STRATEGIC TRANSPORT PROJECTS REVIEW

PROTECTING OUR CLIMATE AND IMPROVING LIVES

Initial Appraisal: Case for Change

Ayrshire & Arran Region

February 2021

Jacobs AECOM

STRATEGIC TRANSPORT PROJECTS REVIEW 2

Project No:	B2356701
Document Title:	STPR2: Initial Appraisal: Case for Change Ayrshire & Arran Region
Revision:	Final
Date:	03/02/2021

Jacobs UK Ltd.

95 Bothwell Street
Glasgow, Scotland G2 7HX
United Kingdom

T +44.(0)141 243 8000
F +44 (0)141 226 3109

www.jacobs.com

Contents

Appendices

Figures

Tables

List of Acronyms

ACRONYM	
AMIC	Ayrshire Manufacturing Investment Corridor
CRWIA	Children's Rights and Wellbeing Impact Assessment
EqIA	Equality Impact Assessment
FSDA	Fairer Scotland Duty Assessment
GDP	Gross Domestic Product
GVA	Gross Value Added
ICIA	Island Communities Impact Assessment
LNR	Local Nature Reserve
MPA	Marine Protected Area
NCN	National Cycle Network
NPF	National Planning Framework
NRS	National Records of Scotland
NSA	National Scenic Area
NTS	National Transport Strategy
ONS	Office for National Statistics
ORR	Office of Rail and Road
RET	Road Equivalent Tariff
RSPB	Royal Society for the Protection of Birds
RTS	Regional Transport Strategy
RTWG	Regional Transport Working Group
SABI	Scottish Access to Bus Indicator
SAC	Special Area of Conservation
SCRIG	Scotland's Centre for Regional Inclusive Growth
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SIMD	Scottish Index of Multiple Deprivation
SRMCS	Scottish Road Maintenance Condition Survey
SPA	Special Protection Area

SPT	Strathclyde Partnership for Transport
SSSI	Site of Special Scientific Interest
STAG	Scottish Transport Appraisal Guidance
STPR	Strategic Transport Projects Review
TMfS	Transport Model for Scotland
TPO	Transport Planning Objective
ULEV	Ultra Low Emission Vehicle

1. Introduction

1.1. Background and Report Purpose

Transport Scotland is currently undertaking the second Strategic Transport Projects Review (STPR2) to inform the Scottish Government's transport investment programme in Scotland over the next 20 years (2022 – 2042). STPR2 takes a national overview of the transport network with a focus on regions and will help deliver the vision, priorities and outcomes that are set out in the National Transport Strategy (NTS2)[1].

STPR2 is being carried out in accordance with Scottish Transport Appraisal Guidance (STAG)[2] which is an objective-led, evidence-based transport appraisal process. The 4 key phases of STAG are illustrated in Figure 1.

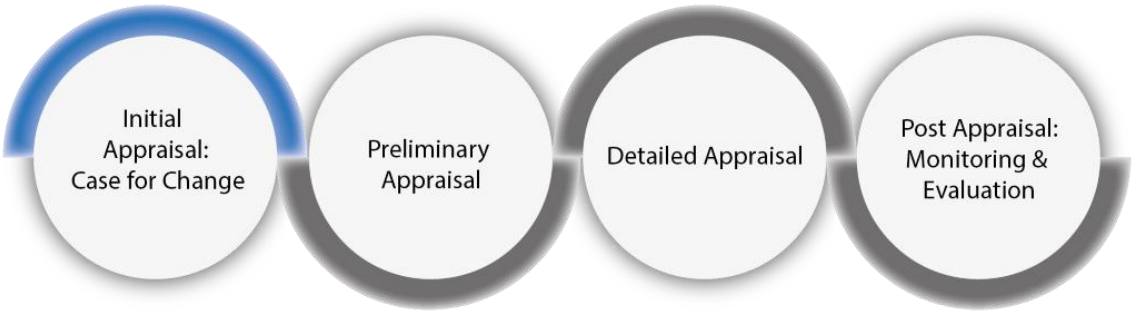


Figure 1: The Four Key Stages to Scottish Transport Appraisal Guidance

This report sets out the Initial Appraisal: Case for Change for the Ayrshire & Arran region which is shown in Figure 2 and forms 1 of 11 STPR2 regions. The Case for Change constitutes the first phase of STAG and sets out the evidence base for problems and opportunities linked to the strategic transport network across the Ayrshire & Arran region drawing on relevant data analysis, policy review and stakeholder engagement. This report is supported by a national level Case for Change report which sets out the overarching vision for transport investment in Scotland and the challenges that must be addressed to support delivery of the priorities set out in NTS2.

It is recognised that the vision set out in NTS2 will only come to fruition through working in partnership with others, including Local Authorities and Regional Transport Partnerships. This is particularly in areas of transport for which local authorities are responsible and which are not within the scope of this national strategic transport review.

STPR2 specifically focusses on Scotland's key strategic transport assets, which are wide ranging and varied. In the context of STPR2, the strategic transport network is defined as being:

- All transport networks and services owned, operated and funded directly by Transport Scotland;
- Transport access to major ports[3] and airports; and

[1] Transport Scotland, National Transport Strategy (NTS2), February 2020, www.transport.gov.scot/media/47052/national-transport-strategy.pdf
[2] Transport Scotland, Scottish Transport Appraisal Guidance (STAG), 2008, www.transport.gov.scot/media/41507/j9760.pdf
[3] List of major ports is still under review.

- The inter-urban bus and active travel network and principal routes within the City Region areas.

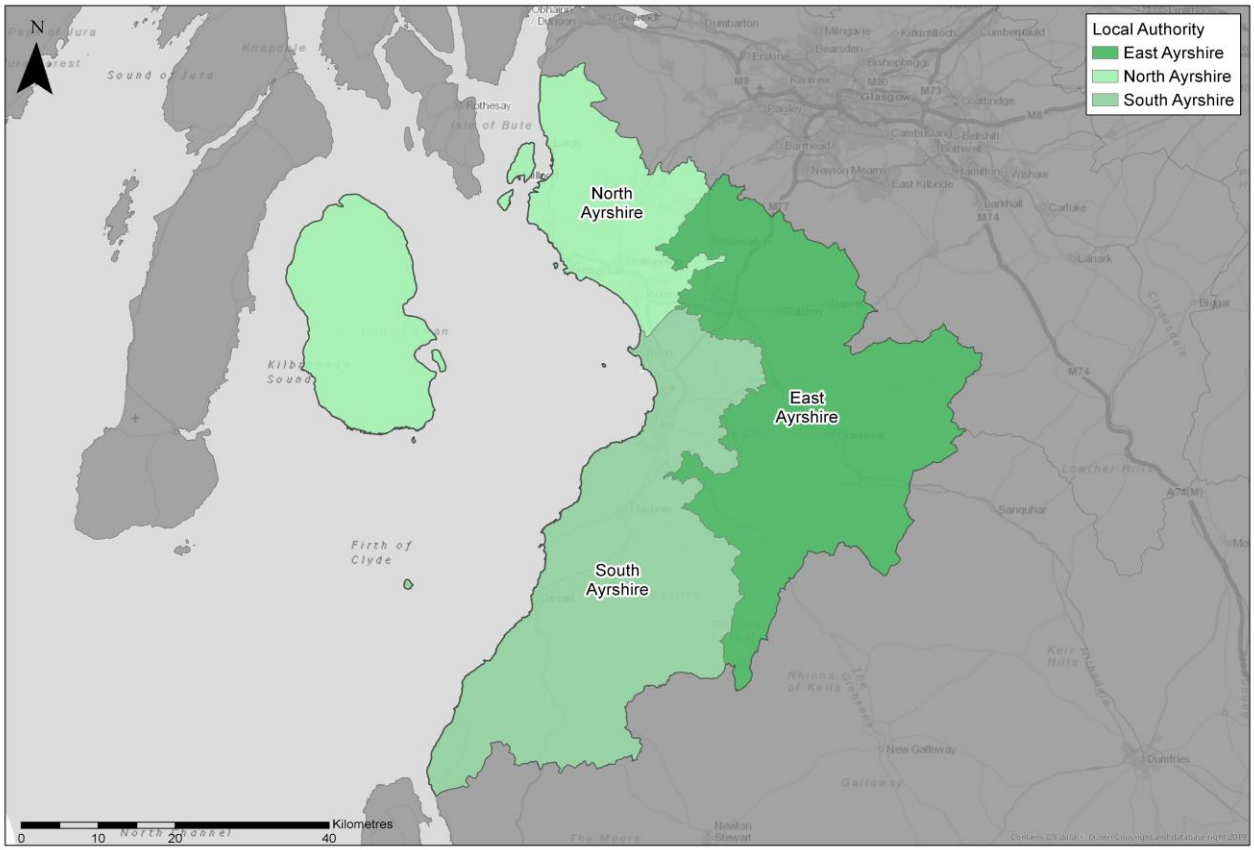


Figure 2: Ayrshire & Arran Study Area

(Click image to enlarge figure)[4]

The Ayrshire & Arran region comprises the 3 local authorities of North Ayrshire, South Ayrshire and East Ayrshire and has an extensive transport network, including active travel, rail and road networks, ferries serving Arran and Cumbrae, and Prestwick Airport.

To reflect the regional approach of STPR2, a Regional Transport Working Group (RTWG) has been established with representatives from the above 3 local authorities, the Ayrshire Roads Alliance, Strathclyde Partnership for Transport (SPT), the Ayrshire Growth Deal, Transport Scotland and the STPR2 consultant team.

This Case for Change report also presents a set of Transport Planning Objectives (TPOs), aligned with the national STPR2 objectives. The TPOs express the outcomes sought for the region. Additionally, the TPOs provide the basis for the appraisal of alternative options and, during Post Appraisal, will be central to Monitoring and Evaluation.

A long list of multi-modal options to address the identified problems and opportunities in the study area was developed and sifted in line with the approach detailed later in this report.

Subsequent phases of the STAG process, the Preliminary and Detailed Appraisal phases,

[4] Large scale figures can be found in Appendix A of this document or by following the link below the figure title, where provided.

will involve more detailed appraisal work considering the feasibility and performance of options to tackle the identified transport related problems and opportunities, and will be developed as the STPR2 process moves forward.

The following chapter will set out the socio-economic, environmental and transport context for the Ayrshire & Arran region.

1.2. COVID-19 impacts

The draft version of this report was published in February 2020 and draws on data and stakeholder engagement collected before the COVID-19 pandemic. It is recognised that the pandemic and the restrictions implemented have changed the way society works and travels, and that the longer term impacts of the pandemic will have to be taken into consideration as STPR2 progresses. A more detailed review of the short term impacts of COVID-19 on STPR2 is provided in the National Case for Change document.

2. Context

2.1. Policy Context

At the national, regional and local levels, relevant transport, planning and economic strategies have been reviewed to provide background context against which this Case for Change has been developed. Figure 3 provides an overview of these strategies, with a summary of key documents presented below.

- **Programme for Government:** Sets out the Scottish Government's ambitions and aims to make Scotland a more successful country with opportunities and increased wellbeing for all.
- **National Transport Strategy 2[5]:** The NTS2 provides the national transport policy framework, setting out a clear vision of a sustainable, inclusive, safe and accessible transport system which helps deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors. It sets out 4 key priorities to support that vision: reduces inequalities; takes climate action; helps deliver inclusive economic growth; and improves our health & wellbeing. The NTS2 Delivery Plan was published on 17 December 2020 detailing the actions being taken by the Scottish Government between 2020 and 2022 to achieve the vision of the NTS2.
- **Climate Emergency[6]:** Declared by the Scottish and UK governments and multiple local authorities, including North Ayrshire Council, in Spring 2019. As part of this, the Climate Change Bill commits the Scottish Government to a target of net zero emissions of all greenhouse gases by 2045. The Climate Change Plan update was published on 16 December 2020, and details Scottish Government's plans to meet new ambitious targets to end our contribution to climate change by 2045.
- **Ayrshire Growth Deal:** In November 2020, the £251 million Ayrshire Growth Deal (£103 million from the Scottish and UK governments, supported by investment from South, East and North Ayrshire councils) was signed to help drive economic development across the region. The deal will invest in growing sectors including aerospace, energy and life sciences as well as building on Ayrshire's existing strengths in food and drink, manufacturing and engineering, with a particular focus on improving the region's digital connectivity and infrastructure. In the lead up to the deal, an Ayrshire Transport Summit was held in Kilmarnock in 2018 bringing together local partners to identify the key problems and opportunities in the region. Findings from the summit have supported a baseline understanding of transport issues in the region.
- **SPT Regional Transport Strategy:** At the regional level transport related problems, objectives and policies/measures are set out in SPT's Regional Transport Strategy (which is also in the process of being updated and due for publication in 2021).

[5] Transport Scotland, National Transport Strategy (NTS2), February 2020, www.transport.gov.scot/media/47052/national-transport-strategy.pdf

[6] Scottish Government, The Global Climate Emergency - Scotland's Response: Climate Change Secretary Roseanna Cunningham's statement, May 2019, https://www.gov.scot/publications/global-climate-emergency-scotlands-response-climate-change-secretary-roseanna-cunninghams-statement/

- **Other Regional and Local Policy Documents:** This includes local transport strategies as well as non-transport specific plans, such as local development plans and economic strategies, which transport improvements play a key role in both the enabling and delivery of their outcomes.

In addition to the 4 priorities presented above, the NTS2 supports the adoption of a Sustainable Travel Hierarchy, which promotes walking, wheeling, cycling, public transport and shared transport options in preference to single occupancy private car use, as well as a Sustainable Investment Hierarchy, which prioritises investment aimed at reducing the need to travel unsustainably and maintaining and safely operating existing assets ahead of new infrastructure investment.

Prior to the commencement of STPR2, an Initial Appraisal: Case for Change study was prepared for the South West of Scotland[7]. While focused on the Dumfries & Galloway local authority area, the study included analysis of transport problems and opportunities in the southern parts of South and East Ayrshire. Data gathered as part of, and relevant findings from, the study have therefore been used as supplementary inputs to this study.

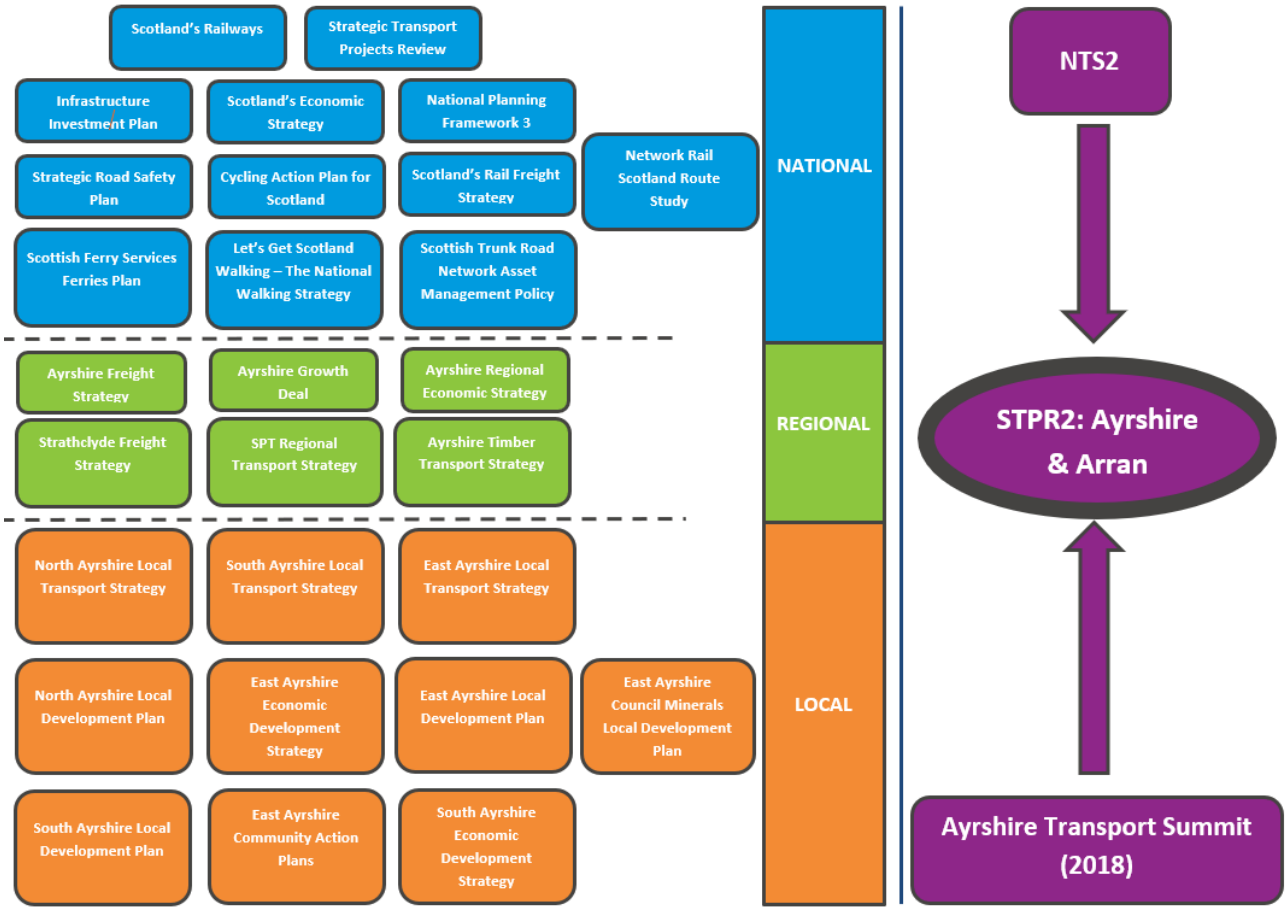


Figure 3: Strategy and Policy Overview

(Click image to enlarge figure)

[7] Transport Scotland, South West Scotland Transport Study, January 2020, https://www.transport.gov.scot/media/47032/swsts-inital-appraisal-case-for-change-including-appendices.pdf

The full list of documents reviewed is presented in **Appendix B**.

To support and inform the development of STPR2, both Strategic Environmental Assessment (SEA) and Equality Impact Assessment (EqIA) are being undertaken. Alongside these assessments, under the Fairer Scotland Duty Act (FSDA), both Child Rights and Wellbeing Impact Assessment (CRWIA) and Island Communities Impact Assessment (ICIA) are being undertaken. Early work on these assessments has informed this Case for Change document.

2.2. Geographic Context

The Ayrshire & Arran region includes a mix of urban and rural areas. Figure 4 shows the Urban Rural 2016 6-Fold Classification[8]. The 6-fold classification consists of the following[9]:

- Large Urban Areas (0%)
- Other Urban Areas (61%) (e.g. Kilmarnock, Ayr, Troon, Irvine, Largs)
- Accessible Small Towns (15%) (e.g. Mauchline, Maybole, Stewarton, Dalry)
- Remote Small Towns (5%) (e.g. Cumnock, Auchinleck, Girvan)
- Accessible Rural (15%) (e.g. Patna, Catrine, Kilmaurs, Fenwick)
- Remote Rural (5%) (e.g. Isle of Arran, Barrhill, New Cumnock)

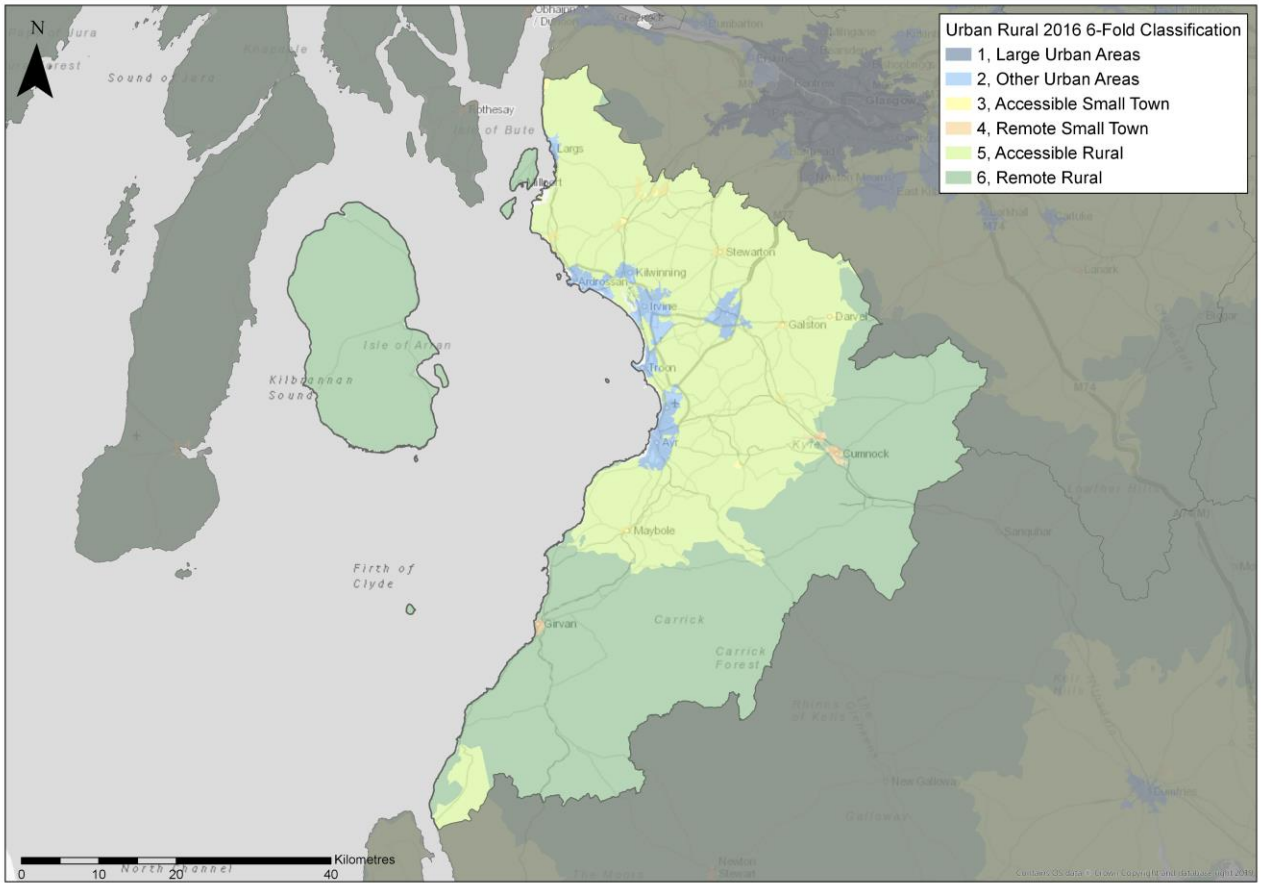


Figure 4: Urban Rural 2016 6-Fold Classification

(Click image to enlarge figure)

[8] NRS, Mid-Year Population Estimates, 2019, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates

[9] The proportion of the regional population residing in each classification is presented in brackets.

2.3. Socio-Economic Context

Note that wherever possible the latest available datasets have been analysed to produce the statistics and results presented in this report. In some cases, however, the data used may not be fully up-to-date. This is typically because the latest data is not yet available, or because the data and/or the method of collection may have changed over time and can no longer be used in the same way. It is also recognised that the pandemic and the restrictions implemented have changed the way society works and travels. However, given the uncertainty over what the potential lasting impacts of the pandemic may be, pre-COVID-19 datasets have been used to reflect the baseline situation.

2.3.1. Population

In 2019 the Ayrshire & Arran region had a population of 369,360 people[10]. The regional population density is higher than the Scotland average[11]. There has been a decrease in the region's population between 2011 to 2019 of 1.2% compared to an increase of 3.2% across Scotland[12].

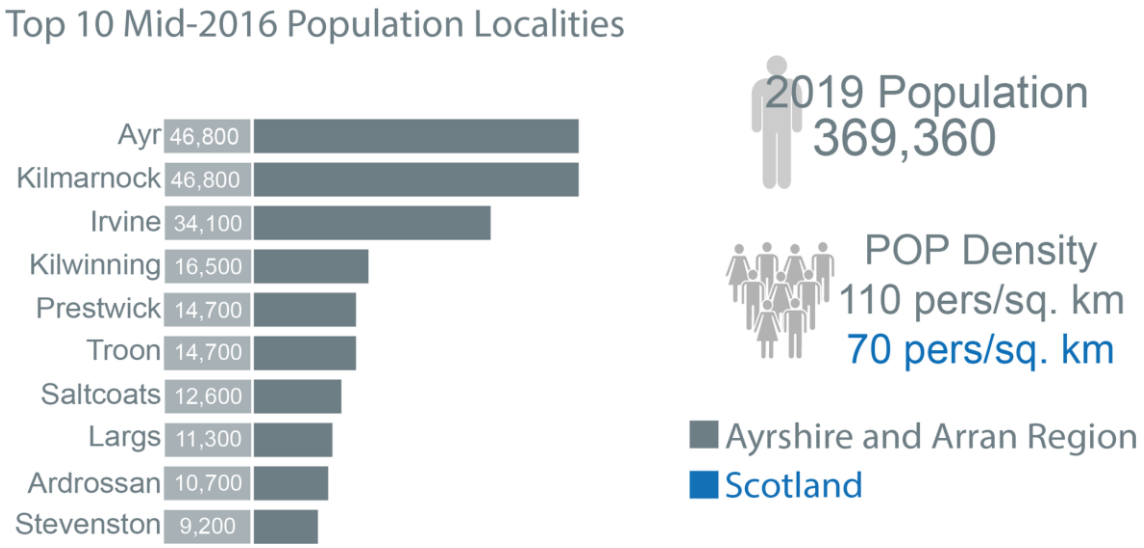


Figure 5: Ayrshire & Arran Largest Settlements by Population, 2019 Population and Population Density

Settlement sizes are shown in Figure 5[13], demonstrating that the largest settlements are in

[10] NRS, Mid-Year Population Estimates, 2019, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates

[11] NRS, Mid-Year Population Estimates, 2019 https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates

[12] NRS, Mid-Year Population Estimates, 2011 and 2019, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates

[13] NRS, Mid-Year Population Estimates, 2019, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates; NRS, Mid-Year Population Estimates for Settlements and Localities

the northern part of the region, within closer proximity to the Glasgow City Region.

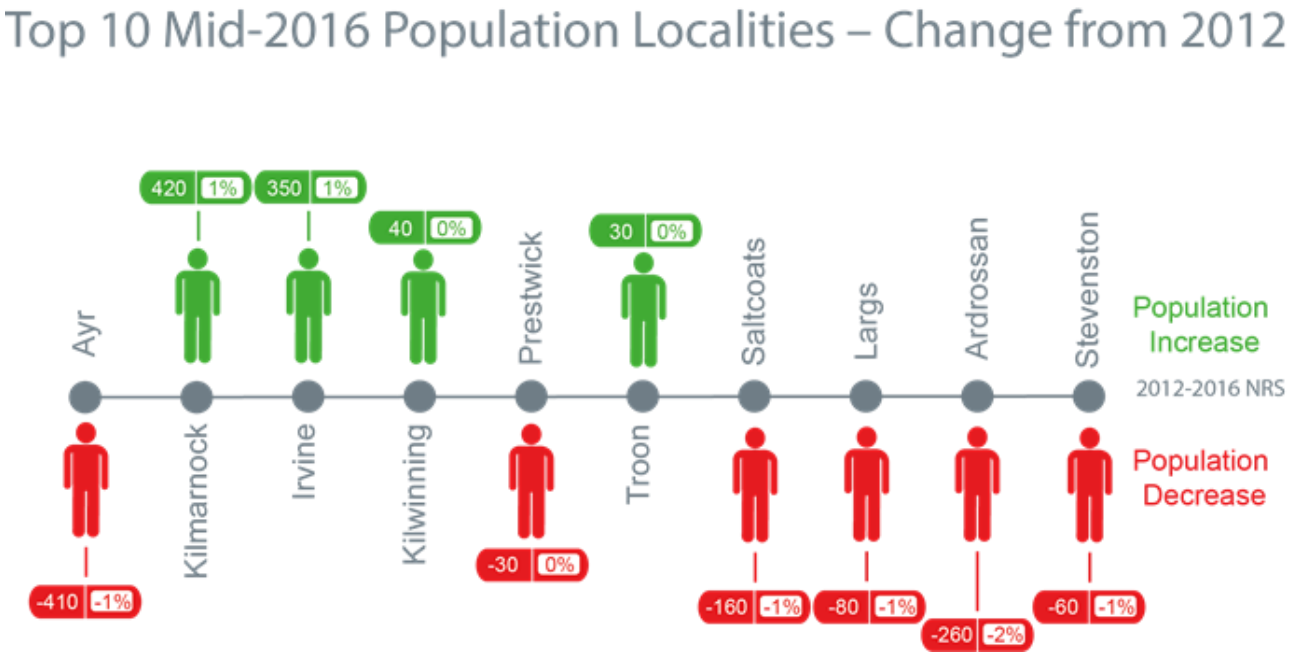


Figure 6: Population Change by Settlement 2012 – 2016

Population change for settlements in the region are shown in Figure 6[14]. This indicates that multiple settlements within the region have recorded a slight decline in population between 2012 and 2016, though Kilmarnock and Irvine recorded a slight population increase of around 1% each.

A comparison of the region's population by age in 2011 and 2019 is presented in Figure 7[15]. This demonstrates that the proportion of people aged 15 and under and the working age population has decreased between 2011 to 2019 in Ayrshire & Arran; whereas across Scotland the proportions have remained the same. Conversely, the proportion of people aged 65+ has increased significantly over the same period; this is broadly in line with the Scotland average. This indicates an ageing population in the region.

in Scotland, 2016, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/settlements-and-localities

[14] NRS, Mid-Year Population Estimates for Settlements and Localities in Scotland, 2012 & 2016, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/settlements-and-localities

[15] NNRS, Mid Year Population Estimates, 2011 and 2019, https://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population-estimates

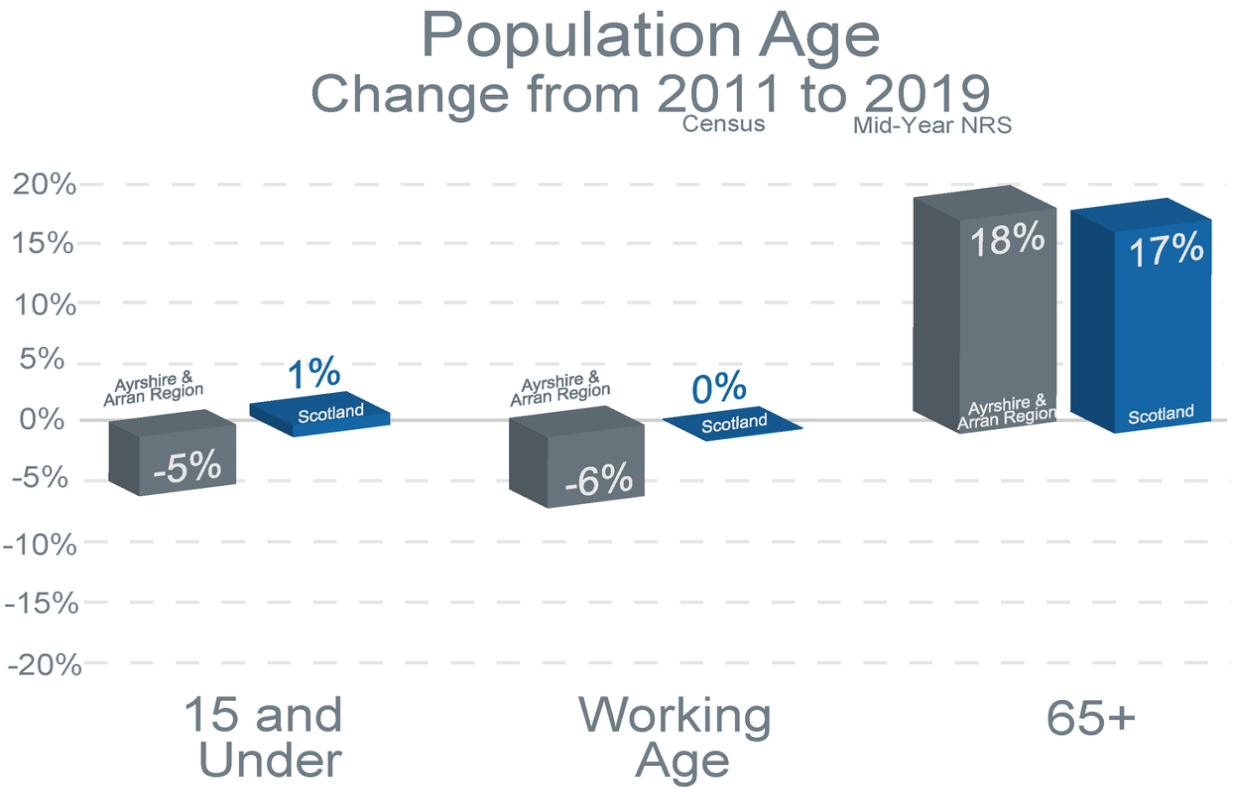


Figure 7: Ayrshire & Arran and Scotland Change in Population by Age, 2011 to 2019

2.3.2. Travel to Work – Mode Share

As shown in Figure 8, car is the most popular mode of travel to work in the region (68%), which is higher than the Scottish average (62%)[16]. Conversely, travel to work levels for walking and bus are slightly below the Scottish average. Rail and home working are in line with Scotland wide figures.

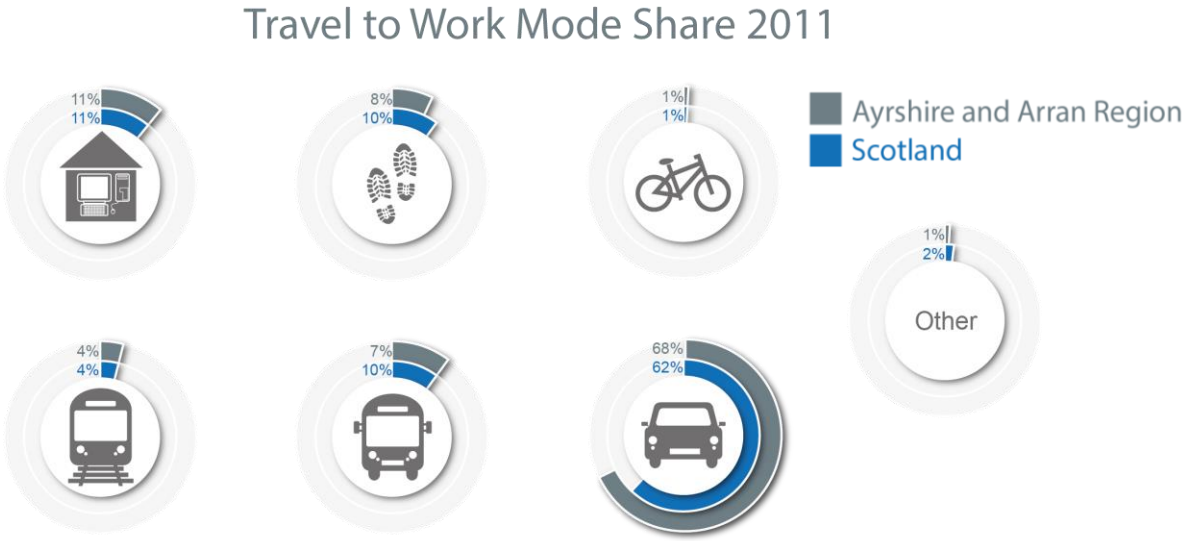


Figure 8: Mode of Travel to Work

[16] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/

The proportion of households with access to a car or van is slightly higher in Ayrshire & Arran compared to Scotland as a whole (71% compared to 69%)[17], reinforcing a trend of higher car dependence related to the rural nature of the region.

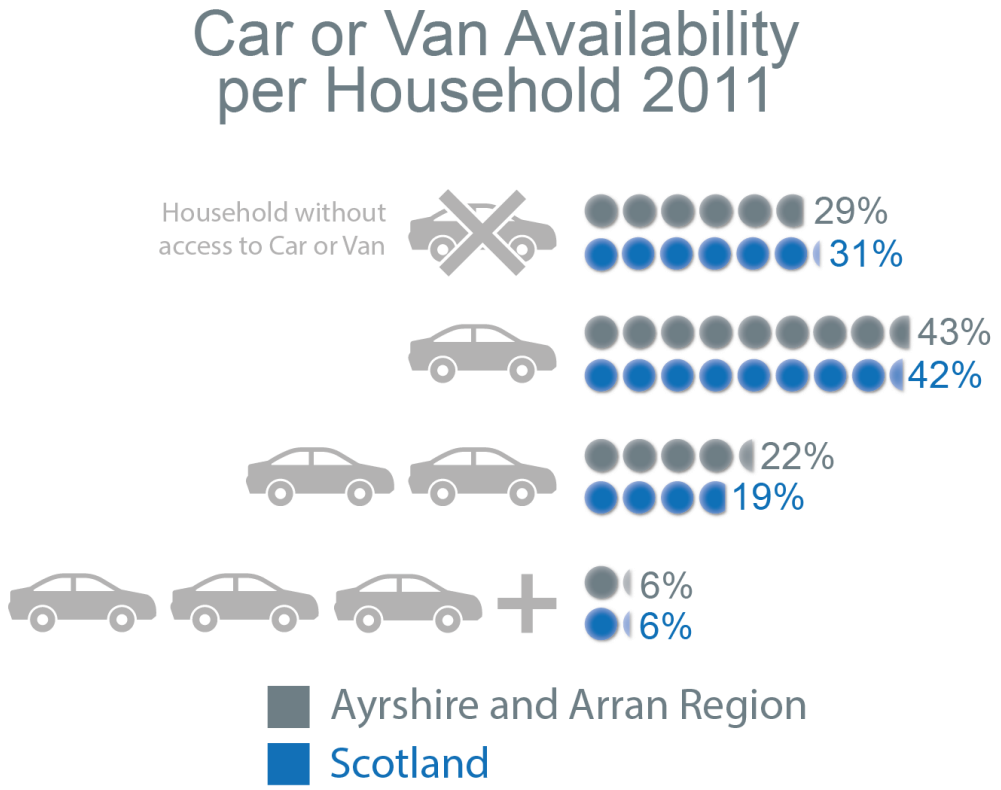


Figure 9: Household Car or Van Availability

[17] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/

2.3.3. Travel to Work – Distance Travelled

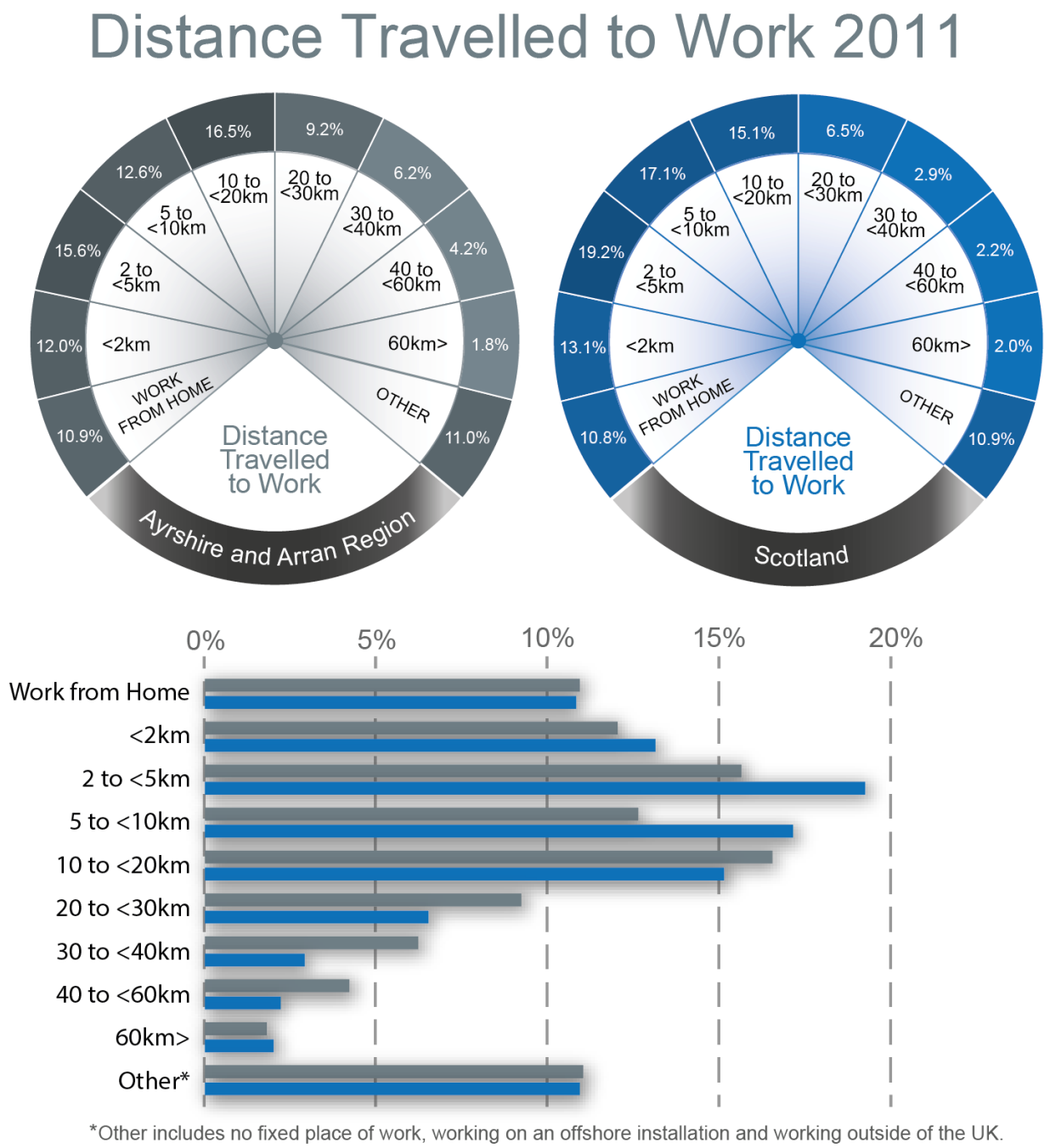


Figure 10: Distance Travelled to Work

As shown in Figure 10, a lower proportion of Ayrshire & Arran residents travel less than 10km to work compared to across Scotland (40% compared to 49%). Conversely, a considerably higher proportion of Ayrshire & Arran residents travel between 10km and 60km compared to across Scotland (36% v 27%)[18]. This is reflective of the strong trend for travel to work in Glasgow City Region. Building on this, previous analysis has shown that only 9% of people who worked in Ayrshire in 2011 commuted in from other regions (approx. 10,000 people), whereas commuting movements out of Ayrshire & Arran are more prevalent with 16% (or approx. 30,000) of all residents in employment commuting to

[18] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/

other regions, mainly the Glasgow City Region[19] (i.e. almost 3 times the movements into the region). Separate analysis shows that Glasgow City and Renfrewshire in particular are popular commuting destinations from Ayrshire & Arran compared to other local authority areas out with the region, with Renfrewshire particularly popular from North Ayrshire[20]. It has been suggested that the number of people commuting to the Glasgow City region may be indicative of a shortage of higher value job opportunities within the Ayrshire region, and indicates that the economic development of the region has traditionally been closely tied to other nearby, more dominant regional economies[21].

2.3.4. Economic Activity

In economic terms, over the last decade, the region has persistently underperformed compared with Scotland as a whole, with higher rates of unemployment in the region in 2019 (4.8% compared to 3.5% nationally[22]). It has been noted that, while Scotland as a whole quickly recovered from the 2008-09 recession, levels of GVA across Ayrshire only recovered to pre-recession levels in 2016[23]. Over the 5-year period 2013 to 2018 however, GVA increased by 14.9%, which was 0.3 percentage points higher than the overall Scotland increase.[24]. Recent data has also shown growth in some sectors, particularly manufacturing which constitutes almost a fifth of the region's overall economic activity[25].

[19] Oxford Economics, International Research on Regional Economies - Implications for Delivering Inclusive Growth in Scotland, May 2019, https://www.scottishfuturestrust.org.uk/storage/uploads/internationalresearchonregionaleconomiesmay2019.pdf

[20] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/

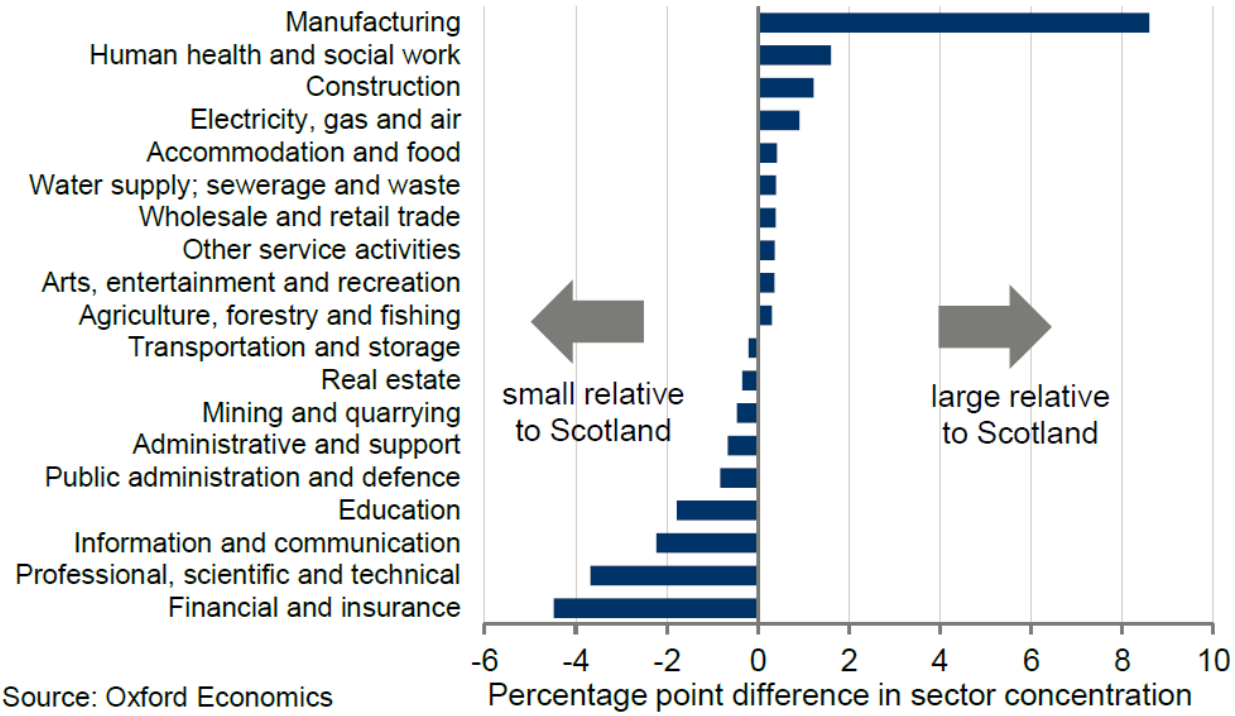
[21] Oxford Economics, International Research on Regional Economies - Implications for Delivering Inclusive Growth in Scotland, May 2019, https://www.scottishfuturestrust.org.uk/storage/uploads/internationalresearchonregionaleconomiesmay2019.pdf

[22] ONS, NOMIS Official Labour Market Statistics, 2019, https://www.nomisweb.co.uk/

[23] Oxford Economics, International Research on Regional Economies - Implications for Delivering Inclusive Growth in Scotland, May 2019, https://www.scottishfuturestrust.org.uk/storage/uploads/internationalresearchonregionaleconomiesmay2019.pdf

[24] ONS, Regional gross value added (balanced) by industry: local authorities by NUTS1 region: UKM Scotland current prices, 2018, https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedbalancedlocalauthoritiesbynuts1region

[25] Oxford Economics, International Research on Regional Economies - Implications for Delivering Inclusive Growth in Scotland, May 2019, https://www.scottishfuturestrust.org.uk/storage/uploads/internationalresearchonregionaleconomiesmay2019.pdf



Source: Oxford Economics

Figure 11: Sector GVA Share Ayrshire vs Scotland 2018

Although Ayrshire has a tendency to underperform in economic terms compared to Scotland as a whole, there are differences within the region. For instance, in South Ayrshire employment fell by 0.5 percentage points between 2013 and 2018 whilst the North Ayrshire and East Ayrshire regions saw employment growth (by 0.8 and 1.3 percentage points respectively)[21]. It is noted that these areas are generally closer to the Glasgow City Region and so may benefit from this close proximity to a large employment centre, whilst those in South Ayrshire are less able to do so. Ayrshire & Arran's close proximity to main employment centres in other regions is reflected in the proportion of residents that travel out with the region for work (16%).

There are 6,976 data zones[26] across Scotland, of which 502 are located in Ayrshire & Arran. Within Ayrshire & Arran, 150 data zones are ranked amongst the 20% most deprived for employment across Scotland; equivalent to 30% of the region's total. This indicates that there is a higher proportion of more deprived data zones in the region compared to Scotland as a whole. Further to this, 15.4% of working age people in North Ayrshire claim out of work benefits, which is the third highest proportion of all local authorities in Scotland; followed by East Ayrshire at 13.6% (sixth highest in Scotland) and South Ayrshire at 11.4% (10th highest in Scotland), as highlighted by the Community Planning Outcomes Profile[27]. These proportions are significantly higher than the local authorities with the lowest proportion of out of work benefit claimants (Aberdeenshire 6%

[26] Data Zones are groups of 2011 Census output areas which have populations of around 500 to 1,000 residents. There are 6,976 2011 Data Zones in Scotland.
[21] Oxford Economics, International Research on Regional Economies, Implication for Delivering Inclusive Growth in Scotland, Section 7.3 Ayrshire, May 2019, https://www.scottishfuturestrust.org.uk/storage/uploads/internationalresearchonregionaleconomiesmay2019.pdf
[27] Community Planning Outcomes Profile, https://scotland.shinyapps.io/is-community-planning-outcomes-profile/

and Orkney Islands, 7%).

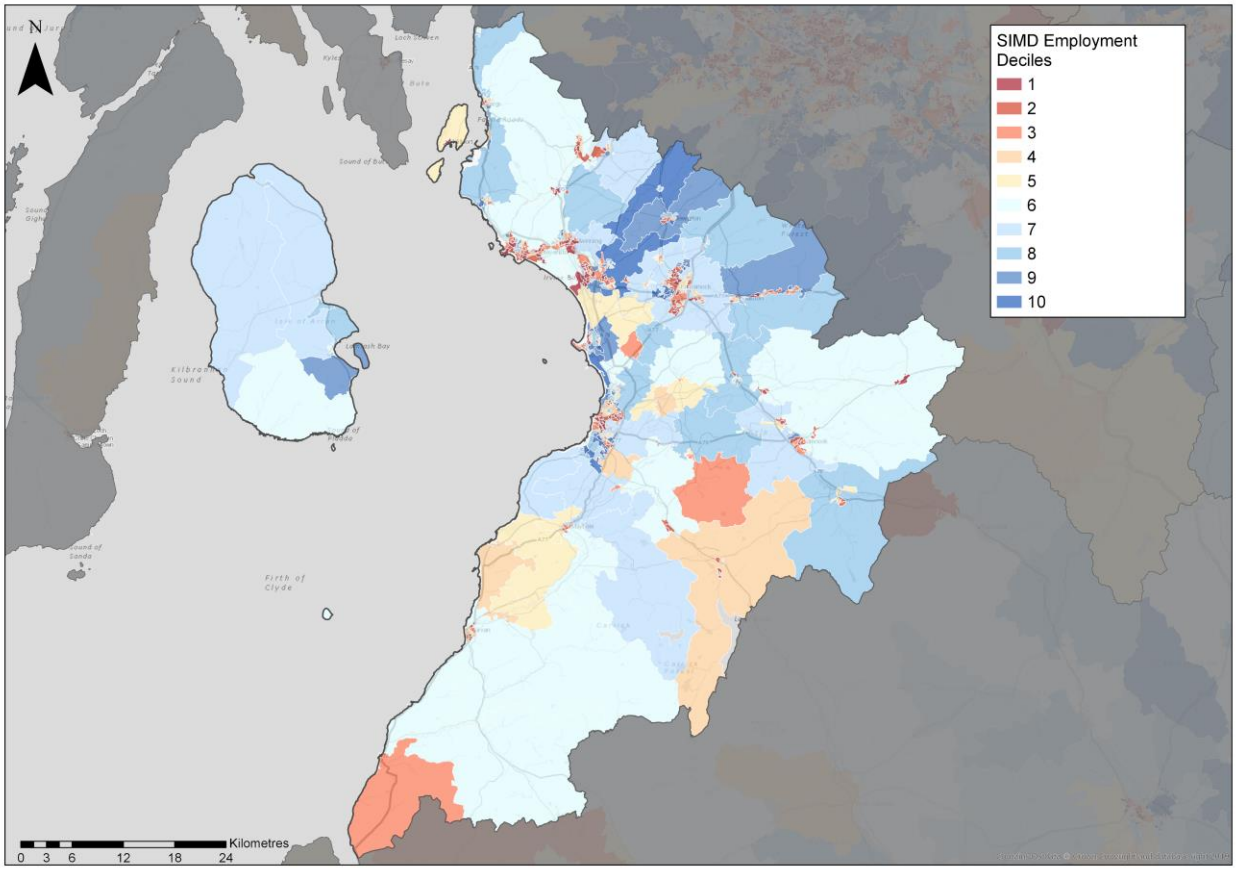


Figure 12: SIMD Employment Domain 2020[28]

(Click image to enlarge figure)

[28] Scottish Government, Scottish Index of Multiple Deprivation (SIMD) Employment Domain, 2020, https://simd.scot/. Red / Orange colours indicate greater levels of deprivation and Blue indicates lower levels of deprivation in relation to employment.

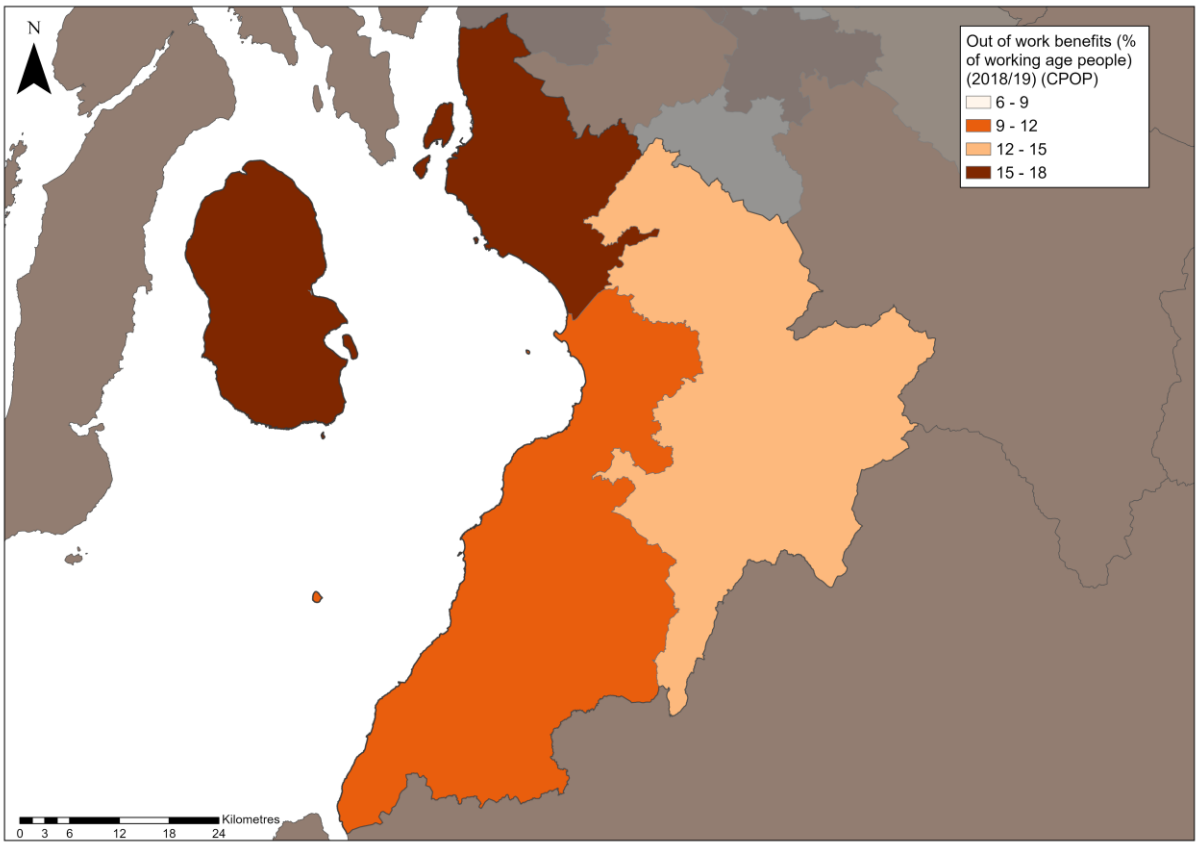


Figure 13: Out of Work Benefits[29]

(Click image to enlarge figure)

2.3.5. Access to Employment

Figure 14 demonstrates accessibility in the region to key employment centres by public transport on a typical weekday morning. Key employment locations are predominantly located in and around Ayr, Kilmarnock and Irvine, where access by public transport in and around these areas is typically up to 45 minutes. However, in other parts of the region, journey times by public transport to key employment sites can be longer than 90 minutes, particularly in southern parts of South and East Ayrshire and eastern parts of East Ayrshire. Further analysis of this data focused on residents in full time employment shows that 10.5% of residents across the region can access a key employment centre by public transport within 10 minutes; 31.7% within 10 – 20 minutes; 23.1% within 20 – 30 minutes; 26.0% within 30 – 60 minutes; 5.4% within 60 – 120 minutes; and 3.4% greater than 120 minutes.

[29] Community Planning Outcomes Profile, https://scotland.shinyapps.io/is-community-planning-outcomes-profile/

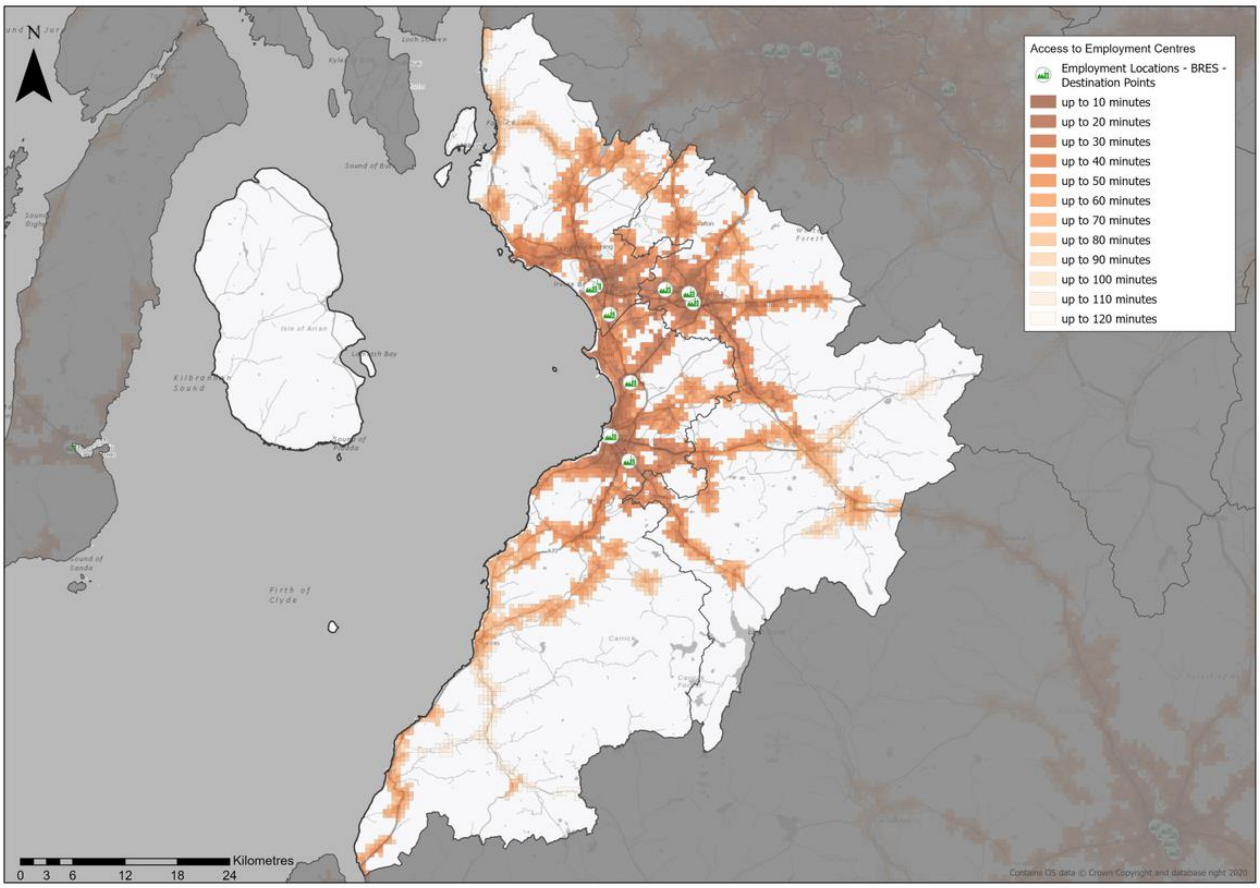


Figure 14: TRACC[30] Public Transport Access to Employment Centres

(Click image to enlarge figure)

30 TRACC - multimodal accessibility and journey time analysis tool.

2.3.6. Deprivation

The Scottish Index of Multiple Deprivation (SIMD[31]) further demonstrates the socio-economic issues experienced in the region, with 30% of all data zones in the region (equating to 153 data zones) within the 20% most deprived in Scotland; these are shown in red in Figure 15. As with levels of employment deprivation outlined in Figure 14, overall deprivation in the region is clustered within Ayr, Irvine, Stevenston, Kilmarnock, Cumnock and Girvan.

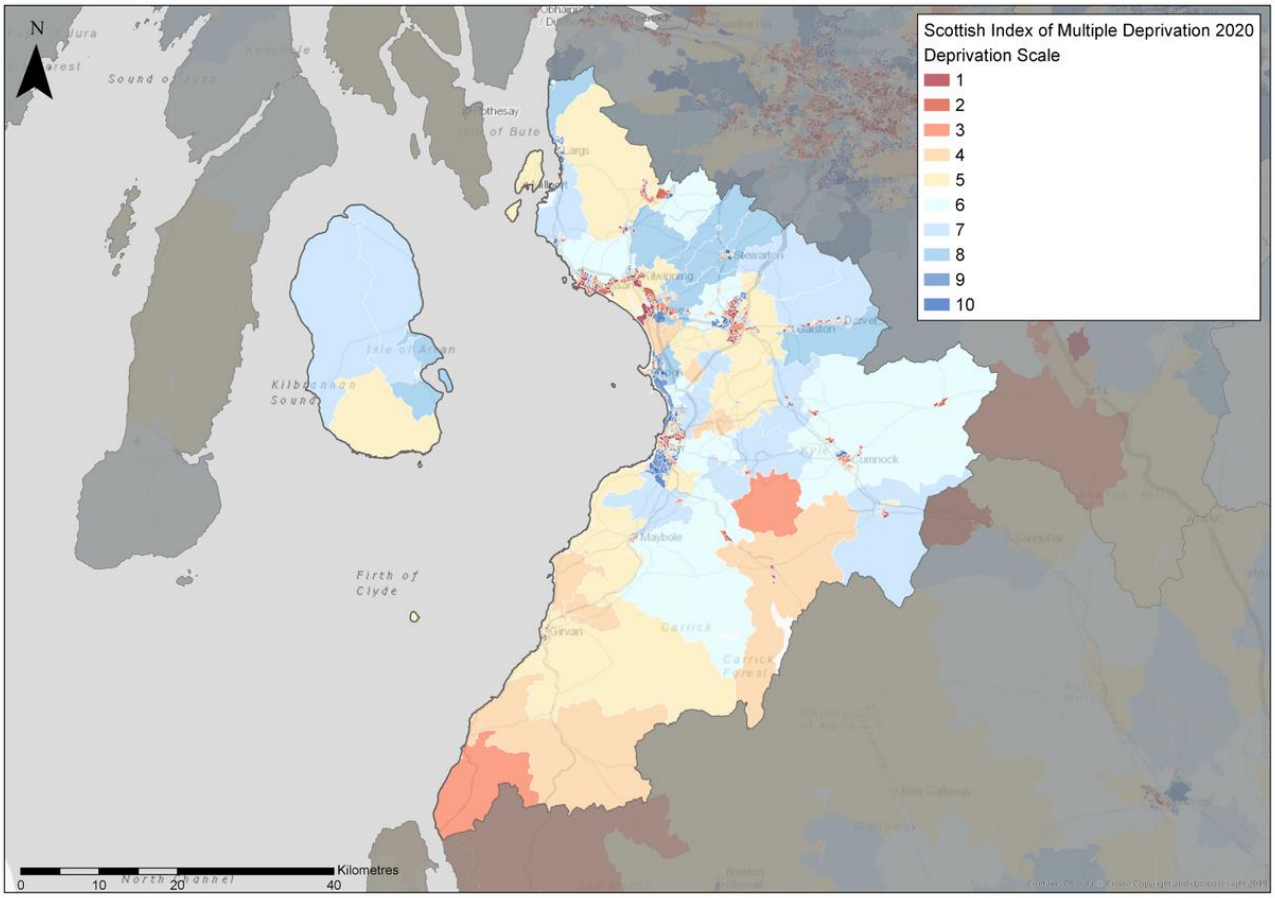


Figure 15: Scottish Index of Multiple Deprivation 2020

(Click image to enlarge figure)

[31] The SIMD Deprivation Scale is measured from 1 (Most Deprived) to 10 (Least Deprived).

2.3.7. Health

From a health perspective, SIMD health indicators show that there are multiple data zones, particularly in urban areas (e.g. Ayr, Irvine, Kilmarnock, Maybole, the Three Towns (Saltcoats, Stevenston and Ardrossan), Girvan and Kilwinning) that record low health indices, while the proportion of adults in Ayrshire with a long term physical or mental health condition is higher in the region compared to Scotland. As shown in Figure 16, all three local authorities have proportions higher than the Scotland average of 30%, with South Ayrshire the highest at 38%[32]. Furthermore, 22.1% of the population in the region has a long term activity limiting health problem or disability, which is also above the Scotland average (19.6%)[33]. Scottish Health Survey data also shows that between 2014 – 2017, 60% of Ayrshire & Arran residents met physical activity guidelines, which is joint lowest across all of Scotland; the average is 64%[34].

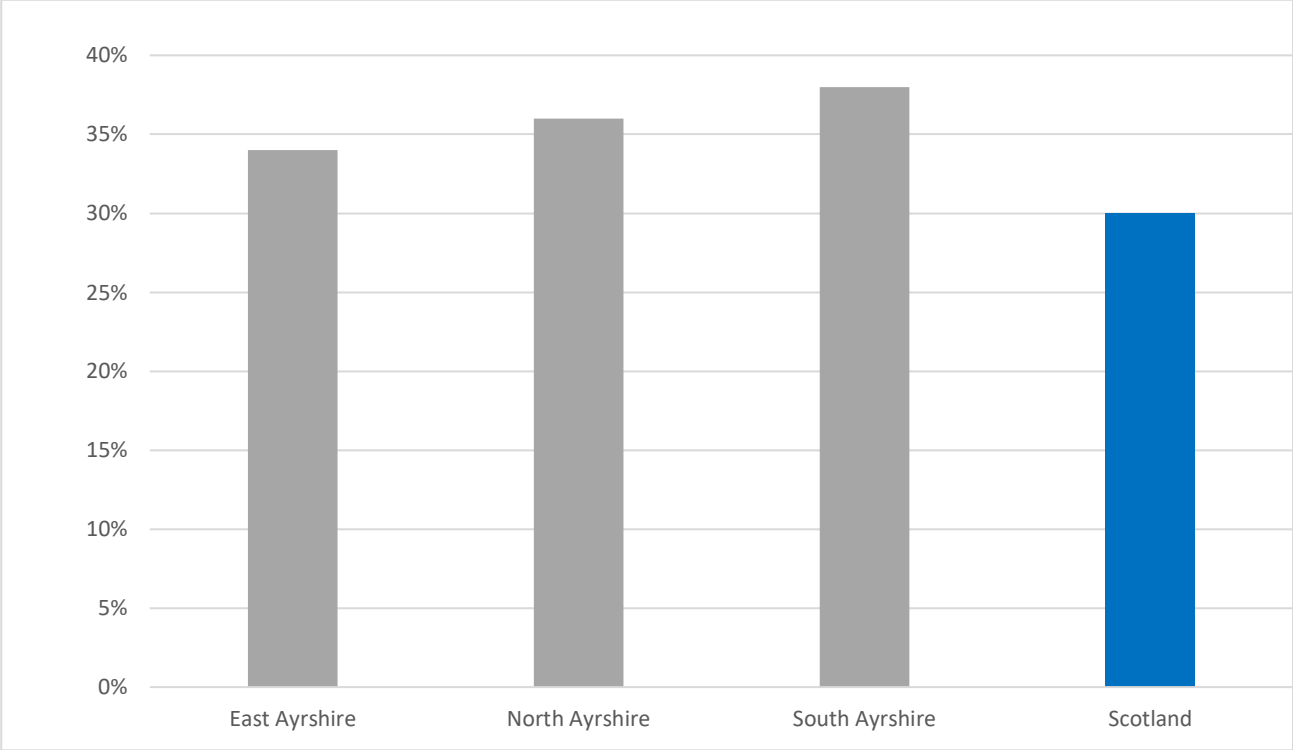


Figure 16: Proportion of population with a long term physical or mental health condition

[32] Scottish Government, Scottish Household Survey, 2018, https://www.gov.scot/publications/scottish-household-survey-key-findings-2018/
[33] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/
[34] Scottish Government, Scottish Health Survey, 2018, https://www.gov.scot/publications/scottish-health-survey-2018-volume-1-main-report

2.4. Environmental Context

Within the Ayrshire and Arran region, there are many areas classified as environmentally sensitive, with varying levels of statutory protection. Environmental designations within the region include the following biodiversity, landscape and heritage designations which fall either wholly or partly within the region:

- 81 Sites of Special Scientific Interest (SSSI)
- 5 Special Protection Areas (SPA)
- 6 Special Area of Conservation (SAC)
- 1 Nature Conservation Marine Protected Area (MPA)
- 2 Marine Consultation Areas
- 3 Local Nature Reserves (LNR)
- 5 Royal Society for the Protection of Birds (RSPB) Reserves
- 1 UNESCO Biosphere Reserve
- 1 National Scenic Area (NSA) situated on the Isle of Arran
- 1 Regional Park
- 20 Gardens and designed landscapes
- 62 Conservation Areas
- 1 Battlefield Site
- 206 Scheduled Monuments.

An environmental constraints mapping exercise has been undertaken, as presented in Figure 17[35]. This shows that the region has a low concentration of designated biodiversity sites, which are largely situated on the Isle of Arran, the coastline and the boundaries of the region, particularly east of Cumnock. There are no Ramsar sites, National Parks or National Nature Reserves within the region.

In addition, the region contains a significant number of historic assets, including 3,315 Category A-C Listed buildings. The highest density of designated cultural heritage assets are around Kilwinning, Dalry, Prestwick and on the Isle of Arran. There are no World Heritage Sites or Heritage MPAs within the region.

[35] Contains SNH information licensed under the Open Government Licence v3.0.

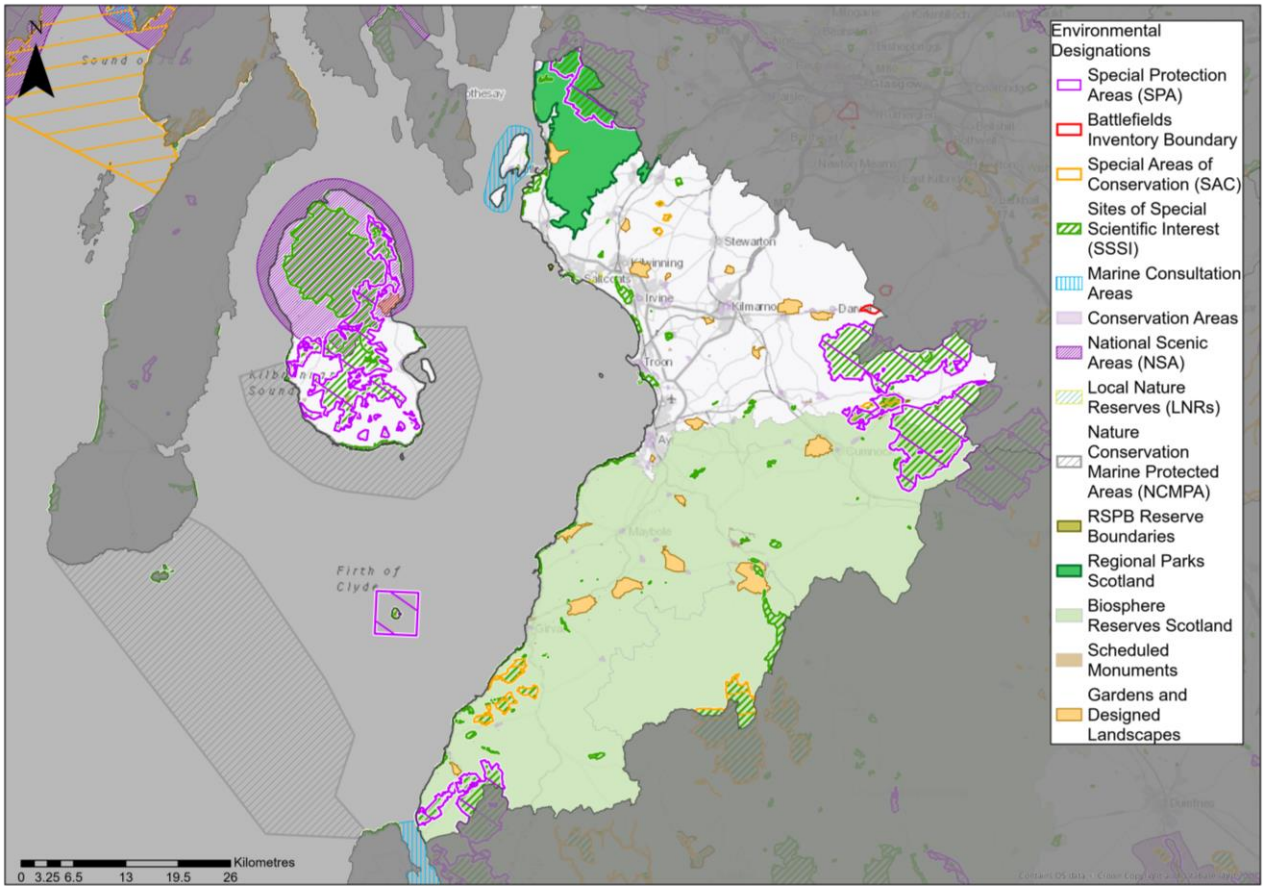


Figure 17: Environmental Designations for Ayrshire and Arran region

(Click to image to enlarge figure)

Scotland's noise map illustrates noise exposure from rail, road, air traffic and industry sources in response to the European Parliament and Council Directive for Assessment and Management of Environmental Noise 2002/49/EC. Scotland's strategic noise mapping represents step one in the process for managing environmental noise; with step two requiring competent authorities to prepare noise action plans in response. The latest mapping (Round 3 data[36]) mapped the following noise sources throughout Scotland: *"roads with more than 3,000,000 (three million) vehicle passages per year; major railways with more than 30,000 (thirty thousand) train passages a year; major airports with more than 50,000 (fifty thousand) movements; and transport sources and industry in qualifying agglomerations (urban areas with populations in excess of 100,000 (two hundred and fifty thousand): Aberdeen, Dundee, Edinburgh and Glasgow)"*[37].

Figure 18 Illustrates the noise levels above 55 decibels (dB)[38] at specific points from modelled noise sources for the region, based on consolidated noise sources for the average day (Lday), evening (Levening) and night (Lnight) metric (referred to as Lden). 55

[36] The noise mapping data is reviewed on a five year rolling programme. Round 3 is the latest 5 year update.

[37] Scottish Government, Scotland's Noise, 2017, https://noise.environment.gov.scot/index.html

[38] Only modelled noise levels above 55 dB have been included on the figure, in order to depict those noise levels with the greatest potential to cause annoyance to the population.

db Lden is the EU indicator threshold for noise exposure defined in the Environmental Noise Directive (Directive 2002/49/EC[39]). Figure 18 shows the greatest modelled noise levels to be located in the north of the region, primarily associated with the M77 and strategic road corridors around Kilmarnock (i.e. A71, A76, A77, A78, A79) and the railway network along the west coast. Noise emissions from airports and industry have not been modelled for this area.

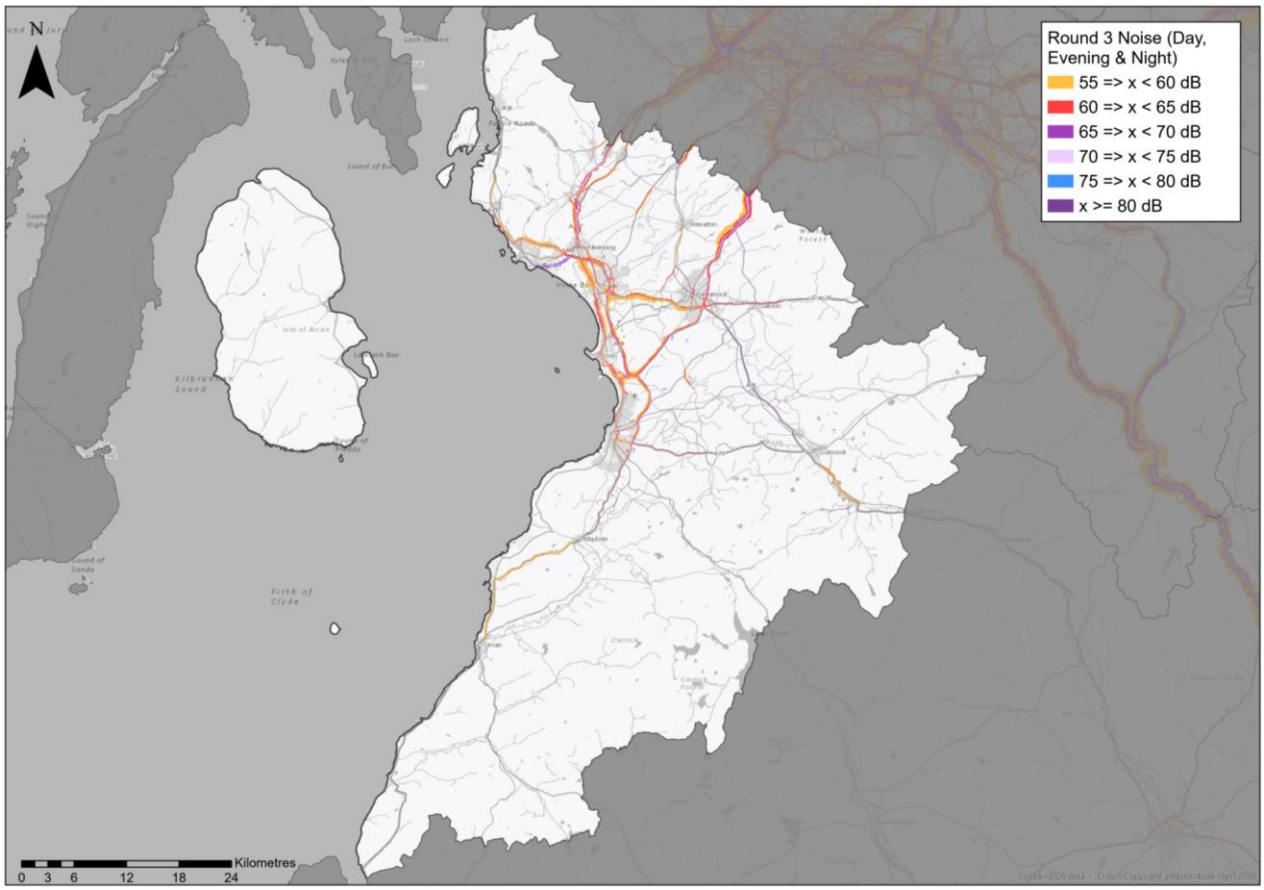


Figure 18: Noise Mapping for Ayrshire and Arran region[40]

SEPA flood mapping identifies flood risk from river and coastal flooding at medium (1 in 200 year) and high (1 in 10 year) likelihood of flooding within the region; this is shown in Figure 19.

Settlements at greatest risk of coastal flooding are located along the Firth of Clyde and include coastal communities along the eastern extents of Arran, including Brodick, and within Great Cumbrae, in addition to towns along the Ayrshire coast such as Prestwick, Ayr, Troon and Largs.

The highest risk of river flooding within the region is from rivers within the catchments of Noddsdale Water, River Garnock, River Irvine, River Ayr, Pow Burn, River Doon, Muck

[39] The European Noise Directive (END), Directive 2002/49/EC of the European Parliament and of the Council, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0049&from=EN

[40] Scottish Government, Scotland's Noise, 2017, https://noise.environment.gov.scot/index.html

Water and Water of Girven. The main receptors at risk of river flooding in the region include the settlements of Dalry, Kilmarnock, Irvine, Kilwinning, Auchinleck, Ayr and Dalmellington, as well as Glasgow Prestwick International Airport.

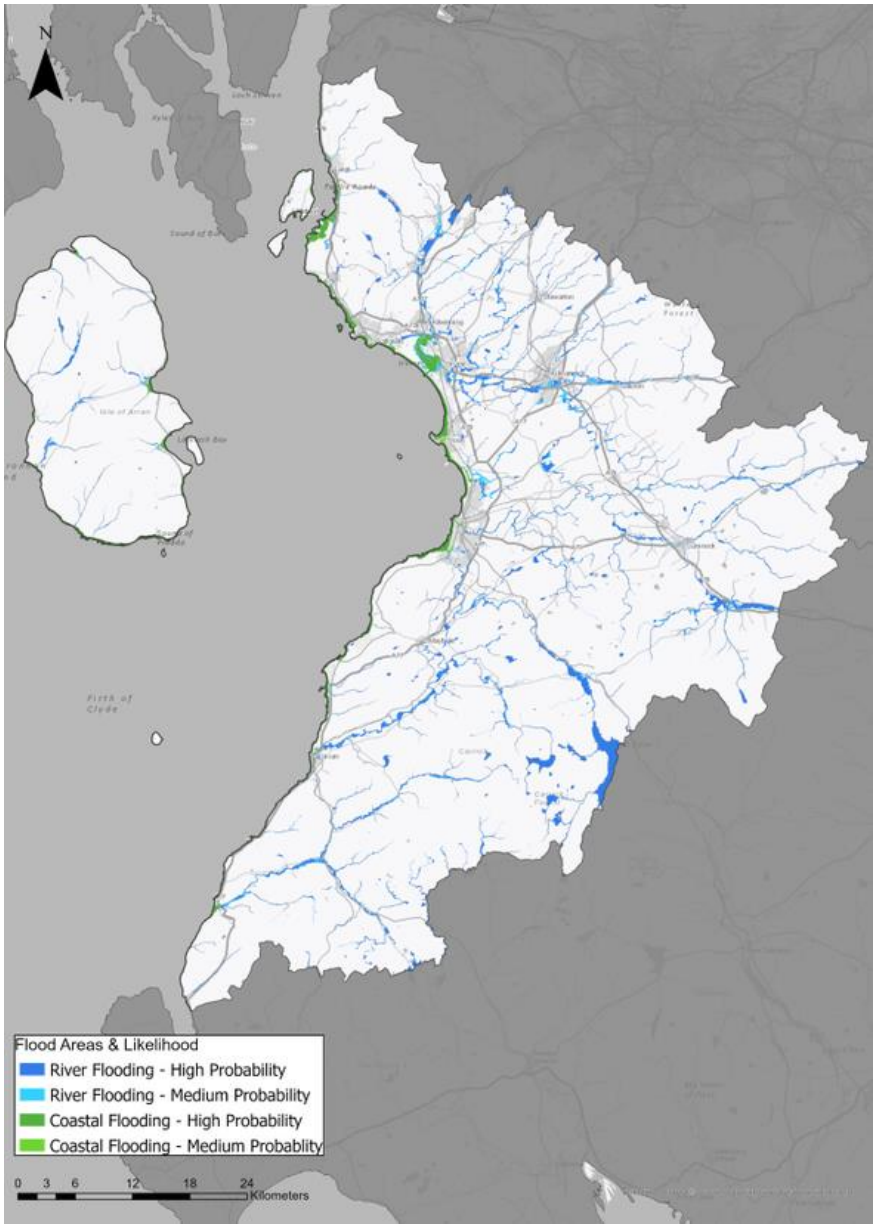


Figure 19: Ayrshire & Arran Region Flood Mapping[41]

Buried peats are an important carbon sink. More than 20% of Scotland is covered by peat soil; with soils representing over half of Scotland's terrestrial store of carbon.[42] Soils in the Ayrshire and Arran region are dominated by mineral gleys, with peaty deposits sporadically found throughout the region. Figure 20 illustrates the distribution of carbon and peatland classes for soils across the region. Classes 1 and 2 represent nationally important carbon-rich soils, deep peat and priority peatland habitat; Class 3 represents

[41] SEPA, 2021, https://map.sepa.org.uk/floodmap/map.htm
[42] NatureScot, Managing nature for carbon capture, 2020, https://www.nature.scot/professional-advice/land-and-sea-management/carbon-management/managing-nature-carbon-capture

occasional peatland habitats with carbon-rich soils and some areas of deep peat; Class 4 represents predominantly mineral soils, unlikely to include carbon-rich soils; and Class 5 represents areas where no peatland habitat is recorded however soils are carbon rich and deep peat.[43]

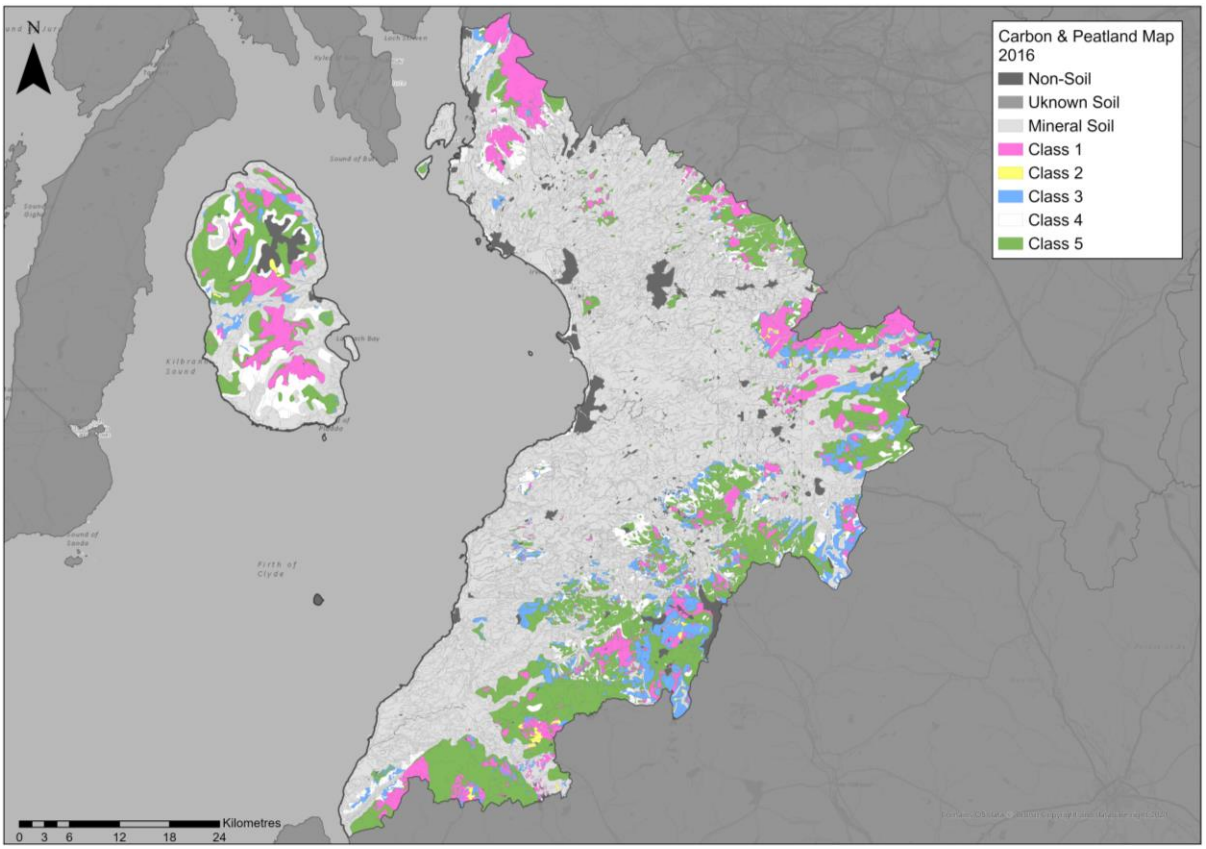


Figure 20: Carbon and Peatland Map for Ayrshire and Arran region[44]

Due to the rural and coastal nature of the landscape, with a lack of densely populated urban areas, there are no Air Quality Management Areas (AQMAs) in the region.

In 2018, South Ayrshire recorded higher CO_2 emissions from transport per capita relative to the other authority areas within the region; whilst North Ayrshire recorded the lowest per capita in the region, as shown in Table 1. Within the region, the highest proportion of Scotland's total CO_2 emissions from transport were from the East Ayrshire authority area, closely followed by the South Ayrshire authority area in 2018. The North Ayrshire authority area recorded the lowest proportion of emissions from transport in the region.

Table 1 shows that the total CO_2 emissions from transport within the Ayrshire and Arran region equated to 5.9% of the Scotland's total transport emissions overall.

[43] Scottish Government, Scotland's Soils, 2016, https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/
[44] Scottish Government, Scotland's Soils, 2016, https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/

Table 1: CO_2 Emissions Per Capita and Percentage of Transport-Related Emissions[45]

Area	Per Capita Transport Emissions, 2018 (t) CO_2	% of Scotland Total Transport Emissions
East Ayrshire	2.0	2.3%
North Ayrshire	1.2	1.5%
South Ayrshire	2.1	2.2%
Ayrshire and Arran region	1.8	5.9%
Scotland average	2.0	-

2.5. Transport Context

Figure 21 shows the key transport networks in the region, including the National Cycle Network (NCN), rail stations, ferry links to Arran and Cumbrae, and the trunk road network. It shows that Ayrshire & Arran's transport network covers all key modes including strong connections to the islands.

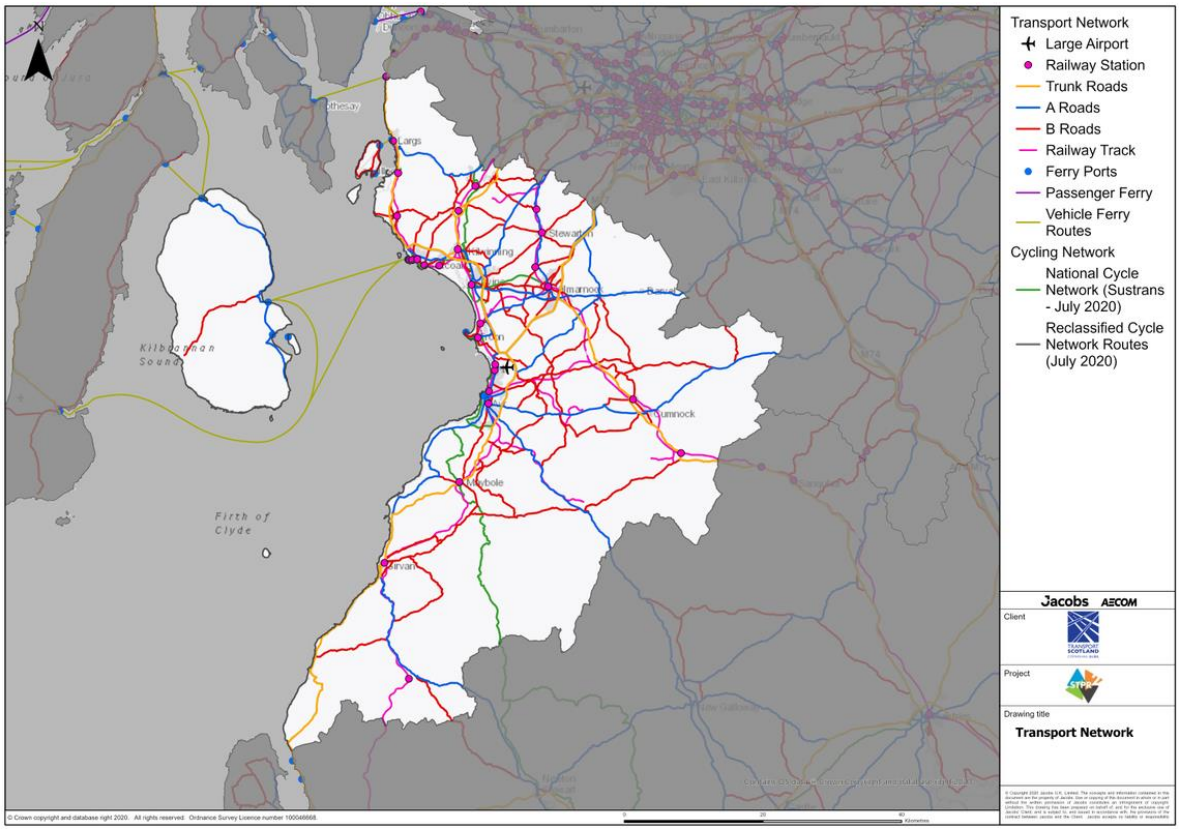


Figure 21: Ayrshire & Arran Transport Network

(Click image to enlarge figure)

[45] UK Government, UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2018, 2020, https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018

2.5.1. Active Travel

Several off-road and on-road cycle routes make up the NCN in the region, which includes: NCN Route 73 (Kilmarnock to Ardrossan, passing through Kilmarnock, Irvine, Saltcoats and Ardrossan), NCN Route 753 (Ardrossan to Gourock) and NCN Route 7 Sunderland to Inverness (passing through Galloway Forest Park, Maybole, Ayr and Kilwinning). In addition, the region has an extensive Core Paths network. Scotland's first road cycle park – often referred to as 'the Ayrshire Alps' – comprises the hill roads of South Carrick and is popular with recreational cyclists due to its scenery, cycle friendly roads and challenging terrain.

Data shows that 0.8% of residents in the region cycle to work, which is lower than the Scotland average of 1.4%[46]. Likewise, 7.8% of residents walk to work, which is also slightly below the Scotland average of 9.9%[47]. More recent monitoring data from Cycling Scotland[48] shows that the proportion of people regularly or usually cycling to work in the region has decreased between 2015-16 and 2017 by 0.2 percentage points in East Ayrshire and 2.1 percentage points in South Ayrshire. However, the data shows that in North Ayrshire there was an increase of 0.5 percentage points since 2015-16.

2.5.2. Bus Network

Bus services in the region are primarily provided by Stagecoach, though smaller operators also provide services. School services, community transport and Demand Responsive Transport (DRT) are also provided. Although there is reasonable coverage between the more populated areas in the region, the frequency of services differs widely depending on the time of day and location.

There has been a general trend of decline in bus use nationally and this is reflected in North and South Ayrshire as shown in Figure 22. East Ayrshire saw a small increase in bus use on average per year, however the Ayrshire & Arran region as a whole saw an absolute decline in bus patronage.

[46] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/
[47] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/
[48] Cycling Scotland, Annual Cycling Monitoring Report, 2018, https://www.cycling.scot/mediaLibrary/other/english/3028.pdf; Cycling Scotland, Annual Cycling Monitoring Report, 2019, https://www.cycling.scot/mediaLibrary/other/english/6353.pdf

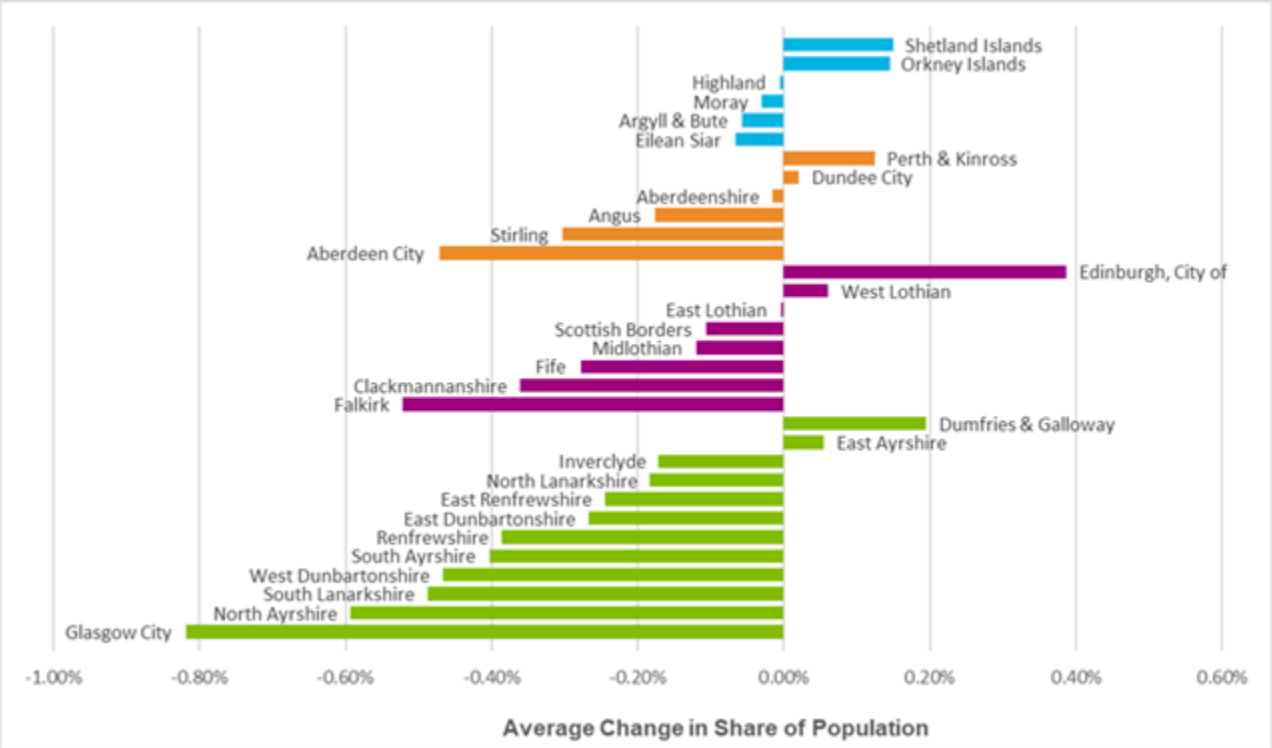


Figure 22: Average Yearly Change in Share of Population Using the Bus Four or More Days a Week, 2003/04 – 2017[49]

On Arran, despite the large increase in visitors to the island since the introduction of the Road Equivalent Tariff (RET), data shows that bus patronage dropped by 2% per annum in the two years of operation compared to the last pre-RET full year[50].

2.5.3. Rail Network

The region is connected to Glasgow by rail via the Glasgow South Western Line. This line includes routes to Ayr, Kilmarnock, Largs (with a branch to Ardrossan) and to Carlisle via Kilmarnock. There are 27 rail stations in Ayrshire & Arran; 6 in East Ayrshire, 12 in North Ayrshire and 9 in South Ayrshire, with a review of patronage data showing that many rail stations have recorded large increases in rail patronage numbers over recent years. For example, Prestwick Town increased by 43% between 2008-09 to 2018-19 and Kilmarnock increased by 53%[51]. Based on total passenger numbers (entries and exits), Ayr (1,458,918), Kilwinning (1,008,180) and Irvine (912,174) were the region's busiest stations

[49] Adults (16+) - use of local bus services, and train services, in the previous month, Transport and Travel in Scotland. Calculated on the basis of the average percentage change per annum across 2003/04, 2005/06, 2007/08, 2009/10, 2012/13, 2014, 2015, 2016 and 2017.

[50] Transport Scotland, Evaluation of the Impact of Road Equivalent Tariff on Arran Final Report, 2017, https://www.transport.gov.scot/media/33631/ts-amfc-ret-arran-final-report.pdf

[51] ORR, Annual estimates of the number of entries/exits and interchanges at each station in Great Britain Table 1415, 2018/2019, https://dataportal.orr.gov.uk/statistics/usage/estimates-of-station-usage

in 2018-19[52].

2.5.4. Maritime

The Ardrossan – Brodick ferry route carried 849,519 passengers and 207,738 cars in 2019[53]. In passenger terms this is the busiest route within the Clyde and Hebrides Ferry Services Network. With 786,819 passengers in 2019[54], the Largs – Cumbrae route was the second busiest service. These routes, alongside other passenger ferry routes which operate within the Ayrshire & Arran region, are listed below:

- Ardrossan – Brodick
- Ardrossan – Campbeltown (summer only)[55]
- Largs – Cumbrae
- Lochranza – Tarbert
- Lochranza – Claonaig (summer only)

In addition to the vehicle and passenger routes there are 2 commercial ports located at Troon and Ayr. An array of industries use the ports, including fishing and for the transport of timber (particularly from Troon). Hunterston Port was previously in operation but is currently sitting dormant; a consultation draft Masterplan[56] for the site was published by the port owners in May 2019.

2.5.5. Road Network

The trunk road network consists of the following routes:

- M77 (Glasgow to Kilmarnock)
- A77 (Kilmarnock to Stranraer)
- A78 (Ayr to Greenock)
- A76 (Dumfries to Kilmarnock)
- A737 (Kilwinning to Paisley)
- A738 (Kilwinning to Pennyburn Roundabout)

In addition to these roads, the A70 between Cumnock and Ayr and A71 between Irvine and Kilmarnock (with both routes continuing east to the M74) provide important east-west links. There is also a network of 44 electric vehicle charging points across the region, although data shows that the number of electric vehicles per head is lower in the region compared to all other regions across Scotland.

2.5.6. Aviation

There is one airport in the Ayrshire & Arran region, at Glasgow Prestwick, north of Ayr. This is the only airport in Scotland which has a rail station with direct access and 30% of all passengers arrive by train[57]. Data shows that passenger numbers at Prestwick Airport

[52] ORR, Annual estimates of the number of entries/exits and interchanges at each station in Great Britain Table 1415, 2018/2019, https://dataportal.orr.gov.uk/statistics/usage/estimates-of-station-usage
[53] Calmac, Annual Carryings, 2019, https://www.calmac.co.uk/corporate/carrying-statistics
[54] Calmac, Annual Carryings, 2019, https://www.calmac.co.uk/corporate/carrying-statistics
[55] During summer timetable, service operates via Brodick on Saturdays only.
[56] Hunterston PARC, Hunterston Master Plan Consultation Draft, May 2019, https://www.peelports.com/media/4436/hunterston-masterplan-2019-digital.pdf
[57] Glasgow Prestwick Airport, Facts and Figures, https://www.glasgowprestwick.com/corporate/about-us/useful-information-2/

have fluctuated in recent years, from 610,000 in 2015, increasing to 696,000 in 2017, before decreasing again to 639,000 in 2019[58]. With regards to freight, over 11,000 tonnes was recorded at Prestwick in 2015, increasing to over 13,000 tonnes by 2019[59].

2.6. Context Summary

The key points to note from the context review are:

- In economic terms, over the last decade, the region has persistently underperformed compared to Scotland as a whole, with areas of high deprivation; some 30% of data zones in the region are ranked amongst the 20% most deprived in Scotland. However, the manufacturing sector has recorded strong growth and constitutes almost a fifth of the regions overall economic activity.
- There has been a decrease in the region's population between 2011 and 2019 (-1.2%) compared to +3.2% across Scotland.
- The proportion of households with access to a car or van ownership availability is higher than the Scottish average, which is reflected in this mode's dominance for travel to work. Conversely, travel to work by bike and foot is below the Scottish average.
- The proportion of people in Ayrshire & Arran with a long term physical or mental health condition is higher in the region compared to Scotland. The proportion of people in the region with a long term activity limiting health problem or disability is also above the Scotland average.
- A lower proportion of Ayrshire & Arran residents travel less than 10km to work compared to the overall rate for Scotland. A considerably higher proportion of the region's residents travel between 10km and 60km compared to the overall rate for Scotland. This is reflective of the strong trend for travel to work in the Glasgow City Region.
- There is generally a good north-south network of transport infrastructure in the region, providing strong transport connections to the Glasgow City Region. The east-west transport network is less developed due to reduced travel demands on these routes.

[58] Civil Aviation Authority, UK Airport Data - Table 10.3, https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-airport-data/

[59] Civil Aviation Authority, UK Airport Data - Table 10.3, https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-airport-data/

3. Problems & Opportunities

3.1. Approach to Problem & Opportunity Identification

Deriving evidenced transport related problems and opportunities is a critical element of the Initial Appraisal: Case for Change. They are identified from a range of sources including a review of existing policy and strategy documents, data analysis and extensive stakeholder engagement. This chapter sets out the problems and opportunities in the Ayrshire & Arran region and details the approach to their identification. Note that local problems and opportunities have been considered in analysis to gain a full understanding of the regional issues, but options to address these may not be within the scope of this strategic study.

3.1.1. Data Analysis

A wide range of data sources has been used to identify transport related problems and opportunities in the region. Analysis of the data has also enabled problems and opportunities identified through stakeholder engagement to be evidenced to understand the real and perceived nature of feedback and comments raised. Sources of analysis have included primary data such as 2011 Census, mobile phone data[60] for journey times, accident data, public transport provision, as well as data gathered from recent reports and studies in the region. Key findings from the data analysis are presented in this chapter, to evidence the problem and opportunity themes set out.

3.1.2. Stakeholder Engagement

Stakeholder engagement is an important element in the identification of problems and opportunities. For the Ayrshire & Arran region this has consisted of:

- **Problems and Opportunities workshops** held in Ardrossan and Kilmarnock with regional stakeholders in June 2019.
- **Option Generation workshops** held in the same locations in November 2019 to identify potential options to address the identified problems and opportunities.
- **Structured Interviews** undertaken with stakeholders, including senior officers across the 3 Ayrshire Local Authorities, Regional Transport Partnership officers and other organisations in the region.
- An **Elected Members Briefing** held in Irvine in January 2020 and attended by around 30 Elected Members and Senior Officers.
- An **Online Survey** carried out between 2nd December 2019 and 10th January 2020 for the public and organisations to provide their views on transport issues and challenges in their day to day journeys.

Figure 23: Stakeholder Engagement

[60] Data supplied by INRIX via Transport Scotland.

- **Regional Transport Working Group** meetings, which includes representatives from the constituent local authorities, the Ayrshire Roads Alliance, SPT, Ayrshire Growth Deal and Transport Scotland.
- **Schools Engagement** has been undertaken across the country, including a primary school in East Ayrshire involved in undertaking an exercise to consider the transport problems and opportunities in their area and to develop this into a transport plan setting out what is required.

Further details of stakeholder engagement activities are available in **Appendix C**.

3.2. Problems & Opportunities

Based on the activities described above, the following transport related problems and opportunities have been identified for the Ayrshire & Arran region. Evidence to support the themes listed below is provided in this section.

- Active Travel Facilities & Safety
- Accessibility
- Connectivity and Journey Times
- Resilience
- Capacity Constraints and Congestion
- Frequency and Fragility of Public Transport
- Transport Poverty and Affordability

It is recognised that inter-dependencies between the identified problems exist and as such, these should not be read in isolation.

3.2.1. Problems

ACTIVE TRAVEL FACILITIES & SAFETY

To realise national policy objectives around improving health and wellbeing, and reducing the impact of transport on the environment, a step change in levels of active travel (walking and cycling) for all journeys is required.

In the Ayrshire & Arran region, levels of active travel are low. This is reflected by the travel to work modal share of the population, whereby, as noted in Chapter 2, only 0.8% cycle to work and 7.8% walk to work in the region (compared to 1.4% and 9.9% nationally)[61]. Figure 24 further demonstrates that a large majority of areas in the region fall below the Scottish Government target set out in the Cycling Action Plan for Scotland[62] for 10% of everyday journeys to be made by bike by 2020. For example, only 28 Output Areas[63] in the region have more than 5% of people who travel to work by bike and only 5 have more than 10% of the population who travel to work by bike.

[61] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/
[62] Transport Scotland, Cycling Action Plan for Scotland 2017 – 2020, https://www.cycling.scot/mediaLibrary/other/english/1099.pdf
[63] Output Areas are the lowest geographical level at which census estimates are provided.

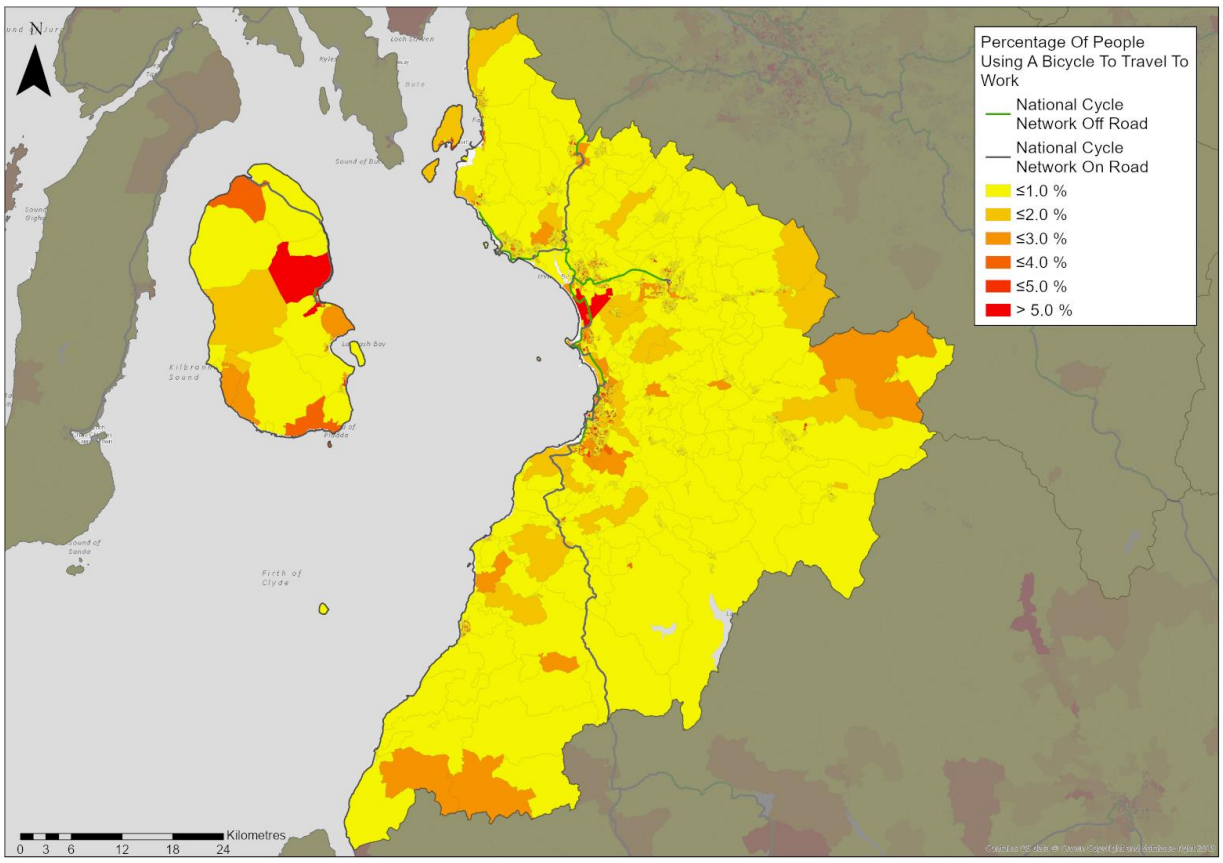


Figure 24: Percentage of People Travelling to Work by Bicycle[64]

(Click image to enlarge figure)

Data within Cycling Scotland's Annual Cycling Monitoring Report (2018 and 2019) also shows that the proportion of people who usually or regularly cycle to work has decreased in 2 of the 3 local authorities in the region between 2015 - 2016 and 2017; East Ayrshire by 0.2 percentage points and South Ayrshire by 2.1 percentage points. However, the data shows that in North Ayrshire there was an increase of 0.5 percentage points[65]. Reasons for the decline are not certain but a strong message emerging from stakeholder engagement has related to concerns around safety. Accident data showed that there were 188 cyclist related casualties in Ayrshire & Arran between 2014 and 2018, with 2 fatal, 52 serious and 134 slight[66]. It was noted by stakeholders that the volume of traffic creates the perception of junctions such as Mauchline Cross on the A76, Bellfield Interchange and Pennyburn Roundabout being unsafe for cyclists. These issues are particularly felt by less experienced cyclists.

It is further noted that whilst the Ayrshire & Arran region is relatively well served by NCN infrastructure, stakeholders felt that the network generally catered for leisure and recreational cycling rather than day-to-day commuter cycle trips. Examples of specific gaps highlighted in the active travel network include routes between: Kilmarnock and Ayr; Mauchline and Ayr; Cumnock and Kilmarnock; east of Kilmarnock; and north of Ardrossan to Skelmorlie and Inverkip (expanded upon under the Opportunities section). The standard of carriageway was also identified as a problem, as well as the absence of (and where they do exist, the standard of) footways. Data from the Scottish Road Maintenance Condition Survey (SRMCS) shows the percentage of Urban and Rural A, B, C and U roads classified as red or amber[67]. Data for 2017 indicated that North

Ayrshire had the highest proportion of Rural A roads classified as red of all local authorities in Scotland at 11.0% (South Ayrshire at 7.3% and East Ayrshire at 2.1%)[68]. This may be a factor in wider safety concerns cited by cyclists.

With regards to active travel facilities, Ayr and Troon rail stations have the highest number of cycle parking spaces, with 52 and 30 spaces respectively[69]. Stations south of Ayr and Kilmarnock generally have a lower number of spaces. It has further been noted by stakeholders that cycle storage facilities are limited on ferry and bus services. For example, cycle spaces on ferry services cannot be reserved and during peak periods (particularly on weekends during the summer), it may not be possible to sail on preferred crossings. With regards to buses, the main operator in the region (Stagecoach) does allow bikes on services, though this is at the discretion of the driver. A lack of onboard storage facilities exacerbates the perception that active travel facilities are limited in the region.

ACCESSIBILITY

The Scottish Access to Bus Indicator (SABI) for Ayrshire & Arran shows that there are large areas of the region where there is low access to bus services, including south and east of Girvan, parts of east East Ayrshire and the north of North Ayrshire (outwith larger settlements such as Dalry, Largs and West Kilbride); this is presented in Figure 25. This supports feedback received during stakeholder engagement that many rural communities in particular feel isolated in transport terms, with residents experiencing difficulties to access employment and key services such as education, healthcare and retail by public transport. There are also variations within urban areas. For example, parts of Kilmarnock and Ayr record low access to bus services, particularly in peripheral areas, demonstrating that lower accessibility does not only impact rural areas. It is noted that dark blue indicates higher accessibility to bus services and light blue indicates lower accessibility.

64 NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/
65 Cycling Scotland, Annual Cycling Monitoring Report, 2018, https://www.cycling.scot/mediaLibrary/other/english/3028.pdf; Cycling Scotland, Annual Cycling Monitoring Report, 2019, https://www.cycling.scot/mediaLibrary/other/english/6353.pdf
66 Department for Transport, STATS19 Road Safety Data, 2014 - 2018, https://data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data
67 Red is a Road Condition Index score ≥ 100 - where the carriageway is in poor overall condition which is likely to require planned maintenance soon (i.e. within a year or so). Amber is an RCI score ≥40 and <100 - where some deterioration is apparent which should be investigated to determine the optimum time for planned maintenance treatment.
68 SCOTS, Backlog and Steady State Report, 2017.
69 National Rail website.

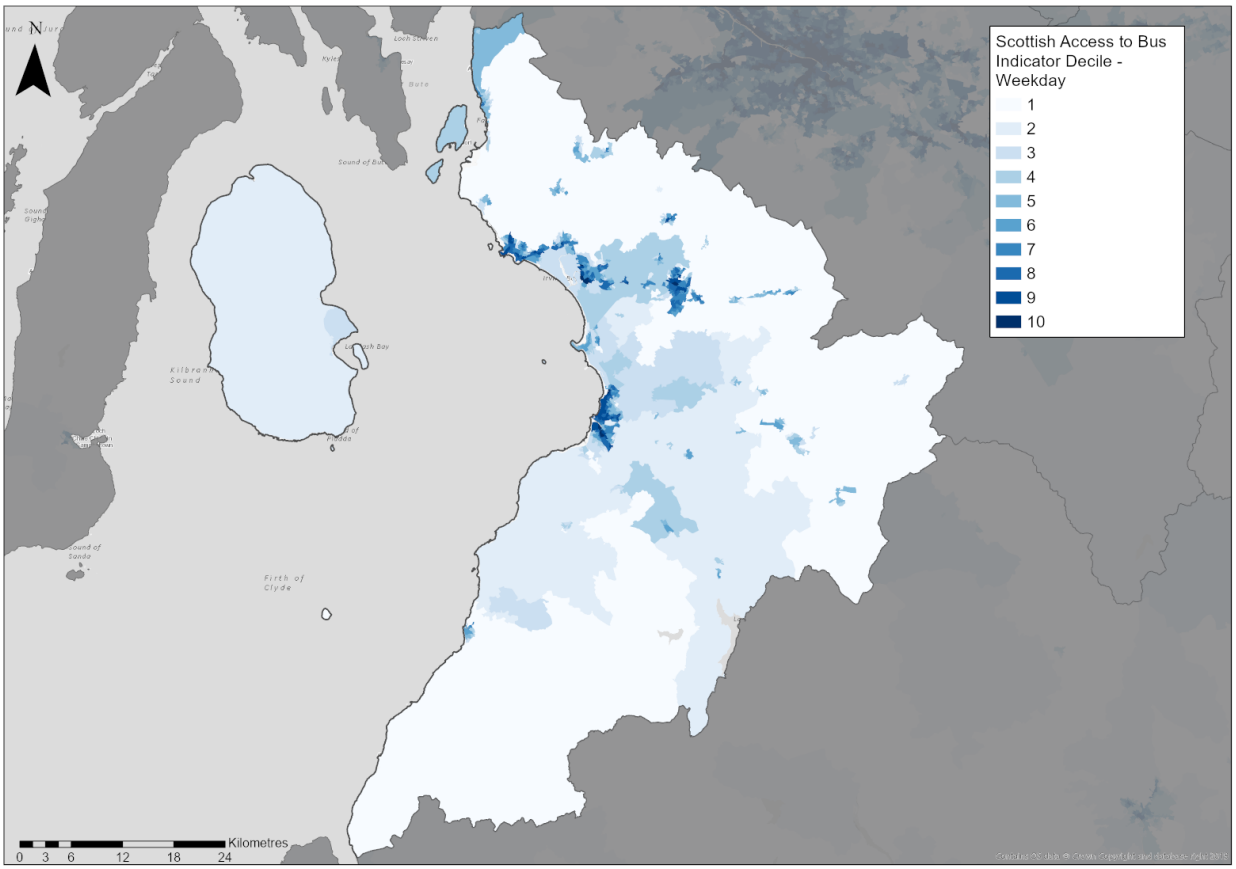


Figure 25: Scottish Access to Bus Indicator, Weekday

(Click image to enlarge figure)

Analysis of TRACC data shows the percentage of Ayrshire & Arran residents that can access key services within defined time parameters, as exemplified below:

- 90% of the region's population can access an employment centre by public transport within 60 minutes of travel time (06:00 to 10:00 departure time) and 65% can access an employment centre by public transport within 30 minutes of travel time.
- 97% of the region's population can access a school by public transport within 30 minutes of travel time (07:00 to 09:00 departure time).
- 50% of the region's population can access a rail station by foot within 30 minutes' walk time.
- 73% of the region's population can access a hospital[70] by public transport within 60 minutes of travel time (07:00 to 10:00 departure time); only 17% can access a Hospital by public transport within 30 minutes of travel time.

The impact of public transport accessibility issues is discussed further under the Frequency and Fragility of Public Transport section.

Further to this, TRACC outputs when shown alongside the 20% most deprived data zones in Scotland located in the Ayrshire & Arran region (see Figure 26) demonstrates that there are a number of deprived data zones where residents are unable to access a rail station, based on a walk time of up to 30 minutes. This includes people residing in Drongan, Cumnock, Mauchline, Newmilns, Galston and peripheral parts of Kilmarnock. It is also to be noted that in parts of the region where people can access rail stations

within a 30 minute walk, frequency of services are often low, including on routes south of Girvan and south of Kilmarnock. For example, there are around 11 services between Kilmarnock and Dumfries throughout the day, but there can be gaps of up to 2 hours between services while there are around 8 services per day between Ayr and Stranraer approximately every 2 hours (though services are more frequent between Ayr and Girvan).

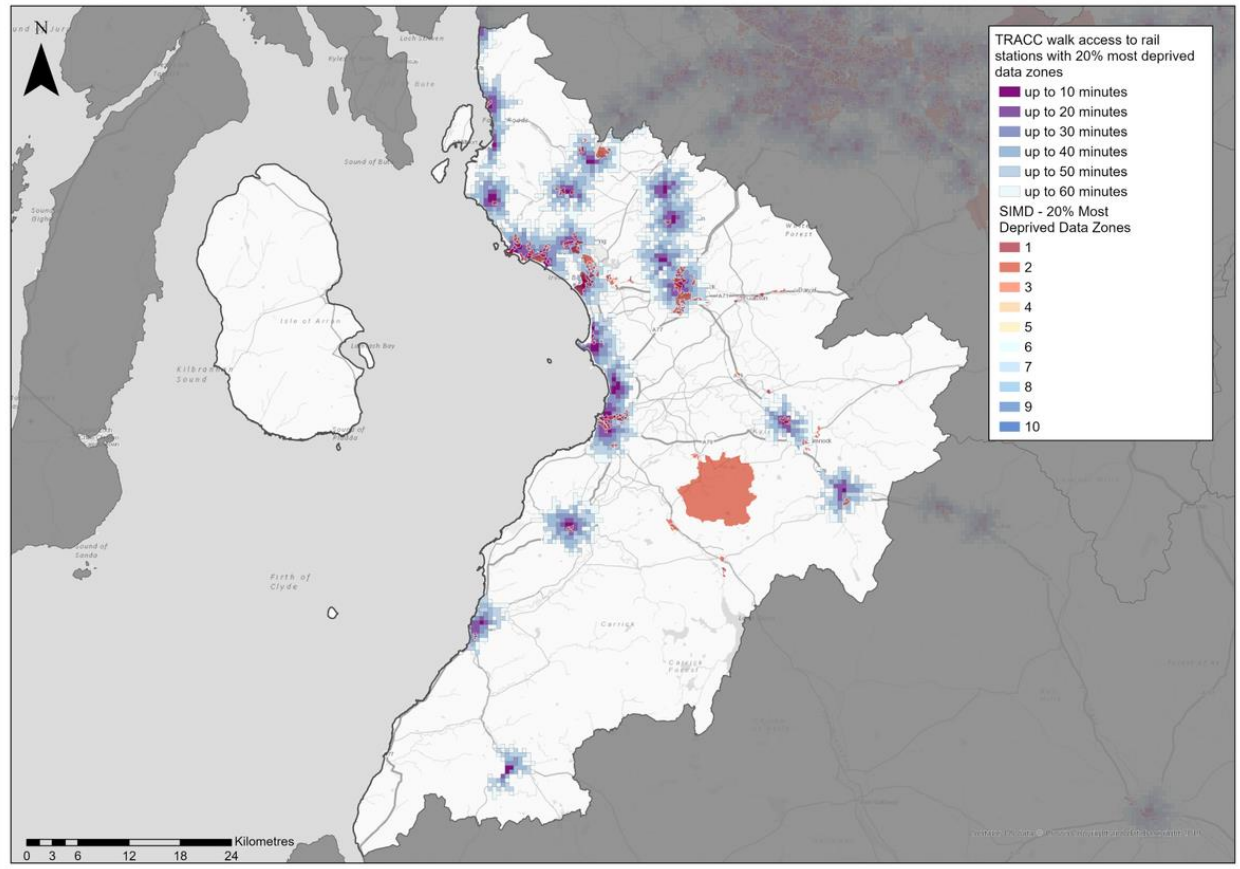


Figure 26: TRACC Walk Access to Rail Stations and 20% most deprived SIMD data zones

(Click image to enlarge figure)

In addition, a reduction in the number of bus services exacerbates poor accessibility to employment sites and key services, as well as increasing social exclusion. For example, the X76 used to run directly between Cumnock and Glasgow; this service now runs between Kilmarnock and Glasgow only, with interchange via 2 services required for travel between Cumnock and Glasgow.

Evidence from structured interviews also highlighted the wider implications of reduced accessibility. It was reported, for instance, that people are less likely to rent homes from the Council in rural parts of East Ayrshire due to a lack of public transport; and where it

[70] Hospitals included in the analysis were sites that were classified as either: 1) Emergency Departments (larger A&E services that typically provide a 24-hour Emergency Medicine consultant led service); 2) Multiple Injury Units; or 3) Small hospitals and health centres in rural areas that carry out Emergency Department related activity and are GP or nurse led. They may or may not be open 24 hours.

is available, fares are considered high. For example, East Ayrshire Council's website highlighted that in January 2020 there were 33 homes for rent in the local authority; all of which are located outwith Kilmarnock (which is considered to be well connected) in places such as Catrine, Dalmellington, Galston, New Cumnock, Newmilns and Rankinston. Consultation suggested that poor public transport connectivity is a primary reason for people choosing not to rent in these areas.

Feedback from stakeholders has also noted that some rail stations do not have step free access, which limits access for specific users including wheelchair users. At Girvan rail station, for example, level access is only provided to Platform 1 with a connecting subway and stairs providing access to Platform 2; this limits accessibility for those with impairments, including the elderly or those with young children; the nearest accessible station is approximately 16km away at Maybole. There are also accessibility issues at other stations in the region, including at Barrhill, Auchinleck, and Newton-on-Ayr stations. Feedback has also been received that the number of pram and wheelchair spaces are frequently limited on many bus services and that there can be a lack of step free access on coach bus services, which further limits access for some users.

CONNECTIVITY AND JOURNEY TIMES

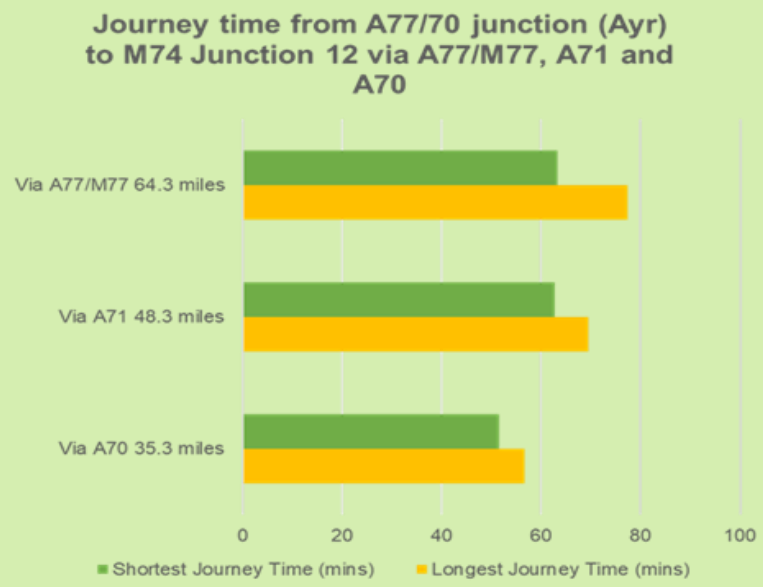


Figure 27: Ayr to M74 Journey Times (INRIX)

The issue of poor road connectivity, and in particular east-west connectivity within Ayrshire, has been frequently raised throughout this study. In particular, it has been suggested that the A70, A71 (and A76 offer sub-optimal and unreliable journey times, which can have consequential impacts in terms of the economic competitiveness of the region, with businesses discouraged from locating in the region due to the associated impacts on access to markets such as northern England.

A comparison of journey times between Ayr and the M74 via A77/M77, A70 and A71 is shown in Figure 27, indicating that the shortest average journey times recorded are relatively similar, despite the route via the A77/M77 being considerably longer. A review of journey times shows that although journey times via the A70 and A71 are generally reliable, journey times per mile are disproportionately longer (1 minute 28 seconds on the A70 and 1 minute 18 seconds on the A71 respectively) than the A77/M77 (59 seconds). This is associated with the single carriageway nature of the A70 and A71, both of which are non-trunk roads. As the A70 and A71 are non-trunk roads and thereby out of scope for STPR2, potential improvements to these routes, as well as other local roads throughout the region, would require to be taken forward by local roads authorities.

There are also long journey times on the A77 associated with travel through 7 speed limited settlements (following completion of the Maybole bypass), as well as the presence of long platoons, often led by HGVs travelling to and from the ports at Cairnryan. Concerns have been raised by stakeholders about the competitiveness of the ports at Cairnryan due to long journey times on the A77, particularly in comparison to the average speeds on road networks to other UK Irish Sea ports, as shown below[71].

- A77 between Ayr and Cairnryan: 38 mph
- A75 between Gretna and Cairnryan: 45 mph
- Heysham, from M6 north: 55 mph
- Liverpool, from M6 north: 51 mph
- Holyhead, from M56/M6: 58 mph

Further to this, data suggests that in the year to date April 2018, South West Scotland ferry routes (at Cairnryan) had declined by 1.4%, whilst Heysham routes had increased by 1.4%. It is not possible to state the extent to which this has been influenced by perceptions of poor connectivity to the port, but stakeholders highlighted slow journey times as a potential barrier to future economic and tourism development in the region.

There are perceived long journey times by bus to Glasgow compared to car or rail. For example, journey time between Troon and Glasgow by car is approximately 50 minutes compared to 1 hour 10 minutes by bus, while travel between Cumnock and Glasgow is typically between 1 hr 20 mins and 1 hr 30 mins by bus, compared to around 55 minutes by car. The need for interchange if travelling by rail between Kilmarnock and Ardrossan or Ayr and Largs due to a lack of direct trains was also noted.

Ferry connectivity has also been highlighted as an issue, particularly with regards to the Ardrossan – Campbeltown ferry, which only operates during the summer season 3 days per week; and only operates via Brodick once per week.

RESILIENCE

Resilience of the A77 and A78 have both been identified as a problem. In the event of an incident on the network leading to a road closure, the diversionary route on the A77 south of Girvan is long and sub-standard for the volume/type of vehicles (including HGVs) travelling on roads such as the A714. As discussed in the previous section, this impacts access to the ports at Cairnryan as well as local areas. Resilience of the A78, which was noted to be prone to flooding, was also highlighted; around 7% of incidents recorded on the route between 2015 and 2018 were associated with flooding[72]. The number of incidents recorded on the A78 totalled 788 between 2015 and 2018, equating to almost 30% of incidents recorded on Ayrshire & Arran's trunk road network; this compares to 1,340 incidents on the A77, equating to 51% of incidents on the regions trunk road network[73]. Closure of the A78 has an adverse impact on local residents given it is the only direct coastal route connecting settlements such as Largs and Skelmorlie. The diversionary routes for the A77 and A78 are mapped below.

[71] Transport Scotland, South West Scotland: Initial Appraisal Case for Change Study, January 2020, https://www.transport.gov.scot/media/47032/swsts-inital-appraisal-case-for-change-including-appendices.pdf

[72] IRIS (Integrated Roads Information System) data.

[73] IRIS (Integrated Roads Information System) data.

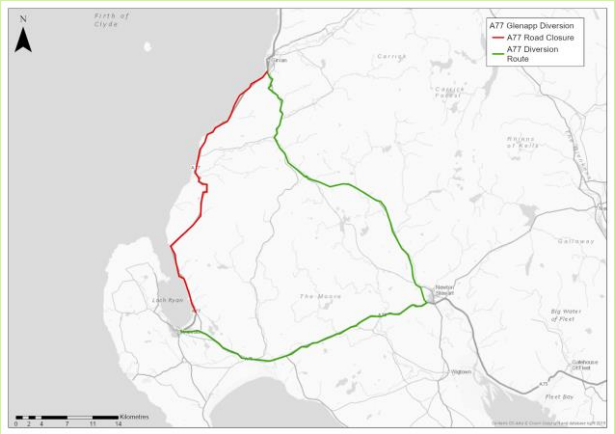


Figure 28: A77 Diversionary Route

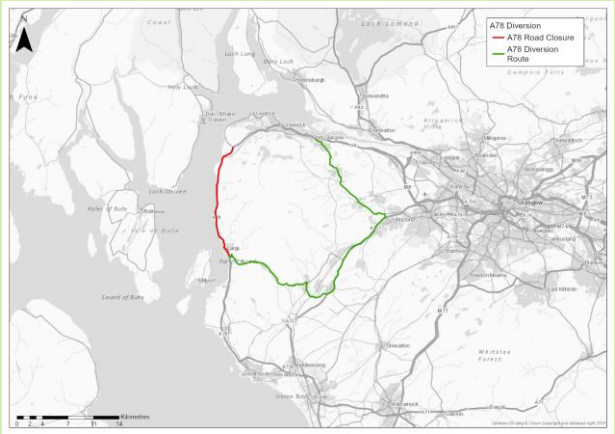


Figure 29: A78 Diversionary Route

(Click images to enlarge figures)

Diversionary route information shows that journey times increase by around 40 minutes to 1 hour 20 minutes in the event of the A77 south of Girvan being closed and by around 55 minutes to 1 hour 15 minutes in the event of A78 north of Largs being closed.

Table 2: Diversionary Route Information for A77 and A78[74]

START POINT	END POINT	IMPACT	EXISTING ROUTE	DIVERSION ROUTE	DIFFERENCE
A77 Girvan	A77 Innermessan	Journey Distance (miles)	26.4	51.8	25.4
		Journey Time (mins)	40 mins	1 hr 20 mins	40 mins
A770 Bankfoot R'b (Inverkip)	A760 / A78 (Largs)	Journey Distance (miles)	10.3	38.8	28.5
		Journey Time (mins)	20 mins	1 hr 15 mins	55 mins

Flooding and inadequate sea defences were also noted as impacting network resilience, particularly on the railway between Saltcoats and Stevenston. The closure of Ayr rail station, which resulted in all services south to Stranraer being suspended between the end of August and early November 2018, is a further example of a lack of resilience on the rail network.

[74] Diversionary routes provided by Scotland Transerv. Journey times based on travel on a weekday at 1pm. Source: Scotland Transerv and Google Maps. A77 diversion route distance based on the length of diversion shown in Figure 28 plus the distance between the A75 / A751 junction and A77 / A751 junction (to Innermessan). A78 diversion route distance based on the length of diversion shown in Figure 29 plus the distance between A8 / A761 junction and A8 / A770.

With regards to ferry network resilience, cancellation data from Calmac[75] demonstrates:

- During the period September 2019 to August 2020, 12.8% of scheduled sailings were cancelled across the year between Ardrossan and Brodick; with the highest percentage (38.1%) recorded in February 2020.
- The percentage of scheduled sailings cancelled between Largs and Cumbrae was lower at 1.7% across the year, although this may be indicative of the shorter crossing time and potentially more sheltered crossing, making it less susceptible to cancellation.

Ferry cancellations, including those as a result of resilience of vessels (e.g. arising from weather conditions) and harbour infrastructure, were noted by stakeholders to have adverse impacts on the local economy and on island residents accessing key services such as health appointments and education facilities on the mainland. The importance of the non-trunk A841 in terms of providing a route to Lochranza for onward ferry travel to the mainland in the event of the Ardrossan-Brodick route being cancelled was also noted by stakeholders.

CAPACITY CONSTRAINTS AND CONGESTION

Capacity constraints on the strategic road network, leading to congestion, has been highlighted as an issue. A recent study at Bellfield Interchange[76] identified queue lengths of more than 200m on the A77 (North), the A71 (East) and the A76 approach arms in the morning peak, and more than 200m in the evening peak on the A77 (North), the A71 (East), the A71 (West) and the A735 (Queens Drive). Queues on the A77 (North) arm were particularly long (greater than 500m) and often extend back beyond extents of the A77 Off Slip onto the main carriageway itself, leading to safety concerns. Bellfield Interchange, alongside Monkton, Dutch House and Whitletts Roundabouts on the A77/A78 at Ayr, the A737 at Kilwinning and the A76 Mauchline cross were all identified by stakeholders as pinch points on the road network.

With regards to the A737, congestion and delay was identified at 2 key locations in a 2016 study[77]; in Kilwinning at the junction of the A737/A738 and on the A738 approach to the A78 Pennyburn Roundabout. For example, queues of over 200m were recorded in the morning period and queues of over 600m were recorded in the evening period on the A738 southbound approach to Pennyburn Roundabout. Stakeholders also noted that the A737/B714 is a key link between North Ayrshire and Glasgow, but these are single carriageway roads; thus making the A71/A77/M77 route more attractive. Further to this, a study of the A76[78] found that the road carries approximately 12,000 vehicles per day north and south of Mauchline, resulting in extensive peak period queuing and delays on the trunk road. It was also noted by stakeholders that the volume of traffic passing through Mauchline has an adverse impact on health and wellbeing and acts as a barrier to future potential growth in and around the town.

[75] Calmac, Performance Figures September 2019 to August 2020, https://www.calmac.co.uk/corporate/route-performance
[76] Option Appraisal Bellfield Interchange Stage 1, 2018
[77] North Ayrshire Strategic Routing Study, 2016
[78] East Ayrshire Council, Dumfries & Galloway Council and Systra, A76 Action Plan Study, January 2015

Traffic data[79] has been reviewed to understand differences in average journey times across the day on key routes throughout the region. Figure 30 shows average southbound journey times between Monkton Roundabout and Bankfield Roundabout (A77 Ayr Bypass); this part of the network includes major pinch points identified by stakeholders. The shortest average journey time was between 22:00-23:00 (8 mins 56 secs) and the longest journey time was between 08:00-09:00 (14 mins 41 secs), equating to a difference of almost 6 minutes (on average) depending on the time of travel.

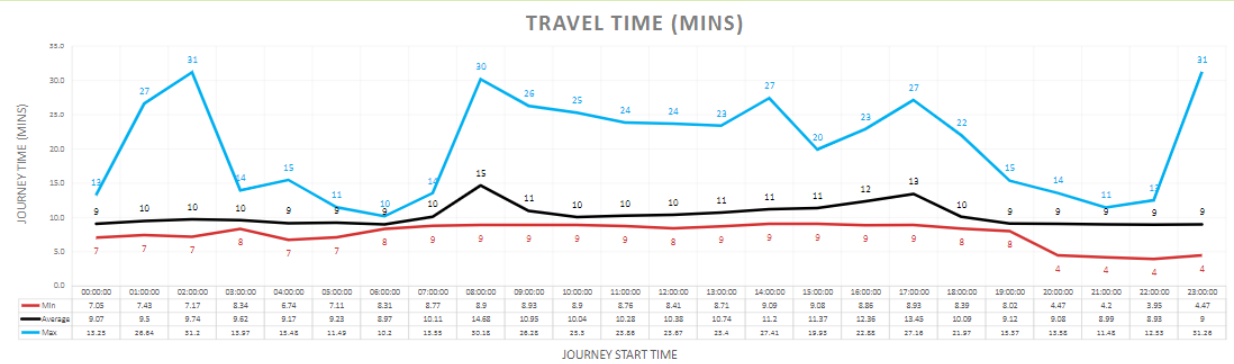


Figure 30: Monkton Roundabout to Bankfield Roundabout (A77) INRIX[80] Journey Times

(Click image to enlarge figure)

Data from the Transport Model for Scotland (TMfS14[81]) further shows road network constraints and potential areas of congestion based on the volume of traffic and road capacity. Locations with the highest volume capacity ratios were generally recorded in urban areas such as Ardrossan, Saltcoats, Stevenston, Kilwinning, Ayr, Irvine, Kilmarnock and Prestwick, as well as on the A71 Galston Road between Galston and Newmilns. Data also shows that traffic levels are forecast to increase in the future (expanded upon in Section 3.2.5); should these increases become reality then capacity constraints and congestion identified by stakeholders are likely to be exacarbated.

Capacity issues on the Arran ferry were also raised, given the increased car traffic experienced on the route since the introduction of the RET which has reduced deck capacity for other users including residents, making it more difficult to access the island, particularly during peak periods. An evaluation on the impact of RET on Arran[82] highlighted that the Ardrossan – Brodick route was beginning to experience vehicle deck capacity issues on peak sailings, with 26% of all sailings in 2015-16 having a car deck utilisation of greater than 80%. In addition, the number of cars carried on the Ardrossan – Brodick route increased by 34% between 2008-2018 and by 18% on the Largs – Cumbrae route over the same time period[83]. This is presented in Figure 31 alongside the

[79] Data supplied by INRIX via Transport Scotland.
[80] INRIX is a private sector organisation whose data services consist of roadway analytics (including journey time metrics).
[81] The current version is TMfS14 which was calibrated and validated using available data for 2014. Note that modelling does not consider any impacts of the COVID-19 pandemic
[82] Transport Scotland, Evaluation of the Impact of Road Equivalent Tariff on Arran Final Report, 2017, https://www.transport.gov.scot/media/33631/ts-amfc-ret-arran-final-report.pdf
[83] Calmac.

change in the number of passengers (pax), coaches and commerical vehicles carried.

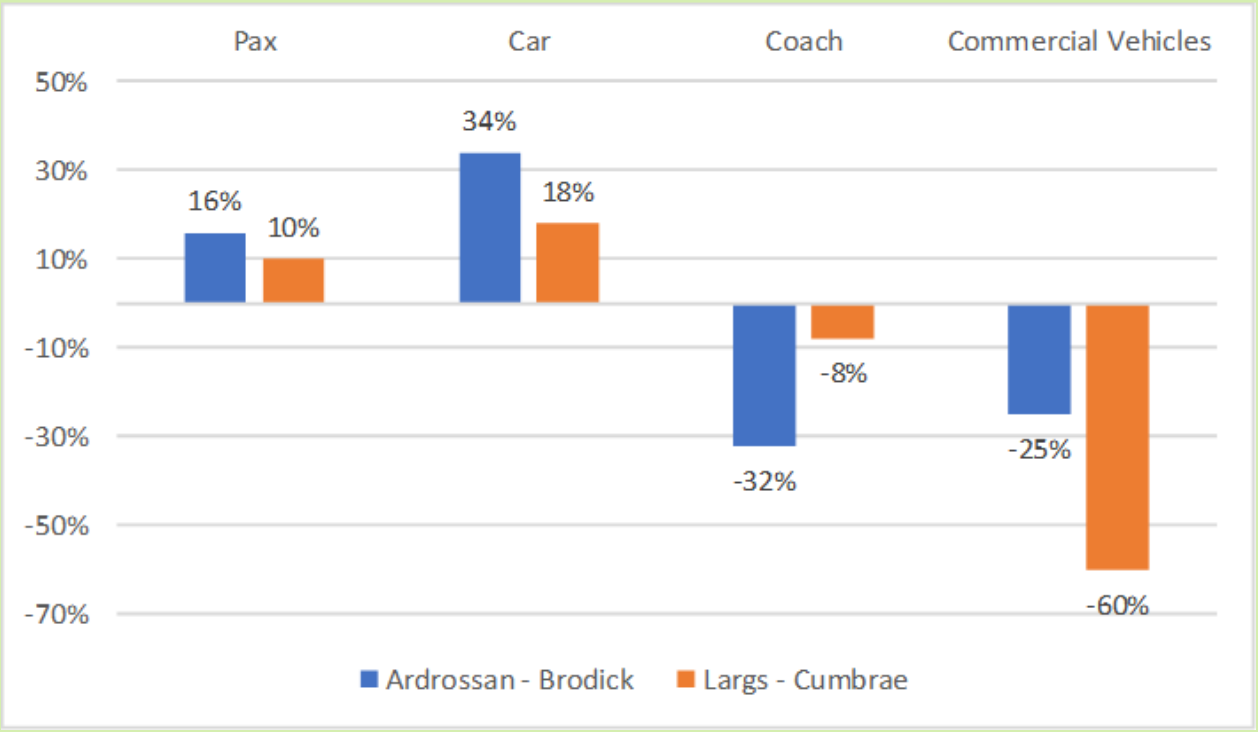


Figure 31: Change in Volumes on Main Arran and Cumbrae Ferry Routes[84]

With regards to rail, stakeholders raised concerns that a lack of platform capacity at Glasgow Central rail station limits the opportunity to operate additional services to/from the Ayrshire region in the future.

FREQUENCY AND FRAGILITY OF PUBLIC TRANSPORT

A lack of public transport prevents access to services and can lead to forced car ownership. There is limited integration between public transport, particularly in rural areas, and limited interconnectivity between bus, rail and ferries with low frequency and limited operating hours.

84 Calmac.

The frequency and fragility of public transport, particularly the bus network, is closely linked to patronage and how well used services are in the Ayrshire & Arran region.

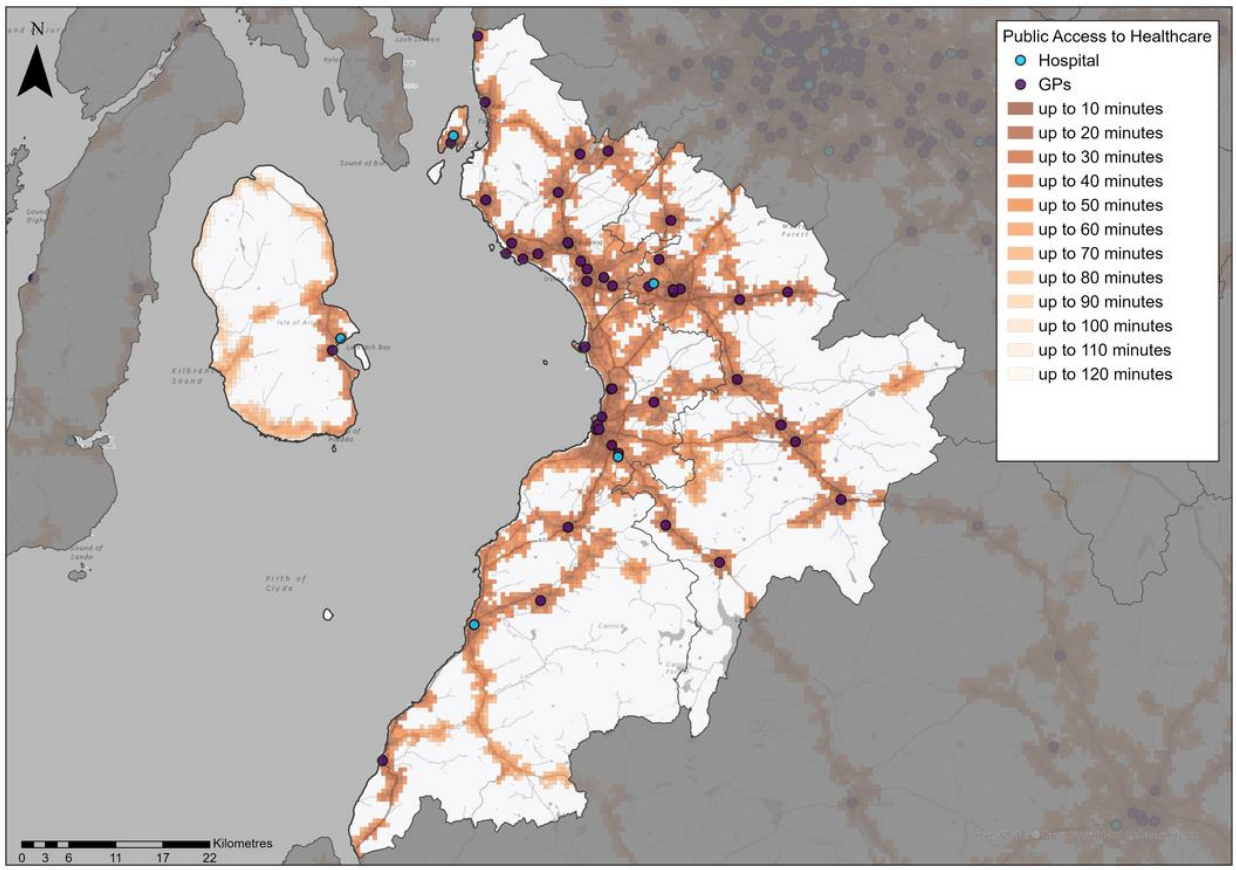


Figure 32: TRACC Access to Healthcare

(Click image to enlarge figure)

Although there was a small average yearly increase in share of the population using a bus 4 or more days per week in East Ayrshire; South Ayrshire and North Ayrshire both observed a decrease on average per year[85]. Overall, the Ayrshire & Arran region saw an absolute decline in bus patronage. Based on research into the causes of bus patronage decline, the worst performing factors that have contributed to patronage decline in the Ayrshire & Arran region have been identified as bus mileage, bus connectivity and bus quality[86].

As reported above, a lack of public transport prevents access to services and can lead to forced car ownership; the proportion of households with access to a car is higher in the region compared to the Scotland average (71% compared to 69%). Issues related to forced car ownership were strongly noted by stakeholders and can exacerbate transport

[85] Adults (16+) - use of local bus services, and train services, in the previous month, Transport and Travel in Scotland. Calculated on the basis of the average percentage change per annum across 2003/04, 2005/06, 2007/08, 2009/10, 2012/13, 2014, 2015, 2016 and 2017.

[86] The bus mileage score is based on data for the South West & Strathclyde, including Glasgow City region, while the region's bus quality score is based on satisfaction figures for Strathclyde that omit Arran and combine Ayrshire, Argyll & Bute and Glasgow City region; accordingly some care should be taken in analysis of these figures.

poverty, as discussed later in this section.

Accessibility analysis using TRACC has been undertaken to understand public transport access to key services, with Figure 32 showing access to Healthcare (GP and Hospital[87]). Results show that a large majority of Ayrshire & Arran residents, particularly those residing in urban areas and within close proximity to main corridors, can access healthcare within 120 minutes by public transport, but there are areas, particularly in rural parts of the region that are unable to access these services. As stated previously, 73% of the region's population can access a Hospital by public transport within 60 minutes of travel time (07:00-10:00 departure time), though only 17% can access a Hospital by public transport within 30 minutes of travel time. Other outputs show similar patterns; for example, access to Education (school) by public transport up to 60 minutes and access to Employment Centres by public transport (up to 120 minutes). Further details are provided in the earlier Accessibility section.

A number of stakeholders highlighted problems of limited integration between public transport, particularly in rural areas, including between bus, rail and ferries, with low frequency and limited operating hours. For example, as of October 2019, of the 10 ferry services operating between Ardrossan and Brodick each day, analysis showed that there is a wait time greater than 20 minutes[88] between train arrival and ferry departure for 8 out of 10 services. Similarly, 8 out of 10 services involve a wait time of greater than 20 minutes when departing via train from Ardrossan Harbour.

[87] Hospitals included in the analysis were sites that were classified as either: 1) Emergency Departments (larger A&E services that typically provide a 24-hour Emergency Medicine consultant led service); 2) Multiple Injury Units; or 3) small hospitals and health centres in rural areas that carry out Emergency Department related activity and are GP or nurse led. They may or may not be open 24 hours.

[88] A 20-minute wait was selected as foot passengers are required to check in at least 10 minutes before departure. The 20 minute wait also takes into account the short walk between the station and ferry terminal.

TRANSPORT POVERTY AND AFFORDABILITY

There are many areas, primarily in the most rural parts of the region, that spend more than the Scottish average on transport expenditure (up to 20%, compared to the Scotland average of 14%)[89]. This includes rural areas close to Galston, south of Ayr, south of Girvan and parts of southern Arran.

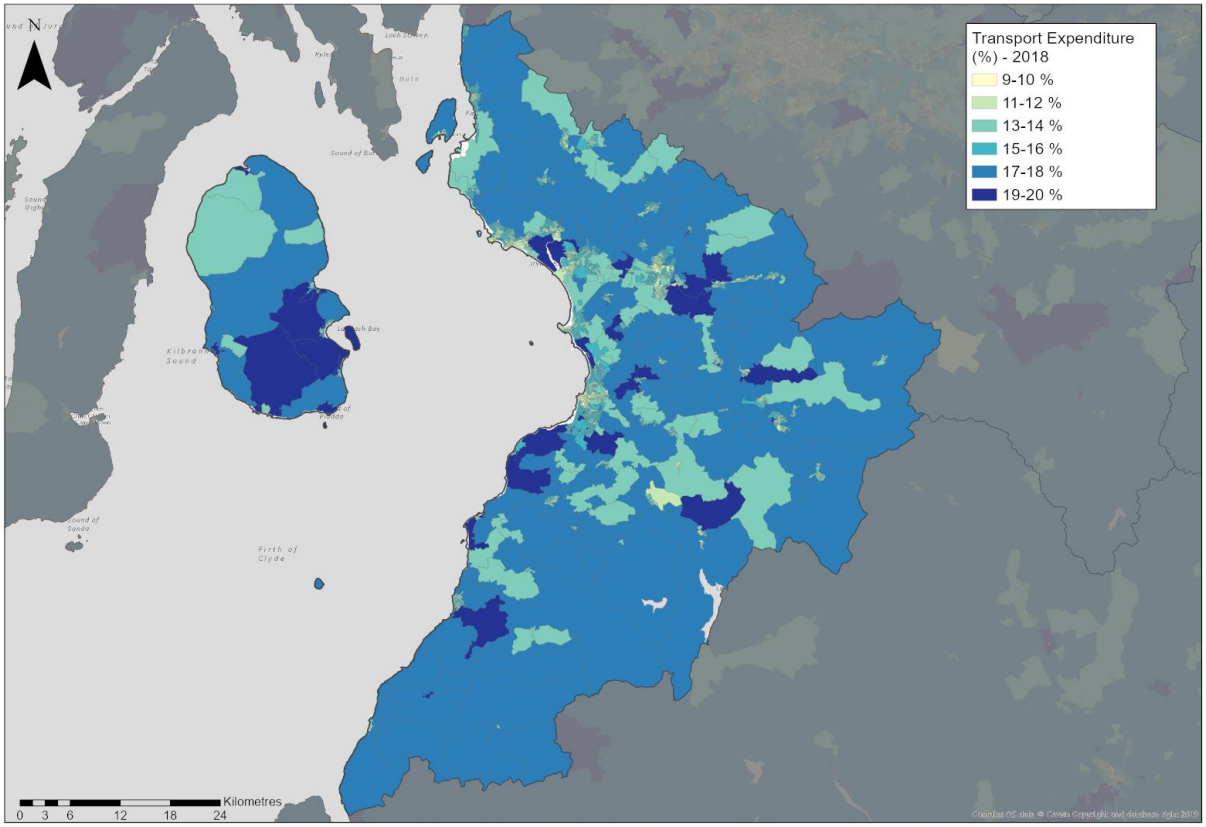


Figure 33: Transport Expenditure in Ayrshire & Arran

(Click image to enlarge figure)

Similarly, the Transport Poverty map[90] shown in Figure 34 demonstrates that 58% of data zones in the region were classified as high risk for transport poverty compared to 38% in Scotland; 36% as medium risk compared to 41% in Scotland; and 6% as low risk, compared to 21% in Scotland.

89 Transport Expenditure is a calculation based on the average weekly household expenditure dedicated to transport as a percentage of the total average weekly household expenditure. ONS, Expenditure, FYE 2018, https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure

90 Transport Poverty analysis is based on research which uses data on household income, car availability and access to the public transport network. Based on Sustrans, Transport Poverty in Scotland, 2016, https://www.sustrans.org.uk/media/2880/transport_poverty_in_scotland_2016.pdf

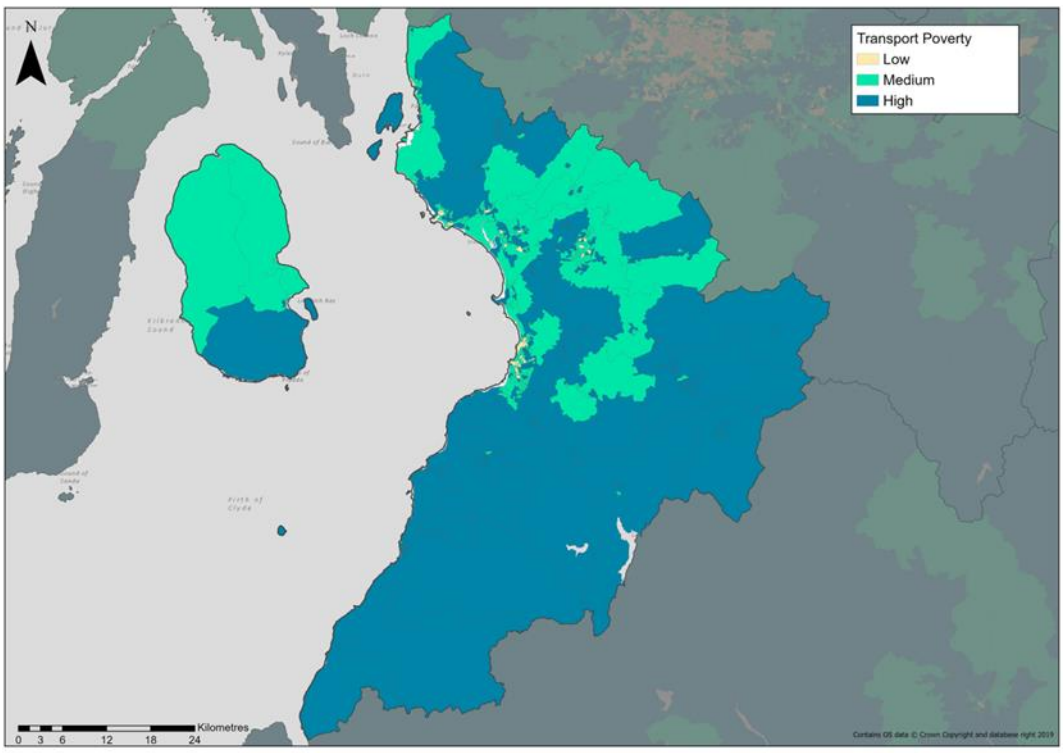


Figure 34: Transport Poverty in Ayrshire & Arran 2020

(Click image to enlarge figure)

Similar to areas with a higher than average expenditure of transport, data zones at high risk of transport poverty are typically located in rural parts of the region and data zones at low risk of transport poverty are typically located in urban areas. This may be indicative of wider accessibility problems experienced in rural parts of the transport network.

Further to this, stakeholders commented that the cost of bus travel in the region is high compared to car (and taxi) and there is a perceived lack of funding to encourage modal shift, including the retention of bus services withdrawn by private bus operators. Funding for active travel infrastructure was also noted as an issue; while funding sources are available for new infrastructure such as new active travel schemes, the resulting maintenance burden can discourage authorities from applying for such funds. Funding for the maintenance of the local road network was also raised as an issue.

Views from young people[91] show many depend on public transport to access work and education but affordability of bus and train fares is an issue. For example, 55% of respondents in the Strathclyde region noted to be spending more than £9 per week on travel to their place of education (compared to 44% nationally) whilst 49% were spending over £12 commuting to work/apprenticeships (compared to 32% nationally).

3.2.2. Online Survey: Reported Problems in the Ayrshire & Arran Region

[91] As part of an event held at the end of 2018 that Scottish Youth Parliament met with over 1,300 young people, including 240 from the SPT area, to hear their views on public transport in Scotland.

As part of the wide-ranging engagement exercise for STPR2, an online survey was undertaken to collect the views from the public and organisations across Scotland on the transport issues and challenges that impact their day-to-day journeys. As part of the survey, respondents were asked to rank their top 3 priority problems.

The top 3 ranked problems for the Ayrshire & Arran region were:

- **Roads** - Quality of road infrastructure, which 50 respondents ranked as their top priority and 72 ranked within their top 3;
- **Bus** - Frequency and reliability of bus services, which 16 respondents ranked as their top priority and 22 ranked within their top 3;
- **Cycling** - Availability of safe cycling infrastructure, which 7 respondents ranked as their top priority and 19 ranked within their top 3.

Other commonly raised areas of concern related to reliability of ferry services, the cost of rail travel, the availability of safe walking/wheeling infrastructure, levels of road traffic congestion, safe overtaking opportunities and the availability of funding to maintain existing transport assets.

The findings from the survey have been used to inform and further validate the identification of the transport related problems described in this section.

3.2.3. Opportunities

This section provides a summary of key opportunity themes identified for the Ayrshire & Arran region.

ECONOMIC DEVELOPMENT

Of the 502 data zones in Ayrshire and Arran, 30% of these are within the lowest 20% for employment ranking across all data zones in Scotland[92]. This is supported by unemployment data from Nomis[93], which shows that unemployment in the region is higher than the Scotland wide average; 2019 unemployment in North Ayrshire was 5.9%, East Ayrshire 4.6% and South Ayrshire 3.7%. The Scotland average was 3.5%. Similarly, SCRIG[94] data highlights that the proportion of employees (18+) in parts of the region earning below the Living Wage is higher than the Scotland average; with 23.8% in East Ayrshire and 21.8% South Ayrshire, compared to the Scotland average of 16.9%. This is slightly lower in North Ayrshire at 16.0%. Each of these data sets are indicative of the economic challenges experienced in the region and represent opportunities to improve the economy.

There are many economic development opportunities in the region, including the Ayrshire Growth Deal. The Growth Deal Agreement document[95] outlines the different areas and projects be taken forward as part of the £251 million Deal. The Economic Infrastructure Programme includes the following projects: HALO Kilmarnock, Ayrshire Engineering Park, Ayrshire Manufacturing Investment Corridor (AMIC) and the i3 Irvine Enterprise Area, though the document also outlines other allocation areas, such as for an Energy, Circular Economy and Environment Programme, Digital and Skills and Inclusion. In addition to the Growth Deal, there are also opportunities to strengthen existing labour market and economic linkages between Ayrshire and the Glasgow City Region including, for example, building on the existing BioCorridor[96].

Figure 35: Ayrshire Growth Deal Heads of Terms Agreement

The importance of the Manufacturing sector in the region is also underlined by data which shows the sector was the fastest growing in the region by GVA share in 2018 (over 8%). Further economic development opportunities highlighted by stakeholders include the use of Hunterston Port and the surrounding rail network for transport of

[92] Scottish Government, Scottish Index of Multiple Deprivation (SIMD), 2020, https://simd.scot/
[93] ONS, NOMIS Official Labour Market Statistics, 2019, https://www.nomisweb.co.uk/
[94] Scotland's Centre for Regional Inclusive Growth, Inclusive Growth Dashboard, https://www.inclusivegrowth.scot/
[95] Ayrshire Growth Deal, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936577/20.11.17_AGD_Deal_Document_-_FINAL.pdf
[96] The Glasgow BioCorridor stretches 50 miles from North Lanarkshire to North Ayrshire and is home to around 40% of Scotland's life science enterprises.

freight and passengers and growth at Prestwick Airport (particularly for the transport of freight). There are further opportunities to utilise the rail network to strengthen economic, as well as social opportunities, particularly in areas such as south of Kilmarnock where some areas have recorded population decreases.

It was also frequently stated by stakeholders that a reduction in journey times and improved connectivity would make the region more attractive to inward investment, including from, though not limited to, northern England via the M74 Corridor. In the case of the ports at Cairnryan, improved journey times on the strategic road network were seen as key to maintaining/enhancing the ports' competitive economic advantage to other UK Irish Sea Ports (Heysham, Liverpool and Holyhead) which are connected to the wider road network by dual carriageway. Stakeholders also highlighted that improvements to the A737 could have economic benefits for the region.

TOURISM

Supporting tourism includes support of The Coig, which forms tourist trails across Ayrshire, Arran, Argyll & Bute and Inverclyde in seeking to emulate the success of the North Coast 500 and was supported in the Scottish Government's PfG 2019-20[97]. Stakeholders noted that routes such as the A760 offer the potential to improve tourist access to the North Ayrshire coastline.

Growing the active travel tourism market through the development and promotion of NCN type infrastructure across the region was raised as a major opportunity by stakeholders, with areas such as Galloway Forest commonly referred to as an 'untapped resource'; there are also opportunities to provide sustainable connections to sites such as National Nature Reserves.

Visit Scotland data shows the number of domestic visitors to the region has fluctuated in recent years, but overall there has been a slight decrease between 2013 and 2018 from 709,000 to 689,000. This is shown in Figure 36 below, alongside total spend for domestic visitors, which has also fluctuated between 2013 and 2018; from a low of £123m in 2013 to a high of £169m in 2016, to £153m in 2017. International visits and spending have increased over the same time period.

[97] Scottish Government, Protecting Scotland's Future: The Government's Programme for Scotland 2019/20, https://www.gov.scot/binaries/content/documents/govscot/publications/publication/2019/09/protecting-scotlands-future-governments-programme-scotland-2019-20/documents/governments-programme-scotland-2019-20/governments-programme-scotland-2019-20/govscot%3Adocument/governments-programme-scotland-2019-20.pdf

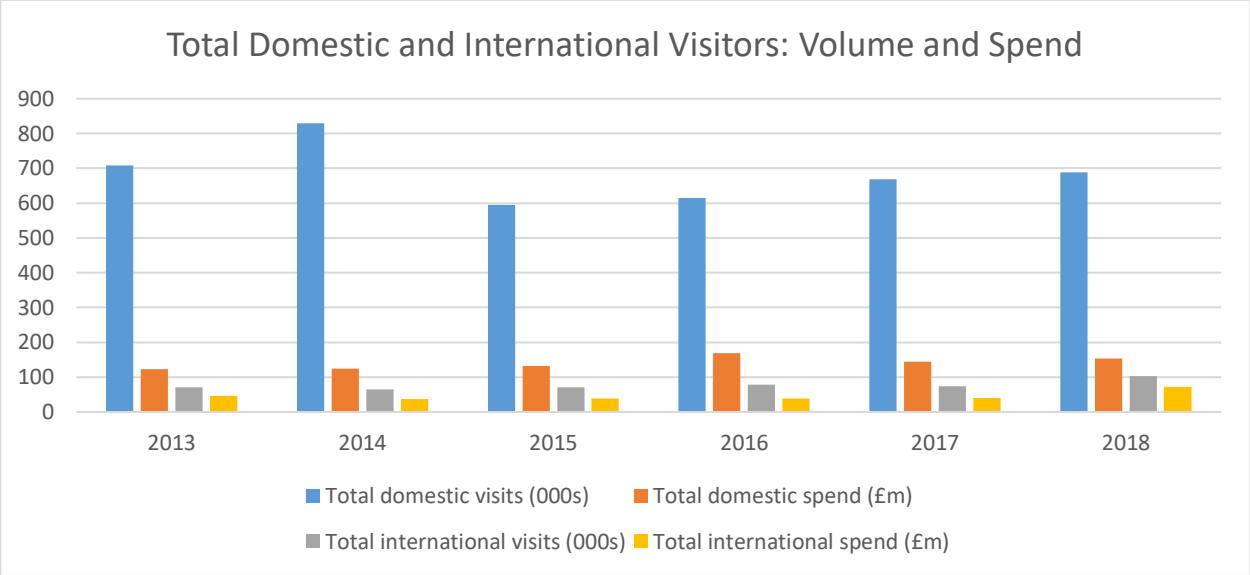


Figure 36: Total Domestic and International Visitors Ayrshire & Arran, 2013 – 2018: Volume and Spend[98]

Reflective of the aspirations to grow the number of visitors to the region, the Ayrshire Growth Deal also includes reference to a Tourism Programme, which includes funding for the Development and Regeneration of The Great Harbour up to £13 million and Investment in Marine Tourism of up to £9.5 million.

JOURNEY TIME REDUCTION, JOURNEY QUALITY AND IMPROVED CONNECTIVITY

Much of the region's road network, including trunk road network, is single carriageway, making it more difficult for motorists to overtake. This has been linked to adversely impacting journey times and journey quality as well as safety concerns associated with driver frustration. A limited number of routes, including the A77/M77 north of Ayr, non-trunk A71 between Kilmarnock and Irvine and A78 south of Chapel Hill Roundabout, are dual carriageway. There are overtaking lanes on the A77 south of Ayr and on some sections of the A78. Stakeholders noted that improvements in journey time, journey quality and improved connectivity would make the region more attractive to investors. Stakeholders also suggested that connectivity to other parts of Ayrshire could be strengthened should improvements be made to the A737 and the non-trunk B714.

With regards to the bus network, some stakeholders highlighted opportunities to enhance inter-regional services should resilience and reliability issues be addressed. This in turn could improve journey quality by bus and improve connectivity. General issues relating to the fragility of the bus network is discussed under the Problems section. It is worth noting at this point however that a number of the problems highlighted relate to limited bus connectivity due to reduced service levels and cutbacks. While increasing service levels would require increased revenue support - an area that is outwith the scope of STPR2 - recent legislation passed by the Scottish Government in the form of the Transport (Scotland) Act 2019 provides new opportunities to improve

[98] Visit Scotland, Insight Department: Visitors to Ayrshire & Arran, Trend Information, December 2019, https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/regional-factsheets/ayrshire-and-arran-factsheet-2018.pdf

local bus service provision through enabling bus service powers to be provided to local authorities. The announcement of the £500m Bus Partnership Fund, as well as research into new service models, including MaaS are further evidence of the opportunities that Transport Scotland are keen to develop alongside transport authority and bus operator partners to improve the attractiveness of public transport options in the future and in doing so improve public transport connectivity, particularly for rural communities. There are further opportunities to utilise the rail network to strengthen economic, as well as social opportunities, particularly in areas such as south of Kilmarnock where some areas have recorded population decreases.

There are also opportunities to improve ferry connectivity; improvements to ferry connections has the potential strengthen the economy, including active travel tourism.

TRAVEL PLANNING, BEHAVIOUR CHANGE AND LOW CARBON

There are opportunities to promote improved travel planning, behaviour change and a shift towards the use of low carbon technologies in the region. With regards to low carbon, within the region, the percentage of total emissions from transport is 40% in East Ayrshire, 36% in South Ayrshire and 20% in North Ayrshire; the Scotland average is 34%. Opportunities to encourage greater uptake of electric vehicles, as well as e-bikes, was a frequent point raised during consultation. In terms of the number of Ultra Low Emission Vehicles (ULEVs) in the region, levels are relatively low at 1.79 ULEVs per 1,000 people[99] compared to the Scotland average of 3.29 ULEVs per 1,000 people. Values for all regions are shown in Figure 37.

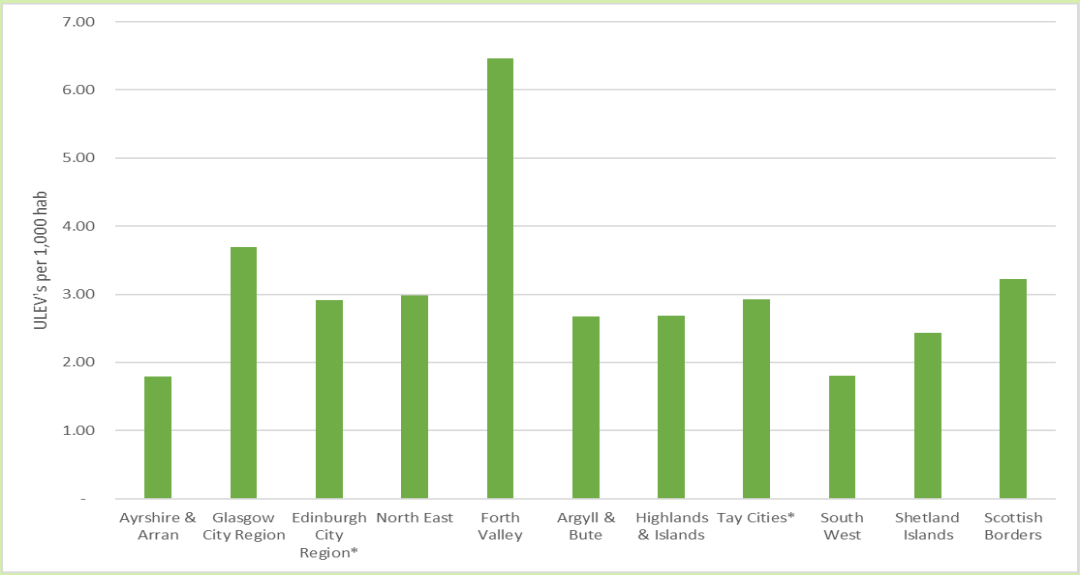


Figure 37: Ultra Low Emission Vehicles per 1,000 people by STPR2 Region

[99] UK Government, VEH0132, Licensed ultra-low emission vehicles by local authority: United Kingdom, 2020 Q1, https://www.gov.uk/government/statistical-data-sets/all-vehicles-veh01. Ultra low emission vehicles (ULEVs) are vehicles that emit less than 75g of carbon dioxide (CO2) from the tailpipe for every kilometre travelled. In practice, the term typically refers to battery electric, plug-in hybrid electric and fuel cell electric vehicles.

Figure 38[100] shows the average distance to car charging points by data zone across the region. There are 44 charging points in the region, but there are a number of areas in the south of South Ayrshire and western parts of Arran which are between 10 and 20 miles from a charging point. Most points are located in Kilmarnock, Ayr, Irvine, the Three Towns and Largs, but there are also points located in Cumnock, Dalmellington, New Cumnock, Auchinleck, Brodick and Millport. As a result, data zones in these areas are within 2.5 miles of a charging point.

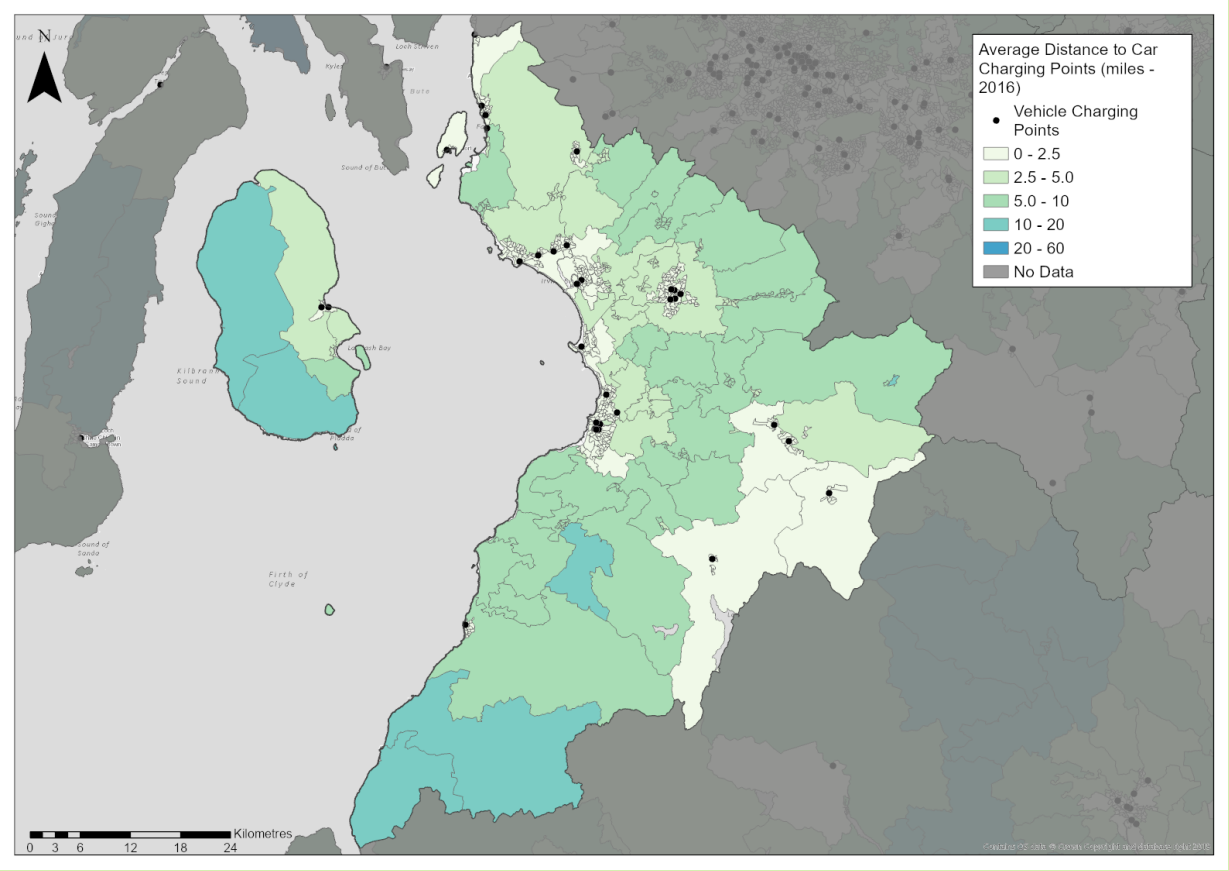


Figure 38: Proximity to nearest EV Charge Point, Ayrshire & Arran

(Click image to enlarge figure)

With regards to moving towards a low carbon rail network, the recently published Rail Services Decarbonisation Action Plan[101] sets out the plan to decarbonise the rail network by 2035, including electrification of parts of the network and alternative traction for rail services between Girvan and Stranraer.

Opportunities also exist to promote digital connectivity and there is the potential for more people to work from home. Access to Super-Fast Broadband ranges between 40% to 64% in the region, with North Ayrshire experiencing the highest levels in the region with

[100] Department for Transport, Table JTS1010, January 2016, https://www.gov.uk/government/statistical-data-sets/journey-time-statistics-data-tables-jts

[101] Transport Scotland, Rail Services Decarbonisation Action Plan, 2020, https://www.transport.gov.scot/media/47906/rail-services-decarbonisation-action-plan.pdf

64% of residential premises having access[102]. North Ayrshire has the 15th highest percentage of all local authorities in Scotland, with East Ayrshire and South Ayrshire 17th and 22nd respectively. Super-Fast Broadband can be linked to increased productivity, particularly if working from home.

Improved integration between land-use planning and sustainable transport can also support efforts to encourage travel behaviour change by reducing travel distances and supporting investment in interventions such as active travel or bus priority measures to reduce the impact of trips generated by new development on the transport network.

There are also opportunities to improve local service delivery by strengthening community involvement and to improve future planning; including through utilising the advantages of digital connectivity. The benefits of building upon existing community involvement to help plan and provide transport solutions, particularly, though not limited to remote and rural areas, can help to ensure transport solutions are brought forward which help to address the specific needs of local communities. With regards to future planning, an example is ongoing work related to NHS Ayrshire & Arran. There are opportunities here to support strategic health developments and to make sure that transport and accessibility are fully considered going forward.

Lastly, there are missing links in the NCN and Scottish Government Cycle route networks in the region. Examples include Kilmarnock to Ayr, Mauchline to Ayr, Cumnock to Kilmarnock, east of Kilmarnock and north of Ardrossan to Skelmorlie and Inverkip, and so there are opportunities to promote greater uptake of cycling and improve health and well-being should the network be improved. Improving the NCN could also increase the attractiveness of the region as a destination for cycle tourism. The existing active travel network is shown in Figure 39.

[102] Ofcom, Connected Nations, 2019, https://www.ofcom.org.uk/research-and-data/multi-sector-research/infrastructure-research/connected-nations-2019/data-downloads

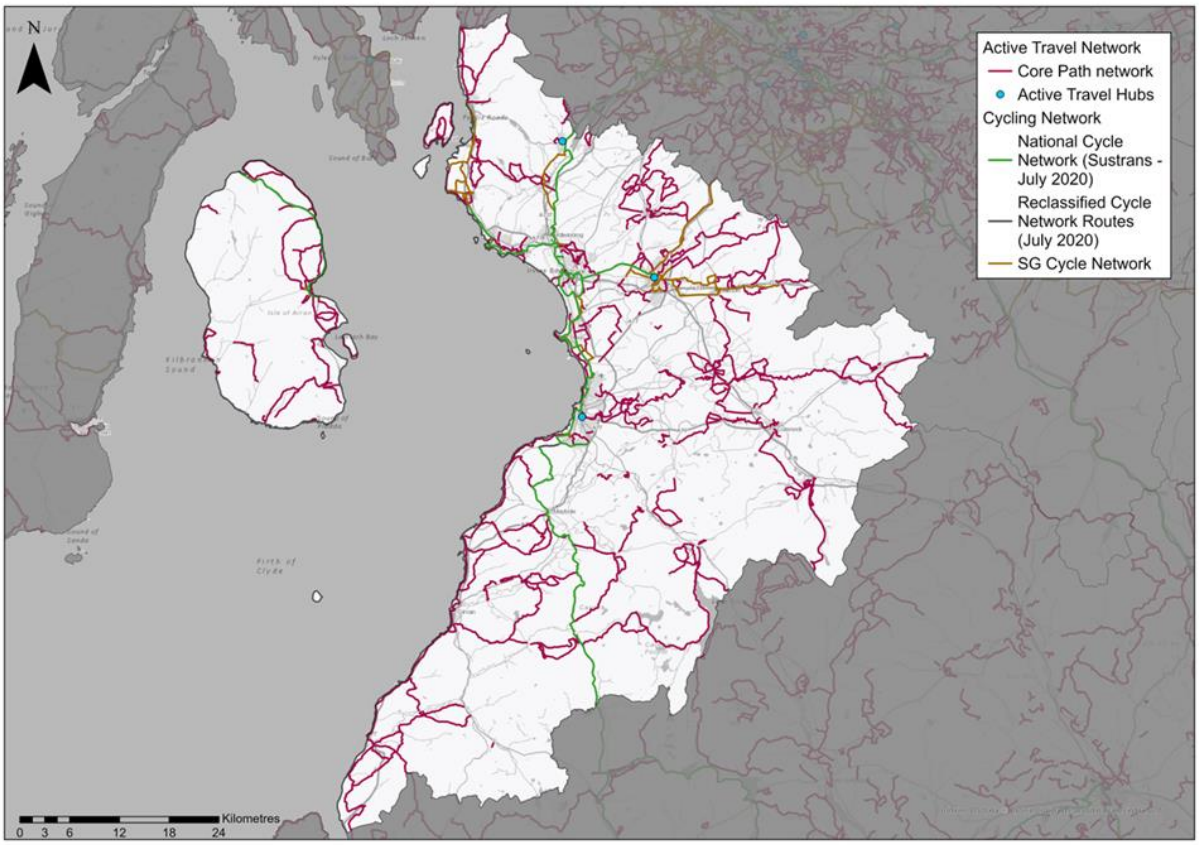


Figure 39: Ayrshire & Arran Active Travel Network

(Click image to enlarge figure)

IMPROVED ROUTE RESILIENCE

Opportunities in relation to improving route resilience are primarily related to the economy and how frequent route closures, arising from planned and unplanned closures, are often exacerbated by a lack of high quality diversionary routes. This can have an adverse impact on the local economy and depending on the route effected, on the regional and national economy. Should route resilience be improved on routes such as: Kilmarnock – Cumnock – Dumfries on the Glasgow South Western Line as an alternative in the event of West Coast Mainline closure; improved diversionary routes on the road network such as the A77 and A78; and more resilient ferries on crossings to Cumbrae and Arran, this has the potential to promote economic growth and attract investment. Evidence related to improving route resilience is noted under the 'Resilience' problem section.

3.2.4. Problems & Opportunities Summary

This Chapter has discussed the transport problems and opportunities in the Ayrshire & Arran region informed through data analysis, stakeholder engagement and policy review. These inform the themes and objectives which any interventions should look to address.

Key problems themes are:

- Active Travel Facilities and Safety: Mode of travel to work by bicycle and foot is lower in the region compared to the Scottish average. This may in part be due to a lack of active travel facilities, including segregated cycle infrastructure for commuting purposes and on-board bike carrying facilities on trains and buses. Safety was also highlighted as a concern.
- Accessibility: There are large areas of the region where there is limited access to public transport, particularly in rural areas, although as noted earlier bus revenue support is out of scope for STPR2. TRACC data further demonstrates the problem; poor accessibility restricts people's access to key services, including employment, education and healthcare.
- Connectivity and Journey Times: This has primarily been highlighted as a problem between Ayrshire and the M74 (via the non-trunk A70 and A71) and south of Ayr to access the ports at Cairnryan via the A77. Long journey times was noted to impact the economic competitiveness of the region.
- Resilience: In the event of A77 route closure the diversionary route has been noted to be long and sub-standard for the volume and type of vehicles using it (e.g. HGVs). The A78 is also prone to flooding which leads to closure. Some 81% of all incidents recorded on the regions trunk roads between 2015-18 were on the A77 or A78. Similarly, ferry cancellations can have an adverse impact on residents accessing key services and, more widely, on the economy.
- Capacity Constraints and Congestion: At Bellfield Interchange, which has recorded long queue lengths, the A77/A78 at Ayr at Monkton, Dutch House and Whitletts Roundabouts and the A737/A738 at Kilwinning. Capacity issues, linked to the introduction of RET, have also been recorded on the Ardrossan – Brodick ferry route.
- Frequency and Fragility of Public Transport: Limited public transport coverage prevents access to services and can lead to forced car ownership. There is limited integration between public transport, particularly in rural areas, and limited interconnectivity between bus, rail and ferries with low frequency and limited operating hours. Bus patronage has fallen in recent years and bus mileage, bus connectivity and bus quality have been cited as contributory factors to this decline.
- Transport Poverty and Affordability: Transport expenditure and poverty is generally higher in rural parts of the region. The cost of bus travel in the region was noted to be high compared to car (and taxi) and there is a perceived lack of funding to encourage modal shift.
- There are opportunities in the region associated with: Economic development, particularly in relation to the Ayrshire Growth Deal; tourism, including, though not limited to, active travel tourism; journey time reduction, journey quality and improved connectivity; travel planning, behaviour change and low carbon, such as improving digital connectivity and electric vehicle infrastructure; and improving route resilience.

3.2.5. Future Conditions

The problems and opportunities identified above are focused on the transport system pre COVID-19, drawing on the findings from data analysis and engagement. Given the timescales for the delivery of STPR2, there is a need for 'horizon scanning' to better understand how potential future uncertainties could impact the operation and management of the transport network, a knowledge of which will support the identification of

interventions that are resilient in the face of potential alternative futures. This process of scenario planning will consider major transport disrupters and uncertainties and is accordingly being carried out at a national level for the STPR2 programme as a whole.

Notwithstanding the above, for the Ayrshire & Arran region, a review of the national transport model, the Transport Model for Scotland (TMfS[103]) has been undertaken. Assuming current policies remain in place and no interventions beyond those already committed will be undertaken, the model suggests that between 2014 and 2037 the following may occur[104]:

- Road Traffic (billion vehicle miles p.a.): a 25% increase in the region, lower than the national growth of 37%.
- Road Congestion (PM Peak Delay seconds/mile): 25% increase in the region, lower than 37% rise across Scotland.
- Bus Passenger mileage forecasts: 16% decrease, higher than the national decline of 5%.
- Rail Passenger mileage forecast 15% increase compared to a 42% rise across Scotland.

While these projections require to be treated with some caution given the uncertainties around future travel behaviours brought about by COVID-19 and other potential future uncertainties, it is clear that there are major challenges ahead which STPR2 must respond to if the transport sector is to play its role in supporting the Scottish Government commitment to meet its net zero emission target.

Other uncertainties in the region concern the future of Prestwick Airport, which is currently under state ownership while work is ongoing to return the airport to the private sector, the future impacts of the RET, and the impacts of the Ayrshire Growth Deal on the transport network in the region. With regards to the Growth Deal, ongoing Regional Transport Working Group engagement will ensure that appropriate consideration is given to growth deal projects alongside other regional developments. This collaborative approach will inform the regional and national appraisal of the strategic transport network being undertaken in STPR2.

[103] The current version is TMfS14 which was calibrated and validated using available data for 2014. Note that modelling does not consider any impacts of the COVID-19 pandemic.
[104] Transport Scotland, Transport Forecasts, 2018, https://www.transport.gov.scot/media/43316/transport-forecasts-2018.pdf

4. Transport Planning Objectives

4.1. National and Regional Objectives

Transport Planning Objectives (TPOs) are of central importance to the STAG process. In line with STAG, TPOs should express the outcomes sought by the study, be based on a comprehensive understanding of problems and opportunities, and lend themselves to clear and transparent appraisal of transport options. They will be a key appraisal tool from initial option identification and sifting through to full scheme appraisal and subsequent monitoring/evaluation.

For STPR2, TPOs have been developed to sit at a national level, supported by regional sub-objectives. At a national level, an overarching set of programme-level TPOs have been established which are closely aligned with the vision, 4 priorities, 12 outcomes and 14 policies contained within NTS2.

A series of regional sub-objectives sits within the overall direction of the national TPOs but with a focus on the specific evidence-based problems and opportunities for the Ayrshire & Arran region. The national TPOs and regional sub-objectives are presented in Table 3 below.

Table 3: STPR2 National Objectives and the Regional Sub-Objectives

NATIONAL OBJECTIVES	AYRSHIRE & ARRAN REGIONAL SUB-OBJECTVES
A sustainable strategic transport system that contributes significantly to the Scottish Government's net zero emissions target	▪ *Reduce the consumption of fossil fuels from the strategic transport system in Ayrshire & Arran and enable a shift to more sustainable modes of transport.* ▪ *Increase the mode share of active travel, particularly for shorter, everyday journeys, and for visitors travelling within the Ayrshire & Arran region.* ▪ *Increase the mode share of public transport throughout the region by providing viable alternatives to single occupancy private car use.* ▪ *Reduce emissions generated by the strategic transport system with a focus on the strategic road network, including the most congested interchanges.*
An inclusive strategic transport system that improves the affordability and accessibility of public transport	▪ *Increase public transport mode share in the Ayrshire & Arran region by improving integration opportunities for active travel on public transport and at key transport interchanges including ferry terminals.* ▪ *Improve mobility and inclusion, recognising the needs of remote communities in Ayrshire & Arran and disadvantaged and vulnerable groups.* ▪ *Reduce transport poverty by increasing travel choice, with a particular focus on communities in Ayrshire & Arran with high levels of multiple deprivation.*

	▪ *Enable access to key centres for healthcare, employment and education by improving public and shared transport in the region.*
A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.	▪ *Reduce the adverse impacts of the strategic transport system on communities by embedding the place principle in changes to the strategic transport system.* ▪ *Improve the quality of places for walking, cycling and wheeling for residents and visitors within Ayrshire & Arran.* ▪ *Reduce demand for unsustainable travel arising from nationally significant growth areas, taking cognisance of the emerging NPF4.*
An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.	▪ *Increase sustainable access between labour markets and key centres for employment, education and training across Ayrshire & Arran and neighbouring regions.* ▪ *Increase the competitiveness of key domestic and international markets by reducing transport costs and improving journey time reliability for commercial transport routes including links to the Glasgow City Region, Glasgow Airport, Prestwick Airport, the M74 Corridor and the ports at Cairnryan.* ▪ *Increase resilience of access to key domestic and international markets to encourage people to live, work, study, visit and invest in Ayrshire & Arran.* ▪ *Increase the mode share of freight by sustainable modes in Ayrshire & Arran.*
A reliable and resilient strategic transport system that is safe and secure for users.	▪ *Improve resilience of the strategic transport system to reduce the impacts of disruption, with a particular focus on the corridors serving Glasgow, the ports at Cairnryan, the Glasgow South Western Line, and lifeline ferry services.* ▪ *Reduce transport related casualties in line with reduction targets* ▪ *Improve resilience in the region through climate change adaptation within the management and maintenance of trunk road, rail and ferry infrastructure.*

Table 4 demonstrates the alignment of the sub-objectives developed for the Ayrshire & Arran region with the identified problems and opportunity themes in the region.

Table 4: Mapping of Problem and Opportunity Themes to Transport Planning Objectives

National Objective/Outcome	Regional Sub-Objectives	Problem Theme							Opportunity Theme				
		Active Travel Facilities & Safety	Accessibility	Connectivity & Journey Times	Resilience	Capacity Constraints & Congestion	Frequency & Fragility of Public transport	Transport Poverty & Affordability	Economic Development	Tourism	Journey Time Reduction, Quality & Connectivity	Travel Planning, Behaviour Change & Low Carbon	Improved Route Resilience
A sustainable strategic transport system that contributes significantly to the Scottish Government's net zero emissions target	Reduce the consumption of fossil fuels from the strategic transport system in Ayrshire & Arran and enable a shift to more sustainable modes of transport.	■				■						■	
	Increase the mode share of active travel, particularly for shorter, everyday journeys, and for visitors travelling within the Ayrshire & Arran region.	■	■			■						■	
	Increase the mode share of public transport throughout the region by providing viable alternatives to single occupancy private car use.	■	■	■		■	■	■				■	
	Reduce emissions generated by the strategic transport system with a focus on the strategic road network, including the most congested interchanges.	■				■					■		■
An inclusive strategic transport system that improves the affordability and accessibility of public transport	Increase public transport mode share in the Ayrshire & Arran region by improving integration opportunities for active travel on public transport and at key public transport Interchanges including ferry terminals.	■	■	■		■	■	■	■		■	■	
	Improve mobility and inclusion, recognising the needs of remote communities in Ayrshire & Arran and disadvantaged and vulnerable groups.	■	■	■			■	■	■			■	
	Reduce transport poverty by increasing travel choice, with a particular focus on communities in Ayrshire & Arran with high levels of multiple deprivation.	■	■				■	■	■				
	Enable access to key centres for healthcare, employment and education by improving public and shared transport in the region.		■	■		■	■	■	■		■	■	
A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing	Reduce the adverse impacts of the strategic transport system on communities by embedding the place principle in changes to the strategic transport system.	■	■		■		■			■		■	
	Improve the quality of places for walking, cycling and wheeling for residents and visitors within Ayrshire & Arran.	■	■							■		■	
	Reduce demand for unsustainable travel arising from nationally significant growth areas, taking cognisance of the emerging NPF4.	■	■	■			■		■			■	
An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland	Increase sustainable access between labour markets and key centres for employment, education and training across Ayrshire & Arran and neighbouring regions.	■	■	■		■	■	■	■		■	■	
	Increase the competitiveness of key domestic and international markets by reducing transport costs and improving journey time reliability for commercial transport routes including links to the Glasgow City Region, Glasgow Airport, Prestwick Airport, the M74 corridor and the ports at Cairnryan.		■	■		■			■		■		■
	Increase resilience of access to key domestic and international markets to encourage people to live, work study, visit and invest in Ayrshire & Arran.			■	■		■		■	■	■		■

	Increase the mode share of freight by sustainable modes in Ayrshire & Arran.			■		■			■		■	■	
A reliable and resilient strategic transport system that is safe and secure for users	Improve resilience of the strategic transport system to reduce the impacts of disruption, with a particular focus on the corridors serving Glasgow, the ports at Cairnryan, the Glasgow South Western Line, and lifeline ferry services.		■	■	■				■	■	■		■
	Reduce transport related casualties in the region in line with reduction targets	■									■		
	Improve resilience in the region through climate change adaptation within the management and maintenance of trunk road, rail and ferry infrastructure.				■								■

5. Option Generation, Sifting and Development

5.1. Strategic Options

As set out earlier, STPR2 specifically focusses on Scotland's key strategic transport assets. In the context of STPR2, a strategic transport project is defined as any transport project that materially contributes to Scottish Government and Transport Scotland policies and strategies. Specifically, this will include:

- Any transport project that plays a significant part in supporting the 4 NTS2 priorities and related outcomes;
- Projects or groups of projects related to transport networks owned, operated and funded directly by Transport Scotland;
- Passenger and freight access to ports and airports of national significance; and
- The inter-urban bus and active travel networks and principal corridors within urban areas.

Within the overall definition above, the interventions considered within STPR2 may include:

- Appropriate transport policy and financial instruments (that are within the responsibility of Scottish Government);
- Demand management measures, including use of technology, innovation, and behavioural change;
- Asset management and safety measures;
- Measures to increase travel by active travel modes;
- Public transport improvements, including interchanges, road space allocation, technology and ticketing;
- Transport links to/from areas of economic activity of national significance;
- Targeted infrastructure improvements on the transport networks owned, operated and funded directly by Transport Scotland;
- Changes to the operation of ferry terminals and services that are part of the CHFS and NIFS network;
- Infrastructure measures at ports and harbours of national significance; and
- Improved access to major airports.

5.2. Approach

In keeping with the principles of STAG, the Initial Appraisal: Case for Change hes been developed to provide a robust method, to generate, clean and sift options;

ensuring a broad range of options across all modes are considered.

The STPR2 option generation, cleaning and sifting approach is summarised in Figure 40 alongside the number of options generated at the various key stages that are specific to the Ayrshire and Arran region.

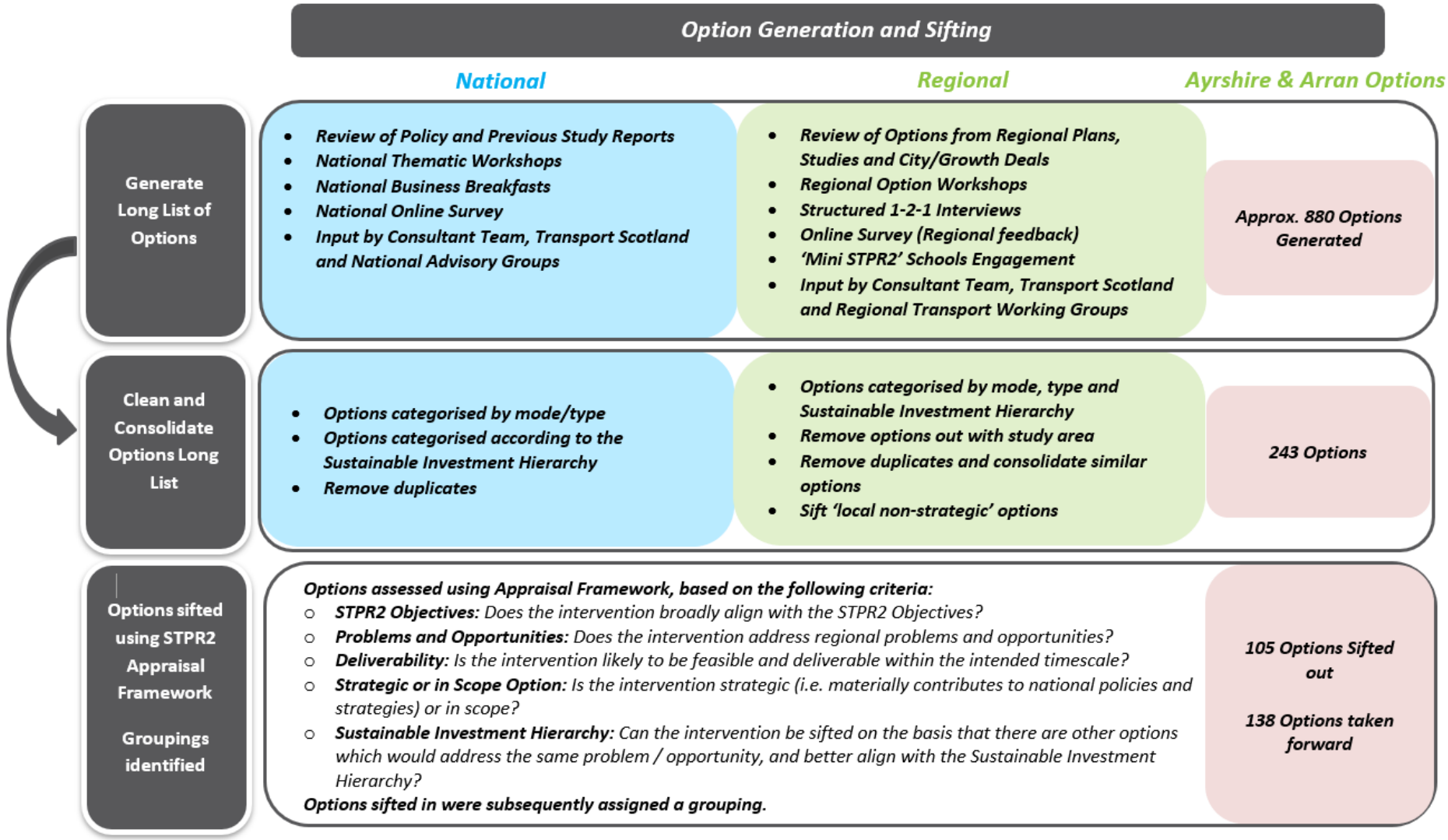


Figure 40: Approach to Option Generation and Sifting

5.2.1. Generation of Long List of Initial 'Options'

A long list of initial transport options was generated based on a range of sources, including: a review of options identified from recent local and regional studies and via extensive stakeholder engagement and public consultation activities. This included Stakeholder Workshops, Structured Telephone Interviews, an Elected Members briefing and an Online Survey. Options were also generated through discussions with the Regional Transport Working Group and supplemented by the Consultant team. Options were identified across all modes and encapsulate many of the main routes and key centres across the regions. Some of these options were well developed and had a clearly defined output, others were suggestions and ideas. All of these ideas/suggestions/options were collated and considered at this stage

Specific to the Ayrshire and Arran Region, there were 880 options generated.

5.2.2. Option Cleaning

Although 880 individual ideas/suggestions/options were identified, this included a number that required further definition, duplicated options and options which were broadly similar. As such, an exercise was undertaken to clean this 'long list'. Options were reviewed at a regional level or a national level depending on the initial source of the information. Options that required further definition were developed, and similar options were consolidated.

Following the option cleaning exercise, 243 options were retained in the long list of interventions to be sifted specific to the Ayrshire and Arran Region.

5.2.3. Option Sifting

Each of the options included in the long list, following cleaning, have been assessed using an Option Sifting methodology developed to drive consistency in the sifting of options across STPR2.

The methodology assesses options against the range of criteria shown in Figure 40 to ensure that any options removed from this stage of the process are done so on a robust and transparent basis. Importantly, this included consideration of the Sustainable Investment Hierarchy. Figure 41 provides more detail of the sifting process.

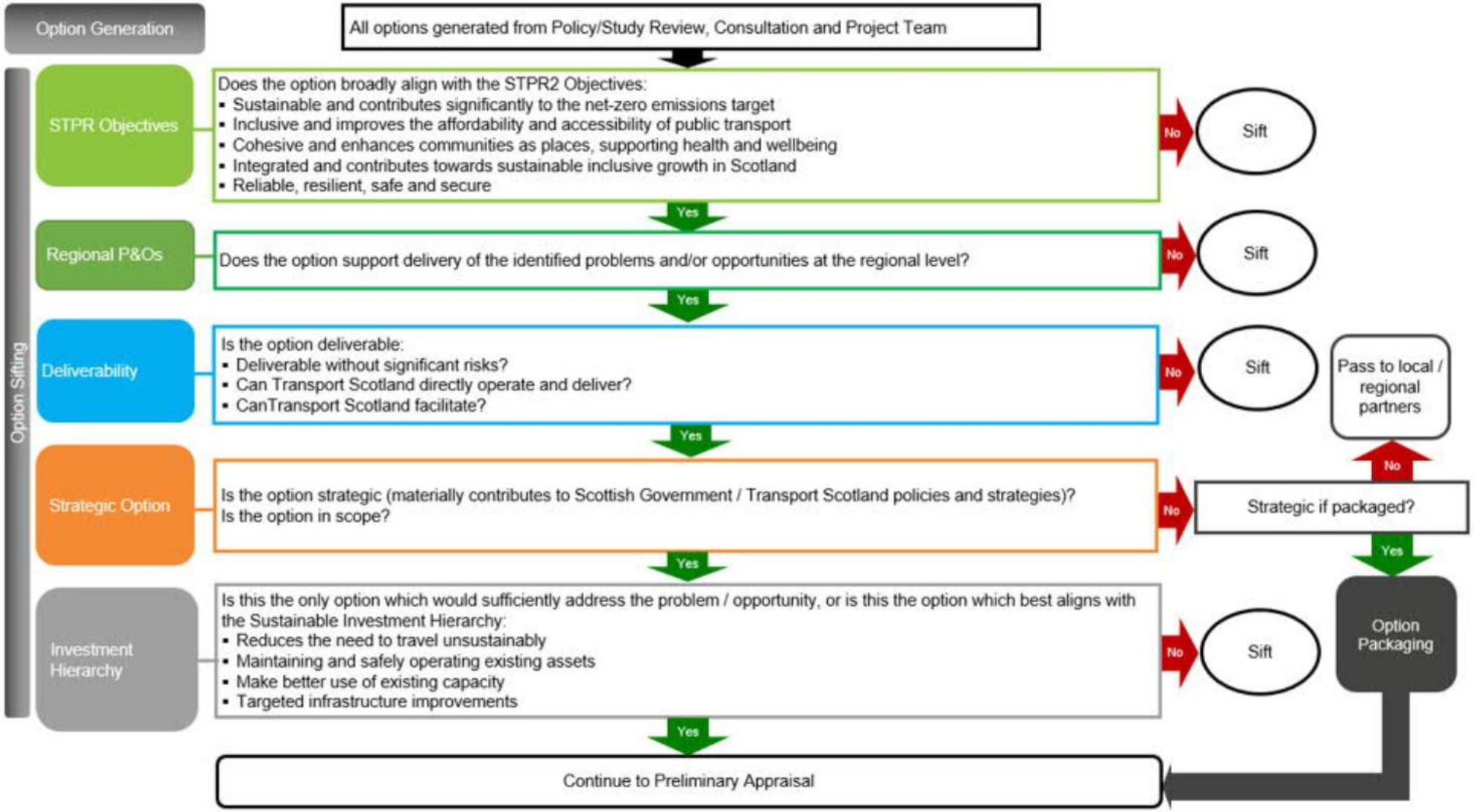


Figure 41: Option Sifting Process

Based on the methodology, options were either:

- Sifted in for further consideration; or
- Sifted out from the process. If appropriate, these will be passed to other areas of Transport Scotland / Scottish Government, or the appropriate local/regional transport authorities and partnerships (through the RTWGs) for consideration out with STPR2.

5.2.4. Option Sifted Out

Options were sifted out at this stage for one of the following reasons:

- Option is out of scope and/or
- Option does not address the problems / opportunities in the region and/or
- Poor performance against transport planning objectives/sifting criteria, and/or
- Deliverability concerns and/or
- The problems/ opportunities are better addressed through another option and/or
- The option is being progressed out with STPR2.

A full list of options that were sifted out across all regions and at a national level is provided as an Appendix to the National Case for Change. In the Ayrshire and Arran Region, 105 options were sifted out at this stage.

5.2.5. Options Sifted In

Following the sifting exercise, 138 options specific to the Ayrshire and Arran Region remain in the process. There are many of these options that share common traits across the regions and many options which in isolation would not deliver the strategic improvements STPR2 is seeking to deliver. Recognising the strategic and national dimension, options that have been sifted in for further appraisal have been allocated to Groupings. Groupings have been established to:

- allow similar options to be collated together to provide a more manageable list for further appraisal;
- collate similar options across regions, thus aiding consistency in definition and appraisal; and, where appropriate
- allow options that may, on their own merit, not be considered strategic, however when grouped address the identified national and regional Problems and Opportunities.

These Groupings will be appraised in the next stages of STPR2. The Groupings represent the range of interventions that STPR2 will consider in the appraisal stages. The list of Groupings along with a short description is provided in Table 5 and a full list of options sifted in for further consideration alongside their allocated Grouping in an Appendix to the National Case for Change.

Table 5: Groupings Proposed to Progress to STPR2 Appraisal

Category	Grouping Name	Grouping Description
Active Travel	Access to Bikes	Options to improve access to bikes (conventional and e-bikes) and equipment such as charging facilities, lights, locks and helmets through bike libraries and other initiatives
Active Travel	Active Travel Hubs	Options to provide active travel hubs in Scotland's cities and major towns that provide advice, bike storage and maintenance facilities
Active Travel	Connect More Settlements to the National Cycle Network (NCN)	Options to expand the NCN to reach more settlements
Active Travel	Cycle / Public Transport Integration	Options (outside of franchise commitments) which allow the safe and efficient transport of bikes on public transport (bus, rail and ferry) and at transport hubs.
Active Travel	Current National Cycle Network	Options to upgrade the existing NCN, including addressing issues where there are safety concerns at on-road sections since their addition to the network.
Active Travel	Information & Signage for Active Travel	Options to provide good quality information, journey planning and signage of active travel networks and facilities
Active Travel	Major Trip Attractor Accessibility by Active Travel	Options to provide safe, high quality active travel routes that enable easy access to major trip attractors (e.g. hospitals, major employment sites) in Scotland's cities and towns

Category	Grouping Name	Grouping Description
Active Travel	Liveable Neighbourhoods	Options to make urban and suburban neighbourhoods in Scotland's cities and towns more conducive for active travel by improving conditions for walking, wheeling and cycling and reducing traffic dominance
Active Travel	Strategic Road Severance	Options to improve facilities and crossings for pedestrians and cyclists in locations where strategic roads have a significant severance effect in communities
Active Travel	Public Bike Hire Schemes	Options to facilitate the roll out of public bike hire schemes to enable their use by more people in more locations across Scotland
Active Travel	Quiet Roads	Options to implement quiet roads, potentially including measures such as traffic calming measures and speed limit reductions that form parts of strategic active travel networks, where appropriate
Active Travel	School Active Travel	Options to provide opportunities for safe and high quality active travel routes that enables school pupils resident in Scotland's cities and towns to walk, wheel or cycle to school
Active Travel	Strategic Expansions of the National Cycle Network	Options to expand the NCN to reach more settlements and complete strategic gaps in the network.
Active Travel	Footway Enhancements on Strategic Routes	Options to upgrade existing footways on trunk roads and principal routes in our towns and cities, such as width, surfacing, drainage and drop kerbs at crossings. In addition, safe crossing facilities on major desire lines and adequate security (such as sightlines, lighting) where feasible.

Category	Grouping Name	Grouping Description
Active Travel	Strategic Active Travel Corridors within and between Urban Areas (Active Freeways)	Options to provide high quality, segregated active travel routes on major distributor routes in Scotland's towns and cities, with connections to major trip attractors
Active Travel	Thriving Centres	Options to make town and neighbourhood centres more conducive for active travel by improving the urban realm and reducing the dominance of vehicular traffic and car parking
Active Travel	Transport Node Connectivity	Options to provide high quality active travel routes between public transport nodes (rail stations, bus stations, interchange facilities) and their catchments (such as residential and key trip attractors), along with high quality cycle parking at the nodes
Active Travel	Village – Town Active Travel Connections	Options to provide active travel routes from villages to a nearby town or regional centre.
Active Travel	Former Rail Route Re-use for active travel	Options to create more active travel routes on former rail lines
Active Travel	Urban Placemaking	Options to facilitate placemaking schemes to improve the quality and ambiance of street spaces in Scotland's cities, towns and villages
Behaviour Change	School Streets	Options to facilitate traffic exclusion zones on streets where it is appropriate to do so near schools at school start/end times
Behaviour Change	National Behaviour Change Programme	Options to implement a national, long-term campaign to promote the benefits of active and sustainable travel and give information on appropriate opportunities to do so

Category	Grouping Name	Grouping Description
Behaviour Change	Regional Behaviour Change Programmes	Options to support regional, long-term campaigns to promote the benefits of active and sustainable travel and give information on appropriate local opportunities to do so
Behaviour Change	Expansion of Car Clubs	Options to expand car club availability and use across Scotland
Behaviour Change	Improved Information on Sustainable Travel Modes	Options to improve information (such as printed, real time and on-vehicle announcements) about active and sustainable travel routes and services
Behaviour Change	Sustainable Travel towns/Cities	City/Town-wide initiatives to give a holistic programme of promotion on active and sustainable travel choices
Behaviour Change	Road Safety Campaigns	Options that consider a national, long-term campaign (and/or support local/regional campaigns) to promote better driver behaviour and reduce road safety fears including people travelling actively
Behaviour Change	Travel Demand Management	Measures to effectively manage travel demand and encourage more sustainable travel options.
Behaviour Change	Low Emission Zones (LEZ)	Options related to Low Emission Zones (LEZ), i.e. where only certain vehicles are allowed to enter, based on their emissions standards.
Bus	Bus Priority Infrastructure	Options to increase the roll out of bus priority measures, and where already available, improve existing measures
Bus	Decarbonisation of the Bus Network	Options related to decarbonisation of the bus network (incl. fleet).

Category	Grouping Name	Grouping Description
Bus	Demand Responsive Transport (DRT) / Community Transport	Measures to support Demand Responsive (DRT) and Community Transport, excluding revenue funding
Rail	Central & North East Scotland Rail Improvements	Options to improve capacity, frequency and reliability of train services, such as, train lengthening and linespeed improvements
Rail	Glasgow, West Coast and South West Scotland Rail Improvements	Options to improve capacity, frequency and reliability of train services, such as, train lengthening and linespeed improvements
Rail	Edinburgh, East Coast and Borders Rail Improvements	Options to improve capacity, frequency and reliability of train services, such as, train lengthening and linespeed improvements
Rail	Highland and Far North Rail Improvements	Options to improve capacity, frequency and reliability of train services, such as, train lengthening and linespeed improvements
Rail	Decarbonisation of the Rail Network	Options related to decarbonisation of the rail network (incl. rolling stock).
Rail	High Speed Rail	Development of High Speed Rail north of HS2 to Scotland and / or within Scotland
Rail	New Rail Lines, Including Re-Opening of Disused Lines for rail services	Options related to re-opening of disused rail corridors for rail and opening new rail lines including associated new stations
Rail	New Rail Stations	Options related to opening new rail stations on the existing rail network

Category	Grouping Name	Grouping Description
Rail	New Sleeper Routes	Option related to the introduction of new or extensions to existing rail sleeper routes
Rail	Rolling Stock Quality	Improvements to the quality of heavy rail rolling stock not already committed to within the relevant ScotRail and Caledonian Sleeper franchise. This does not include decarbonisation options which are covered under RL5.
Public Transport	Public Transport Network Coverage, Frequency and Service Integration	Options to improve the network coverage, frequency and service integration of bus and rail, excluding revenue funding. Particularly access to key services such as healthcare, education, leisure and retail**.**
Public Transport	Mobility Hubs and Multi-modal Interchanges	Implement new / upgrade existing strategically important mobility hubs, Park & Ride sites and other multi-modal interchanges.
Public Transport	Regional Passenger Facilities/Station Enhancements	Bus and rail passenger facilities and station enhancement improvements, including improved accessibility to facilities for passengers with reduced mobility.
Public Transport	Integrated Public Transport Ticketing	Integration of ticketing across public transport (bus, rail, light rail and ferries).
Ferries / Island Connectivity	Ferry Service Improvements on the CHFS and NIFS network	Options related to CHFS or NIFS network that suggest a change to ferry services, such as capacity, frequency or related port infrastructure.
Ferries / Island Connectivity	New Ferry Routes (Internal to Scotland)	Options related to new internal ferry routes (within Scotland) which may reduce operating costs or subsidy on the CHFS or NIFS network.

Category	Grouping Name	Grouping Description
Ferries / Island Connectivity	New International Ferry Routes	Options relating to new international ferry services that could bring positive economic benefit to Scotland but which are not sufficiently attractive to the market.
Ferries / Island Connectivity	Decarbonisation of Ferry Network	Options related to decarbonisation of the ferry network (incl. vessels).
Ferries / Island Connectivity	Fixed Links	Options related to fixed links which meet at least one of the following criteria: Connect the Scottish mainland to an island; Reduce the operating costs of the CHFS or NIFS network; Address a strategic problem as identified through evidence-based appraisal that cannot be addressed by reasonable alternatives.
Road	North West Scotland Trunk Road Network Improvements	Package of measures to improve the capacity, reliability and resilience of routes, such as overtaking opportunities, partial dualling, junction improvements and route realignment.
Road	North East Scotland Trunk Road Network Improvements	Package of measures to improve the capacity, reliability and resilience of routes, such as overtaking opportunities, partial dualling, junction improvements and route realignment.
Road	South West Scotland Trunk Road Network Improvements	Package of measures to improve the capacity, reliability and resilience of routes, such as overtaking opportunities, partial dualling, junction improvements and route realignment.
Road	South East Scotland Trunk Road Network Improvements	Package of measures to improve the capacity, reliability and resilience of routes, such as overtaking opportunities, partial dualling, junction improvements and route realignment.

Category	Grouping Name	Grouping Description
Road	Low Emission/Ultra Low Emission/Electric Vehicle National Action Plan	A National Action Plan to support the shift to Low Emission/Ultra Low Emission/Electric Vehicles and help deliver Scottish Governments net zero targets.
Road	Road Safety (Vision Zero) Measures	A national package of road safety measures, such as road safety campaigns and technology to target casualty reduction.
Road	Trunk Road Space Reallocation	Package of measures to reallocate road space on the trunk road network, such as reduction of on-street parking, high occupancy vehicle lanes and no parking zones.
Road	Review of speed limits (national)	Review of speed limits across the road network, including the potential to implement 20mph zones
Freight	Decarbonisation of Freight Deliveries	Measures to encourage low carbon fuels (including electric, hydrogen, CNG/LNG) that will decarbonise the freight transport sector in line with the Scottish Government targets and commitments.
Freight	Freight Consolidation Measures	Measures related to Freight Consolidation and Multimodal Hubs to help facilitate sustainable freight deliveries.
Freight	Freight Rest Stops	Measures to help facilitate the introduction of freight rest stops for HGV drivers to take breaks and rest periods as required by regulation.
Freight	Freight Reliability and Efficiency Improvements	Measures aimed at improving the reliability and efficiency of freight journeys.

Category	Grouping Name	Grouping Description
Freight	Last-Mile Logistics	Moving freight deliveries to low/zero carbon forms of transport, by encouraging the use of active travel measures and electric vehicles to service last-mile logistics
Freight	Sustainable Modal Shift of Freight	Transferring the delivery of freight from road vehicles to more sustainable modes, such as rail and water freight.
Freight	Rail Freight Enhancements	Measures to facilitate the growth of rail freight in Scotland, such as Gauge, Route Availability, Trailing Length, Terminals and Pathing
Technology	Connected Autonomous Vehicles (CAV)	Measures related to Connected Autonomous Vehicles (CAV), i.e. the operation of vehicles without direct driver input to control. This grouping relates to all modes of transport.
Technology	Co-operative Intelligent Transport Systems (C-ITS)	Measures related to C-ITS, which are a group of technologies and applications that allow effective data exchange through wireless technologies between vehicles and infrastructure which can also be applied to vulnerable road users such as pedestrians, cyclists or motorcyclists.
Technology	Transport Scotland Operational Communications	Options related to both wireless and fibre communications to support the management and operation of Transport Scotland services
Technology	Nationwide Open Data, Passenger Information and Communications	Options related to transport data and the provision of public transport information and passenger communications for journey planning.
Technology	Adaptive Traffic Control on the Trunk Road	Options that allow optimisation of the performance of the Trunk Road Network through adaptive control.

Category	Grouping Name	Grouping Description
Technology	Incident Management System Upgrade	Measures to improve the system software or architecture of Incident Management Systems.
Technology	Control Centre of the Future	Development of operation functions and procedures within the Traffic Scotland National Control Centre to adapt to changing requirements
Technology	Intelligent Transport Systems (ITS) Roadside Infrastructure on Motorways and Trunk Road Network	Options to improve transport outcomes such as transport safety, transport productivity, travel reliability, informed travel choices, social equity, environmental performance and network operation resilience
Multimodal	Improve Routes to Major Ports and Airports	Options related to improving surface access to Major Ports and Airports, by all modes.
Multimodal	Improved Resilience of the trunk road and rail networks	Options to improve the resilience of the trunk road and rail network including the impacts from climate change.
Multimodal	Mobility as a Service (MaaS) Digital Platform	Options which assist in the development and adoption of a MaaS digital platform for Scotland across a wide range of existing public, shared and demand-responsive transport services.
Mass Transit	Glasgow Metro	Development of the public transport network within the Glasgow city region, with consideration of bus rapid transport, rail conversion, light rail and underground elements

Category	Grouping Name	Grouping Description
Mass Transit	Edinburgh Mass Transit Options	Development of the public transport network within the Edinburgh City Region with consideration of bus rapid transit, rail conversion, and tram network extension
Mass Transit	Aberdeen Mass Transit Options	Development of the public transport network within the Aberdeen City Region, with consideration of bus rapid transit, and light rail

5.3. Next Steps

This chapter has described the process undertaken to arrive at a list of options for STPR2. These options presented as Groupings will be taken forward for more detailed development and appraisal through the next stage of the STPR2 process.

This will include an assessment of the likely impacts of Groupings against the:

- STPR2 Transport Planning Objectives;
- STAG criteria [i.e. Environment, Safety, Economy, Integration, and Accessibility and Social Inclusion];
- Established policy directives; and
- Feasibility, affordability and public acceptability of options.

Commenting on the Report

As part of the STPR2 engagement process, feedback on the Transport Options contained within this STPR2 Case for Change report can be submitted using a comments form that can be accessed here. The closing date for comments is midnight on 31 March 2021.

APPENDICES

Jacobs AECOM

Appendix A: Figures

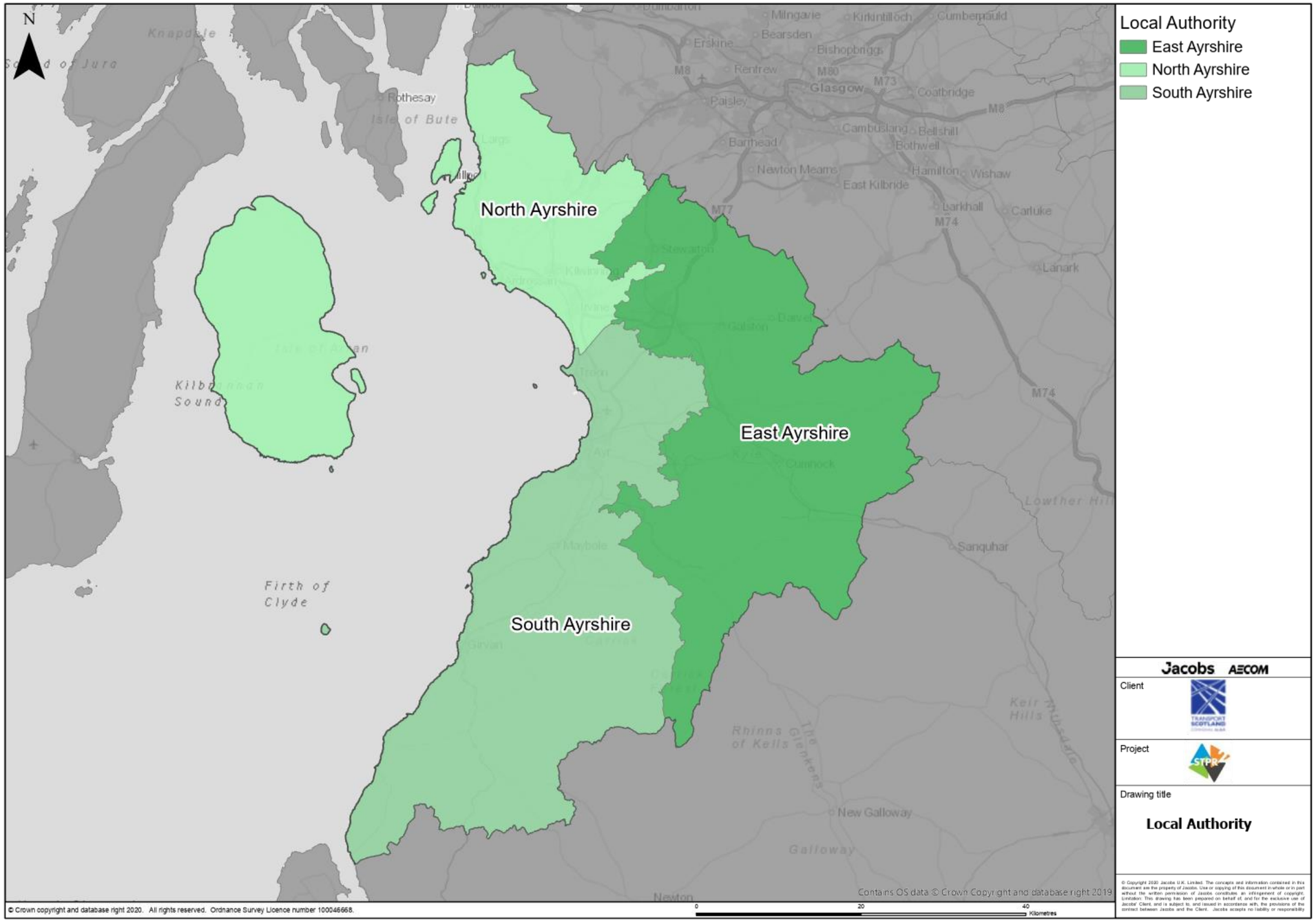


Figure A 1: Ayrshire & Arran Study Area (Click image to go back to main report)

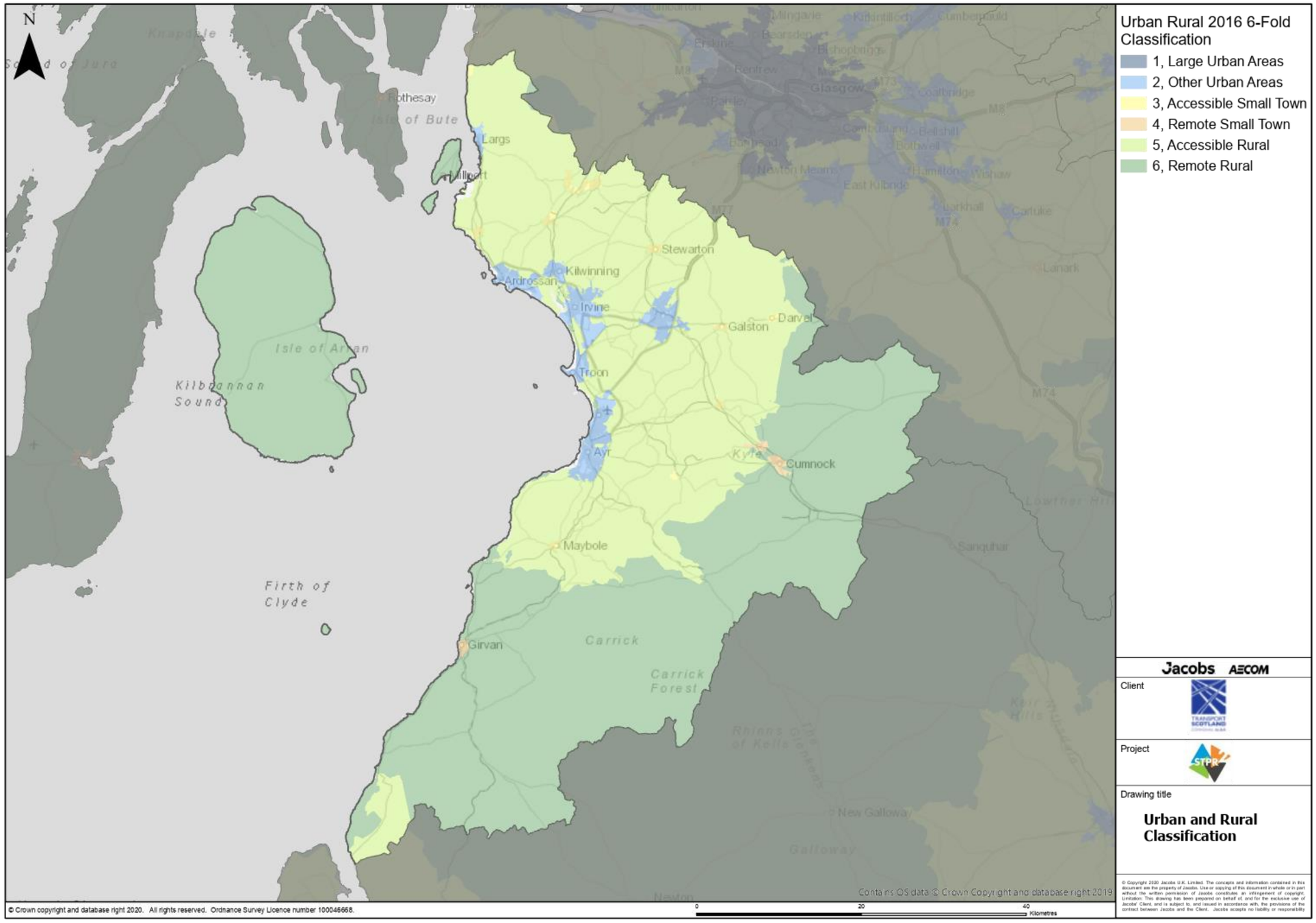


Figure A 2: Urban Rural 2016 6-Fold Classification (Click image to go back to main report)

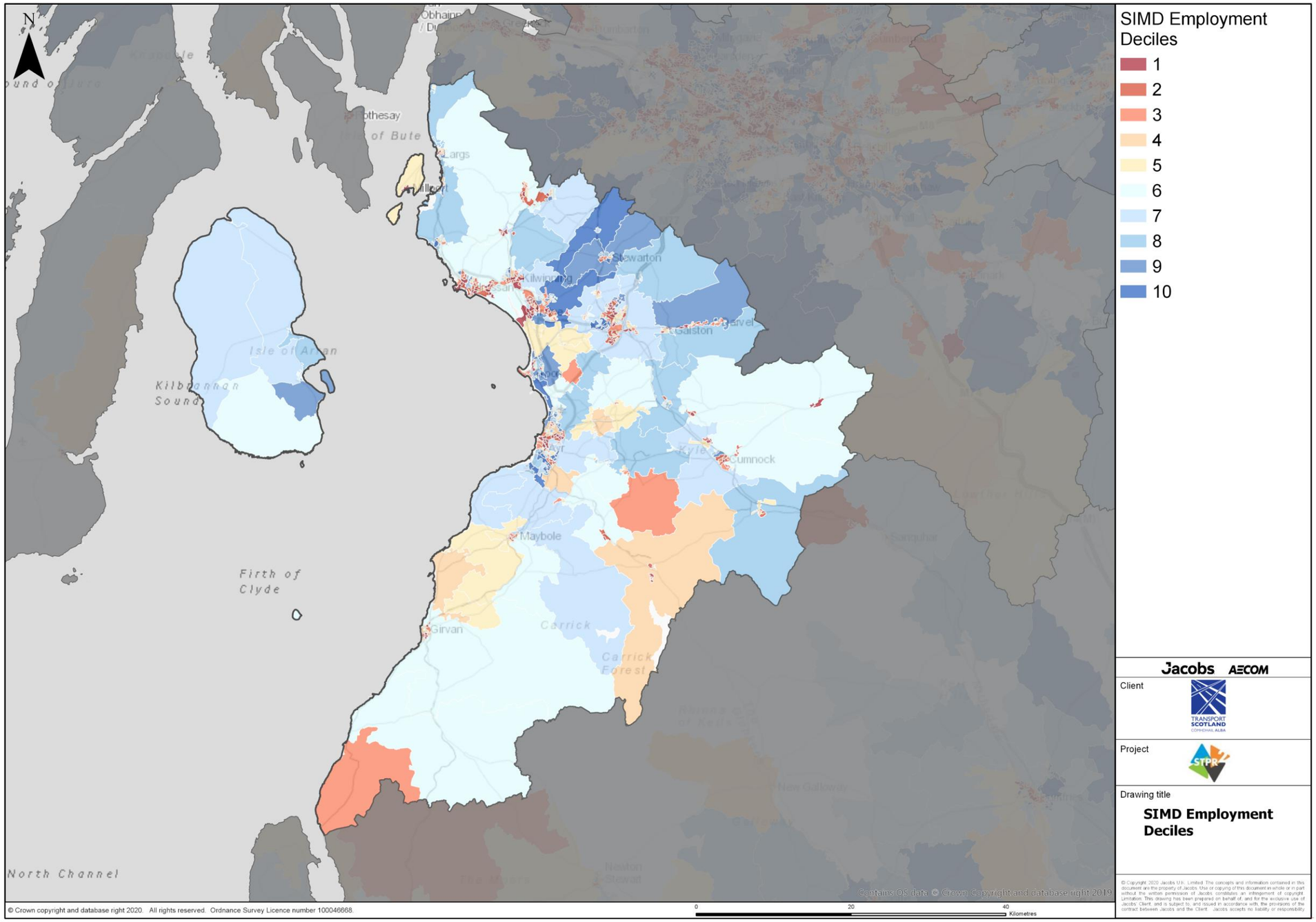


Figure A 3: SIMD Employment Domain 2020 (Click image to go back to main report)

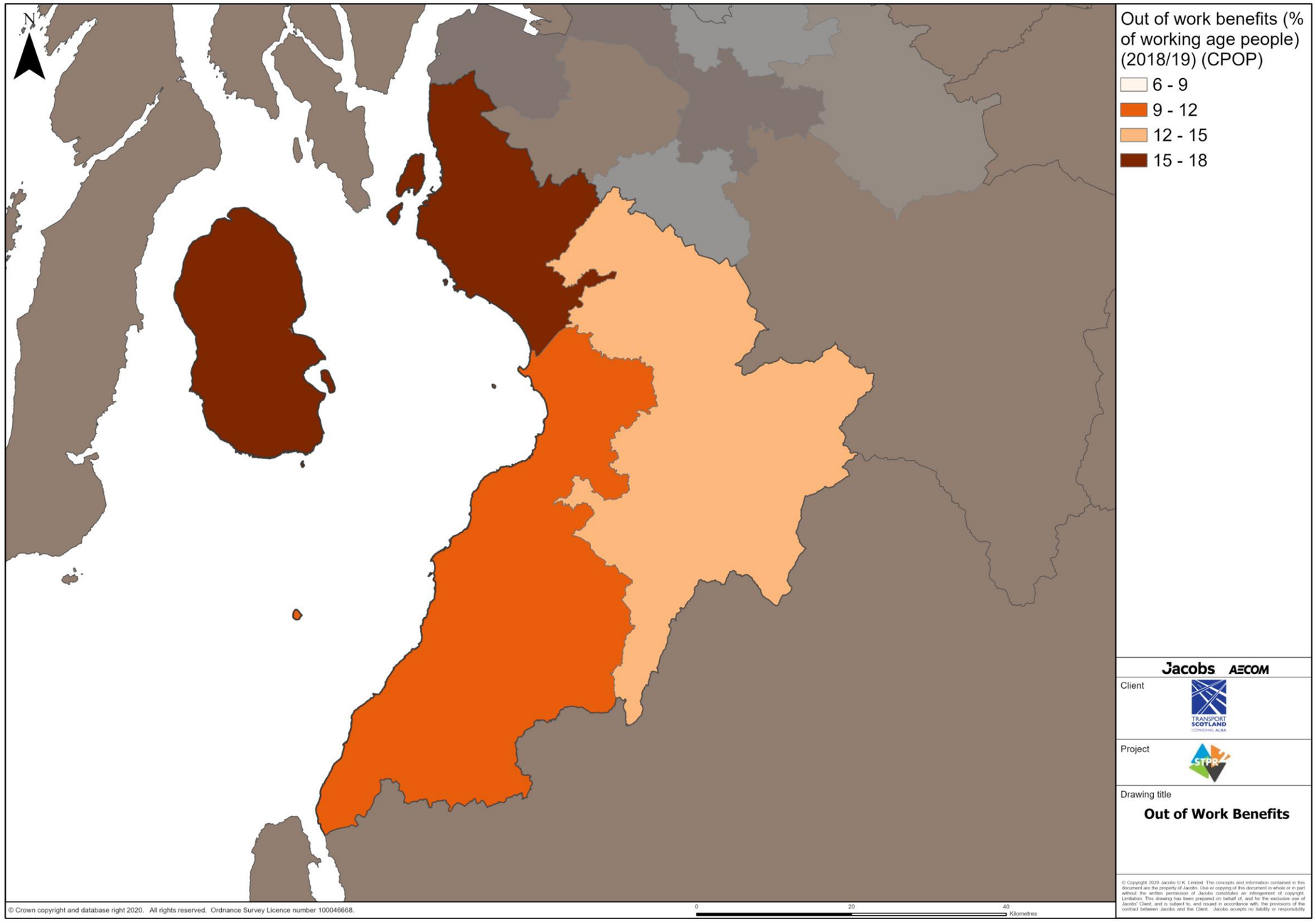


Figure A 4: Out of Work Benefits (Click image to go back to main report)

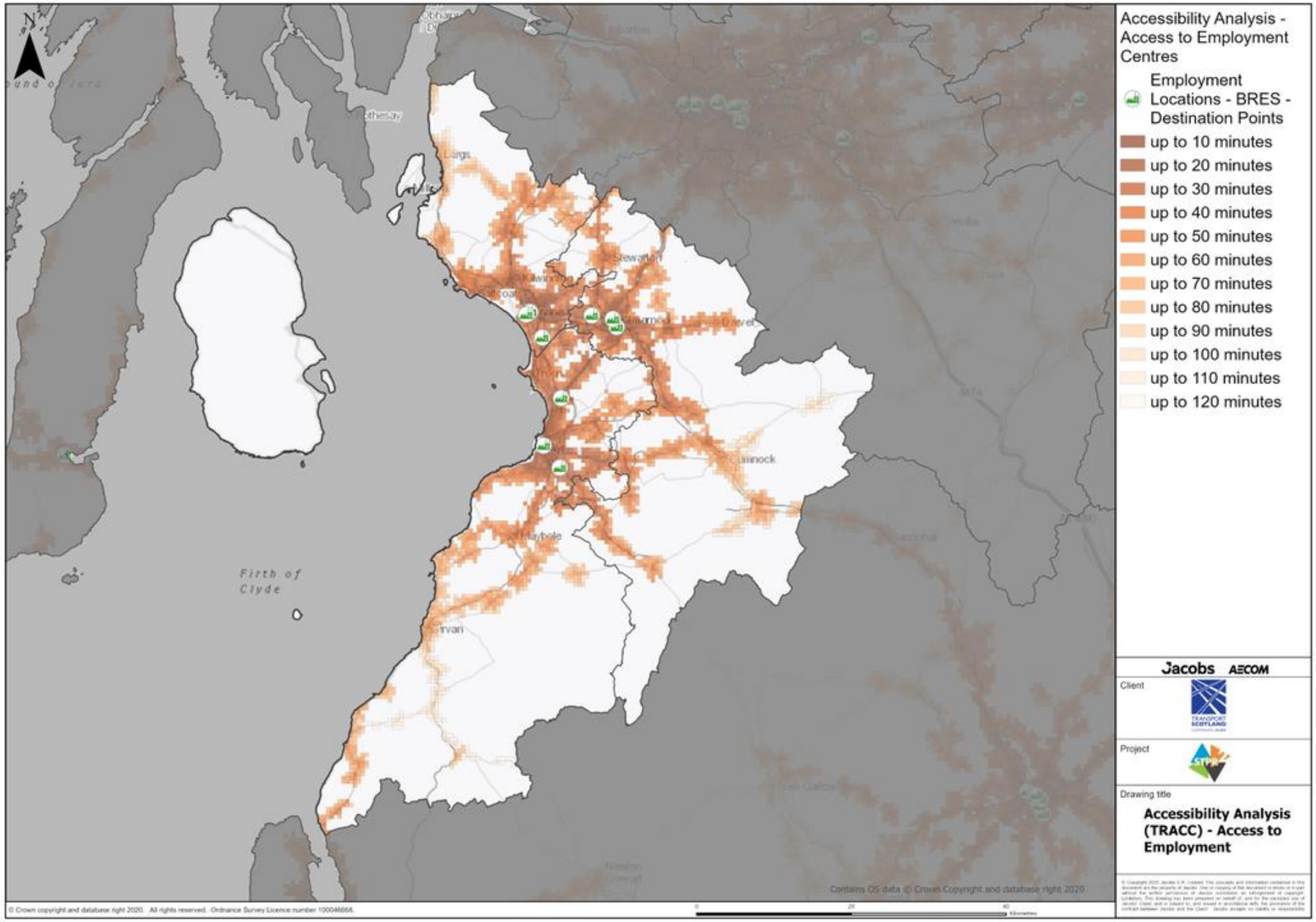


Figure A 5: TRACC Public Transport Access to Employment (Click image to go back to main report)

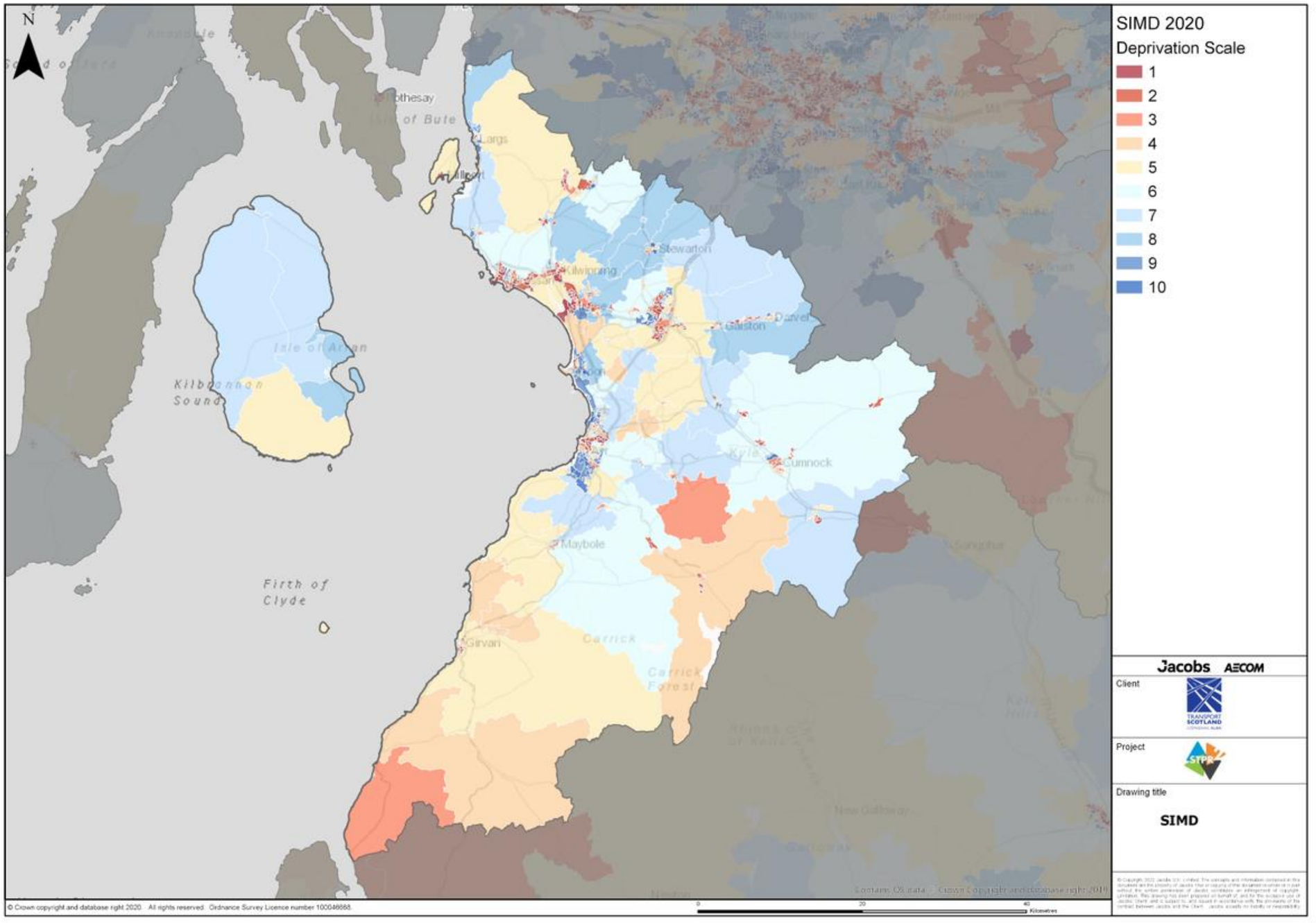


Figure A 6: Scottish Index of Multiple Deprivation 2020 (Click image to go back to main report)

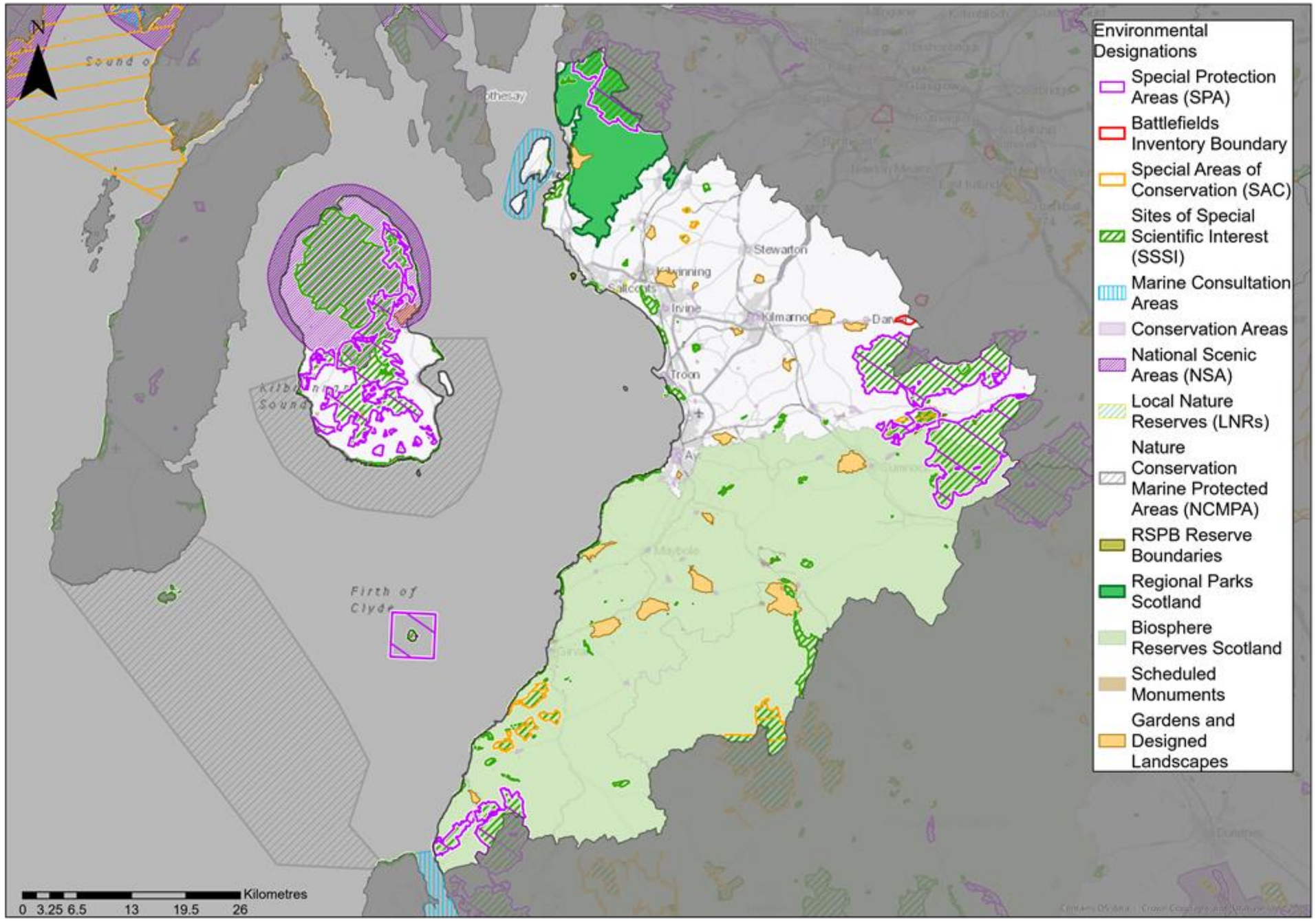


Figure A 7: Environmental Designations (Click image to go back to main report)

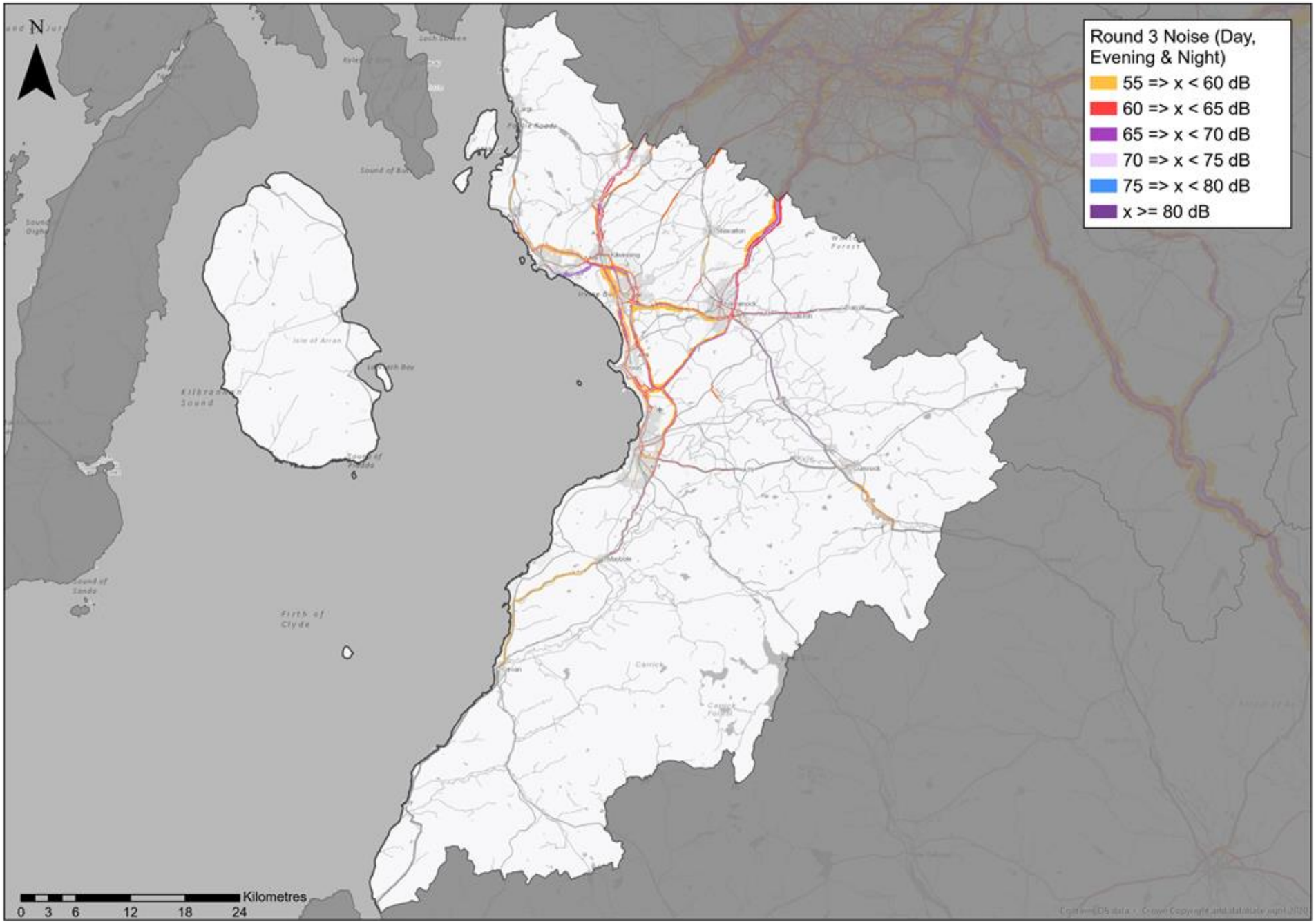


Figure A 8: Noise Mapping for Ayrshire and Arran region (Click image to go back to main report)

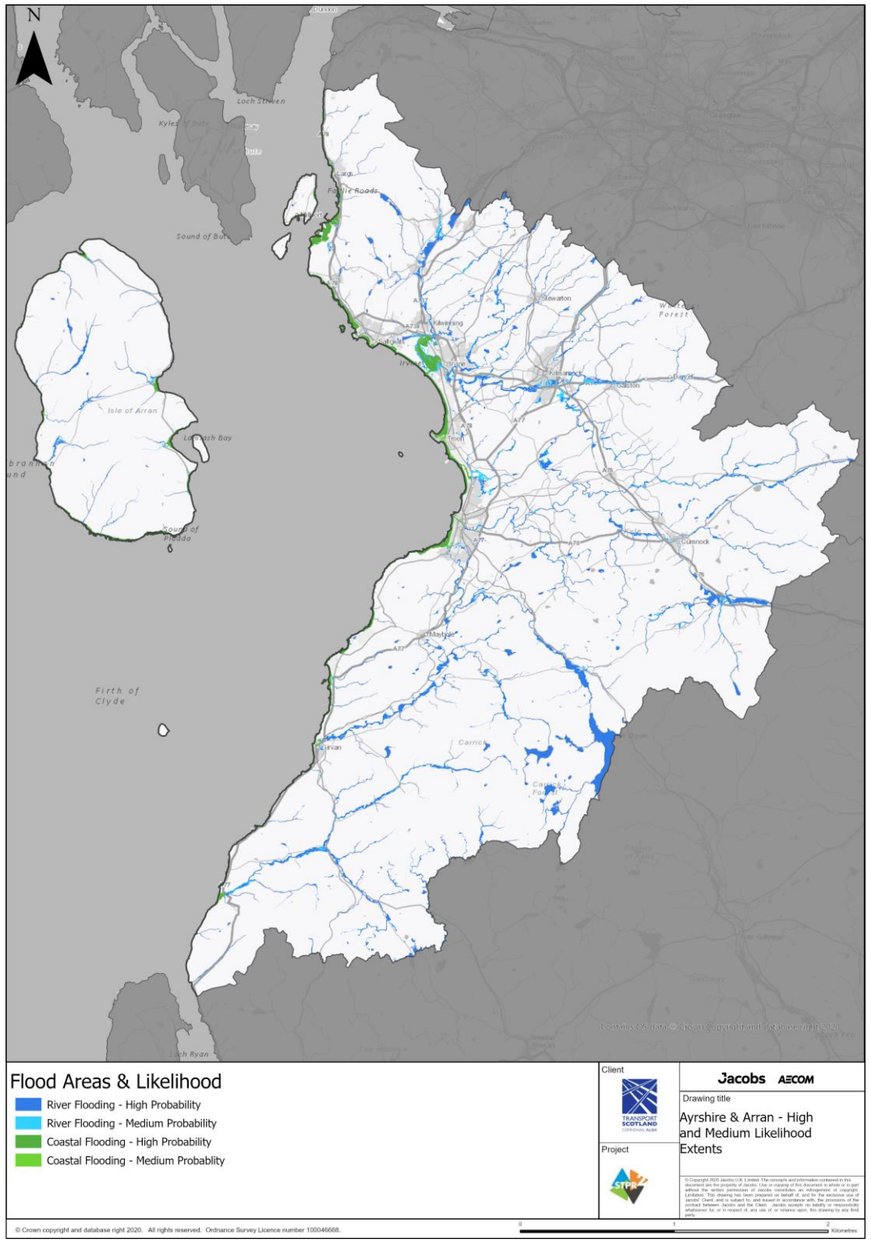


Figure A 9: Ayrshire and Arran Region Flood Map (Click image to go back to main report)

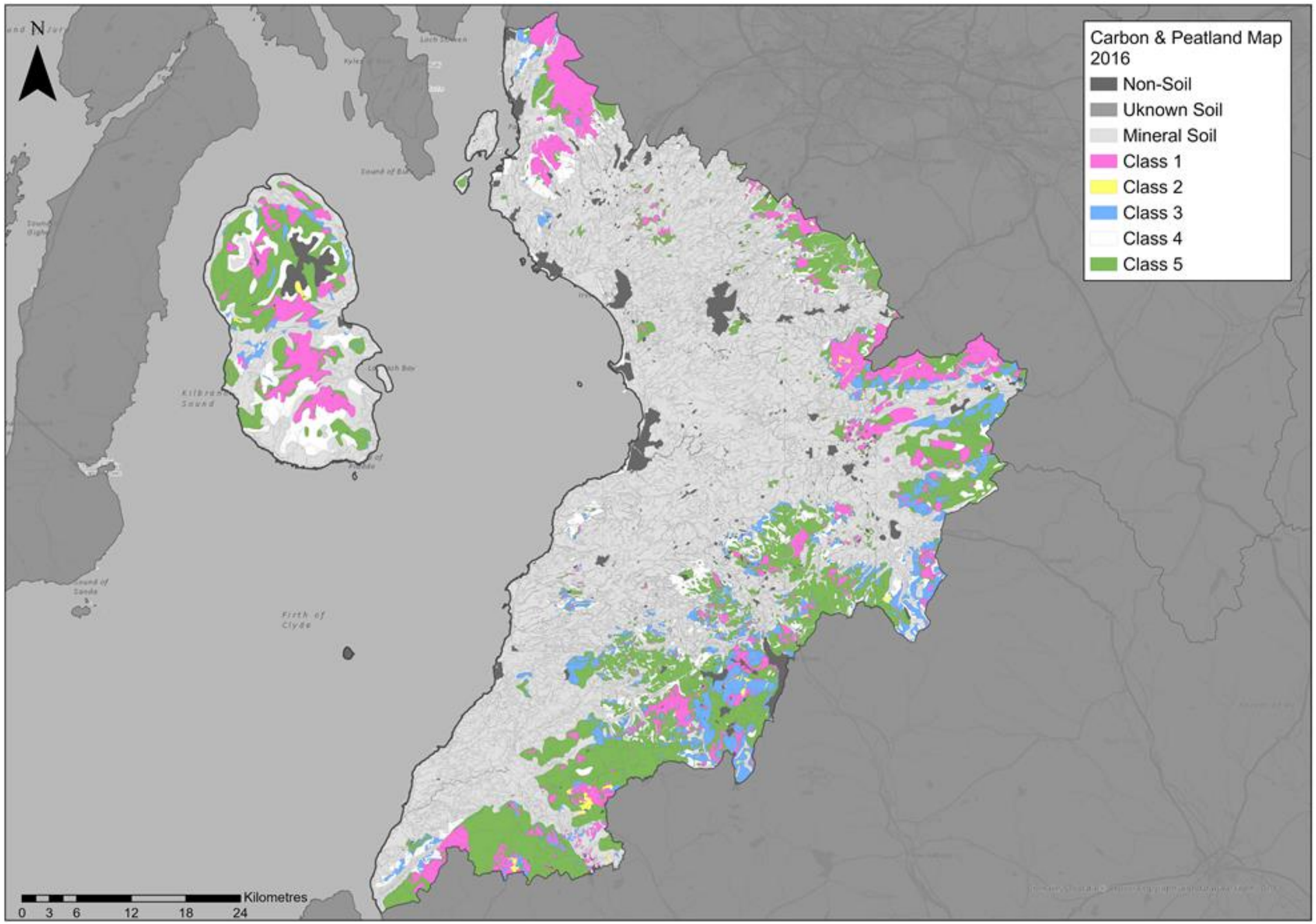


Figure A 10: Carbon and Peatland Map for Ayrshire and Arran region (Click image to go back to main report)

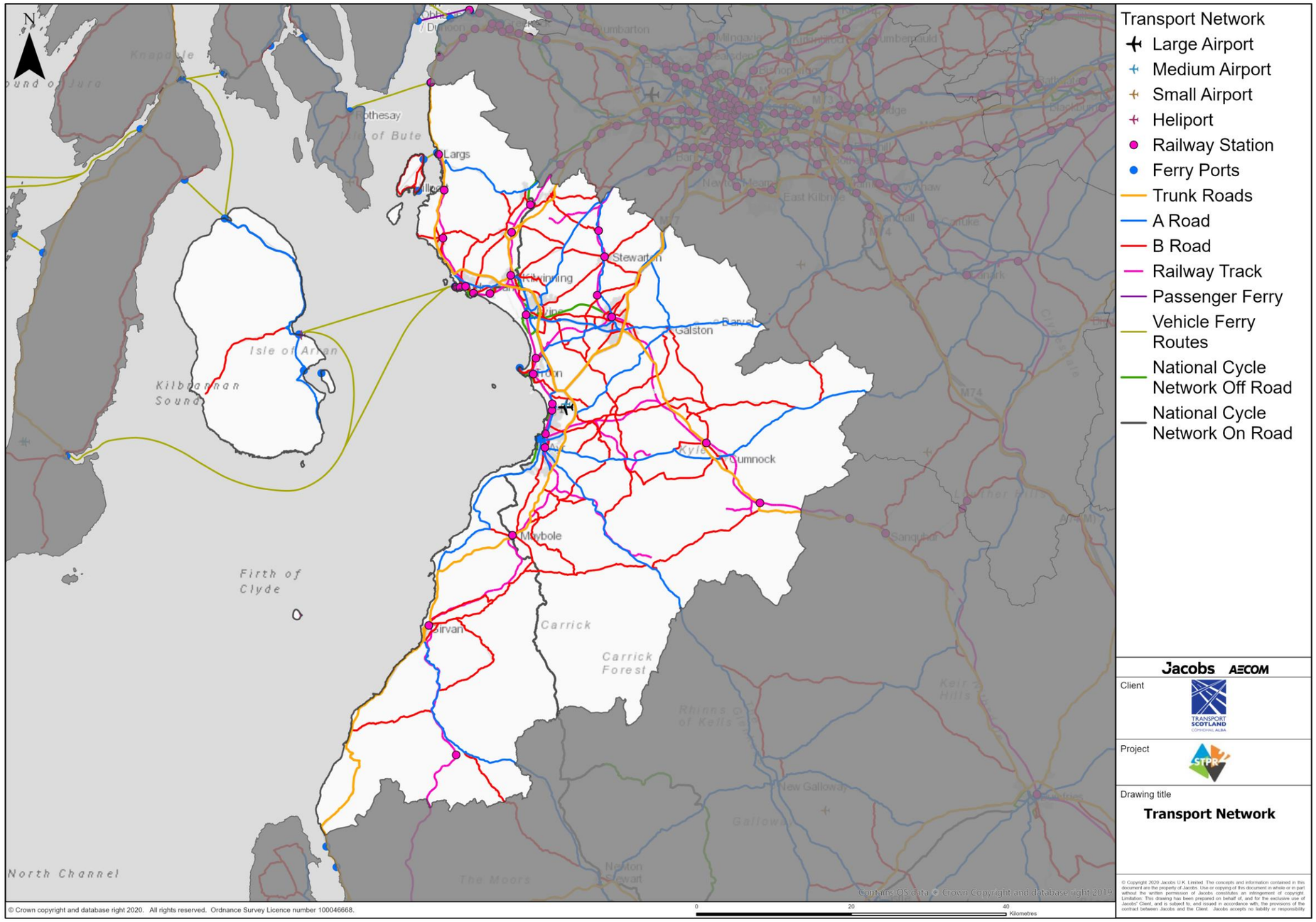


Figure A 11: Ayrshire & Arran Transport Network (Click image to go back to main report)

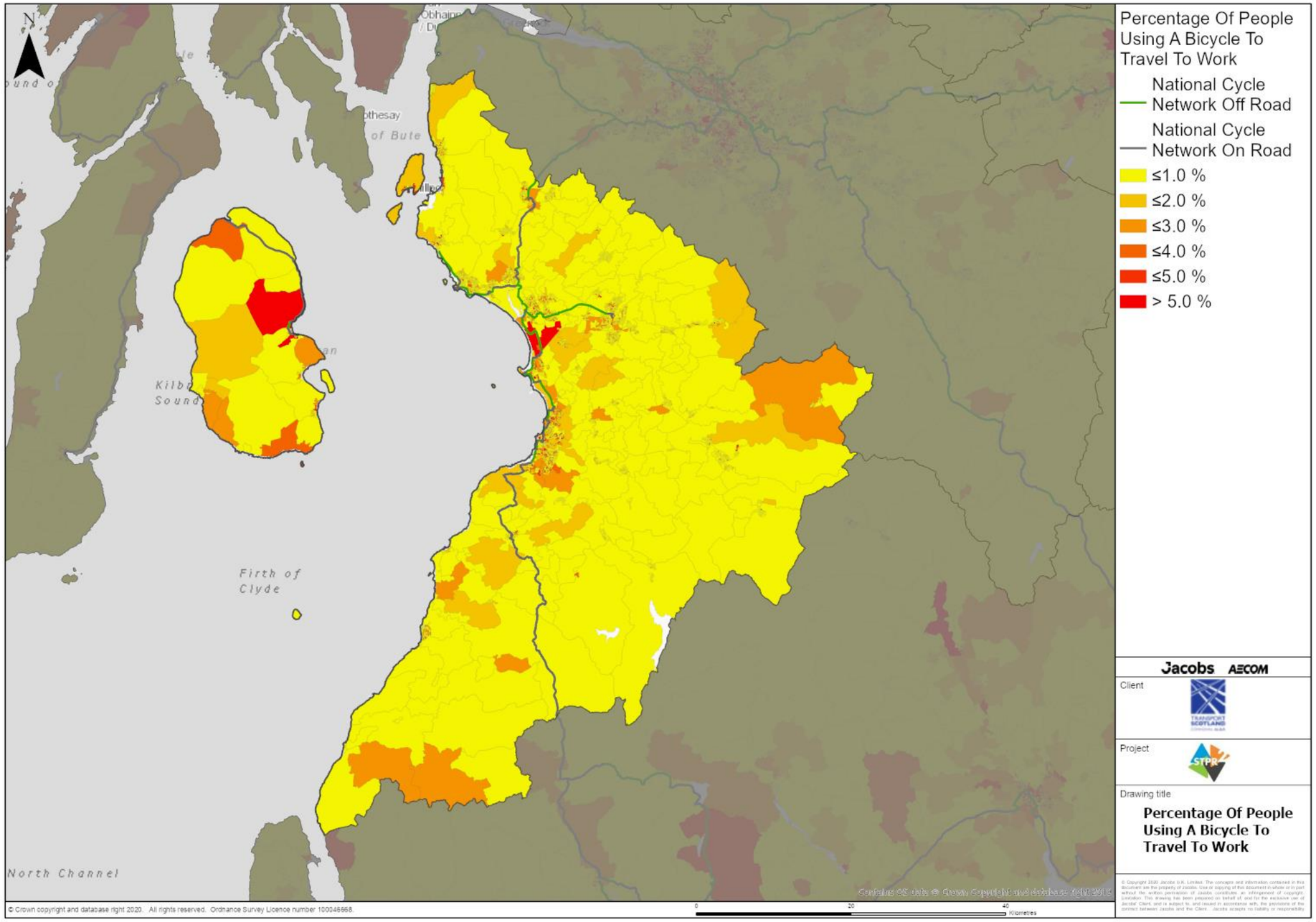


Figure A 12: Percentage of People Travelling to Work by Bicycle (Click image to go back to main report)

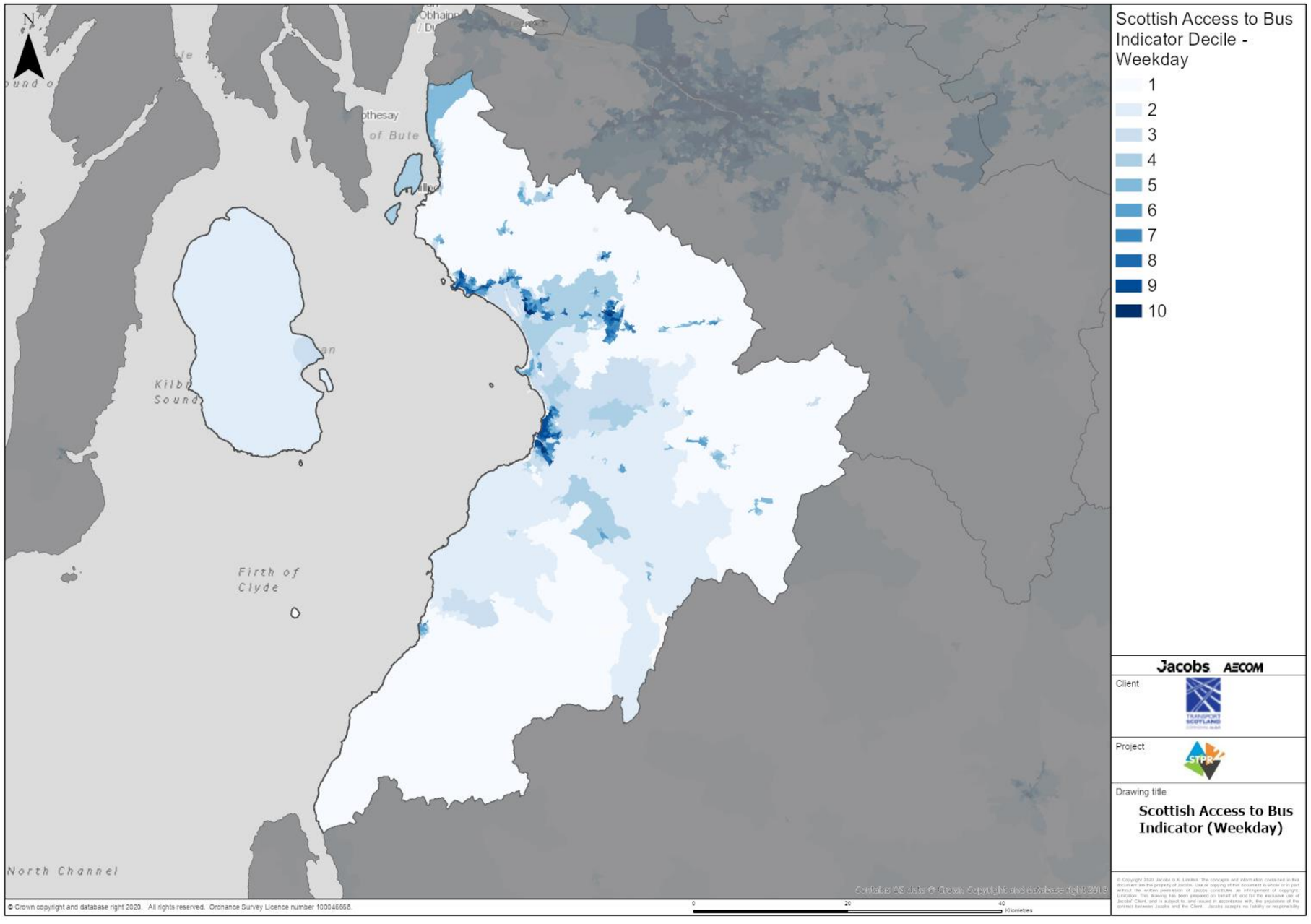


Figure A 13: Scottish Access to Bus Indicator, Weekday (Click image to go back to main report)

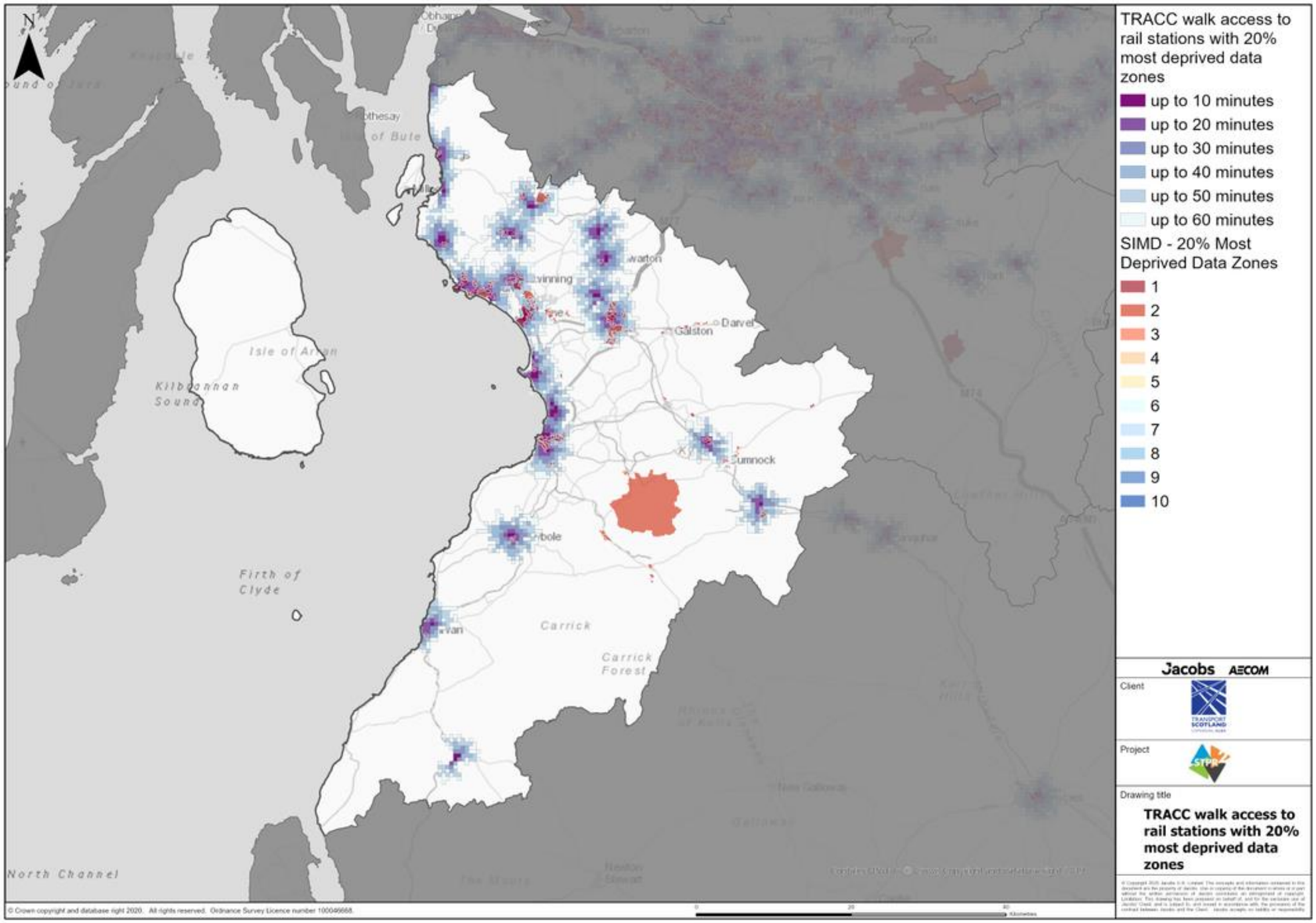


Figure A 14: TRACC Walk Access to Rail Stations and 20% most deprived SIMD data zones (Click image to go back to main report)

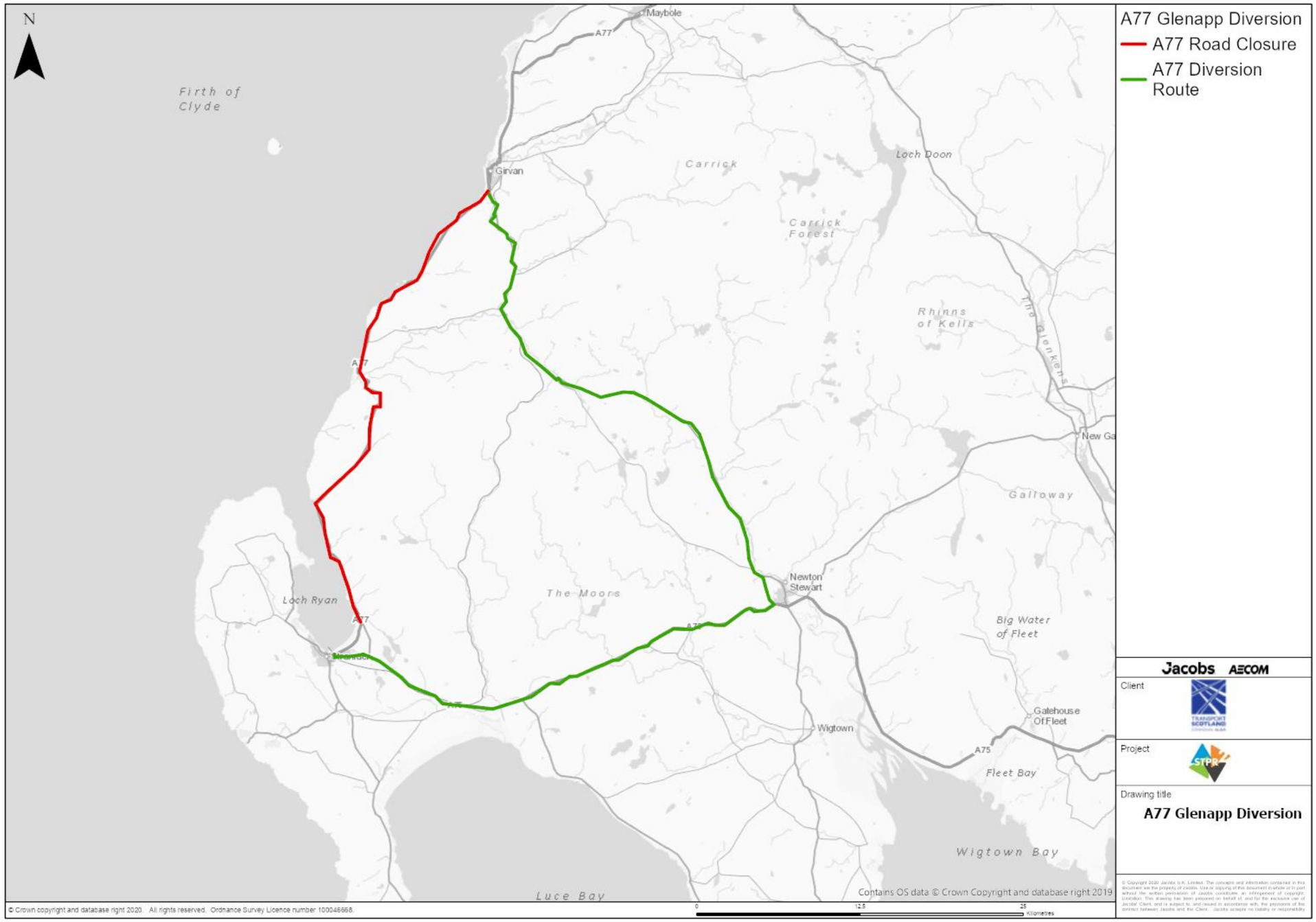


Figure A 15: A77 Diversionary Route (Click image to go back to main report)

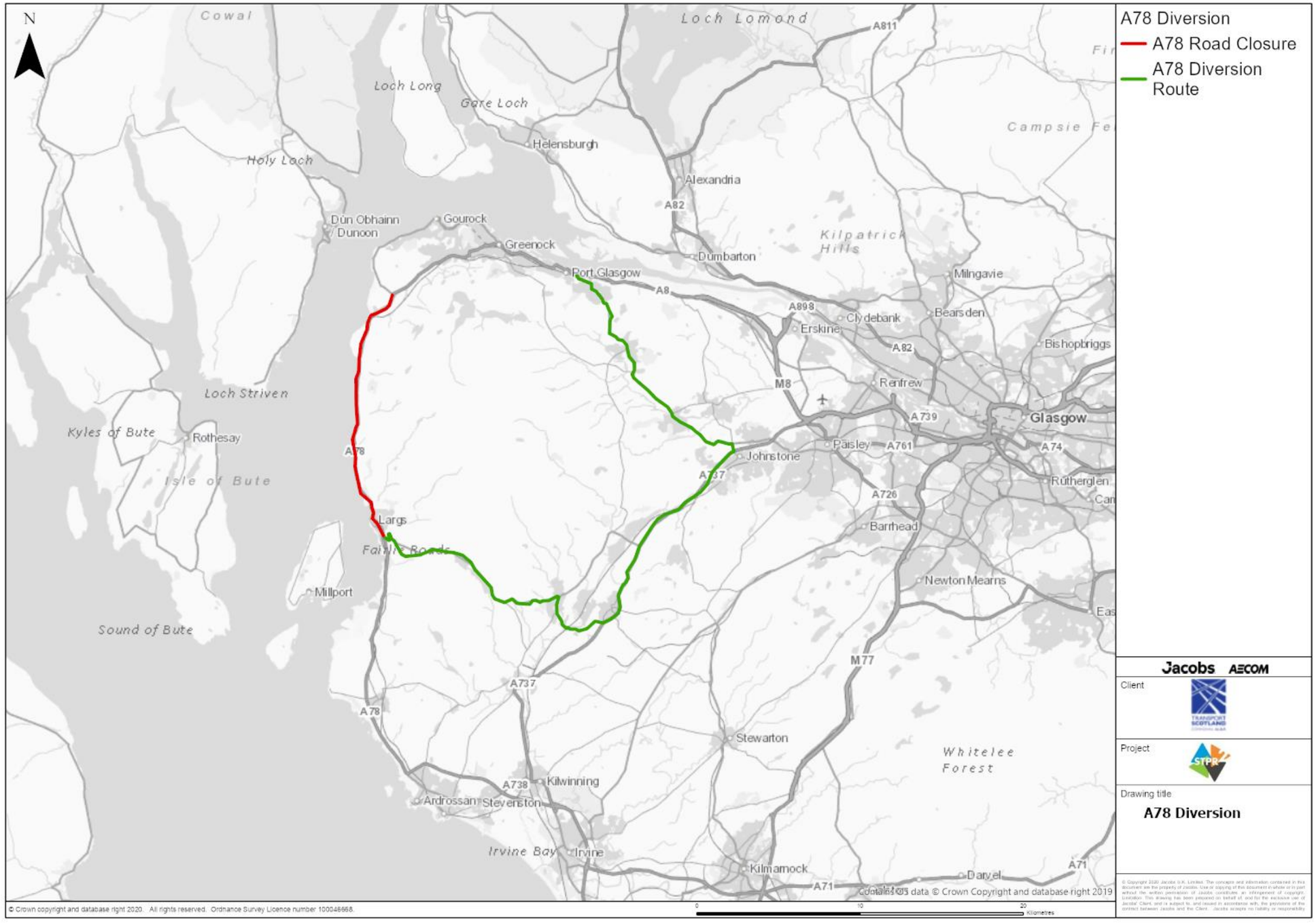


Figure A 16: A78 Diversionary Route (Click image to go back to main report)

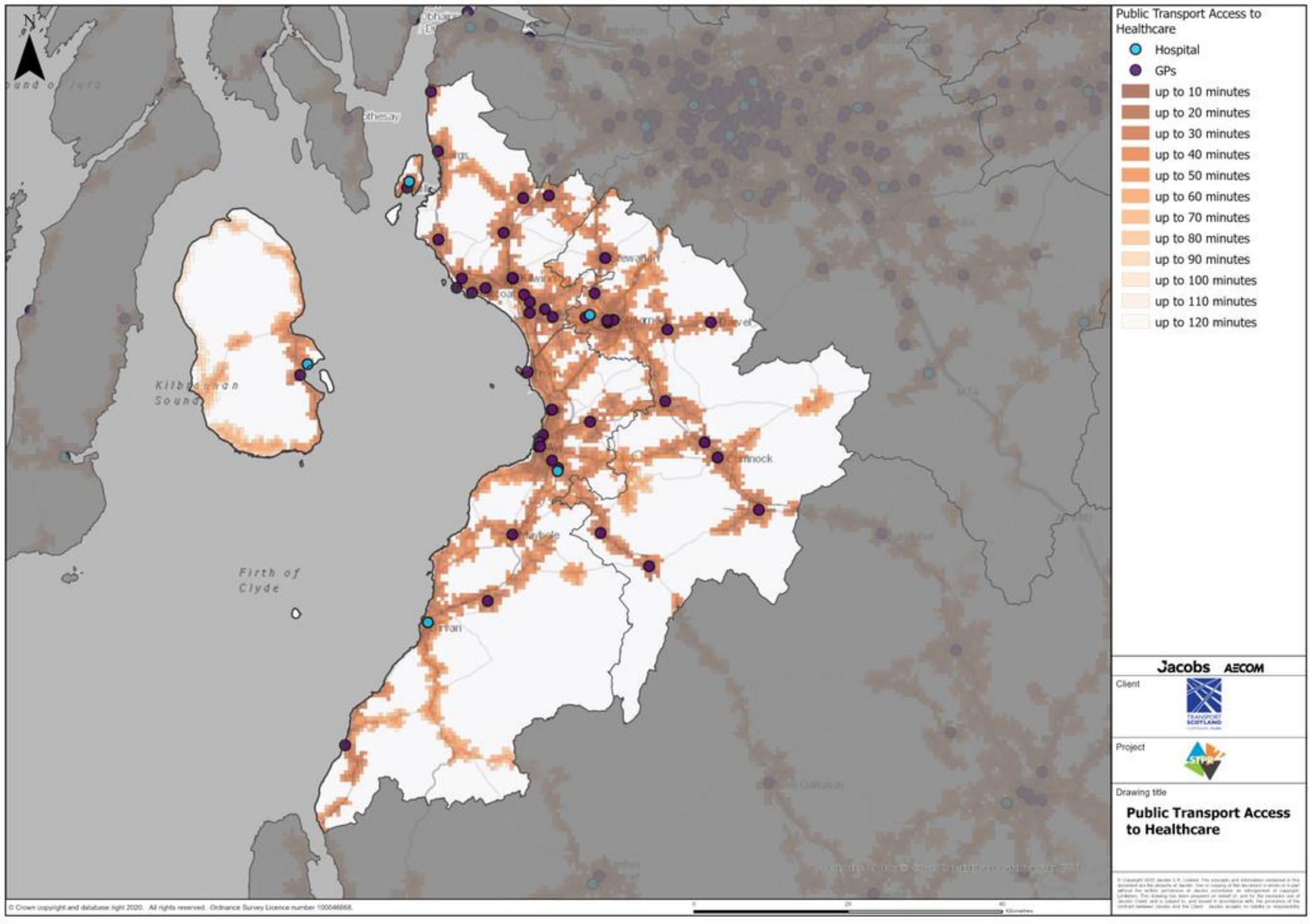


Figure A 17: TRACC Access to Healthcare (Click image to go back to main report)

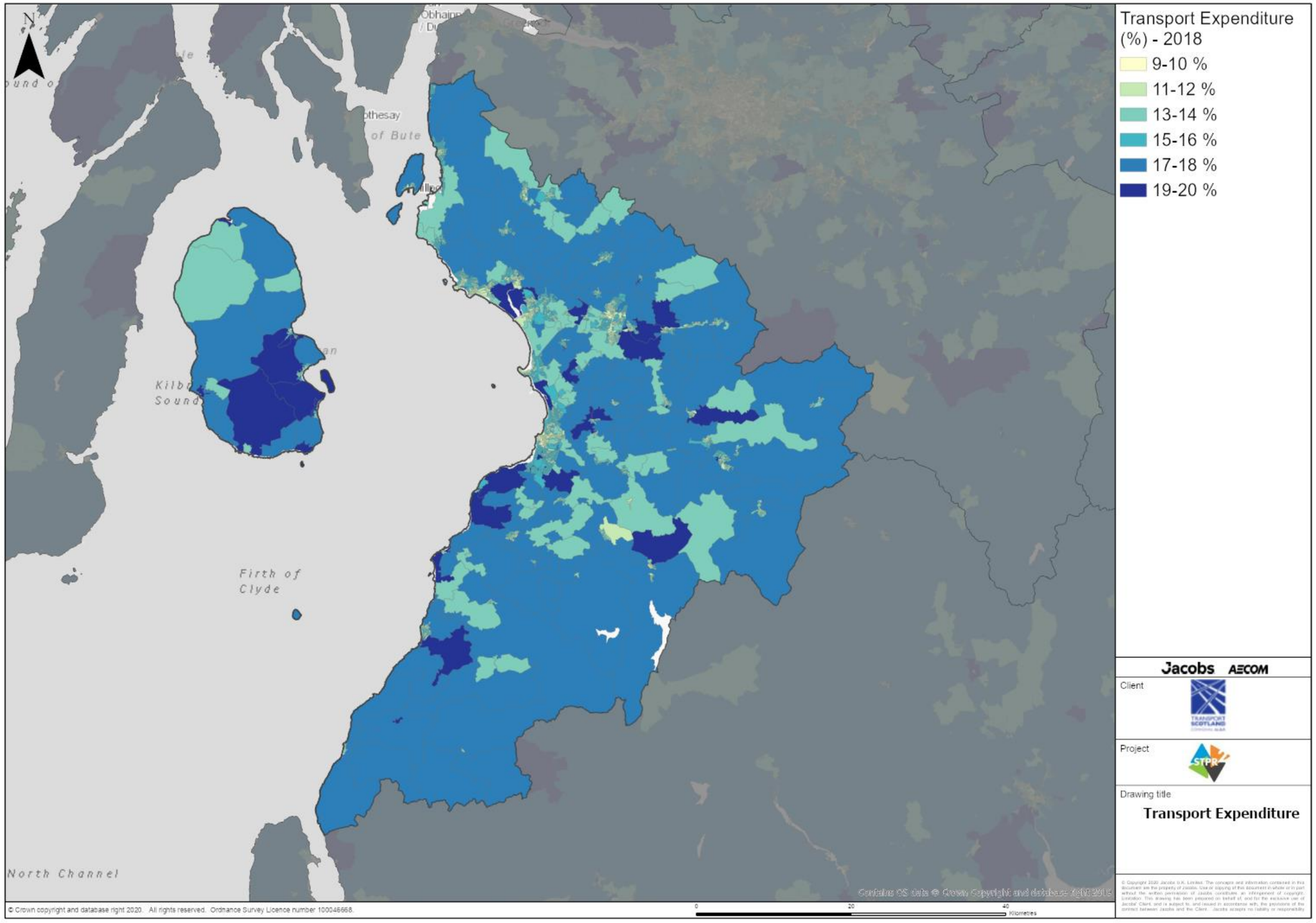


Figure A 18: Transport Expenditure in Ayrshire & Arran (Click image to go back to main report)

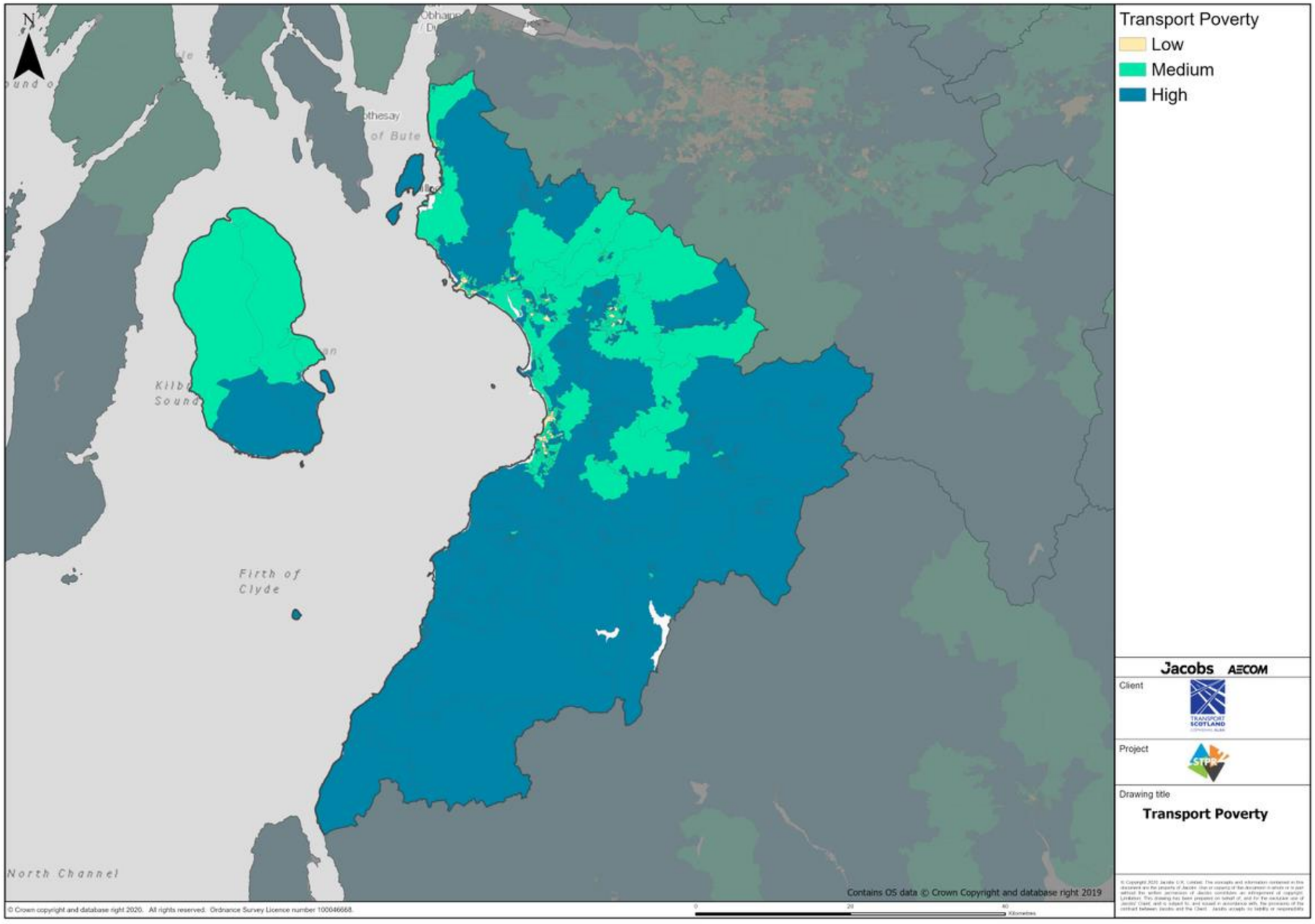


Figure A 19: Transport Poverty in Ayrshire & Arran 2020 (Click image to go back to main report)

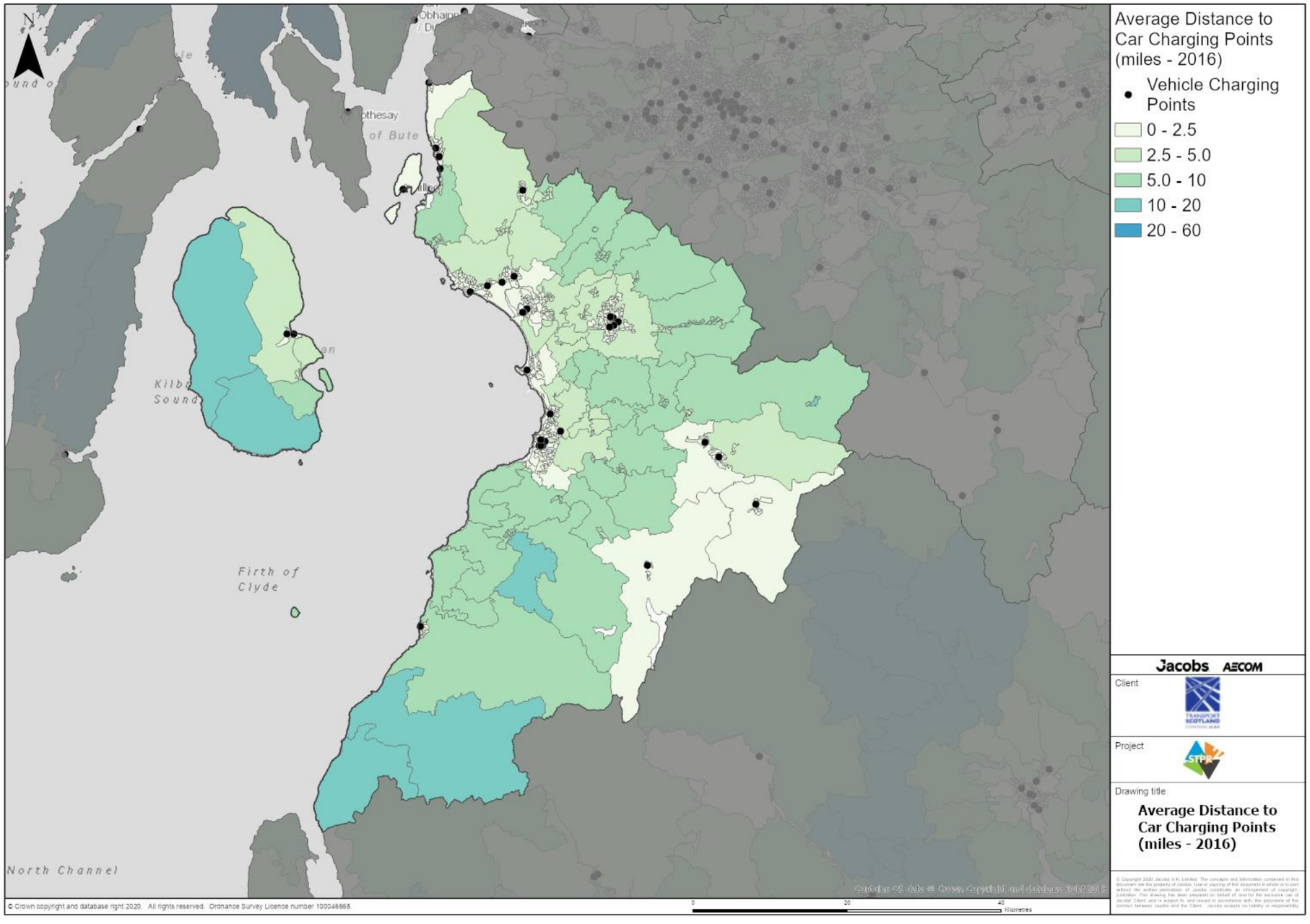


Figure A 20: Proximity to nearest EV Charge Point, Ayrshire & Arran (Click image to go back to main report)

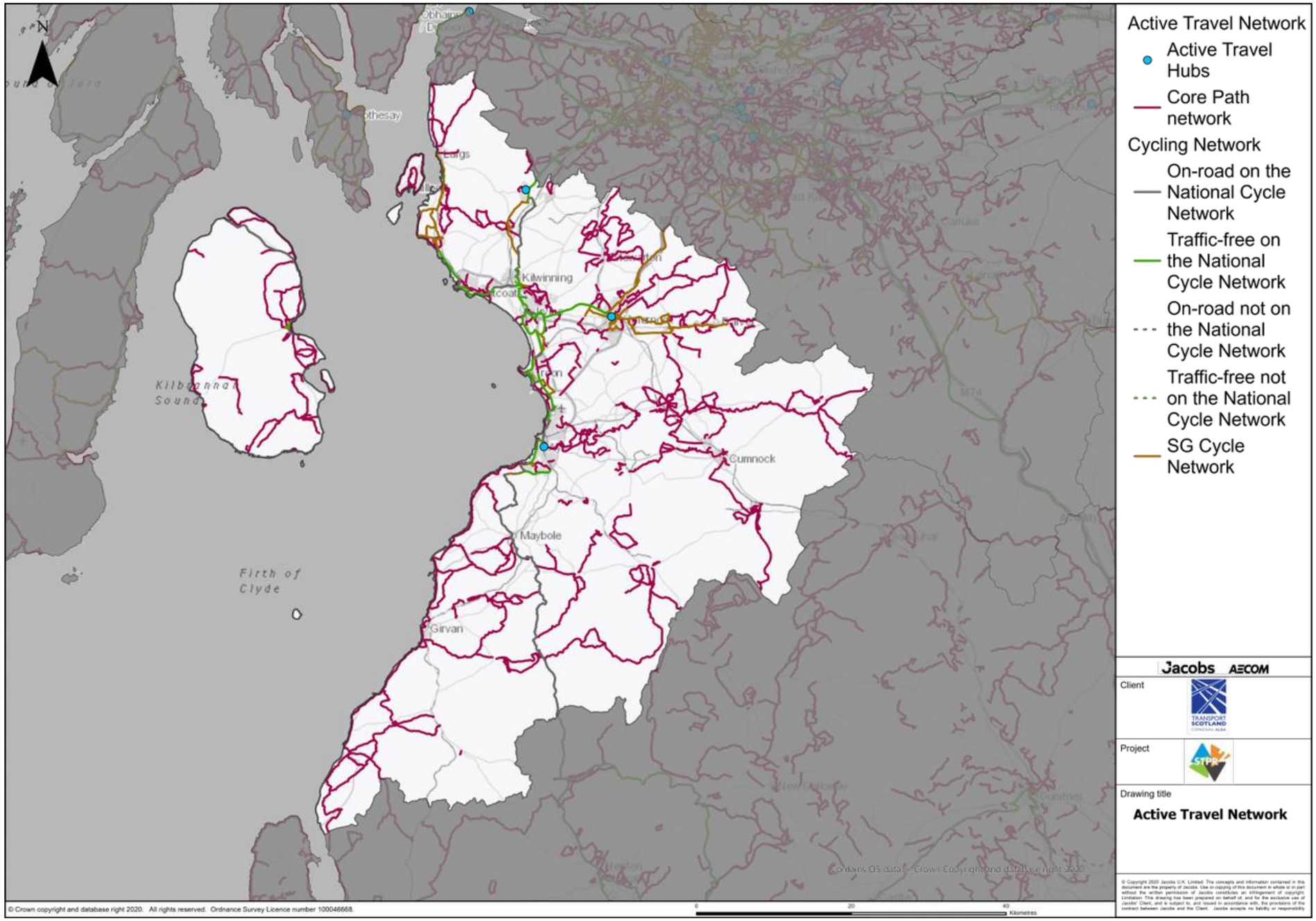


Figure A 21: Ayrshire & Arran Active Travel Network (Click image to go back to main report)

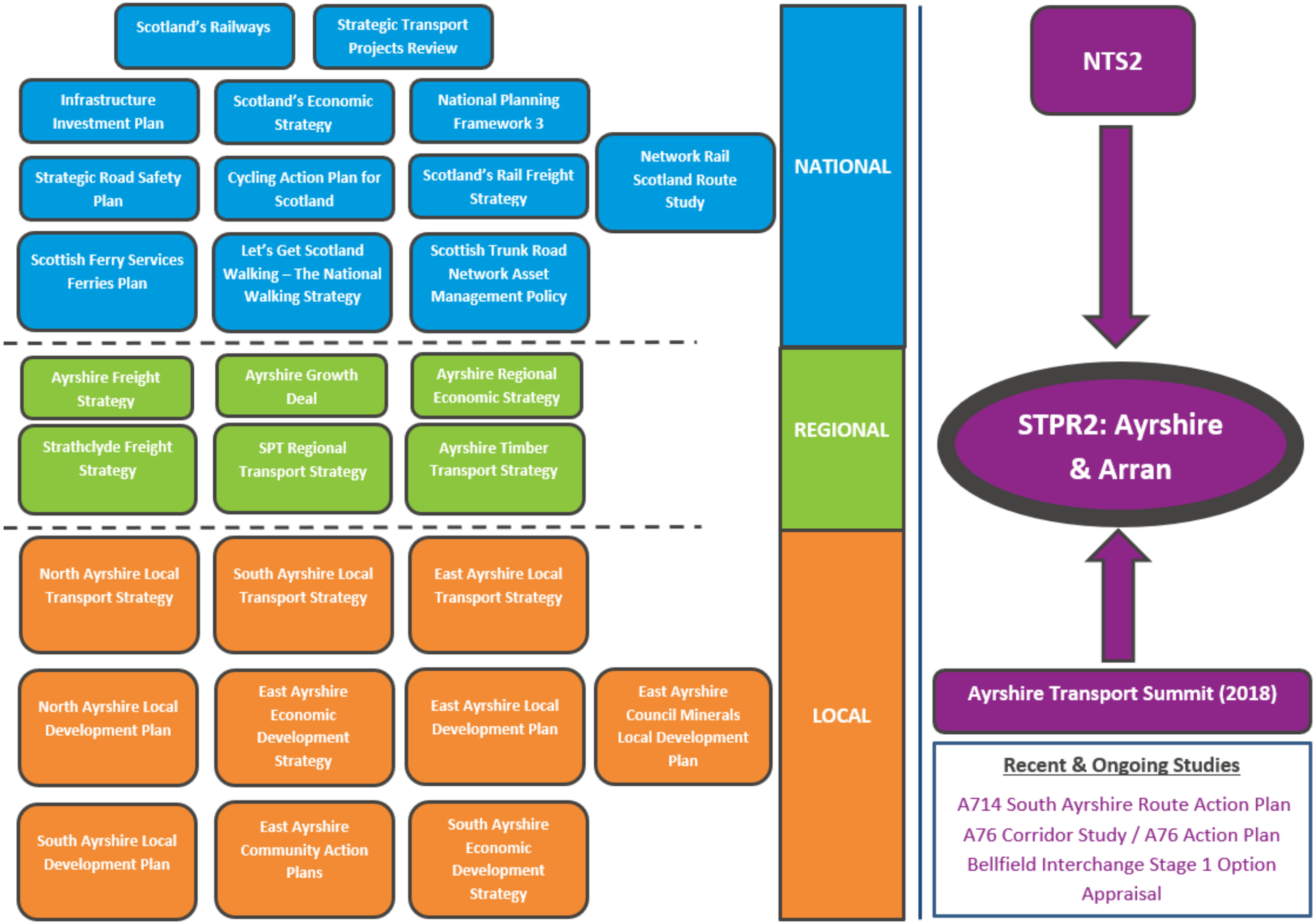


Figure A 22: Strategy and Policy Overview (Click image to go back to main report)

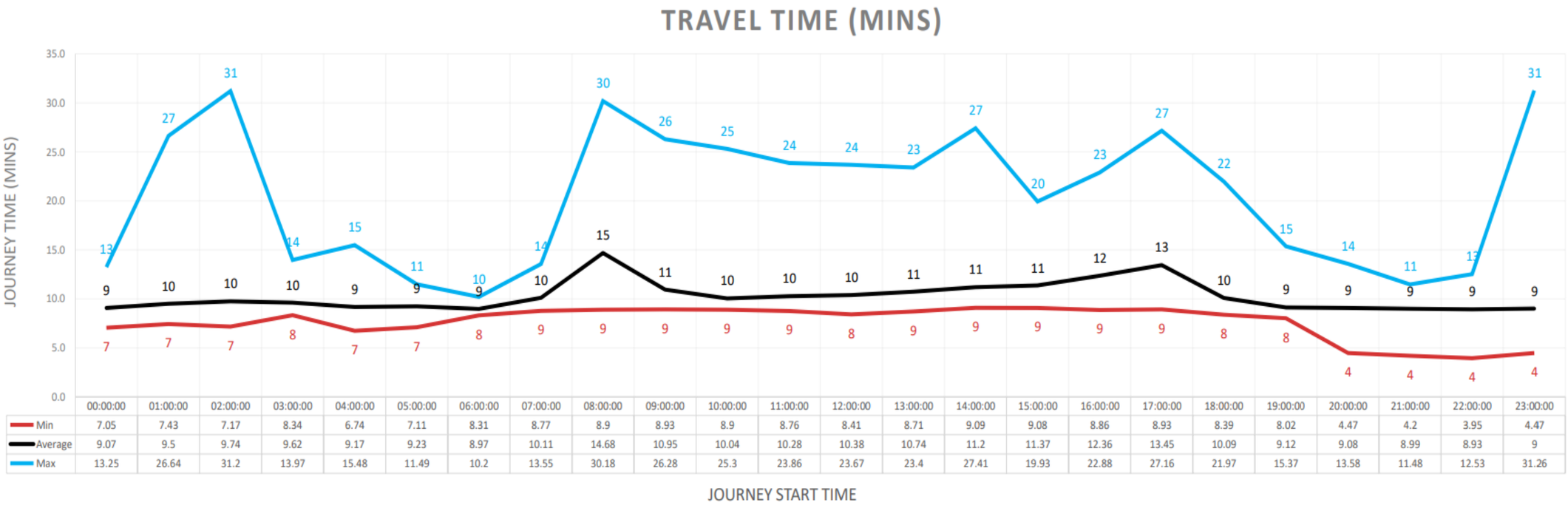


Figure A 23: Monkton Roundabout to Bankfield Roundabout (A77) INRIX Journey Times (Click image to go back to main report)

Appendix B: List of Policy Documents

THEME	TITLE	AUTHOR	YEAR
Development	East Ayrshire Local Development Plan	East Ayrshire Council	2017
Development	Minerals Local Development Plan: Proposed Plan	East Ayrshire Council	2018
Development	South Ayrshire Local Development Plan	South Ayrshire Council	2014
Development	North Ayrshire Local Development Plan	North Ayrshire Council	2014
Development	North Ayrshire Local Development Plan 2	North Ayrshire Council	2019
Development	Draft Infrastructure Investment Plan 2021-22 to 2025-26	The Scottish Government	2020
Development	National Planning Framework 3	The Scottish Government	2014
Development	The National Islands Plan	Scottish Government	2019
Economy	Ayrshire Growth Deal	North, South and East Ayrshire Councils, The Scottish Government, UK Government	2020

Economy	East Ayrshire Economic Development Strategy 2014 – 2025	East Ayrshire Council	2014
Economy	South Ayrshire Economic Development Strategy 2013 – 2023	South Ayrshire Community Planning Partnership	2013
Economy	North Ayrshire Economic Development & Regeneration Strategy 2016 – 2025	North Ayrshire Council	2016
Economy	Millport & Cumbrae Economic Plan 2015	Douglas Wheeler Associates to North Ayrshire Council	2015
Economy	Scotland's Economic Strategy	The Scottish Government	2015
Economy	Low Carbon Economic Strategy	The Scottish Government	2010
Energy	The Future of Energy in Scotland: Scottish Energy Strategy	The Scottish Government	2017
Environment	North Ayrshire Environmental Sustainability & Climate Change Strategy	North Ayrshire Council	2017
Environment	Ayrshire Flood Risk Management Strategy	Ayrshire Local Plan District, 2016	2016
Environment	Climate Change Plan Update 2018 - 2032	Scottish Government	2020
Other	Protecting Scotland, Renewing Scotland: Programme for Scotland 2020-21	Scottish Government	2020

Other	East Ayrshire Community Action Plans	Various	Various
Other	Glasgow Prestwick Airport Strategic Plan 2017 – 2022	Glasgow Prestwick Airport	2017
Tourism	Ayrshire & Arran Tourism Strategy	Ayrshire Economic Partnership	2012
Tourism	Making Waves in North Ayrshire: Tourism Action Plan 2018 – 2022	North Ayrshire Council	2018
Tourism	East Ayrshire Tourism Action Plan	East Ayrshire Council	2017
Transport	Ayrshire Transport Summit	All Ayrshire Alliance	2018
Transport	A Catalyst for Change, The Regional Transport Strategy for the west of Scotland 2008-21	SPT	2008
Transport	Freight Strategy for Strathclyde	SPT	2018
Transport	Ayrshire Freight Strategy	Ayrshire Roads Alliance	2016
Transport	South West Scotland Transport Study, Initial Appraisal: Case for Change	Transport Scotland	2020
Transport	A76 Corridor Study	East Ayrshire and Dumfries & Galloway Councils	2015
Transport	A714 South Ayrshire Route Action Plan	Ayrshire Roads Alliance	2014

Transport	Ayrshire Timber Transport Strategy	Ayrshire Joint Structure Plan and Transportation Committee	2005
Transport	Accessing a sustainable future: The East Ayrshire Local Transport Strategy 2009-2014	East Ayrshire Council	2009
Transport	South Ayrshire Council Local Transport Strategy 2009 – 2014	South Ayrshire Council	2009
Transport	North Ayrshire Local Transport Strategy 2015-20	North Ayrshire Council	2015
Transport	North Ayrshire Council Road Safety Plan	North Ayrshire Council	2015
Transport	North Ayrshire Council Town Centre Parking Strategy 2014 – 2020	North Ayrshire Council	2014
Transport	Strategic Transport Projects Review	Transport Scotland	2009
Transport	National Transport Strategy 2	Transport Scotland	2020
Transport	National Transport Strategy 2 Delivery Plan	Scottish Government	2020
Transport	Scotland's Railways	Transport Scotland	2006
Transport	Scotland's Rail Freight Strategy	Transport Scotland	2016
Transport	Scottish Trunk Road Network Asset Management Strategy	Transport Scotland	2018
Transport	Scottish Ferry Services Ferries Plan 2013 - 2022	Transport Scotland	2013

Transport	Strategic Road Safety Plan	Transport Scotland	2016
Transport	Rail Services Decarbonisation Action Plan: Pathway to 2035	Transport Scotland	2020
Transport	Network Rail Scotland Route Study	Network Rail	2016
Transport	Cycling Action Plan for Scotland	Transport Scotland	2017

Appendix C: Stakeholder Engagement

ENGAGEMENT TYPE	DATE	VENUE	PURPOSE AND DETAILS	NO. OF ATTENDEES
Problems & Opportunities Workshop	Tuesday 18th June 2019	Ardrossan Civic Centre, Ardrossan	Workshop with stakeholders including representatives from transportation, education, health and environmental sectors, in addition to local authority officers, to identify transport related problems and opportunities in the region.	16
	Friday 21st June 2019	Palace Theatre Complex, Kilmarnock		16
Structured Interviews	July – October 2019	-	Interviews with key stakeholders, including Senior Officers within the 3 Ayrshire local authorities, Regional Transport Partnership officers and Business representatives, to identify transport related problems and opportunities and potential options for the region.	16
Interventions Workshop	Wednesday 20th November 2019	Ardrossan Civic Centre, Ardrossan	Workshop with stakeholders including representatives from transportation, education, health and environmental sectors, in addition to local authority	16

	Thursday 21st November 2019	Palace Theatre Complex, Kilmarnock	officers, to identify potential interventions to address problems and opportunities previously identified.	15
Elected Members Briefing / Workshop	Friday 24th January 2020	North Ayrshire Council, Cunninghame House, Irvine	Elected Members from across the region attended a briefing session on emerging findings from STPR2 and to provide feedback on potential interventions that should be considered as the study moves forward.	30
Online Survey	Monday 2nd December 2019 – Friday 10th January 2020	Online	Online survey promoted to members of the public and organisations to validate emerging problems from the STPR2 process and to provide feedback on potential interventions to improve the strategic transport network, across all modes, in the future.	185 responses