Ref	Comment	Image
8	Opportunity to realign westbound carriageway to formalise eastbound right-turning lane, and to create driveways to remove on-street parking	
9	Large junction footprint creates unnecessary traffic, bus and pedestrian delay	

Ref	Comment	Image
10	Long queues with buses mixing with traffic inbound	
11	SPT project to narrow central reserve to create more space for bus	

Ref	Comment	Image
12	Right turning buses delayed egressing bus stop, potentially holding up other westbound buses.	
13	Opportunity for pre-signal inbound to overcome constrained downstream section	

Ref	Comment	Image
14	Parking available behind shopping centre	


Corridor 4 - Paisley Road West Section 4 Bellahouston to Ibrox
BusCorridors
Site Photos
15
Parking a significant barrier to bus progression approaching Helen Street roundabout
Shieldhall Road
Bowling Green
Play Space
A8
Broomloan Rd
Edmiston Drive
Playing Field
Ibrox
Helen St
B768
M8
Craigton
Paisley Road West
A761
Palace Of Art
Bellahouston Dr
Other Sports Facility
Allotments
Bellahouston Park
St Leo The Great Church
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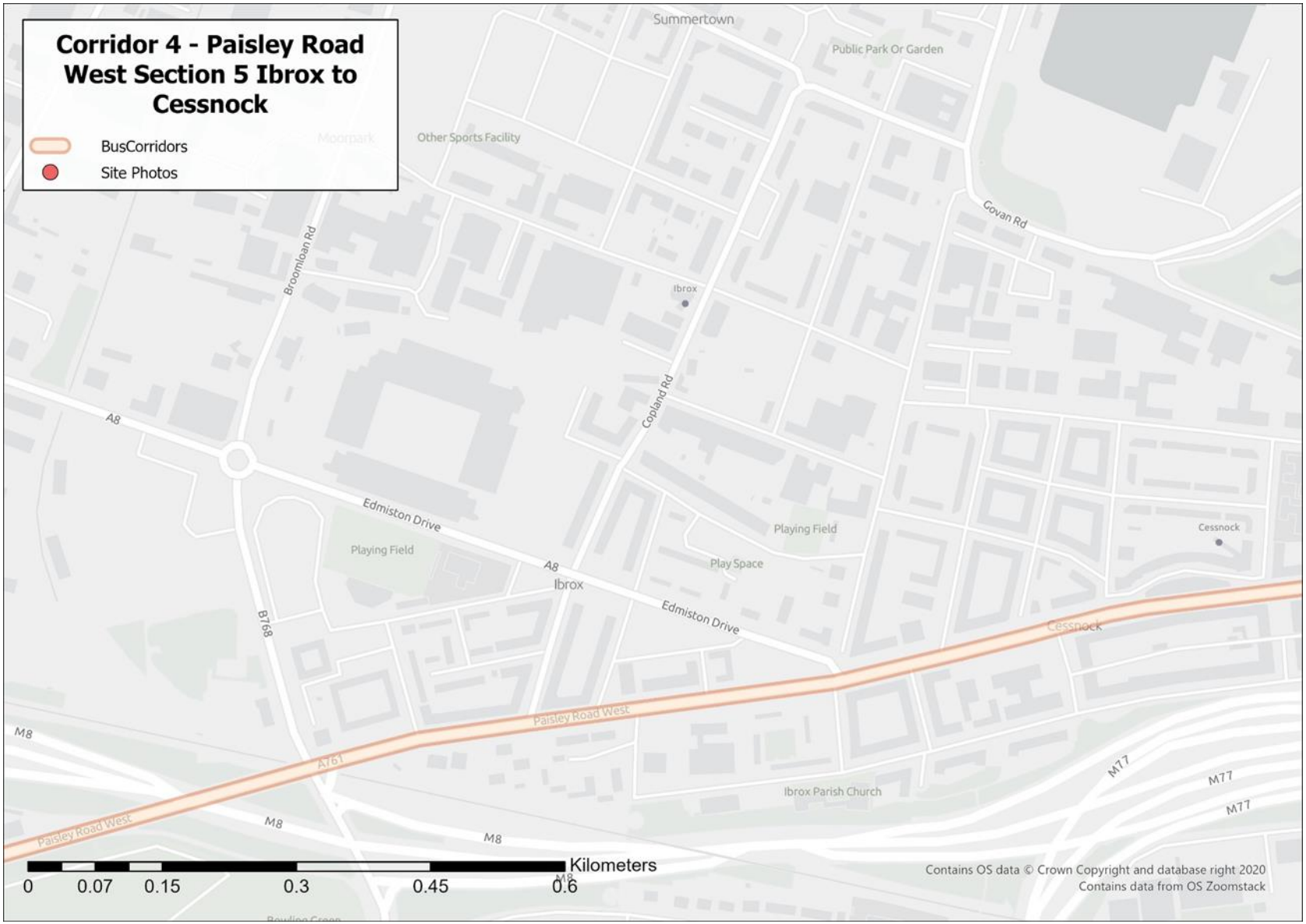
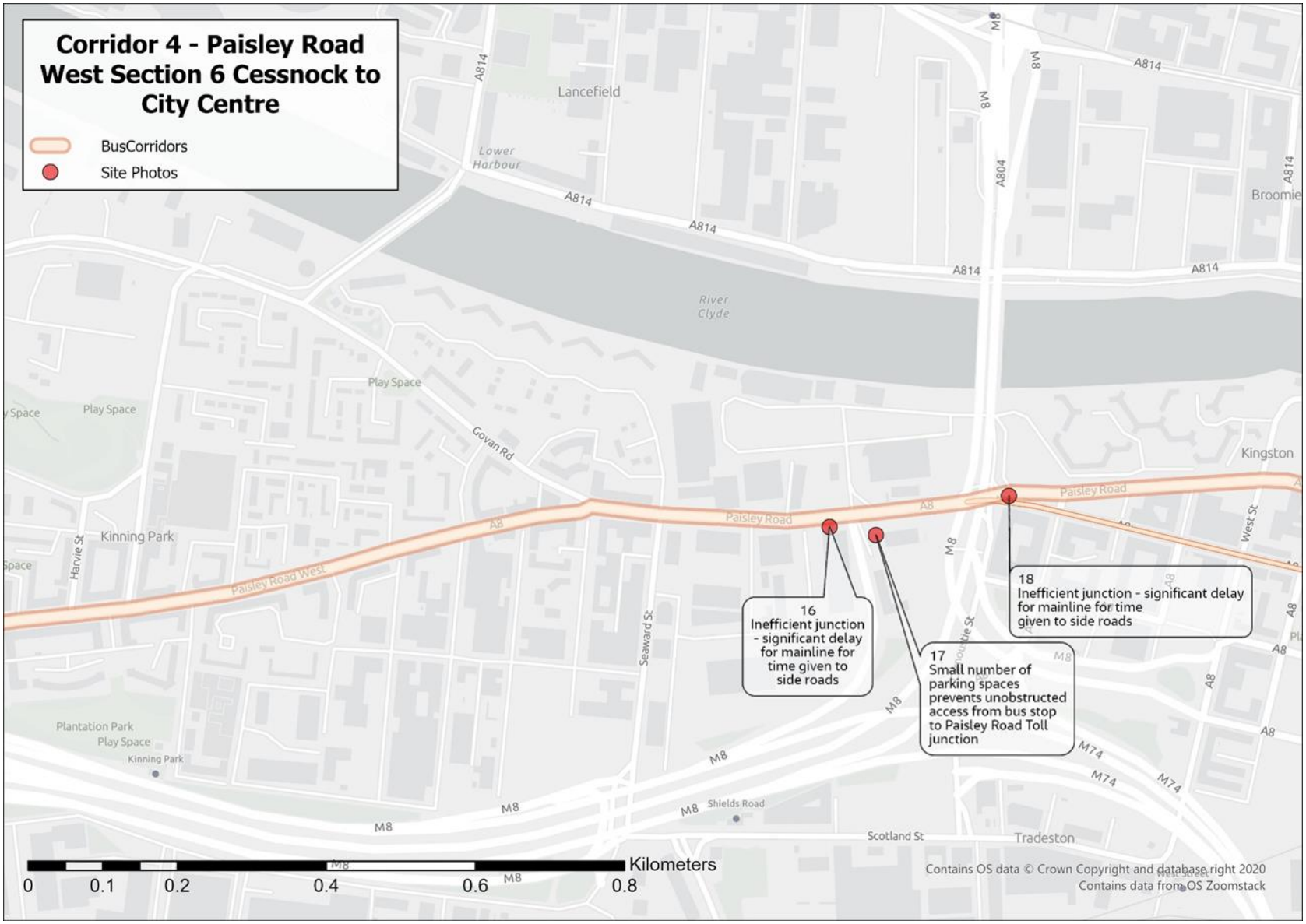
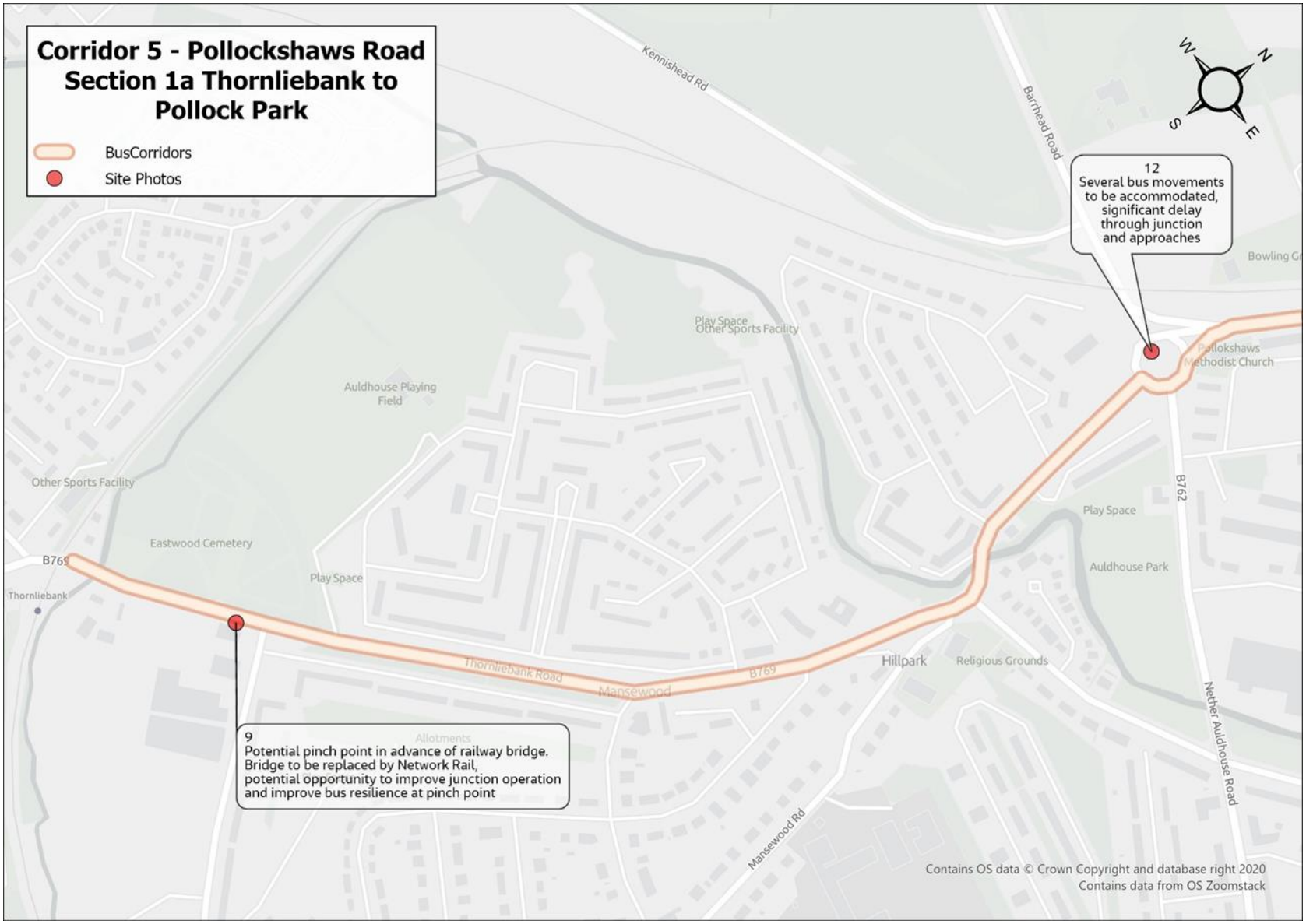
Contains data from OS Zoomstack


Corridor 4 - Paisley Road West Section 5 Ibrox to Cessnock
BusCorridors
Site Photos
Summertown
Public Park Or Garden
Other Sports Facility
Govan Rd
Broomloan Rd
Ibrox
Copland Rd
A8
Edmiston Drive
Playing Field
Play Space
Cessnock
B768
Paisley Road West
M8
A761
M77
Ibrox Parish Church
Kilometers
0
0.07
0.15
0.3
0.45
0.6
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack


Corridor 4 - Paisley Road West Section 6 Cessnock to City Centre
BusCorridors
Site Photos
16
Inefficient junction - significant delay for mainline for time given to side roads
17
Small number of parking spaces prevents unobstructed access from bus stop to Paisley Road Toll junction
18
Inefficient junction - significant delay for mainline for time given to side roads
Lancefield
Lower Harbour
River Clyde
Broomie
Kingston
Govan Rd
Paisley Road
Paisley Road West
Kinning Park
Harvie St
Seaward St
Shields Road
Scotland St
Tradeston
Plantation Park
Play Space
A814
A804
M8
M74
A8
0 0.1 0.2 0.4 0.6 0.8 Kilometers
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
16	Inefficient junction - significant delay for mainline for time given to side roads	
18	Inefficient junction - significant delay for mainline for time given to side roads	


Corridor 5 - Pollockshaws Road Section 1a Thornliebank to Pollock Park
BusCorridors
Site Photos
12
Several bus movements to be accommodated, significant delay through junction and approaches
9
Potential pinch point in advance of railway bridge. Bridge to be replaced by Network Rail, potential opportunity to improve junction operation and improve bus resilience at pinch point
Kennishead Rd
Barrhead Road
Play Space
Other Sports Facility
Auldhouse Playing Field
Pollokshaws Methodist Church
Other Sports Facility
Eastwood Cemetery
B769
Thornliebank
Play Space
B762
Play Space
Auldhouse Park
Thornliebank Road
Mansewood
B769
Hillpark
Religious Grounds
Allotments
Nether Auldhouse Road
Mansewood Rd
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Contains data from OS Zoomstack

Ref	Comment	Image
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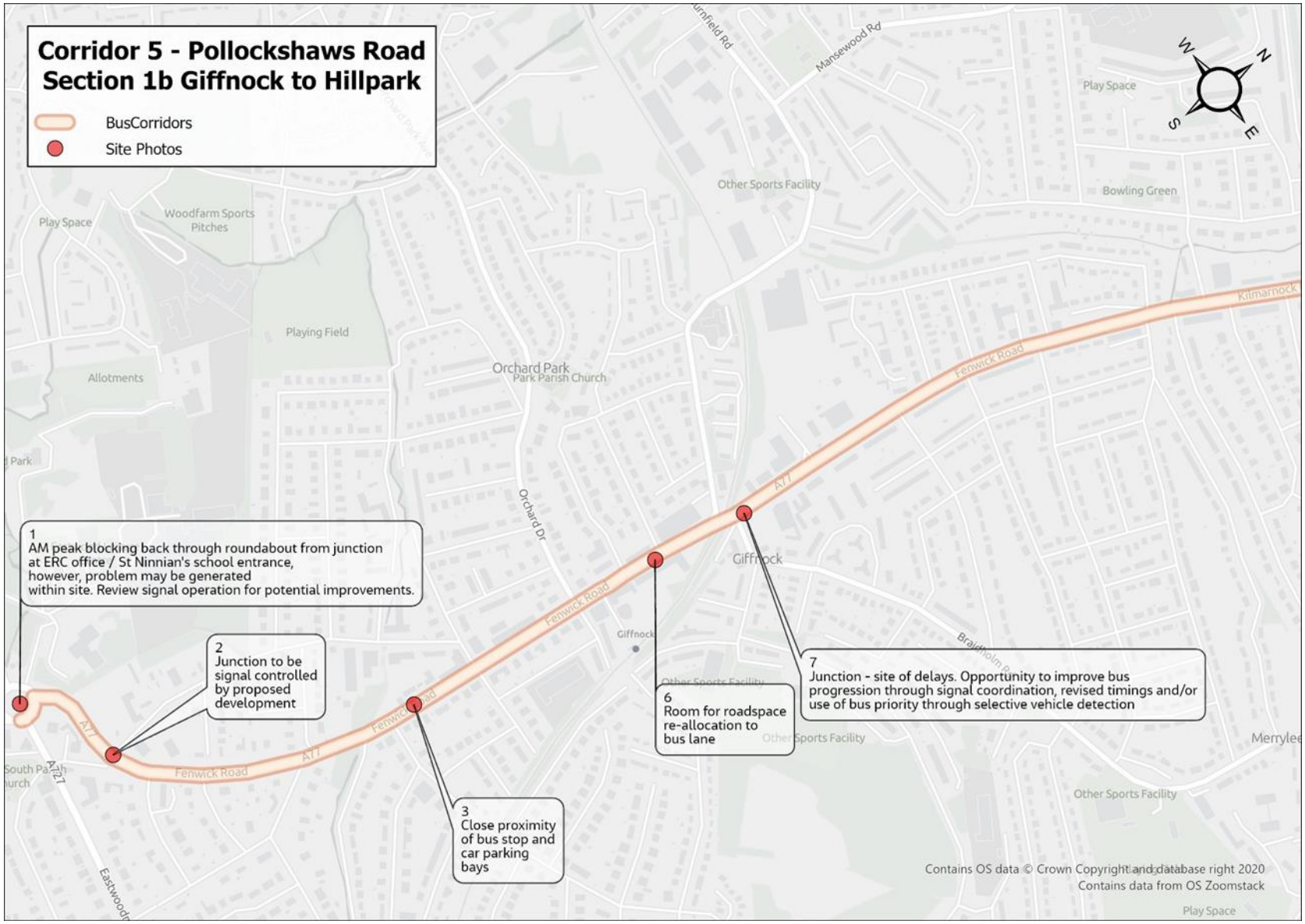
Corridor 5 - Pollockshaws Road
Section 1b Giffnock to Hillpark
BusCorridors
Site Photos
1
AM peak blocking back through roundabout from junction at ERC office / St Ninnian's school entrance, however, problem may be generated within site. Review signal operation for potential improvements.
2
Junction to be signal controlled by proposed development
3
Close proximity of bus stop and car parking bays
6
Room for roadspace re-allocation to bus lane
7
Junction - site of delays. Opportunity to improve bus progression through signal coordination, revised timings and/or use of bus priority through selective vehicle detection
Fenwick Road
A77
Kilmarnock
Giffnock
Orchard Park
Park Parish Church
Woodfarm Sports Pitches
Playing Field
Allotments
Play Space
Other Sports Facility
Bowling Green
Mansewood Rd
Orchard Dr
Braidholm Rd
Merrylee
Eastwood
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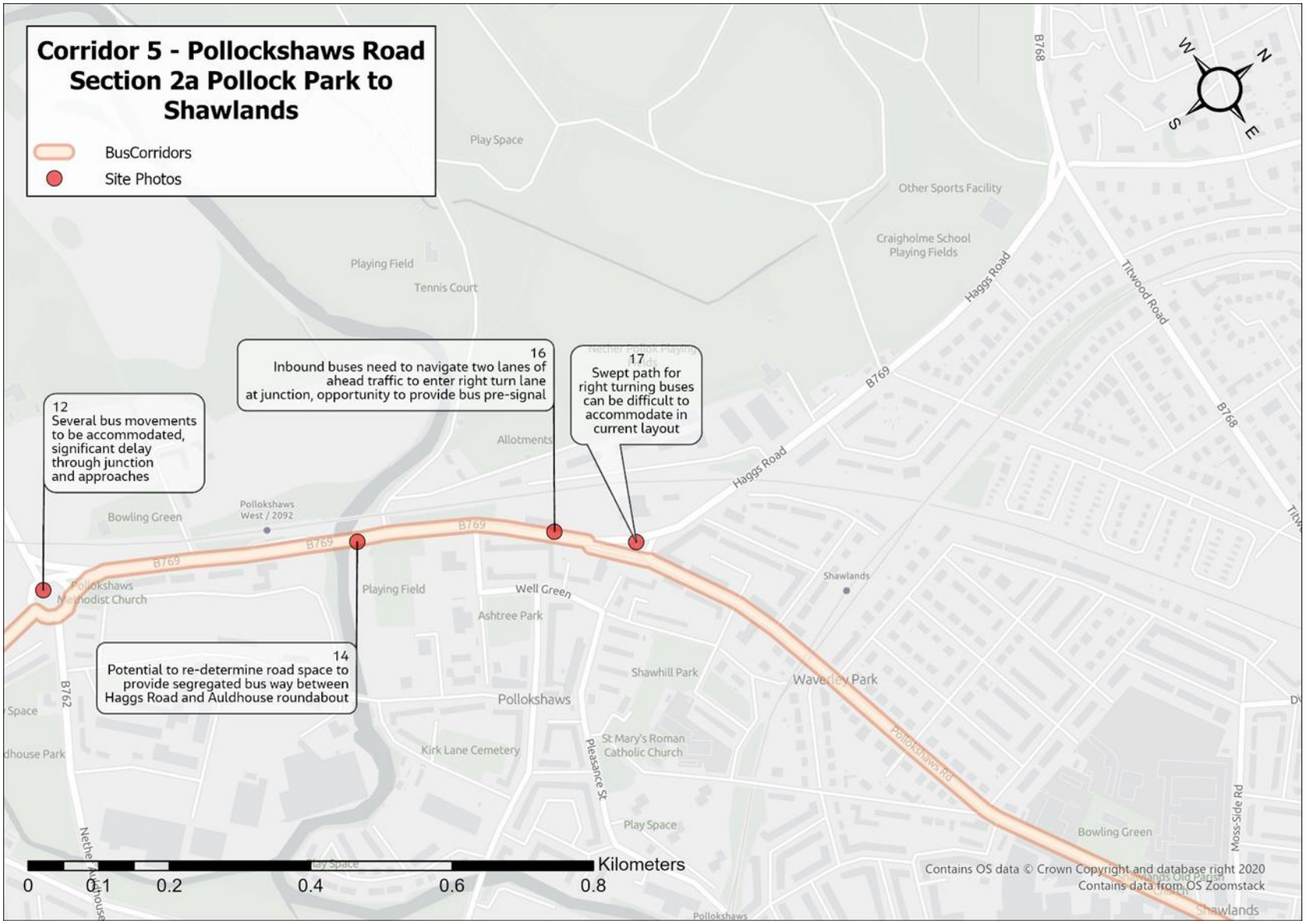
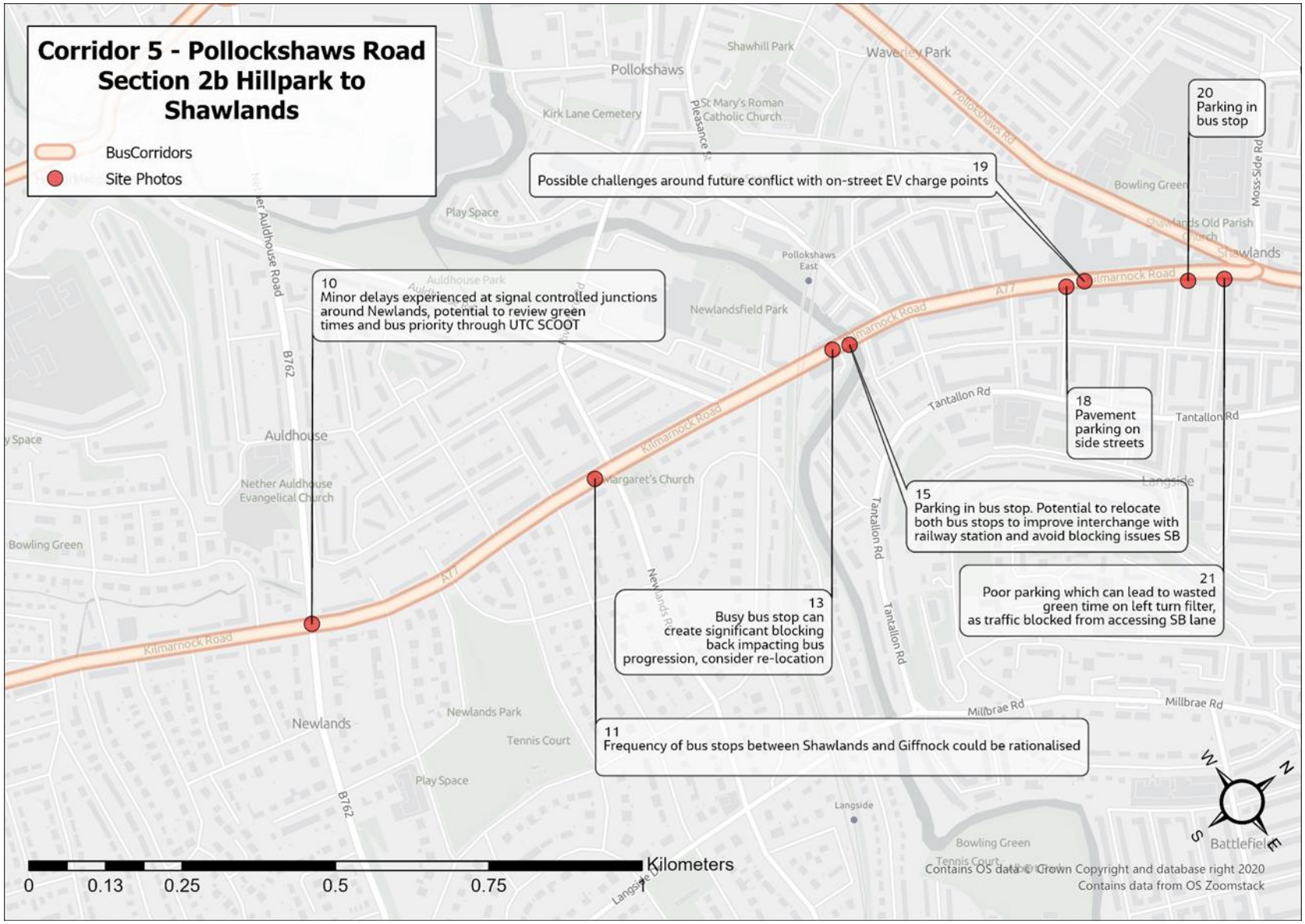
Ref	Comment	Image
3	Close proximity of bus stop and car parking bays	
6	Room for roadspace re-allocation to bus lane	

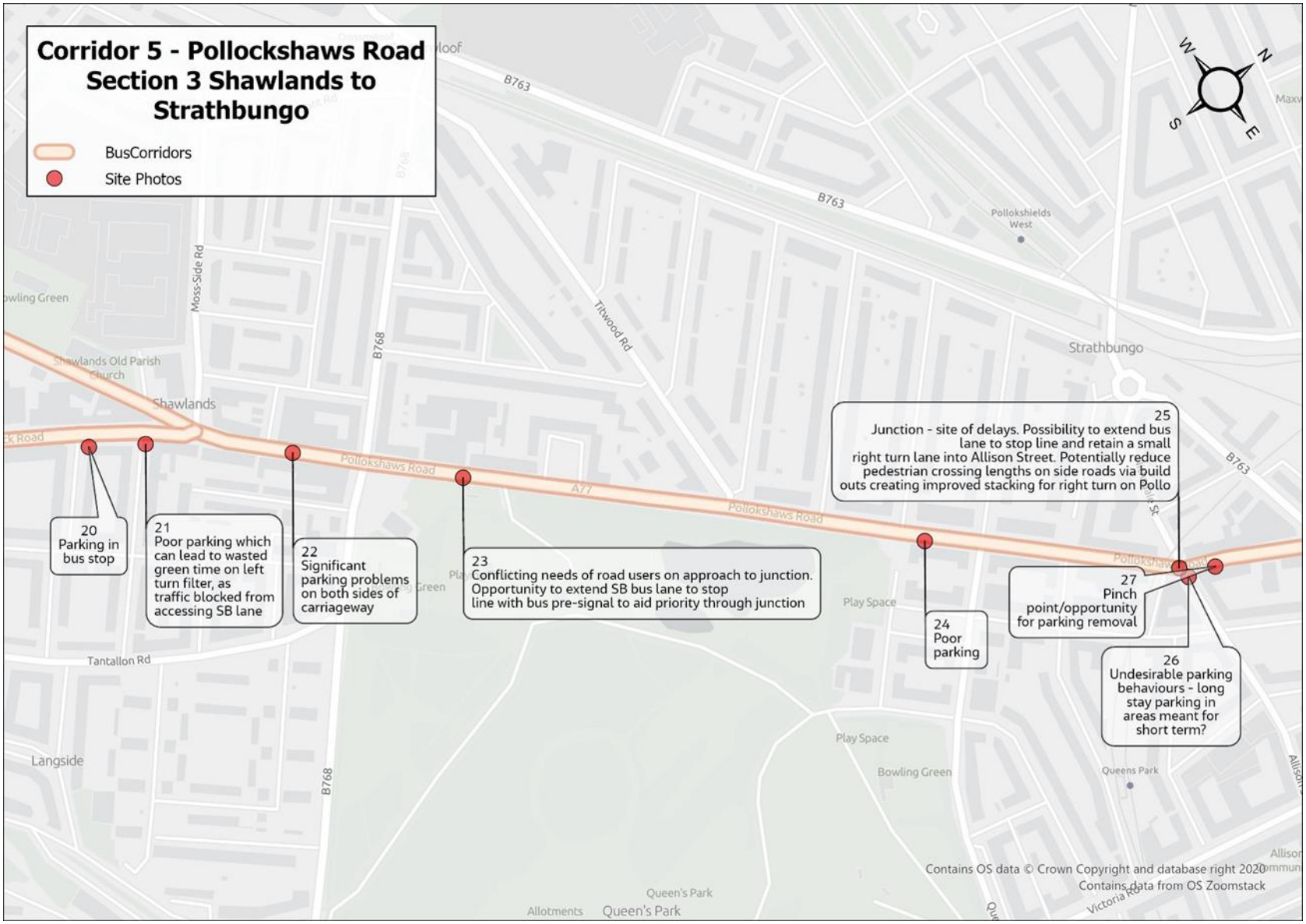
Ref	Comment	Image
7	Junction - site of delays. Opportunity to improve bus progression through signal coordination, revised timings and/or use of bus priority through selective vehicle detection	


Corridor 5 - Pollockshaws Road Section 2a Pollock Park to Shawlands
BusCorridors
Site Photos
12
Several bus movements to be accommodated, significant delay through junction and approaches
16
Inbound buses need to navigate two lanes of ahead traffic to enter right turn lane at junction, opportunity to provide bus pre-signal
17
Swept path for right turning buses can be difficult to accommodate in current layout
14
Potential to re-determine road space to provide segregated bus way between Haggs Road and Auldhouse roundabout
B769
B768
B762
Haggs Road
Tinwood Road
Pollokshaws Rd
Moss-Side Rd
Pleasance St
Play Space
Playing Field
Tennis Court
Other Sports Facility
Craigholme School Playing Fields
Allotments
Bowling Green
Pollokshaws West / 2092
Pollokshaws Methodist Church
Well Green
Ashtree Park
Shawlands
Shawhill Park
Waverley Park
Pollokshaws
Kirk Lane Cemetery
St Mary's Roman Catholic Church
Kilometers
0
0.1
0.2
0.4
0.6
0.8
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack


Corridor 5 - Pollockshaws Road Section 2b Hillpark to Shawlands
BusCorridors
Site Photos
10
Minor delays experienced at signal controlled junctions around Newlands, potential to review green times and bus priority through UTC SCOOT
19
Possible challenges around future conflict with on-street EV charge points
20
Parking in bus stop
18
Pavement parking on side streets
15
Parking in bus stop. Potential to relocate both bus stops to improve interchange with railway station and avoid blocking issues SB
21
Poor parking which can lead to wasted green time on left turn filter, as traffic blocked from accessing SB lane
13
Busy bus stop can create significant blocking back impacting bus progression, consider re-location
11
Frequency of bus stops between Shawlands and Giffnock could be rationalised
Pollokshaws
Shawhill Park
Waverley Park
Kirk Lane Cemetery
St Mary's Roman Catholic Church
Play Space
Pollokshaws East
Newlandsfield Park
Auldhouse
Nether Auldhouse Evangelical Church
Kilmarnock Road
A77
B762
Tantallon Rd
Langside
Millbrae Rd
Newlands
Newlands Park
Tennis Court
Bowling Green
Shawlands
Battlefield
Kilometers
0
0.13
0.25
0.5
0.75
1
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
15	Parking in bus stop. Potential to relocate both bus stops to improve interchange with railway station and avoid blocking issues southbound	
18	Pavement parking on side streets	
19	Possible challenges around future conflict with on-street Electric Vehicle charge points	

Ref	Comment	Image
20	Parking in bus stop	
21	Poor parking which can lead to wasted green time on left turn filter, as traffic blocked from accessing southbound lane	


Corridor 5 - Pollockshaws Road Section 3 Shawlands to Strathbungo
BusCorridors
Site Photos
20 Parking in bus stop
21 Poor parking which can lead to wasted green time on left turn filter, as traffic blocked from accessing SB lane
22 Significant parking problems on both sides of carriageway
23 Conflicting needs of road users on approach to junction. Opportunity to extend SB bus lane to stop line with bus pre-signal to aid priority through junction
24 Poor parking
25 Junction - site of delays. Possibility to extend bus lane to stop line and retain a small right turn lane into Allison Street. Potentially reduce pedestrian crossing lengths on side roads via build outs creating improved stacking for right turn on Pollo
26 Undesirable parking behaviours - long stay parking in areas meant for short term?
27 Pinch point/opportunity for parking removal
B763
B768
A77
Pollokshaws Road
Moss-Side Rd
Titwood Rd
Shawlands
Strathbungo
Pollokshields West
Tantallon Rd
Langside
Play Space
Bowling Green
Queens Park
Queen's Park
Allotments
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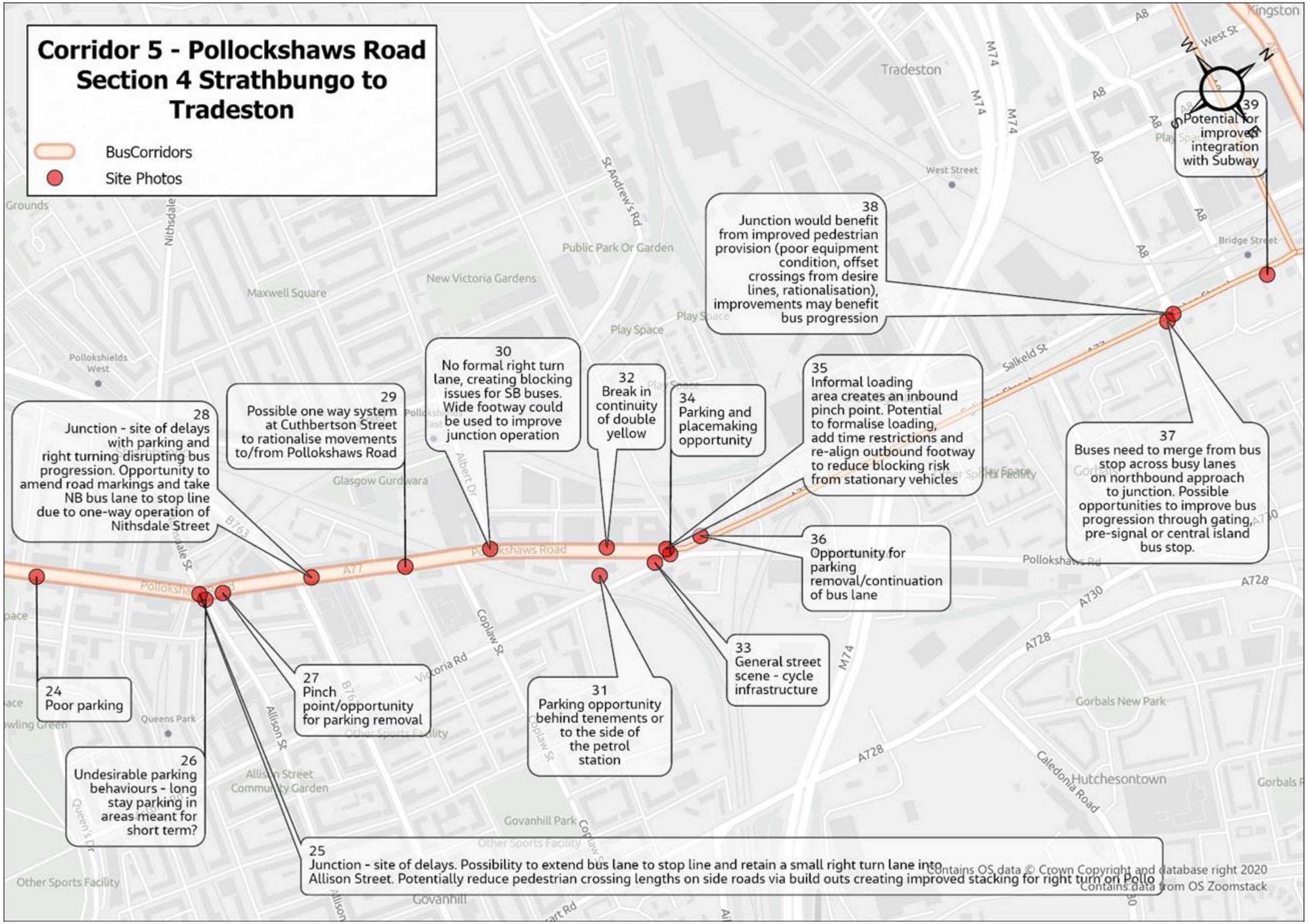
Contains data from OS Zoomstack

Ref	Comment	Image
23	Conflicting needs of road users on approach to junction. Opportunity to extend southbound bus lane to stop line with bus pre-signal to aid priority through junction	
24	Poor parking	
26	Undesirable parking behaviours - long stay parking in areas meant for short term?	


Corridor 5 - Pollockshaws Road
Section 4 Strathbungo to Tradeston
BusCorridors
Site Photos
24 Poor parking
25 Junction - site of delays. Possibility to extend bus lane to stop line and retain a small right turn lane into Allison Street. Potentially reduce pedestrian crossing lengths on side roads via build outs creating improved stacking for right turn on Pollo
26 Undesirable parking behaviours - long stay parking in areas meant for short term?
27 Pinch point/opportunity for parking removal
28 Junction - site of delays with parking and right turning disrupting bus progression. Opportunity to amend road markings and take NB bus lane to stop line due to one-way operation of Nithsdale Street
29 Possible one way system at Cuthbertson Street to rationalise movements to/from Pollokshaws Road
30 No formal right turn lane, creating blocking issues for SB buses. Wide footway could be used to improve junction operation
31 Parking opportunity behind tenements or to the side of the petrol station
32 Break in continuity of double yellow
33 General street scene - cycle infrastructure
34 Parking and placemaking opportunity
35 Informal loading area creates an inbound pinch point. Potential to formalise loading, add time restrictions and re-align outbound footway to reduce blocking risk from stationary vehicles
36 Opportunity for parking removal/continuation of bus lane
37 Buses need to merge from bus stop across busy lanes on northbound approach to junction. Possible opportunities to improve bus progression through gating, pre-signal or central island bus stop.
38 Junction would benefit from improved pedestrian provision (poor equipment condition, offset crossings from desire lines, rationalisation), improvements may benefit bus progression
39 Potential for improved integration with Subway
Tradeston
Kingston
Maxwell Square
New Victoria Gardens
Public Park Or Garden
Glasgow Gurdwara
Queens Park
Allison Street Community Garden
Govanhill Park
Govanhill
Gorbals New Park
Hutchesontown
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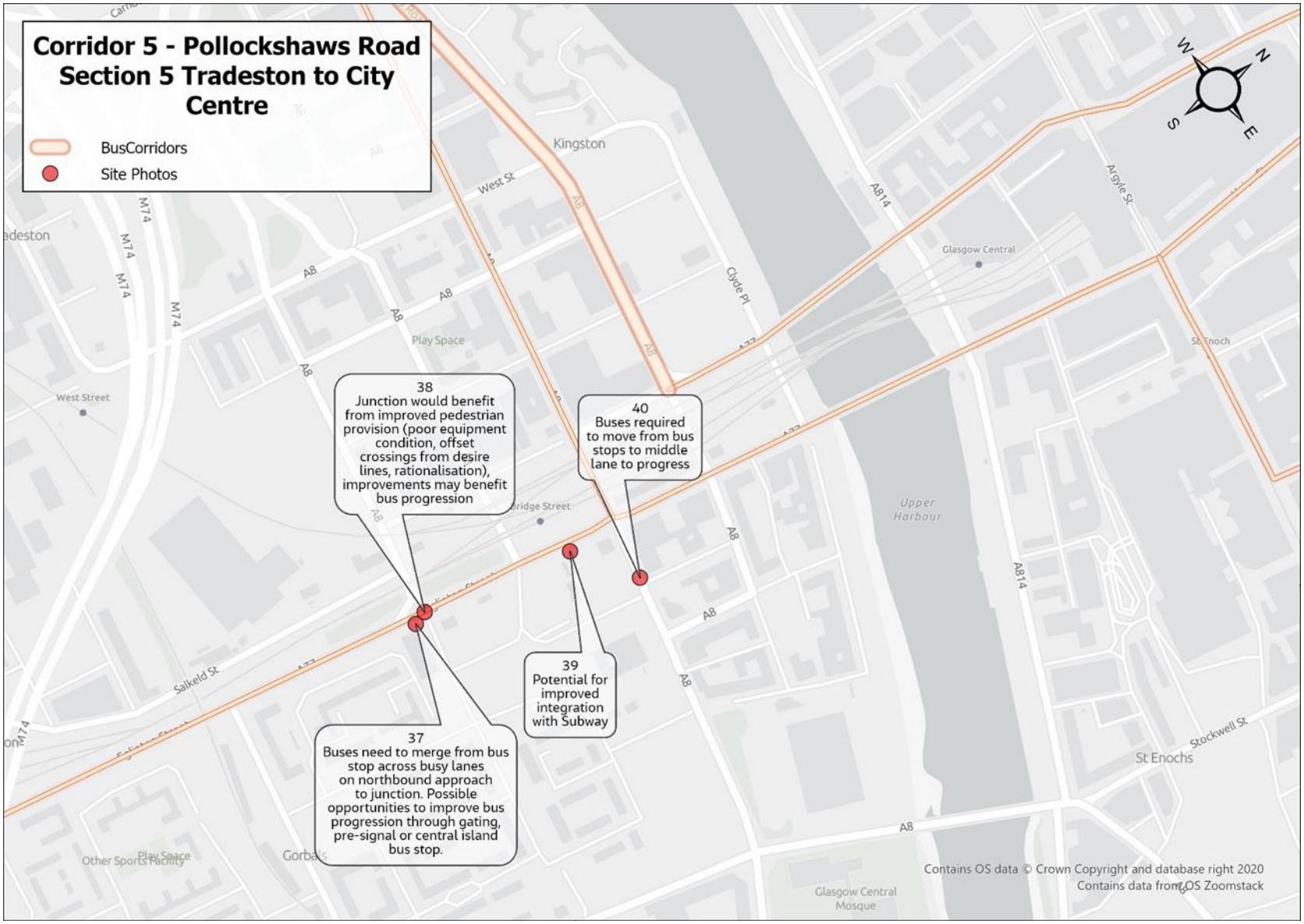
Contains data from OS Zoomstack

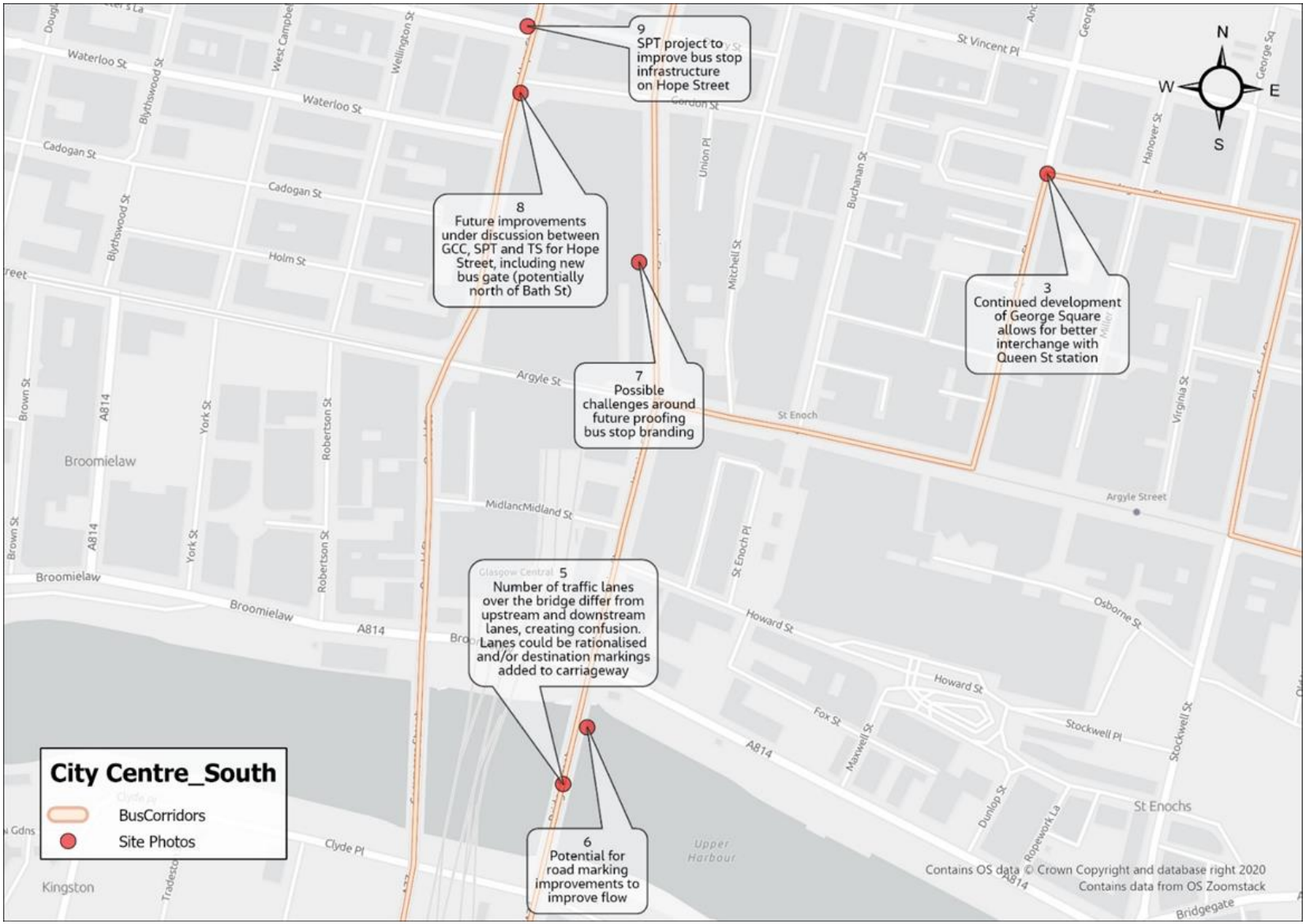
Ref	Comment	Image
28	Junction - site of delays with parking and right turning disrupting bus progression. Opportunity to amend road markings and take northbound bus lane to stop line due to one-way operation of Nithsdale Street	
31	Parking opportunity behind tenements or to the side of the petrol station	
32	Break in continuity of double yellow lines	

Ref	Comment	Image
33	General street scene - cycle infrastructure	
34	Parking and placemaking opportunity	
36	Opportunity for parking removal/continuation of bus lane	

Ref	Comment	Image
37	Buses need to merge from bus stop across busy lanes on northbound approach to junction. Possible opportunities to improve bus progression through gating, pre-signal or central island bus stop.	
39	Potential for improved integration with Subway	


Corridor 5 - Pollockshaws Road Section 5 Tradeston to City Centre
BusCorridors
Site Photos
38
Junction would benefit from improved pedestrian provision (poor equipment condition, offset crossings from desire lines, rationalisation), improvements may benefit bus progression
40
Buses required to move from bus stops to middle lane to progress
39
Potential for improved integration with Subway
37
Buses need to merge from bus stop across busy lanes on northbound approach to junction. Possible opportunities to improve bus progression through gating, pre-signal or central island bus stop.
Kingston
West Street
Play Space
Glasgow Central
Clyde Pl
Argyle St
Upper Harbour
St Enochs
Stockwell St
Salkeld St
Other Sports Facility
Glasgow Central Mosque
A8
A814
M74
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Ref	Comment	Image
40	Buses required to move from bus stops to middle lane to progress	


9
SPT project to improve bus stop infrastructure on Hope Street
8
Future improvements under discussion between GCC, SPT and TS for Hope Street, including new bus gate (potentially north of Bath St)
7
Possible challenges around future proofing bus stop branding
3
Continued development of George Square allows for better interchange with Queen St station
5
Number of traffic lanes over the bridge differ from upstream and downstream lanes, creating confusion. Lanes could be rationalised and/or destination markings added to carriageway
6
Potential for road marking improvements to improve flow
City Centre_South
BusCorridors
Site Photos
N
W
E
S
Waterloo St
Cadogan St
Holm St
Argyle St
Broomielaw
A814
Clyde Pl
Kingston
St Enoch
Argyle Street
Howard St
Osborne St
Stockwell Pl
St Enochs
Bridgegate
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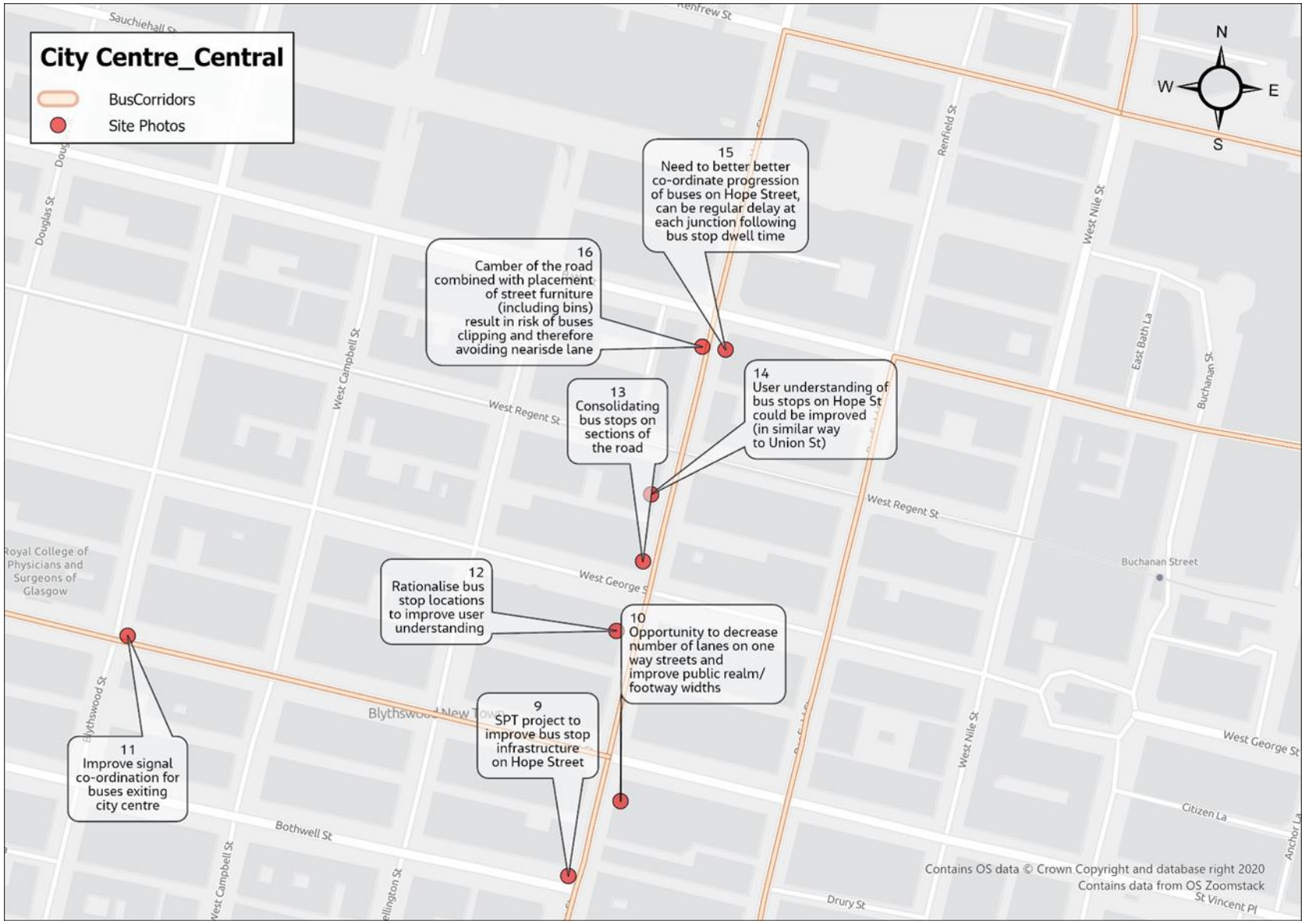
Contains data from OS Zoomstack

Ref	Comment	Image
3	Continued development of George Square allows for better interchange with Queen St station	No Photo
5	Number of traffic lanes over the bridge differ from upstream and downstream lanes, creating confusion. Lanes could be rationalised and/or destination markings added to carriageway	No Photo
6	Potential for road marking improvements to improve flow	
7	Possible challenges around future proofing bus stop branding	
8	Future improvements under discussion between Glasgow City Council, SPT and Transport Scotland for Hope Street, including new bus gate (potentially north of Bath St)	No Photo

Ref	Comment	Image
9	SPT project to improve bus stop infrastructure on Hope Street	


City Centre_Central
BusCorridors
Site Photos
N
W
E
S
15
Need to better better co-ordinate progression of buses on Hope Street, can be regular delay at each junction following bus stop dwell time
16
Camber of the road combined with placement of street furniture (including bins) result in risk of buses clipping and therefore avoiding nearisde lane
13
Consolidating bus stops on sections of the road
14
User understanding of bus stops on Hope St could be improved (in similar way to Union St)
12
Rationalise bus stop locations to improve user understanding
10
Opportunity to decrease number of lanes on one way streets and improve public realm/ footway widths
9
SPT project to improve bus stop infrastructure on Hope Street
11
Improve signal co-ordination for buses exiting city centre
Sauchiehall St
Renfrew St
Douglas St
West Campbell St
West Regent St
West George St
Bothwell St
Drury St
Renfield St
West Nile St
East Bath La
Buchanan St
Buchanan Street
Citizen La
Anchor La
St Vincent Pl
Royal College of Physicians and Surgeons of Glasgow
Blythswood St
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Contains data from OS Zoomstack

Ref	Comment	Image
10	Opportunity to decrease number of lanes on one-way streets and improve public realm/ footway widths	No Photo
11	Improve signal co-ordination for buses exiting city centre	No Photo
12	Rationalise bus stop locations to improve user understanding	No Photo
13	Consolidating bus stops on sections of the road	
14	User understanding of bus stops on Hope St could be improved (in similar way to Union St)	No Photo
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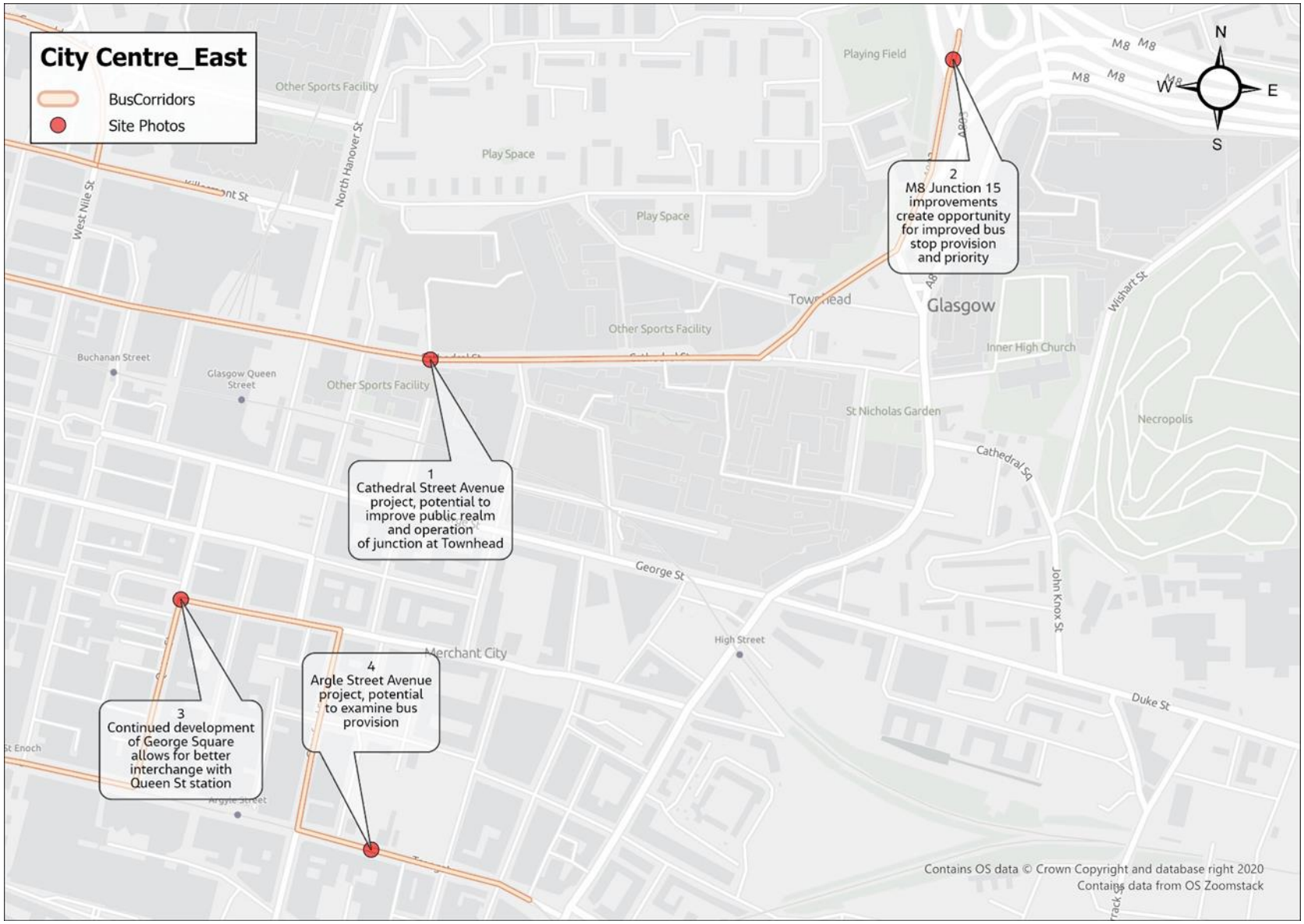
Ref	Comment	Image
16	Camber of the road combined with placement of street furniture (including bins) result in risk of buses clipping and therefore avoiding nearside lane	


City Centre_East
BusCorridors
Site Photos
1
Cathedral Street Avenue project, potential to improve public realm and operation of junction at Townhead
2
M8 Junction 15 improvements create opportunity for improved bus stop provision and priority
3
Continued development of George Square allows for better interchange with Queen St station
4
Argle Street Avenue project, potential to examine bus provision
Playing Field
Other Sports Facility
Play Space
Play Space
Other Sports Facility
Other Sports Facility
Townhead
Glasgow
Inner High Church
St Nicholas Garden
Necropolis
Cathedral Sq
George St
High Street
Merchant City
John Knox St
Duke St
Wishart St
North Hanover St
West Nile St
Buchanan Street
Glasgow Queen Street
M8
N
S
E
W
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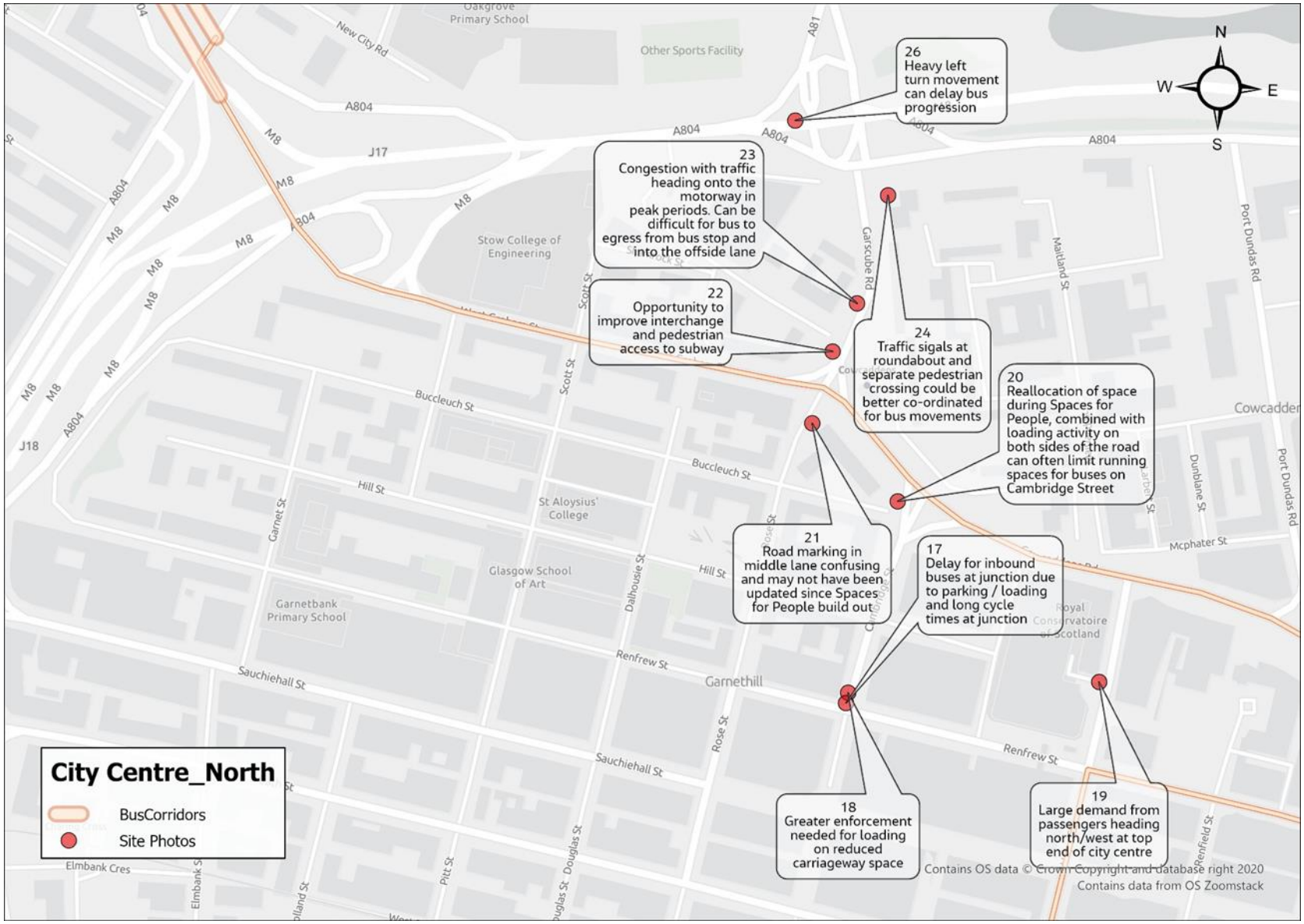
Contains data from OS Zoomstack


26
Heavy left turn movement can delay bus progression
23
Congestion with traffic heading onto the motorway in peak periods. Can be difficult for bus to egress from bus stop and into the offside lane
22
Opportunity to improve interchange and pedestrian access to subway
24
Traffic sigals at roundabout and separate pedestrian crossing could be better co-ordinated for bus movements
20
Reallocation of space during Spaces for People, combined with loading activity on both sides of the road can often limit running spaces for buses on Cambridge Street
21
Road marking in middle lane confusing and may not have been updated since Spaces for People build out
17
Delay for inbound buses at junction due to parking / loading and long cycle times at junction
18
Greater enforcement needed for loading on reduced carriageway space
19
Large demand from passengers heading north/west at top end of city centre
City Centre_North
BusCorridors
Site Photos
N
W
E
S
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

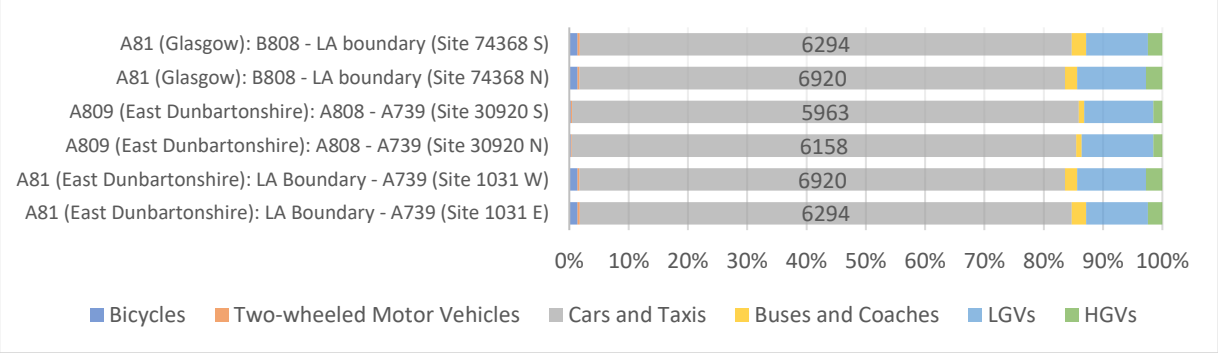
Ref	Comment	Image
17	Delay for inbound buses at junction due to parking / loading and long cycle times at junction	
20	Reallocation of space during Spaces for People, combined with loading activity on both sides of the road can often limit running spaces for buses on Cambridge Street	
22	Opportunity to improve interchange and pedestrian access to subway	

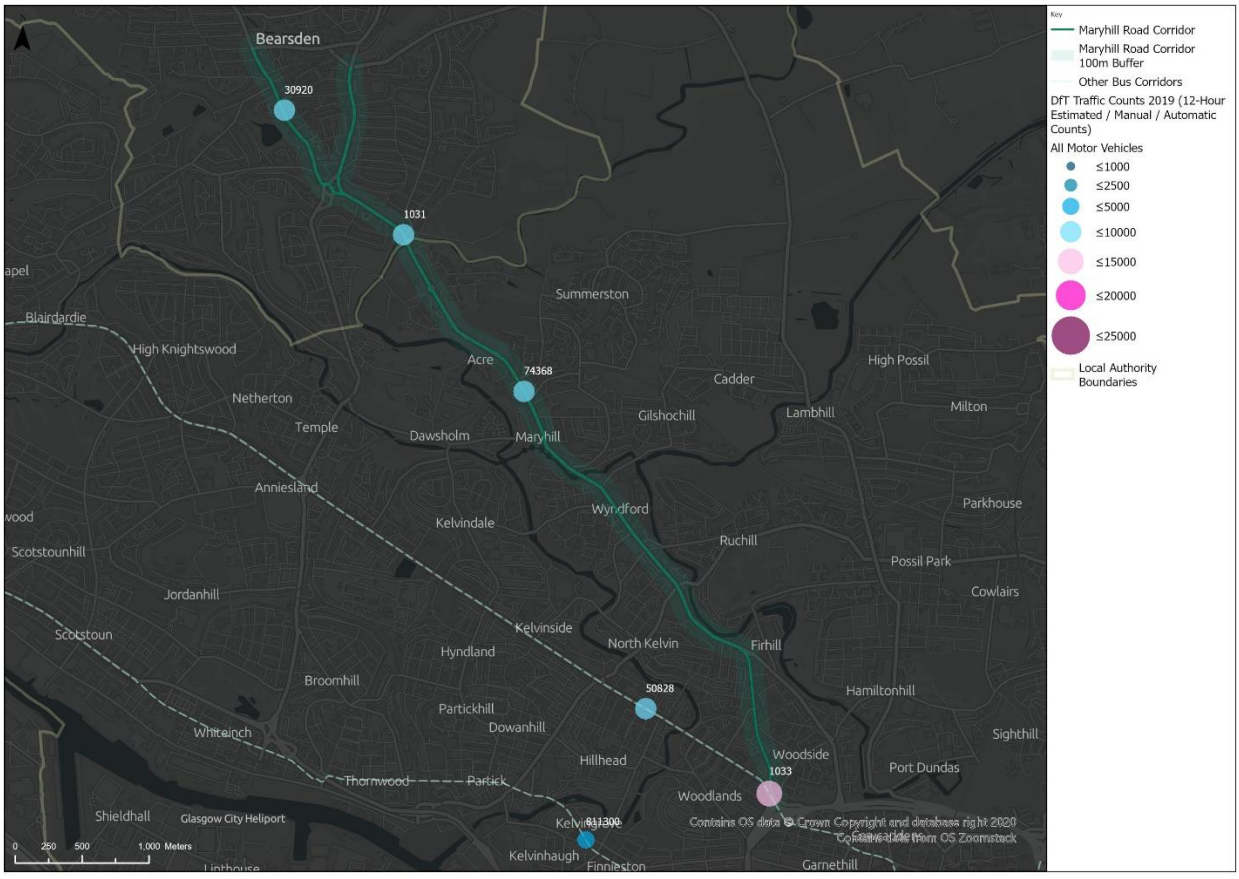
Appendix E. Traffic Flow Data

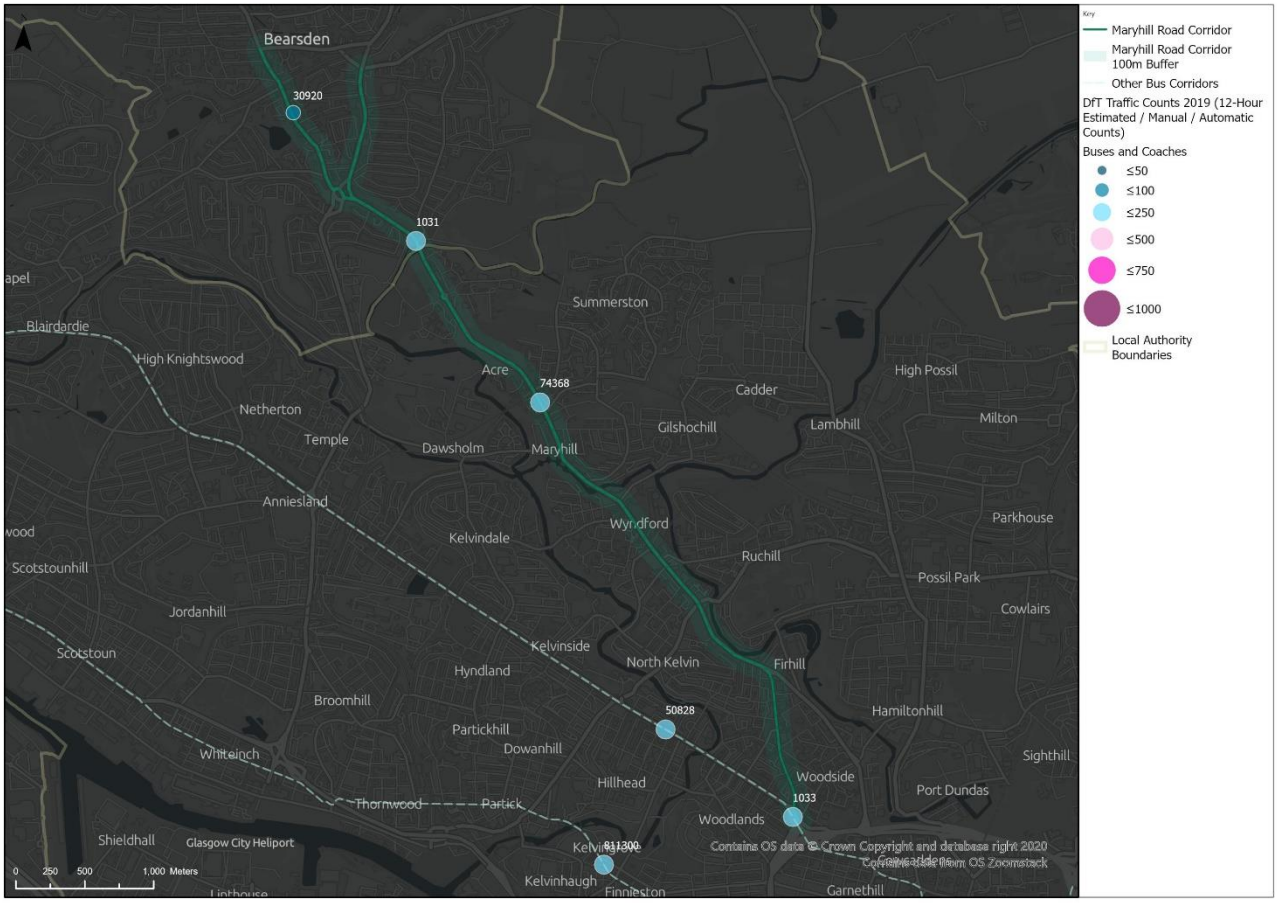
Appendix E provides a high level overview of the traffic characteristic on the corridors under consideration. The information presented is informed by available Department for Transport (DfT) traffic count data published via roadtraffic.dft.gov.uk, specifically DfT's 2019 (pre-COVID-19) Average Annual Daily Flow (AADF) data based on12-hour traffic counts.

In considering this data and the associated outputs, it should be noted that DfT data may be estimated from manual or automatic counts undertaken in prior years, which may reduce the accuracy of the data. The data extracted for the count sites on each of the corridors under consideration includes flows estimated from counts undertaken in previous years. Further analysis of traffic volumes and composition will be undertaken during the preliminary and detailed appraisal and will consider additional data sources including traffic count data available from the Local Authorities, including Glasgow City Council's SCOOT data.

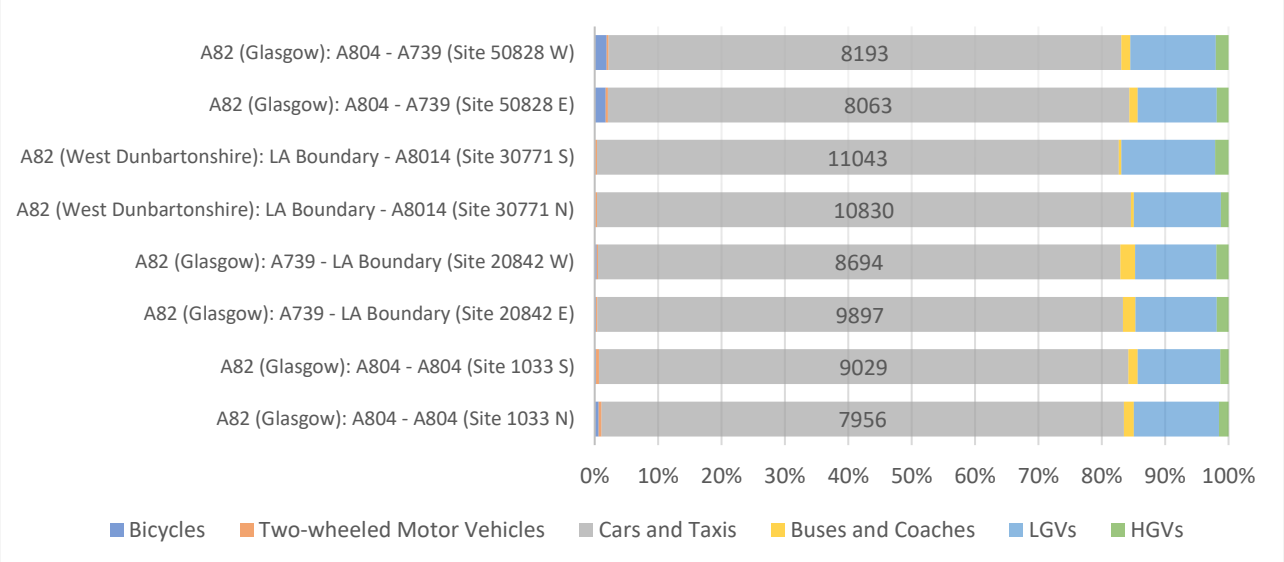
C1. Maryhill Road







C2. Great Western Road




Key
Great Western Road Corridor
Great Western Road Corridor 100m Buffer
Other Bus Corridors
DfT Traffic Counts 2019 (12-Hour Estimated / Manual / Automatic Counts)
All Motor Vehicles
≤1000
≤2500
≤5000
≤10000
≤15000
≤20000
≤25000
Local Authority Boundaries
Bearsden
Renfrew
30771
30920
1031
30924
20842
74368
74425
80368
50828
1033
811300
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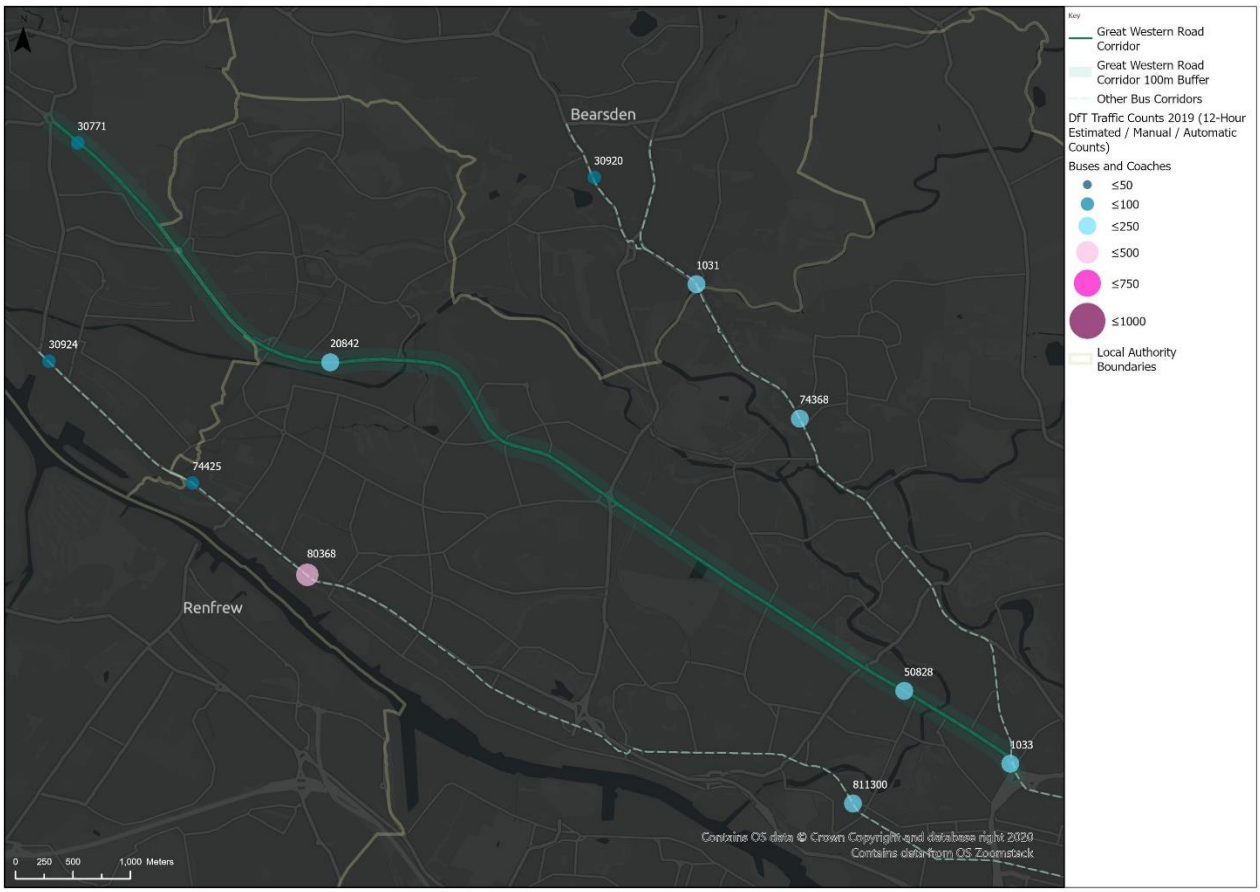
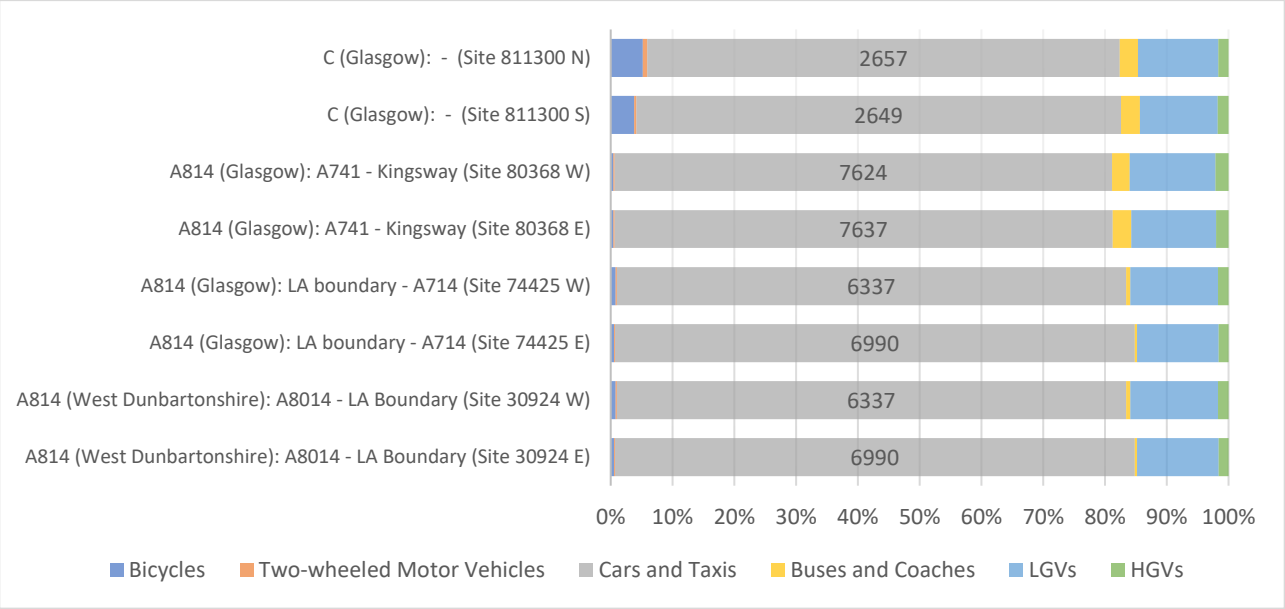
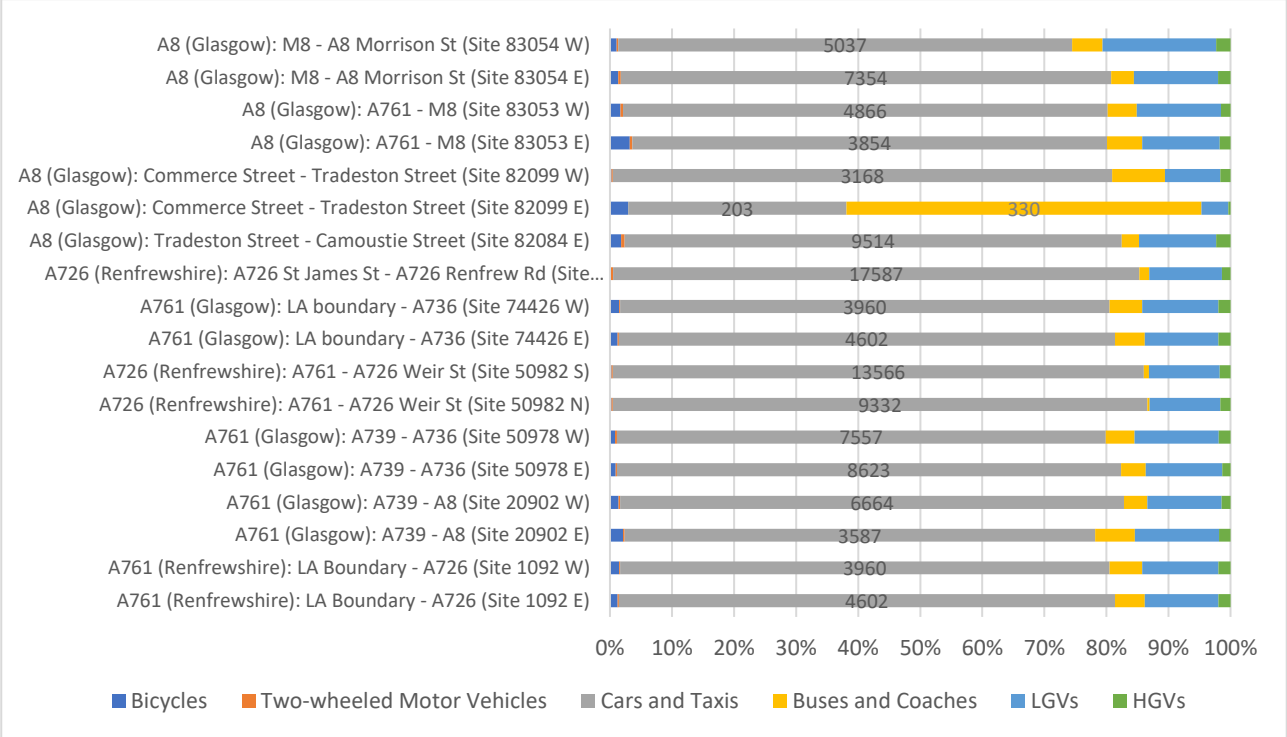
Contains data from OS Zoomstack
0 250 500 1,000 Meters


Key
Great Western Road Corridor
Great Western Road Corridor 100m Buffer
Other Bus Corridors
DfT Traffic Counts 2019 (12-Hour Estimated / Manual / Automatic Counts)
Buses and Coaches
≤50
≤100
≤250
≤500
≤750
≤1000
Local Authority Boundaries
Bearsden
Renfrew
30771
30920
1031
30924
20842
74368
74425
80368
50828
1033
811300
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack
0 250 500 1,000 Meters

C3. Dumbarton Road



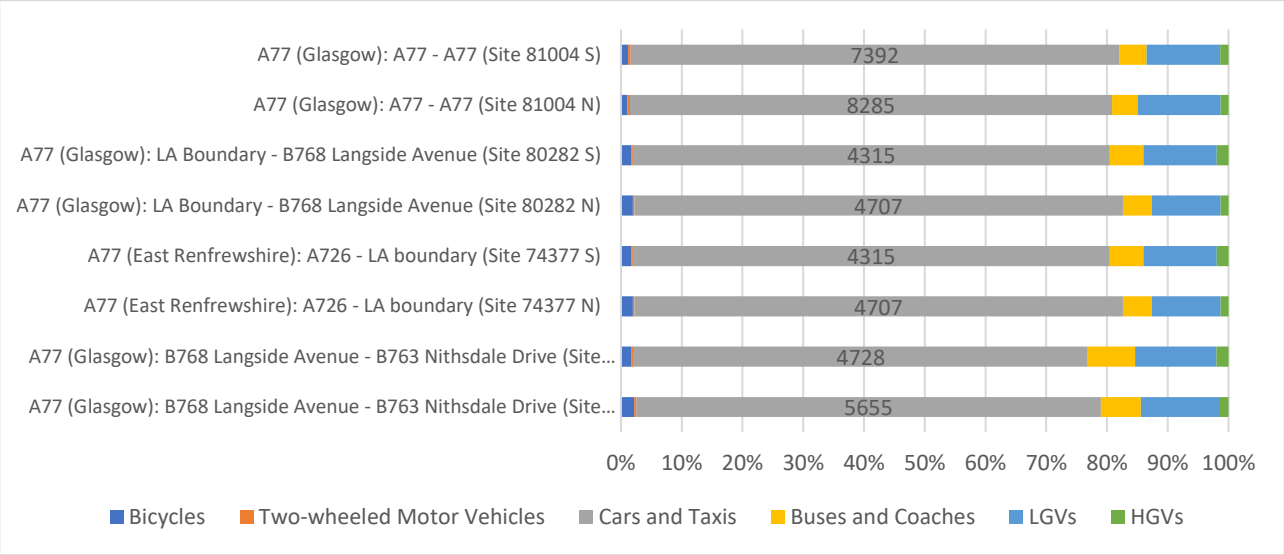
C4. Paisley Road West

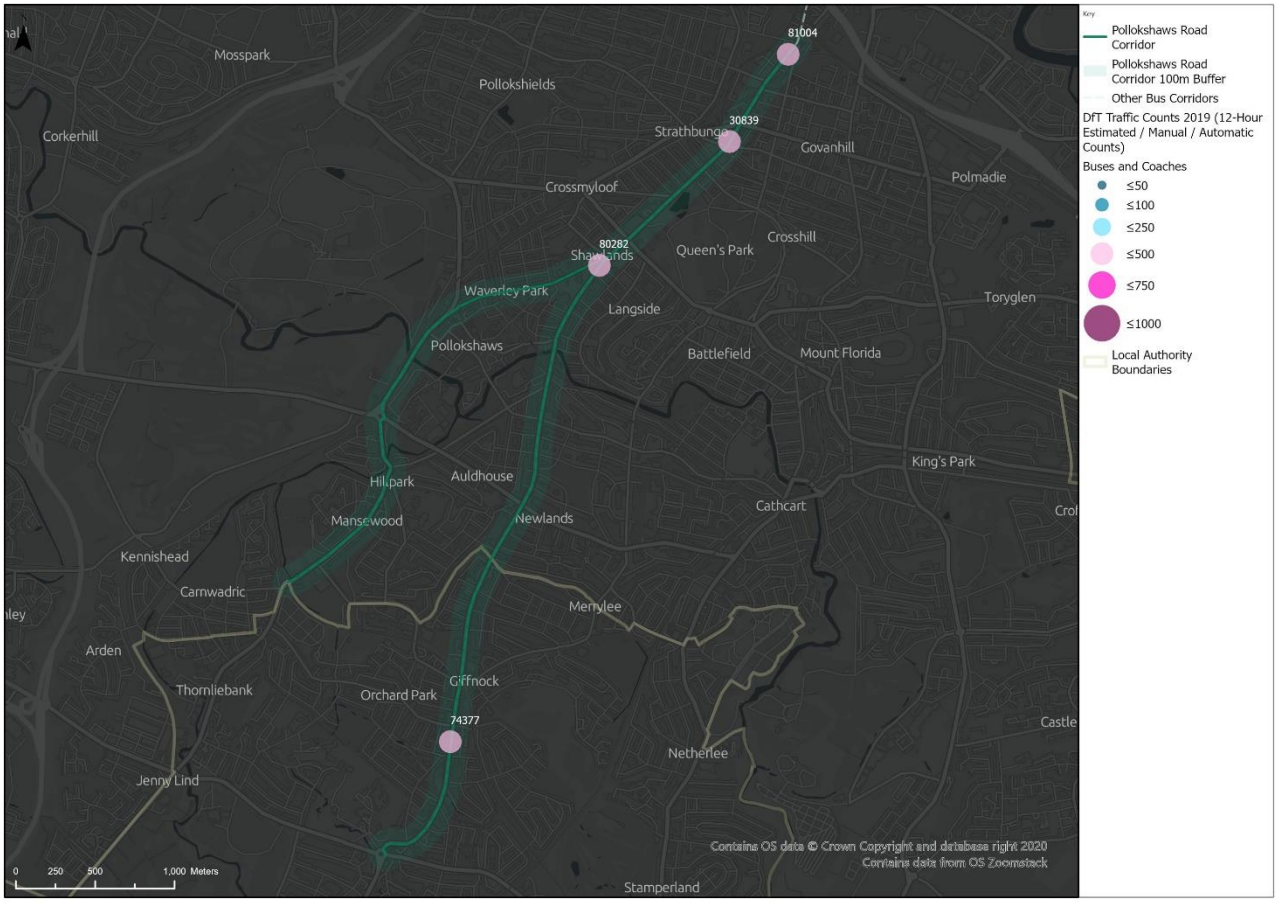



Key
Paisley Road West Corridor
Paisley Road West Corridor 100m Buffer
Other Bus Corridors
DfT Traffic Counts 2019 (12-Hour Estimated / Manual / Automatic Counts)
All Motor Vehicles
≤1000
≤2500
≤5000
≤10000
≤15000
≤20000
≤25000
Local Authority Boundaries
Renfrew
Paisley
80368
50828
1033
811300
83053
83054
82084
82088
82091
82095
82099
82090
82092
82093
82085
82104
82105
82103
80257
50982
74426
1092
50978
20902
81004
30839
80282
0 250 500 1,000 Meters
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

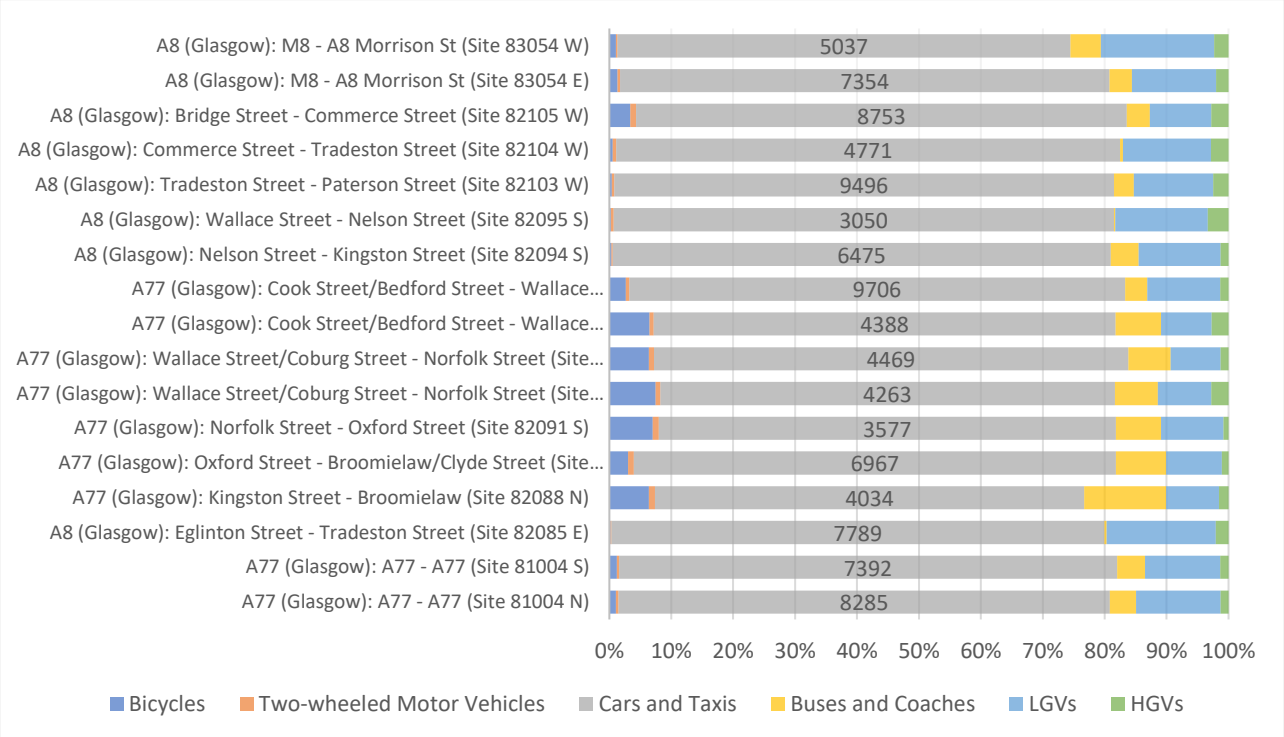

Key
Paisley Road West Corridor
Paisley Road West Corridor 100m Buffer
Other Bus Corridors
DfT Traffic Counts 2019 (12-Hour Estimated / Manual / Automatic Counts)
Buses and Coaches
≤50
≤100
≤250
≤500
≤750
≤1000
Local Authority Boundaries
Renfrew
Paisley
80368
50828
1033
811300
83053
83054
82084
82088
82090
82091
82099
82095
82092
82094
82093
82085
82104
82105
82103
80257
50982
74426
1092
50978
20902
81004
30839
80282
0 250 500 1,000 Meters
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

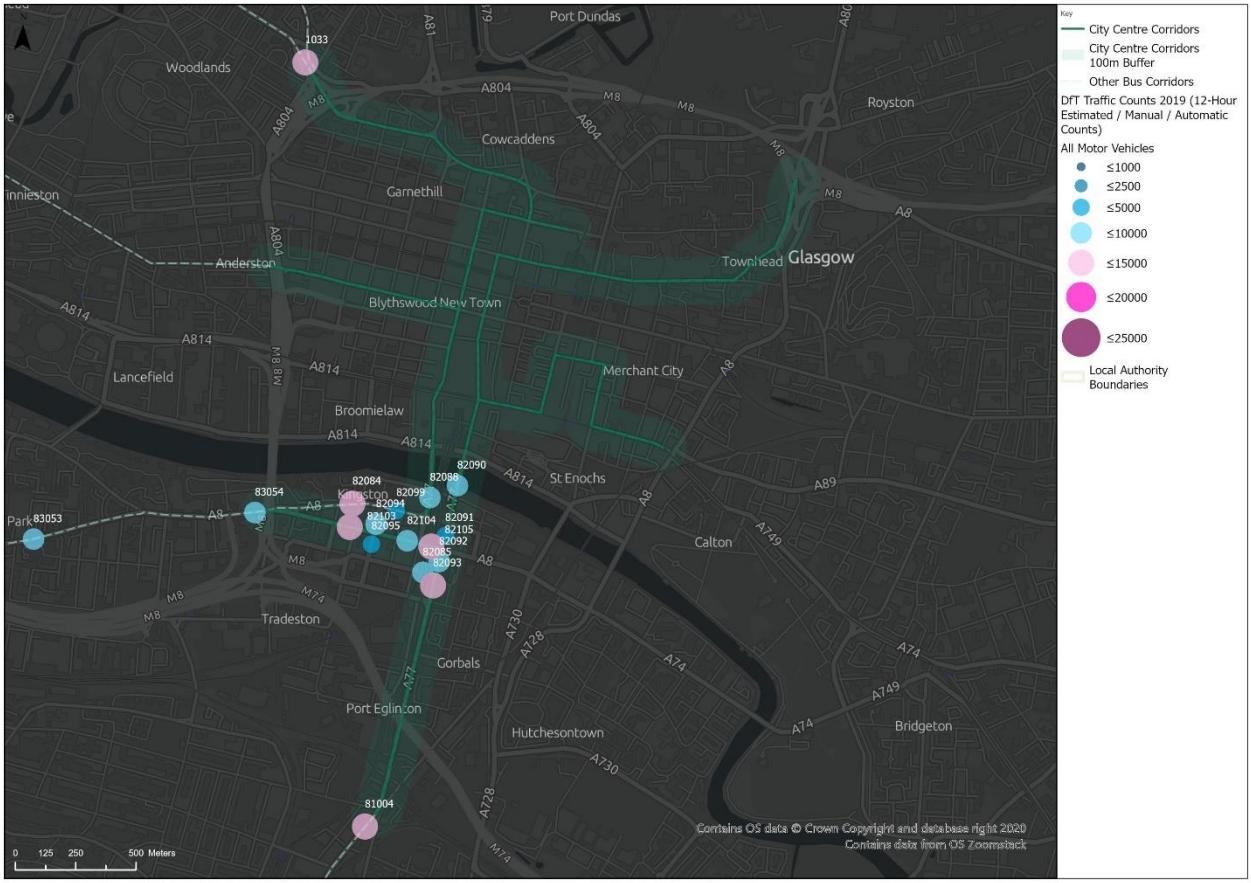
C5. Pollokshaws Road

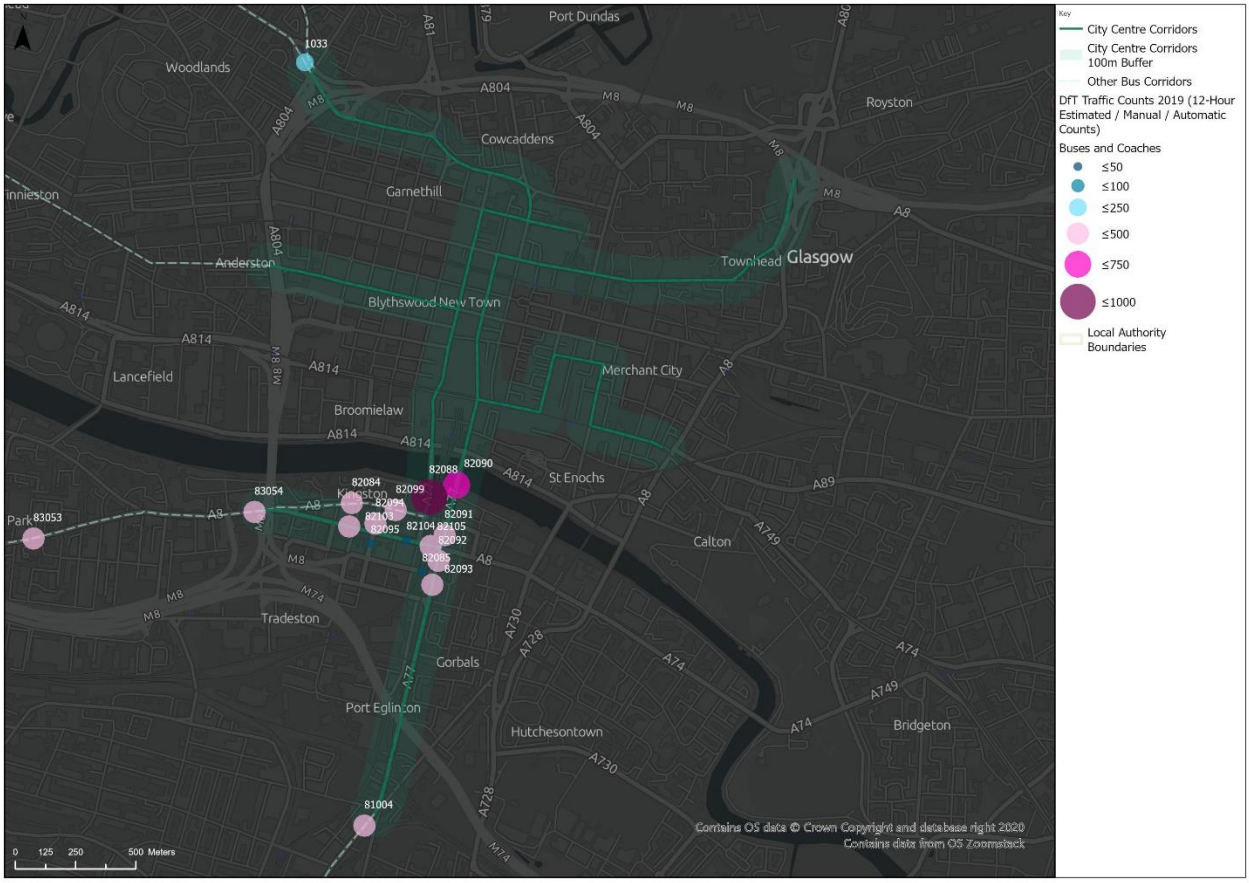




City Centre Corridors




Key
City Centre Corridors
City Centre Corridors 100m Buffer
Other Bus Corridors
DfT Traffic Counts 2019 (12-Hour Estimated / Manual / Automatic Counts)
All Motor Vehicles
≤1000
≤2500
≤5000
≤10000
≤15000
≤20000
≤25000
Local Authority Boundaries
Port Dundas
Woodlands
Royston
Cowcaddens
Garnethill
Townhead
Glasgow
Blythswood New Town
Anderston
Lancefield
Merchant City
Broomielaw
St Enochs
Calton
Tradeston
Gorbals
Port Eglinton
Hutchesontown
Bridgeton
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack
0 125 250 500 Meters


Key
City Centre Corridors
City Centre Corridors 100m Buffer
Other Bus Corridors
DfT Traffic Counts 2019 (12-Hour Estimated / Manual / Automatic Counts)
Buses and Coaches
≤50
≤100
≤250
≤500
≤750
≤1000
Local Authority Boundaries
Port Dundas
Woodlands
Royston
Cowcaddens
Garnethill
Townhead
Glasgow
Blythswood New Town
Anderston
Lancefield
Merchant City
Broomielaw
St Enochs
Calton
Tradeston
Gorbals
Port Eglinton
Hutchesontown
Bridgeton
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Contains data from OS Zoomstack
0 125 250 500 Meters

Appendix F. Accident Data

Appendix F details an analysis of Department for Transport (DfT) Road Safety data which has been undertaken to consider personal injury accidents within a 100m buffer zone of each of the 5 bus corridors for the 5-year period 2016 – 2020. The data has been extracted from publicly available information from the STATS-19 database published via data.gov.uk. The analysis is focused on instances of casualties on each corridor, disaggregating these by casualty severity (Recorded as Fatal, Serious and Slight within STATS-19) and by casualty mode, e.g. pedestrian, cyclist, bus / coach occupant etc. The table below provides an overview of the casualties recorded on each corridor.

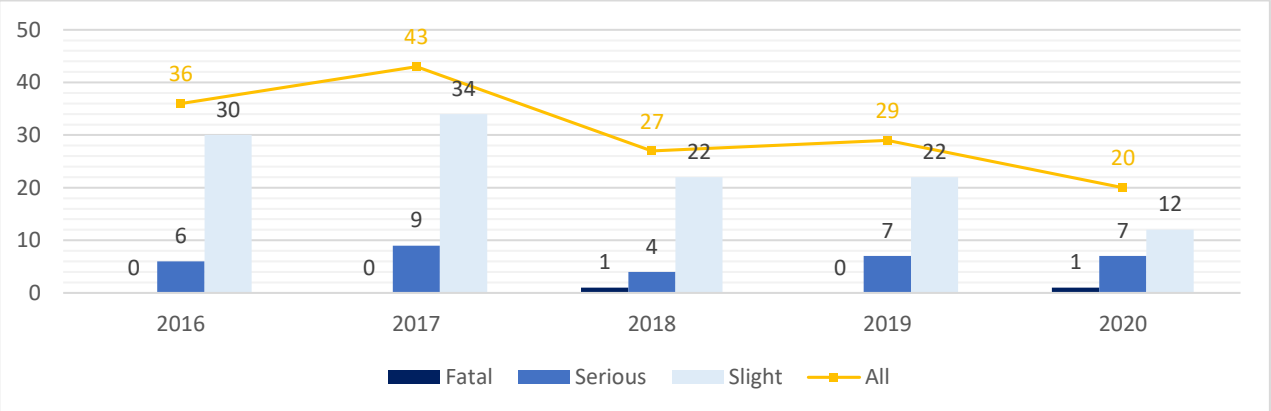
Corridor	2016	2017	2018	2019	2020	Trend	Total
Maryhill Road	36	43	27	29	20		**155**
Great Western Road	45	45	39	23	20		**172**
Dumbarton Road	70	38	44	47	20		**219**
Paisley Road West	71	50	36	25	24		**206**
Pollokshaws Road	54	45	34	41	19		**193**
City Centre	118	94	87	70	44		**413**
Total	**394**	**315**	**267**	**235**	**147**		**1358**

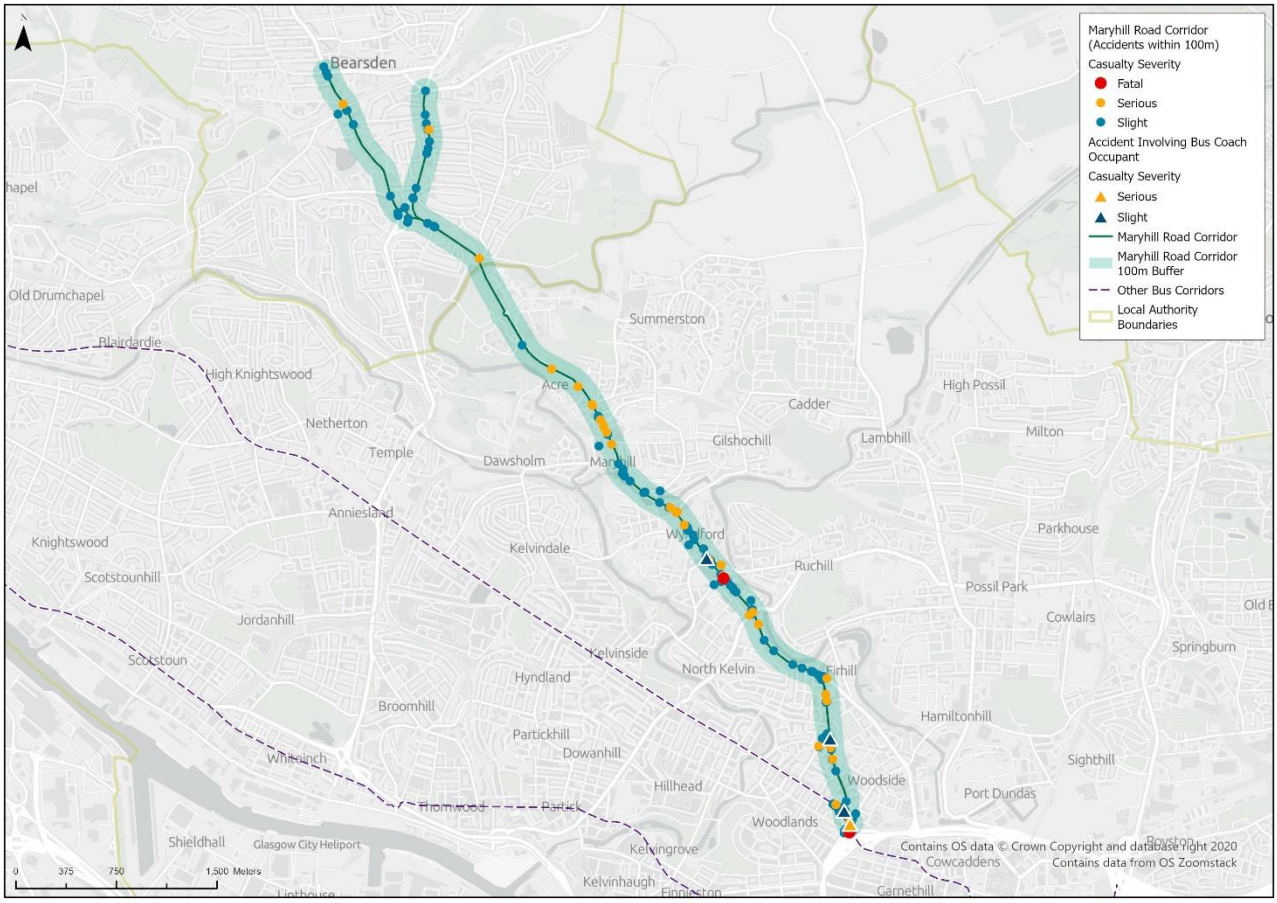
A direct comparison cannot necessarily be made given the differing extents and characteristics of each corridor. However, a review of the percentage split by casualty type provides the following insights:

- The proportion of Fatal casualties ranged from 0.5% on the Dumbarton Road corridor to 2.3% on the Great Western Road Corridor.
- The proportion of Serious casualties ranged from 16.3% of casualties on the Great Western Road corridor to 23.2% on city centre corridors.
- The proportion of Slight casualties ranged from 75.8% on city centre corridors to 82.4% on the Pollokshaws Road corridor.

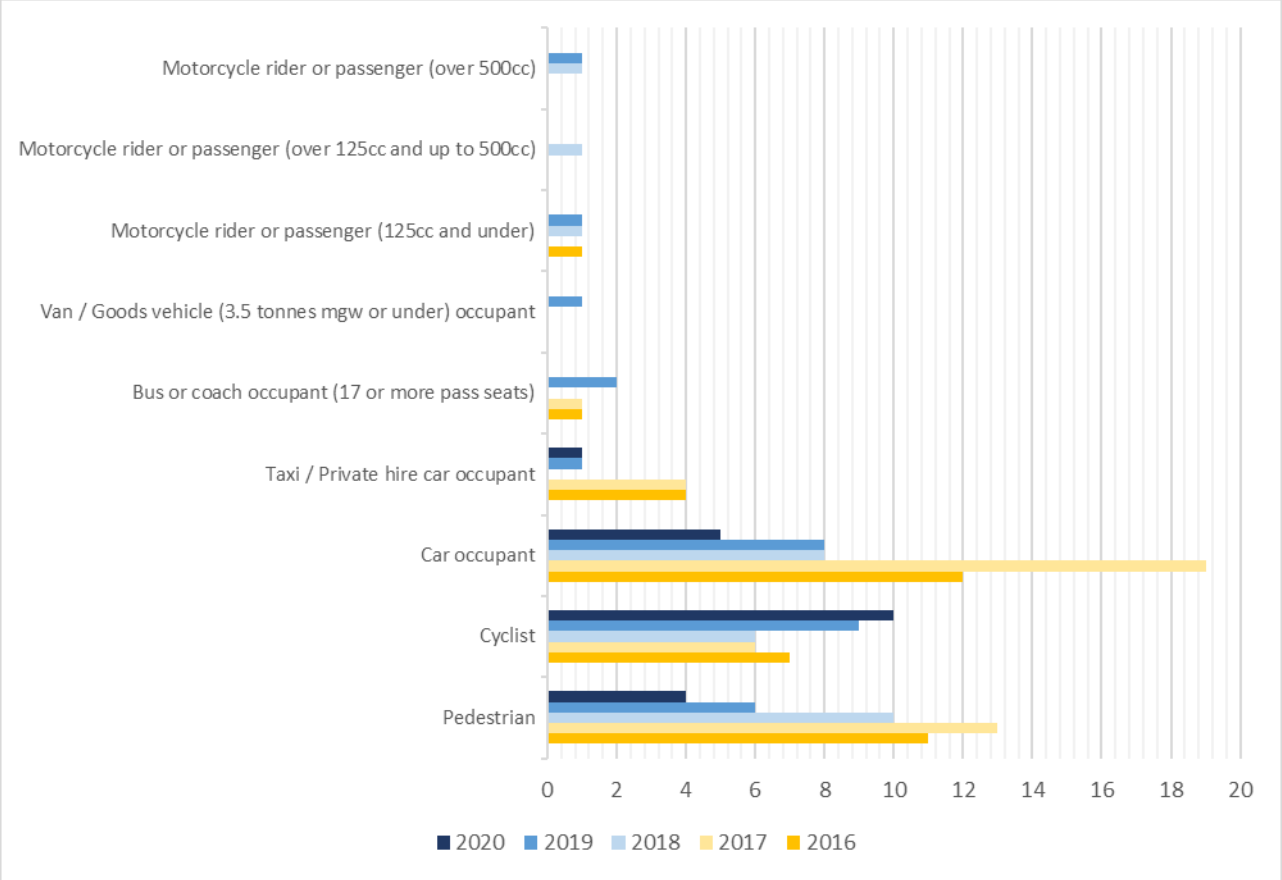
C1. Maryhill Road

Severity	2016	2017	2018	2019	2020	Trend	Total
Fatal	0	0	1	0	1		**2**
Serious	6	9	4	7	7		**33**
Slight	30	34	22	22	12		**120**
All	**36**	**43**	**27**	**29**	**20**		**155**



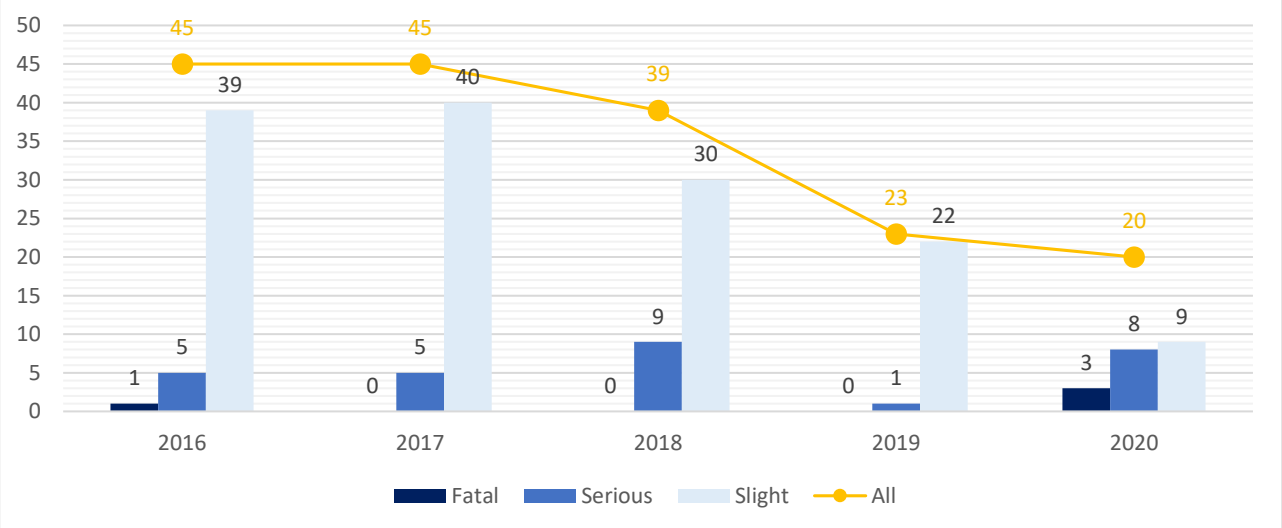


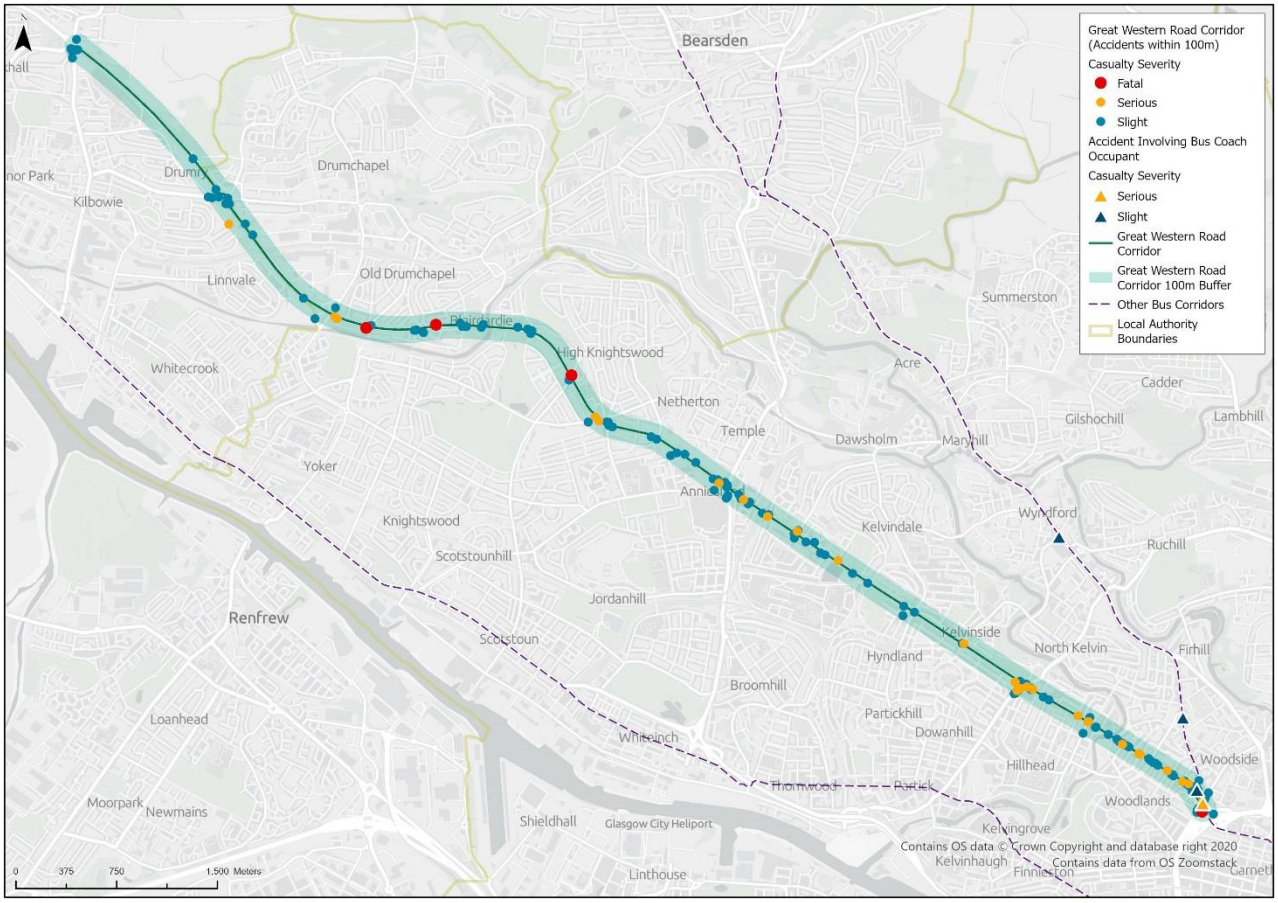
Casualty Type	2016	2017	2018	2019	2020	Trend	Total
Pedestrian	11	13	10	6	4		**44**
Cyclist	7	6	6	9	10		**38**
Car occupant	12	19	8	8	5		**52**
Taxi / Private hire car occupant	4	4	0	1	1		**10**
Bus or coach occupant (17 or more pass seats)	1	1	0	2	0		**4**
Van / Goods vehicle (3.5 tonnes mgw or under) occupant	0	0	0	1	0		**1**
Motorcycle rider or passenger (125cc and under)	1	0	1	1	0		**3**
Motorcycle rider or passenger (over 125cc and up to 500cc)	0	0	1	0	0		**1**
Motorcycle rider or passenger (over 500cc)	0	0	1	1	0		**2**
All	**36**	**43**	**27**	**29**	**20**		**155**



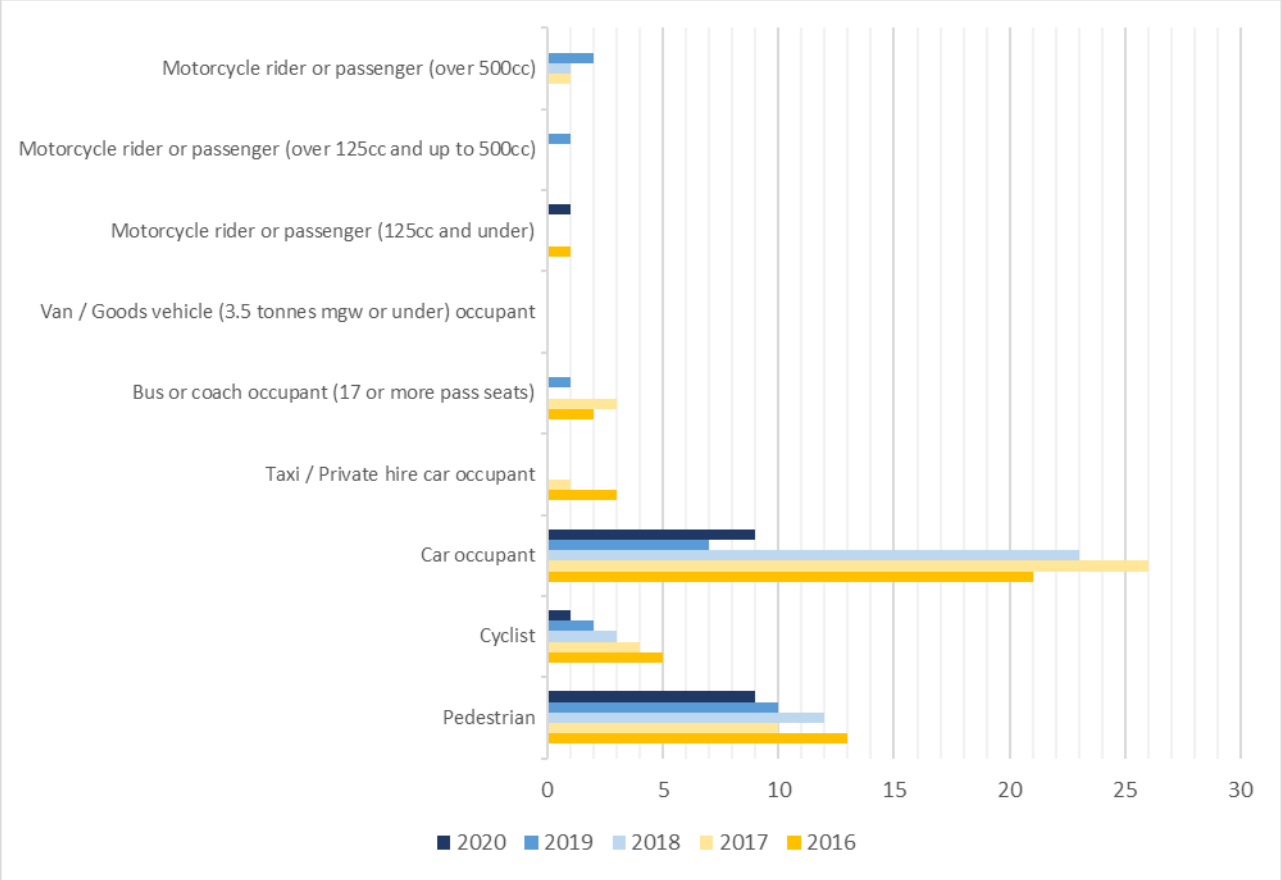
C2. Great Western Road

Severity	2016	2017	2018	2019	2020	Trend	Total
Fatal	1	0	0	0	3		**4**
Serious	5	5	9	1	8		**28**
Slight	39	40	30	22	9		**140**
All	**45**	**45**	**39**	**23**	**20**		**172**



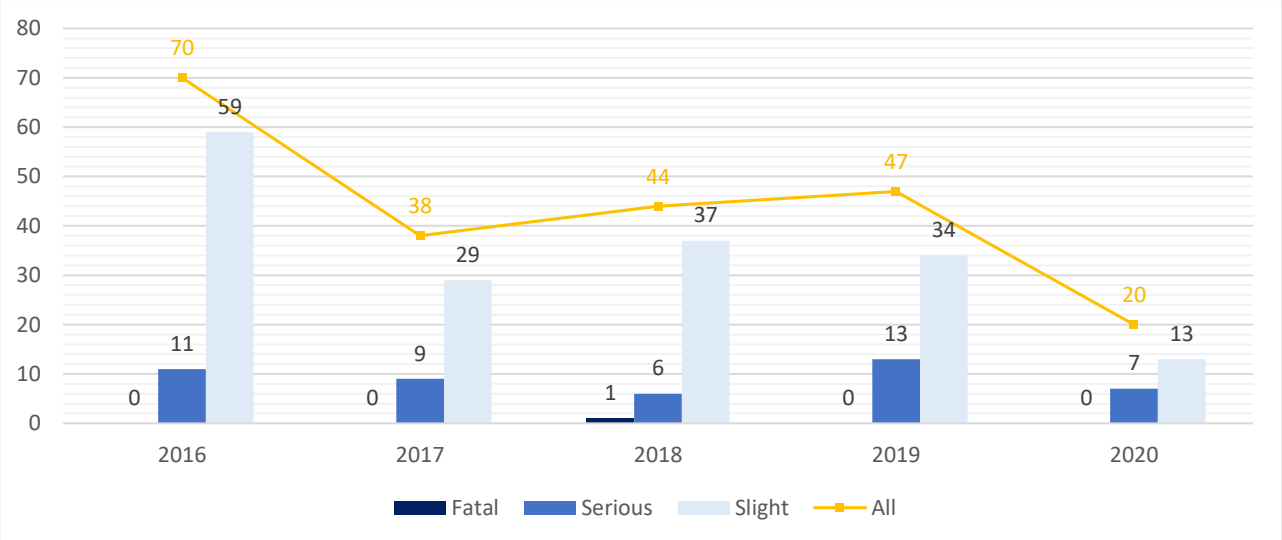


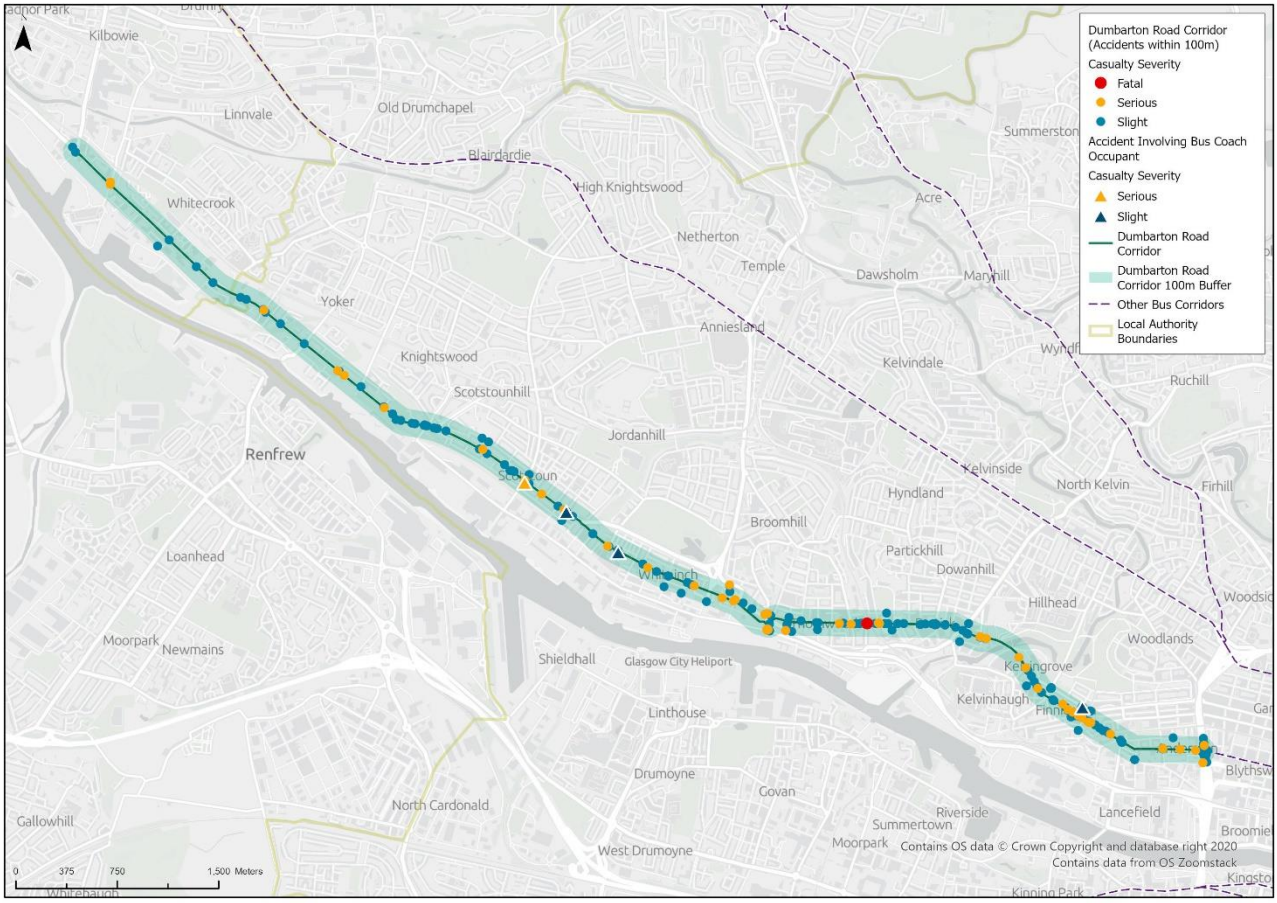
Casualty Type	2016	2017	2018	2019	2020	Trend	Total
Pedestrian	13	10	12	10	9		**54**
Cyclist	5	4	3	2	1		**15**
Car occupant	21	26	23	7	9		**86**
Taxi / Private hire car occupant	3	1	0	0	0		**4**
Bus or coach occupant (17 or more pass seats)	2	3	0	1	0		**6**
Van / Goods vehicle (3.5 tonnes mgw or under) occupant	0	0	0	0	0		**0**
Motorcycle rider or passenger (125cc and under)	1	0	0	0	1		**2**
Motorcycle rider or passenger (over 125cc and up to 500cc)	0	0	0	1	0		**1**
Motorcycle rider or passenger (over 500cc)	0	1	1	2	0		**4**
All	**45**	**45**	**39**	**23**	**20**		**172**



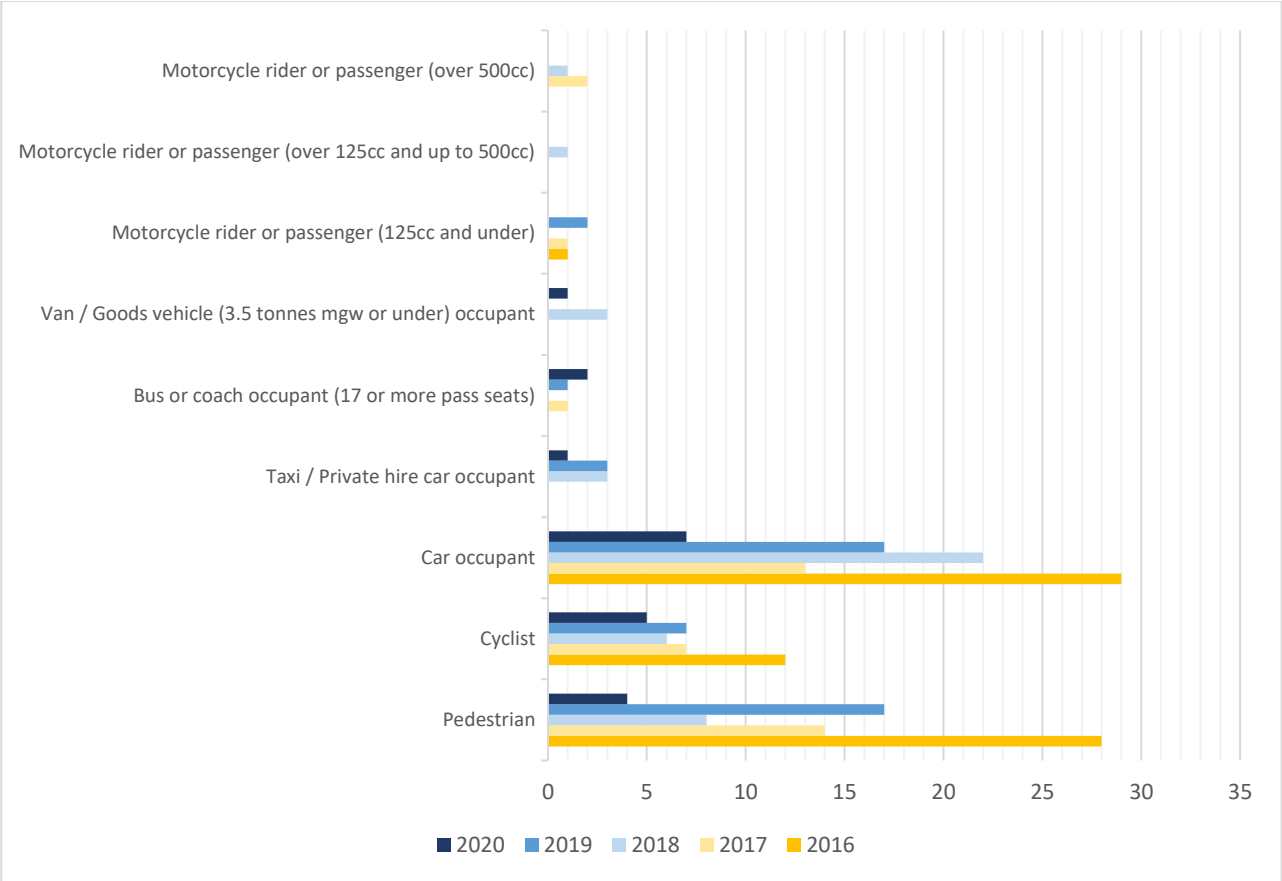
C3. Dumbarton Road

Severity	2016	2017	2018	2019	2020	Trend	Total
Fatal	0	0	1	0	0		**1**
Serious	11	9	6	13	7		**46**
Slight	59	29	37	34	13		**172**
All	**70**	**38**	**44**	**47**	**20**		**219**



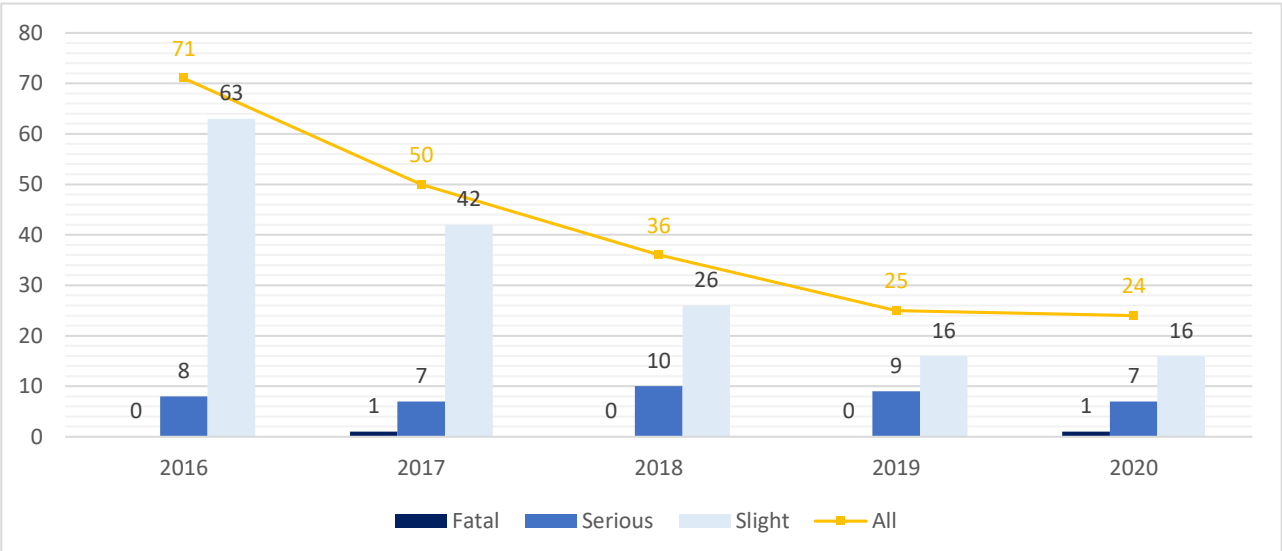


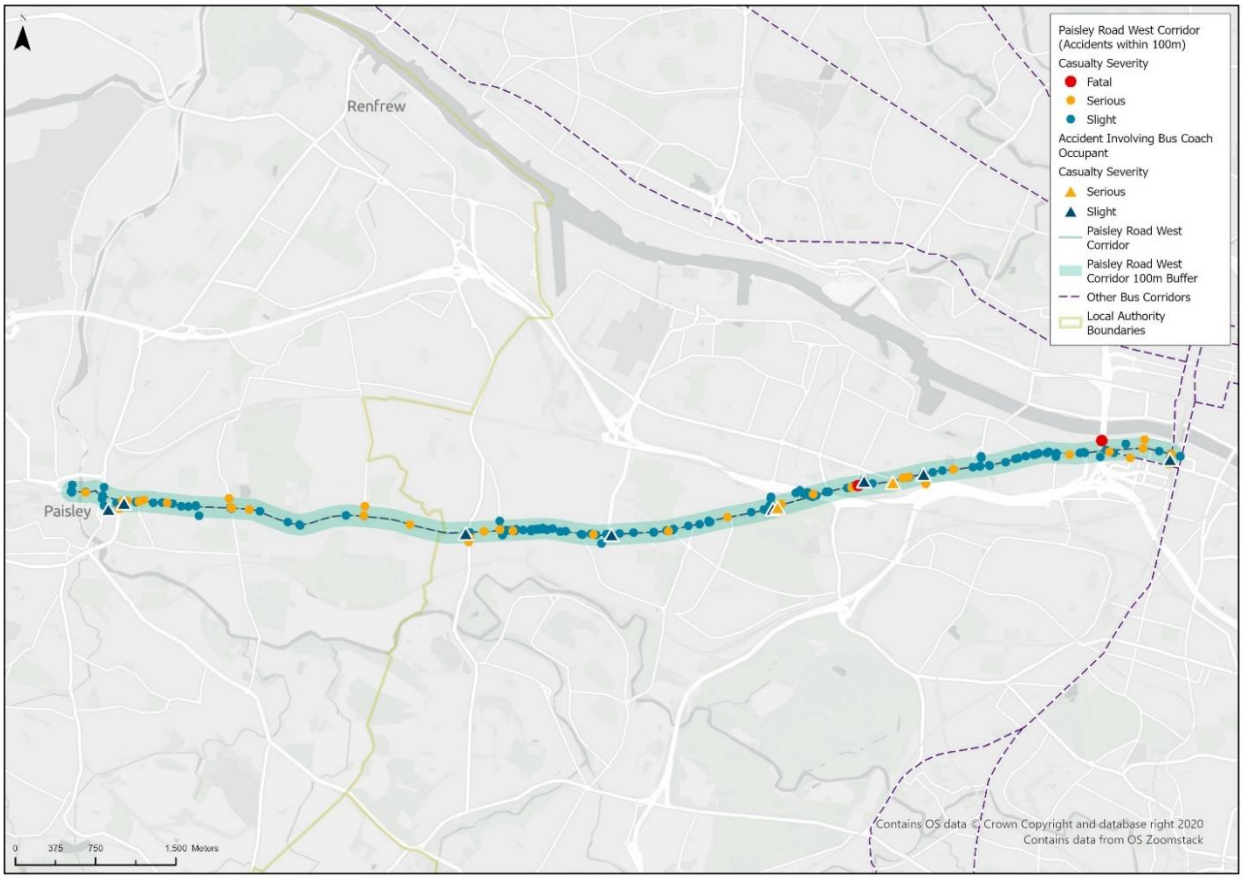
Casualty Type	2016	2017	2018	2019	2020	Trend	Total
Pedestrian	28	14	8	17	4		**71**
Cyclist	12	7	6	7	5		**37**
Car occupant	29	13	22	17	7		**88**
Taxi / Private hire car occupant	0	0	3	3	1		**7**
Bus or coach occupant (17 or more pass seats)	0	1	0	1	2		**4**
Van / Goods vehicle (3.5 tonnes mgw or under) occupant	0	0	3	0	1		**4**
Motorcycle rider or passenger (125cc and under)	1	1	0	2	0		**4**
Motorcycle rider or passenger (over 125cc and up to 500cc)	0	0	1	0	0		**1**
Motorcycle rider or passenger (over 500cc)	0	2	1	0	0		**3**
All	**70**	**38**	**44**	**47**	**20**		**219**



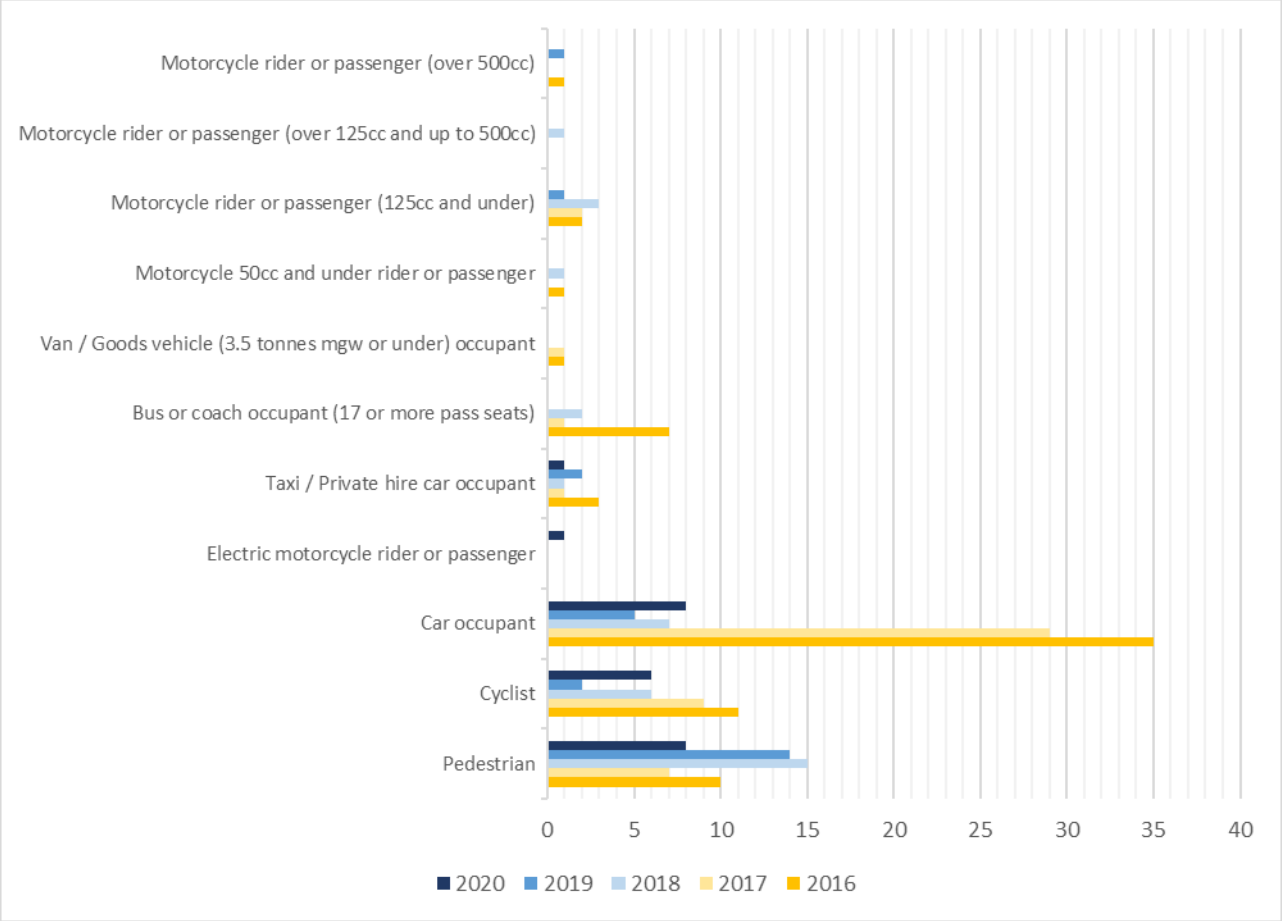
C4. Paisley Road West

Severity	2016	2017	2018	2019	2020	Trend	Total
Fatal	0	1	0	0	1		**2**
Serious	8	7	10	9	7		**41**
Slight	63	42	26	16	16		**163**
All	**71**	**50**	**36**	**25**	**24**		**206**



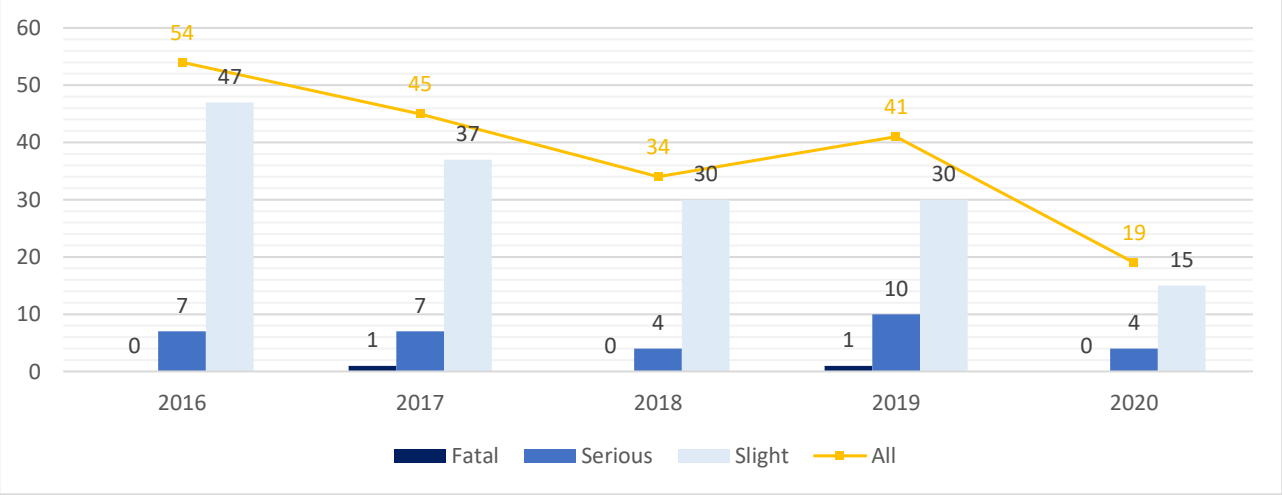


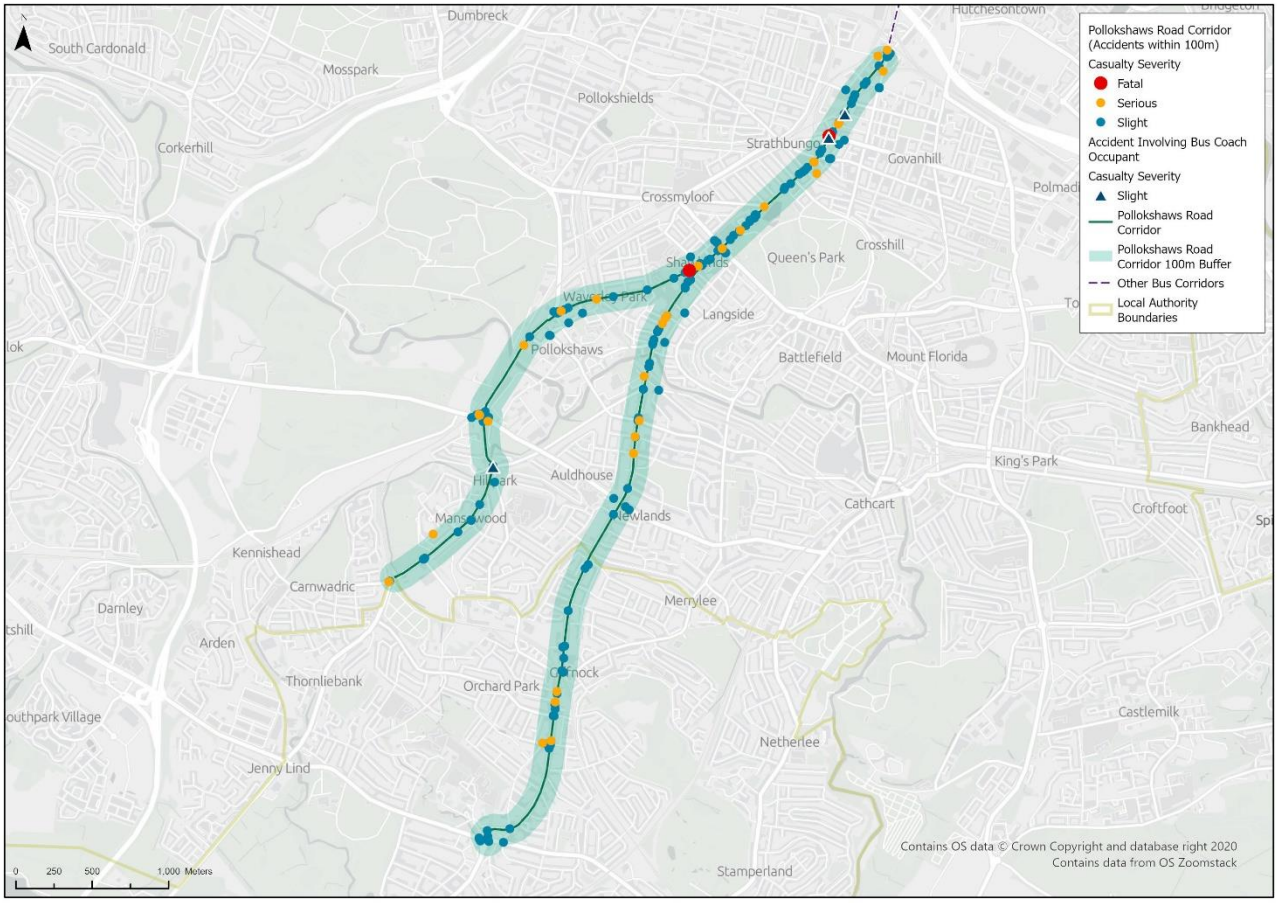
Casualty Type	2016	2017	2018	2019	2020	Trend	Total
Pedestrian	10	7	15	14	8		**54**
Cyclist	11	9	6	2	6		**34**
Car occupant	35	29	7	5	8		**84**
Electric motorcycle rider or passenger	0	0	0	0	1		**1**
Taxi / Private hire car occupant	3	1	1	2	1		**8**
Bus or coach occupant (17 or more pass seats)	7	1	2	0	0		**10**
Van / Goods vehicle (3.5 tonnes mgw or under) occupant	1	1	0	0	0		**2**
Motorcycle 50cc and under rider or passenger	1	0	1	0	0		**2**
Motorcycle rider or passenger (125cc and under)	2	2	3	1	0		**8**
Motorcycle rider or passenger (over 125cc and up to 500cc)	0	0	1	0	0		**1**
Motorcycle rider or passenger (over 500cc)	1	0	0	1	0		**2**
All	**71**	**50**	**36**	**25**	**24**		**206**



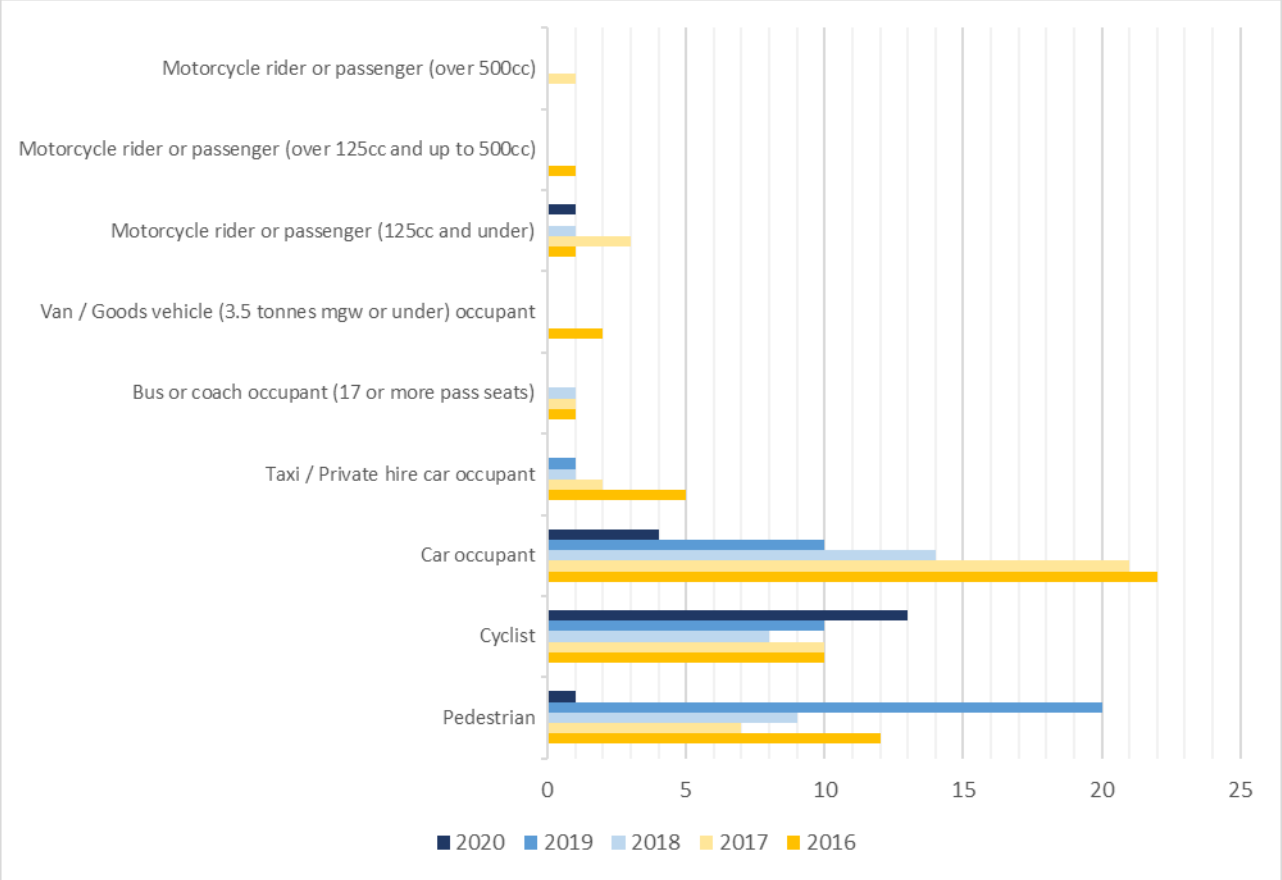
C5. Pollokshaws Road

Severity	2016	2017	2018	2019	2020	Trend	Total
Fatal	0	1	0	1	0		**2**
Serious	7	7	4	10	4		**32**
Slight	47	37	30	30	15		**159**
All	**54**	**45**	**34**	**41**	**19**		**193**



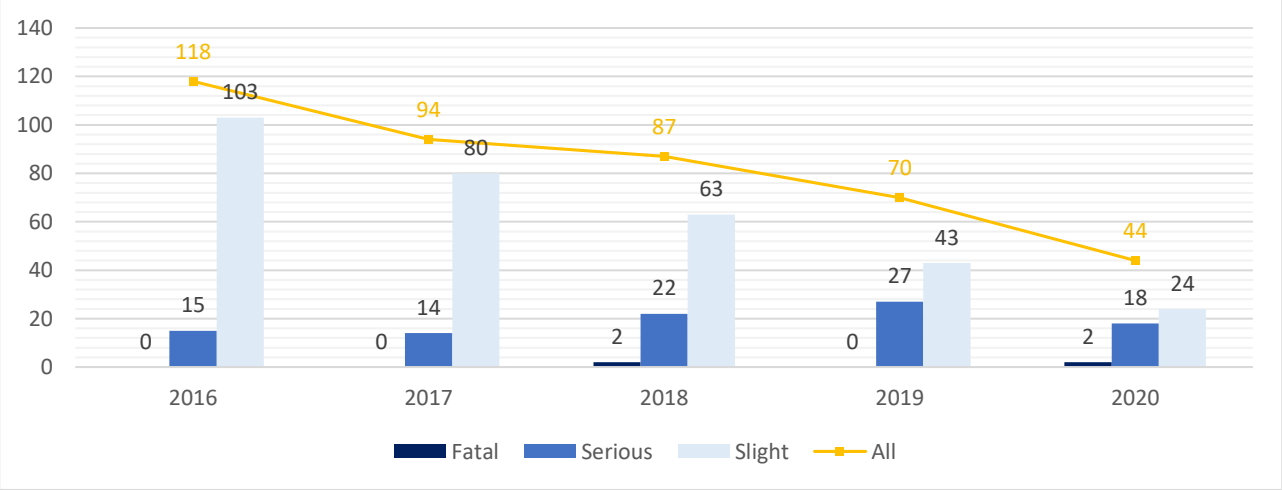


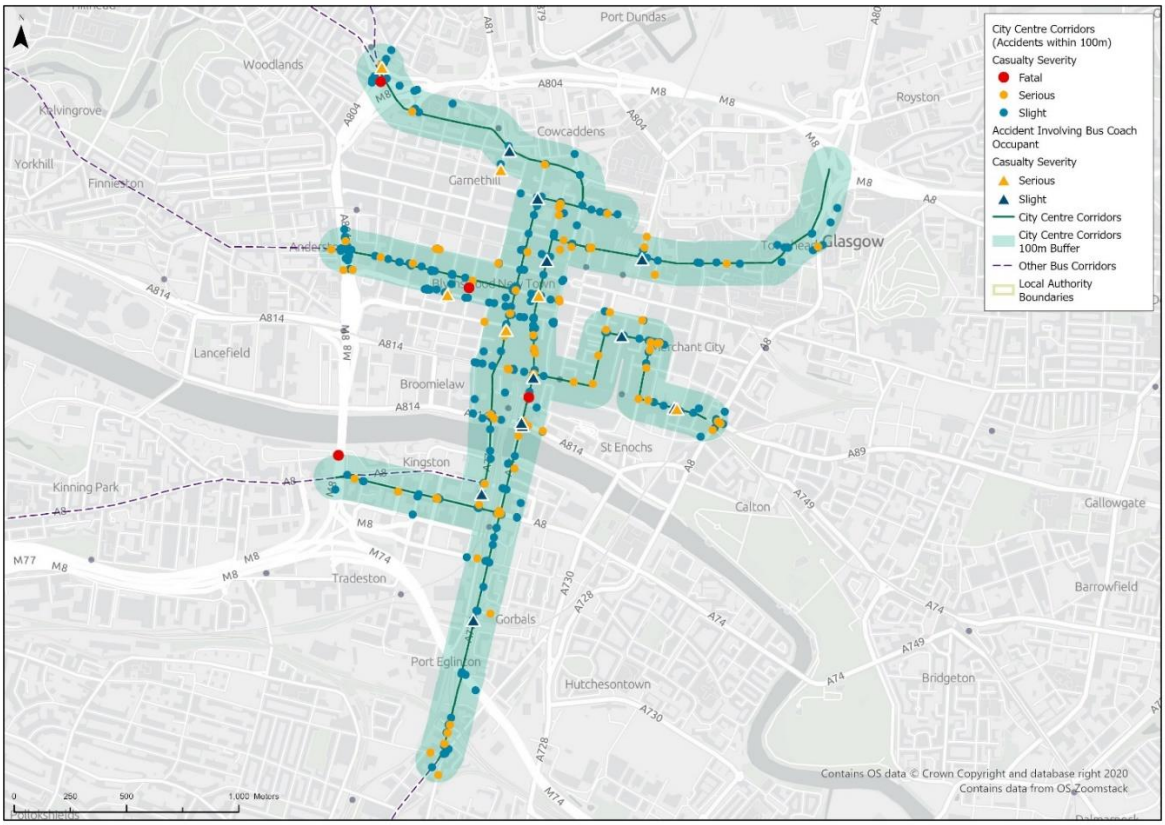
Casualty Type	2016	2017	2018	2019	2020	Trend	Total
Pedestrian	12	7	9	20	1		**49**
Cyclist	10	10	8	10	13		**51**
Car occupant	22	21	14	10	4		**71**
Taxi / Private hire car occupant	5	2	1	1	0		**9**
Bus or coach occupant (17 or more pass seats)	1	1	1	0	0		**3**
Van / Goods vehicle (3.5 tonnes mgw or under) occupant	2	0	0	0	0		**2**
Motorcycle rider or passenger (125cc and under)	1	3	1	0	1		**6**
Motorcycle rider or passenger (over 125cc and up to 500cc)	1	0	0	0	0		**1**
Motorcycle rider or passenger (over 500cc)	0	1	0	0	0		**1**
All	**54**	**45**	**34**	**41**	**19**		**193**



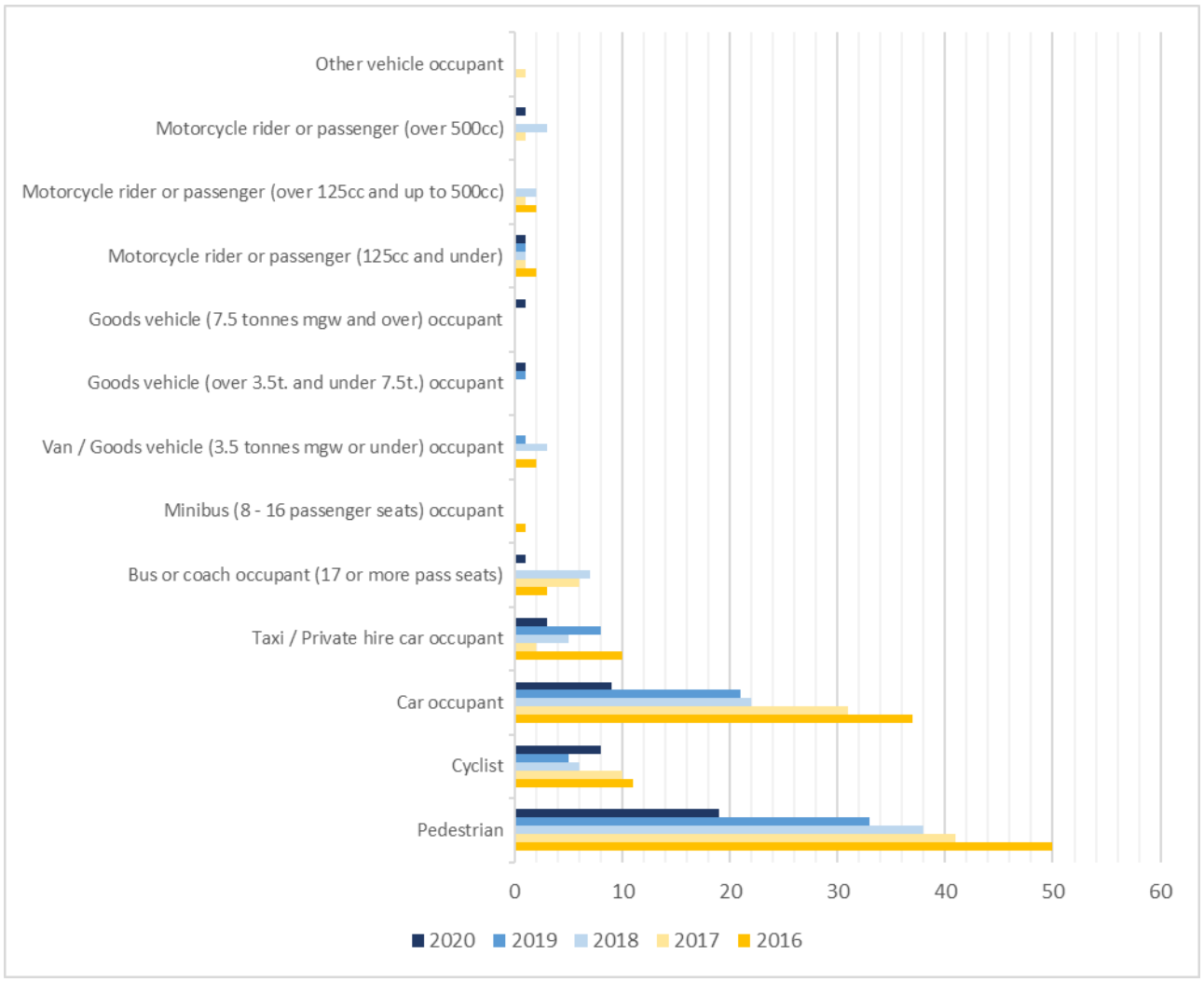
City Centre Corridors

Severity	2016	2017	2018	2019	2020	Trend	Total
Fatal	0	0	2	0	2		**4**
Serious	15	14	22	27	18		**96**
Slight	103	80	63	43	24		**313**
All	**118**	**94**	**87**	**70**	**44**		**413**





Casualty Type	2016	2017	2018	2019	2020	Trend	Total
Pedestrian	50	41	38	33	19		**181**
Cyclist	11	10	6	5	8		**40**
Car occupant	37	31	22	21	9		**120**
Taxi / Private hire car occupant	10	2	5	8	3		**28**
Bus or coach occupant (17 or more pass seats)	3	6	7	0	1		**17**
Minibus (8 - 16 passenger seats) occupant	1	0	0	0	0		**1**
Van / Goods vehicle (3.5 tonnes mgw or under) occupant	2	0	3	1	0		**6**
Goods vehicle (over 3.5t. and under 7.5t.) occupant	0	0	0	1	1		**2**
Goods vehicle (7.5 tonnes mgw and over) occupant	0	0	0	0	1		**1**
Motorcycle rider or passenger (125cc and under)	2	1	1	1	1		**6**
Motorcycle rider or passenger (over 125cc and up to 500cc)	2	1	2	0	0		**5**
Motorcycle rider or passenger (over 500cc)	0	1	3	0	1		**5**
Other vehicle occupant	0	1	0	0	0		**1**
All	**118**	**94**	**87**	**70**	**44**		**413**


Other vehicle occupant
Motorcycle rider or passenger (over 500cc)
Motorcycle rider or passenger (over 125cc and up to 500cc)
Motorcycle rider or passenger (125cc and under)
Goods vehicle (7.5 tonnes mgw and over) occupant
Goods vehicle (over 3.5t. and under 7.5t.) occupant
Van / Goods vehicle (3.5 tonnes mgw or under) occupant
Minibus (8 - 16 passenger seats) occupant
Bus or coach occupant (17 or more pass seats)
Taxi / Private hire car occupant
Car occupant
Cyclist
Pedestrian
0
10
20
30
40
50
60
2020
2019
2018
2017
2016

Appendix G. Socio-Economic Data

Scottish Index of Multiple Deprivation

The figures below illustrate the overall Scottish Index of Multiple Deprivation (SIMD) rank by quintile for data zones surrounding each of the five bus corridors under consideration. The following points summarise the observations from the review of this data in the vicinity of each corridor.

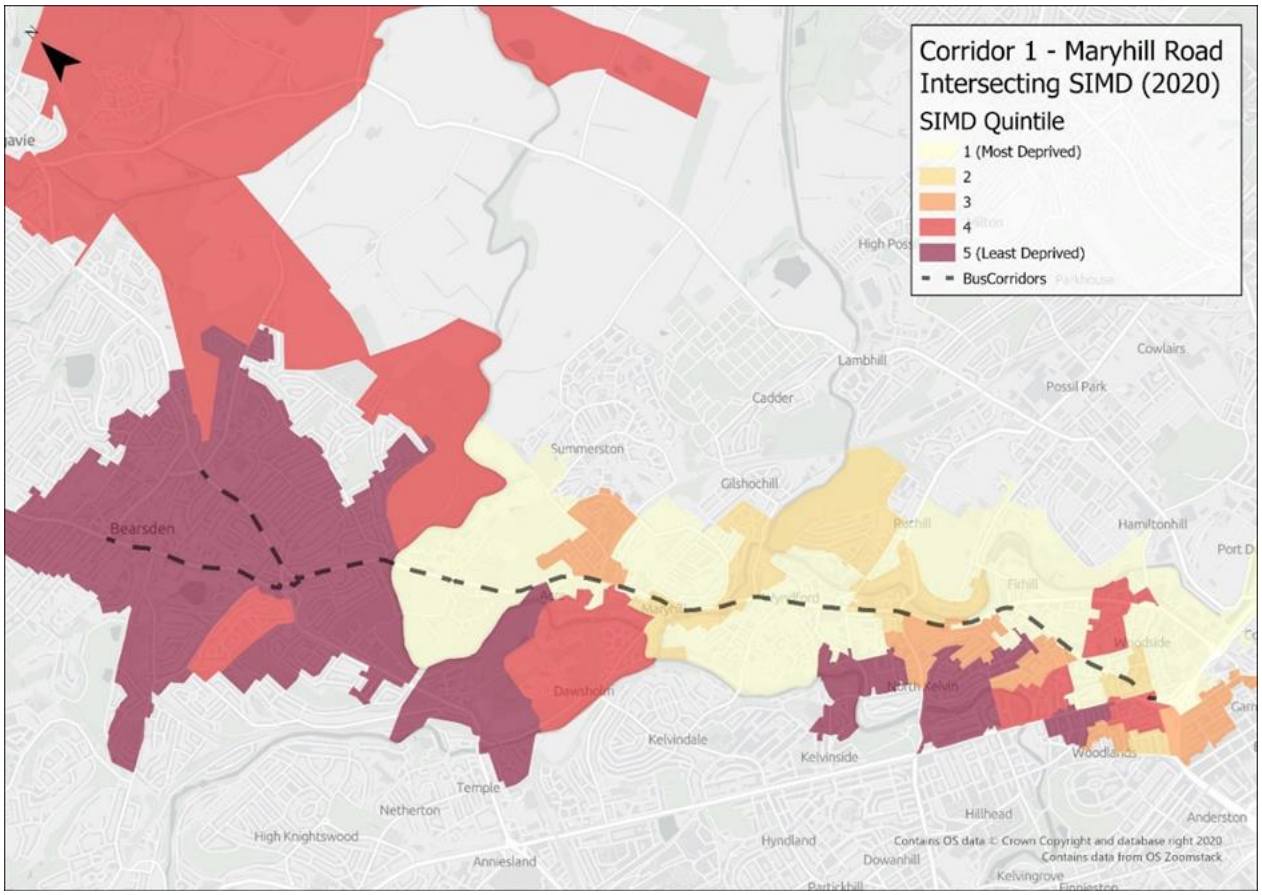
- The data zones surrounding the northern extent of the Maryhill Road corridor (Corridor 1), which are largely located in East Dunbartonshire, have a low level of deprivation, as do areas west of the corridor such as Kelvindale, Kelvinside and Woodlands. On the eastern side of the corridor, higher levels of deprivation are present through Maryhill, Ruchill and North Woodside.

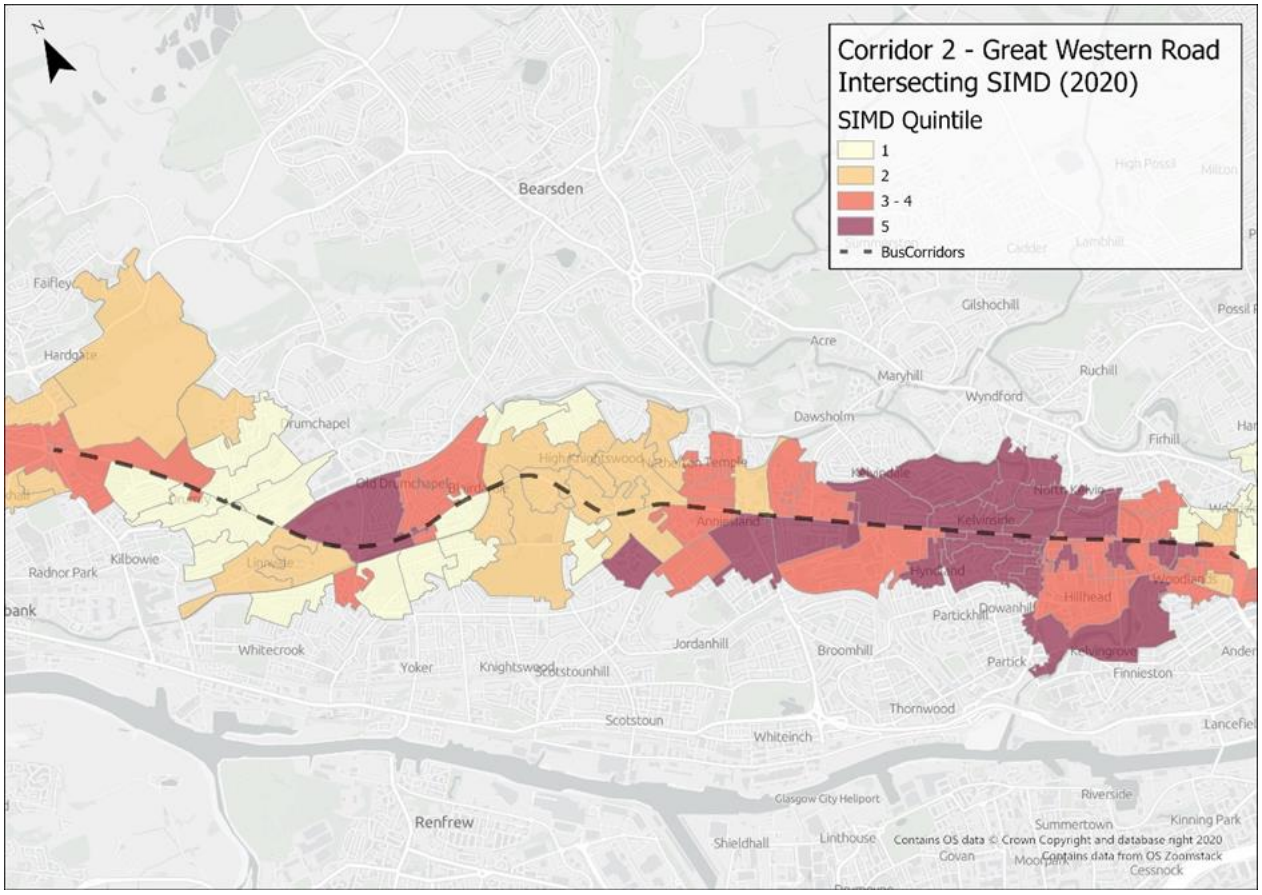
- On the Great Western Road corridor (Corridor 2) the data zones with the lowest deprivation are found close to the University of Glasgow in areas such as Hyndland, Hillhead, Kelvinside and Woodlands. Levels of deprivation increases further west in Clydebank, Drumry and Drumchapel.

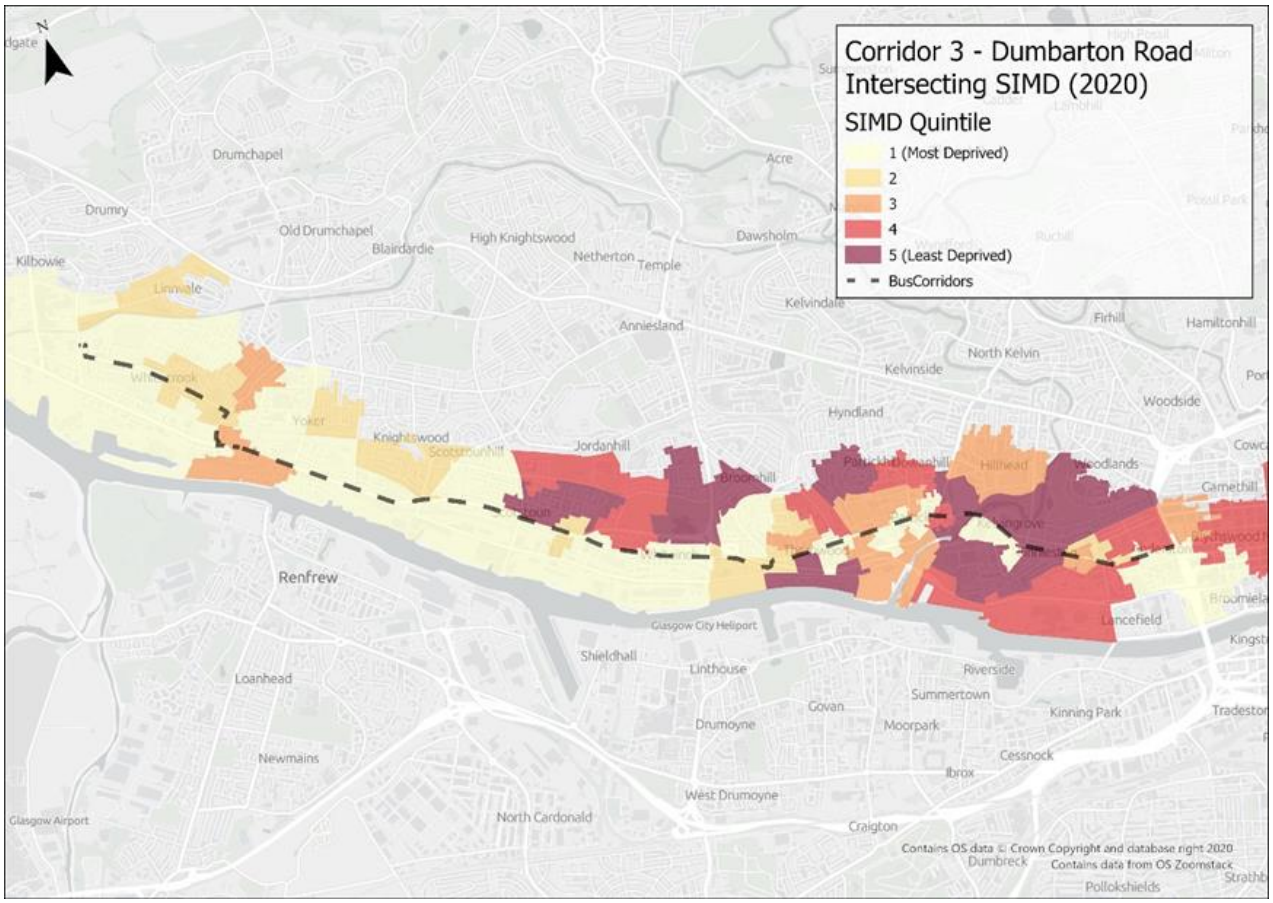
- The Dumbarton Road corridor (Corridor 3) has a large number of surrounding areas with high deprivation particularly within West Dunbartonshire in Clydebank. Areas within Glasgow City Council also have high levels of deprivation in Yoker and in areas along the Clyde. Deprivation is significantly lower closer to the city centre particularly in Hyndland, Thornwood, Kelvingrove and Finnieston.

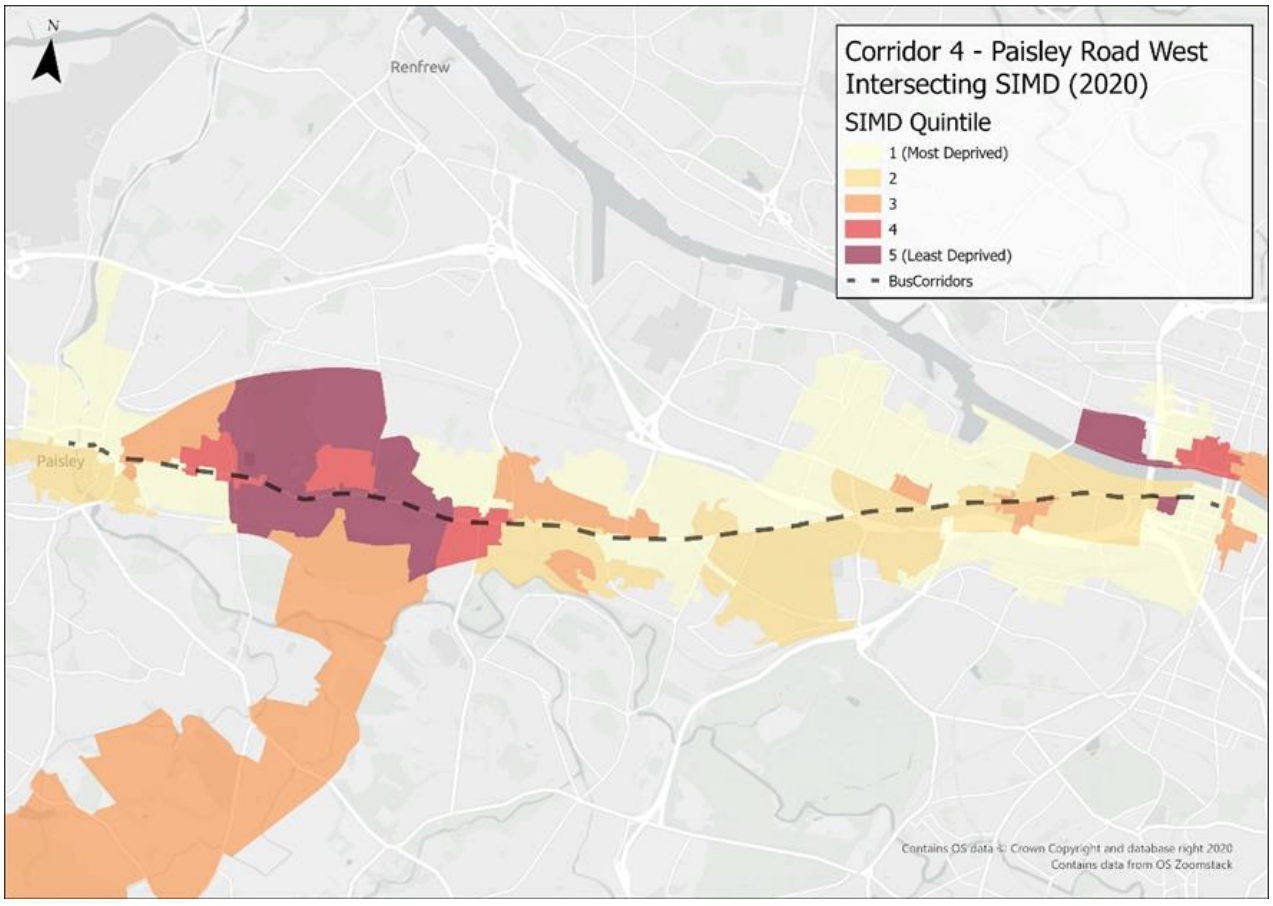
- The Paisley Road West corridor (Corridor 4) has on average the highest levels of deprivation of all five corridors. The highest levels of deprivation are observed in Paisley (Renfrewshire), Ibrox and Tradeston (Glasgow). Lower levels of deprivations are observed in Paisley Ralston (Renfrewshire).

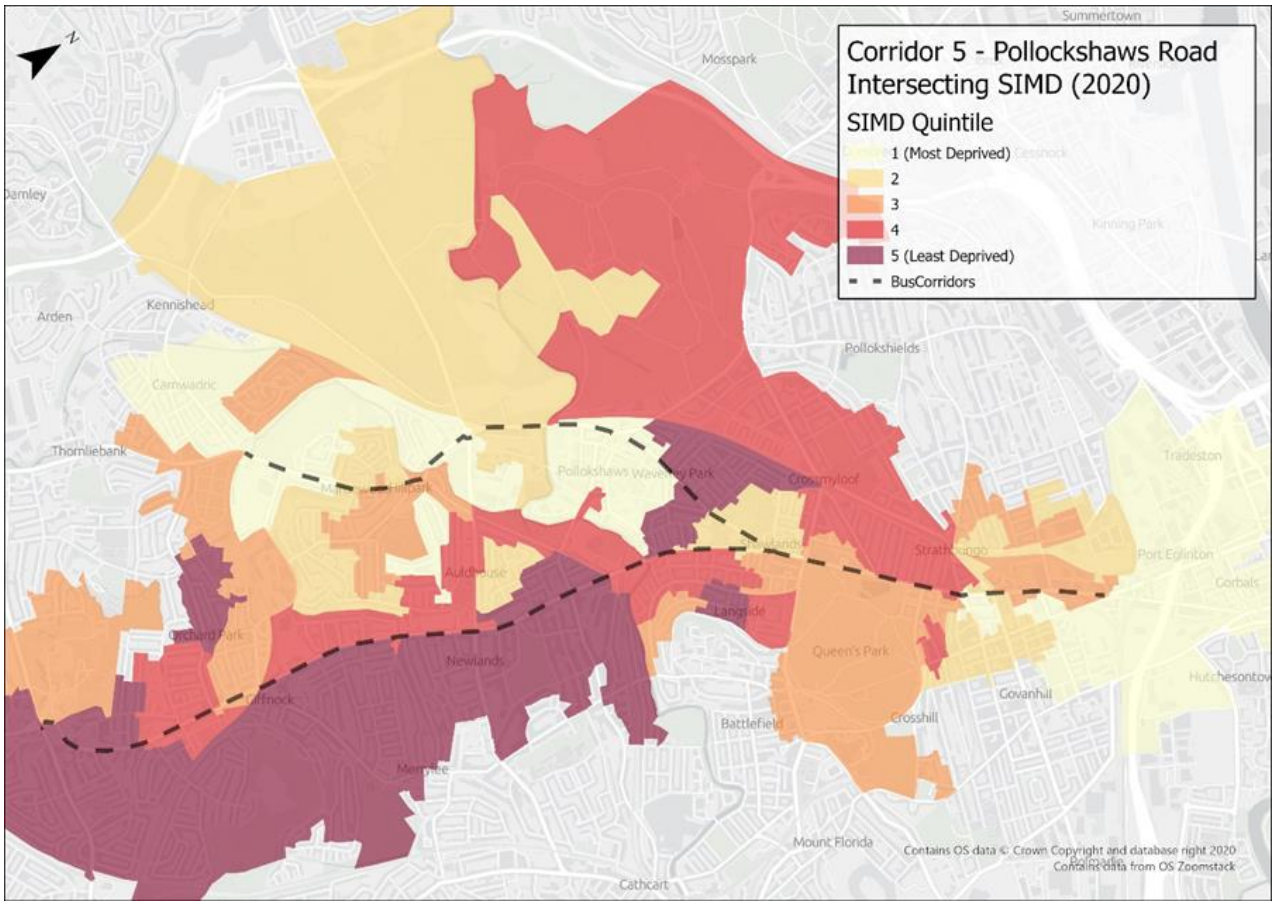
- The Pollokshaws Road corridor (Corridor 5) has a varied SIMD score along its extent. In the areas closest to the city centre, such as Tradeston and the Gorbals, levels of deprivation are high, whilst as the corridor moves further out to Queens Park and Pollokshaws deprivation decreases. As the corridor splits and moves along Kilmarnock Road, the areas surrounding have low levels of deprivation including Giffnock and Newlands. In the areas on the outer regions of Pollokshaws Road including HIllpark and Thornliebank, higher levels of deprivation are observed.


Corridor 1 - Maryhill Road
Intersecting SIMD (2020)
SIMD Quintile
1 (Most Deprived)
2
3
4
5 (Least Deprived)
BusCorridors
Bearsden
Summerston
Gilshochill
Lambhill
Cadder
Possil Park
Cowlairs
Hamiltonhill
Ruchill
Firhill
Dawsholm
Kelvindale
Kelvinside
Woodlands
Temple
Netherton
High Knightswood
Anniesland
Hyndland
Hillhead
Anderston
Dowanhill
Kelvingrove
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack


Corridor 2 - Great Western Road
Intersecting SIMD (2020)
SIMD Quintile
1
2
3 - 4
5
BusCorridors
Bearsden
Gilshochill
Acre
Maryhill
Ruchill
Wyndford
Dawsholm
Firhill
Kelvinside
Hillhead
Partickhill
Dowanhill
Jordanhill
Broomhill
Partick
Finnieston
Whitecrook
Yoker
Knightswood
Scotstounhill
Scotstoun
Thornwood
Whiteinch
Renfrew
Glasgow City Heliport
Riverside
Summertown
Kinning Park
Shieldhall
Linthouse
Govan
Cessnock
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack


Corridor 3 - Dumbarton Road
Intersecting SIMD (2020)
SIMD Quintile
1 (Most Deprived)
2
3
4
5 (Least Deprived)
BusCorridors
N
Drumchapel
Drumry
Old Drumchapel
Blairdardie
High Knightswood
Netherton
Temple
Dawsholm
Acre
Kilbowie
Linnvale
Kelvindale
Anniesland
Firhill
Hamiltonhill
North Kelvin
Kelvinside
Woodside
Hyndland
Knightswood
Jordanhill
Hillhead
Woodlands
Gamethill
Renfrew
Glasgow City Heliport
Lancefield
Shieldhall
Linthouse
Riverside
Summertown
Govan
Kinning Park
Loanhead
Drumoyne
Moorpark
Newmains
Cessnock
Ibrox
West Drumoyne
Glasgow Airport
North Cardonald
Craigton
Dumbreck
Pollokshields
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack


Corridor 4 - Paisley Road West
Intersecting SIMD (2020)
SIMD Quintile
1 (Most Deprived)
2
3
4
5 (Least Deprived)
BusCorridors
N
Renfrew
Paisley
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

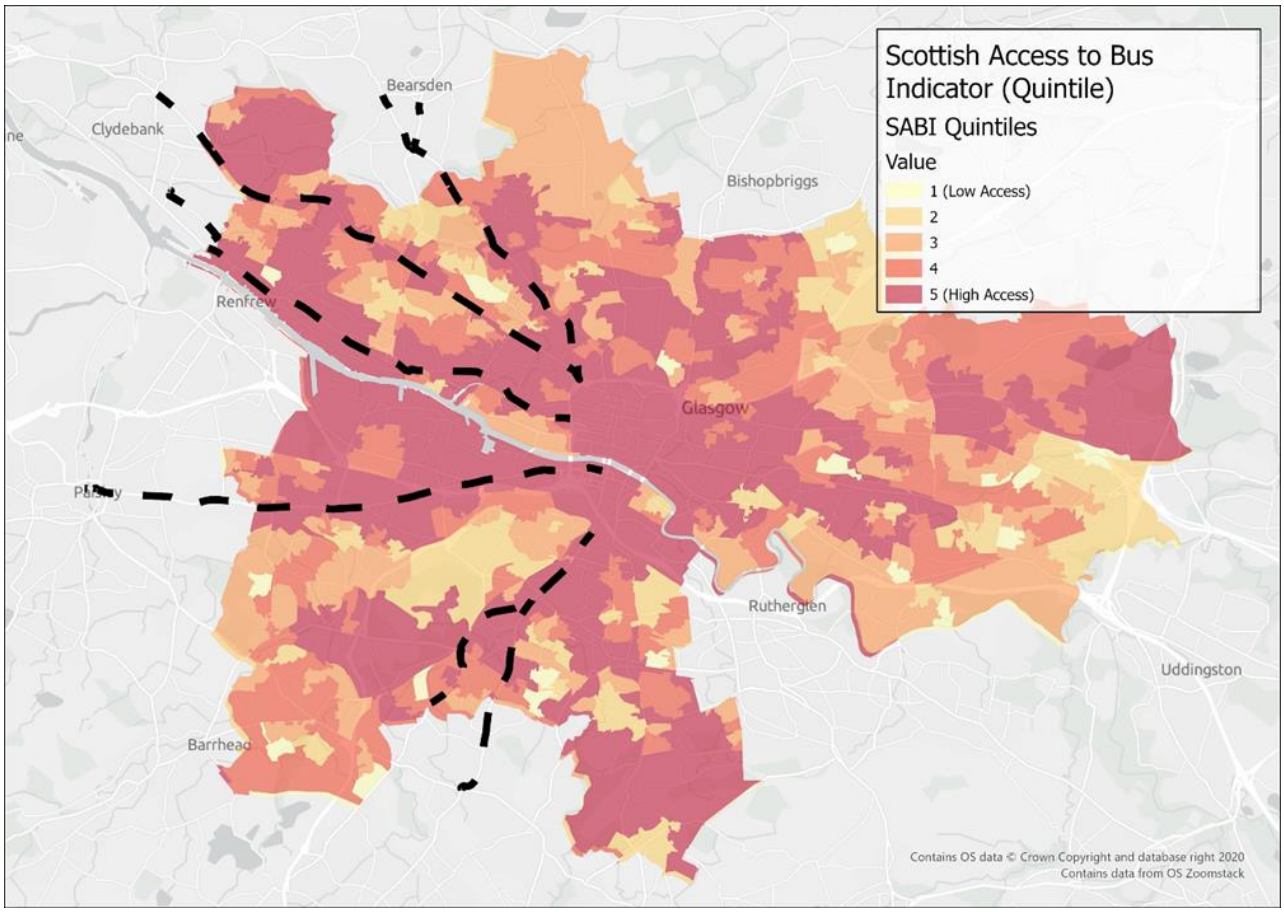


Scottish Access to Bus Indicator (SABI)

The figure below illustrates Scottish Access to Bus Indicator (SABI) outputs for 2019 scaled in quintiles. The indicator gives a score for the availability and frequency of bus service in each Census 2011 data zone.

The data zones surrounding the five bus corridors largely score highly on the SABI scale, particularly in areas closer to the city centre. Dumbarton Road and Paisley Road West have the highest SABI score within their surrounding zones.

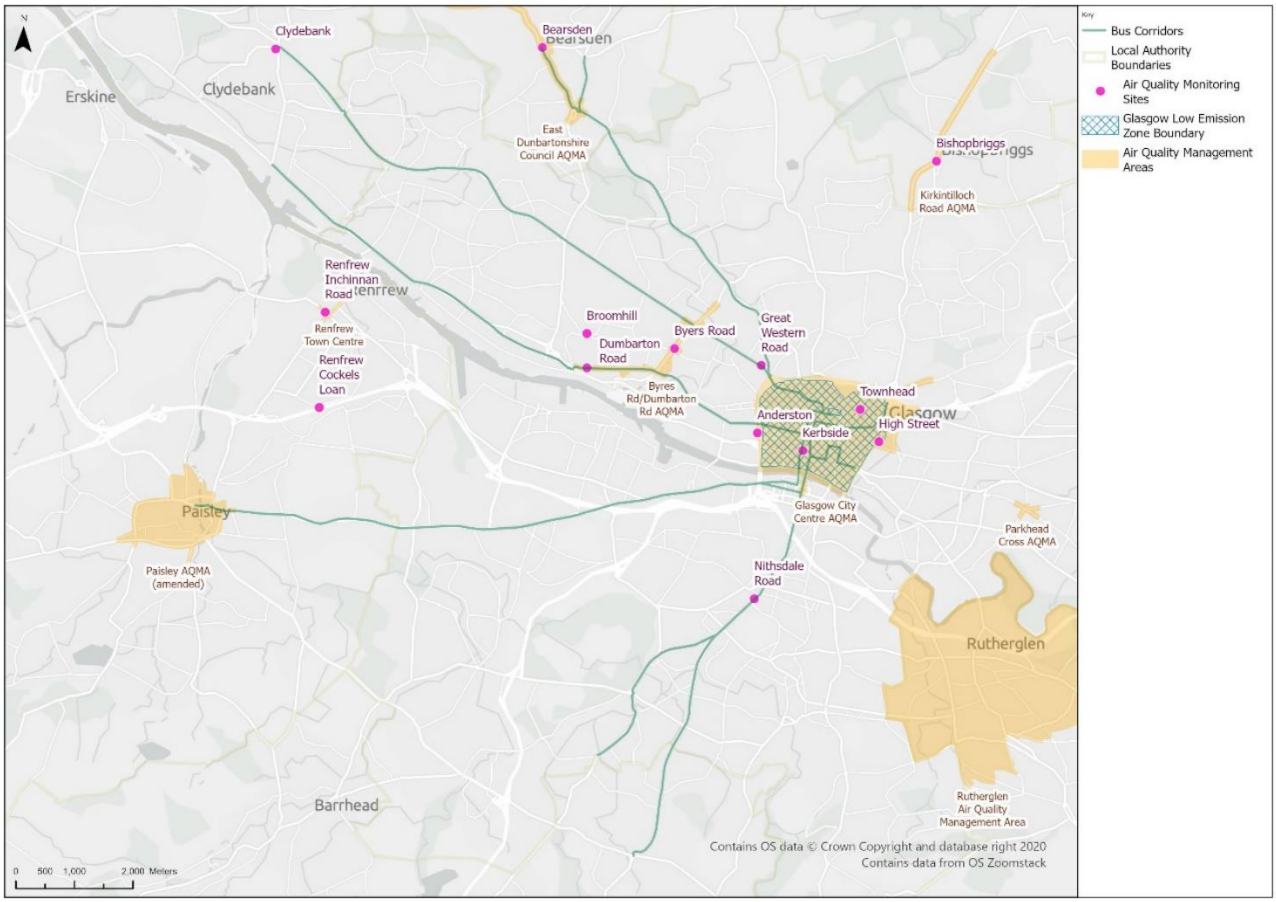
Areas around Great Western Road have the lowest score of all the corridors with some areas scoring as low as 1, particularly in the zones surrounding the Canal and the Kelvin River. For areas surrounding Maryhill Road and Pollokshaws Road, bus accessibility decreases as the routes travel further away from the city centre.


Scottish Access to Bus Indicator (Quintile)
SABI Quintiles
Value
1 (Low Access)
2
3
4
5 (High Access)
Bearsden
Clydebank
Bishopbriggs
Renfrew
Glasgow
Ruthergten
Uddingston
Barrhead
Contains OS data © Crown Copyright and database right 2020
Contains data from OS Zoomstack

Appendix H. Air Quality Data

Appendix A provides an overview of air quality information in the vicinity of the corridors under consideration. The figure below illustrates identified air quality management sites and the five Air Quality Management Areas (AQMAs) intersection the corridors.

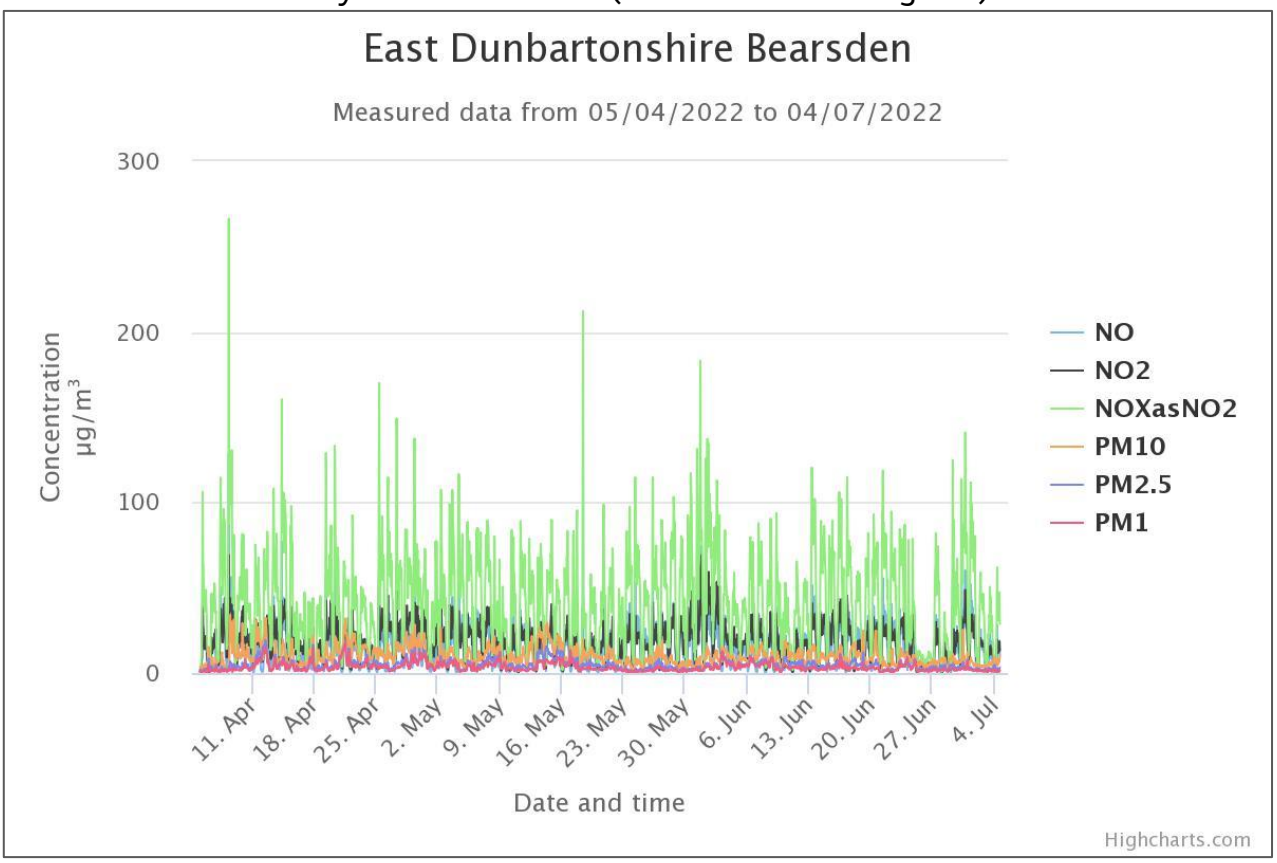
The figure also illustrates the boundary of the Glasgow Low Emission Zone (LEZ), which was introduced in 2018 and has initially applied to local bus services only. As advised on the Low Emissions Zones Scotland website (https://www.lowemissionzones.scot/local-zones/glasgow), the Glasgow LEZ was extended in May 2022 "to include all vehicles in the Phase 2 scheme design". However, a 1-year grace period will apply and "practical Phase 2 enforcement will not start until 1 June 2023".



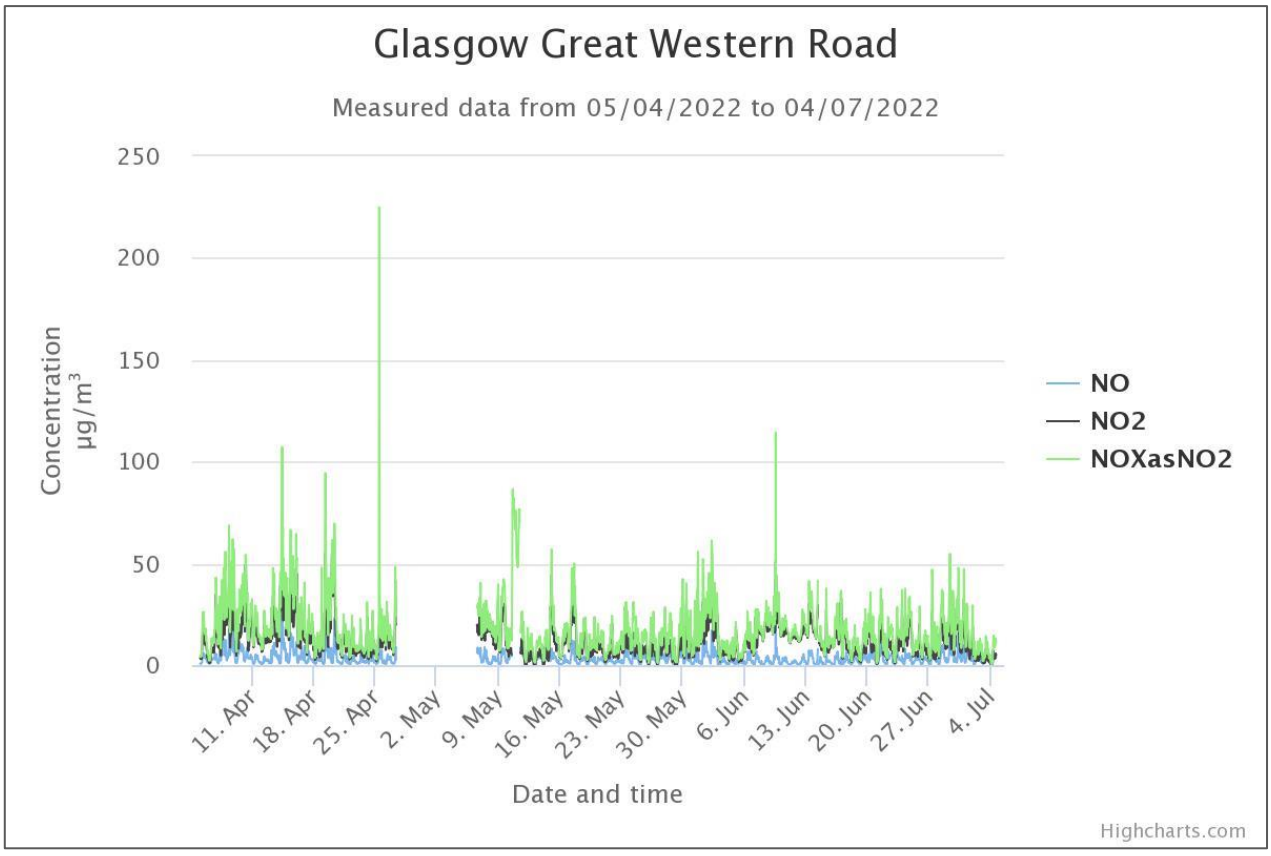
The air quality management sites identified have been identified from Scotland's Environment Air Quality in Scotland website (scottishairquality.scot) which provides detailed information on current and historic pollution levels for pollutants measured at each site:

The following charts are extracted from the Air Quality in Scotland website and illustrate pollutant levels for the last 90 days. No monitoring site data was available at the time of review in the vicinity of the Paisley Road West corridor.

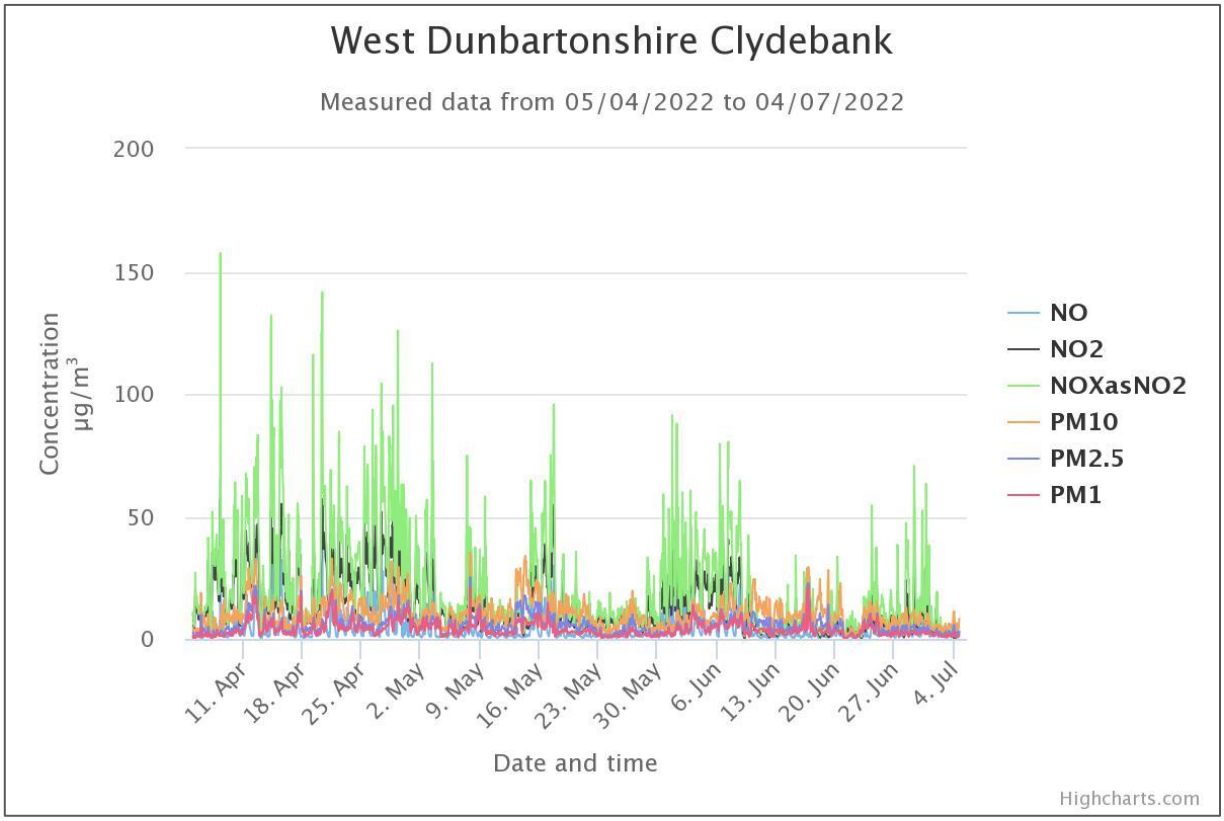
Maryhill Road Corridor (Bearsden Monitoring Site)



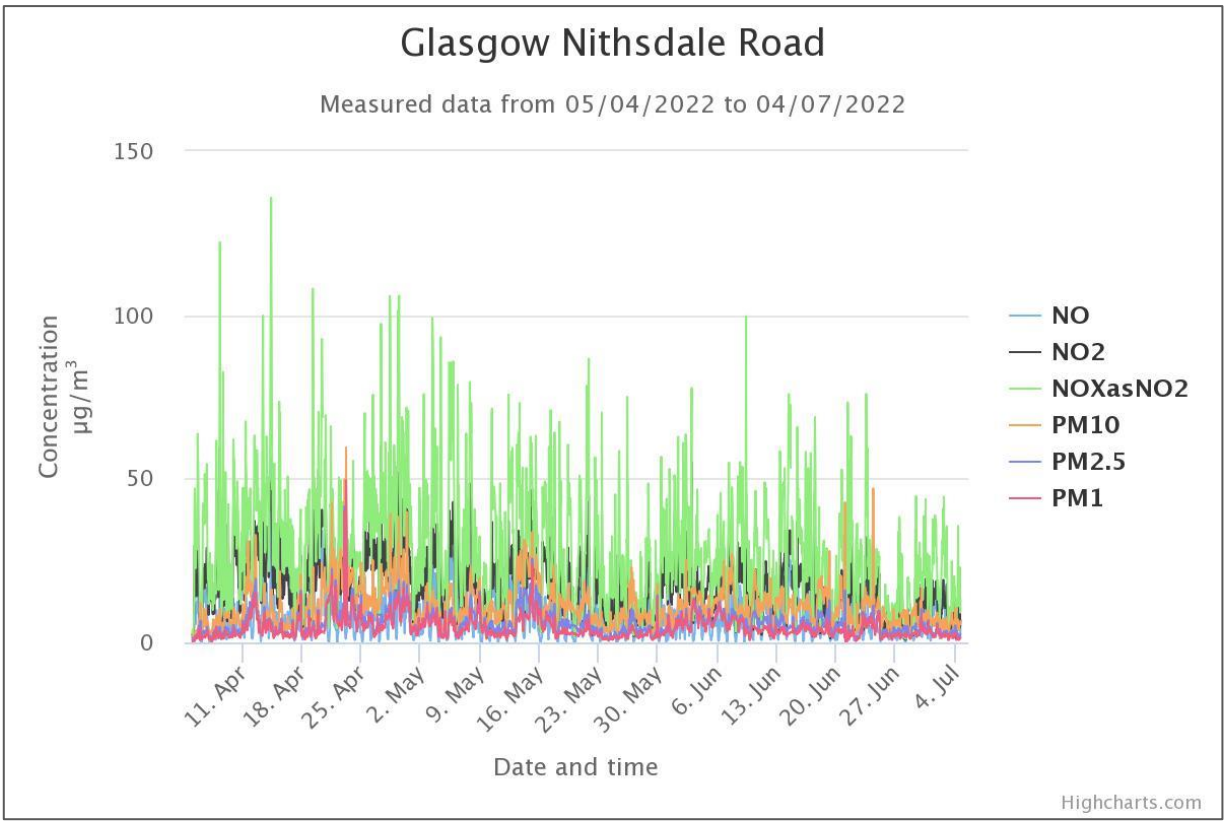
Great Western Road Corridor (Great Western Road Monitoring Site)



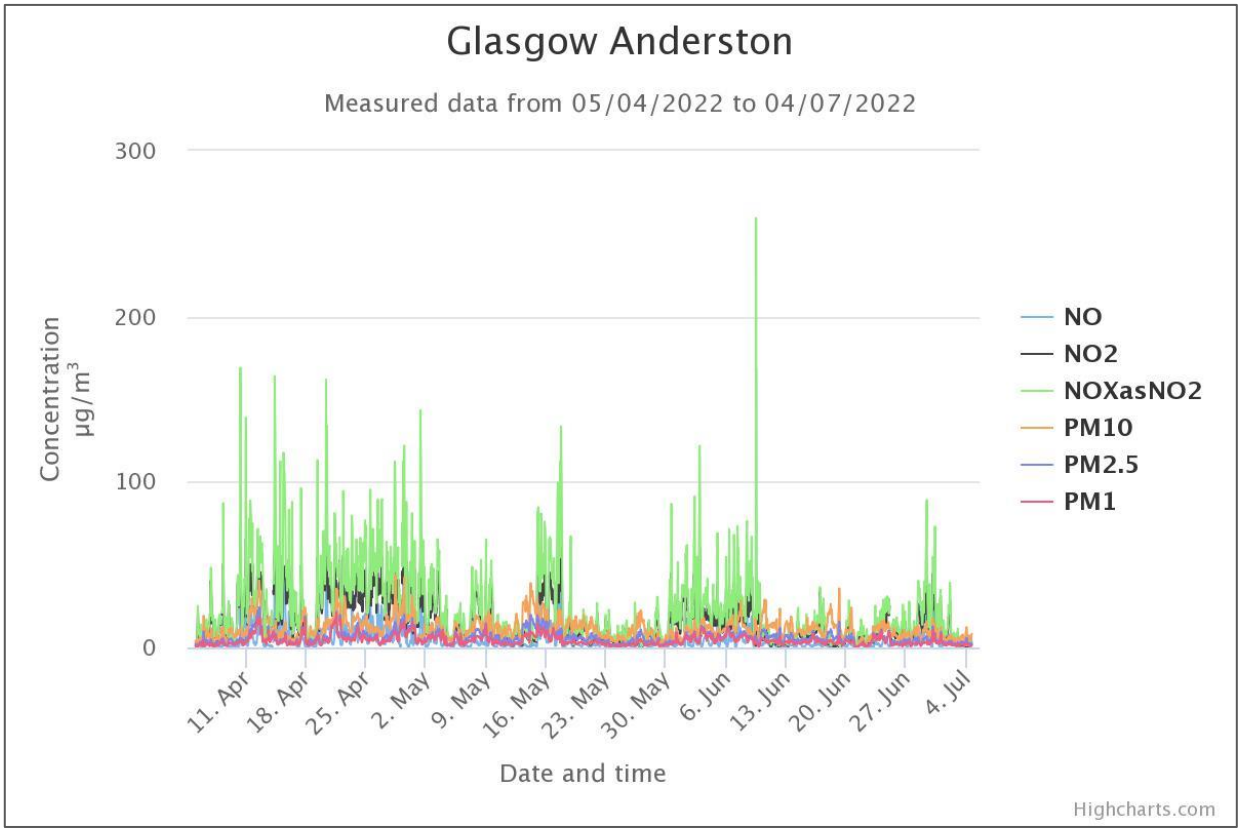
Great Western Road Corridor (Clydebank Monitoring Site)



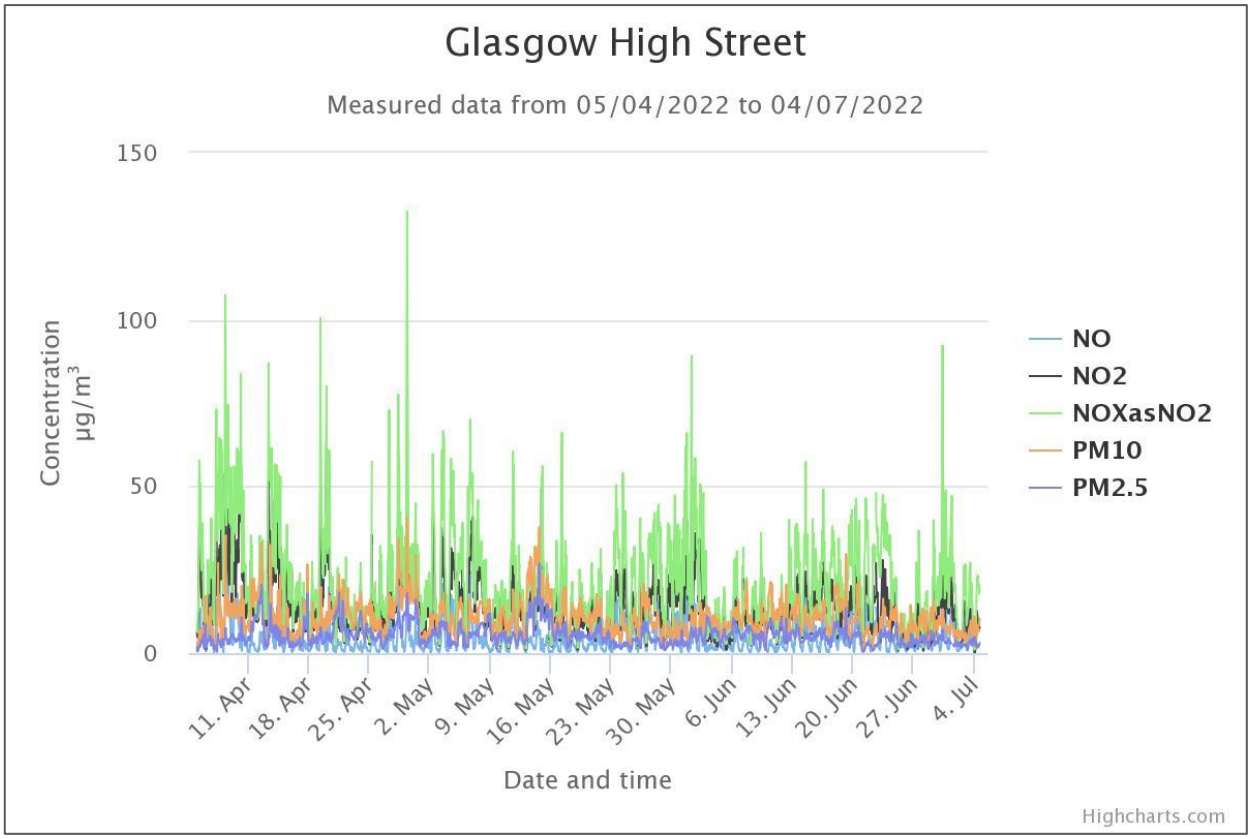
Pollokshaws Road Corridor (Nithsdale Road Monitoring Site)



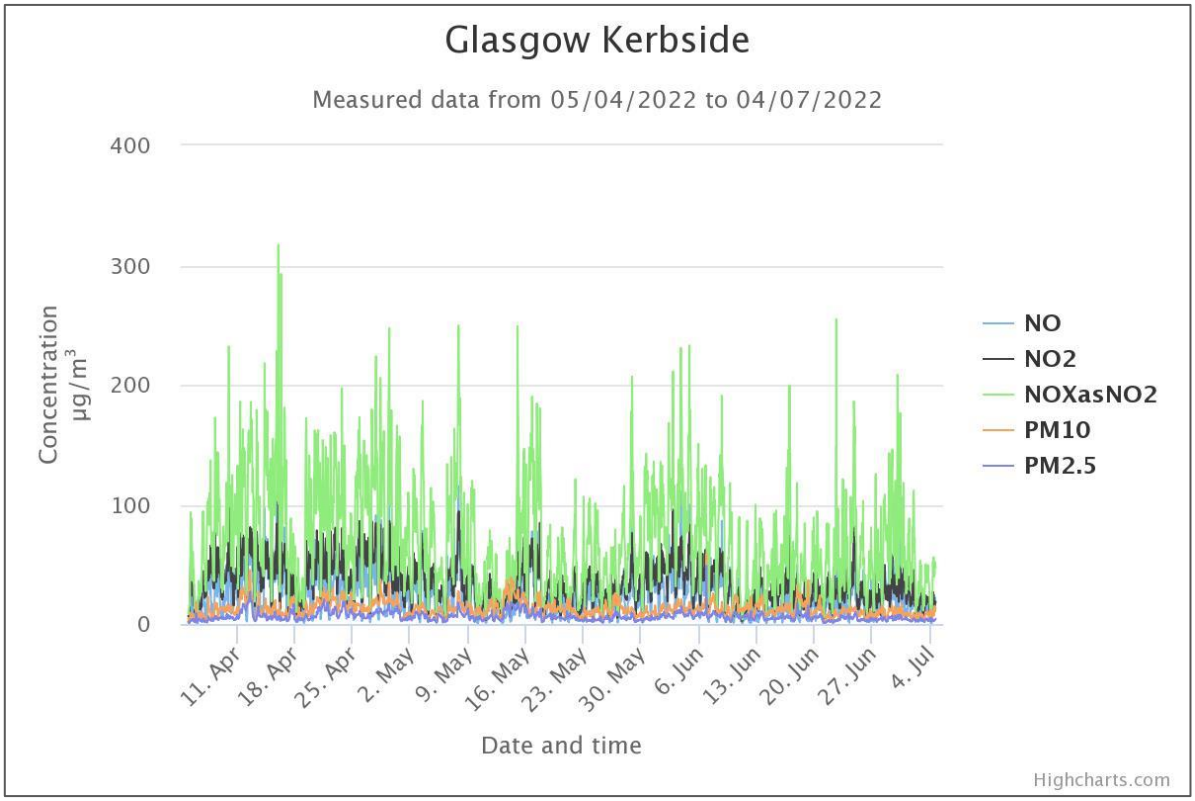
City Centre Corridors (Anderston Monitoring Site)



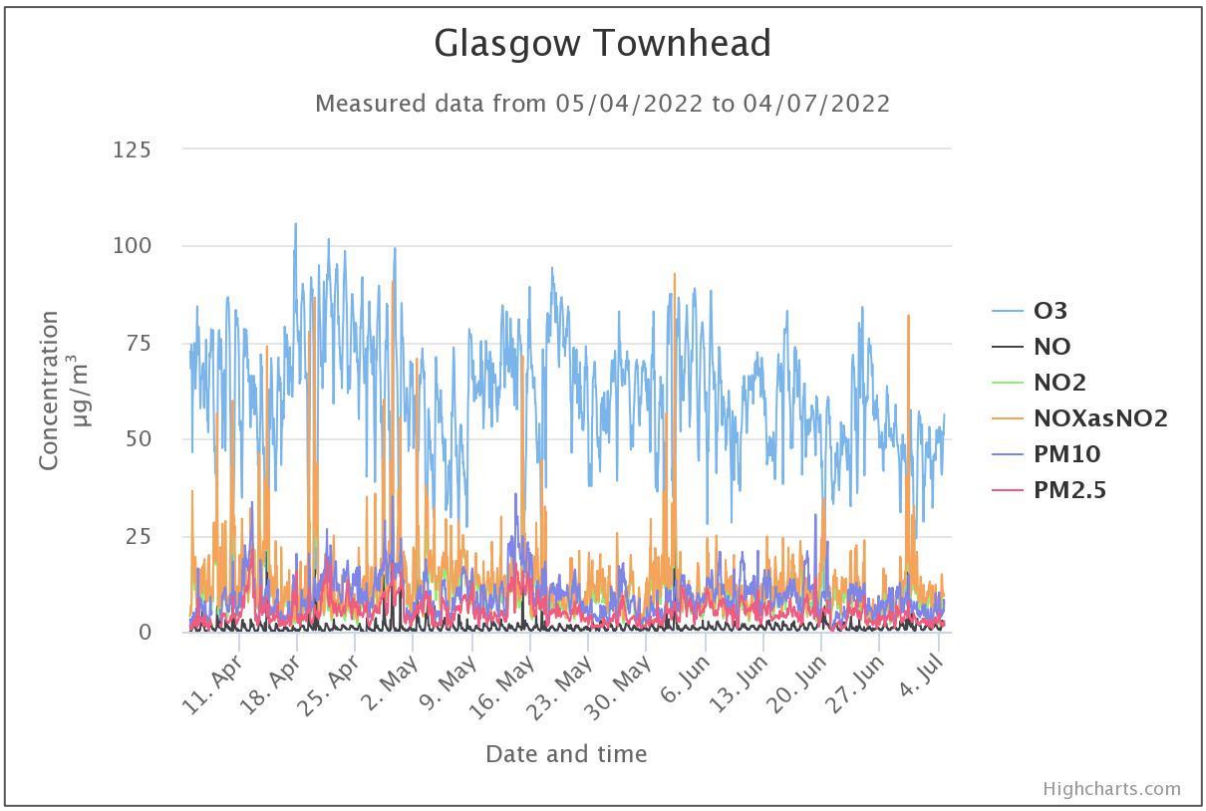
City Centre Corridors (High Street Monitoring Site)



City Centre Corridors (Kerbside Monitoring Site)



City Centre Corridors (Townhead Monitoring Site)



Appendix I. Findings from Public and Stakeholder Engagement

First Bus

Date: June 1, 2022
Project name: Glasgow Bus Partnership
Project no: B2340240
Prepared by: Joseph Campbell
Location: Glasgow
Participants: Linda Shields & Paul Clark (First Bus), Andrew Kelly & Joseph Campbell (Jacobs)

What does your organisation/team want to get out of this project?

Anything that will quicken journey times – currently too many traffic signals and routes are not always bus friendly which slows down journey times. Parking enforcement is another element (massive issues for many of the corridors) and this is where First lose time (added pressure where cycle lanes are in place).

If journey times could be saved then First would consider a two-pronged approach – using vehicle savings to improve frequency/customer experience on each route, and/or using cost savings to invest in other routes

First would also like to see longer terms land use planning to increase density along these corridors to make bus more sustainable / more attractive.

What currently works well on these corridors in terms of bus priority measures?

Where there is no parking, the route runs much better. For example, on Maryhill Road corridor past Maryhill Station – no problems are generally encountered and the services can make up time.

Splitting the express services does work well, e.g. First number 1 and X4 services using the Clydeside Expressway and is popular due to journey times and frequency

What are the key problems that cause bus delay or bus access problems on each corridor, and opportunities for improvement?

General

Traffic signals – relying on control centre-based changing of signal timings. A transponder would make a big difference, rather than remote manual altering of timing. For example, during the recent Ed Sheeran concert at Hampden, congestion prevented buses entering First Caledonia depot as no-one available to manually adjust signal plans.

Travelling across the city centre – grid system in the city makes it difficult to turn. One option could be to break the city centre services up and avoid the cross movements. First are the only operator that cross the city centre with multiple bus routes. Travelling across the city centre is becoming less reliable and it's getting more difficult due to pedestrianisation of city centre. Difficult to prioritise city centre for pedestrians while maintaining reliable bus times. Finding a way to reduce the need to cross the city centre would be worth considering as improving things in city centre would go a long way to journey time savings.

Too many bus stops in some locations, which has a significant impact on journey times. However, we do need to strike the balance with making bus stops accessible and attractive. First recognise the contribution of dwell times to overall bus delay and are keen to progress quicker boarding ticketing options. Still early days with 'tap on tap off' in terms of improvements at dwell times but concession fare passengers still need to get a ticket (circa 30% of tickets are concessions) so making that tap on tap off would make a big difference. Transport Scotland currently need these fares to be ticketed rather than tap on tap off. Need a recommendation to increase number of ticketless journeys as this change will make a massive difference to journey times. First not aware of other operators are looking at tap on tap off yet.

Parking enforcement – extent of bus lane enforcement cameras is something to be looked at. Local authorities in England are putting more focus on enforcement which doesn't happen to the same extent

here. Need to make sure that any funds arising from bus lane enforcement are ring fenced for bus infrastructure improvement.

Part of the problem is a cultural issue (perhaps people know they can get away with it) and fines being too low so not a real deterrent. Fines in other parts of the UK seem to be more of a deterrent than in Scotland. Accidents also occur with bus manoeuvres trying to avoid parked cars (cost incurred due to time to deal with and knock-on operational issues). Could the DDA Act be used to prosecute a parked vehicle that prevents a passenger embarking or disembarking on a wheelchair? Will be a few quick wins on parking but heavily relies on getting enforcement correct.

A lot more can be done with showing destinations and frequencies on bus stop flags (showing the first and last bus times). Currently a lack of interaction with drivers (which may be a generational thing) and is a barrier to a lot of people, so anything that can be put on flags / bus stops can give people confidence to use the services. A lot can be done with naming of bus stops as well to give confidence of services that stop there – all of which will help with patronage levels. Branding of corridors would be welcome – something similar to Fastlink would be something to consider. Potentially colour coding the lines like London Underground and show frequencies, destinations etc.

The Glasgow Bus Alliance is being used to maximise co-operation between operators – all are fighting for similar outcomes. Greater opportunities for integrated ticketing approach through SPT (it's coming and people want that) but work to be done to get a tap on tap off multi-operator approach. That will be challenging from a commercial point of view but things like this need to be looked at.

Demand is outstripping supply at the moment due to staffing issues – weekend leisure trips are becoming more important to sustain weeklong demand. Expecting staff shortage issues to be an ongoing issue that may take years to address. Not necessarily expecting a bounce on bus demand as a result of forthcoming rail strikes as people will likely just work from home rather than re-mode.

Issues with unregulated growth of taxis and this has impacted on bus services, but with potential taxi driver shortages there may now be an opportunity for marketing to make people more aware of available bus services and a campaign to explain how bus services can promote safe travel.

C3 Dumbarton Road

Opportunity for a bus gate on Crow Road with bus and local access only to encourage general traffic onto parallel routes (as discussed with SPT)

Parking restrictions on approach to bus stops if a blanket ban on parking is not achievable through busier areas like Partick and Finnieston. First have provided images of the main pinch points on this corridor – parking is the main issue.

Finnieston – could you push traffic onto a parallel street (like Partick) and have bus priority on Argyle St or Sauchiehall St. This is becoming a very busy area with a lot going on so should be a priority section.

The Clydesdale Expressway is very important to alleviate pressure on these sections.

C4 Paisley Road West

Traffic management when there's a match on at Ibrox could be improved. Issues around Helen St access to M8 with priority to get coaches onto motorway, meaning buses and general traffic suffer.

Services are re-routed on matchdays to deal with this – further information to be provided.

C5 Pollokshaws Road

Parking a big issue around Shawlands and if we could solve that it would solve a lot of the problems.

Will be a challenge balancing with future cycle schemes

Issues with matches at Hampden as well – see example with Ed Sheeran and a lot happening at Hampden during the summer.

McGill's

Date:	June 22, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Sasha Liwicki & Jenny Muir
Location:	MS Teams
Participants:	Ralph Roberts & Colin Napier (McGills), Andrew Kelly & Jenny Muir (Jacobs)

What does your organisation/team want to get out of this project?

Ultimately as a bus operator, McGills want to achieve what's best for the travelling public - quicker journeys and more consistent journeys.

The Glasgow Bus Partnership is aiming for a 20% improvement in running speeds at the arterial sections of the city boundary and 50% improvement in the city centre. The consequence of this improvement could then include reducing fares, increasing frequency and providing new services in other areas of Glasgow.

This would help operators recover two decades of reduced productivity, which is currently decreasing at a faster rate due to issues experienced on the bus network in very recent years

What currently works well on these corridors in terms of bus priority measures?

There is not a lot of existing infrastructure that gives good priority to buses

Some existing infrastructure could work well if operations were enforced better

Pollokshaws Road has fragmented priority, needs to be joined up

Great Western Road also has a bit of bus priority and this works in the wider areas (the western end of the route) but doesn't work well from the start of Great Western Road to Byres Road.

What are the key problems that cause bus delay or bus access problems on each corridor?

C4 Paisley Road West

- Paisley Road West would greatly benefit from bus priority
- -All about road space reallocation, less parking and improved enforcement. See McGill's previously submitted report to the GBP for more detail on this.
- -Plenty of opportunity to reallocate road space and increase efficiency
- -Some sections beyond Ibrox are essentially a dual carriageway, McGill's express there's not many delays caused in this area apart from when the football is on, so it may not be a good investment compared to other areas where the greatest delay is experienced (e.g. through Cardonald)
- -Supportive of taking away the central reservation to allow to a bus lane, meaning some parking could still remain

C5 Pollokshaws Road

Haggs Road junction is heavily affected by congestion at peak times

Suggests that the roundabout by Pollok Park could have a lane for buses so they could bypass the roundabout from Barrhead Road to Pollokshaws Road

When turning right on the junction on Pollokshaws Road/Haggs Road, the junction is designed quite badly which causes inefficiency. Exacerbated by parked cars.

Between Pollok Park and the Granary junction, the houses all have driveways so there is no need for on street parking

The Granary junction needs to change and is one of the biggest pinch points on the route. Issues are inconsistent meaning they are difficult to mitigate, but regularly cause delay.

The Pollokshaws Road and Minard Road crossing: parking is causing big delays in this area. Parking restrictions need enforced

What has prevented additional bus priority from being implemented on these corridors in the past?

Lack of desire from the local authority and the elected members over the years

Not permitted to use bus CCTV or traffic cameras to prosecute cars parked in the bus lane. This legislation needs to change which necessitates political will and someone on board to push the agenda forward.

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

C4 Paisley Junctions project (info from Renfrewshire Council through workstream A)

European bus priority models

Any other points you feel the project team should be aware of?

To note: McGill's don't operate in the Maryhill Road corridor or the Great Western Road corridor. They used to operate in Dumbarton Road and they know Paisley Road West and Pollokshaws well.

Side streets could provide parking alternatives

Focus on meeting the aspirations of a world class integrated transport system (policy 17 in Glasgow Transport Strategy)

People parking in bus stops has a cumulative effect on customers' waiting times. The impact of one person in a car blocking a bus route has effect on multiples of bus users

Need to aim high because proposals may become diluted with time

West Coast Motors

Date:	June 22, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Jenny Muir
Location:	MS Teams
Participants:	Murray Rogers (West Coast Motors) Joseph Campbell & Jenny Muir (Jacobs)

What does your organisation/team want to get out of this project?

To ensure West Coast Motors (WCM) can move customers as quickly as possible, therefore creating a more attractive offering to customers.

Timetables have been eroded over the years, services have been getting slower, impacting the number of passengers that WCM carry. Keen to know what can be done to improve journey times.

Making sure bus is a viable alternative to other modes of transport.

What currently works well on these corridors in terms of bus priority measures?

Hasn't seen successful implementation of initiatives to improve bus priority

What are the key problems that cause bus delay or bus access problems on each corridor?

C1 Maryhill Road

Biggest service, service 17 serves this corridor

Traffic signal priority is 'few and far between'

Bus lanes are in operation during peak time only. Post pandemic peak times have shifted. WCM find that their peak times are 10.30am going into the City Centre and 3.30pm coming out. Acknowledge that this might shift again. Requests that peak times are continuously reviewed

Lack of bus lane enforcement has been a long-standing issue

Removal of parking in bus lane (both legal and illegal) will improve bus journey times

Installation of utilities – consideration of impact on public transport corridor where multiple roadworks on a corridor take place at the same time. Example roadworks on Phoenix Road planned for same time as part closure of viaduct on the motorway. Expect this to impact service.

Phoenix Road is a pinch point

Consider sequenced signalling in city centre meaning buses would not have to stop at each separate set of lights. Hope Street given as an example. This would have a positive impact on air quality. Due to gradient, buses kick out high level of emissions when gaining traction to move away from red lights.

C2 Great Western Road

Interact with this corridor through service 15

Also interact with this route on behalf of City Link (West Coast Motors driver and vehicle, City Link registration)

Service can be impacted by closures on Erskine Bridge. I.e. Switchback gets choked, which causes delays to services.

Great Western Road not a great concern, this may be due to service only interacting with Great Western Road for specific sections and therefore not exposed to issues along the full extents of this corridor.

Look to First as being more knowledgeable of the issues along this route as they provide a greater number of services which serve this corridor. If First influence improvements, WCM win out of those improvements.

- Installation of utilities – consideration of impact on public transport corridor where multiple roadworks on a corridor take place at the same time.

C3 Dumbarton Road

N/A

C4 Paisley Road West

- Must divert onto the motorway when there is a football match at Ibrox. Accepts that this is something they must manage in advance and in doing so can ensure that they remain operating compliantly.
- Bigger issue is unknown factors which create local congestion and cannot be managed in advance.
- Services 153, 124 and others touch on this corridor.
- Look to McGills as being more knowledgeable of the issues along this route as they provide a greater number of services which serve this corridor. If McGills influence improvements, WCM win out of those improvements.

C5 Pollokshaws Road

Several supported services interact with these corridors, timetable in control of SPT

Look to SPT having more awareness of the issues considering

What has prevented additional bus priority from being implemented on these corridors in the past?

n/a

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

C1 Maryhill - SPT is in the process of improving the system to give buses which are running late priority at junctions, however there seem to be problems making this work to a degree that makes a difference.

Any other points you feel the project team should be aware of?

'Quality Partnership' referenced throughout. Similar discussions have taken place in the Quality Partnership forum in the past.

Movement of peak times post pandemic highlights need for peak times to be continuously reviewed.

GCC Technical Services

Date:	June 27, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Ali Angus
Location:	Glasgow
Participants:	Christine Francis, Kevin Argue & Aidan O'Meara. (GCC Technical Services) Andrew Kelly & Ali Angus (Jacobs)

What does your organisation/team want to get out of this project?

- Coherent, cohesive approach to project selection and delivery. There are fantastic ambitions about carbon reduction etc in Glasgow but not a coherent approach on how best to use road space. GCC wish for project to come to them as a coherent defined, refined project. Prioritised hierarchy of corridors. Competing demands when designing things
- Cohesive plan for corridors, how do we plan this out? Most corridors can't have bus and cycle priority, how to balance? Where are we going with these designs? Please don't confine the project to bus – how does it join with other modes of transport. Where are the opportunities on this transport corridor to join up with other modes of transport?
- Route prioritisation – which one are you going to deliver first?

What currently works well on these corridors in terms of bus priority measures?

- Lessons learnt (Fastlink) – people like simplicity. Seating when waiting for the buses, reliability, comfort. Getting rid of stops means not servicing communities not appealing to people if they need to travel further to get to the stop. Frequency.
- Telling passengers current information – live updates.

What are the key problems that cause bus delay or bus access problems on each corridor?

- On the Dumbarton Road corridor, there is a lot of pressure between Kelvinhaugh Street and Corunna Street. Would be good to look at in terms of active travel and connecting Yorkhill. Buses do get delayed through there. Network management? Significant pressure from businesses for use of the space through Finnieston. For cafes and parking / loading on argle street itself. they will be making changes, but only public realm, junction improvements etc. Will need to know what's going on with GBP on Argyle Street for when GCC do their community consultation. Kelvin Way, Radner Street, Kelvinhaugh Street, first stage public consultation in January.

What has prevented additional bus priority from being implemented on these corridors in the past?

- There will be huge objections from business people about Traffic Regulation Orders – loading areas, careful about approaching businesses like Partick etc. Reduced parking outside shop may make shop owners think it'll affect their business.
- How do we get all these things (bus lanes, cycle lanes, traffic, parking and loading, cafés using street space) to coexist, not enough space – identify pinch points.
- Paisley Road West is an active travel priority route.
- Journey time saving: Operators will have to look at their practices and the amount of time they spend letting people on/ticketing/stopping etc.
- It may be to the detriment of the project to focus on journey time saving. It could mean removing bus stops and therefore not serving the communities. Focus on bus passenger experience improvement instead of journey time. Journey time saving doesn't on its own achieve anything, better to improve the experience, reliability most important, facilities for passengers.
- Bus priority measures you can implement but modal shift is not just about the frequency of the service. Holistic package instead. Reliability is the most important, comfortable, safe. AO- where do you lose your time is at stops and junctions. If you improve the functionality of the junctions,

you have less time waiting [therefore reducing the journey time without getting rid of stops]. Don't need huge sections of bus lanes, also constrained by the speed limit. Look at junction improvements and passenger experience.

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

- Plan for an active travel link from Riverside along the river, complementary to active travel measures planned. How does it link in for bus passengers? There are multiple rail stations along those lines. AO – PLANS: riverbank, active travel parallel route to the proposed bus corridor, riverside museum going west. Connecting Yorkhill and Anderston, fully funded. Whole scale junction realignment.
- Queen Margret Drive and Byres Road street space improvements. Don't have a design for it yet. Opportunity to look at that junction as part of the bus partnership fund.
- NHS are wanting a new junction design for Gartnavel Hospital – stage 2/3 with Sustrans to link the two hospitals, active travel junction. Already bus trimmed priority at this junction.
- New crossing outside Websters Theatre on Great Western Road. Stand alone on-demand crossing. Public realm project that is fully funded and in design. Great Western Road corridor, can't see enough space to fit everything in.
- There is a planning application from Glasgow Academy school, new junction at Caledonian Crescent/Great Western Road. Glasgow Academy are building new sports centre open to public, separate entrance for public from the school gates.
- Maryhill Road / St Georges Cross have plans for fully segregated cycles lanes, change to the junction alignment. This won't affect Maryhill Road traffic or road movement. Primary focus is north south on Maryhill Road.
- South City Way Stage 5 – this will tie into the junction with Trongate, not yet funded.
- A803 will tie in on junction 15 with Royal Infirmary Hospital (bus priority on Springburn Road).
- Cowcaddens and Cambridge Street will be influenced by underline project associated with New City Road Avenues project. Should be on site October/ November this year – Contact: Ciaran Buchanan.
- There are plans for new junctions on Clyde Street and Bridge Street. To improve the pedestrian and active travel experience. On the bridge but not on the Jamacia Street side.
- Waverley Park collective, liveable neighbourhood projects (Derek Dunsire). There is also an active travel corridor along Kilmarnock Road. Steve Gray should know about this route.
- Howard Street junction improvements being ed by Traffcom (Workstream A)
- Hope St – originally an Avenues project to make it more pleasant, bus shelter infrastructure improvements etc. SPT were keen to see that approach. An additional bus gate on Hope Street has been considered but assuming the reductions of traffic volumes, may be limited benefit. Anything that comes out of the feasibility study for future improvements will be complementary to anything already agreed with SPT.
- Active travel improvements on St Vincent Crescent / Corunna Street/ Kelvinhaugh Street.
- Does the 'People Friendly City' [goals/concepts] being taken forward by the City Centre Transformation Study overtake the plans [to prioritise bus travel in the city centre]? The people friendly city proposes to reduce the amount of traffic in the city centre. Restrictions on traffic coming in, reduce car use to a point where physical bus priority may not be really needed. Strategic Park and Rides. People not driving into city centre on a corridor where you have public transport priority. Clean green friendly.

Any other points you feel the project team should be aware of?

All the corridors are to the west – Christine and Kevin are working on active travel in the east – disparity was mentioned during their consultation processes regarding investment on the east side of the city, which needs to be a key consideration during any public engagement

GCC TraffCom

Date:	June 29, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	James Thompson
Location:	Glasgow
Participants:	Jamie Rodden, Peter Toal, Brian Davidson & Nicola Bell (GCC TraffCom), Colm Smyth & James Thompson (Jacobs)

What does your organisation/team want to get out of this project?

- TraffCom were not originally aware of the project.
- TraffCom's general stance is they would rather use technology to provide benefits than take capacity away from the network (e.g. for active travel projects).
- TraffCom would like to get the funding for innovative technology such as Artificial Intelligence within the City Centre. This system would monitor and predict what will happen across the next 5 minutes and change/adapt the signal timings to suit from a plan library.
- BIAS is still rolled out across the GCC routes but there are gaps and these will be identified and by filling in these gaps this will have a journey time benefit.
- The UTC system is dated and there would be benefits in upgrading.

What currently works well on these corridors in terms of bus priority measures?

- SCOOT and BIAS: The BIAS (Bus Information and Signalling) system currently provides priority / extensions to buses that are running 2 minutes behind schedule. Considering that most junctions are operating over capacity in the peak periods they currently provide the best operation possible.
- BIAS is installed at 120 junctions in Glasgow and received 35,000 to 40,000 requests for priority last year indicating that's it is utilised and effective.
- Bus drivers have said that they notice less time waiting at red lights.

What are the key problems that cause bus delay or bus access problems on each corridor?

- City Centre congestion and demand on the network, in general.
- Another big issue is cars double parked / waiting to pick up passengers. They do not see an issue as it may only be a few minutes but causes a knock-on effect for the network.
- Compliance for parking / bus lane restrictions. Last year there were £20m worth of fines reflecting the non-compliance across the city.
- Many of the routes have "villages" along the routes which have a lot of passengers getting on and off and makes the 20% reduction difficult to achieve with the stop/starting.
- Travel through the city centre has the biggest delays.
  - Could consideration to dropping passengers at the edge of the city centre be made – any measures that reduce vehicles in the city centre would provide greatest benefit
  - Multiple bus routes rather than 'super-routes' across multiple authorities
- The answer to any request for crossing points by default is to put in a signalised crossings, resulting in too many crossings and added delay and there is too much contention in removing any.

What has prevented additional bus priority from being implemented on these corridors in the past?

- Funding.
- Existing parking and the difficulty faced to removing this.
- Technology on street is too old.

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

- In general, cycle priority schemes and integrating these into bus priority schemes is the biggest risk such as:
  - St Georges Cross Active Travel
  - South City Cycleway
  - Trongate Segregated Cycleway
  - Avenues Project
  - Byres Road Loading Initiative

Any other points you feel the project team should be aware of?

- There is a lack of CCTV coverage outwith a number of junctions. Therefore, monitoring of the network is limited.
- West Dunbartonshire has taken junctions off SCOOT but GCC TraffCom has the capability to put these back on.
- Renfrewshire has a new UTC system they control themselves.
- Artificial Intelligent system is costly and exponentially increases the wider the area. Therefore proposal to ringfence the city centre using Artificial Intelligence (AI) technology and improve/upgrade the SCOOT and BIAS system of the outer regions.

TraffCom will provide Jacobs with

- List of all junctions on SCOOT / BIAS and the gaps in the region not on UTC
- Information on the Artificial Intelligence systems and costs
- Upgrade proposals and costs for BIAS
- Desire to improve CCTV coverage (incident hotspots / enforcement issues) and costing of CCTV equipment.

East Dunbartonshire

Date:	June 1, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Joseph Campbell
Location:	Microsoft Teams
Participants:	Thomas McMenamin, Graeme McLay & Christopher McGeogh (East Dunbartonshire Council), Andrew Kelly & Joseph Campbell (Jacobs)

What does your organisation/team want to get out of this project?

There are a number of actions within the East Dunbartonshire Council (EDC) Local Transport Strategy to 2025 which relate to bus, including a specific action within the plan relating to bus services in Bearsden. Fundamentally EDC would like to see the actions within the Local Transport Strategy progressing as part of this project, given it had progressed through committee as approved actions.

On A81, the Canniesburn Toll signalisation project is key, with construction of a signalised layout (including pedestrian crossings) expected to commence from October 2022 and stretching into next year.

In the past EDC installed SCOOT and MOVA on some of the signals on A81 corridor, and are not averse to developing this further and ensuring that junctions are better linked e.g. junction at Asda is a standalone signalised junction, so looking for something to improve these and link better.

What currently works well on these corridors in terms of bus priority measures?

No comment on this.

What are the key problems that cause bus delay or bus access problems on each corridor?

C1 Maryhill Road

From discussions EDC have had with bus operators, no sections on the A81 corridor have been identified as particularly problematic (both with operators or the public), with the A803 corridor in Bishopbriggs the key location of constraint.

There is a need to improve bus journey times and make bus more attractive as a modal choice, particularly given the high car usage in EDC (most notably in Bearsden and Milngavie), so anything that can be delivered as part of this study, to make bus journeys more attractive and ultimately increase patronage would be of great benefit. Also it's important to point out that despite high levels of car ownership in these locations, not everyone has access to a car, therefore people do rely on bus services in these areas.

The corridor falls within an Air Quality Management Area, therefore any actions to mitigate air pollution would be of benefit.

The Boclair Road junction is very busy, particularly during the peaks and EDC have looked to mitigate (including right turn green arrow stages at the junction), however still problematic and heavily congested so anything to improve would be welcome. The junction can back up beyond the Asda junction and options to mitigate included a gyratory (encompassing Roman Drive, Roman Drive and Milngavie Road) and improvements to the Boclair Road junction but neither progressed. EDC to send details of what they've looked at to ensure we're not considering something that's already been ruled out.

Asda junction –Traffic backs up from Boclair Road junction so can have a green signal but not move due to backing up at previous junction.

Dryman Road – pedestrian signals between Station Road and Ledcameroch Road which are in danger of failing so looking at signalising the entire Station Road junction (is in the plan for this year). Flooding issues at this junction.

Trying to synchronise rail and bus timetables – issue in Lenzie and came up as an issue on this corridor a number of years ago.

Installed a number of high access kerbs already but ensure any locations of additional need are looked at for required enhancements on the corridors.

Bus cages provided at locations where services have been identified as having issues accessing the bus stops

Parking not identified as a major issue on A81, particularly any vehicles parking on bus stops. More of an issue with parking on footways. Support for bus lanes lacking in the past but a feeling that this view has changed given the sustainability agenda.

Canniesburn Toll – pedestrian crossings on every arm of junction and shared use footways / cycleways. Likely from analysis that some arms will be impacted while others will benefit but the pedestrian crossings will improve accessibility and open up the area for active travel, therefore an overall benefit. Will be MOVA control on CanniesburnToll and the junction on Dryman Road will also be MOVA to link up with Canniesburn Toll. No specific analysis on impact on bus movements, just on general traffic but assumed that the overall improvements at the junction will improve conditions for bus services.

EDC did look at bus priority measures on Canniesburn Toll (including a bus stop), but proved too difficult for services to cross 2 lanes of traffic to access the bus stop then same again to re-join carriageway so this wasn't included in the proposals.

Action in Local Transport Strategy to look at Asda and Boclair Road junctions further and consider how to better improve.

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

Producing second Active Travel Strategy – developing the options within here to consider taking forward and will then go out to consultation. Bears Way – no plans for that to be changed anytime soon. Original plans were to extent to take to Maryhill Road / University of Glasgow site / Kelvin Way and down to Botanic Gardens and tie into GCC aspirations there. Could be a long-term aspiration.

Speed limits – EDC supportive of Scottish Government proposals for 20mph speed limit. Transport Scotland now looking at 20mph for restricted roads and would imagine that both of these corridors would fall under the place criteria that TS are looking at – should make journey times more reliable if it happens. Would consider aspirational but does have a bit of momentum around it.

Any other points you feel the project team should be aware of?

No views on any issues within the Glasgow side of the corridor.

Access to healthcare and improving bus connectivity to hospitals is in Local Transport Strategy, so route via Canniesburn Toll and Anniesland Cross to Queen Elizabeth University Hospital (QEUH) is important – can flag this but not considered as part of this study.

West Dunbartonshire

Date:	June 21, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Jenny Muir
Location:	MS Teams
Participants:	Raymond Walsh, Derek Barr & Liam Greene (West Dunbartonshire Council) Sam Matthews & Jenny Muir (Jacobs)

What currently works well on these corridors in terms of bus priority measures?

Discussion focused on the two corridors which enter West Dunbartonshire; Dumbarton Road/Glasgow Road and Great Western Road/A82, both of which have limited bus services currently due to the routeing of buses through West Dunbartonshire

What are the key problems that cause bus delay or bus access problems on each corridor?

C2 Great Western Road

Corridor currently not served by many bus services, attribute this to there not being many frontages (residential or commercial) along the outer section of Great Western Road. There are some bus movements North – South across the corridor at the key roundabouts on the A82 which should be considered for bus prioritisation

Kilbowie Road Roundabout and Drumry Road Roundabouts are busy for these bus movements and for traffic in general

Opportunity to install a dedicated bus lane by reallocating road space

C3 Dumbarton Road

- Cyldebank interchange is busy with many local services
- Buses route via Barns Street towards Glasgow instead of Glasgow Road itself, a largely residential area

What has prevented additional bus priority from being implemented on these corridors in the past?

More services using Dumbarton Road corridor as an East-West route than Great Western Road. Funding is often directed to routes with more services, which may have prevented improvements in the past

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

Aspirations to renew signals on Kilbowie Roundabout (signals, bus priority). Expect costs to be high and potentially prohibitive to this project progressing. Welcome an opportunity to access additional funding in connection with GBP.

Currently undertaking a Route Strategy for bus priority on Dumbarton Road (Between Mountblow Road and Glasgow boundary)

Noted that Clydebank Bus Station is the 4th busiest bus station in Scotland. West Dunbartonshire Council are looking at the entire interchange. Bid underway to upgrade Clydebank interchange.

Light rail, overground, underground and STPR2 proposals (Clyde Metro) also need to be taken into consideration

There was discussion through another project around running a tram down the centre of Great Western Road, RW doesn't feel this is a viable option

Any other points you feel the project team should be aware of?

Supportive of bus prioritisation. A82 has greater opportunities for dedicated provision than Dumbarton Road. However, there isn't any residential frontage along A82 within West Dunbartonshire Council boundary.

Renfrewshire Council

Date:	June 24, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Sasha Liwicki & Jenny Muir
Location:	MS Teams
Participants:	Alastair Scott (Renfrewshire Council), Andrew Kelly & Jenny Muir (Jacobs)

What does your organisation/team want to get out of this project?

Paisley Road West is a well-used commuter route. Keen to improve active travel from Paisley to City Centre, also to improve bus user experience, including reliability, meaning bus becomes a more viable option/alternative to private motor vehicle.

What currently works well on these corridors in terms of bus priority measures?

Hasn't seen successful implementation of initiatives to improve bus priority

What are the key problems that cause bus delay or bus access problems on each corridor?

C4 Paisley Road West

- Looked at this corridor as part of Spaces for People. High level active travel plans drawn up, however parking laybys meant plans for a cycle lane were not delivered
- Removal of central reservation means potential for space to be gained
- AK – Witnessed combination of double parking (loading) and central reservation resulting in bus delays. AS agrees
- Busy corridor, no bus priority currently, congestion results in bus delays, impacting reliability
- Introduction of any kind of bus priority would be an improvement
- Lots of on street parking in the Paisley section of the corridor. Consider reallocation of space for active travel or bus priority
- Glasgow Road parking restrictions seem to be very relaxed with people parking there all day
- On the eastern side of the corridor at the junction at Barshaw Park, there is a 2-lane corridor where one lane could become a bus lane. Although the largest delay problem doesn't exist here, it can still make a psychological difference as the bus seems to have priority. Greater continuity in the bus lane means that private drivers are less likely to park in bus lanes

What has prevented additional bus priority from being implemented on these corridors in the past?

- A lot of residential properties with on street parking
- It is a very busy corridor with retail facilities which require deliveries

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

Regeneration of Causeyside Street in Paisley. Connecting Paisley Canal Railway Station and Paisley Gilmore Street with a bidirectional cycleway along the west side of Causeyside Street. Will also improve bus accessibility with the decluttering of footways. Causeyside currently has time restricted parking which is not well enforced, the plan is to formalise the parking as it would be contentious to remove parking entirely. The bus will stop on carriageway and not pull in, so traffic will have to wait behind the buses when they stop. Yet to go to public consultation.

- Renfrewshire Council working with Glasgow City Council and BPF to improve bus priority. Consultant is looking at improving junctions in Paisley town centre, including Glasgow Road/Mill

Street junction. Yet to go through public consultation. Also considering smart technology to give buses priority at traffic lights.

- Gauze Street/Cotton Street junction, looking at providing a turning head. Currently buses have to go through the gyratory in Paisley and if they could turn around faster that would improve efficiency so trying to solve this issue is part of the project. McGills are in favour of this. AS will see if he can share drawings.

Any other points you feel the project team should be aware of?

Bus operators are more enthused by physical infrastructural change rather than technological advancements such as systems to notify traffic lights

The corridor has been on the radar for the council so very welcome to change

East Renfrewshire

Date:	June 17, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Richard Hayes, Colm Smyth
Location:	Glasgow
Participants:	Dermot McGonigle & John Shelton (East Renfrewshire Council), Richard Hayes & Colm Smyth (Jacobs)

What does your organisation/team want to get out of this project?

At peak times progress along corridor is slow but steady. In off peak there is no problem. Discussions with operator indicated that nothing major is required in terms of physical improvements through East Renfrewshire Council (ERC) section of the corridor.

Would like to promote model shift to buses but don't think this is driven by conditions in East Renfrewshire, more by issues in Glasgow.

ERC has seen corridor as an opportunity to put forward improvement to sustainable transport. This includes segregated cycle lanes.

Had aspirations to introduce trial bus lanes in Giffnock as part of us Priority Rapid Development Fund (BPRDF) measures. ERC have issued a copy of BPRDF report to Jacobs. Proposed improving bus reliability but have mixed views on benefits.

Eastwood Toll: more concerned about active travel, street scape and removal of barriers to travel.

What currently works well on these corridors in terms of bus priority measures?

Bus stop facilities allow buses to pull in well.

No priority at junctions but not needed as much as in other sections of the corridor.

Most problems are associated with roadworks.

Suspect that buses may be operating at optimum journey times.

Have not considered introducing bus priority measures at signals. First Bus has never raised the issue.

Fenwick Road/ Burnfield Road junction works well for vehicles/ buses (however does not work well for pedestrians)

What are the key problems that cause bus delay or bus access problems on each corridor?

C5 Pollokshaws Road

Ayr Road/ Fenwick Road roundabout (Eastwood Toll) can lock up for a short period of time but no comments have been received specifically about buses or from bus operators. The signalised junction at the St Ninians/Council office access is not considered the cause, the problem is typically generated by queuing back from inside the site (park traffic and school drop off).

Pedestrian crossings at Eastwood Toll could provide better facilities for access to stops.

What has prevented additional bus priority from being implemented on these corridors in the past?

Suspect that buses may be operating at optimum journey times.

Bus Operators have never raised bus priority at signals as an issue through this section.

If there is scope to improve Fenwick Road/ Burnfield Road junction, it can be argued that benefits should be given to pedestrians.

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

Nothing specific but aspirations are for an active travel route on this corridor. It is a strategic cycle corridor in the Local Development Plan.
Berryhill Road to be signalled but not considered that it will affect Bus Priority

Any other points you feel the project team should be aware of?

Thornliebank Road bridge over the railway to be demolished. New single bridge to be considerably wider (pedestrian facilities on same structure). Don't consider that it will impact buses.

Integration of bus priority is the more important factor.

Bus Users

Date:	June 24, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Sasha Liwicki & Jenny Muir
Location:	MS Teams
Participants:	Greig MacKay (Bus Users), Joseph Campbell & Jenny Muir (Jacobs)

What does your organisation/team want to get out of this project?

A tangible benefit for bus passengers

More reliable and improved journey times

Better on-street information

Better value fares and better connectivity with other modes. Suggests the idea of a 'travel wallet' where one card/fare could be used for multiple modes of transport. The simplicity of this could change people's behaviour.

Private vehicles need to be more restricted on these key corridors. Public transport should be the default mode.

What currently works well on these corridors in terms of bus priority measures?

Maryhill road going into Garscube Road is good for buses and there's levelled crossings have been improved. Taking cycle traffic away from road traffic has been good around Maryhill.

What are the key problems that cause bus delay or bus access problems on each corridor?

C1 Maryhill Road

There' are pinch points along the route that cause bus delays, including Canniesburn Toll Roundabout where the cars can cut across buses during rush hour

Limited road space means there's not much space for bus lane priority

Peak time bus priority is not enforced

Consider traffic lights that prioritise buses in the Bearsden area

In Maryhill, people living in the area are much more likely to use the buses so this area would greatly benefit from increased frequency of buses. This area needs better bus infrastructure such as build-out bus stops so buses don't get stuck and high frequency services can run smoothly. A block raised curb can also improve accessibility, improving loading times. This section would also benefit from a full-time bus lane.

Parking should not be permitted. There's not enough road space for parking. Currently accessibility issue with buses unable to pull into bus stop due to parked cars.

In the city centre bus traffic light priority is important.

C2 Great Western Road

Great Western Road has a lot of retail outlets and side roads coming off it

A lot of parking along the side of Great Western Road, if 50-60% of this was removed there would be space for bus priority, inc. bus build outs

The corridor is well-placed for bus users. Improving it would improve bus usage

Byres Road to City centre section, there is potential to make a difference, currently there is a high frequency of deliveries, manoeuvres etc. Enabling bus priority in this area would have maximum impact.

Anniesland is generally better for bus travel as the road is wider and there is a bus lane camera for enforcement

More space at the western end. Maybe look at changing the bus stops from pull in ones to build out ones. Potential for speed reduction in this area

C3 Dumbarton Road

Around Finneston the parking is more controlled and the roads are slightly wider. Although parking will need to be reviewed

Mainly concerned for the section of Bryers Road heading West.

The Partick Bus Station still has buses getting stuck because they don't have right of way

Traffic issue around Clydebank which could be solved with traffic light sequences and priority traffic lights

Bus stops should be changed from 'pull in' to 'build out' if possible

Competing with the subway stations and trains in this area so would benefit with efficiency and better value

Would benefit from real-time bus stop information as people don't tend to read timetables, they go to the stop and read the display

C4 Paisley Road West

- Lots of parking on Paisley Road West, on-road parking needs to be removed. Would result in pollution and noise levels decreasing (air quality is poor in this area)
- Bus priority would need to be enforced
- Section from city centre to Ibrox could be improved, also where the corridor reaches Paisley traffic becomes a problem again.
- The main area that needs intervention is Ibrox to city centre

C5 Pollokshaws Road

Shawlands has a lot of traffic lights

Between Bridge Street and Eglinton Toll traffic is fairly smooth

But through Strathbungo to Shawlands better enforcement and removal of parking is needed.

Build out bus stops are also needed

Recommends removal of parking at Shawlands Cross due to limited road space

Bus stop reduction could be considered for Shawlands because there are so many in this area

Pollokshaws Road split should ensure buses get priority

Pollokshaws Road also has some on street parking that should be removed

The road to Giffnock also has a lot of on street parking

What has prevented additional bus priority from being implemented on these corridors in the past?

On street parking

Traffic lights

Pull in bus stops

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

N/A

Any other points you feel the project team should be aware of?

Across all the corridors: enforcement of bus priority is essential

Taxis shouldn't be allowed in bus lanes as there are so many private hire cars in this area. Including private hires which act as delivery drivers

Should aspire for a general standard across these corridors: bus stop design, real time information etc. High frequency services help get people into the habit of getting the bus

Emphasises that other parts of Glasgow should also have its own corridors.

Sustrans

Date:	June 27, 2022
Project name:	Glasgow Bus Partnership
Project no:	B2340240
Prepared by:	Sasha Liwicki & Jenny Muir
Location:	MS Teams
Participants:	Michael Melton & Angus Calder (Sustrans), Andrew Kelly & Jenny Muir (Jacobs)

What does your organisation/team want to get out of this project?

An approach that jointly enhances active travel and public transport connectivity along these corridors.

Where there are constraints over space, follow the transport hierarchy. However, we recognise there may need to be trade-offs between different transport modes as determining factors may mean it's not always possible to follow the transport hierarchy (other factors such as gradient, space etc can interfere with these trade-offs)

What currently works well on these corridors in terms of bus priority measures?

Wider areas of road where congestion and on street parking is less frequent. Also, areas of low-density housing. Such as Bearsden, the outer parts of C2, between Cessnock and Paisley (C4), and the outer areas of C5

What are the key problems that cause bus delay or bus access problems on each corridor?

C1 Maryhill Road

Stockingfield Bridge is being installed (expected to be completed Sept 22), Maryhill Road is the nearest major road. Potential to consider how people travelling actively in and out of the city could then get to Maryhill Road and become bus users.

Where C1 joins Garscube Road: There is a cycle route which ends here, requires consideration for how this could continue onto Maryhill Road. Current designs allow for route to be extended northward along Maryhill Road, thus need to be aware for any infrastructure proposals at the junction of Maryhill Road and Garscube Road. This section of route has also experienced bus delays.

Travelling south along Maryhill Road, cycle movements are being directed along Garscube Road (as per Glasgow strategy). This allows focus on bus for section south of this junction.

Separate corridors for active travel and buses in the city centre looks possible given number of streets and grid structure.

C2 Great Western Road

Further out on the corridor there aren't any problems (there are 3 lanes of traffic with one lane dedicated to cycle infrastructure, with space available for a bus lane).

Byres Road and Kelvinbridge the corridor gets a lot busier. Parking and non-enforcement of parking creates issue. Public realm is poor. Lots of potential for this street. Lots of space available due to side road closures. Side road closure sections along Byres Road are currently dead space.

Wider network options should be considered to reduce the vehicles on this section of the road

Non-enforcement of parking on this section. Currently not pleasant for public transport i.e. not a nice area to wait for a bus

Great Western Road has high potential for public/active transport as it's so wide so there is space for bus stops

The subway stops are quite cut off and difficult to get to from Great Western Road, potential to take the bus to Great Western Road and then get on the subway into the city centre

Cycle provision on St George's Road is being constructed as part of Connecting Woodside, also Avenues Project being installed on New City Road, terminating on St George's Road. Initially these proposals were meant to tie into St George's Place, however for a number of reasons prevented this (inc. bus movements, restrictions on right/left turns). This requires a more zoomed out approach to look at how different junctions could work together.

West Prince's St designated as a Quiet Route. Improvements scheduled. This provides a cycle alternative to Great Western Road, however issue of crossing Great Western Road would remain.

C3 Dumbarton Road

Limited knowledge of issues on this corridor

AK - High density housing throughout the corridor raises more problems

AK - Running through high street areas such as Yoker (similar issues to C2 with parking and busy streets)

- AK - Areas such as Partick with lots of on-street parking and two lanes of traffic where it would be difficult to get bus priority and protected cycling

AK- Running through Finnieston, the area is getting busier with new developments so similar spaces with traffic and parking dominating the streets

City centre end of this corridor overlaps with Yorkhill/Kelvingrove project which is at concept design stage. Potential opportunity for network planning so that cyclists and buses should be routed separately instead of forcing every mode into one street.

GCC are improving the Kelvinway and the National Cycle Network (NCN) in that area. Thus, radial routes across the corridor are important in this section.

Section of NCN is not good quality. Not considered a viable active travel route, particularly outside of daytime hours. Thus this area lacks in connections to City Centre.

Redevelopment of area surrounding Cyldebank Station concluding (funded through Places for Everyone (PfE) programme), includes improved crossing points.

C4 Paisley Road West

Similarly limited knowledge

- AK - South of the river, the space is not very well used in terms of junction design
- AK - Through Cessnock, there are areas where bus priority could be improved but this is also an aspiration for the city cycle network
- AK - Further out of Cessnock, there are areas with bus delays, but junctions where efficiency can be improved
- AK - Relatively free flowing until Paisley is reached. Renfrewshire council has looked into improving cycle provision
- Renfrewshire council have completed a concept design to redesign Hawkhead Road Junction, proposals for protected cycle crossing. Proposals as they are toretain 2 lanes along Glasgow Road. Capacity sacrificed along north & south roads. Large median along corridor, in theory protected cycle lane, bus lane and traffic lane could be rolled out along the corridor.
- Paisley town centre improvements underway.

C5 Pollokshaws

AK - When coming up Govan Hill the road narrows as there's a lot of parking, loading, and junctions with signals that are poorly coordinated

AK - Parallel to this section is the South City Way

Just past Queens Park, the corridor stays very busy with lots of parking and loading and bus routes diverging. Everything slows down drastically at this junction. Lots of manoeuvring.

East Renfrewshire Council are looking at corridor from Glasgow boundary to motorway. Continuation of these proposals into Glasgow would be advantageous. Generally, there is not much of an alternative route from this area. Consideration of connecting into South City Way.

What has prevented additional bus priority from being implemented on these corridors in the past?

Parking and the domination of vehicles on the roads. Parking management/solutions is important for the corridor. Glasgow doesn't have far reaching residents parking zones. Need to make parking more

difficult and for this to be enforced. Removal of parking and/or making parking cost prohibitive would encourage modal shift.

What other projects or initiatives are you aware of that would influence the design of future bus priority measures on these corridors?

C1 Plans for the cycle corridor to be extended. The main cycle corridor would be from Maryhill Road into Garscube road. The cycle lane is on East side of the junction of Maryhill Road and Garscube Road so could bypass much of the junction and avoid bus routes.

C2 There is a proposal for improved cycle provision on St George's Road. Failed cycle infrastructure proposals have existed around the junction at St George's Place. The junction has the potential to be a lot more efficient. West Princes Street is also a potential for a connecting cycle route to Great Western Road.

C3 The corridor overlaps with the Yorkhill Kelvingrove project which is led by the GCC so could provide opportunity to network plan this area. The redevelopment of Clydebank Station area (PfE) also overlaps with the corridor which has made the area nicer and more accessible for pedestrians

C4 There is a currently a Renfrewshire Council proposal looking at Hawkhead Road junction to improve safety for cyclists and pedestrians. A protected cycle junction. Suggests similar junctions could be taken on along the whole corridor as there is reasonable width along the road for protected cycle lanes, a bus lane, and a vehicle lane. A project connecting Canal Street, Paisley, and the town centre which provides better cycling provision and improving bus stops

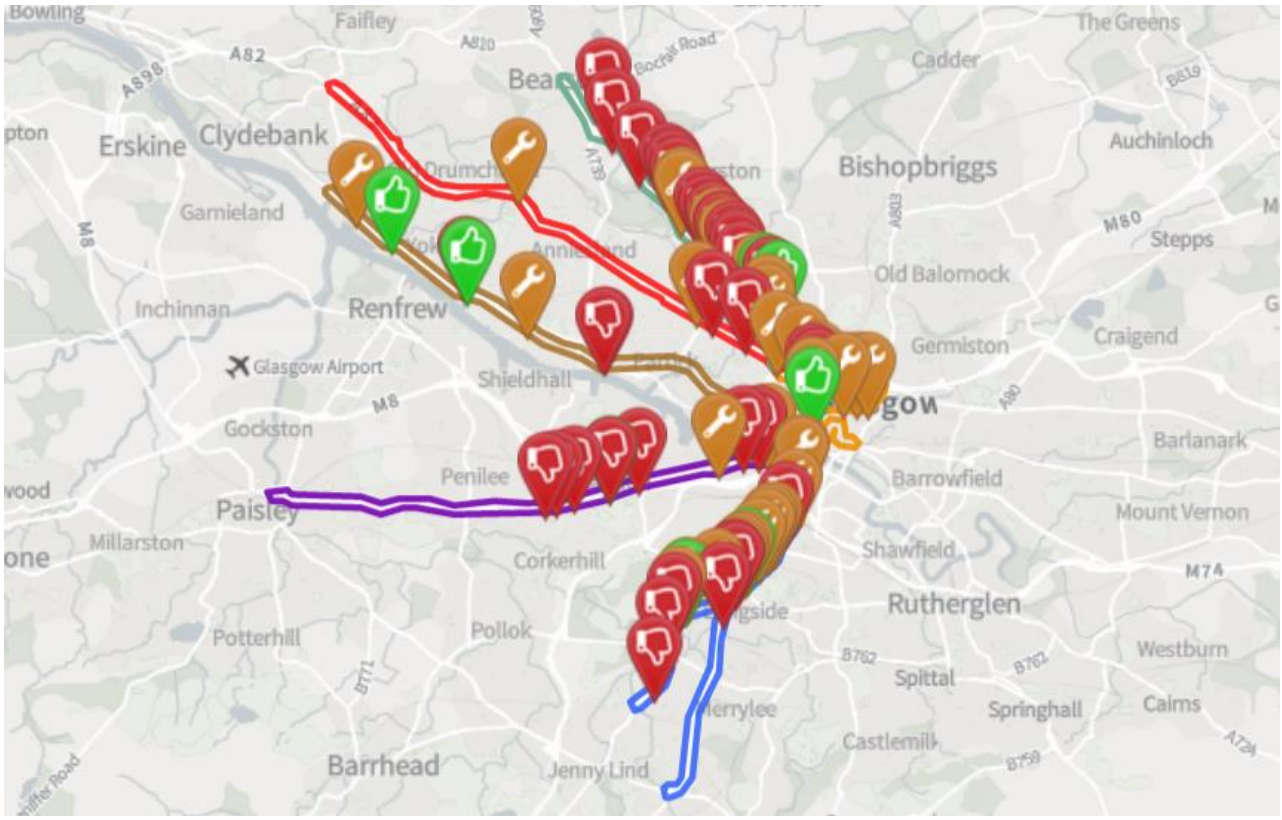
Any other points you feel the project team should be aware of?

Enforcement of parking restrictions is just as important the restrictions themselves

Hopes that the bus priority corridors also work in tandem with aspirations for active travel. The starting point is the council officer who has oversight over both projects and making them aware that these projects need to be integrated. The Space Allocation Framework task should help cover this.

Placecheck Summary

The comments below have been collated from a Placecheck site open to the public through the Glasgow City Council Consultation Hub. These represent comments to date and will be updated in advance of the Strategic Business Case submission as more comments are collected and these are used to inform options identification.



C1 – Maryhill

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things I don't like	Too many traffic signals alongside Tesco	Seems very stop-start on a bus	55.8874	-4.28563
Things I don't like	Delay at traffic signals		55.8844	-4.28076
Things I don't like	Too many parked cars	on street parking should be removed	55.8857	-4.28217
Things I don't like	Too many parked cars	on street parking should be removed here	55.8905	-4.2899
Things I don't like	Too many parked cars	on street parking should be removed here	55.8984	-4.30022
Things I don't like	Remove parking in front of pub	parked cars restrict bus traffic	55.8824	-4.27911
Things we need to work on	Put 90 bus route currently using Hotspur St back onto Maryhill Road and allow it to turn right into Ruchill Road.		55.8879	-4.28686
Things we need to work on	Construct a zebra crossing at every pair of bus stops along Maryhill Road to enable		55.8862	-4.28379

Category	What is it?	Why am I adding it?	Latitude	Longitude
	passengers to access bus stops directly.			
Things we need to work on	Remove traffic signals at Community Halls, they delay traffic unnecessarily, replace pedestrian crossings with zebras which delay traffic less.		55.8766	-4.27102
Things we need to work on	Remove new traffic signals at North Woodside Road which delay all traffic unnecessarily, replace pedestrian crossings with zebras which delay traffic less.		55.875	-4.27078
Things we need to work on	St George's Cross junction - retime traffic signals which currently give priority to traffic exiting motorway - let vehicles queue on motorway access road. Prioritise Maryhill Road bus routes.		55.8702	-4.26853
Things I don't like	Bike safety	The entire length of Maryhill Road feels unbelievably dangerous on a bike. There is a massive need for segregated cycle infrastructure. Most local cyclists use pavement illegally due to the danger.	55.889	-4.28784
Things we need to work on	North Maryhill town centre	In need of placemaking to form the hub of a 20-minute neighbourhood. Wider pavements, cycle lanes etc. Currently dominated by commuter traffic, making it an unattractive place to spend time.	55.895	-4.29799
Things I don't like	50mph to 30mph transition	This area of the road is very dangerous. Traffic transitions from 50 to 30mph at the same point as cars are turning into a car wash. I have seen numerous accidents and near misses in this area as drivers are often moving at different speeds, and perhaps unaware of cars coming in and out of the car wash.	55.8991	-4.30239
Things we need to work on	Dangerous junction	Of all the junctions on Maryhill Road, this one is most in need of redesign as a proper protected intersection.	55.8842	-4.28074
Things I like	Garscube Road cycle lanes	The Garscube Road cycle lanes are absolutely amazing - please please please finish the job by continuing them all the way up Maryhill Road	55.8801	-4.27188
Things I don't like	Shiskine drive	Shiskine drive is frankly terrifying as a pedestrian or cyclist. Presumably it is a 30mph road, but the wide-open design encourages and allows 40-50mph, which seems to be the norm for cars on this road	55.8967	-4.29893

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things I don't like	Crossing Maryhill Road	Super dangerous at rush hour. I was hit by a car while rushing to catch the bus to work. Technically my error, as it was a red man at the traffic light. My view of the traffic in the far lane was obscured by a bus and I did not realise it was in motion. Efforts to make the road easier and safer to cross even without traffic lights please.	55.8871	-4.28525
Things we need to work on	Old style bus stops	Can we get new style bus stops with level boarding and digital displays?	55.8946	-4.29759
Things I don't like	Illegal parking	Cars parked in bus lane and half on pavement on double yellows every single day and nothing is done.	55.8914	-4.29164
Things I don't like	Illegal parking	Cars parked in bus lane on double yellows all day every day, please enforce by removal.	55.884	-4.28025
Things I don't like	Lack of cycle lane	Space was available to extend Garscube cycle lane beyond Firhill Road to Maryhill and beyond, but they just peter out and the space was given up for car parking.	55.8794	-4.27011
Things I like	path to canal	Excellent addition to the public realm	55.8786	-4.26774
Things I don't like	Site of accident	Just witnessed an accident caused by one driver speeding at the other being unaware that the bus lane is not a bus lane on a Sunday. Bus lane should be a bus lane 24/7 and have hard segregation to avoid confusion	55.8979	-4.30057
Things we need to work on	kerbside barrier	It extends for too great a distance and is an impediment to pedestrians, particularly at the very narrow pavement adjacent to the pharmacy.	55.8802	-4.27334
Things I don't like	Lack of bus lane	Much of Maryhill Rd has space for a bus lane, but has not been marked	55.909	-4.31917
Things I don't like	Add bus lane	there is room for a bus lane on Milngavie Road	55.9138	-4.32162
Things I don't like	Reduce road speed from 50 to 40	There is space for permanent bus lanes and segregated cycle lanes from Maryhill Railway Station to at least Canniesburn Toll.	55.9029	-4.31044

C2 – Great Western Road

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things I don't like	Bus lane always parked in	Even during peak hours	55.8774	-4.28839
Things we need to work on	Create bus lanes in addition to cycle lanes	remove parking, add bus and cycle lanes	55.8999	-4.34815
Things we need to work on	St George's Cross junction - retime traffic signals which currently give priority to traffic exiting motorway - let vehicles queue on motorway access road. Prioritise Maryhill Road bus routes.		55.8702	-4.26853
Things we need to work on	Cowcaddens gyratory - construct an inbound signalised bus lane diagonally across gyratory to prioritise buses.		55.8681	-4.26068
Things we need to work on	Cycle lanes	Great Western Road could really use cycle lanes. At one end this would connect to the Byres Road lanes, and at the other to The Underline avenue	55.8788	-4.29286
Things I don't like	Bus stuck in traffic queue	Parked cars and right-turning traffic hold up buses	55.8742	-4.27802

C3 – Dumbarton Road

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things I don't like	Poor crossing opportunity between bus stops	Key interchange between 77 and 2/3 services but no crossing and lots of double-parking	55.8708	-4.32097
Things I like	Bus bypass of signals	Always beats the traffic queue	55.8828	-4.36332
Things I don't like	Huge queues in the morning	Too many parked cars, always delays the bus leading up to Kingsway	55.883	-4.36462
Things we need to work on	Can some of the express buses not go along Glasgow Road?	To save some time going through Barnes Street	55.8962	-4.39809
Things I like	Bus bypass of junction		55.8914	-4.38666
Things I don't like	Roundabout Broomhill/Thornwood	Buses have difficulty here and no easy crossing for pedestrians or active traffic route. Will get much worse with new drive thrus being built immediately of this roundabout. Make this part of Dumbarton Road bus / local access / active travel only with cars running South Street to Castlebank Street to expressway at Riverside museum	55.8708	-4.322
Things we need to work on	Bus bypass?	Buses always get delayed at this junction - seems obvious to use this lane as a bus bypass	55.8767	-4.34481

C4 – Paisley Road West

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things I don't like	Seems to take ages going past Springfield Quay	Stop-start traffic lights	55.8537	-4.27379
Things I don't like	Parking at Paisley Road Toll	Buses get caught up in queues	55.8538	-4.27862
Things I like	Bus bypass	Saves some time	55.8483	-4.31943
Things I don't like	Match-day traffic at Ibrox	Buses can be held up while clearing Ibrox traffic	55.8498	-4.31108
Things we need to work on	Factoring in delivery of segregated cycling lanes.	Highly supportive of delivering bus prioritisation routes, but any street design must also allow space for segregated cycleways along these five major roads. Here at Paisley Road West, underneath the Kingston Bridge, the Tradeston segregated cycleway comes to an end. Future plans for the extension of this high-quality cycleway westwards along Paisley Road West will hinge on any the design of any planned bus prioritisation works to Paisley Road. Please ensure this is fully considered as part of the design work for this and the other four routes, and that bus prioritisation works do not exclude the delivery of safe, segregated cycleways on these roads now or in the future.	55.8542	-4.27091
Things we need to work on	Safe cycle lanes required	We need safe segregated cycle lanes along Paisley Rd West to connect to the South West City Way	55.8526	-4.28581
Things I don't like	Parked cars on east bound section require busses/cars/bicycles to share 1 lane	It created unnecessary conflict and feels dangerous on a bicycle. Displace car parking to side roads & remove central reservation, creating enough space for dedicated car, bus and cycle lanes.	55.8458	-4.33943
Things I don't like	parked cars forcing cars/busses/bicycles to share 1 lane	Feels dangerous on a bicycle and busses are frequently blocked by turning cars. Car parking should be displaced to side roads and central reservation removed so that bicycles and busses both have decided lanes.	55.8467	-4.33093
Things I don't like	Roundabout that (eastbound) is unsuitable for inexperienced cyclists	Cyclists should be able to continue eastbound down paisley road west without having to cross lanes of traffic and without having to enter a dangerous roundabout - a bypass is needed for bicycles and busses.	55.8483	-4.31991
Things I don't like	The whole of the paisley road west.	Because you guys pretending your actually going to do anything of significance on this road is a joke. Enjoy yer funding for the continuous consultations.	55.8461	-4.3364

C5 – Pollokshaws Road

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things I don't like	Right turners at lights slow down buses		55.8408	-4.2655
Things I don't like	Granary junction is too slow	All buses are slowed down by traffic lights and parking	55.8304	-4.28108
Things we need to work on	Bus prioritisation works must complement cycle access to South City Way.	Any bus prioritisation works along Pollokshaws Road must factor in allowing safe cycle access to the South City Way at Eglinton Toll. There should be a simple and easy way for cyclists to cross this junction and make use of the cycle routes on Victoria Road. Ideally, any plans for works on Pollokshaws Road into Shawlands should also include delivery of safe segregated cycle lanes now, or at least not preclude their delivery on these bus prioritisation routes in future.	55.8429	-4.26259
Things I don't like	Remove bus stop	Too close to other nearby stops	55.814	-4.30598
Things we need to work on	Bus lane camera enforcement needed	Bus lanes constantly blocked by unnecessary parked private cars	55.8311	-4.27985
Things we need to work on	Bus lane camera enforcement needed	Bus lanes constantly blocked by unnecessary parked private cars	55.8359	-4.27105
Things I don't like	Junction is not cycle friendly.	The A77 is a major route for cycling. This junction needs a redesign and made safe for cycling.	55.8304	-4.28072
Things we need to work on	Connect to waverleyparkstreets.com project	This route forms the border for the Waverley park streets project and is also a link in the Glasgow Cycle Network plans. Parking should be removed here and safe segregated cycle lanes installed.	55.8289	-4.28664
Things we need to work on	Connect with Connecting Pollokshaws works/infrastructure.	This road is part of the border to the Connecting Pollokshaws project. Can all this infra be joined up?	55.8259	-4.29868
Things I don't like	Safe cycling infrastructure needed	This is part of the Glasgow cycle network and segregated cycle lanes are needed here	55.825	-4.29977
Things we need to work on	Frequently blocked bus stop	Cars, vans and deliveries often partially or fully block this bus stop, causing problems for drivers, passengers getting on and slowing down journey times. Vehicles also park frequently on double yellow lines along Pollokshaws Road	55.8322	-4.27799
Things I don't like	Dangerous roundabout	The Auldhouse roundabout is extremely dangerous. This should be redesigned. Fendon Roadd is a good example: https://www.cambridgeshire.gov.uk/residents/travel-roads-and-parking/transport-projects/cycling-pedestrian-improvements/fendon-road-and-queen-edith-s-way-roundabout Or a Dutch style turbo roundabout:	55.8211	-4.30323

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things I don't like	Bad junction	Junction is unfriendly for walking and wheeling. It takes too long to cross wide roads. Green light time for crossing is insufficient for pedestrians, especially older or disabled people, at a very busy junction	55.8305	-4.28097
Things we need to work on	Terrible junction for cycling.	This junction is part of the proposed cycle network and needs a redesign so it's actually usable for cycling.	55.8274	-4.29589
Things we need to work on	Crossing in need of improvement	Time for green light on this pedestrian crossing is very short. Insufficient for older people, disabled people or people with children to cross safely	55.8343	-4.27401
Things we need to work on	Improve pedestrian crossing	Vehicles travelling south cannot turn right onto Minard Road and vehicles travelling north cannot turn left onto Minard Road. But pedestrian crossing doesn't reflect this	55.8316	-4.27887
Things I like	Clear bus lane	Bus lane going south kept generally clear here and works well, enabling buses to make good progress in traffic	55.8325	-4.27709
Things we need to work on	Slow progress here for buses	Buses slow down significantly here due to high volume of parked cars and traffic, as well as no bus lane. Removing spaces for parking would clear this part of the route and create space for bus lane to continue	55.8366	-4.26997
Things I like	Bus bypass	Works really well, keeps buses moving	55.8272	-4.29613
Things we need to work on	Junction improvements for cycling and buses	This junction is a link in the proposed cycle network. It needs to be redesigned to allow safe cycle connections onto Allison St allowing cyclists to get to Victoria Rd safely.	55.837	-4.26918
Things I don't like	Cycling is not safe here.	Many people cycle along here and in the traffic it's not safe. The parking needs to be removed and cycle lanes installed.	55.8269	-4.285

City Centre

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things I like	Bus gate and rearranged bus stops works much better		55.8601	-4.25697
Things I don't like	City centre traffic signals not joined-up	Adds a lot of time for bus movements	55.8646	-4.25726
Things we need to work on	Events at O2 academy can slow down buses		55.8487	-4.26038
Things we need to work on	St George's Cross junction - retime traffic signals which currently give priority to traffic exiting motorway - let vehicles queue on motorway access road. Prioritise Maryhill Road bus routes.		55.8702	-4.26853
Things we need to work on	Cowcaddens gyratory - construct an inbound signalised bus lane diagonally across gyratory to prioritise buses.		55.8681	-4.26068
Things we need to work on	Reset traffic signals to cut waiting - side road does not need so much time.		55.8651	-4.25523
Things we need to work on	Renfield and Hope Streets - reset linked traffic signals to favour buses as well as pedestrians.		55.8621	-4.25718
Things I don't like	Renfield st	Buses always getting caught in traffic here, really slows down trips that cross the centre	55.8636	-4.25596
Things we need to work on	Factoring in delivery of segregated cycling lanes.	Highly supportive of delivering bus prioritisation routes, but any street design must also allow space for segregated cycleways along these five major roads. Here at Paisley Road West, underneath the Kingston Bridge, the Tradeston segregated cycleway comes to an end. Future plans for the extension of this high-quality cycleway westwards along Paisley Road West will hinge on any the design of any planned bus prioritisation works to Paisley Road. Please ensure this is fully considered as part of the design work for this and the other four routes, and that bus prioritisation works do not exclude the delivery of safe, segregated cycleways on these roads now or in the future.	55.8542	-4.27091

Category	What is it?	Why am I adding it?	Latitude	Longitude
Things we need to work on	Bus prioritisation works must complement cycle access to South City Way.	Any bus prioritisation works along Pollokshaws Road must factor in allowing safe cycle access to the South City Way at Eglinton Toll. There should be a simple and easy way for cyclists to cross this junction and make use of the cycle routes on Victoria Road. Ideally, any plans for works on Pollokshaws Road into Shawlands should also include delivery of safe segregated cycle lanes now, or at least not preclude their delivery on these bus prioritisation routes in future.	55.8429	-4.26259
Things we need to work on	Improve pavement space	Lack of pavement space in front of O2 Academy causes crowds to spill out onto the street and block or slow down buses	55.8485	-4.26078
Things we need to work on	Cathedral st avenue.	Cathedral St is supposed to be part of the Avenue project. This street urgently needs a reduction in cars and cycle lanes.	55.8631	-4.24346
Things we need to work on	Cars illegally turning right slow buses down	Many cars turn right here from the West bound lane despite the signs saying not to. This delays buses. The junction needs to be improved to prevent this.	55.8631	-4.24011
Things we need to work on	kerbside barriers	These impede the movement of pedestrians, they remove pavement space and become litter traps. They encourage drivers to travel too fast.	55.8628	-4.24759

Appendix J. Risk and Uncertainty Log

Risk Log

Reference	Risk Type	Risk	Description	Likelihood	Impact	Approach to Risk	Mitigating Actions	Owner
GBP-R001	Outcomes	Strategic bus network review	A strategic review of the bus network across the Glasgow city region could propose changes to routes, services or timetables which may alter the services running on the five routes under review and affect the effectiveness of proposed measures	Medium	Medium	Manage	Retain flexibility where possible and maintain dialogue with review team. Ensure appraisal of options is fully informed by evolving network review. Demonstrate demand for high frequency and high-quality services on the five routes being studied (as set out in the Case for Change wider Glasgow Transport Strategy)	GBP
GBP-R002	Outcomes	Competition for streetspace with proposals for active travel measures and placemaking improvements	Proposed active travel measures could constrain options for developing bus priority	High	High	Manage	Consultation and dialogue with active travel team. GCC are developing a Streetspace Allocation Framework which will address this risk and inform bus priority options. This work is being undertaken by the same team examining these 5 corridors	Jacobs/Steer
GBP-R003	Delivery	Land ownership acquisition/uncertainty	Proposed measures may require acquisition of land which owners are unwilling to sell, or ownership is uncertain	Medium	High	Mitigate	Design measures which minimise the need for land acquisition and initiate early dialogue with any affected landowners	Jacobs/Steer
GBP-R004	Stakeholders	Political support	The political support required to implement transformational change may be insufficient, or may be less of a priority for newly elected members than other areas of policy delivery	Medium	High	Mitigate	Early and continued consultation and dialogue with key elected members	GBP
GBP-R005	Data	Quality and reliability of delay data	Delay data provided by bus operators may have insufficient detail to inform designs	Medium	High	Mitigate	Continued consultation and dialogue with bus operators	Jacobs/Steer
GBP-R006	Outcomes	Options fail to achieve the 20% bus journey time reduction / do not deliver anticipated benefits.	Benefits delivered are limited/partnership objectives are not achieved/not achieved in full.	High	High	Mitigate	Detailed and comprehensive project scope with rigorous appraisal / analysis processes built in. Experienced delivery team with dedicated experienced task leads for key project elements. Comprehensive engagement and collaboration with GCC, Transport Scotland and other partnership members / stakeholders.	Jacobs/Steer
GBP-R007	Outcomes	Options inappropriately inconvenience non-bus road users and do not create the right balance of roadspace allocation and benefits / disbenefits to other road users	Benefits delivered are limited/partnership objectives are not achieved/not achieved in full.	Medium	High	Mitigate	Detailed and comprehensive project scope with rigorous appraisal / analysis processes built in. Experienced delivery team with dedicated experienced task leads for key project elements. Comprehensive engagement and collaboration with GCC, Transport Scotland and other partnership members / stakeholders.	Jacobs/Steer
GBP-R008	Stakeholders	Key stakeholders object to emerging preferred options.	Requirements for additional engagement leading to additional effort, costs and delay.	Medium	High	Mitigate	Early and multi-stage comprehensive engagement with key stakeholders built into methodology and programme. Dedicated consultation and engagement lead to assist in managing process and relationships. Communication strategy and activities developed to gain buy-in and minimise potential for stakeholder objections.	Jacobs/Steer
GBP-R009	Outcomes	Solutions do not sufficiently account for bus passengers' and other road users' needs due to project focus on meeting partners' needs, and those of the process.	Failure to meet partnership objectives. Potential delay to programme and/or increased project costs due to additional effort required in engagement.	Low	High	Mitigate	Methodology structured to achieve stakeholder buy-in from and early stage and comprehensive engagement and collaboration throughout programme to ensure needs are met and delivery and effort is correctly focused throughout the commission.	Jacobs/Steer
GBP-R010	Stakeholders	Conflicts between the Council, other partners and stakeholders become barriers to change.	More complex appraisal process and/or more engagement effort required that anticipated/in scope, leading to programme delay and/or increased project costs. Potential that full stakeholder buy-in is not achieved, undermining project outcomes and ability of partnership to meet objectives.	Medium	Medium	Mitigate	Detailed scope and clear objectives agreed / established at outset and comprehensive engagement / collaboration activities built into scope, including formal progress meetings, providing regular opportunities for concerns / issues / risks to be raised and addressed.	GBP

Uncertainty Log

Ref	Uncertainty Type	Factor	Description	Timescale	Uncertainty (Likelihood)	Impact on Case for Change	Comments
GBP-U001	Demographics	Ageing Population	Increased life expectancy and reduced birth rate resulting in a greater proportion of older people	Within next 20 years	Near Certain	Medium	Ageing population may lead to increased demand for public transport due to availability of concessionary travel and greater prevalence of medical conditions, disabilities or medications which may prevent driving. This may be more notable for bus travel than for rail travel. There may also be an increased demand for public transport to health and social care services.
GBP-U002	Technology	Widespread uptake of Electric Vehicles (EVs)	Advances in EV technology and incentives significantly increase the uptake of EVs and car use continues to grow.	Within next 10 years	More than Likely	Medium	There is a risk that advancement in EV technology and improved affordability/availability of EVs results in an increase in single occupancy car use, which could have implications for congestion, with widespread implications including increased journey times, reduced reliability, and increased number of accidents. Greater reliance on private car may also have impacts on equality.
GBP-U003	Policy	Restrictions on car use within the city centre and other specific areas of Glasgow	Significant demand management measures introduced to discourage private car trips into the city centre (e.g. introduction of Workplace Parking Levy, Ultra Low Emission Zone) to support net zero targets.	Within next 10 years	Reasonably Foreseeable	High	Significant demand management measures in Glasgow city centre could result in a shift away from private car to public transport, park and choose, walking and cycling for journeys to the city centre. This may also have longer term implications for land use, shifting to a denser population in the city centre (and other local centres) and around major public transport nodes, which could in turn result in a reduction in car ownership and a broader shift to public transport and active travel.
GBP-U004	Travel Behaviour	Increased popularity of home-working and online shopping	Enhanced digital connectivity and changing attitudes to where people choose to live and work results in more home-working and online shopping.	Within next 10 years	Reasonably Foreseeable	High	Increased home working and online shopping is likely to result in reduced travel for commuting and shopping purposes and may result in an overall reduction in travel demand. However, time savings associated with less commuting and travelling to shops could result in an increase in more leisure trips such as visiting friends, family and leisure facilities, active travel for leisure, and visiting cafes or restaurants either during a lunch break, or at the start or end of the working day. Increased home-based working will also shift the pattern of trips observed during lunch breaks and before/after work, due to the change in trip origins.
GBP-U005	Travel Behaviour	COVID-19 Recovery	Impact of COVID-19 pandemic on future travel demand	Within next 10 years	Reasonably Foreseeable	High	The COVID-19 pandemic and its aftermath introduced a high degree of uncertainty into all aspects of transport planning. Whilst the impact of restrictions during the pandemic is reasonably well understood, there is significant uncertainty regarding the structural (permanent) changes in peoples' behaviour over the next few years, including implications for traditional AM and PM travel demand peaks, commuting behaviour and the regularity of commuting trips.
GBP-U006	Technology	Widespread Uptake of Mobility as a Service (MaaS) and micro-mobility innovations	Advances in MaaS and micro-mobility innovations (e.g. E-Scooters) significantly alter travel behaviour and vehicle ownership.	Within next 20 years	Reasonably Foreseeable	Medium/High	Advancement in MaaS technology may result in a move away from private car use, by providing a viable alternative for all, and connecting the gaps in the public transport networks. Affordable and integrated MaaS could result in a significant increase in demand for the existing public transport network. There could be positive impacts in terms of equality if MaaS reduces reliance on car ownership and results in a connected and affordable transport network.
GBP-U007	Technology	Widespread uptake of Autonomous Vehicles (AVs)	Advances in AV technology significantly alter travel behaviour and vehicle ownership.	Within next 20 years	Reasonably Foreseeable	Medium	Advancement in AV technology may result in higher travel demand, due to more useable travel time. However, it may encourage other changes in travel behaviour, such as increased car sharing, or reduced car ownership/increased use of MaaS. Even if AVs result in increased car use, features of AVs may mitigate traditional risks (e.g. useable travel time may place less emphasis on journey times, optimisation of speed/braking may improve journey time reliability, removal of human error may reduce accidents). Greater reliance on private car may also have impacts on equality.
GBP-U008	Environment	Disruptive Impacts of Climate Change	Climate change results in increasing disruption to the transport network, including flooding, landslides, snow, ice, and extreme temperatures	Within next 20 years	Reasonably Foreseeable	Medium	Disruptions could result in accidents, damage, closures, diversions, delays, and reduced running speeds.
GBP-U009	Travel Behaviour	Increased popularity of cycling	Attitudes to climate change and greater health consciousness result in significantly increased levels of cycling for all journey types	Within next 10 years	Hypothetical	High	Increased propensity to cycle is likely to result in a reduction in traffic levels, reduced demand for public transport and greater value for money for cycling infrastructure investment. It may also increase the level of potential conflict between cycle users and bus movements.

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GBP-U010	Economic Conditions	Future Withdrawal or Reduction of Bus Services	The future operation and frequency of bus services is dependent on the business strategy of privately owned bus operators. Unprofitable / unviable services may be withdrawn or reduced.	Within next 20 years	Hypothetical	High	Benefits of bus priority measures may not be realised if regular services do not continue to operate along current routes.

Level of Uncertainty	Likelihood
Near certain	The outcome will happen or there is a high probability that it will happen
More than likely	The outcome is likely to happen but there is some uncertainty
Reasonably foreseeable	The outcome may happen, but there is significant uncertainty
Hypothetical	There is considerable uncertainty whether the outcome will ever happen