STRATEGIC TRANSPORT PROJECTS REVIEW

PROTECTING OUR CLIMATE AND IMPROVING LIVES

Initial Appraisal: Case for Change
Tay Cities Region

February 2021

Jacobs AECOM

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ACRONYM	
AQMA	Air Quality Management Areas
BRES	Business Register and Employment Survey
CAV	Connected Autonomous Vehicles
CRWIA	Children's Rights and Wellbeing Impact Assessment
DRT	Demand Responsive Transport
ECML	East Coast Mainline
EqIA	Equality Impact Assessment
EV	Electric Vehicle
FSDA	Fairer Scotland Duty Assessment
GDP	Gross Domestic Product
GVA	Gross Value Added
HGV	Heavy Goods Vehicle
HIAL	Highlands and Islands Airports Limited
HML	Highland Mainline
ITS	Intelligent Transport Systems
LEZ	Low Emissions Zone
LNR	Local Nature Reserves
MaaS	Mobility as a Service
MPA	Marine Protected Areas
NCN	National Cycle Network
NNR	National Nature Reserves
NPF	National Planning Framework

NRS	National Records Scotland
NSA	National Scenic Area
NTS2	National Transport Strategy
ORR	Office of Rail and Road
RTS	Regional Transport Strategy
RTWG	Regional Transport Working Group
SABI	Scottish Access to Bus Indicator
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEPA	Scottish Environmental Protection Agency
SIMD	Scottish Index of Multiple Deprivation
SMRCS	Scottish Road Maintenance Condition Survey
SPA	Special Protection Area
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 new National Transport Strategy (NTS2)[1].

STPR2 is being carried out in accordance with the 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.

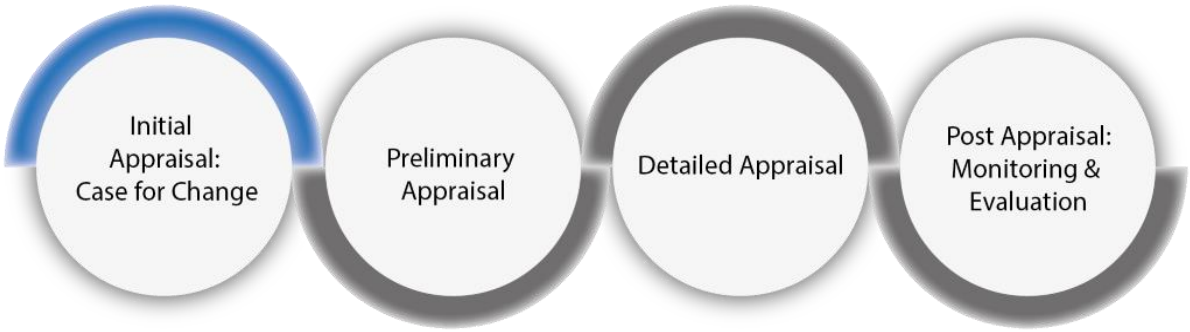

Figure 1: The 4 Key Phases to the Scottish Transport Appraisal Guidance

This report sets out the Initial Appraisal: Case for Change for the Tay Cities region as 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 Tay Cities region drawing on relevant data analysis, policy review and stakeholder engagement. The report set outs a robust method, aligned with the principles of the NTS2, to generate, clean and sift options; ensuring a broad range of options across all modes are considered that address the problems and opportunities in the region. 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:

[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

- All transport networks and services owned, operated and funded directly by Transport Scotland;
- Transport access to major ports[3] and airports; and
- The inter-urban bus and active travel network and principal routes within the region.

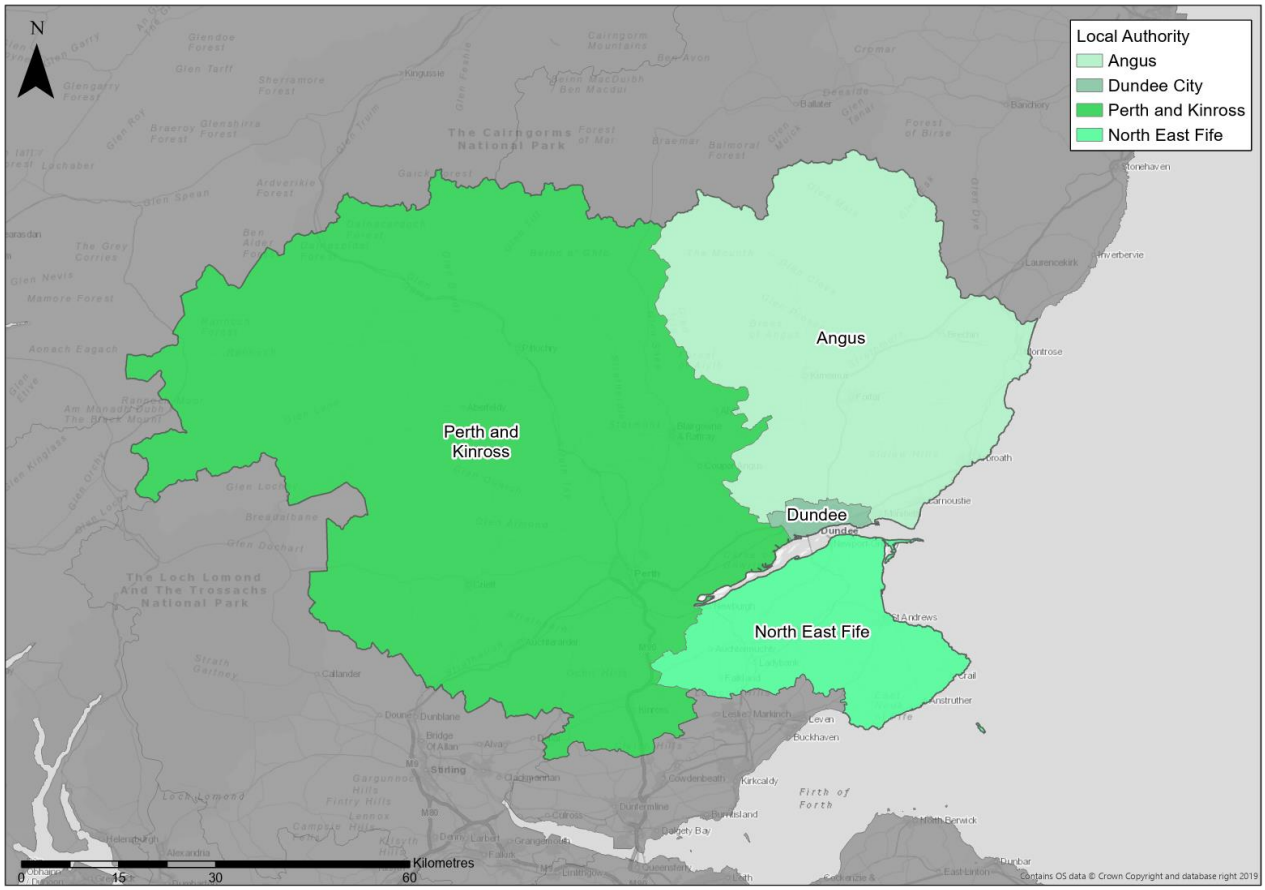

Figure 2: Tay Cities region study area[4]

(click image to enlarge figure)

The Tay Cities region comprises the 4 local authorities of Angus, Dundee, Fife (north east section) and Perth & Kinross. For the purposes of STPR2, the Fife Council area spans 2 regions, with the southern part of Fife included in the Edinburgh and South East Scotland (ESES) region and North East Fife included in the Tay Cities region. This is to align with the North East Fife area as included in The Tay Cities Deal[5].

The Tay Cities region has an extensive and complex transport network, reflecting the diverse nature of the different parts of the region and needs of its people.

To reflect the regional approach of STPR2, a Regional Transport Working Group (RTWG) has been established with representatives from the 4 local authorities, Tactran and SEStran (Regional Transport Partnerships), Network Rail, ScotRail, Scottish Natural

[3] List of major ports is still under review

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

[5] Tay Cities Deal, https://www.taycities.co.uk/about-us

Heritage, Sustrans, Transport Scotland and the STPR2 consultant team.

This Case for Change report also presents the final set of Transport Planning Objectives (TPOs), aligned with the national STPR2 objectives. The TPOs express the outcomes sought for the region and 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 proposed approach detailed later in this report.

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

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.

The following Chapter sets out the Socio-Economic, Environmental and Transport Context for the Tay Cities region.

2. Context

2.1. Policy Context

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

- **Programme for Government**[6]; 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 (NTS2)**[7]; 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 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**[8]; declared by the Scottish and UK Governments and multiple local authorities, including those in the Tay Cities region. 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.
- **Tactran Regional Transport Strategy 2015-2036 Refresh**[9]; which sets out the strategic direction and outcomes to be achieved over its lifespan to 2036, which is to deliver: "*a transport system, shaped by engagement with its citizens, which helps deliver prosperity and connects communities across the region and beyond, which is socially inclusive and environmentally sustainable and which promotes the health and well-being of all*". It then identifies 6 objectives for transport in the region:
  - Economy: To ensure transport helps to deliver regional prosperity.
  - Accessibility, Equity and Social Inclusion: To improve accessibility for all, particularly for those suffering from social exclusion.

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[6] Scottish Government, Protecting Scotland, Renewing Scotland: The Government's Programme for Scotland 2020-2021, https://www.gov.scot/publications/protecting-scotland-renewing-scotland-governments-programme-scotland-2020-2021/

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

[8] 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/

[9] Tactran, Regional Transport Strategy 2015-2036 Refresh, 2015, https://www.tactran.gov.uk/strategy.php

  - Environment: To ensure that the transport system contributes to safeguarding the environment and promotes opportunities for improvement.
  - Health & Well-Being: To promote the health and well-being of communities.
  - Safety & Security: To improve the real and perceived safety and security of the transport network.
  - Integration: To improve integration, both within transport and between transport and other policy areas.

- **SEStran Regional Transport Strategy**[10]; which sets a vision and objectives for transport in the South East Scotland region (including Fife) to 2025. Its objectives are:
  - Economy – To ensure transport facilitates economic growth, regional prosperity and vitality in a sustainable manner.
  - Accessibility – To improve accessibility for those with limited transport choice (including disabled people) or no access to a car, particularly those who live in rural areas.
  - Environment – To ensure that development is achieved in an environmentally sustainable manner.
  - Safety and Health – To promote a healthier and more active SEStran area population.
- **Tay Cities Deal**[11]; which brings together public, private and voluntary organisations in the local authority areas of Angus, Dundee, Fife and Perth & Kinross to deliver a smarter and fairer region. It will see funding of up to £700 million for the region, including £150 million each from the Scottish Government and the UK Government. Together with regional partners' contribution, this deal has the potential to secure more than 6,000 jobs and attract £400 million of investment over the deal period. It seeks to:
  - grow the base of knowledge-led businesses
  - support more businesses to trade internationally
  - attract investment
  - focus on inclusion
  - innovation
  - attract and retain talented people
  - improve connectivity to, from and around the region
  - increase economic participation
  - reduce inequalities.
- **Local Transport Strategies**[12]; which set out the transport objectives and priorities for the local authorities within the Tay Cities region.

[10] SEStran, Regional Transport Strategy 2015-2025 Refresh, 2015, https://sestran.gov.uk/publications/regional-transport-strategy-2015-2025-refresh/
[11] Tay Cities Deal, https://www.taycities.co.uk/about-us
[12] The local transport strategies reviewed are outlined in Appendix B

- **Other Regional and Local Policy Documents**[13]; such as the Strategic Development Plan, and Local Development, City, Economic Plans and Strategies which set out non-transport-specific objectives and priorities, but for which transport plays a key role in both the enabling and delivery of their outcomes.

In addition to the 4 Priorities presented above, the NTS2[14] 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.

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

A full list of reviewed documents is contained in Appendix B.

[13] The other regional and local policy documents reviewed are outlined in Appendix B
[14] Transport Scotland, National Transport Strategy (NTS2), February 2020, www.transport.gov.scot/media/47052/national-transport-strategy.pdf

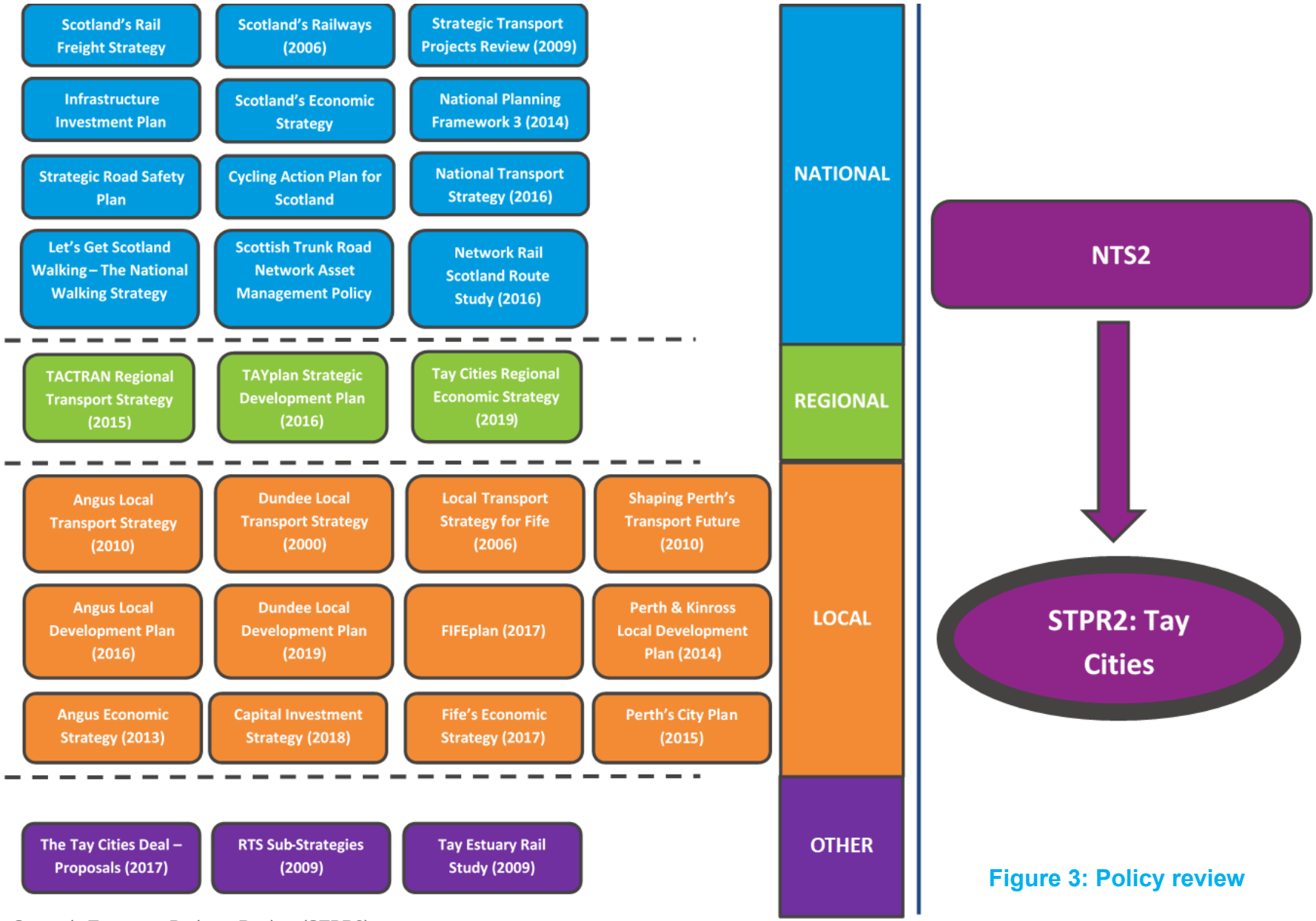


Figure 3: Policy review

2.2. Geographical Context

The Tay Cities region comprises a broad mix of urban and rural settlements and areas, including examples of each of the Scottish Government's 6-fold urban-rural classifications: a Large Urban Area (Dundee), Other Urban Areas (including Perth, Arbroath), Accessible Small Towns (e.g. Cupar, Auchterarder, Brechin), Remote Small Towns (e.g. Blairgowrie, Crieff) and the remaining areas classed as either Accessible Rural or Remote Rural[15].

Of the region's total population[16], 31% live in large urban areas, 27% in other urban areas, 11% in accessible small towns, 3% in remote small towns, 23% in accessible rural areas and 4% in remote rural areas.

Figure 4 below shows the rural/urban makeup of the region.

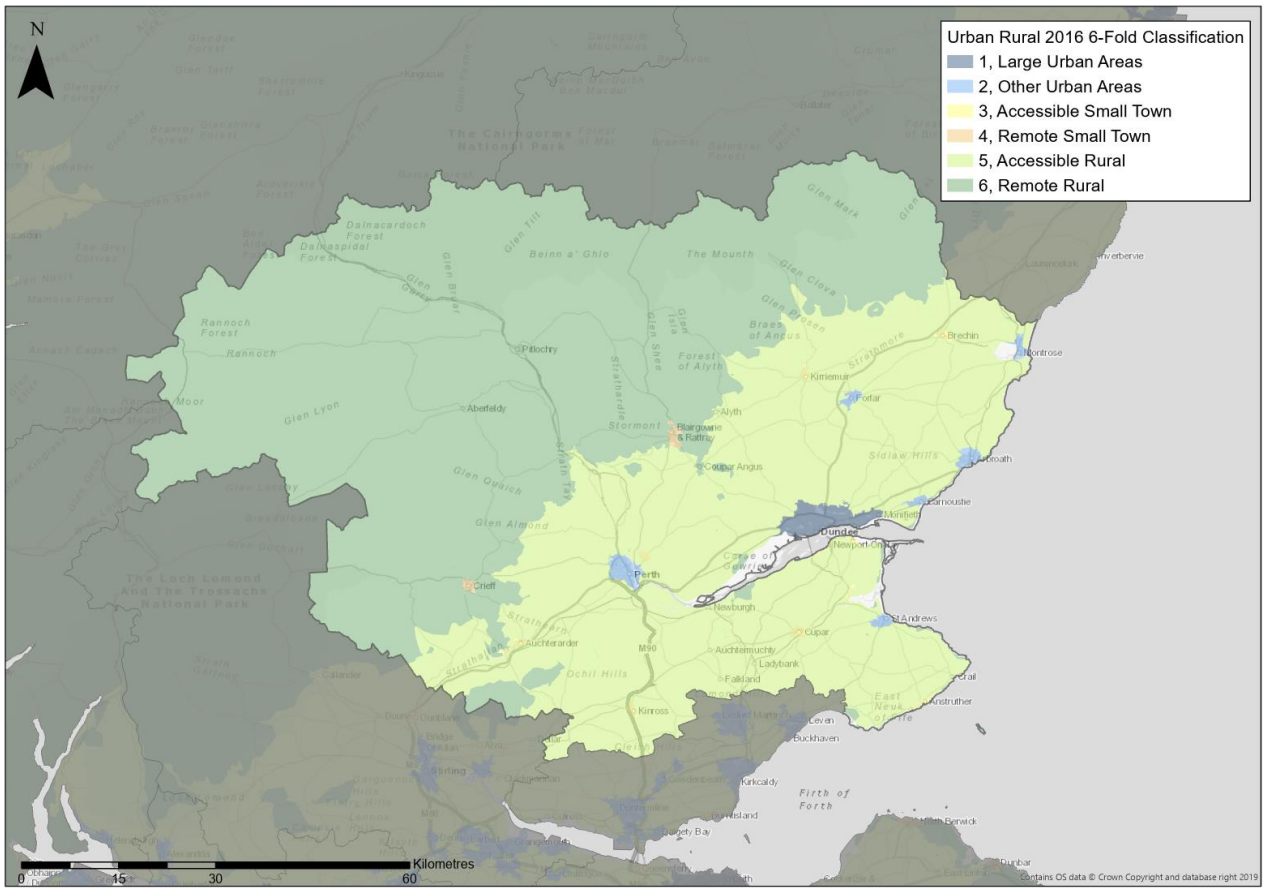


Figure 4: Scottish Government Urban Rural 2016 6-fold Classification

(click image to enlarge figure)

[15] Scottish Government, Urban Rural Classification, 2016, https://www.gov.scot/publications/scottish-government-urban-rural-classification-2016/pages/2/

[16] Based on 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

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. Benchmarking

To compare the performance of socio-economic indicators for the region, benchmark categories were created using the urban rural classification. The classification defines the urban and rural areas across Scotland, based upon 2 main criteria: population and accessibility. This area classification is split and defined across categories ranging from large urban area to remote rural, where the geographies of local authorities are divided up in percentage terms across these categories. The local authorities selected are considered the most representative for each of the benchmark categories, generally being the top 5 or 6 local authorities within that related category.

The 4 benchmark categories are:

- Scottish Cities (Aberdeen, Dundee, Edinburgh and Glasgow);
- Urban (including Fife, Falkirk, Inverclyde, Midlothian, North Lanarkshire and West Lothian);
- Rural (including Perth & Kinross, Aberdeenshire, Highland, Scottish Borders, Dumfries & Galloway and Moray);
- Islands (Na h-Eileanan Siar, Orkney and Shetland Islands).

2.3.2. Population

The Tay Cities region (including the whole of Fife) has a population of 493,136 (approximately 9% of the total population of Scotland) based on 2019 mid-year population estimates from National Records Scotland (NRS)[17]. Settlement sizes taken from NRS mid-2016 population estimates are presented in Figure 5, demonstrating that whilst Dundee and Perth are the largest settlements, many of the region's people live in smaller urban areas.[18] Whilst many are located along the Dundee-Carnoustie-Arbroath-Montrose coastal corridor, the region also has towns in more rural settings, such as Forfar and Blairgowrie to the north; and Cupar and St Andrews to the south of the Tay.

[17] 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

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

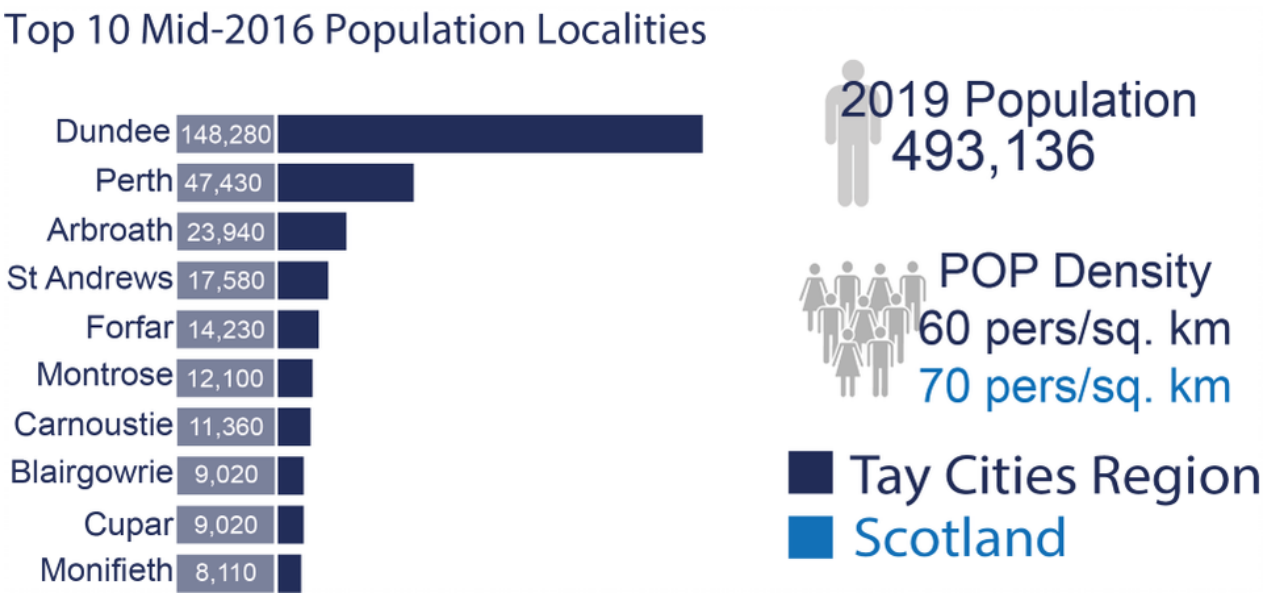


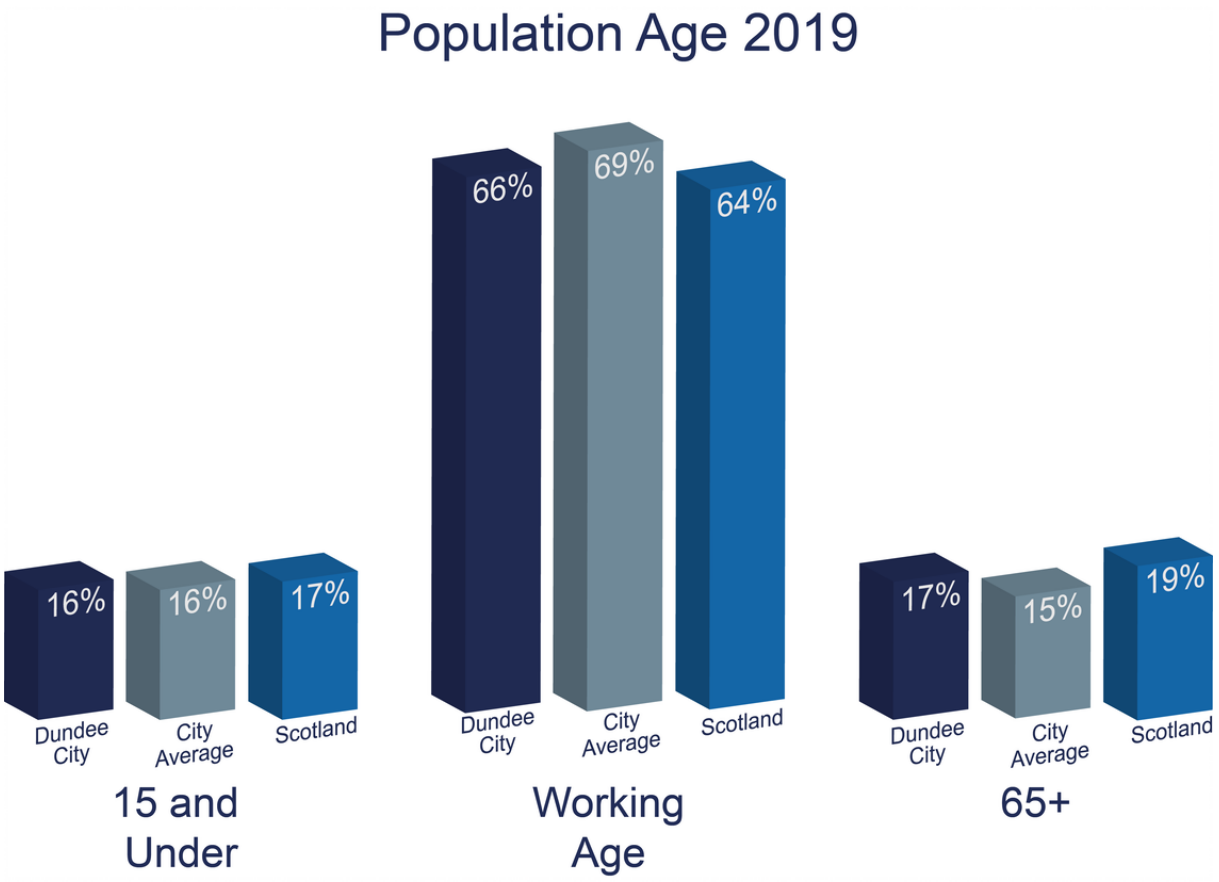
Figure 5: Tay Cities region largest settlements by population 2016; and 2019 population and population density

The Tay Cities region (outwith Dundee City) has a smaller proportional working age population than the Scottish Regional average (61% compared to 63%); there are fewer people aged 15 and under (16% compared to 18%), and more people aged over 65 (23% compared to 19%), which indicates an older population demographic in the region than the Scottish Regional average and for the rest of Scotland, as a whole. Figure 6 shows that the Tay Cities region has an older population than comparable areas.

Due to the differing urban and rural nature of the local authorities, Dundee City is compared against the other major cities in Scotland, while the rest of the region (excluding Dundee City) is compared against the urban and national benchmark. Dundee City has a slightly lower proportion of people of working age than the Scottish Cities average (66% compared with 69%), and a higher older population percentage than the Scottish Cities average (17% compared to 15%)[19].

Since 2011, there has been population growth in the region, but this has been at a much lower rate than the Scottish Cities and Urban benchmarks.

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



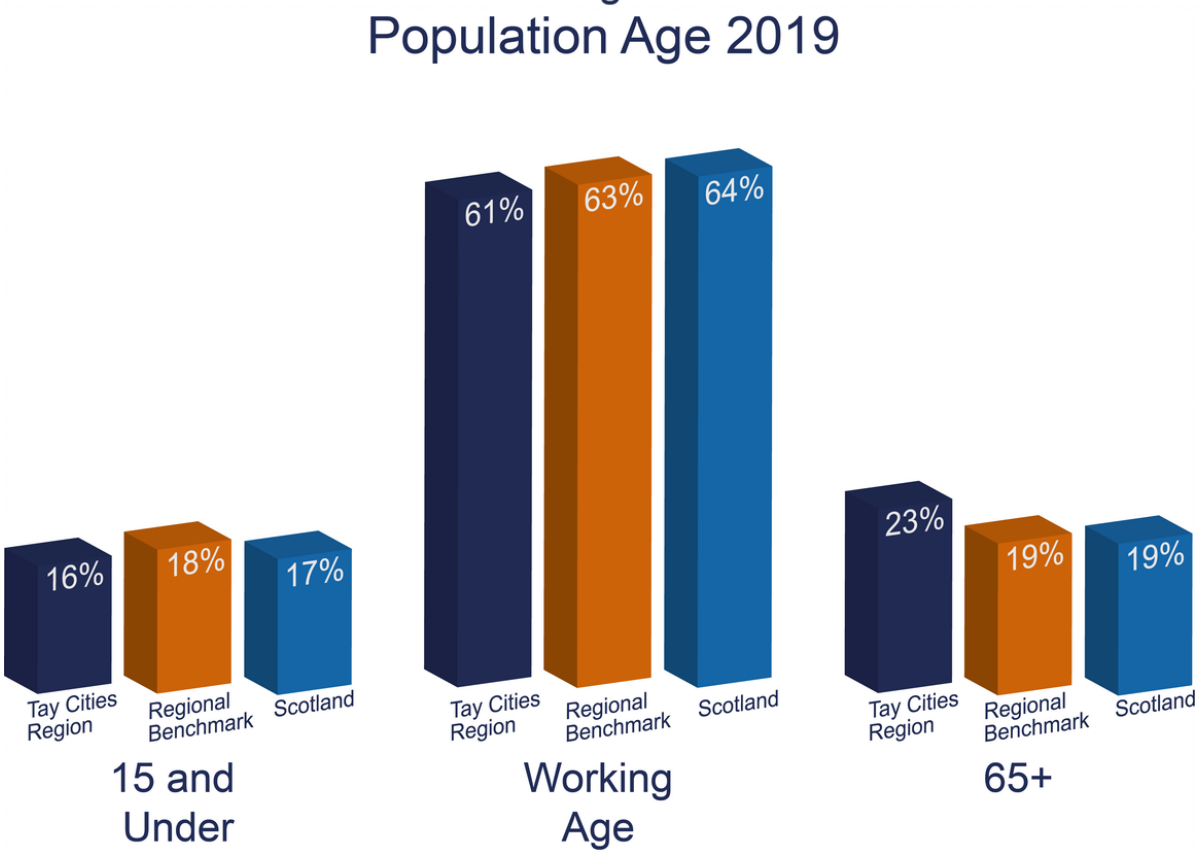


Figure 6: Top: Dundee City percentage of total population by age; Bottom: Tay Cities region (excluding Dundee City) percentage of total population by age

2.3.3. Travel to Work – Mode Share

Travel to work mode share is a key metric in providing context for the key transport trends of the region. Figure 7 provides the mode share for travel to work across the region based on Census 2011[20] information.

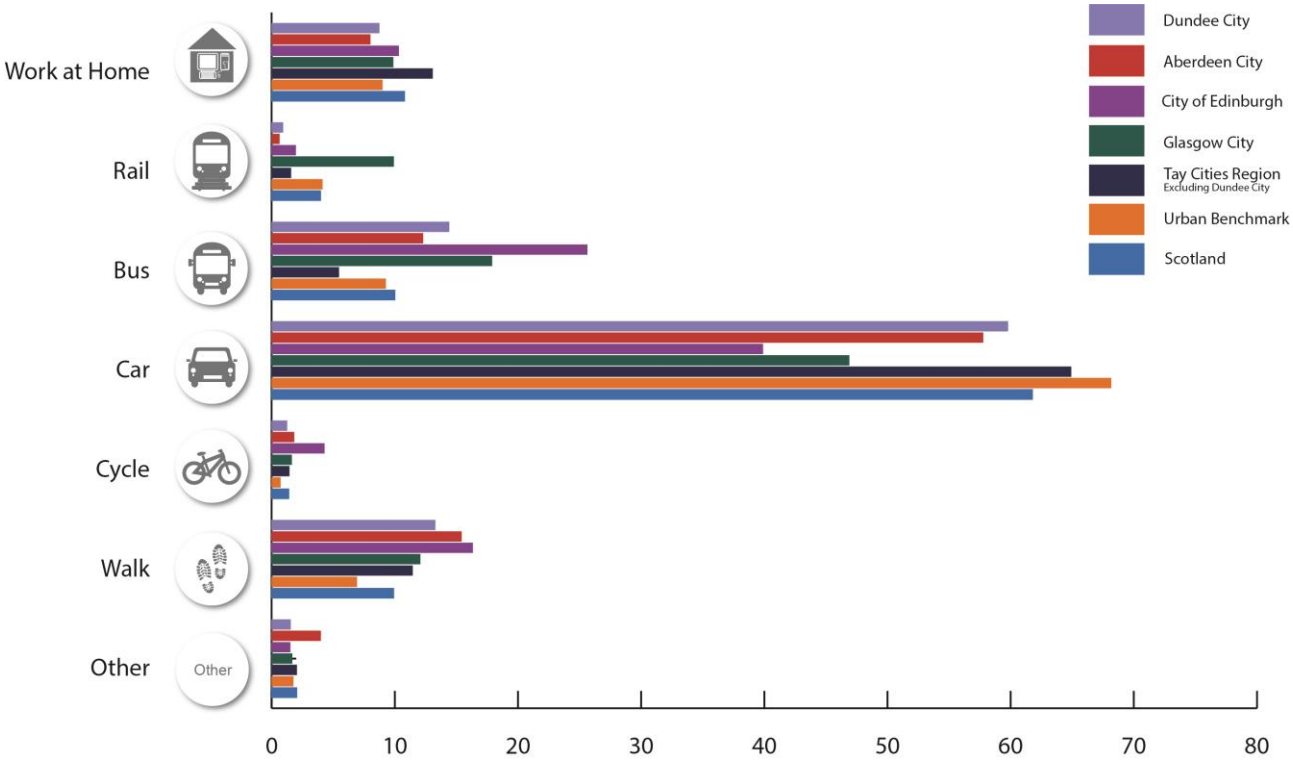


Figure 7: Travel to work mode share for Tay Cities region and benchmarks

Travelling by car is the most popular mode of travel to work in the region as a whole, representing 66% (including car passengers) of the mode share, which is the same as the Scottish average. In Dundee City car mode share is 60%, more than 10% greater than the Scottish Cities benchmark. In the Tay Cities Region excluding Dundee City, car mode share is 68%, similar to the Urban Benchmark.

The cycling mode share is similar to the national average and is at similar levels within each local authority area within the region. Walking mode share is broadly similar throughout the region. Dundee City, and to a lesser extent Perth & Kinross, have slightly higher walking levels than Angus and North East Fife. Walking levels in the Tay Cities area are generally similar to the national average.

Bus use varies throughout the region with Dundee City having 14.4% mode share while the region as a whole, excluding Dundee City, has 6.1%. Both of these figures are slightly lower when compared to the city (17.6%) and urban (9.3%) benchmark respectively. The rail mode share for Dundee city is 0.9%, which is lower than the national and city benchmark (3.7% and 2.8% respectively).

There is generally a similar proportion of people who work from home across the region to the national average, with Perth & Kinross being slightly above average at 15% compared

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

to 11% nationally.

Figure 8 illustrates the car (or van) ownership levels per household in the region.[21]

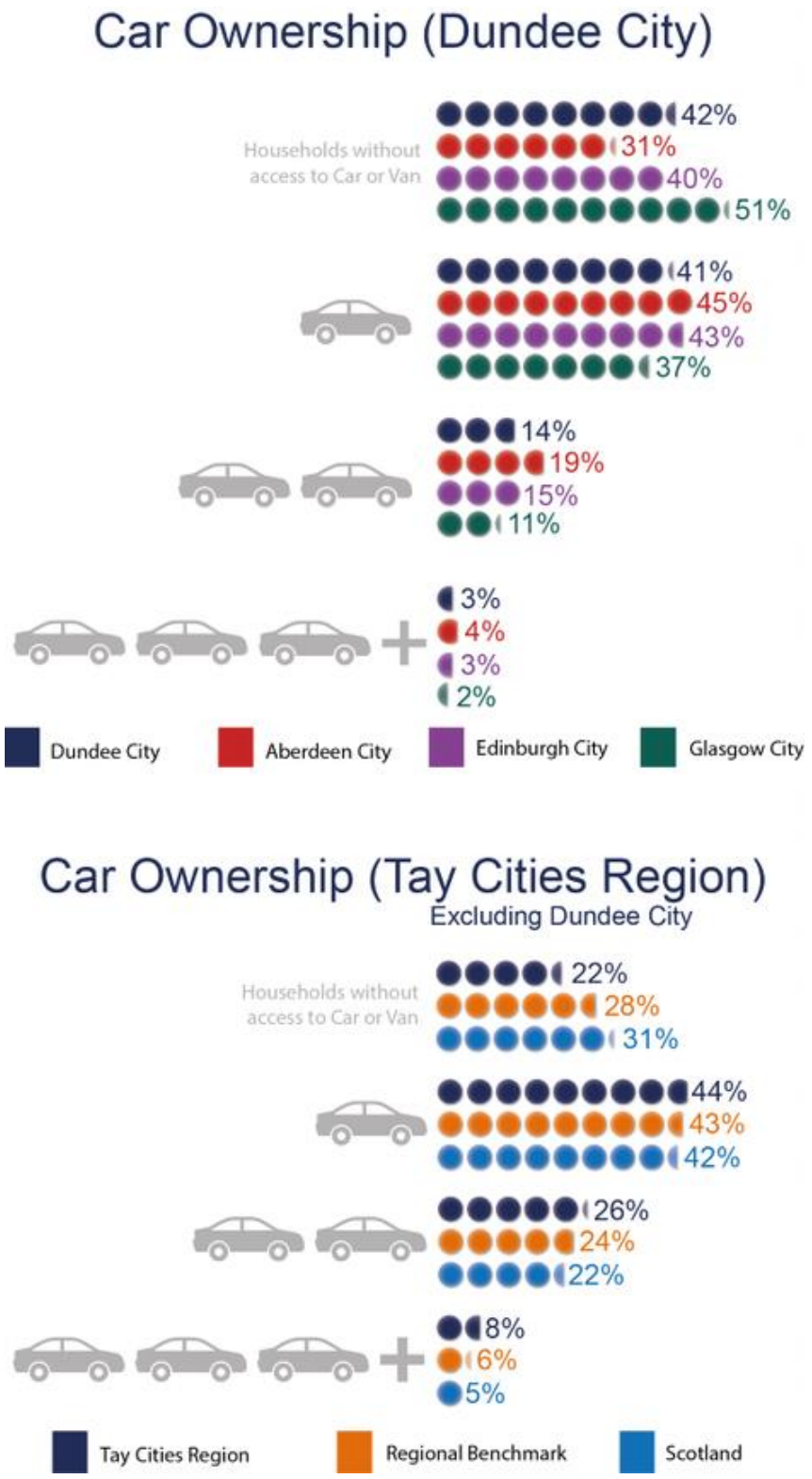


Figure 8: Access to Car (or Van) Per Household

Access to car or van in Dundee City is broadly similar to the Scottish Cities benchmark in all metrics, demonstrating slightly lower levels of car ownership than Edinburgh or Aberdeen, but higher than Glasgow. The Tay Cities region has slightly higher ownership levels in all categories than the urban and national benchmark. The number of households with no car ownership is significantly less than the urban and national benchmark.

As a component of Transport Poverty[22], the levels of car availability in the Tay Cities region are reflected in the 'high risk' classification of 35% of SIMD data zones[23] in the region. This compares to 36% of data zones nationally. Whilst the proportion of 'medium risk' data zones (46%) is slightly higher than the national proportion (43%). The proportion of 'low risk' data zones in the Tay Cities region (20%) is similar to the national proportion (21%).

2.3.4. Travel to Work – Distance Travelled

Figure 9 shows the percentage of the working population that travel within distance bands (0-10km, 10-30km etc.) to work[24]. There is a higher than average proportion (15.3% in Dundee City and 16.4% in the wider Tay Cities region) of people travelling very short distances to work in the region (under 2km), slightly higher than the Scottish Cities and Urban benchmark, as well as the national average.

[22] 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

[23] 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.

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

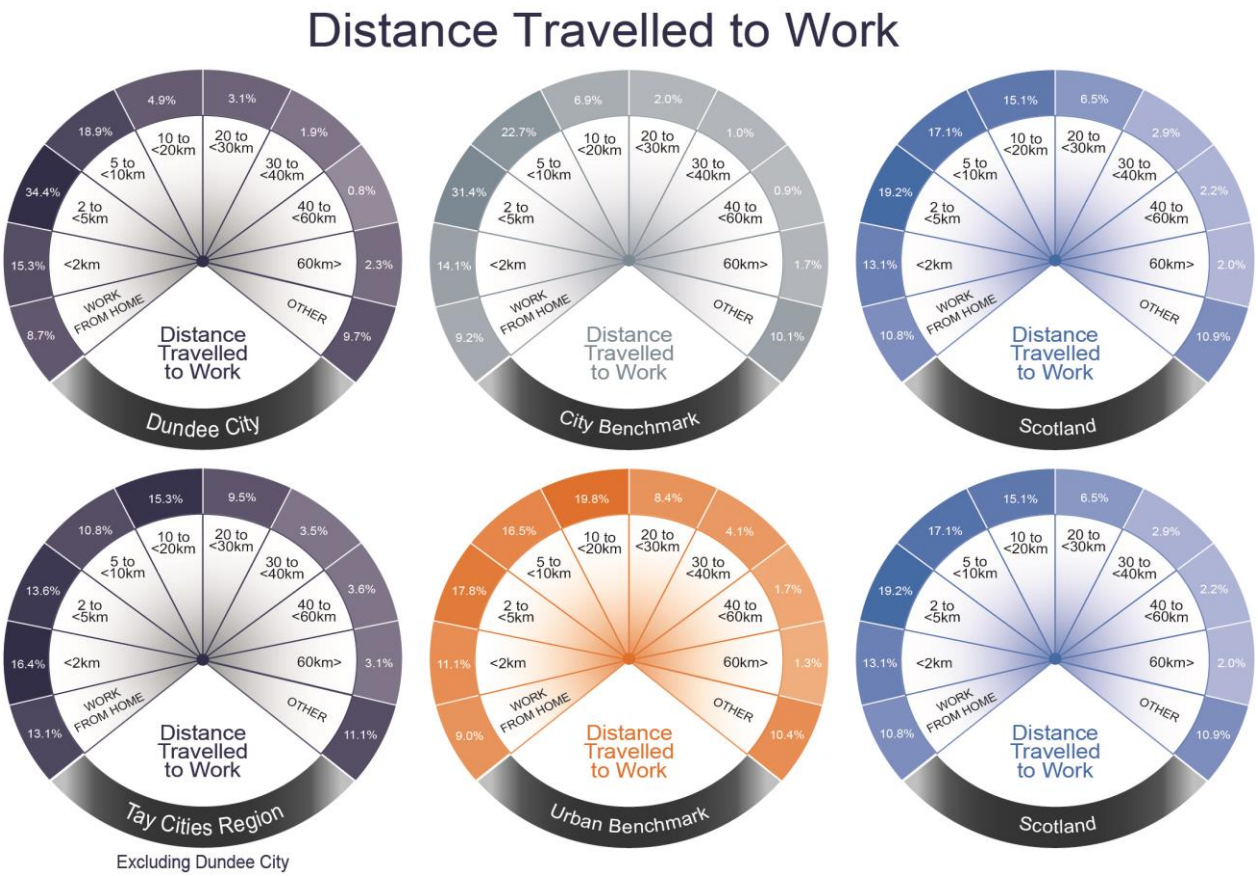


Figure 9: Percentage of working population and the distance travelled to work

The majority of working population from Dundee City (69%) travel less than 10km to work, which is generally in line with the Scottish Cities benchmark (68%). The working population outside of Dundee City in the Tay Cities region travelling over 30km to work is 10%, which is higher than the Urban benchmark (7%). Within the region, Angus has the highest proportion of very short distance travelled to work (less than 2km), and also the highest proportion of very long distance travelled to work (60km and over). Perth & Kinross has the highest proportion of people working from home. The most common distance travelled to work by residents of Perth & Kinross and Dundee City was 2km to 5km. The most common distance travelled to work by residents of North Fife was between 10km and 20km.

Figure 10 illustrates the travel to work movements between local authorities within the Tay Cities region[25], as well as movements to and from neighbouring regions to the north/north east and south/south east. In total, 76% of residents of the Tay Cities region (including data for all of Fife) work within their own local authority boundary, this being highest in Dundee (85%). Of the 24% that do not work within their home local authority, 13% work within another of the Tay Cities region authorities, and 11% work outwith the region. However, journeys from Fife (mostly from the South of Fife) to Edinburgh skew these regional figures: of residents of Angus, Dundee City and Perth & Kinross, 7% work outwith the Tay Cities region.

[25] Data for Fife shows all of the Council area: commuting to South East Scotland area from that part of Fife which is in the Tay Cities region is anticipated to be much lower

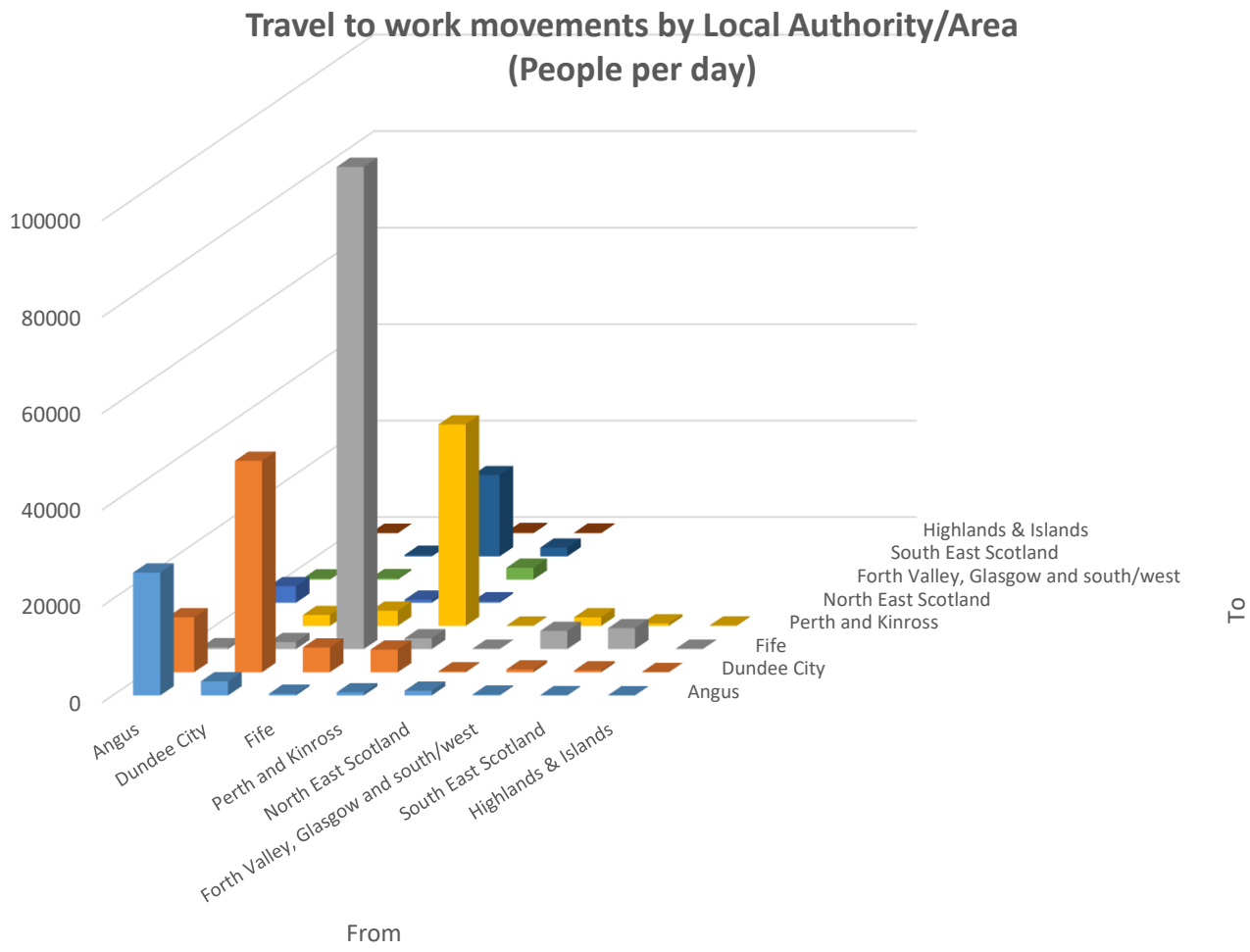


Figure 10: Travel to Work by Local Authority (Census 2011)

As noted, the majority of travel to work is contained within each respective local authority area, especially in Dundee City where 85% of the population works within the local authority boundary. Table 1 shows the proportions of work locations of each authority's residents more clearly. The most notably cross-boundary flow is from Angus to Dundee City; over a quarter of Angus' working population work in Dundee City.

Table 1: Travel to Work percentage of residents working in area (Census 2011)

WORKPLACE AREA	HOME LOCATION AUTHORITY			
	Angus	Dundee City	Fife	Perth & Kinross
Angus	60%	6%	0%	1%
Dundee City	27%	84%	4%	9%
Fife	1%	3%	78%	4%
Perth & Kinross	3%	4%	2%	77%
North East Scotland	8%	1%	0%	1%
Forth Valley, Glasgow and south/west	1%	1%	3%	5%
South East Scotland	0%	1%	13%	3%
Highlands & Islands	0%	0%	0%	0%

2.3.5. Travel to School – Mode Share

Hands-Up Survey Scotland data show that between 53% and 57% of primary school pupils travel to school by active modes (walking, cycling or scooting) in each of the Tay Cities region's authorities, in each case a little higher than the national average of 52.5% (data for 2018)[26]. However, the region shows wide variances in the proportion of secondary school children that travel actively: 61% in Angus and 52% in Dundee City but 39% in Perth & Kinross and 38% in Fife[27] compared to the national average of 44%.

Analysis of TRACC data[28] shows the percentage of Tay Cities residents that can access key services within defined time parameters. The data indicates that 95% of the region's population aged 5 to 17 can access a school by public transport within 30 minutes of travel time (07:00 to 09:00 departure time).

2.3.6. Household Income and Transport Expenditure

In 2019 the mean full-time gross weekly earnings in Scotland was £548.40. Within the Tay Cities region all local authority areas were below the national average, with Angus, at 11.3% below average, performing the worst in the region and Perth & Kinross performing the best, at 0.4% below average[29]. In Scotland, an average of 14% of household spending was on transport and travel between 2016 and 2018, equating to an average weekly expenditure of £68.20[30].

[26] Sustrans, Hands Up Scotland Survey, 2020 https://www.sustrans.org.uk/our-blog/projects/2019/scotland/hands-up-scotland-survey/
[27] This is for all of Fife. Disaggregated data for north east Fife only is not available
[28] TRACC - multimodal accessibility and journey time analysis tool.
[29] ONS, NOMIS Annual Survey of Hours and Earnings, 2019, https://www.ons.gov.uk/releases/employeeearningsintheuk2019
[30] Transport Scotland, Scottish Transport Statistics No. 38, 2019, https://www.transport.gov.scot/publication/scottish-transport-statistics-no-38-2019-edition/

Transport expenditure in the Tay Cities region is varied[31]. In both cities and larger towns, such as St Andrews and Montrose, transport expenditure is generally comparable to the Scottish average, with the majority of urban areas ranging between 9% and 16% of household spending. In deeper rural areas of Perth & Kinross, Angus and north east Fife transport expenditure is generally high, reaching 20% of household income in areas.

2.3.7. Economic Activity

Economic activity refers to whether residents aged 16 to 74 were in work or actively looking for work. Annual economic activity estimates are produced by the Office for National Statistics.

Dundee City economic activity levels[32] were 72.8% in 2019, a drop of 3.9% from 2014, and 2.8% lower than the Scottish Cities benchmark. Economic activity for the Tay Cities region excluding Dundee City was 78.9%, a drop of 0.2% from 2014, and 1.4% higher than the national average.

The average employment rate[33] in Dundee City was 68.6%, which was 3.9% lower than the Scottish Cities benchmark and noticeably lower than the rest of the Tay Cities region which has an employment rate of 76.3%.

The Tay Cities region contributed 9.0% of Scotland's total benefits claimants in 2019[34] (the area has 9.0% of the country's population). The number of claimants in the area increased by 21.8% over a 5-year period (between January 2015 and December 2019). Of the total number of claimants in Scotland in 2019, Dundee City had the highest proportion of benefits claimants in 2019 the region (4.3%), followed by Angus (2.0%), Perth and Kinross (1.6%) and North Fife (0.7%).

Figure 11 illustrates the industry sector disaggregation for employed residents in the Tay Cities region according to the 2018 UK Business Register and Employment Survey (BRES)[35]. The graph on the top indicates the sector breakdown for Dundee City, as well as the Scottish Cities benchmark and national average; the graph on the bottom highlights the performance of the region, excluding Dundee City, against the urban benchmark and national average.

[31] 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

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

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

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

[35] ONS, NOMIS Business Register and Employment Survey (BRES), 2018, https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/businessregisterandemploymentsurvey

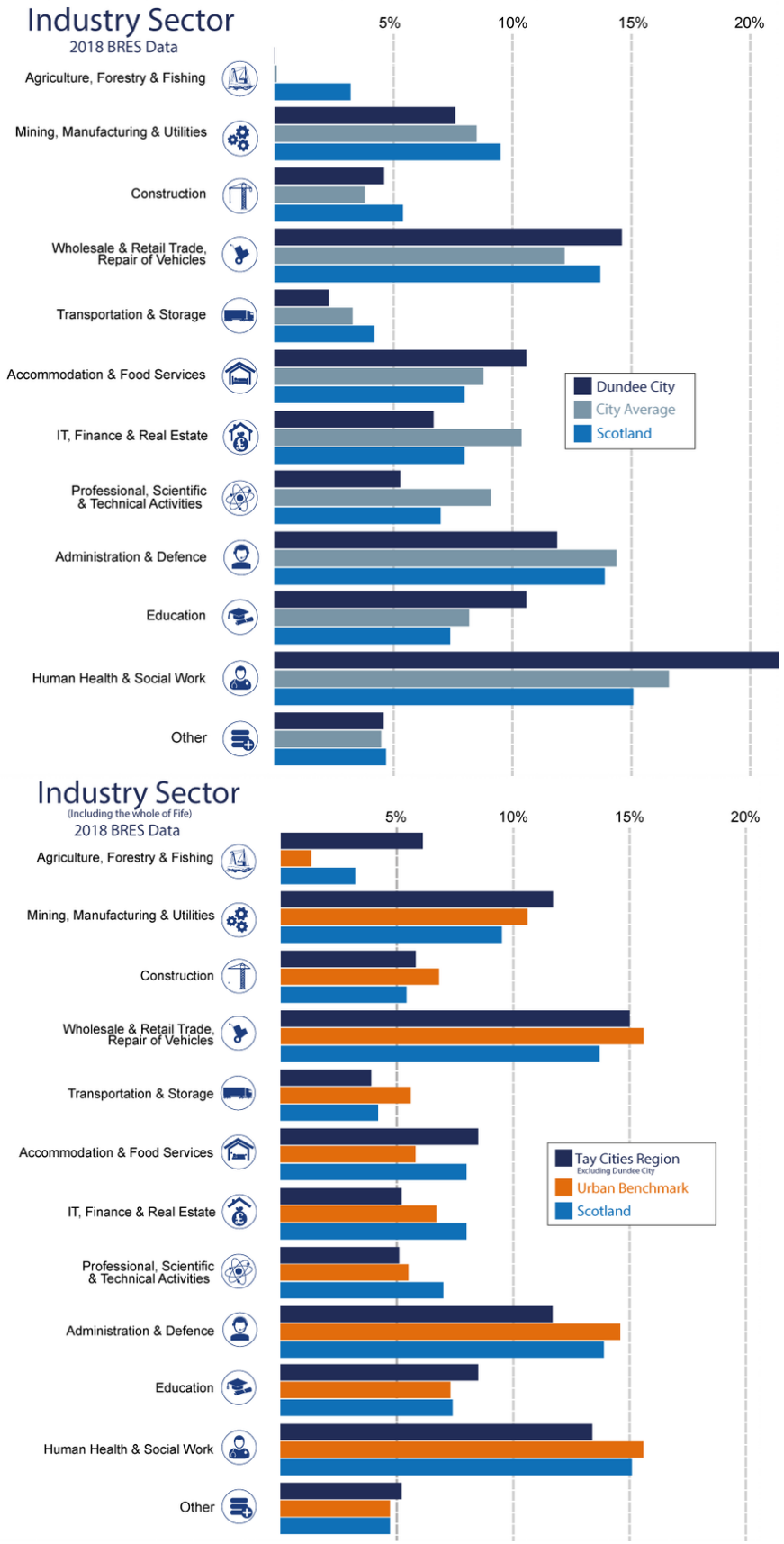


Figure 11: Percentage of people working in each industry sector for Tay Cities region

In the Tay Cities region (but excluding Dundee), the largest proportion of people work in the Wholesale/Retail trades at 15.0%, followed by Health and Social Work at 13.4%. Employment patterns in Dundee City are somewhat different to that of the rest of the region: the largest sector is Health and Social Work at 21.2%, which is 4.6% higher than the Scottish Cities average. This is followed by Wholesale/Retail Trades (14.6%), Admin & Defence (11.9%), and Accommodation and Food Services, and Education (both 10.6%). Dundee City has a smaller proportion of people working in sectors such as Information Technology, Finance and Real Estate (6.7%) and Professional, Scientific and Technical Activities (5.3%) than the city benchmark (10.4% and 9.1% respectively).

Total Gross Value Added (GVA) by the Tay Cities region[36] in 2018 was £17,047 million[37], which was 12.0% of Scotland's GVA (for 14.4% of the country's population). Regional GVA increased by 9.2% between 2013 and 2018, which was 5.3% less than the national benchmark increase. Regional GVA per head[38] was £21,634 in 2018, which was an increase of 8.0% in the same period.

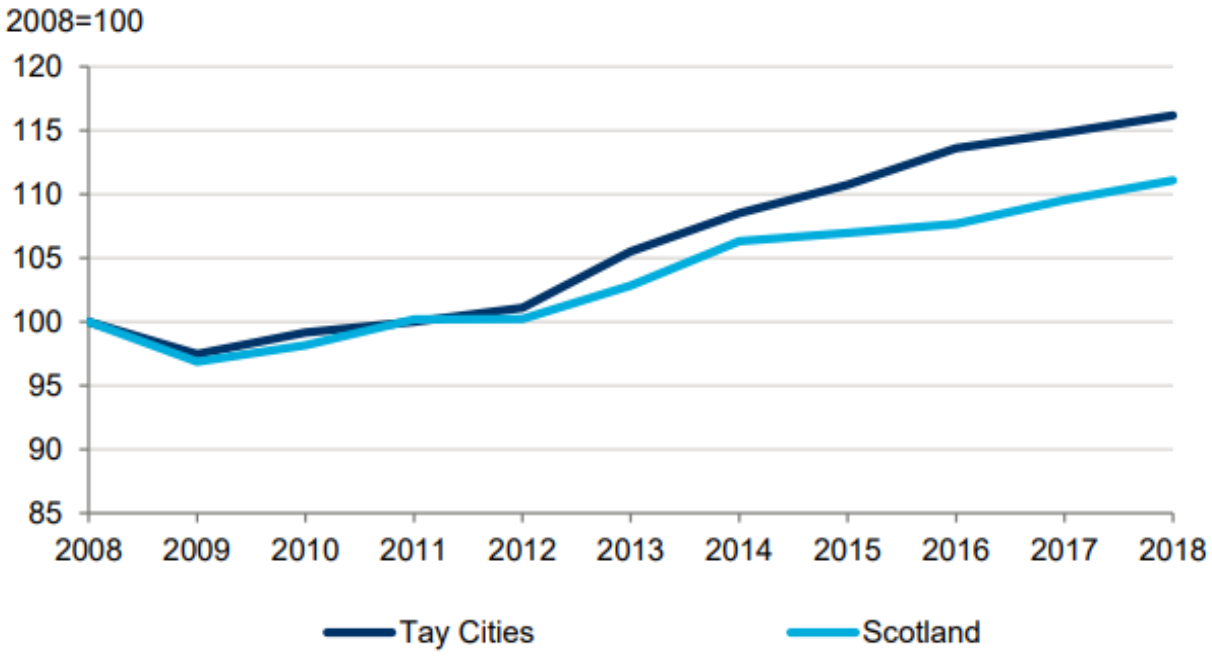
Figure 12 shows the Tay Cities regional GVA performance compared to that of Scotland between 2008 and 2018, illustrating that Tay Cities region has been outperforming the national average growth consistently since 2012.

Figure 13 highlights the regional sectoral split relative to that for Scotland as a whole. This demonstrates the relative importance of manufacturing, energy and education to the region's economy, and that the region has a limited concentration of Scotland's professional, scientific and financial economy.

[36] This data is presented for the region as defined for STPR2 (i.e. Angus, Perth & Kinross, Dundee City and North East Fife)

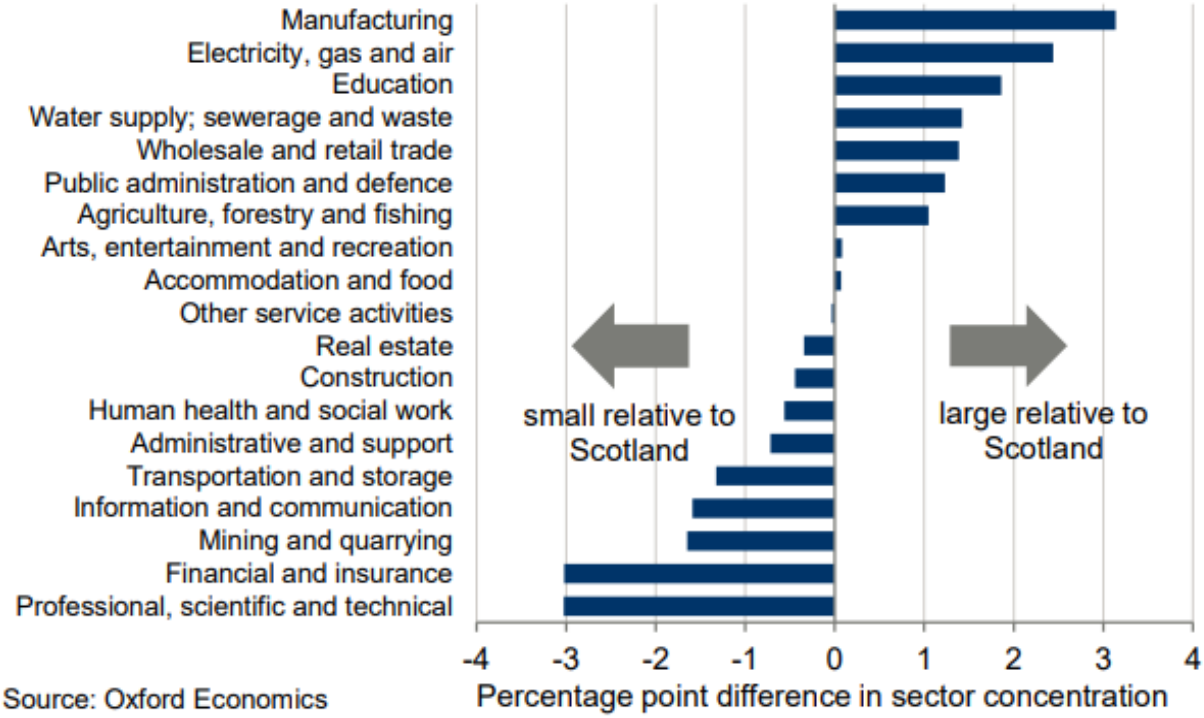
[37] ONS, Regional gross value added (balanced) by industry: local authorities by NUTS1 region: UKM Scotland current prices, 2018, https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/regionalgrossvalueaddedbalancedlocalauthoritiesbynuts1region

[38] Based on NRS, Mid-Year Population Estimates Scotland 2018 and ONS, Regional gross value added (balanced) by industry: local authorities by NUTS1 region: UKM Scotland chained volume measures in 2016 money value, 2018.



Source: Oxford Economics

Figure 12: Index of GVA, Tay Cities region and Scotland, 2008-2018[39]



Source: Oxford Economics

Figure 13: Sector GVA share, Tay Cities region and Scotland, 2008 - 2018

2.3.8. Access to Employment

Figure 14 illustrates the accessibility to key employment centres in the region (to locations in Dundee, Perth and St Andrews, as defined by BRES) by scheduled bus and rail services during a typical weekday morning between 6am and 10am[40].

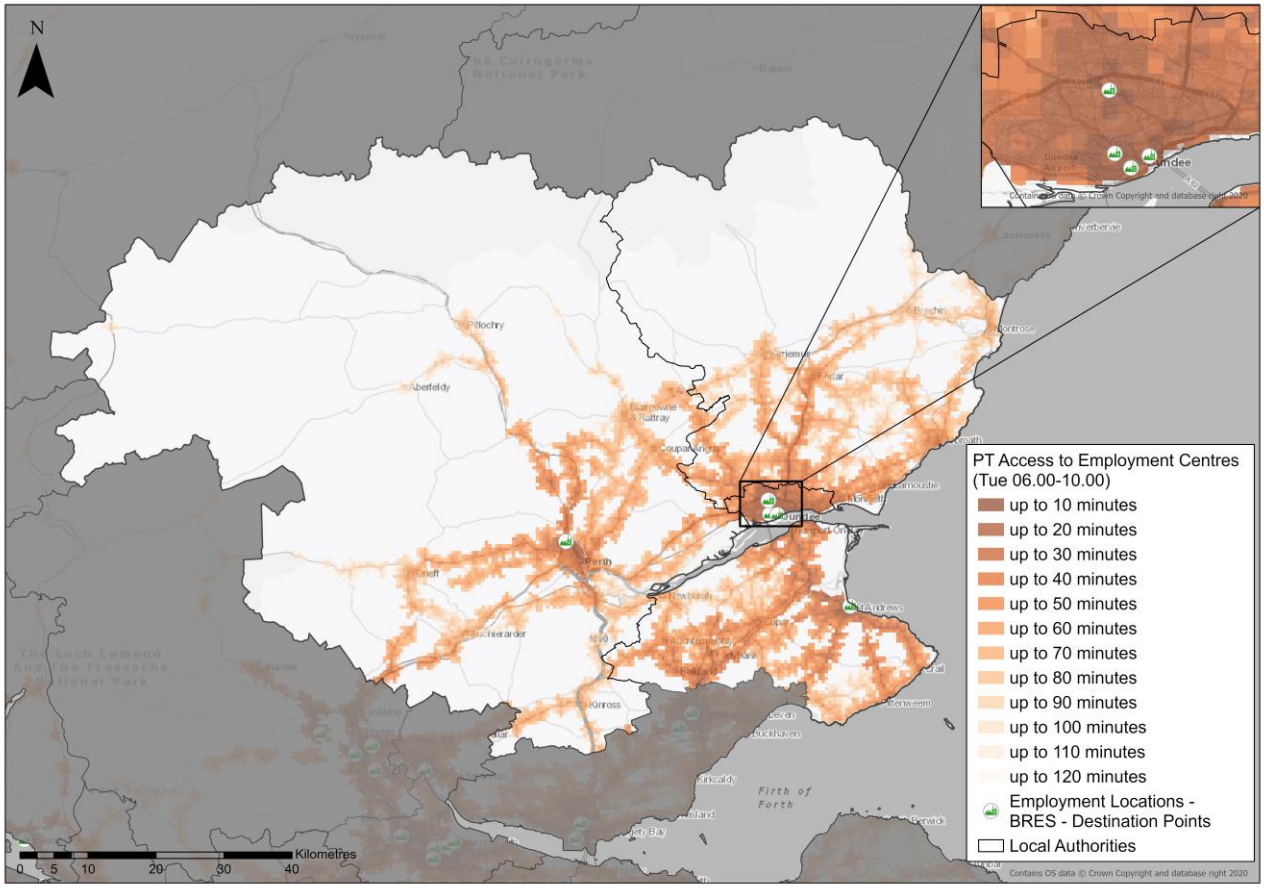


Figure 14: AM journey time isochrones to key employment areas, by public transport

(click image to enlarge figure)

Approximately 82% of the population can access key employment centres within a 60-minute journey time by public transport. In Perth and Dundee City access is generally good, with most urban and suburban areas able to access key employment centres with a journey time of 30-minutes or less. In North East Fife access is not as good as Perth and Dundee City, but approximately 95% of the population can access employment opportunities (within the region or elsewhere) within a 60-minute journey time. In rural Angus and Perth & Kinross accessibility is more varied, with approximately 70% and 68% of the population respectively able to access employment centres within a 60-minute journey time. In the deeper rural areas, access to key employment sites by public transport often takes longer than 2 hours or is impossible using scheduled services.

[39] 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

[40] TRACC - multimodal accessibility and journey time analysis tool.

2.3.9. Access to Education

Figure 15 illustrates journey times to further and higher education centres by scheduled bus and rail during a typical weekday morning between 06:00 and 10:00[41]. It shows that most residents of the urban areas of the region have reasonable access to educational opportunities, but that many residents of rural locations do not and highlights the geographic inequity of accessibility.

Within the region approximately 90% of the population aged between 16 to 74 can access further and higher education within a 60-minute journey time by public transport. Dundee city has the highest percentage of population aged 16 to 74 able to access higher and further education centres, where 99% can access these centres by public transport within 40 minutes. Perth & Kinross is the lowest in the region, where approximately 75% of the population between 16 and 74 can access higher and further education within 60 minutes.

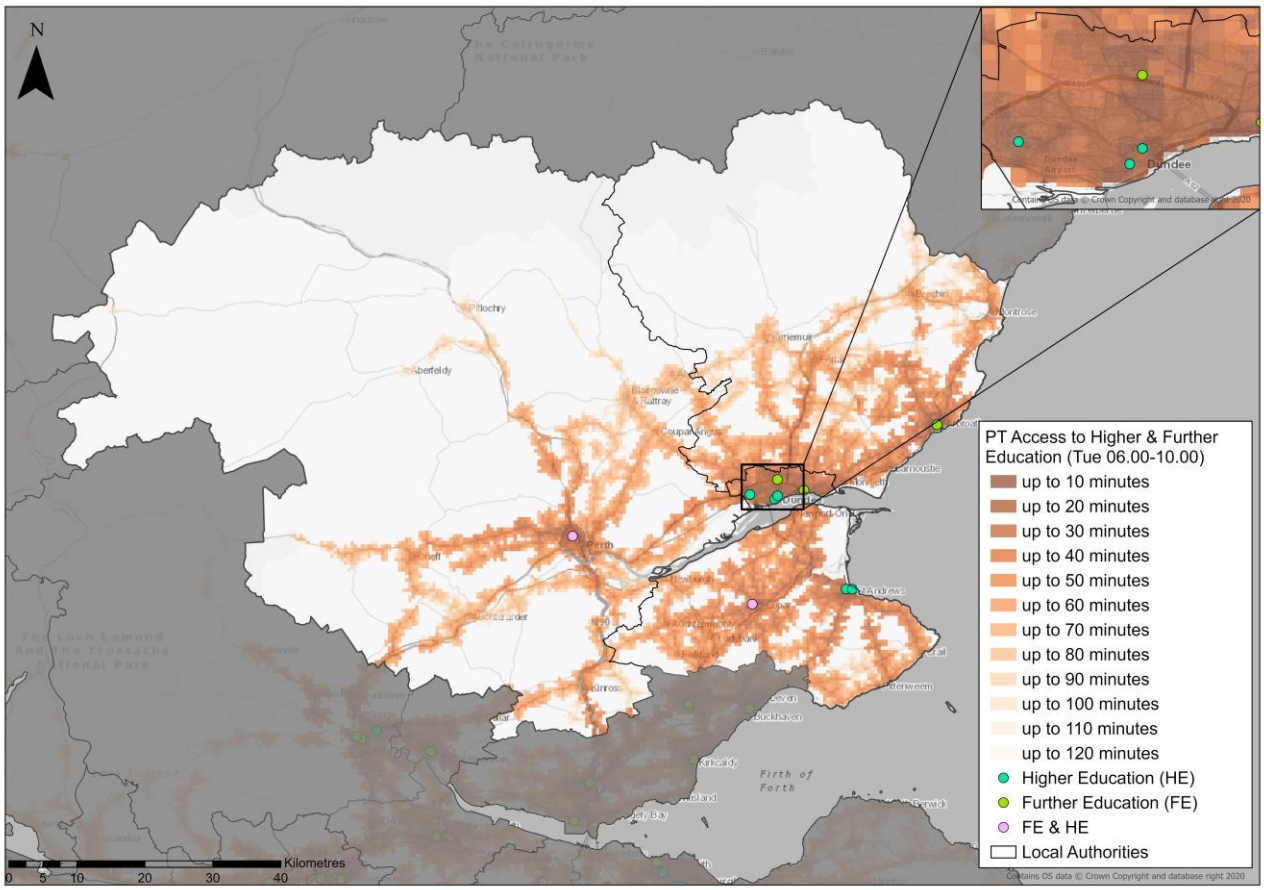


Figure 15: AM period journey time isochrones to further and higher education, by public transport

(click image to enlarge figure)

[41] TRACC - multimodal accessibility and journey time analysis tool.

2.3.10. Deprivation and Health

The Scottish Index of Multiple Deprivation (SIMD) is a relative measure of deprivation and demonstrates the socio-economic issues experienced nationally. The SIMD is measured across 6,976 small areas (data zones), of which there are 626 in the Tay Cities region.[42]

Within the Tay Cities region deprivation is generally low; 15% (97 zones) of the region's data zones were within the 20% most deprived nationally and 8% (50 zones) were within the 10% most deprived. As illustrated in Figure 16, areas of deprivation are mostly located in Dundee City, but also exists in parts of Perth, Arbroath, Brechin, Blairgowrie, Forfar and Montrose.

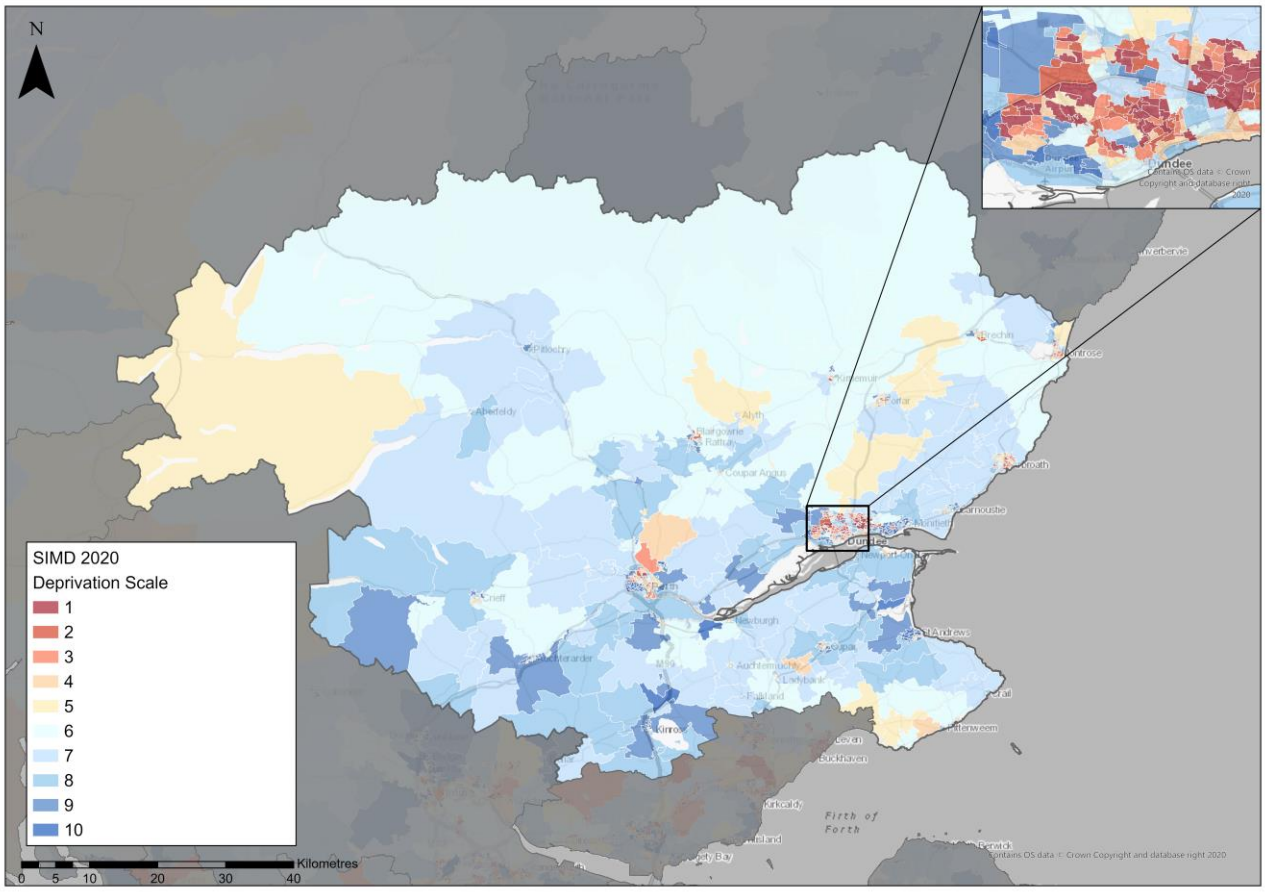


Figure 16: SIMD data zone locations for Tay Cities region, coloured by decile ranking[43]

(click image to enlarge figure)

In the region, Dundee City is the local authority with the highest percentage of data zones that are deprived, with 37% of its data zones in the 20% most deprived nationally. North East Fife had the lowest percentage with 1% of data zones in the 20% most deprived nationally. Perth & Kinross have 6% and Angus have 8% of its data zones in the 20% most deprived nationally.

[42] Scottish Government, Scottish Index of Multiple Deprivation (SIMD), 2020, https://simd.scot/

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

When compared to Scottish Cities, Dundee City has the second highest proportion of data zones in the 20% most deprived nationally, behind Glasgow City. Over one third (70 data zones) of Dundee City data zones were within the 20% most deprived nationally and 24% (45 data zones) were within the 10% most deprived.

SIMD Health rankings, as displayed in Figure 17, indicate that health quality throughout the region is varied. In Dundee City, 37% of the data zones within the region are ranked in the lowest 20% for health in Scotland, while in contrast North East Fife has 1%, Angus has 2% and Perth & Kinross has 3%. Forty two percent of North East Fife's data zones are in the top 20% (i.e. healthiest) in Scotland, while 11%, 18% and 28% of Dundee City, Angus and Perth & Kinross, respectively, are in the top 20%.[44]

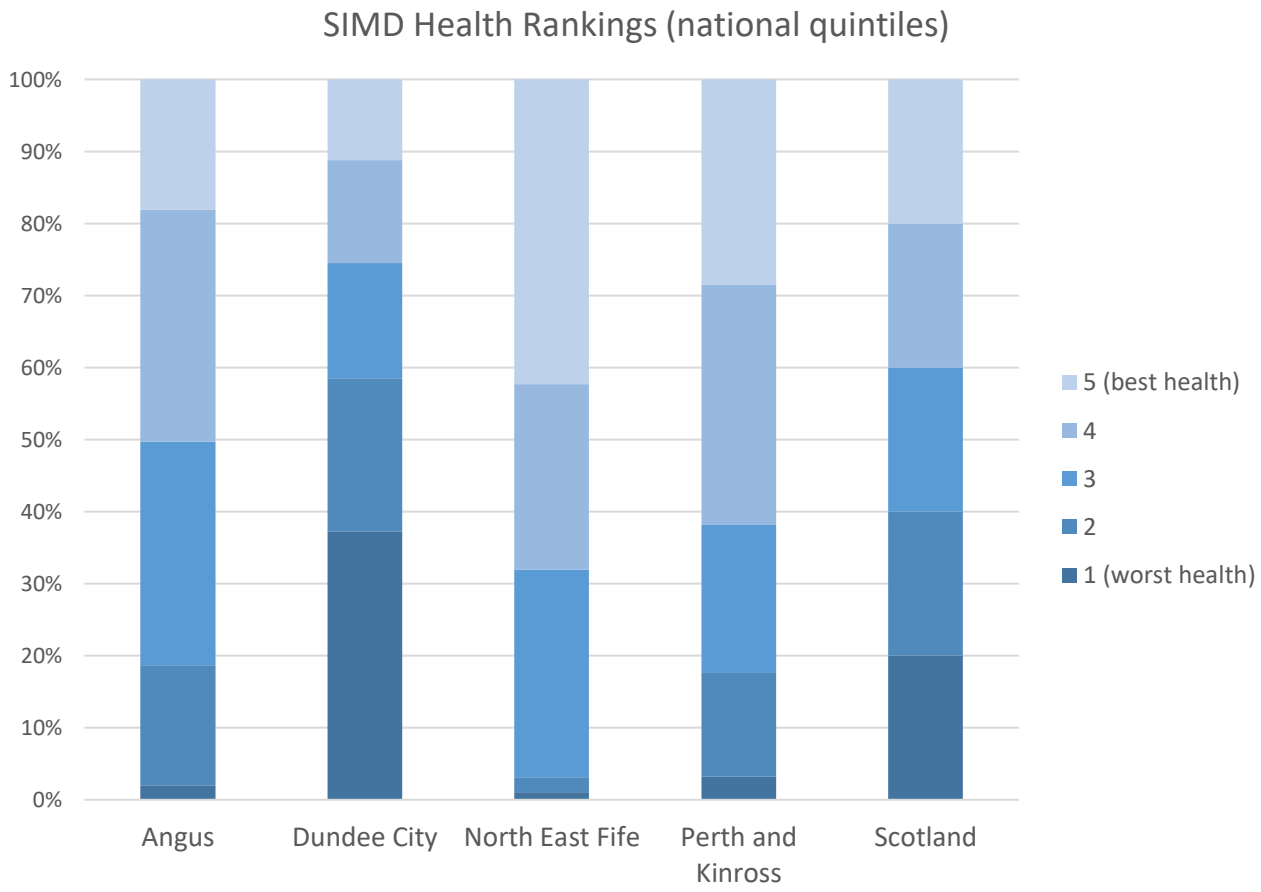


Figure 17: SIMD Health data zones in Tay Cities region

Figure 18 illustrates accessibility to healthcare (hospitals and GP surgeries) in the region by public transport. Access to healthcare facilities from most towns and much of the 2 cities in the region is within a 30-minute journey by bus or train. However, there are large areas of rural Angus and rural Perth & Kinross, and some parts of North East Fife which cannot access healthcare within a 2-hour journey.

[44] Scottish Government, Scottish Index of Multiple Deprivation (SIMD), 2020, https://simd.scot/

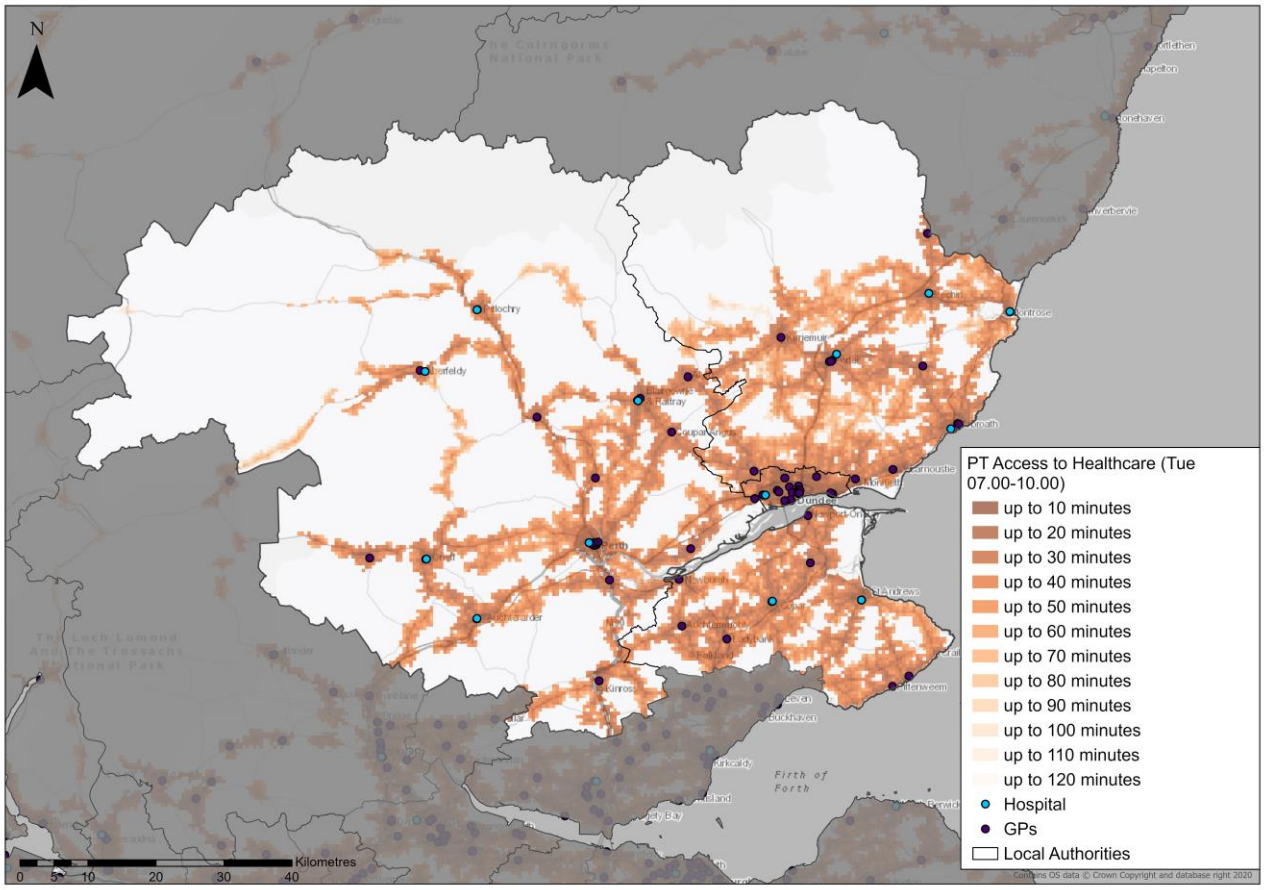


Figure 18: AM period journey time isochrones to healthcare (hospitals and GPs), by public transport

(click image to enlarge figure)

Approximately 96% population within the Tay Cities region is within a 60-minute journey by public transport to a hospital or GP surgery. This drops to approximately 93% when considering hospital sites alone.

The Scottish Household Survey data includes information on the proportion of the population of each local authority area which has a long-term physical or mental health condition[45], which can be used as a proxy as an indicator of health outcomes, and also of the ability of people to use all modes of transport.

Each of the Tay Cities region's local authorities has higher proportions of their populations that have a long-term physical or mental health condition than the Scottish average of 23% (Angus 26%, Perth & Kinross 27%, Fife 29% and Dundee City 35%).

According to the 2011 Census data[46] 19.8% of the population in the region's day-to-day activities are limited a little or a lot by their disability (including data for all of Fife). Applying this proportion to the number of residents of the Tay Cities region, around 97,000 residents have a limiting disability.

[45] Scottish Government, Scottish Household Survey, 2018, https://www.gov.scot/publications/scottish-household-survey-key-findings-2018/

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

2.4. Environmental Context

Within the Tay Cities 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:

- 184 Sites of Special Scientific Interest (SSSI)
- 15 Special Protection Areas (SPA)
- 26 Special Areas of Conservation (SAC)
- 9 Ramsar Sites
- 7 National Nature Reserves (NNR)
- 8 Local Nature Reserves (LNR)
- 3 Royal Society for the Protection of Birds (RSPB) Reserves
- 6 National Scenic Areas (NSA)
- 2 National Parks (parts of both the Cairngorms National Park and Loch Lomond and Trossachs National Park)
- 1 Regional Park (part of the Lomond Hills Regional Park)
- 72 Gardens and designed landscapes
- 97 Conservation Areas
- 5 Battlefield Sites
- 1231 Scheduled Monuments.

An environmental constraints mapping exercise has been undertaken, as presented in Figure 19[47]. As can be seen, the majority of the designated sites are towards the north and north west of the region, towards the Grampian Mountains and around the coast and Tay Estuary. There are no Nature Conservation Marine Protected Areas (MPA) within the region.

In addition, the region contains a significant number of historic assets, including 11,078 Category A-C Listed buildings. Designated cultural heritage assets can be found throughout the region with several notable concentrations in and around Perth and the A9 corridor. There are no World Heritage Sites within the region.

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

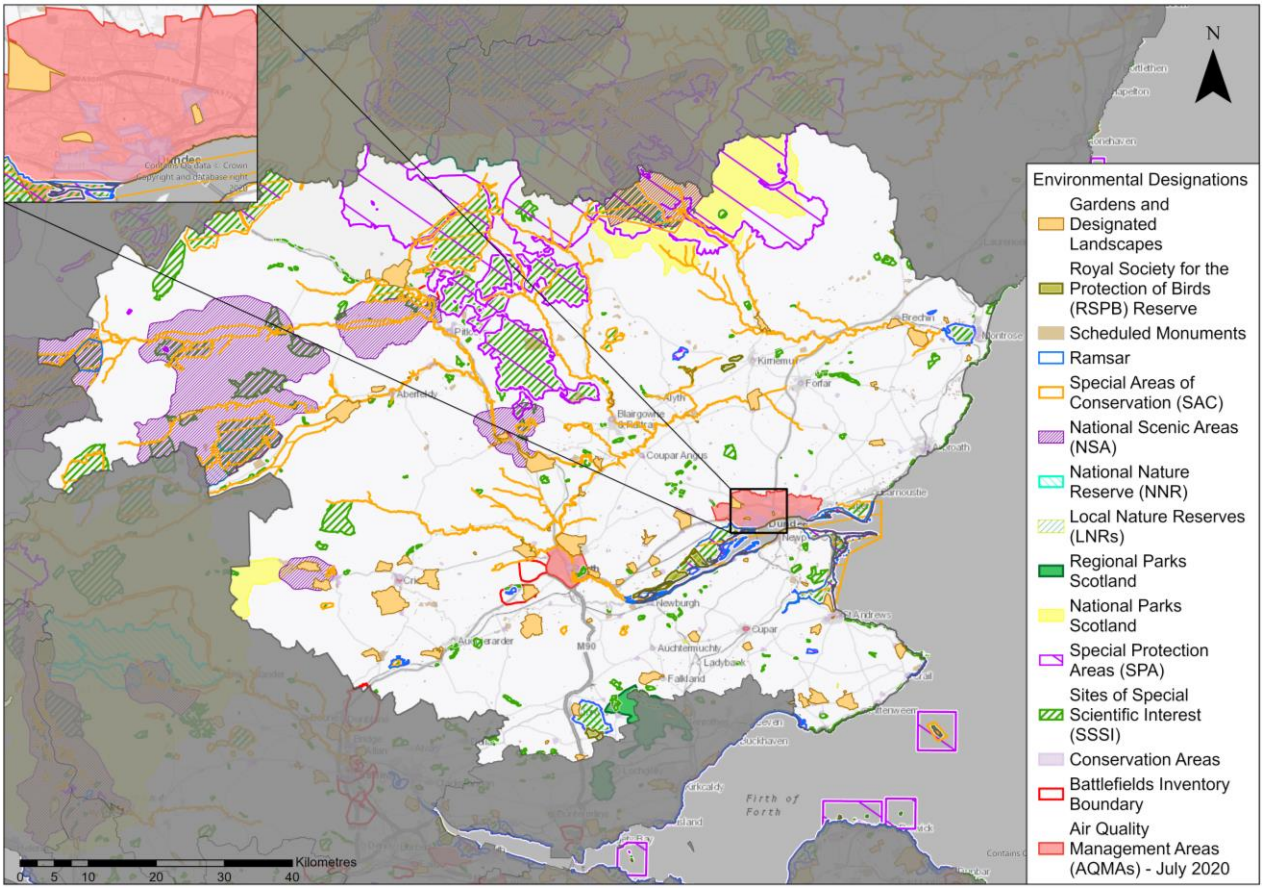


Figure 19: Environmental Designations for Tay Cities region

(click 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[48]) 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)"[49].*

Figure 20 illustrates the noise levels above 55 decibels (dB)[50] 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

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

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

[50] 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)[51].

Figure 20 shows the greatest modelled noise levels to be primarily located in the east of the region around Dundee (from road, industry and rail noise sources and Dundee Airport), and associated with the strategic road corridors into Perth (i.e. the M90 and A9); together with the rail corridor through Perth. Noise levels exceed a 65db threshold on, and in the immediate vicinity of, most of the strategic road network in the region.

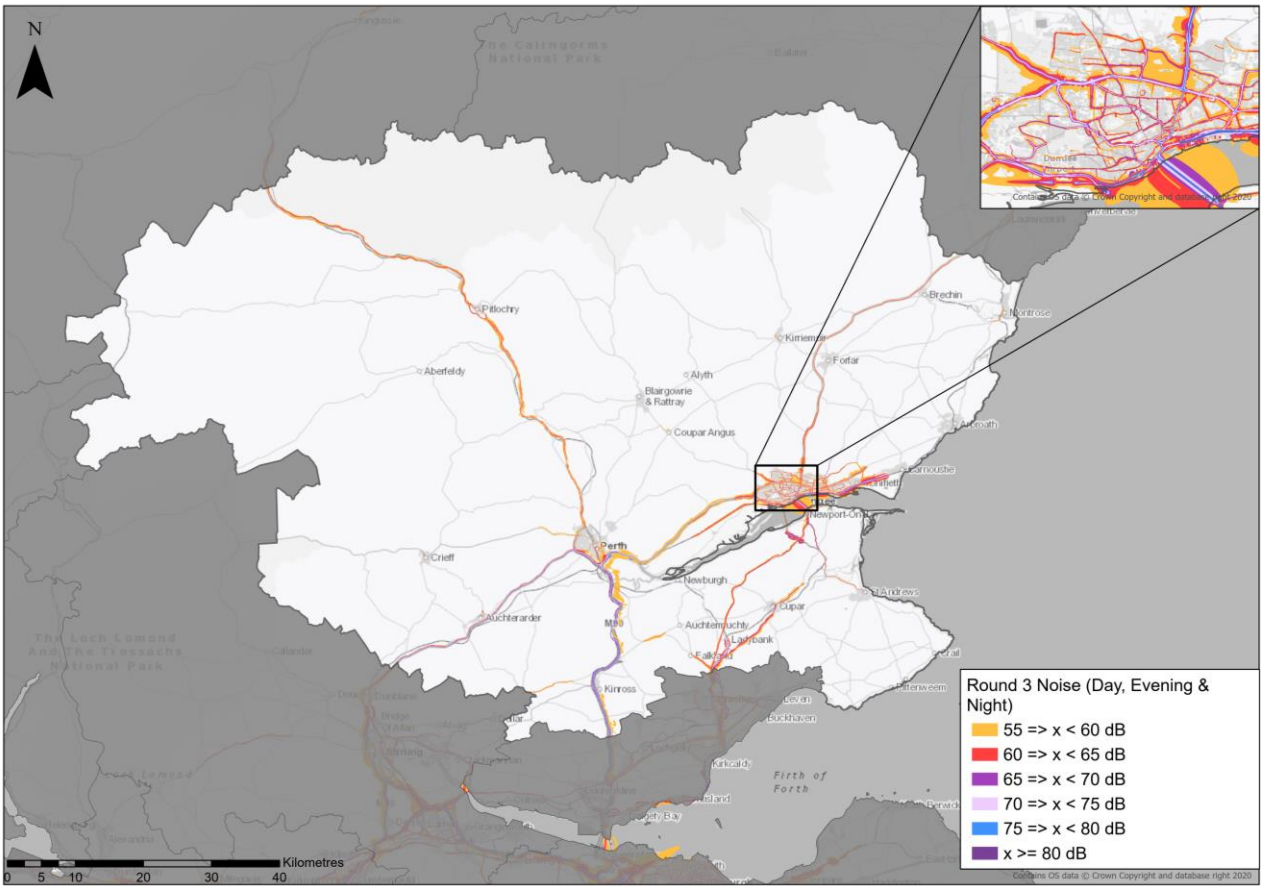


Figure 20: Noise Mapping for Tay Cities region[52]

(click image to enlarge figure)

The Scottish Environmental Protection Agency (SEPA) flood mapping[53] identifies flood risk from surface water, river and coastal flooding at medium (1 in 200 year) and high (1 in 10 year) likelihood of flooding within the region. Figure 21 illustrates the flood areas within the Tay Cities region, identifying likely areas of surface, coastal and river flooding.

[51] 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

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

[53] SEPA (2021) https://map.sepa.org.uk/floodmap/map.htm, accessed 20/01/21

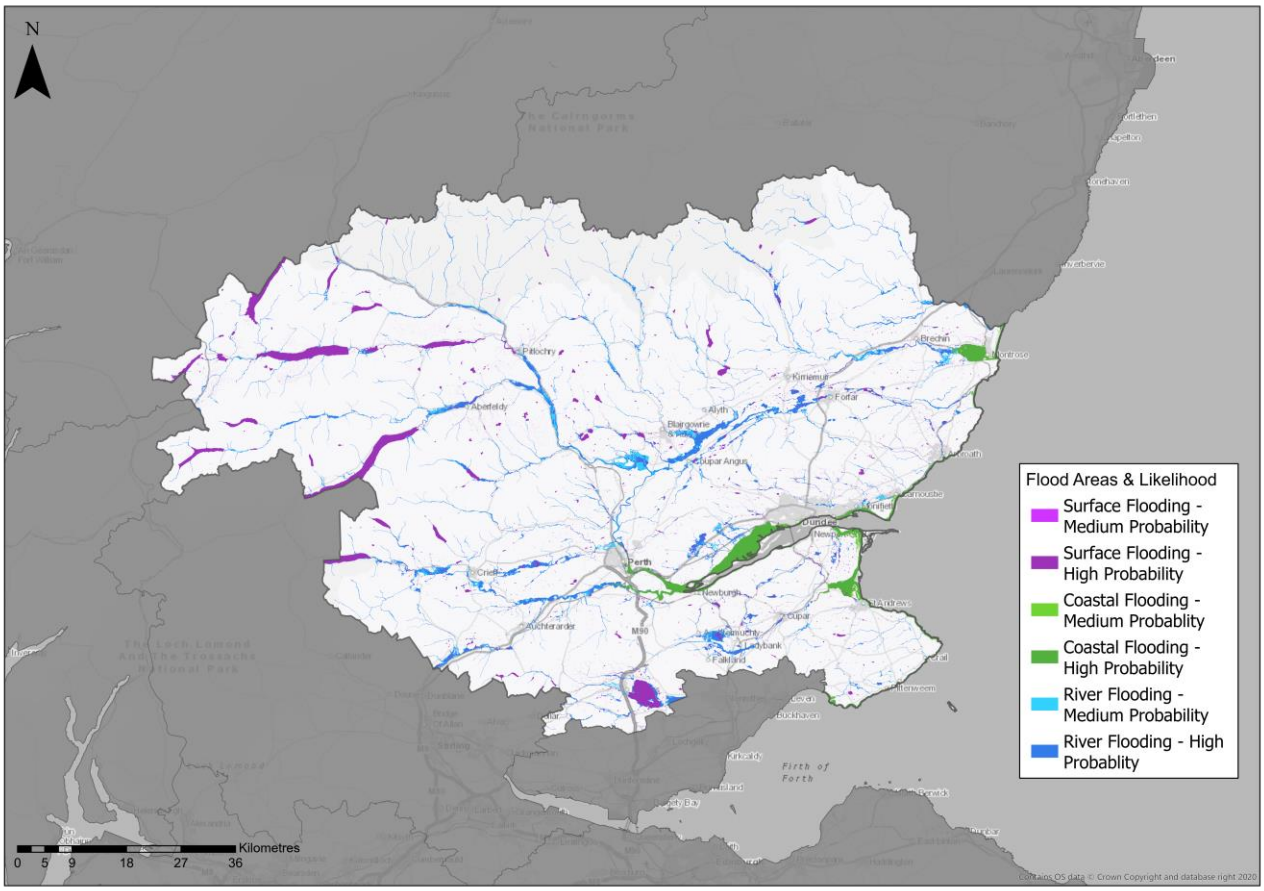


Figure 21: SEPA flood areas and likelihood of flooding in the Tay Cities region

(click image to enlarge figure)

Settlements at greatest risk of coastal flooding are located along the Firth of Tay, St Andrew's Bay and Montrose Bay and include Perth, St Andrews, Newburgh, Leuchars, Newport-on-Tay, Dundee and Montrose. Areas at medium and high risk of river flooding are predominantly located in the vicinity of River Earn, River Tay, River Isla, River South Esk and their tributaries. Settlements at risk include Forfar, Cupar and Auchtermuchty.

Areas at high and medium risk of surface water flooding are typically associated with Lochs within the east of the region where population density is typically low.

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[54]. The soil types in the region are mainly mineral gleys, brown soils and mineral podzols. Figure 22 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 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

[54] NatureScot, Managing nature for carbon capture, 2020, https://www.nature.scot/professional-advice/land-and-sea-management/carbon-management/managing-nature-carbon-capture

recorded however soils are carbon rich and deep peat.[55]

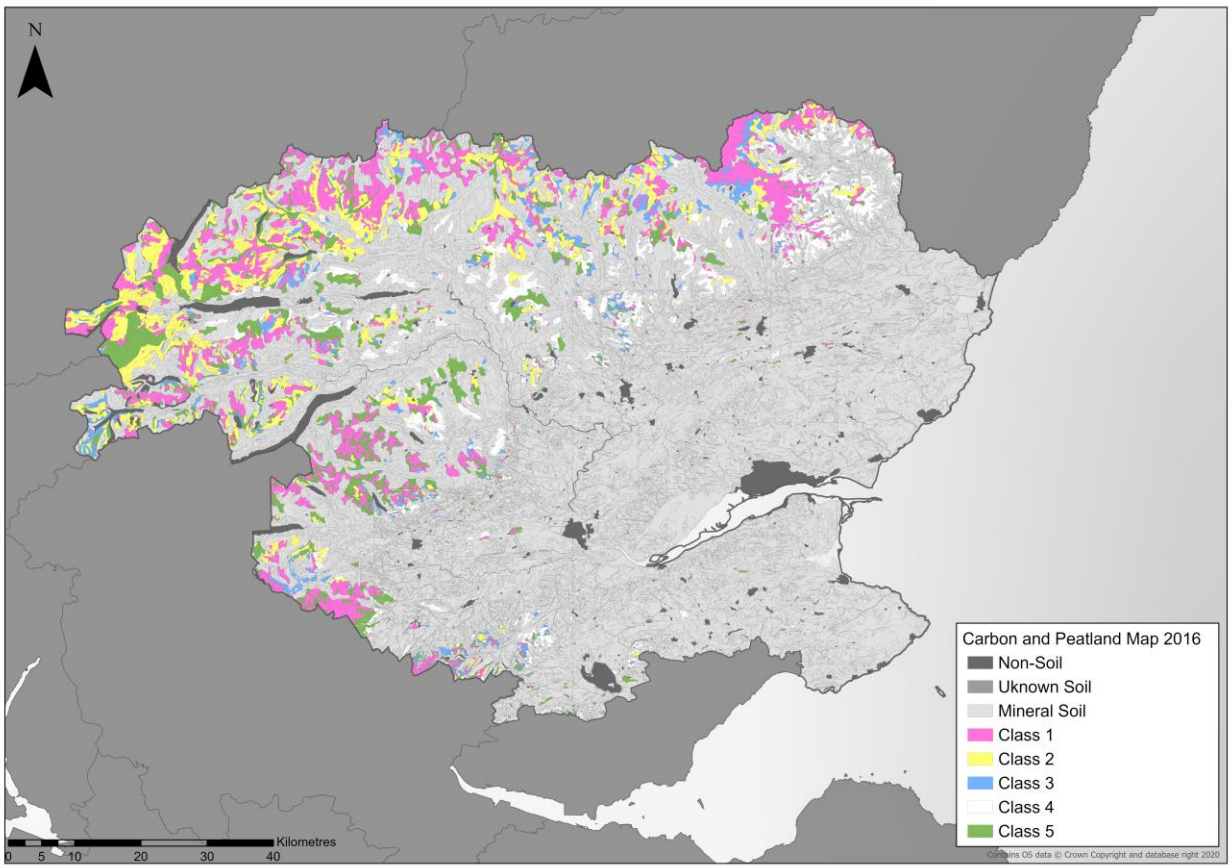


Figure 22: Carbon and Peatland Map for Tay Cities region[56]

(click image to enlarge figure)

There are 4 Air Quality Management Areas (AQMAs) in the region[57]; located within the following urban locations:

- Dundee AQMA - an area encompassing the local government area of the city of Dundee
- Perth AQMA - an area encompassing the main built-up area of Perth
- Crieff AQMA - an area of Crieff incorporating the A85 from East High Street to West High Street
- Bonnygate AQMA - an area of central Cupar centred on Bonnygate (A91).

Each of these AQMAs has been declared due to concerns regarding emissions of both Nitrogen Dioxide and Particulate Matter. Transport is a significant source of local pollution in all instances.

[55] Scottish Government, Scotland's Soils, 2016, https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/
[56] Scottish Government, Scotland's Soils, 2016, https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/
[57] Scottish Government, Air Quality Management Areas (AQMAs), 2020, http://www.scottishairquality.scot/laqm/aqma

In 2018[58], Perth & Kinross recorded higher CO_2 emissions from transport per capita relative to the other authority areas within the region; whilst Dundee City recorded the lowest per capita in the region, as shown in Table 2. Within the region, the highest proportion of Scotland's total CO_2 emissions from transport were from the Fife authority area, closely followed by the Perth & Kinross authority area in 2018. The Dundee City authority area recorded the lowest proportion of emissions from transport in the region.

Table 2 shows that the total CO_2 emissions from transport within the Tay Cities region equated to 15.5% of the Scotland's total transport emissions overall.

Table 2: CO_2 Emissions Per Capita from Transport and Percentage of Scotland Total Transport-Related Emissions[*][59]

Area	Per Capita Transport Emissions, 2018 (t) CO_2	% of Scotland Total Transport Emissions
Angus	2.2	2.3%
Dundee City	1.4	1.9%
Fife	1.7	5.7%
Perth & Kinross	4.1	5.6%
Tay Cities region	2.2	15.5%
Scotland average	2.0	-

[*] Calculated based on total transport emissions per authority area.

[58] 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

[59] 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. Transport Context

Figure 23 shows the key transport network in the region, including the National Cycle Network (NCN), rail lines and the trunk road network. It demonstrates that Tay Cities region has a wide-ranging transport network, with many strategic connections routing through, notably routes linking the Central Belt and further south to the north and north east of Scotland.

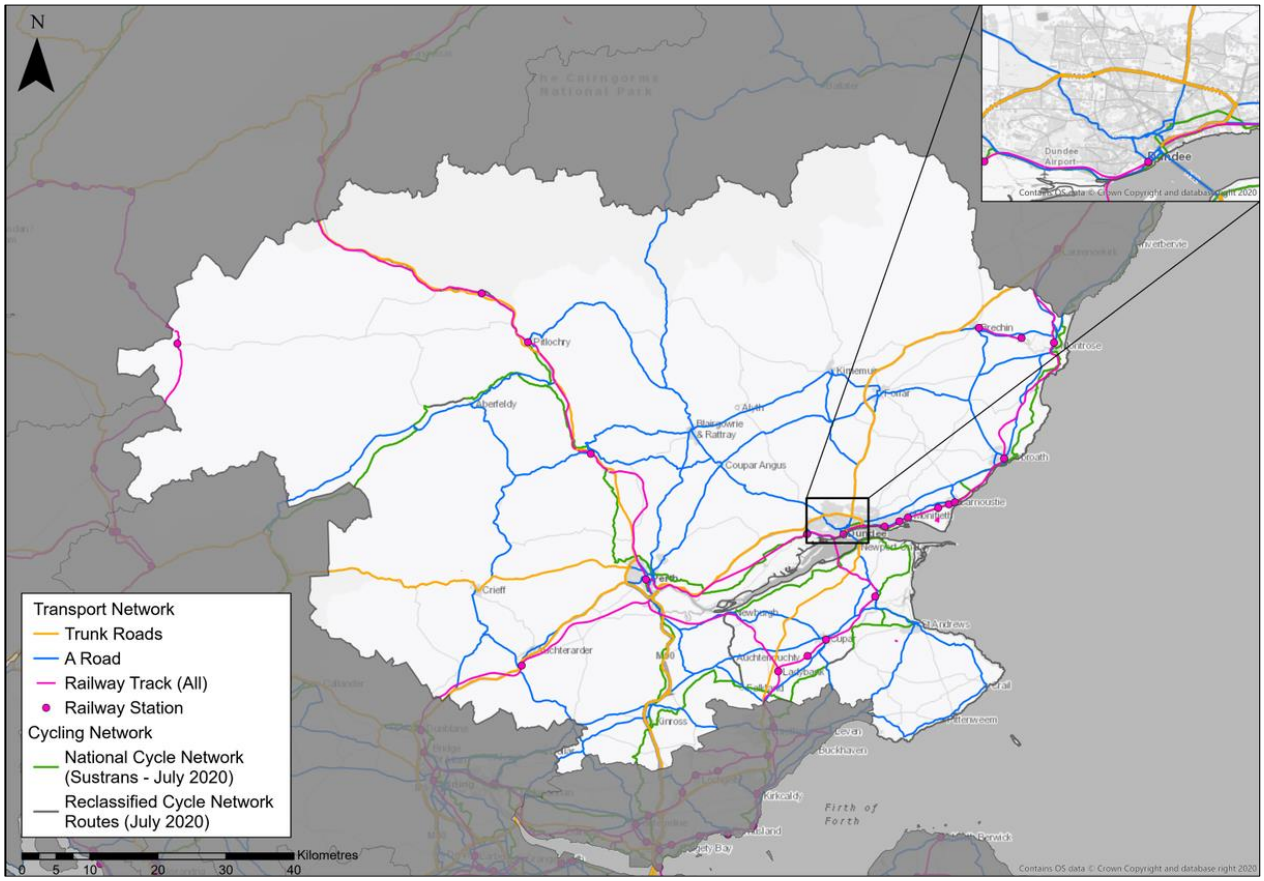


Figure 23: Tay Cities region transport network

(click image to enlarge figure)

2.5.1. Active Travel Network

There is a diverse range of off road and on road cycle routes, including sections of the National Cycle Network:

- NCN1 - from Kinross – North Fife – Dundee (via Tay Bridge), then follows the coast through to Arbroath and Montrose.
- NCN77 - between Dundee and Pitlochry via Perth.
- NCN775 - from NCN1 in Milnathort to Perth where it links with Route 77.
- NCN776 - links Route 1 in Falkland with Route 777 in Newburgh.
- NCN777 - along the south side of the Tay Estuary, linking Route 776 in Newburgh with Route 1 at Newport-on-Tay.

There are also other active travel routes, including each of the local authority's Core Paths networks, other walking and cycling networks and 'quiet routes' on some minor rural roads. Each authority in the region also has a range of initiatives underway to encourage and enable more active travel, including school traffic exclusion areas and 20mph zones.

2.5.2. Walking

Figure 24 illustrates the proportion of people not walking in the previous 7 days (as asked in the Scottish Household Survey)[60]. Nationally, 31% of people report that they had not walked as a means of transport in the previous week, and 39% that they had not walked for pleasure. The levels in Dundee City, Perth & Kinross and Fife are similar to the national average, meaning that around a third of people do not walk regularly. The proportion of people walking in Angus is substantially lower: 40% do not walk for transport regularly, and 46% not for leisure.

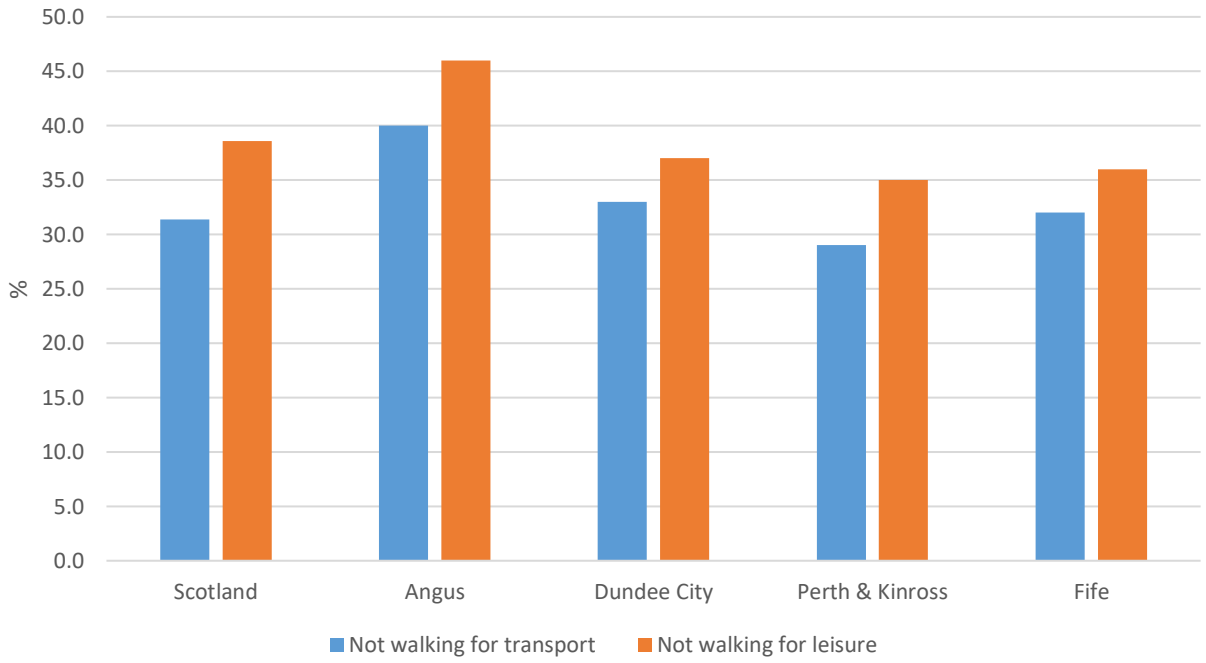


Figure 24: Proportion of people not walking in previous 7 days

2.5.3. Bus & Coach Network

There is an extensive bus network in the region, though the frequency of services differs widely depending on the time of day and location. Most local bus services in the region are operated by Stagecoach and National Express (Xplore Dundee), with other operators[61] providing more localised and schools services. Longer-distance bus and coach services, largely operated by Scottish Citylink, Megabus and Parks of Hamilton, provide connections between some of the region's main settlements and onward to Inverness, Aberdeen, Edinburgh and Glasgow.

Community transport providers offer an effective and flexible service for some journeys in the region that are unable (due to personal circumstances or lack of other services) to be made by scheduled public transport. The Community Transport Association lists 4 providers in the region[62], though previous work undertaken by Tactran and local authorities has indicated that there are many organisations and services operating in the region. All

[60] Transport Scotland, Transport and Travel in Scotland, 2019, https://www.transport.gov.scot/our-approach/statistics/#42764

[61] Including Wisharts (Friockheim), Burnbrae Garage, Docherty's Midland Coaches, Elizabeth Yule, Smith & Sons Coaches, Sweeney's Garage

[62] Dundee Community Transport SCIO, Strathcare (Crieff), Comrie Community Bus Trust and Killin Community Bus Company

are, however, available only in certain geographic areas and/or to specific groups of users, so there are (as in all regions) significant gaps in provision.

Figure 25 shows the change in share of population using the bus 4 or more days a week for each local authority area between 2003-04 and 2017. Although the number of regular users is relatively low, bus use in the Tay Cities region has held up reasonably well in the last 15 years, with the region showing modest growth in the number of regular users against a declining national picture, especially in Dundee City.

In Dundee City 56% of adults use a bus at least once a month, above the national average of 43%. This is a similar proportion as in Glasgow City, but well below the Edinburgh average of 82%. The other areas of the region are below the national average (40% in Fife, 37% in Perth & Kinross, and only 29% in Angus).

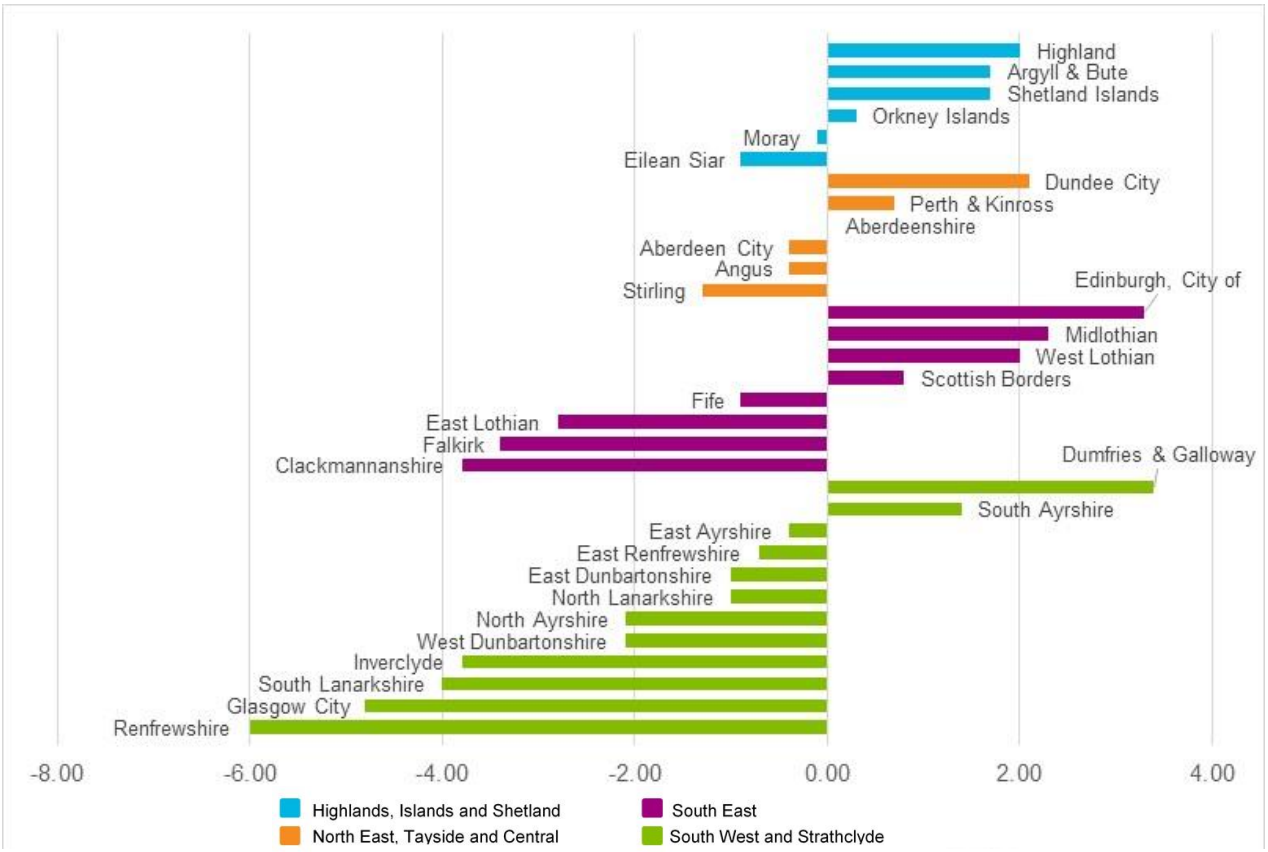


Figure 25: Change in share of population (%) using the bus 4 or more days a week, 2003-04 to 2017[63]

2.5.4. Rail Network

There are 20 rail stations in the Tay Cities region: 2 in Dundee City, 4 in North Fife, 7 in Perth & Kinross and 7 in Angus. They are served by combinations of the 5 rail lines that pass through the region:

- East Coast Mainline (ECML) Aberdeen – London

[63] 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.

- Central Belt (Glasgow and Edinburgh) – Aberdeen
- Highland Mainline (HML) Perth – Inverness
- Edinburgh – Perth
- West Highland Line (Rannoch station is in Perth & Kinross).

Rail journey times for centre to centre journeys between the main settlements within the region and the main destinations beyond it (Aberdeen, Edinburgh and Glasgow) are largely competitive with that of car, with the exception of Perth – Edinburgh, where rail journeys typically take around 50% longer than car.

Combined boardings and alightings at the region's top 3 busiest stations in 2018-19[64] were at Dundee (2,015,782), Perth (1,112,068) and Leuchars (644,262).

There have been significant increases in rail usage across the region in recent years, with 8% more boardings and alightings at the region's 20 stations in 2018-19 than 2014-15[65]. 16 of the region's stations saw growth over that period. Of the 10 busiest stations in the region, Carnoustie has seen the largest growth, with patronage increasing over 38% between 2014 and 2019; however, a spike in 2018 is likely attributed to Carnoustie Golf Links hosting a major sporting event in July 2018. Gleneagles and Leuchars stations have both seen patronage growth of over 20% over the same 5-year period. The 2 largest stations in the region, Dundee and Perth, have seen 8.9% and 3.1% growth respectively.

Of the 10 busiest stations in the region, only 2 have seen patronage decline over the last 5 years, Arbroath and Montrose; in both cases because passenger numbers towards Aberdeen have declined more than passenger numbers towards Dundee, which have increased. Montrose has shown consistent year on year decline, resulting in a 19.6% decline since 2014.

2.5.5. Ports, Maritime and Aviation

There are 3 commercial ports in the Tay Cities region:

- Port of Dundee
- Montrose Port
- Perth Harbour

The ports have different operators, and each has their own individual characteristics, but between them provide services in the region to the oil & gas and other freight sectors (including forest products and dry bulk goods), and the cruise ship market.

Highlands and Islands Airports Ltd (HIAL) operate Dundee Airport, which in Autumn 2020 had 2 scheduled routes (to/from London City Airport with typically 1 flight per day Monday – Friday and 1 on Sundays and to/from Belfast City with approximately 2 flights a week, both operated by Loganair). The airport has previously offered scheduled flights to a broader range of destinations, including London Stanstead, Birmingham, and Amsterdam.

[64] 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

[65] 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

2.5.6. Road Network

The trunk road network in the Tay Cities region consists of the following routes:

- A9 Dunblane – Perth – Inverness
- M90 Queensferry Crossing – Perth
- A90 Perth – Dundee – Aberdeen
- A92 Dunfermline – Dundee
- A85 Perth – Lochearnhead

Congestion is a frequent peak-time occurrence at some locations on the trunk road network, notably at the Broxden (A9/M90/A93) and Inveralmond (A9/A912) roundabouts near Perth and at several junctions on the A90 Kingsway at Dundee. Perth & Kinross Council and Dundee City Council have both stated that congestion at these locations is a factor in encouraging strategic traffic to divert from the trunk road to less suitable local roads, hence exacerbating road safety and air pollution problems within the cities.

The following non-trunk roads also perform key regional functions within the Tay Cities region:

- A91 Kinross/Milnathort (M90) to St Andrews; and A915 linking Kirkcaldy – Leven – St Andrews
- A92 Dundee – Montrose: coastal route linking, along with A935 – link from Montrose Port to the A90 through Brechin
- A93/A94 Perth – Blairgowrie/Coupar Angus and Forfar
- A977 Kinross – Kincardine Bridge
- A932 Arbroath – Brechin
- A919/A914 St Andrews – Dundee

Transport Model for Scotland (TMfS)[66] is the national transport model for Scotland which provides a broad representation of transport supply and estimates of transport demand. The model covers the whole population of Scotland and details, at a strategic level, the choices made by people on how, where, why and when they travel. Vehicle trip data from TMfS14 highlights the travel patterns for the Tay Cities region, indicating the proportion of vehicles trips to a specific region or local authority. In each local authority area within the Tay Cities region, the majority of vehicle travel is within each local authority boundary.

The data shows that most travel in the region is local[67]. Of all journeys starting in Perth & Kinross, Angus and Dundee City, 81%, 86% and 90% end within the Tay Cities region respectively. The most important single destinations outwith the region for journeys starting in each of these 3 authority areas are the north east (9% of journeys from Angus) and Fife (7% of journeys from Perth & Kinross and 6% from Dundee). Of journeys originating in Fife, 77% remain within the authority area (data for all of Fife).

2.5.7. Strategic Park and Ride / Park and Choose

Strategic Park and Ride sites in the region are adjacent to the main road network at Kinross, Broxden and, to a lesser extent, Scone. Broxden in particular serves both local and long-distance Park and Ride. It also facilitates car sharing and, increasingly, electric

[66] 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.
[67] Transport Scotland, Transport Forecasts, 2018, https://www.transport.gov.scot/media/43316/transport-forecasts-2018.pdf

vehicle charging.

2.5.8. Ultra-Low Emission Vehicles

There has been significant growth in the Tay Cities region in the registration of Ultra Low Emission Vehicles (ULEVs). Over a 5-year period (2014 to 2019) there has been on average a yearly growth rate of 48% (on average 300 new registrations per year)[68], though the average yearly growth rate nationally is 63%.

Dundee City Council has been one of Scotland's most proactive authorities leading work to install electric vehicle infrastructure and encourage EV uptake.

Tactran and the region's authorities are looking to capitalise on and accelerate this change through the recent publication of its regional EV (Electric Vehicle) Strategy[69] and the establishment of a regional EV Delivery Forum.

2.5.9. Road Safety

There has been a sharp decline in recorded road traffic accidents in the region[70]. When comparing the number of recorded accidents between the periods of 2004 to 2008 and 2014 to 2018, there is a 54% decline, which is relatively evenly spread across the region. This is the largest percentage decline in all regions in Scotland, and significantly larger than the national change (39% decline). The overall change comprised a 56% fall in the number of accidents in non-built-up areas and 51% in built up areas. Figure 26 illustrates the locations of recorded road accidents in which people were injured in the Tay Cities region between 2014 and 2018, categorised by severity.

[68] Department for Transport, Vehicle Licencing Statistics, 2019, https://www.gov.uk/government/statistics/vehicle-licensing-statistics-2019

[69] Tactran, Tactran Regional EV Strategy, 2019, https://www.tactran.gov.uk/projects_climatechange.php

[70] Department for Transport, STATS19 Road Safety Data, 2019, https://data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-safety-data

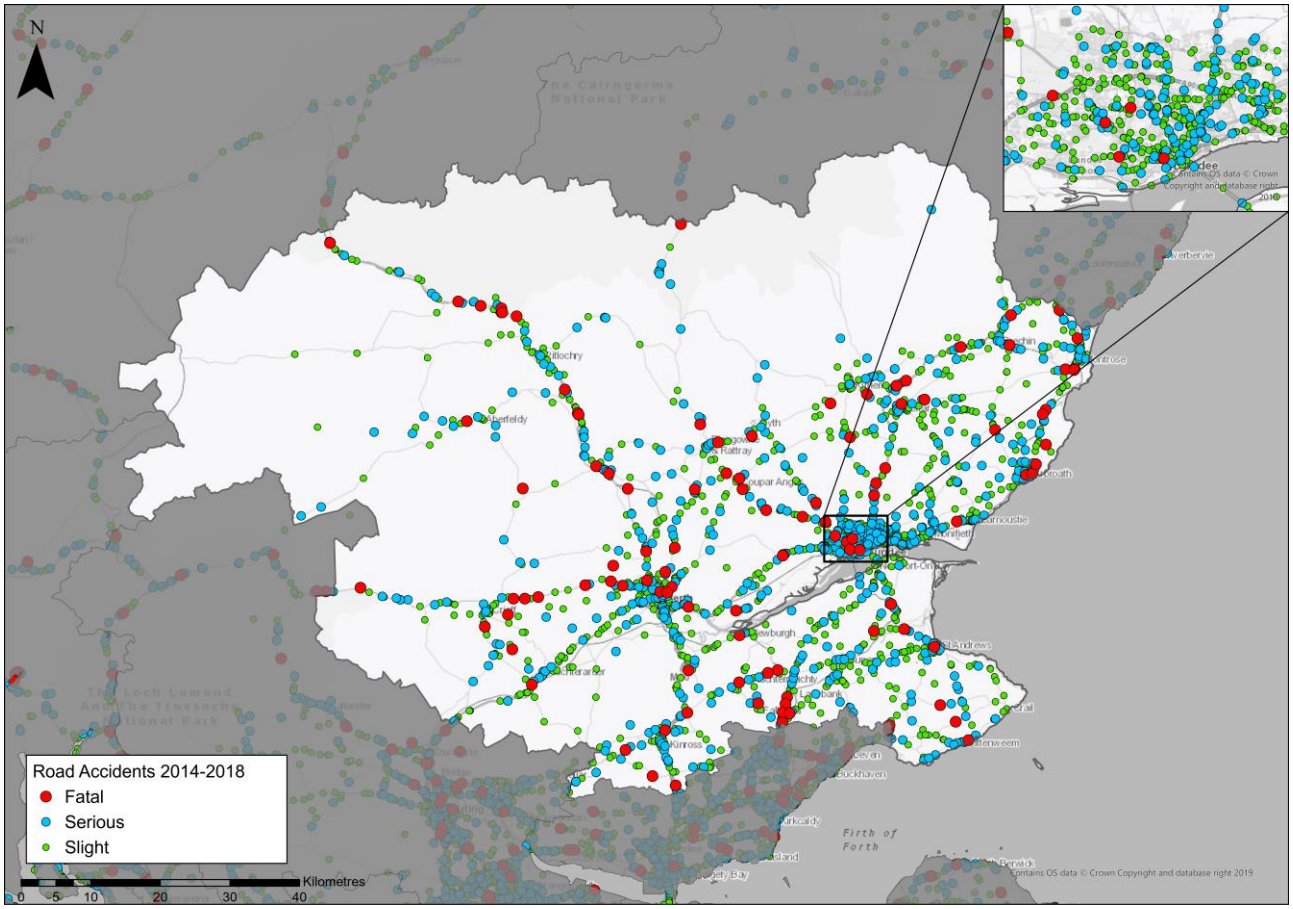


Figure 26: Locations of road accidents (Slight, Serious and Fatal) in Tay Cities region from 2014-2018

(click image to enlarge figure)

Between 2014 and 2018, 181 accidents were recorded on the A9, the largest number of accidents recorded on a road in the region. Approximately half of the accidents on the A9 (95) were recorded on the section to the north of Inveralmond Roundabout, where the A9 Dualling Perth to Inverness programme is currently in preparation.

However, when considering only fatal and severe accidents, the A9 and A90, which are the two longest roads in the region, had the joint largest number of recorded accidents (58) in the region.

2.6. Context Summary

Key points to note from the context review are:

- The Tay Cities region comprises a broad mix of urban and rural settlements and areas.
- The region (including all of Fife) is home to 14.4% of Scotland's population, and the region's population is a little older on average than that of Scotland as a whole. Dundee City has a higher proportion of older people than the Scottish Cities average.
- Economic activity levels are in line with national benchmarks, except for in Dundee City which performs less well than other Scottish cities, but regional GVA growth has been higher than the national average in recent years.
- Deprivation levels are high in many parts of Dundee City, and in selected parts of other settlements in the region. In Dundee City, 37% of the population live in the top fifth of most health deprived data zones in Scotland, and each of the region's local authority areas has significantly higher proportions of their populations with long-term health conditions than the national average.
- Access to key services is reasonable for most residents of the region's cities and larger towns, but transport options are limited in more rural areas and for people unable to use scheduled public transport and without car availability. Bus patronage in the region is holding up better than in some other parts of Scotland, though many bus services are frequently delayed by traffic congestion.
- Car is the main mode of transport for most journeys, even though a large majority of journeys are made within residents' home local authority area.
- Carbon emissions from transport in the region are higher than the Scottish average. Air Quality Management Areas are in place in 4 towns/cities in the region because of local air pollution from transport.
- The region's transport network caters for both local and through trips, the latter because of the region's role in connecting the north and north-east of Scotland to the Central Belt and beyond. Traffic congestion is severe at peak times on the trunk road network around Perth and Dundee, affecting both strategic and local trips.
- The region (especially Dundee City) has been taking a lead in the promotion of electric vehicles and uptake of other new transport technologies.

3. Problems & Opportunities

3.1. Approach to Problems & Opportunities 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 Tay Cities 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 Scottish Household Statistics[71], Transport and Travel in Scotland[72], INRIX[73] journey time and TRACC connectivity data, as well as data gathered from recent reports and studies in the region. Key findings from the data analysis are presented below, 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 Tay Cities region this has consisted of:

[71] Scottish Government, Scottish Household Survey, 2018, https://www.gov.scot/publications/scottish-household-survey-key-findings-2018/
[72] Transport Scotland, Transport and Travel in Scotland, 2019, https://www.transport.gov.scot/our-approach/statistics/#42764
[73] Data supplied by INRIX via Transport Scotland.

- **Problems and Opportunities workshops** held in Dunkeld and Dundee in June 2019. They were attended by 44 representatives (out of 129 invited) of regional stakeholders from public, private and third sector organisations.
- **Option Generation Workshops** were held in Perth and Dundee in November 2019 to generate potential interventions which may address the identified problems and opportunities. The same stakeholders invited to the June 2019 workshops, and some others, were invited to the Intervention Generation workshops; 26 attended (of 169 invited).
- **Structured interviews** with senior officers from the local authorities and Regional Transport Partnerships of the region.
- **An Elected Members Briefing Workshop** was held in January 2020. Key elected members with a transport portfolio, selected by the RTWG, were invited and it was an opportunity for them to hear first-hand about the project and its programme, problems and opportunities gathered, the interventions generated, as well as putting forward their views for interventions to be considered.

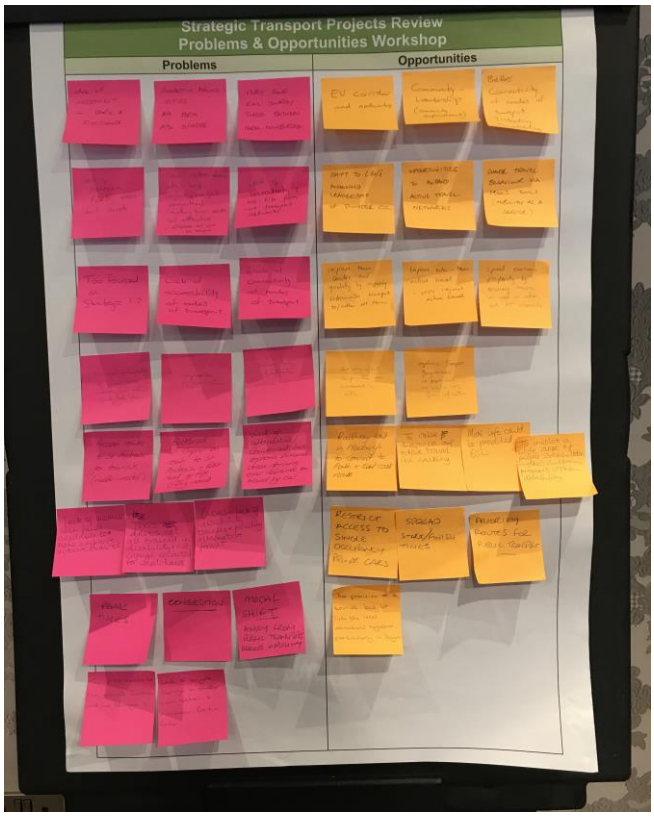


Figure 27: Stakeholder engagement

- **An online survey** commenced in late 2019, was promoted widely in the Tay Cities region to enable anyone to feed into the STPR2 process. The survey generated 3,025 responses nationally.
- **Regional Transport Working Group (RTWG) meetings**, which include representatives from Angus, Dundee City, Perth & Kinross and Fife Councils, Tactran and SEStran (Regional Transport Partnerships), Network Rail, ScotRail, Scottish Natural Heritage, Sustrans, Transport Scotland and the STPR2 consultant team.
- **Schools Engagement** has been undertaken across the country, engaging with pupils at selected primary and secondary to hear their ideas for transport priorities and interventions.

More detail on the stakeholder engagement activities is contained in Appendix C.

3.2. Problems & Opportunities

Based on the evidence described in the previous section, the following transport-related problems and opportunities have been identified for the Tay Cities region.

3.2.1. Problems

Evidence to support the problem themes listed below is provided in this section.

- Deprivation
- Transport exclusion
- Physical activity and health
- Limited transport choice
- Active travel facilities/safety
- Air pollution
- Carbon emissions
- Public transport availability and competitiveness
- Freight movements
- Inter- and cross-regional connectivity
- Road and rail capacity constraints and congestion

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

DEPRIVATION

There is a wide disparity in the level of deprivation throughout the region.

Figure 28 shows the SIMD ranking for data zones across the region. 37% of SIMD data zones in Dundee City are in the most deprived quintile nationally; deprivation levels in Dundee City are nearly twice the national average.[74]

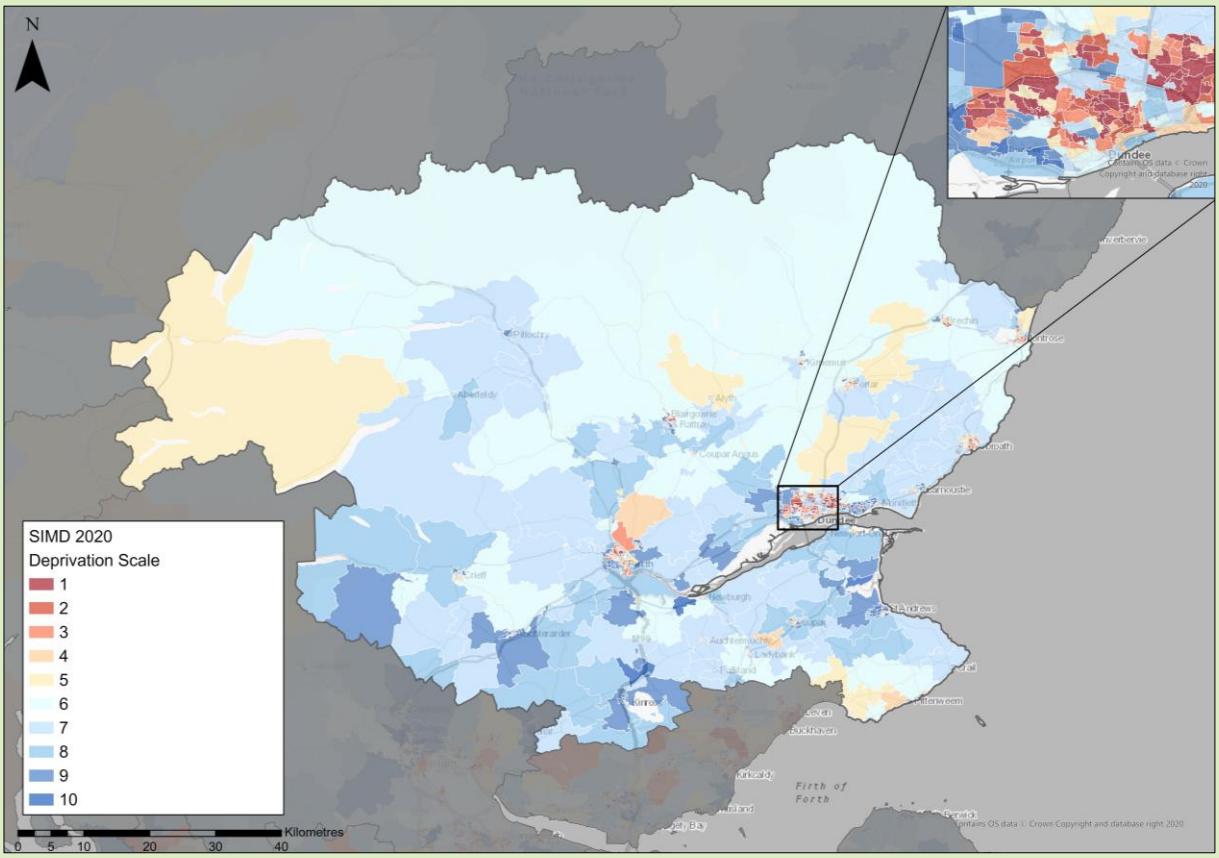


Figure 28: SIMD data zone locations for Tay Cities region, coloured by decile ranking[75]

(click image to enlarge figure)

Deprivation in the other local authorities' areas is much lower (1% of north east Fife in the most deprived quintile), though pockets of significant deprivation do exist outwith Dundee City - parts of Arbroath, Perth and Blairgowrie are in the most deprived 10% of Scottish data zones.

Although deprivation arises from a broad and often complex range of factors, improved transport may be able to assist some people living in deprived circumstances connect to better opportunities for employment, education or healthcare, and to a wider range of services.

[74] Scottish Government, Scottish Index of Multiple Deprivation (SIMD), 2020, https://simd.scot/

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

TRANSPORT EXCLUSION

On any given day[76], 27% of the population of Scotland does not travel anywhere. This proportion changes with age; nearly half of Scots aged 80 and over do not travel on any given day.

According to the 2017 Scottish Health Survey, more than a quarter of the region's population (and nearly a third of that of Dundee City) has a long-term physical or mental health condition. Many of these people will be unable to use a full range of transport choices, so may lack access to a full range of opportunities and/or be dependent on others to help them travel.

The region has a higher proportion of older people than the Scottish average, who are more likely to suffer health problems and less able to use all transport options. The number of elderly residents of the region is forecast to increase substantially in years to come, potentially exacerbating transport exclusion.

Stakeholders highlighted that some people – especially young and older people, and women – can feel excluded from using all forms of transport because of road safety and/or personal security concerns. They note that this places significant barriers to accessibility, especially in the hours of darkness.

Stakeholders also highlighted that not all rail stations in the region have step-free access from street to train, which places a significant constraint on train use for some people[77]. Bus services are Equality Act 2010 compliant[78], but roadside infrastructure does not always enable access to bus for people with mobility difficulties.

Sustrans identified areas whose residents are more at risk of transport poverty, based on average levels of household income, car availability and access to the public transport network[79]. The assessment shows higher levels of transport poverty in more rural parts of the region, but also pockets elsewhere, including several of the outer suburbs of Dundee. Figure 29 illustrates the High, Medium and Low levels of Transport Poverty within the region.

[76] Transport Scotland, Transport and Travel in Scotland, 2019, https://www.transport.gov.scot/our-approach/statistics/#42764

[77] According to http://accessmap.nationalrail.co.uk/, Dunkeld & Birnam, Rannoch, Golf Street and Barry Links stations have no step-free access from street to platform whilst Monifieth, Invergowrie, Springfield and Balmossie have partial step-free access (usually to 1 platform only). Other stations provide step-free access from street to platform, but none of the region's stations offers consistently level boarding from platform to train.

[78] I.e. meet the standards as set out in the Equality Act 2010

[79] 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

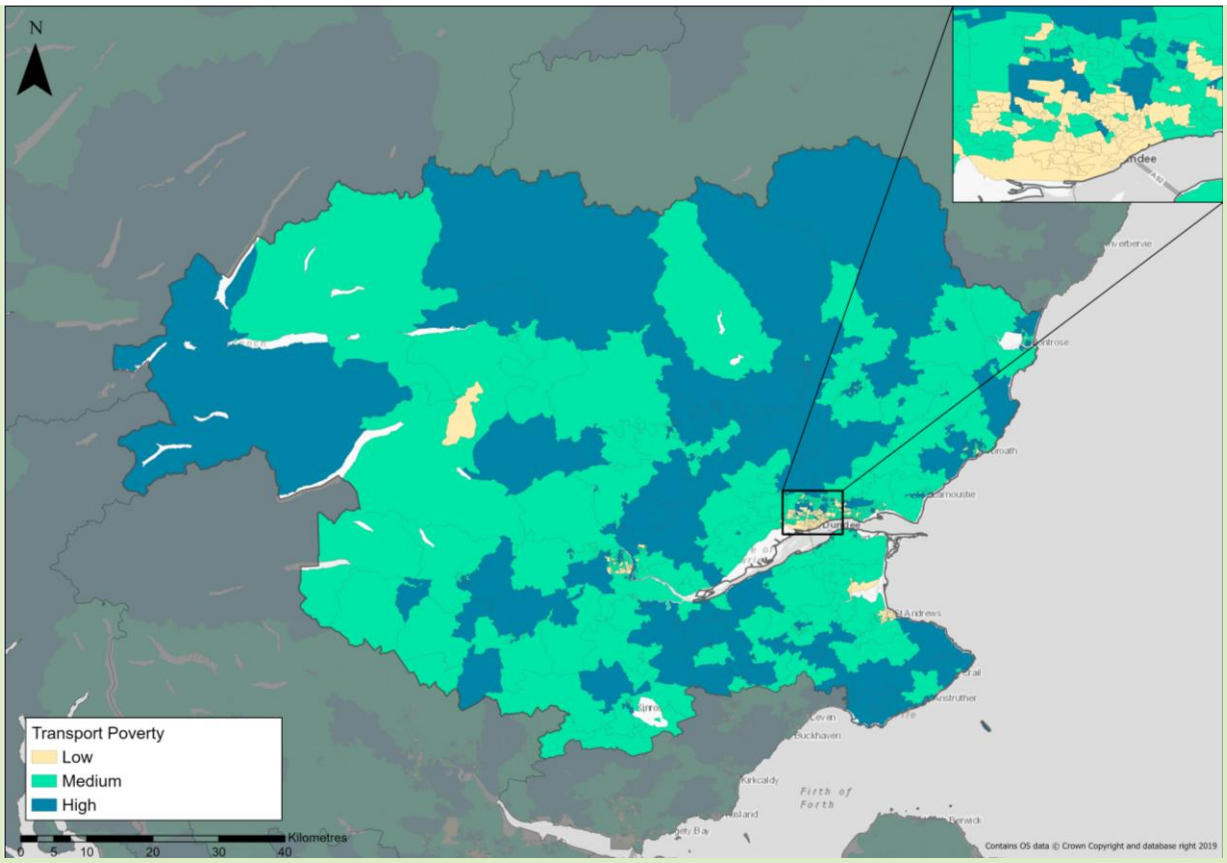


Figure 29: Risk of transport poverty in the Tay Cities region

(click image to enlarge figure)

PHYSICAL ACTIVITY AND HEALTH

Physical activity levels of much of the region's population fall below recommended guidelines: 34% of adults living in the NHS Tayside area (which excludes north east Fife) do not achieve recommended amounts of physical activity (i.e. do not get at least 150 minutes of moderately intensive physical activity or 75 minutes vigorous activity per week or an equivalent combination of both)[80].

The proportion of people walking on a regular basis in the region has been decreasing quickly: the proportion reporting walking at least once a week as a means of transport fell from 75% in 2012 to 69% in 2016 (n=680), whilst the proportion walking weekly for pleasure or fitness decreased from 69% to 63% in the same period[81].

In Dundee City, 37% of the population lives in a SIMD area ranked in the bottom quintile for health (Figure 30), and there are pockets of health deprivation in other parts of the region. Transport choices have the potential to improve health outcomes, especially if they are successful in promoting active travel: "*The potential benefits of physical activity*

[80] Scottish Government, Scottish Health Survey, 2018, https://www.gov.scot/publications/scottish-health-survey-2018-volume-1-main-report

[81] Transport Scotland, Transport and Travel in Scotland, 2019, https://www.transport.gov.scot/our-approach/statistics/#42764

to health are huge."[82] "*For most people, the easiest and most acceptable forms of physical activity are those that can be incorporated into everyday life. Examples include walking or cycling instead of travelling by car*."[83]

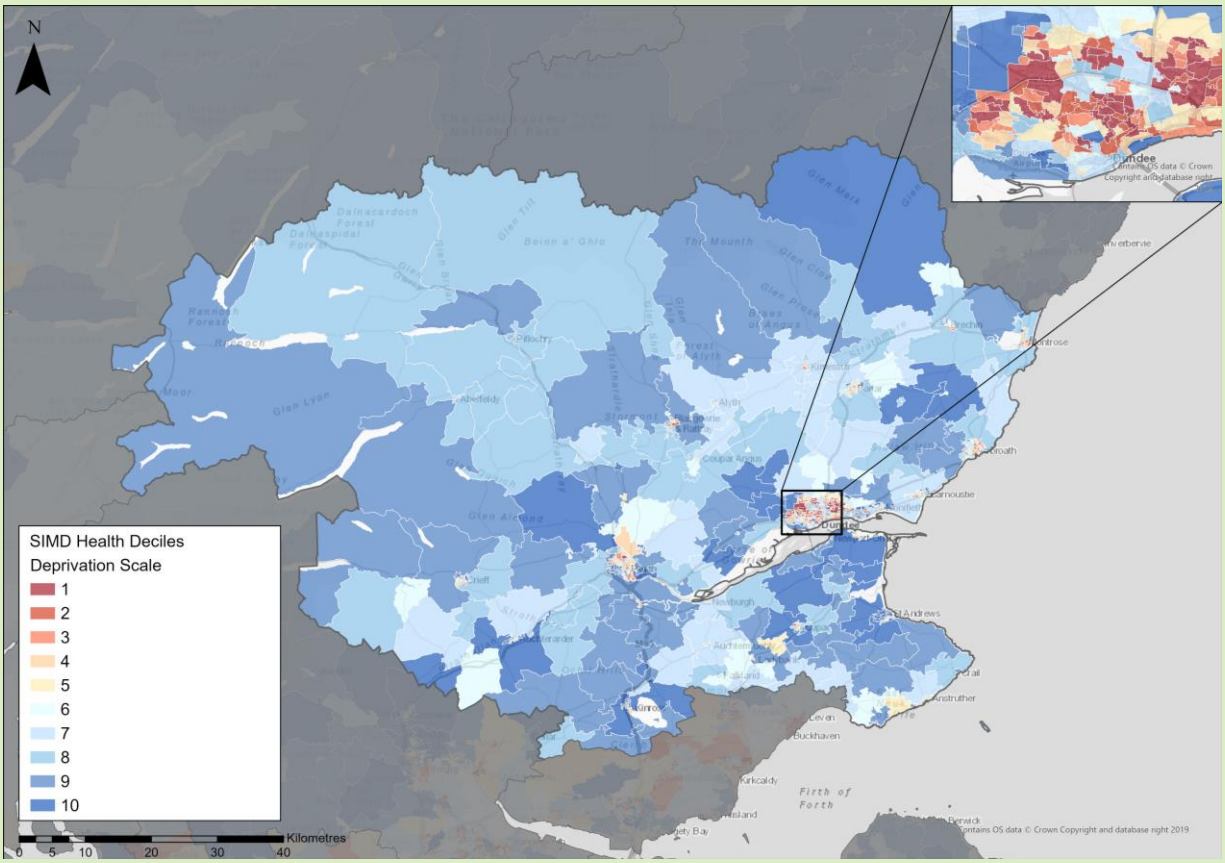


Figure 30: SIMD health rankings Tay Cities region, coloured by decile ranking[84]

(click image to enlarge figure)

LIMITED TRANSPORT CHOICE

Parts of the region suffer from relatively poor accessibility: 20% of data zones in Perth & Kinross, 21% in Angus and 18% in north east Fife are within the bottom decile for geographic access (SIMD). This data is reinforced by stakeholder views, several of whom highlighted accessibility challenges, particularly for residents of rural areas that do not have a car.

Public transport provides a good option for many journeys, especially between town/city centres and from city centres to their suburbs. But it does not provide an option for all journeys, as discussed in Section 2. As a further example, Figure 31 shows how well

[82] Sir Liam Donaldson, Chief Medical Officer, 2009

[83] Department of Health, Start Active, Stay Active - A report on physical activity for health from the four home countries' Chief Medical Officers, 2011, https://www.gov.uk/government/publications/start-active-stay-active-a-report-on-physical-activity-from-the-four-home-countries-chief-medical-officers

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

public transport provides a connection from locations across the region to the nearest GP or other health facility. Thirteen percent of residents from Perth & Kinross and 10% from Angus do not have a scheduled public transport service from their home to a health facility.

Limited public transport availability, especially in rural areas, is cited by stakeholders as a contributory factor to car dependency and resulting transport poverty. However, as 28% of the region's households have no access to a car or van[85]; some of these households will face very limited transport choice.

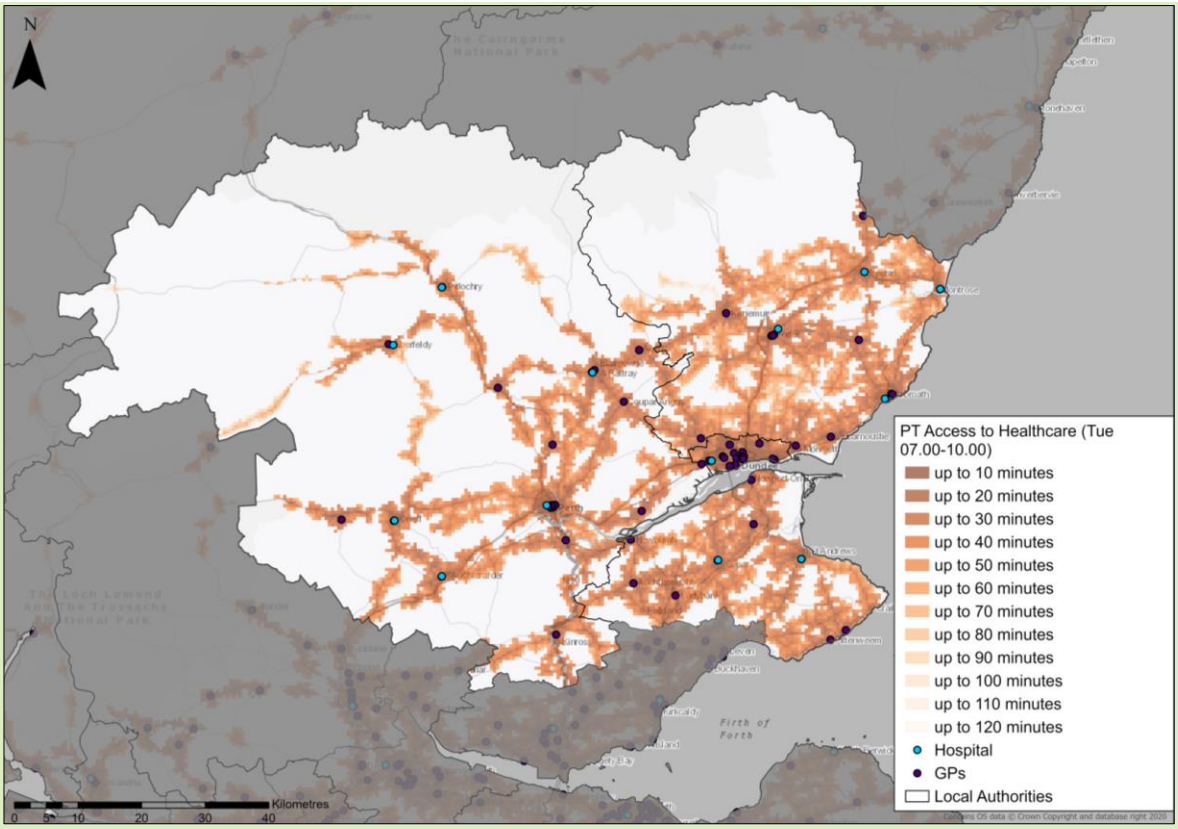


Figure 31: Public transport accessibility to health facilities (09:00-17:00)[86]

(click image to enlarge figure)

ACTIVE TRAVEL FACILITIES / SAFETY

While the coastal and A9 (north of Perth) corridors in the region are served by NCN infrastructure, some stakeholders report that this largely focuses on the leisure and tourism sectors rather than day-to-day commuter cycle trips[87], and that the NCN (in the region) does not provide high-quality, traffic-free routes throughout. Figure 32 shows the proportion of people that travel to work by bike (yellow is lower % and red is higher %).

[85] NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/
[86] TRACC - multimodal accessibility and journey time analysis tool.
[87] UK-wide, 56% of journeys on the NCN are reported to be for functional reasons, 44% for leisure https://www.sustrans.org.uk/media/2804/paths_for_everyone_ncn_review_report_2018.pdf

Each of the region's authorities is working to improve active travel routes and reduce perceptions of road danger. Examples include 'quiet route' traffic calming on rural roads, traffic exclusion zones around schools and the introduction of 20mph zones.

However, many gaps remain for both local and longer active journeys. Some are 'true' gaps: missing links in networks, such that there is no reasonably direct route for walking, cycling or wheeling for the chosen journey. But many more relate to safety and/or quality of routes, whereby people feel that there is no safe and attractive option for them or their dependants to use. Short car journeys are a common response to these issues, resulting in congestion and pollution, and contributing to reduced physical activity which disproportionally affects younger, older and disabled people.

Busy roads passing through communities cause particular barriers, the A90 Kingsway in Dundee being the most commonly cited during engagement. This accords with Cycling Scotland's research into the barriers to cycling, in which "not safe enough on the roads, bad drivers, etc" was by far the most common reason for not cycling, being quoted as the one main reason by 25% of respondents (the next most common reason being quoted by only 11%)[88].

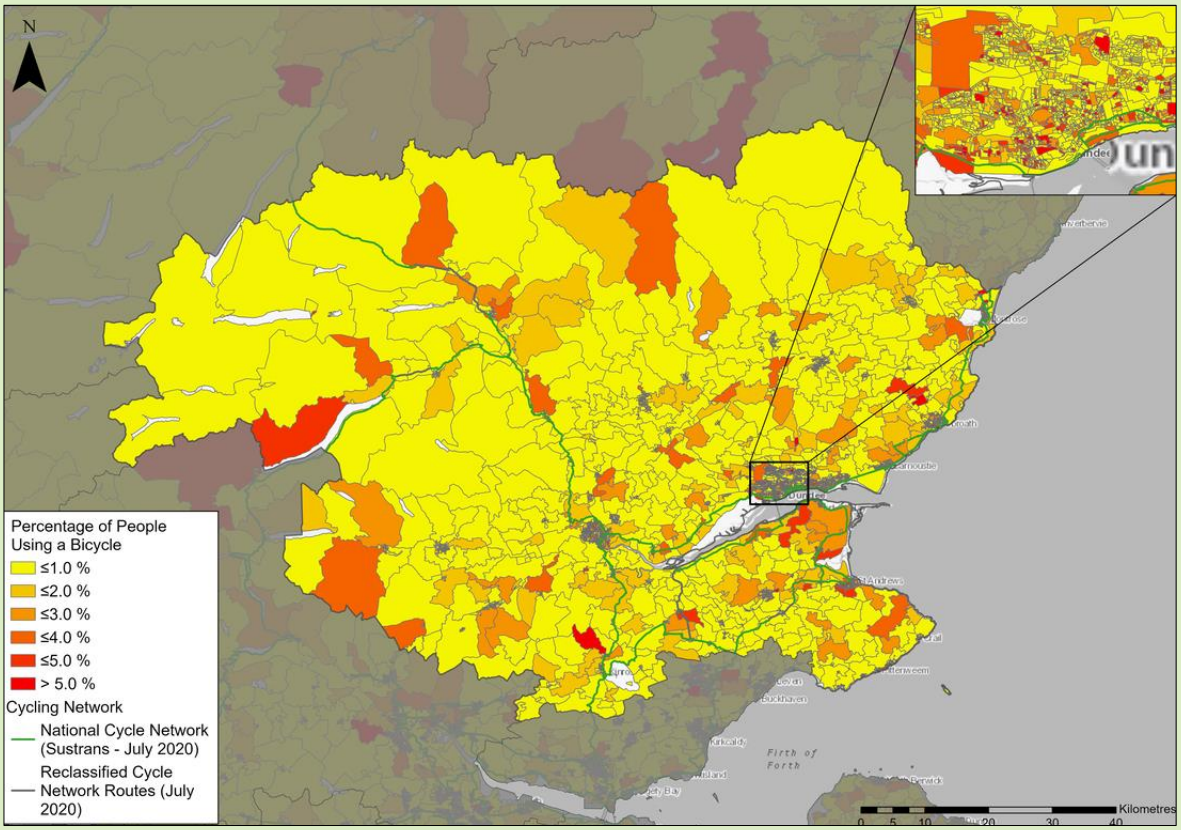


Figure 32: Mode of travel to work (Bicycle) [89]

(click image to enlarge figure)

[88] Cycling Scotland, Attitudes and Behaviours Towards Cycling in Scotland, 2019, https://www.cycling.scot/mediaLibrary/other/english/7268.pdf

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

AIR POLLUTION

Although air quality is good in most of the Tay Cities region, air pollution from road transport (particularly NO_2 pollution) exceeds standards on some main roads in Dundee, Perth, Cupar and Crieff[90].

This has resulted in the declaration of Air Quality Management Areas (AQMAs) as shown in Figure 33. The health of people that live or otherwise spend significant amounts of time in these areas is adversely affected by this pollution.

Local authorities suggest that traffic levels at pollution hotspots in the Dundee and Perth AQMAs are inflated because of peak time congestion on the trunk road network.

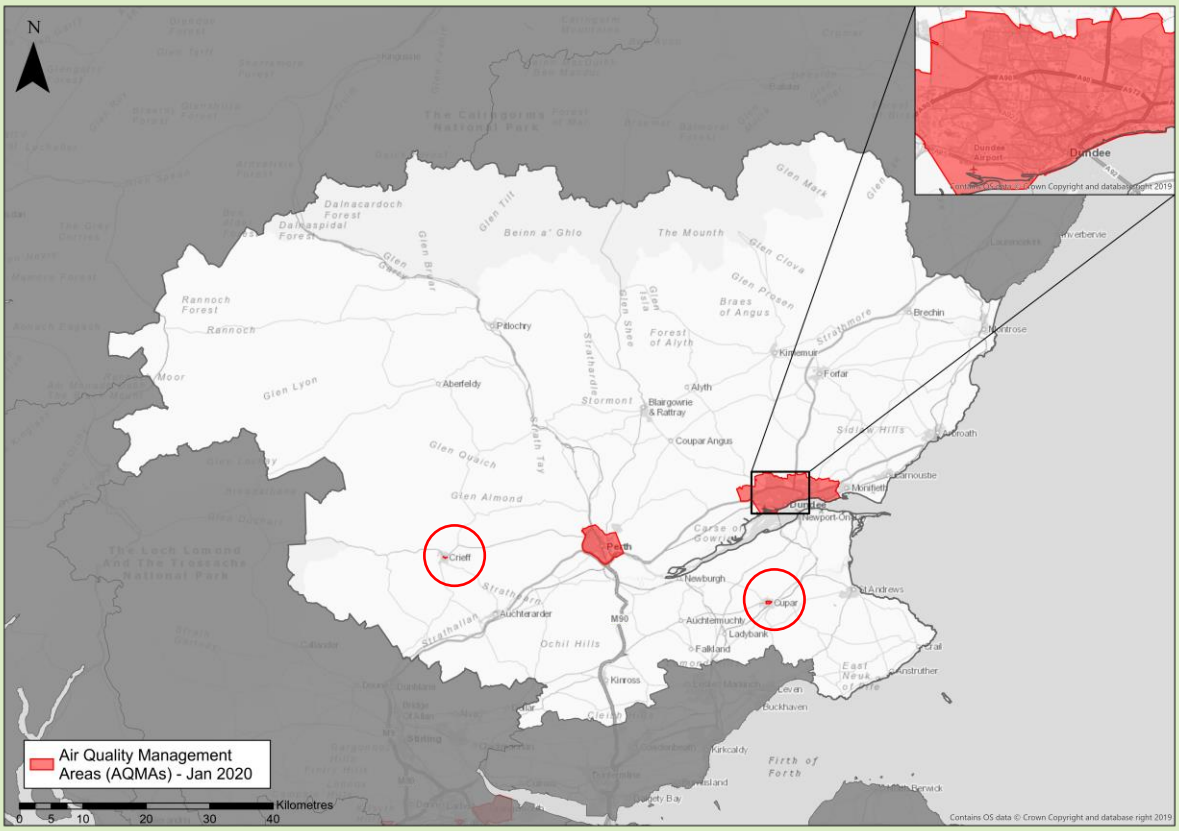


Figure 33: Locations of AQMAs

(click image to enlarge figure)

Following the commitment made in the 2017 Programme for Government, Dundee City Council is working to introduce a Low Emission Zone, with implementation anticipated in 2022[91]. Other AQMAs are due to have Low Emission Zones introduced by 2023, where National Low Emission Framework appraisal supports the approach[92].

[90] Scottish Government, Air Quality Management Areas (AQMAs), 2020, http://www.scottishairquality.scot/laqm/aqma

[91] Low Emissions Zones Scotland, 2020, https://www.lowemissionzones.scot/about

[92] Scottish Government, National Low Emission Framework, 2019, http://www.scottishairquality.scot/assets/documents/technical%20reports/00545018.pdf

CARBON EMISSIONS

UK Government data shows that total carbon emissions per capita in the Tay Cities region are broadly in line with the Scottish average, both in terms of overall emissions and the trend of reductions over time. However, carbon emissions from transport are not[93].

Regional transport emissions[94] from transport were slightly lower in 2018 than 2005 (1.4% lower), similar to the national trends where transport emissions fell in the same period (albeit by 1.2%). Over a 5-year period (between 2014 and 2018 inclusive) emissions from transport in the Tay Cities region increased by 6.2%, similar to the average for Scotland (5.9% increase).

The Scottish Government has set targets for rail services to be decarbonised by 2035[95]. Tactran's Regional EV Strategy outlines that by 2032 the region will aim to be *Scotland's exemplar region for enabling the electrification of transport in the context of a smart, integrated, sustainable mobility system*. This strategy aims to build on the Dundee's recognition as Europe's Most Visionary EV City in 2018.

PUBLIC TRANSPORT AVAILABILITY AND COMPETITIVENESS

Rail offers competitive journey times with car for many longer distance centre-to-centre journeys to key destinations outside the region (the exception being Perth – Edinburgh, where bus is competitive with car). Figure 34 presents the journey times comparisons from key Tay Cities region settlements to Glasgow, Edinburgh and Aberdeen.

Rail use in the region has been increasing in recent years, and recent timetable improvements should continue this trend. But the network is limited, and many stakeholder comments relate to the fact that some of the region's towns, including Forfar, Blairgowrie and St Andrews, are distant from the rail network.

Stakeholders commented that rail fares are typically higher in the Tay Cities region than in other regions. As an example, ScotRail's day return fares to Glasgow are 10-20% more per mile from the main stations in the Tay Cities region than from Stirling.[96]

An exercise has been undertaken to compare the cost of rail journeys in the Tay Cities region against other regions in Scotland, as shown in Table 3. This indicates that the average journey fare in the region is £16.17, reflecting the relative proximity to major urban centres and opportunities. However, the region has one of the highest average fares per mile at £0.25[97] for regional journeys.

[93] 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

[94] Regional transport emission data includes data for all of Fife.

[95] Scottish Government, Ambitious plans to transport Scottish rail network unveiled, 2020, https://www.gov.scot/news/ambitious-plans-to-transform-scottish-rail-network-unveiled/

[96] ScotRail, 2020, https://www.scotrail.co.uk/tickets

[97] Data sourced from MOIRA 2.2.

Table 3: Local and Regional Rail Fares

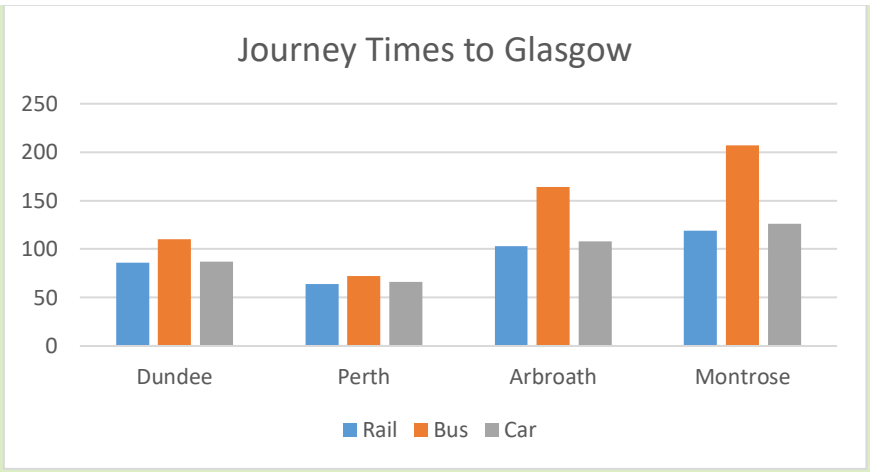
Region	Local		Regional		Fare per mile Ratio (Reg/Loc)[98]
	Average Journey Fare	Average Fare Per Mile	Average Journey Fare	Average Fare Per Mile	
Argyll and Bute	£3.62	£0.23	£10.52	£0.21	93%
Ayrshire and Arran	£3.39	£0.30	£6.79	£0.20	67%
Edinburgh and South East Scotland (incl. South Fife)	£4.63	£0.31	£10.91	£0.23	74%
Forth Valley	£3.15	£0.41	£7.37	£0.24	58%
Glasgow City	£2.98	£0.34	£8.46	£0.23	66%
Highlands and Islands	£6.42	£0.20	£31.99	£0.22	111%
North East of Scotland	£4.26	£0.28	£28.36	£0.26	93%
Scottish Borders	£1.83	£0.44	£10.87	£0.21	48%
South of Scotland (incl. Scottish Borders and Dumfries & Galloway)	£3.16	£0.28	£12.68	£0.19	66%
Tay Cities (incl. North Fife)	£5.55	£0.30	£16.17	£0.25	85%
South West of Scotland (Dumfries & Galloway)	£5.06	£0.24	£14.21	£0.17	72%

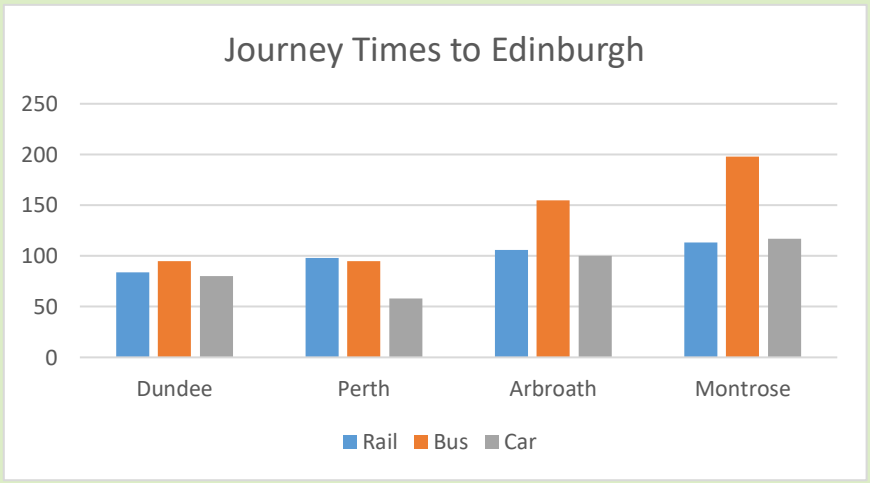
The bus network of the region is reasonably comprehensive (see Figure 35 for indicative public transport accessibility to town centres in the region), but some areas' services are weak, and many corridors (especially in rural areas) do not have a frequency and quality of service that stakeholders perceive to be competitive with car.

The number of regular bus users in the region has been relatively stable in recent years (in comparison with a declining trend across Scotland), but many services, particularly those operating in/through the region's cities, are reported by operators to regularly be delayed by traffic congestion. Most congestion problems for buses occur in the region's city centres, though trunk road congestion also delays buses, notably at the A9/A912 Inveralmond roundabout and on the A90 Kingsway in Dundee.

Stakeholders report a variety of concerns about public transport integration: of poor integration with active modes (particularly cycling), and of weak timetable integration. The poor standards of some stops and stations is also cited regularly. The lack of regional Park and Ride sites, especially within and around Dundee, limits public transport integration and connectivity throughout and beyond the region.

Nationally, public transport fares have increased by an average of 58% in the last decade, whilst motoring costs have increased by only 30%[99].





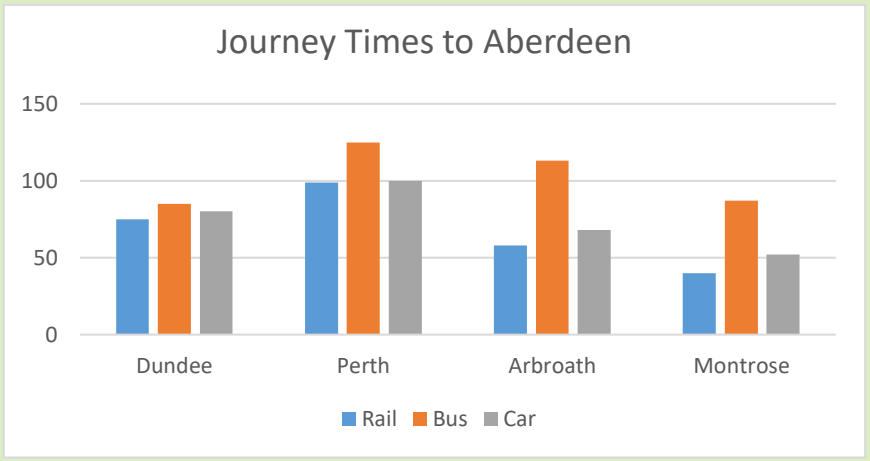


Figure 34: Rail, bus and car journey time comparisons from key Tay Cities region settlements to Glasgow, Edinburgh and Aberdeen[100]

[98] The ratio of the average regional fare per mile to the average local fare per mile.
[99] Transport Scotland, Scottish Transport Statistics No. 38, 2019, https://www.transport.gov.scot/publication/scottish-transport-statistics-no-38-2019-edition/
[100] The rail, bus and car journey time comparison was developed utilising data from Google Maps, ScotRail Timetables 2020, ORR Passenger Rail Performance data, Intercity Bus service timetables.

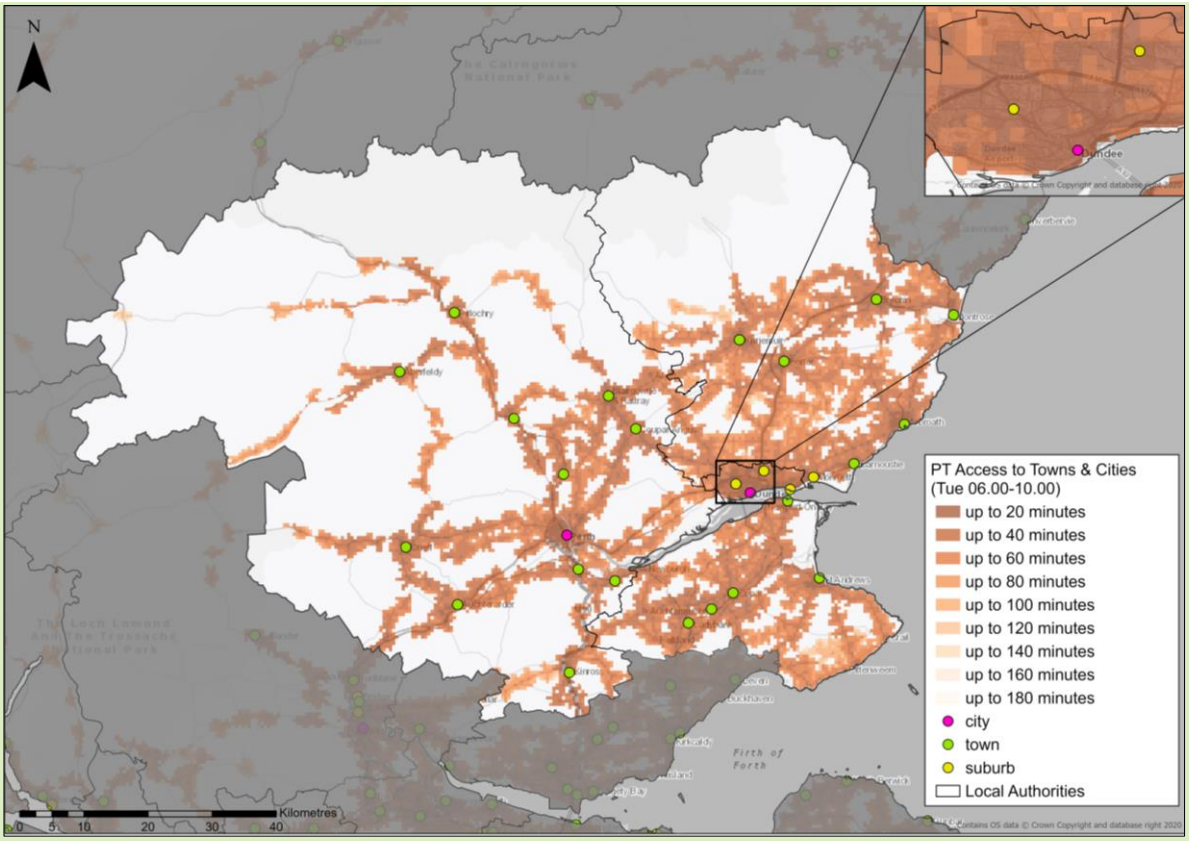


Figure 35: Public transport accessibility to town centres (06:00-10:00)

(click image to enlarge figure)

FREIGHT MOVEMENTS

The Tay Cities region plays an important role in freight movements for the Scottish economy: both for movements within/to/from the region, and through it to/from the north/north east Scotland.

Trunk Road congestion increases business costs, and stakeholders report frustrations with peak time delays, especially on the A90 in Dundee and the A9/M90 at Perth. Stakeholders note that the volumes of heavy vehicle movements on some routes increase community severance (highlighting the A90 Kingsway in Dundee and the A94 Scone – Forfar exacerbated by vehicles bypassing congestion in Dundee, but also in some of the region's smaller towns such as Cupar and Crieff).

The region's main ports (Dundee, Montrose and Perth) are targeting growth, with the offshore market providing opportunities. Timber is another source of this potential new demand, especially for Perth Harbour, but timber extraction is leading to new pressures for heavy vehicle movements on some rural roads. Consideration is being given to whether rail provides an opportunity for more sustainable timber transport from the region. There are no road/rail or sea/rail freight transhipment facilities in the Tay Cities region (though a rail freight facility is being developed at the Highland Spring site at Blackford) which some stakeholders perceive as limiting the potential for transfer of freight to more sustainable modes than road.

Existing rail capacity within the region, and throughout Scotland, constrains the potential

efficiency of rail freight. Capacity on the Highland Main Line (HML), for example, is constrained by significant sections of single-track as well as short crossing loops.

Stakeholders report a lack of adequate lorry parking facilities in the region.

INTER- AND CROSS-REGIONAL CONNECTIVITY

Although the region's cities and some other towns are well connected to major road and rail networks, parts of the region, notably areas of north east Fife, north Angus and west Perthshire, are distant from them. Further to this, some settlements have adequate road connections, but poor public transport connections. Some connections between major towns and cities, specifically between Dundee and St Andrews, are considered inadequate for the efficient movement of people and goods.

Cross-regional road and rail links are essential for connectivity between the Central Belt and north/north east Scotland, though these cross-regional movements create problems of congestion (especially on the A90/A9 routes) and air pollution in the Tay Cities region. These movements exacerbate trunk road congestion, which in turn increases traffic levels in the region's cities.

No direct international air connections (or scheduled flights to any destination apart from London City and Belfast) are currently available from the region. Access to Edinburgh Airport is therefore reported by stakeholders to be important for the Tay Cities' regional economy, but the only direct public transport connections to the airport from the region had been the coach link from Dundee city centre, and this service has ceased operating in 2020. Public transport journeys from the Tay Cities region to Edinburgh Airport therefore require interchange, typically at Halbeath Park and Ride or Edinburgh Gateway station.

No direct public transport connections are available from the region to Scotland's other main airports (Glasgow, Aberdeen), though the recently-improved Montrose – Inverurie rail service does provide better links from parts of Angus to Aberdeen Airport.

ROAD CAPACITY CONSTRAINTS AND CONGESTION

At Perth, peak time congestion is common on the trunk road network. Based on the data analysis undertaken using INRIX[101] (speed data) and stakeholders' views, significant road capacity constraints around both the region's cities were identified at Broxden (A9/M90/A93) and Inveralmond (A9/A912) junctions.

At Dundee, similar problems occur on the A90 Kingsway, most particularly at the Swallow Roundabout (A85 junction, to the west of the city) and the Forfar Road junction (A90/A972/A929 junction, north of the city). Congestion at the A92/B978 Claypotts junction is also common. These problems constrain accessibility within the region for freight and bus/coach movements, as well as by car, and also for journeys across it between the Highlands/North East and the Central Belt and beyond.

Trunk road congestion at both Perth and Dundee leads to additional traffic routeing

[101] Data supplied by INRIX via Transport Scotland.

through the cities. As well as the trunk road junctions highlighted above, bus journeys are frequently delayed by congestion in the region's cities, and major roads cause severance problems, especially for people travelling on foot or by bike.

The Transport Model for Scotland (TMfS), suggests that between 2014 and 2037 road traffic (vehicle miles travelled) is forecast to increase by 38% in the Tay Cities region, slightly higher than the national growth of 37%. It also predicts a 77% increase in road congestion (PM Peak Delay seconds/mile) in the region, much higher than the predicted 37% rise across Scotland[102].

RAIL CAPACITY AND ACCESS CONSTRAINTS

With regards to rail, the Revolution in Rail timetable changes have introduced extra trains, in response to long-held aspirations to improve both service frequency and passenger capacity in the Tay Cities region. This is generating growth for demand for rail travel in the region, including a reverse in the decline in patronage at Arbroath and Montrose. Further benefits to the corridor, including journey time, local and inter-city connectivity, and service frequency, are now in part limited by infrastructure. These constraints include signalling and the need to provide additional infrastructure to enable intercity services to pass the stopping trains that provide regional connectivity.

Despite the recent timetable changes, rolling stock loadings are anecdotally reported to remain high on some services, especially those between Aberdeen and the Central Belt.

Figure 36 highlights the journey times to access rail stations in the region, when travelling by foot. Relatively little of the region is within a short walking distance of a station, including much of the urban areas of Dundee and Perth. Many people are therefore dependent on other modes of transport to access rail services.

Many comments received from stakeholders during the engagement for this review highlighted the lack of step-free access from street to train at a large proportion of the region's stations, which constrains train access for many people.

[102] Transport Scotland, Transport Forecasts, 2018, https://www.transport.gov.scot/media/43316/transport-forecasts-2018.pdf

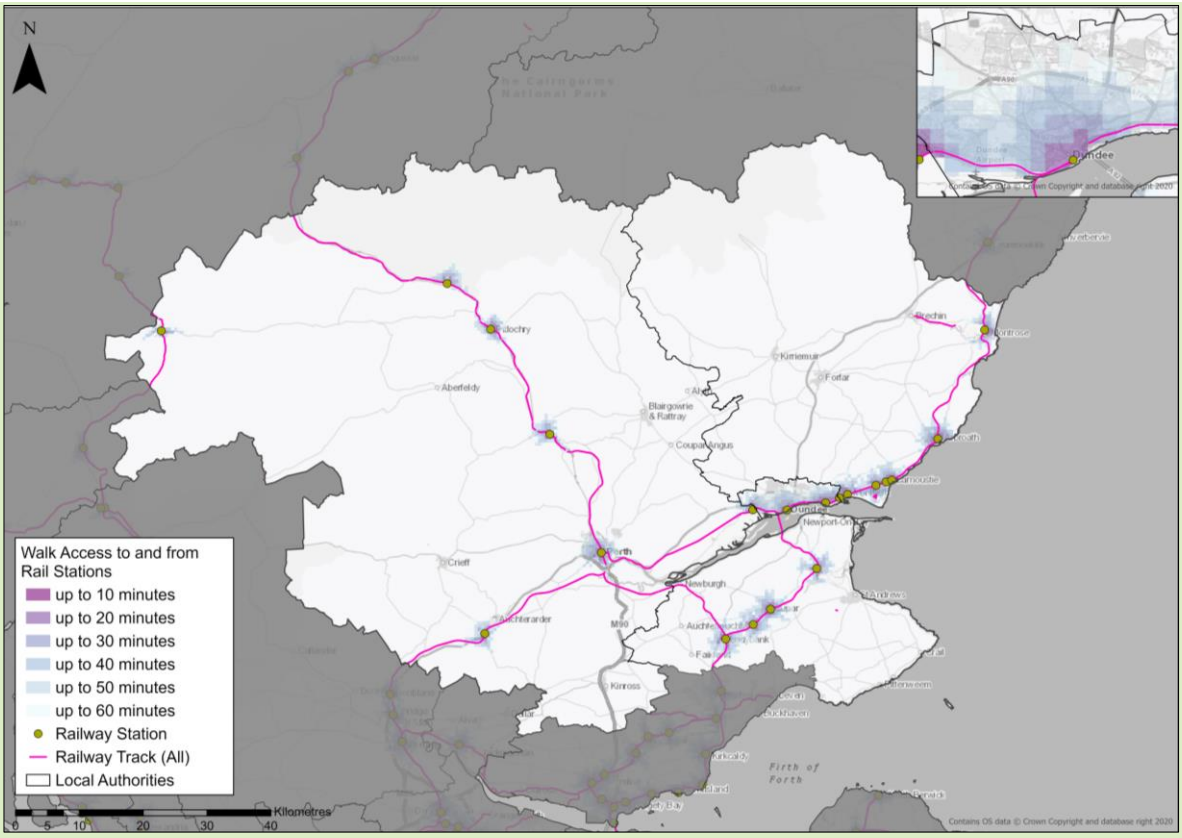


Figure 36: Journey time catchments to rail stations, by walking

(click image to enlarge figure)

Online Survey: Reported Problems in the Tay Cities region

As part of the wide-ranging engagement exercise undertaken for STPR2, an online survey was promoted to collect the views from the public and organisations across Scotland on the transport issues and challenges that impact their day to day journeys. A total of 3,025 responses to the survey were received, with 9% (284) submitted for Tay Cities region. As part of the survey, respondents were asked to rank their top priority problems.

The most commonly raised problems for the region were:

- Cycling – Availability of safe cycling infrastructure
- Roads – Quality of roads infrastructure
- Rail – Cost of rail travel
- Rail – Access to nearest rail station
- Active Travel – Availability of safe walking/wheeling infrastructure
- Bus – Cost of bus travel

The findings from the survey have been used to inform and where appropriate act as a cross-check with the identification of the transport related problems described in this section.

3.2.2. Opportunities

This section provides a summary of key opportunity themes identified for the Tay Cities region. Evidence to support the opportunity themes listed below is provided in this section.

- Technological Opportunities
- Behavioural Change
- Development of the Active Travel Network
- Supporting Economic Change
- Public Transport Growth
- Tourism Growth

TECHNOLOGICAL OPPORTUNITIES

The Tay Cities region has demonstrated good potential to respond to new technological opportunities to promote sustainable and active travel choices.

Recent initiatives in the region include:

- Dundee City Council's work to increase electric vehicle use, including one of the biggest fleets of electric taxis, and the publication of Tactran's Electric Vehicle Strategy, which builds on Dundee City Council's lead
- The Dundee MILL ("Scotland's smart mobility test lab", which amongst other initiatives is working to implement smart parking payment and more efficient business fleet use)
- NaviGoGo, Scotland's first Mobility as a Service (MaaS) pilot project, which operated in Dundee and North Fife
- Tactran and Dundee City Council have (separately) recently been awarded funds from the MaaS Scotland Investment Fund, to roll out MaaS solutions in partnership with regional and local stakeholders
- Travelknowhow, Tactran's on-line travel plan advice tool
- Perth & Kinross Council is funding the development of the Perth shop-local reward system, Mi-rewards, with the aspiration that incentives would be available for local bus users and people walking and cycling to the city
- The multi-operator ABC bus ticket and introduction of contactless payment technology by the region's main bus operators
- The Michelin Scotland Innovation Parc in Dundee has received funds from Scottish Enterprise and Dundee City Council amongst others and will focus on sustainable mobility, clean transport and low carbon energy. This includes innovative public transport schemes, such as the potential hydrogen power projects in Dundee and Fife
- Ember's Dundee – Edinburgh service, using electrically-powered coaches

These initiatives and others demonstrate a good willingness from the region's transport authorities and other partners to identify and capitalise on the new opportunities becoming available within the transport sector.

BEHAVIOURAL CHANGE

Local authorities in the Tay Cities region, and Tactran, have been at the forefront of trialling travel behaviour change programmes in Scotland. For over a decade, initiatives including Dundee Travel Active, Perth on the Go, Angus on the Go and Travel Fife have been engaging with residents of the region and encouraging them to adopt more active (walking, wheeling and cycling) and sustainable (including public transport, car share, EVs) travel choices.

Some of these initiatives have yielded significant results (for example, 40% of participants in Dundee Travel Active reported increasing the amount of walking and cycling they did as a result[103]) and most have been well received by their target audiences and key decision makers. Much of the authorities' work focusses on working with young people, which experience has shown is typically cost-effective and has the potential to yield long-term benefits. Some regional stakeholders identify the potential for social prescribing by health professionals to support behavioural change amongst other cohorts too.

This therefore provides confidence that behavioural change programmes can be effective in helping to meet aspirations for more use of active and sustainable transport choices in the region.

DEVELOPMENT OF THE ACTIVE TRAVEL NETWORK

Development of the active travel network was highlighted by stakeholders as a key opportunity for both leisure and functional trips. Doing so for both purposes "helps people make healthy living choices and assists in delivering places that are happier, more inclusive and equal, and more prosperous"[104].

Transport Scotland's Review of Active Travel Policy Implementation[105] identifies the factors that enable more people to walk and cycle more often:

- The right infrastructure (good quality routes, connecting the right places, associated parking and other elements)
- The right information
- The right enablers of change (access to bikes, led walks, etc)
- The right attitudes (active travel seen to be relevant, acceptable)

Research undertaken for Cycling Scotland[106] shows that, setting aside journeys that are too far to cycle and poor weather, the main perceived barriers to cycling are feeling

[103] Derek Halden Consultancy (DHC) for Scottish Government, Going Smarter - Monitoring and Evaluation of the Smarter Choices, Smarter Places Programme, March 2013, https://www.transport.gov.scot/media/4811/scsp_-_goingsmarter_-_final_version_-_do_not_edit.pdf

[104] Scottish Government, Active Travel Framework, 2019, https://www.transport.gov.scot/media/47158/sct09190900361.pdf

[105] Transport Scotland, Review of Active Travel Policy Implementation, October 2016, https://www.transport.gov.scot/publication/review-of-active-travel-policy-implementation/

[106] Cycling Scotland, Attitudes and Behaviours Towards Cycling in Scotland, 2019, https://www.cycling.scot/mediaLibrary/other/english/7268.pdf

unsafe and lack of appropriate infrastructure, both of which can be addressed by appropriate network development.

Each of the region's local authorities and RTPs are working on proposals to improve the network (including Places for Everyone projects in Arbroath and Perth, Dundee's strategic cycle network proposals and Tactran's active travel audits for many of the region's settlements, regional walking and cycling networks); these will deliver substantial improvements, but inevitably not provide high-quality facilities for every active journey in the region. Further to this, Tactran has defined an aspirational active travel network for its part of the region[107].

SUPPORTING ECONOMIC CHANGE

The Tay Cities Deal[108] aspires for the region "to be one of the most productive, knowledge-led economies in Europe". 'Connected Tay' is one of the key themes of the Deal, seeking to improve digital and real connectivity of the region.

The deal states that "*Poor connectivity impacts upon the competitiveness of businesses in our region and those who access markets through the region*" whilst "*Connectivity is also needed to ensure that businesses are able to access markets, customers and suppliers more easily and cost-effectively.*"

The deal highlights that the right inter- and intra-regional transport investments can help achieve these outcomes and realise the sustainable economic growth that the region seeks: *"Improved connectivity will make our region more attractive to investors and tourists. Consequently, improved connectivity to the major transport hubs of Edinburgh, Glasgow, London and other European cities is a vital part of this strategy…Major investment is also required in improved road, rail, port, air and digital connectivity, infrastructure and capacity across the region and beyond."*

Regional partners are already working to identify some potential solutions, including consideration of Aberdeen – Central Belt rail improvements, the 7 cities rail proposals and improving access to Montrose port.

PUBLIC TRANSPORT GROWTH

More than three-quarters of the residents of the Tay Cities region find public transport convenient, and satisfaction with public transport is higher than the national average[109]. Many residents of the region state that they could use public transport to commute to work: 59% of residents of Dundee City, along with 49%, 33% and 25% of Fife[110], Angus

[107] Tactran, Regional Transport Strategy 2015-2036 Refresh, 2015, https://www.tactran.gov.uk/strategy.php
[108] Tay Cities Deal, https://www.taycities.co.uk/about-us
[109] Transport Focus, Bus Passenger Survey – Autumn 2018 report, March 2019, https://www.transportfocus.org.uk/research-publications/publications/bus-passenger-survey-autumn-2018-report/
[110] All of Fife

and Perth & Kinross respectively[111]. Yet at the 2011 Census[112], less than 10% of the region's employees commuted by public transport.

These factors support the potential for more people to make use of public transport modes more often (for a variety of journey purposes). The development of new Park and Ride sites and enhancement of existing bus and rail Park and Ride interchanges throughout the region could facilitate the potential uptake in public transport use and enable transfer of parts of some journeys to more sustainable modes.

Transport Scotland's Electrification Programme[113] commits to the substantial rolling programme of rail electrification with the aim of decarbonising passenger rail services by 2035. Other potential benefits of electric trains include improved journey times, increased reliability and increased passenger experience (noise reduction and improved air quality in enclosed stations).

There are further opportunities to enhance public transport growth under the new Transport Act 2019[114], with the new powers given to local authorities regarding the provision of bus services.

TOURISM GROWTH

Regional plans and stakeholders highlight the potential to encourage more tourists to visit the region (and sites within it) by sustainable transport modes, and that transport improvements and sustainable links to key tourism sites, such as the V&A, have the potential to encourage more people to stay in the region for longer.

The Tay Cities region 2019 Tourism Strategy[115] aspires to "*Grow the value of overnight stays across the region from £433m in 2016 to £550m in 2024 (approximately 3% growth year on year); and improve the all-round experience for visitors across the region*". The strategy highlights transport's role in helping deliver this, and particularly the need to facilitate tourist movements by public transport as a greater proportion of visitors seek lower-carbon activities.

111 Transport Scotland, Transport and Travel in Scotland, 2019, https://www.transport.gov.scot/our-approach/statistics/#42764
112 NRS, Census 2011 (Scotland), 2011, https://scotlandscensus.gov.uk/
113 Transport Scotland, Electrification Programme, https://www.transport.gov.scot/projects/electrification-programme/
114 Scottish Government, Transport (Scotland) Act 2019, 2019, https://www.legislation.gov.uk/asp/2019/17/contents/enacted
115 Tay Cities Region, Tourism Strategy 2019-2024, https://www.taycities.co.uk/sites/default/files/tay_cities_region_tourism_strategy_-_final_version_july_19.pdf

3.2.3. Future Conditions

The problems and opportunities identified above are focused on the transport system pre Covid19 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 Tay Cities region, a review of the national transport model, the Transport Model for Scotland[116] (TMfS), 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.

For the Tay Cities region, a review of the national transport model, TMfS, has suggested significant increases in road traffic and rail patronage in the coming decades, but a reduction in bus patronage. It should be noted that these forecasts are based on forecasts and behaviours prior to the publication of NTS2[117] and pre-COVID-19 and are therefore subject to change.

[116] Transport Scotland, Transport Forecasts, 2018, https://www.transport.gov.scot/media/43316/transport-forecasts-2018.pdf

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

3.3. Summary

This chapter has discussed problems and opportunities highlighted through data analysis, the stakeholder engagement and informed by the policy review. This in addition to the key points arsing in the socio economic, geographic, transport and environmental content inform the themes and objectives which any interventions should look to address.

Of note are:

- Deprivation: deprivation levels are high in parts of the region, especially (but not only) in parts of Dundee City.
- Transport Exclusion: 27% of Scotland's population do not travel anywhere on a given day. Many people are excluded from transport or find using transport more difficult than they otherwise would, because of issues including physical and mental health needs, lack of appropriate infrastructure, poverty/cost and road safety/personal security concerns.
- Physical Activity and Health: many of the region's residents do not get recommended exercise levels, and the proportion of people walking regularly has been falling quickly.
- Limited Transport Choice: parts of the region and some of the region's residents suffer from poor accessibility to key services. Elevated levels of both car dependency and transport poverty result.
- Active Travel Infrastructure: the region's local authorities are working to improve facilities for walking, cycling and wheeling, but many gaps in provision remain.
- Air Pollution: pollution from transport has led to the declaration of 4 Air Quality Management Areas in the region.
- Carbon Emissions: emissions from transport in the region have been increasing in recent years, in contrast to a (small) national decline.
- Public Transport Availability and Competitiveness: public transport provides good connections for some journeys in the region, but there are many for which it does not provide a convenient, accessible and cost-effective choice. Evidence suggests that there is potential to grow public transport use.
- Freight Movements: the region's transport network caters both for local and cross-regional freight movements. The region's ports are targeting growth, but intermodal transfer facilities in the region are currently very limited.
- Inter- and Cross-Regional Connectivity: cross-regional movements add to congestion and air pollution levels in the Tay Cities region. The only direct flight connections from the region are to London City and Belfast; the region therefore depends on other airports for long-distance connections, but no direct public transport options to access them are available.
- Road Capacity: there significant congestion on parts of the region's road network at peak times, notably on the Trunk Roads around Perth and Dundee. This causes delays and increases traffic levels and pollution on less suitable routes.
- Rail Capacity: recent improvements have increased rail capacity and patronage is rising.
- Technological Opportunities: the region is showing good willingness to respond to new opportunities to promote inclusive, sustainable transport choices.
- Behavioural Change: there are good examples of programmes that demonstrate the willingness of the region's population to use active and sustainable modes.
- Economic Change: the region's economic growth plans (including for tourism) highlight the benefits that improved transport infrastructure and services could have for the region.

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 Tay Cities region. The national TPOs and regional sub-objective are presented in Table 4 below.

Table 4: National TPOs and the regional sub-objectives

NATIONAL OBJECTIVE	TAY CITIES REGIONAL SUB-OBJECTIVES
A sustainable strategic transport system that contributes significantly to the Scottish Government's net zero emissions target.	▪ *Reduce the consumption of fossil fuels through managing travel demand and enabling a shift to more sustainable modes of transport.* ▪ *Increase the use of active travel, particularly for shorter journeys within the region and as part of longer multi-modal end-to-end journeys.* ▪ *Improve public transport and opportunities for car sharing as viable alternatives, to reduce single occupancy private car use.* ▪ *Reduce carbon emissions generated by the strategic transport system in the region.*
An inclusive strategic transport system that improves the affordability and accessibility of public transport.	▪ *Increase public transport share by connecting sustainable modes of transport to facilitate integrated journeys, especially at major transport nodes.* ▪ *Improve mobility and inclusion, particularly for members of vulnerable and disadvantaged groups.* ▪ *Reduce transport poverty in relation to the level of household income spent on transport, particularly in more deprived areas of the region.* ▪ *Improve public transport access to key services.*

NATIONAL OBJECTIVE	TAY CITIES REGIONAL SUB-OBJECTIVES
A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.	▪ *Reduce demand for unsustainable travel and the adverse impacts of transport on people and places/communities by supporting and embedding the place principle changes to the strategic transport system across the region.* ▪ *Significantly increase the share of active travel, particularly for shorter journeys within the region and as part of longer multi-modal end-to-end journeys.* ▪ *Reduce demand for unsustainable travel arising from nationally significant growth areas, taking cognisance of the emerging NPF4.* ▪ *Reduce emissions from transport where they are harmful to people's health.*
An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.	▪ *Increase access for the region's population to education, training, employment and tourism, and expand labour market catchments.* ▪ *Improve sustainable and competitive transport access to key domestic and international markets, for the Tay Cities region and those other parts of Scotland that are dependent on the region's transport network.* ▪ *Enable the transfer of freight movements to sustainable modes.*
A reliable and resilient strategic transport system that is safe and secure for travellers.	▪ *Increase resilience from disruption on the region's road and rail infrastructure.* ▪ *Reduce transport related casualties in line with or better than reduction targets.* ▪ *Improve perceived and actual security of the transport network with a particular focus on for those people – especially young people and the elderly – for whom this is a particular barrier to travel.*

Table 5 demonstrates the alignment of the objectives and outcomes developed for the Tay Cities region with the identified problems and opportunity themes in the region.

Table 5: Mapping of Problem and Opportunity Themes to Transport Planning Objectives

National Objective	Regional Sub-Objectives	Problem Theme												Opportunity Theme					
		Deprivation	Transport Exclusion	Physical Activity & Health	Limited Transport Choice	Active Travel Facilities	Air Pollution	Carbon Emissions	Public Transport Availability	Freight Movements	Inter- and Cross-Regional	Road Capacity Constraints	Rail Capacity and Access	Technological Opportunities	Behavioural Change	Active Travel Network	Support Economic Change	Public Transport Growth	Tourism Growth
A sustainable strategic transport system that contributes significantly to the Scottish Government's net zero emissions target.	Reduce the consumption of fossil fuels through managing travel demand and enabling a shift to more sustainable modes of transport.			■		■	■	■	■	■	■	■	■	■	■	■		■	
	Increase the use of active travel, particularly for shorter journeys within the region and as part of longer multi-modal end-to-end journeys.	■	■	■	■	■	■	■				■			■	■		■	
	Improve public transport and opportunities for car sharing as viable alternatives, to reduce single occupancy private car use.	■	■		■		■	■	■		■	■	■		■			■	
	Reduce carbon emissions generated by the strategic transport system in the region.			■		■	■	■	■			■	■	■	■	■		■	

National Objective	Regional Sub-Objectives	Problem Theme												Opportunity Theme					
		Deprivation	Transport Exclusion	Physical Activity & Health	Limited Transport Choice	Active Travel Facilities	Air Pollution	Carbon Emissions	Public Transport Availability	Freight Movements	Inter- and Cross-Regional	Road Capacity Constraints	Rail Capacity and Access	Technological Opportunities	Behavioural Change	Active Travel Network	Support Economic Change	Public Transport Growth	Tourism Growth
An inclusive strategic transport system that improves the affordability and accessibility of public transport.	Increase public transport share by connecting sustainable modes of transport to facilitate integrated journeys, especially at major transport nodes.	■	■		■	■	■	■	■		■		■	■		■	■	■	
	Improve mobility and inclusion, particularly for members of vulnerable and disadvantaged groups.	■	■	■	■	■			■		■		■	■		■	■	■	
	Reduce transport poverty in relation to the level of household income spent on transport, particularly in more deprived areas of the region.	■	■	■	■	■			■					■		■	■	■	
	Improve public transport access to key services.	■	■		■				■		■		■				■	■	

National Objective	Regional Sub-Objectives	Problem Theme												Opportunity Theme					
		Deprivation	Transport Exclusion	Physical Activity & Health	Limited Transport Choice	Active Travel Facilities	Air Pollution	Carbon Emissions	Public Transport Availability	Freight Movements	Inter- and Cross-Regional	Road Capacity Constraints	Rail Capacity and Access	Technological Opportunities	Behavioural Change	Active Travel Network	Support Economic Change	Public Transport Growth	Tourism Growth
A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.	Reduce demand for unsustainable travel and the adverse impacts of transport on people and places/communities by supporting and embedding the place principle changes to the strategic transport system across the region.																		
	Significantly increase the share of active travel, particularly for shorter journeys within the region and as part of longer multi-modal end-to-end journeys.																		
	Reduce demand for unsustainable travel arising from nationally significant growth areas, taking cognisance of the emerging NPF4.																		

National Objective	Regional Sub-Objectives	Problem Theme											Opportunity Theme					
		Deprivation	Transport Exclusion	Physical Activity & Health	Limited Transport Choice	Active Travel Facilities	Air Pollution	Carbon Emissions	Public Transport Availability	Freight Movements	Inter- and Cross-Regional	Road Capacity Constraints	Rail Capacity and Access	Technological Opportunities	Behavioural Change	Active Travel Network	Support Economic Change	Public Transport Growth	Tourism Growth
	Reduce emissions from transport where they are harmful to people's health.	■			■	■	■	■	■	■		■		■	■	■		■	
An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.	Increase access for the region's population to education, training, employment and tourism, and expand labour market catchments.	■	■		■				■		■	■	■	■		■	■	■	■
	Improve sustainable and competitive transport access to key domestic and international markets, for the Tay Cities region and those other parts of Scotland that are dependent on the region's transport network.						■	■	■	■	■	■	■		■		■	■	■
	Enable the transfer of freight movements to sustainable modes.				■		■	■		■	■	■		■	■		■		

National Objective	Regional Sub-Objectives	Problem Theme												Opportunity Theme					
		Deprivation	Transport Exclusion	Physical Activity & Health	Limited Transport Choice	Active Travel Facilities	Air Pollution	Carbon Emissions	Public Transport Availability	Freight Movements	Inter- and Cross-Regional	Road Capacity Constraints	Rail Capacity and Access	Technological Opportunities	Behavioural Change	Active Travel Network	Support Economic Change	Public Transport Growth	Tourism Growth
A reliable and resilient strategic transport system that is safe and secure for travellers.	Increase resilience from disruption on the region's road and rail infrastructure.				■				■			■	■	■			■		
	Reduce transport related casualties in line with or better than reduction targets.		■	■		■									■	■			
	Improve perceived and actual security of the transport network with a particular focus on for those people – especially young people and the elderly – for whom this is a particular barrier to travel	■	■	■	■	■			■			■	■	■		■			

5. Option Generation and Sifting

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 has 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 37 alongside the number of options generated at the various key stages that are specific to

the Tay Cities region.

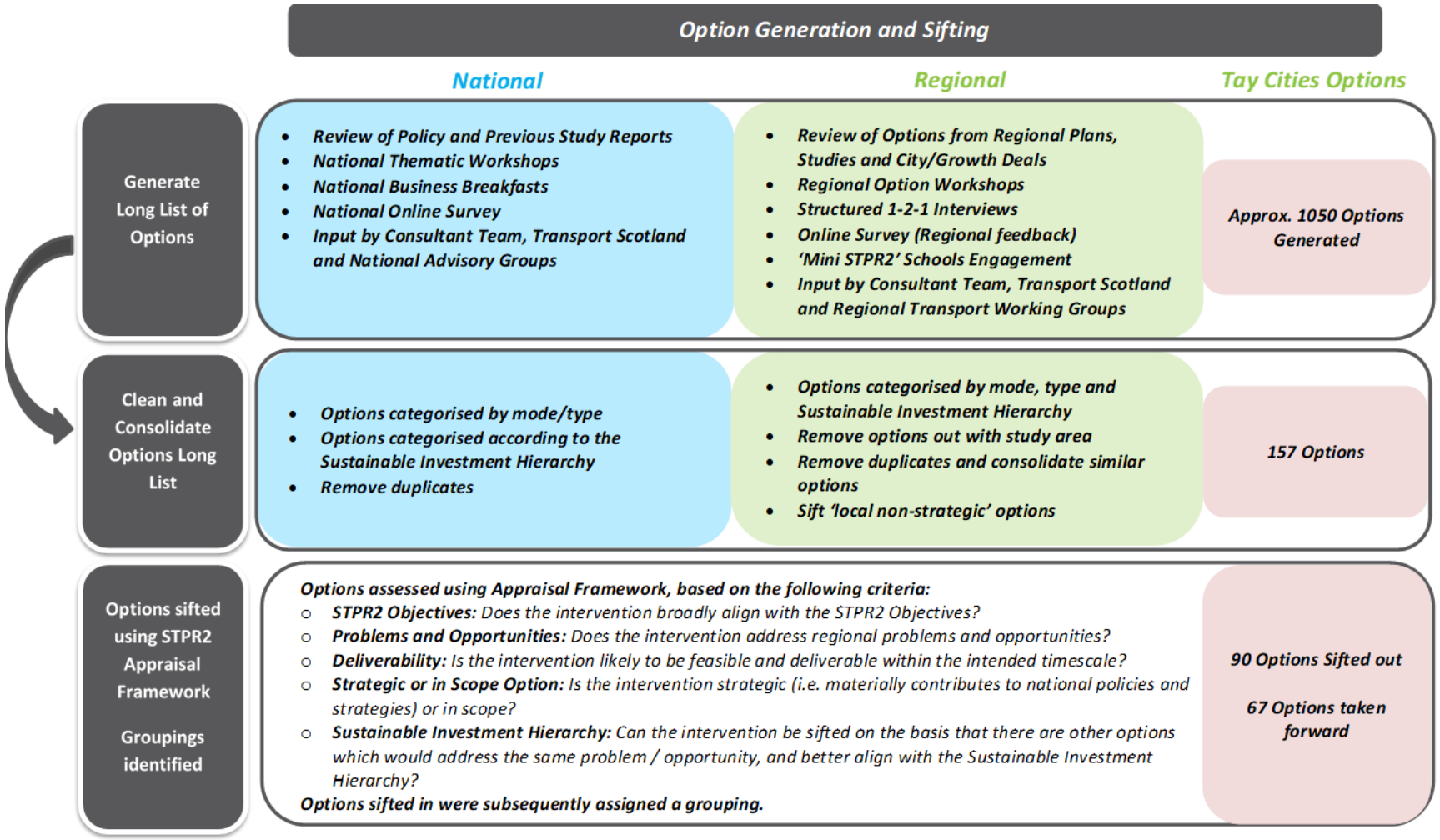


Figure 37: Approach to Option Generation and Sifting

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 Tay Cities region, there were over 1050 options generated.

5.2.2. Option Cleaning

Although over 1050 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, 157 options were retained in the long list of interventions to be sifted specific to the Tay Cities 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.

Options will be assessed against the range of criteria shown in Figure 37 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 38 provides more detail of the sifting process.

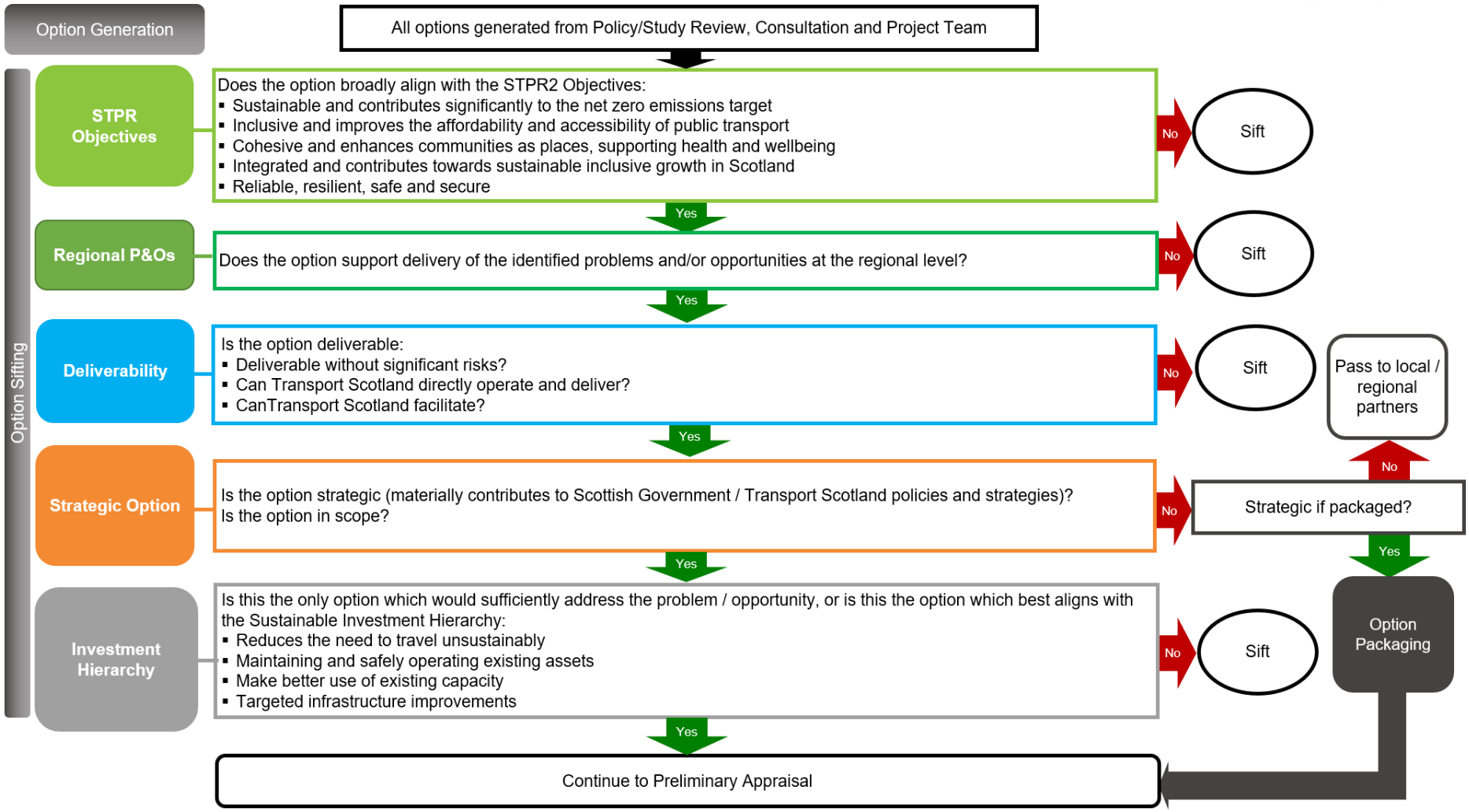


Figure 38: Option sifting process

Based on the methodology above, 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.

5.2.1. Options 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 Tay Cities region, 90 options were sifted out at this stage.

5.2.2. Options sifted in

Following the sifting exercise, 67 options specific to the Tay Cities 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 and a full list of options sifted in for further consideration alongside their allocated Grouping is provided in an Appendix to the National Case for Change.

Table 6: 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.

Category	Grouping Name	Grouping Description
Technology	Adaptive Traffic Control on the Trunk Road	Options that allow optimisation of the performance of the Trunk Road Network through adaptive control.
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.

Category	Grouping Name	Grouping Description
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
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 this 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

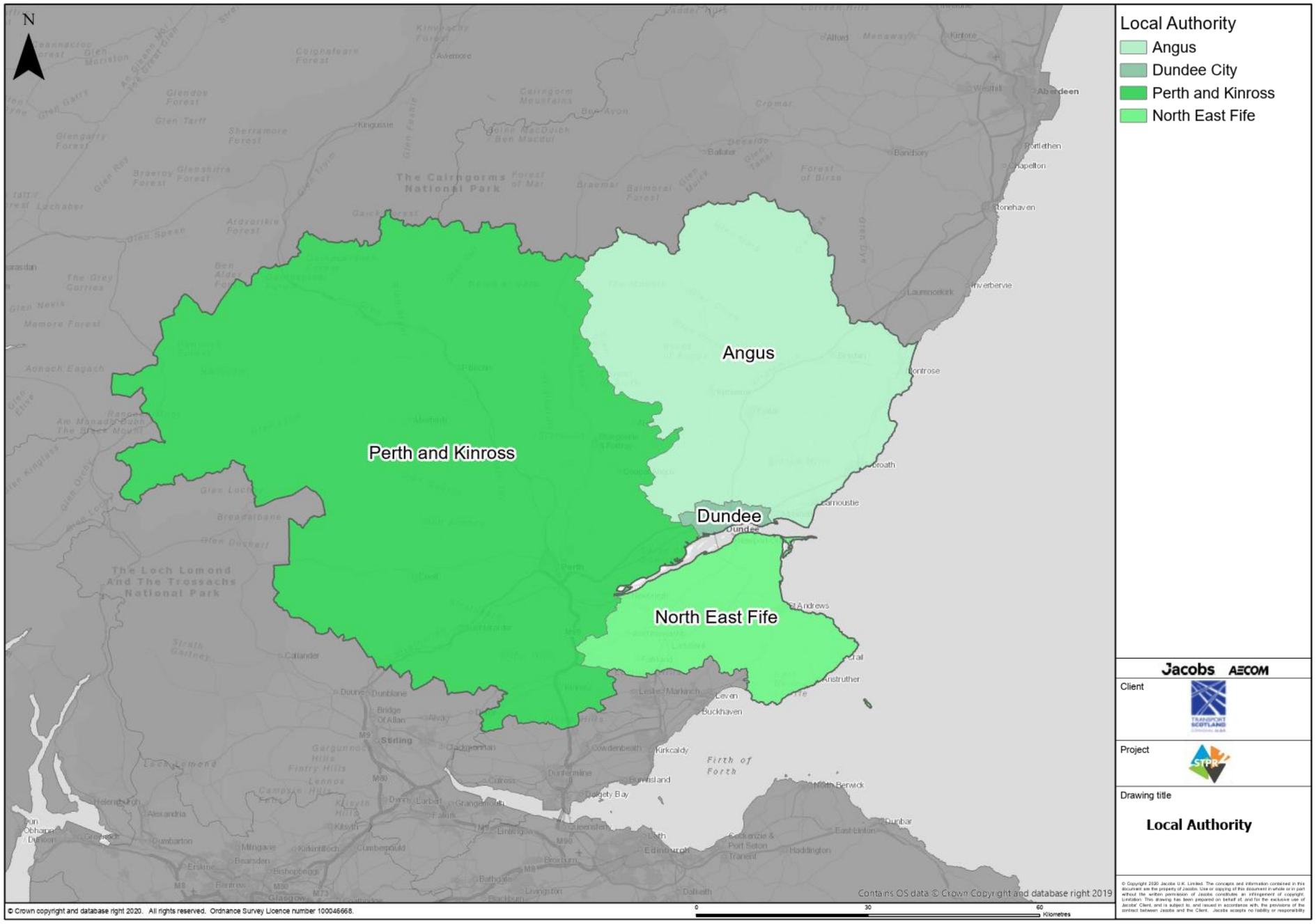


Figure A. 1 - Tay Cities region Study Area (click image to go back to main report)

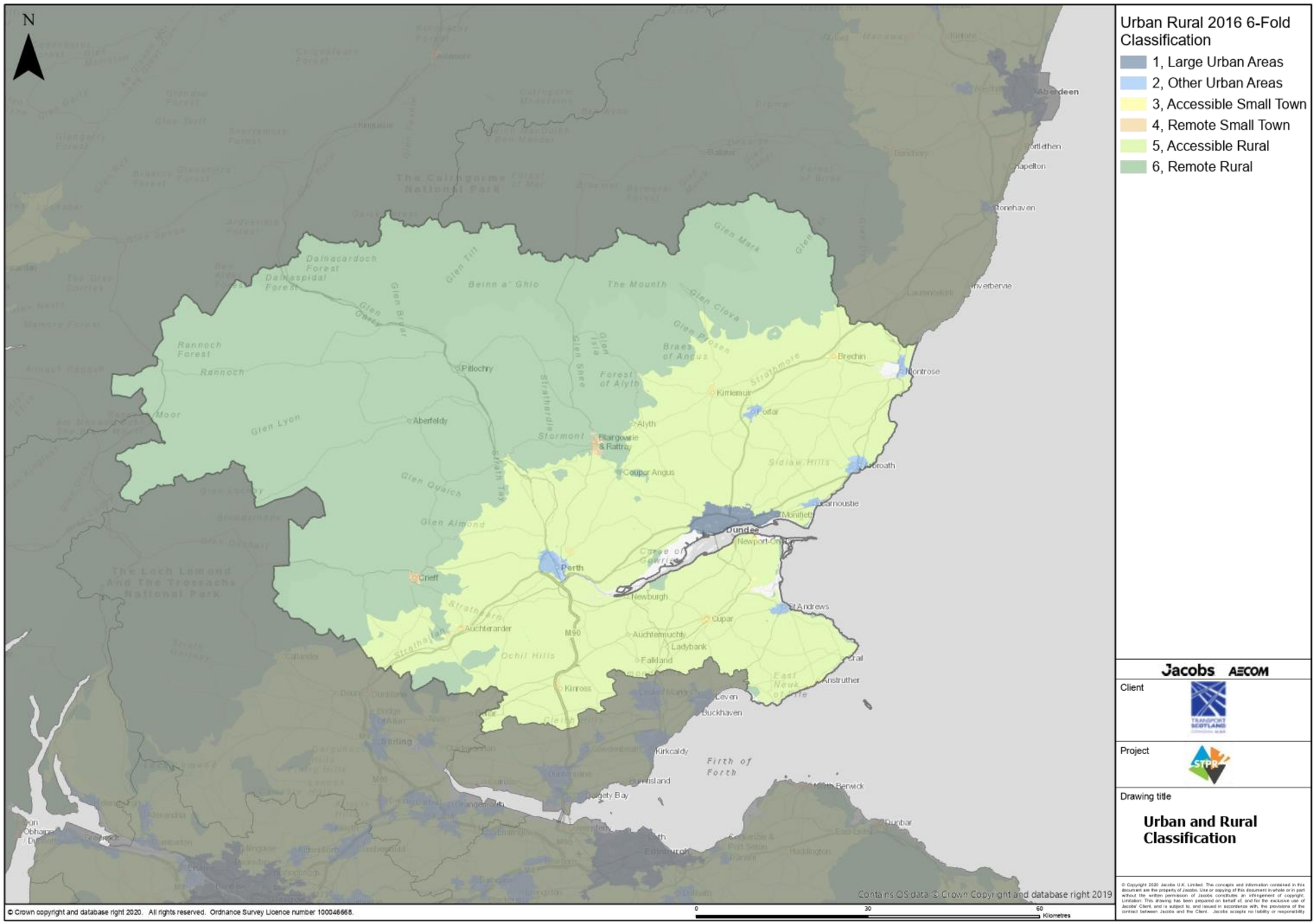


Figure A. 2 – Scottish Government Urban Rural 2016 6-fold Classification (click image to go back to main report)

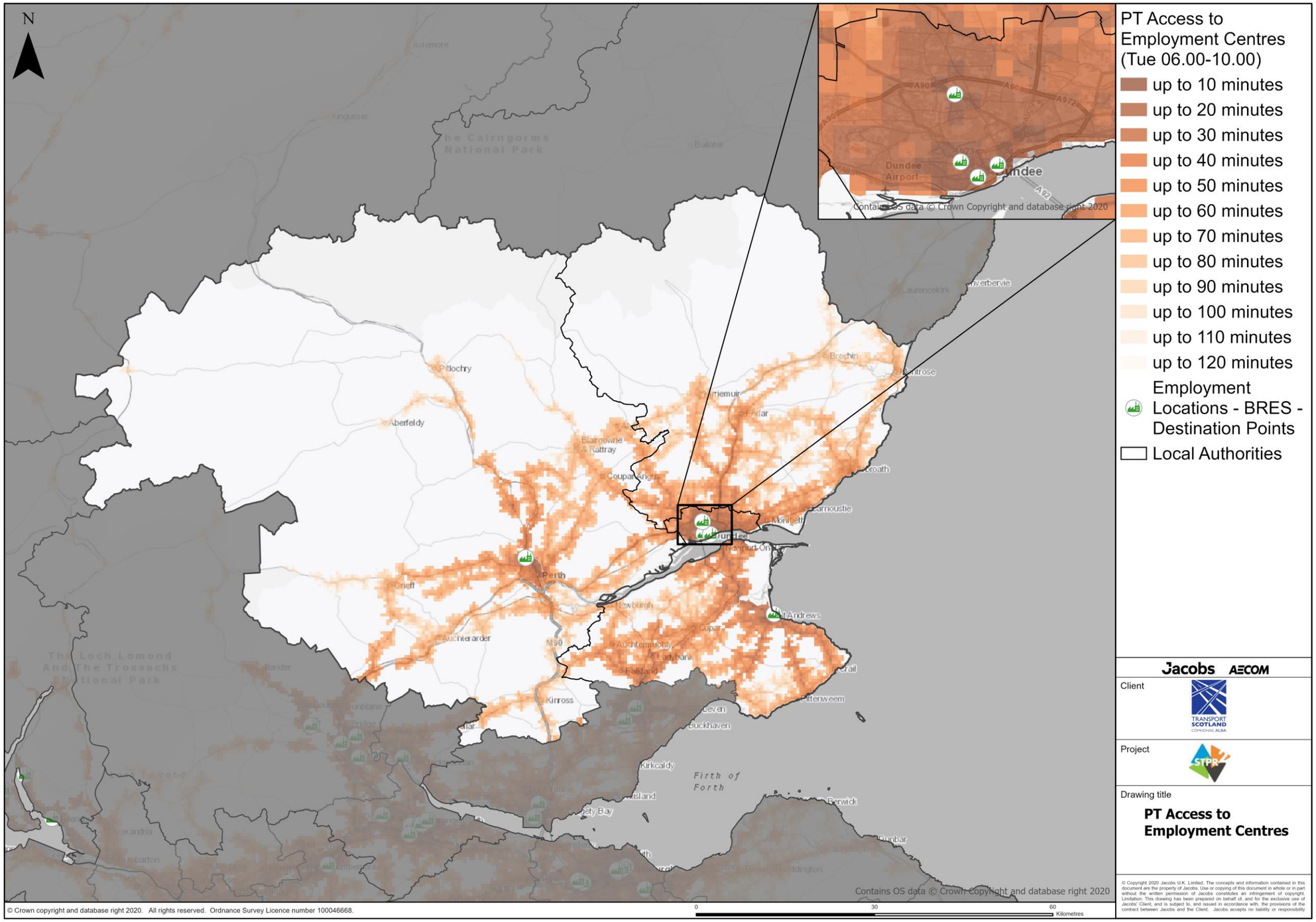


Figure A. 3 - AM journey time isochrones to key employment areas, by public transport (click image to go back to main report)

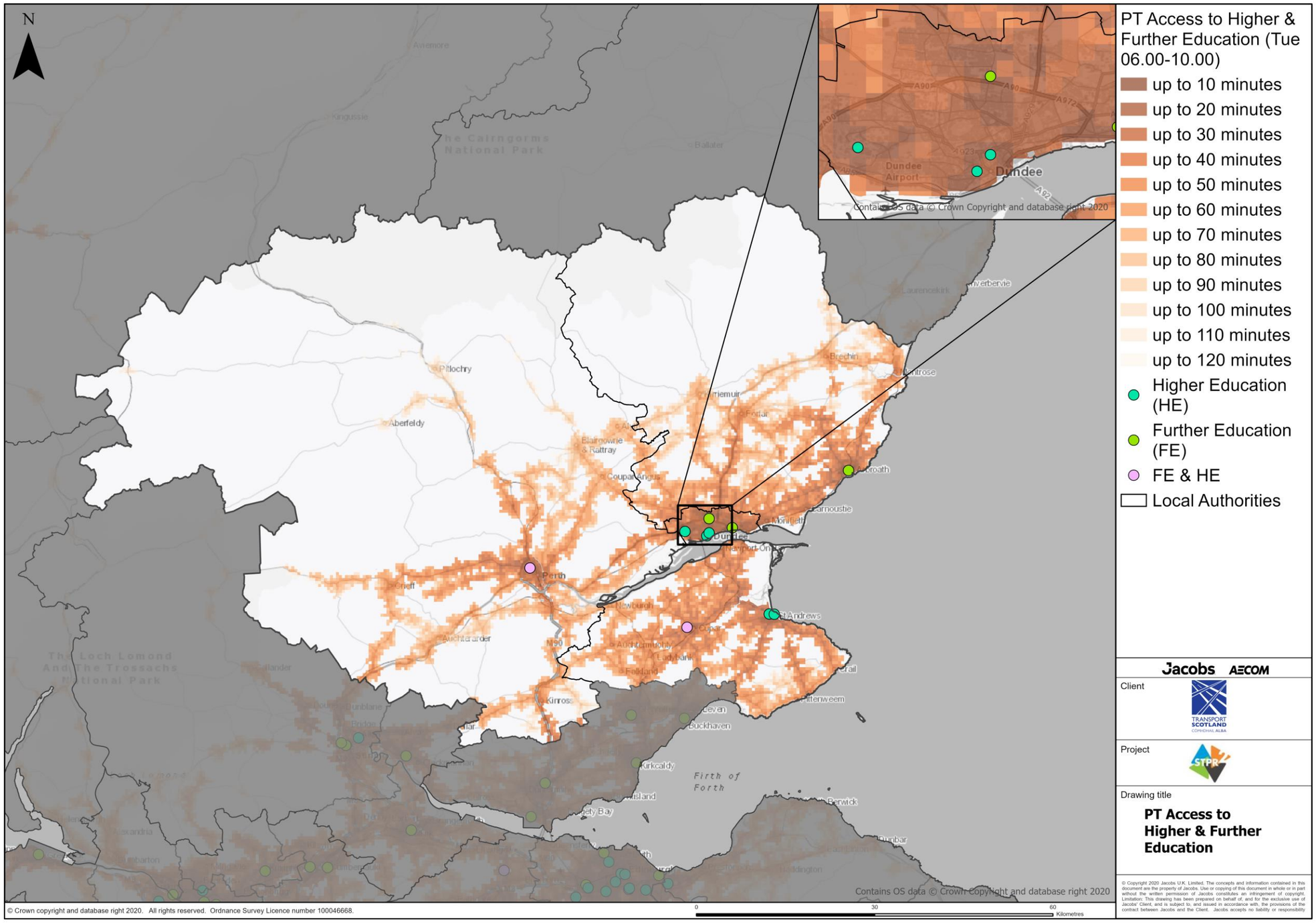


Figure A. 4 - AM period journey time isochrones to further and higher education, by public transport (click image to go back to main report)

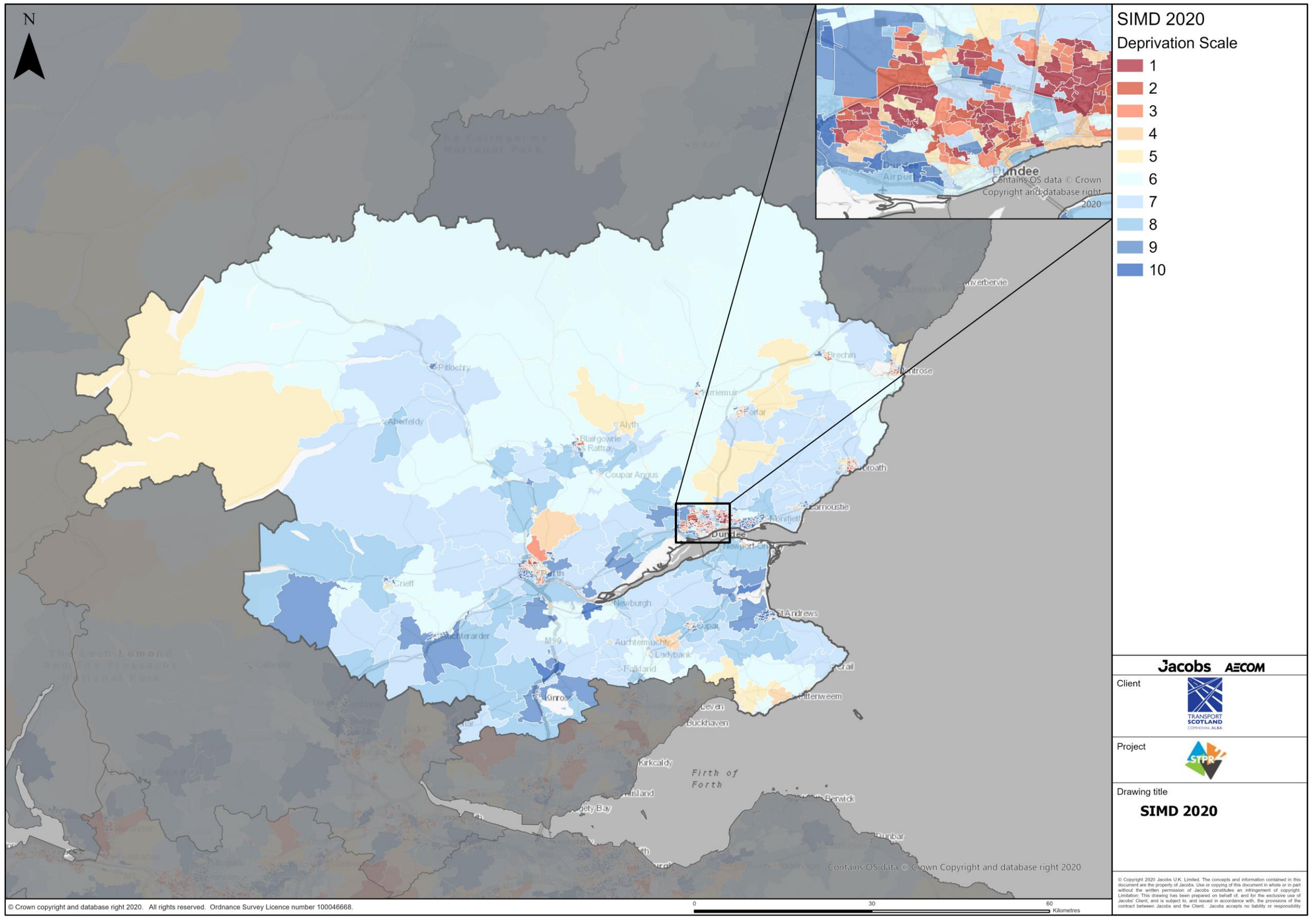


Figure A. 5 - SIMD data zone locations for Tay Cities region, coloured by decile ranking (click image to go back to main report)

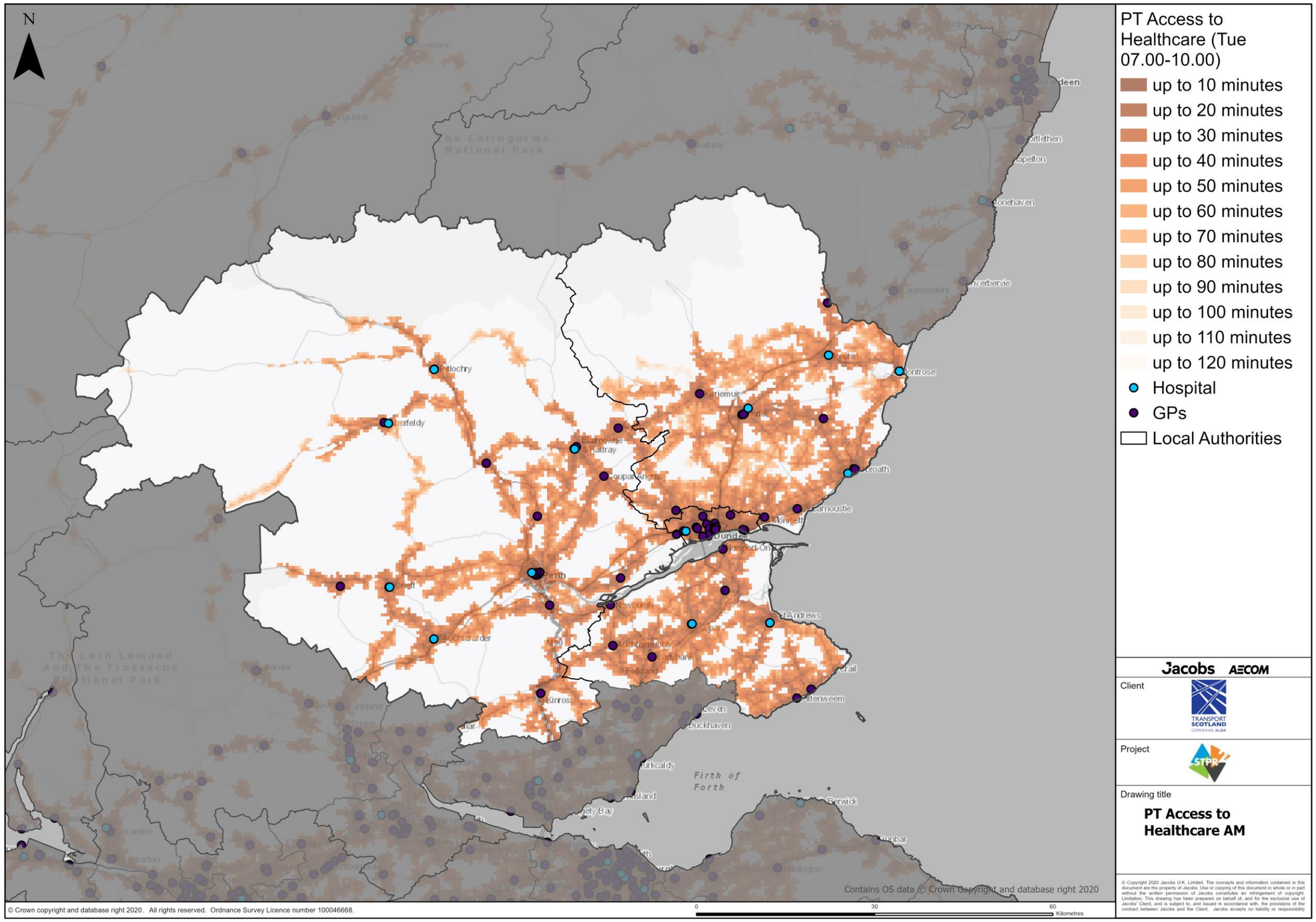


Figure A. 6 - AM period journey time isochrones to healthcare (hospitals and GPs), by public transport (click image to go back to main report)

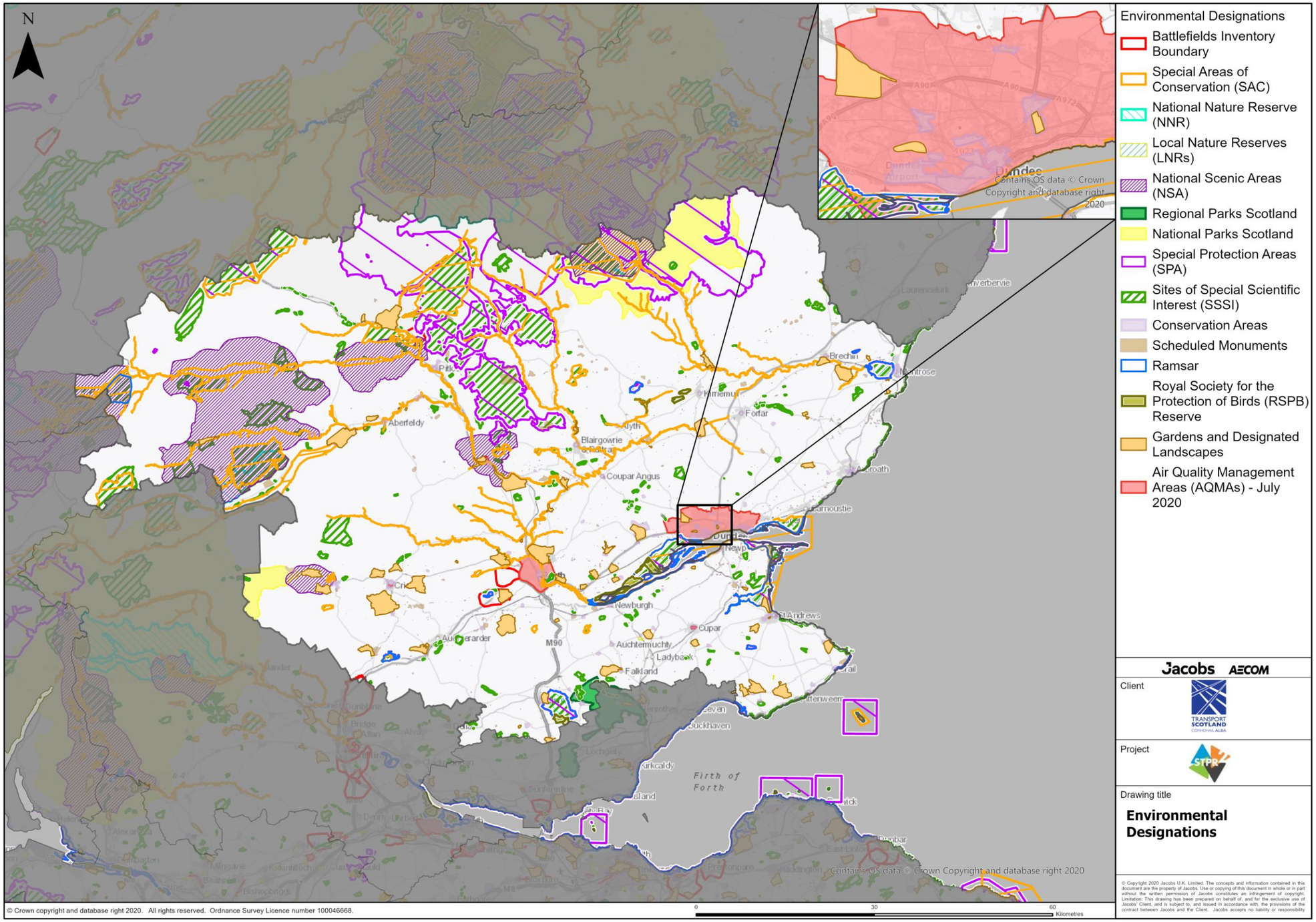


Figure A. 7 - Environmental designations map for Tay Cities region (click image to go back to main report)

Figure A. 8 – Noise Mapping for Tay Cities region (click image to go back to main report)

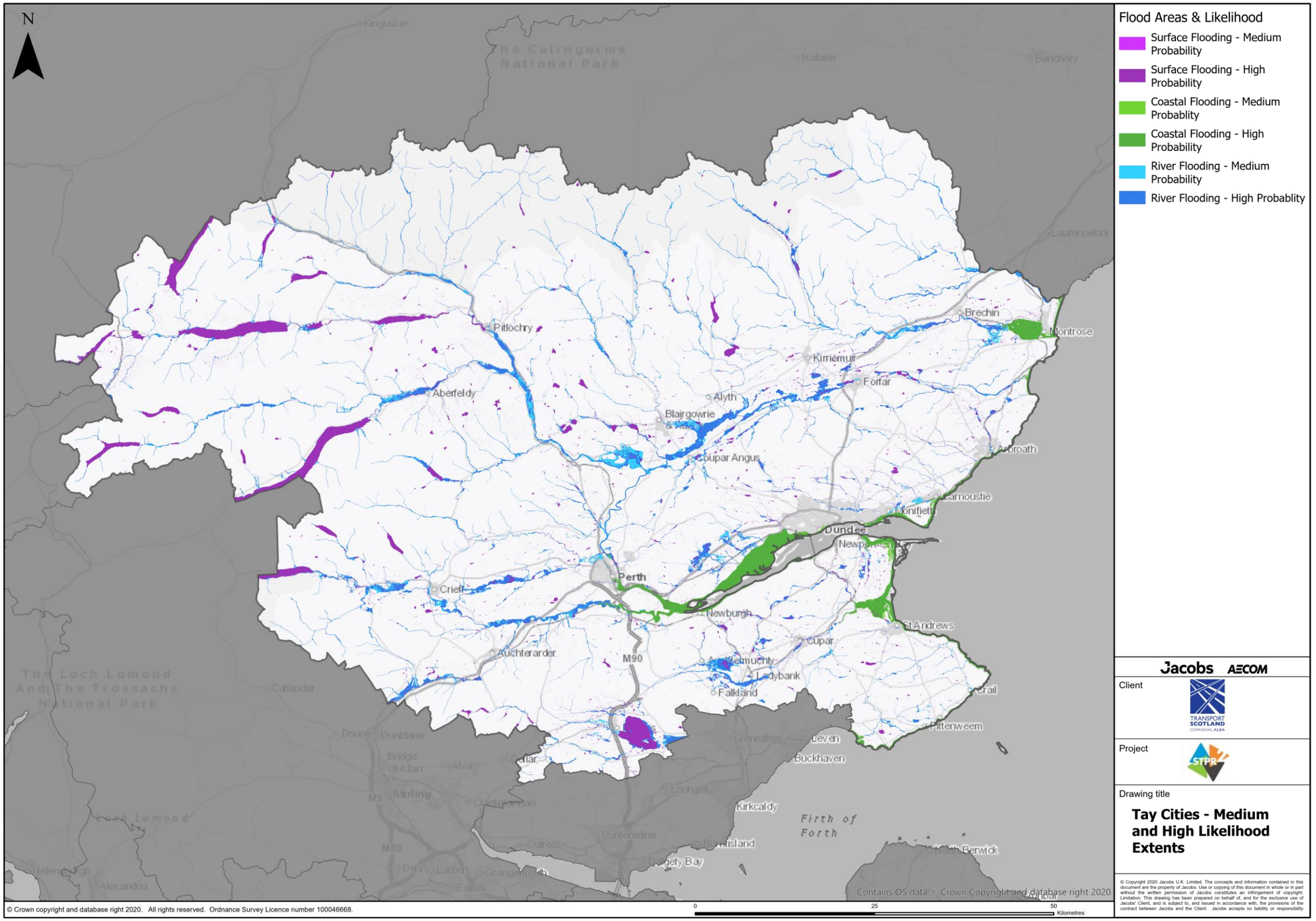


Figure A. 9: SEPA flood areas and likelihood of flooding in the Tay Cities region (click image to go back to main report)

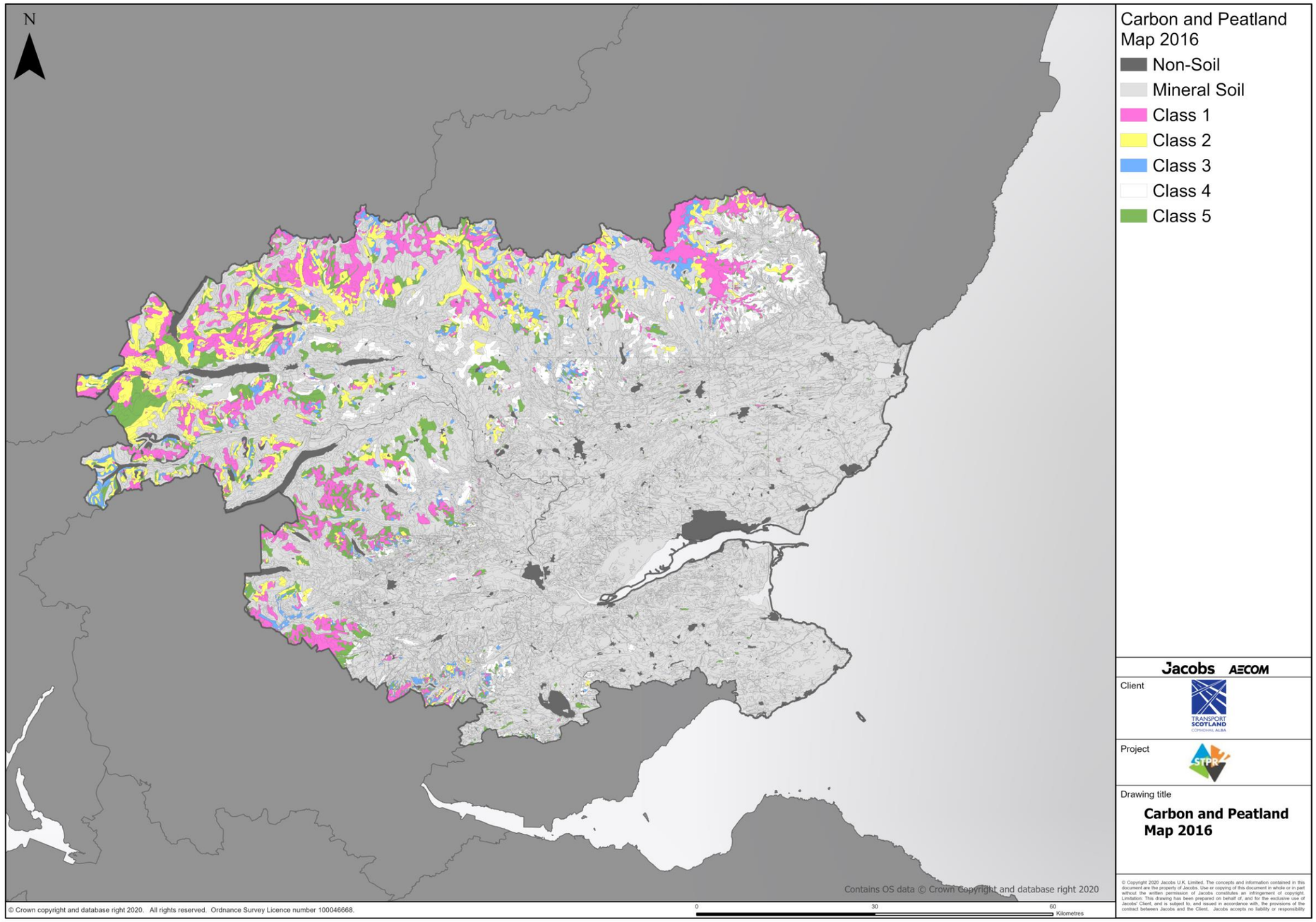


Figure A. 10 – Carbon and Peatland map for Tay Cities region (click image to go back to main report)

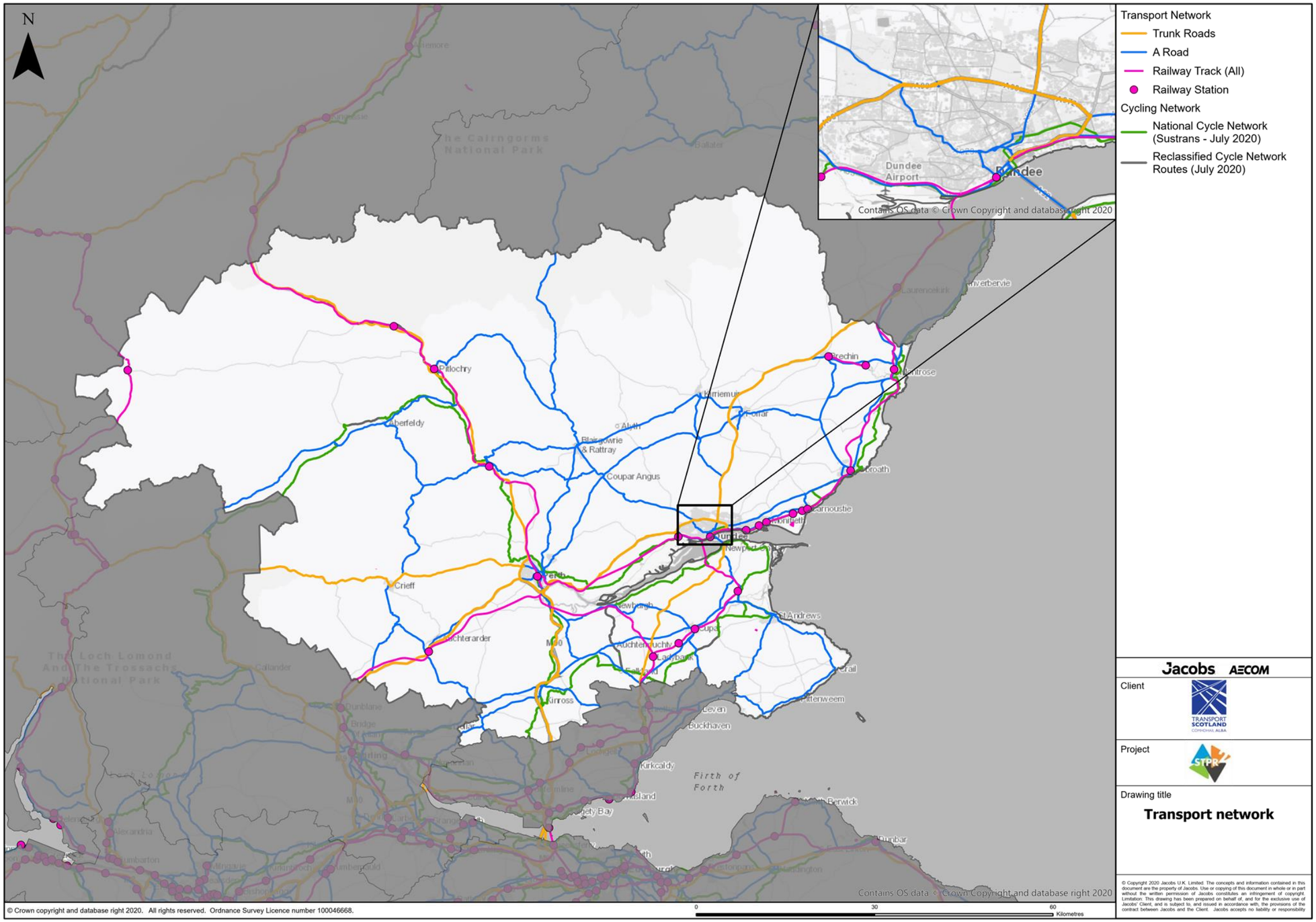


Figure A. 11 - Tay Cities region Transport Network (click image to go back to main report)

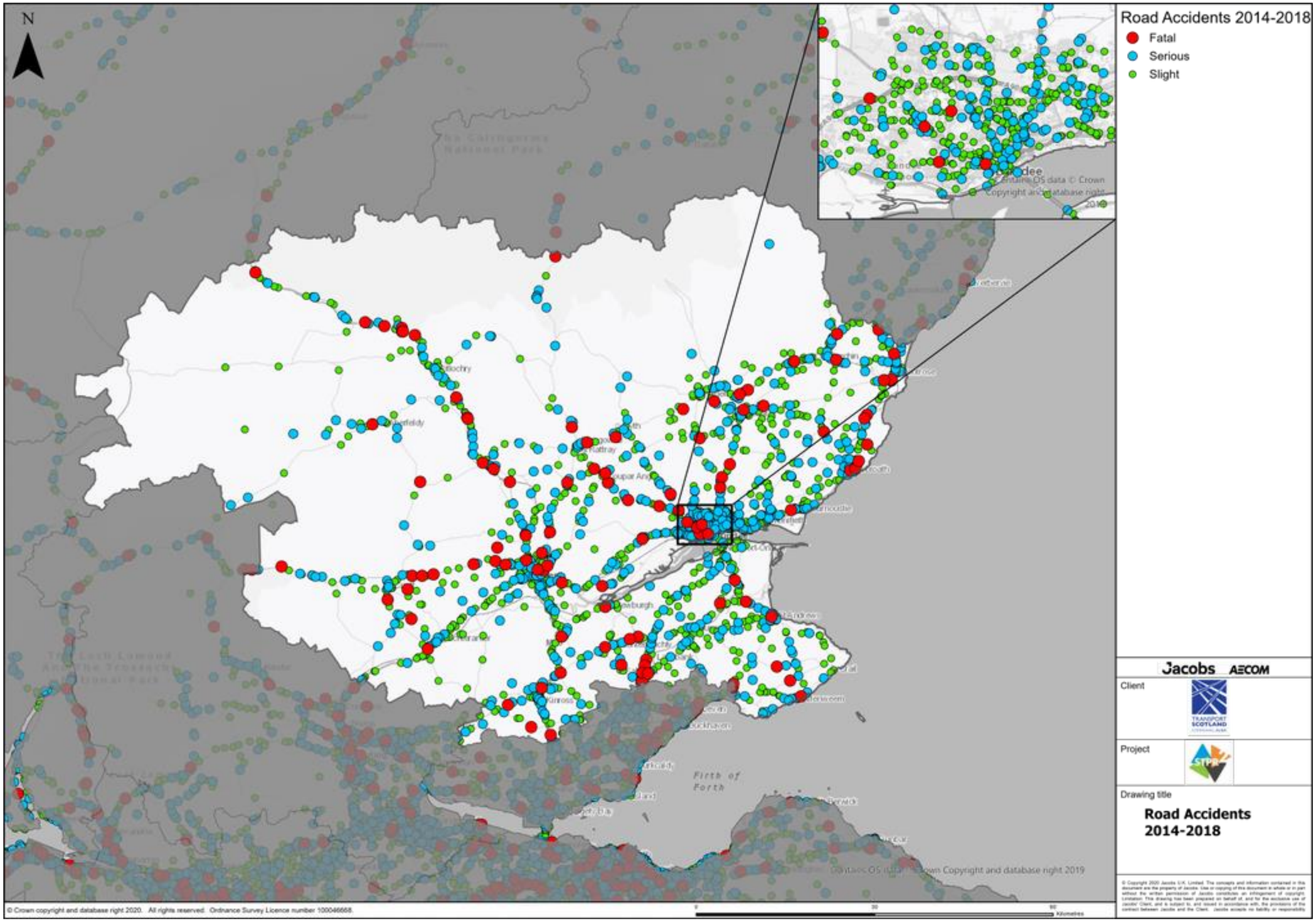


Figure A. 12 - Locations of Road Accidents (Slight, Serious and Fatal) in Tay Cities region from 2014-2018 (click image to go back to main report)

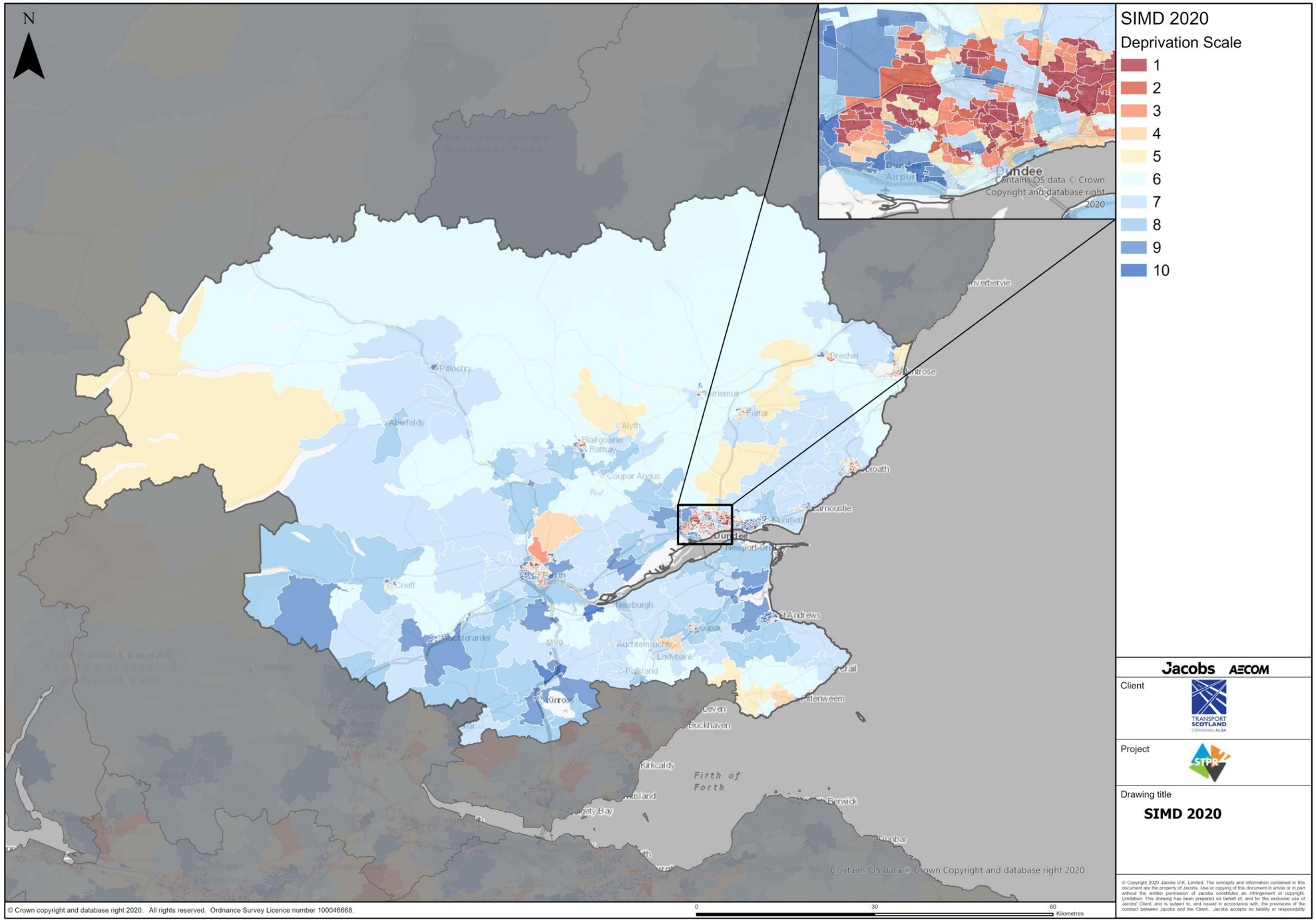


Figure A. 13 - SIMD data zone locations for Tay Cities region, coloured by decile ranking (click image to go back to main report)

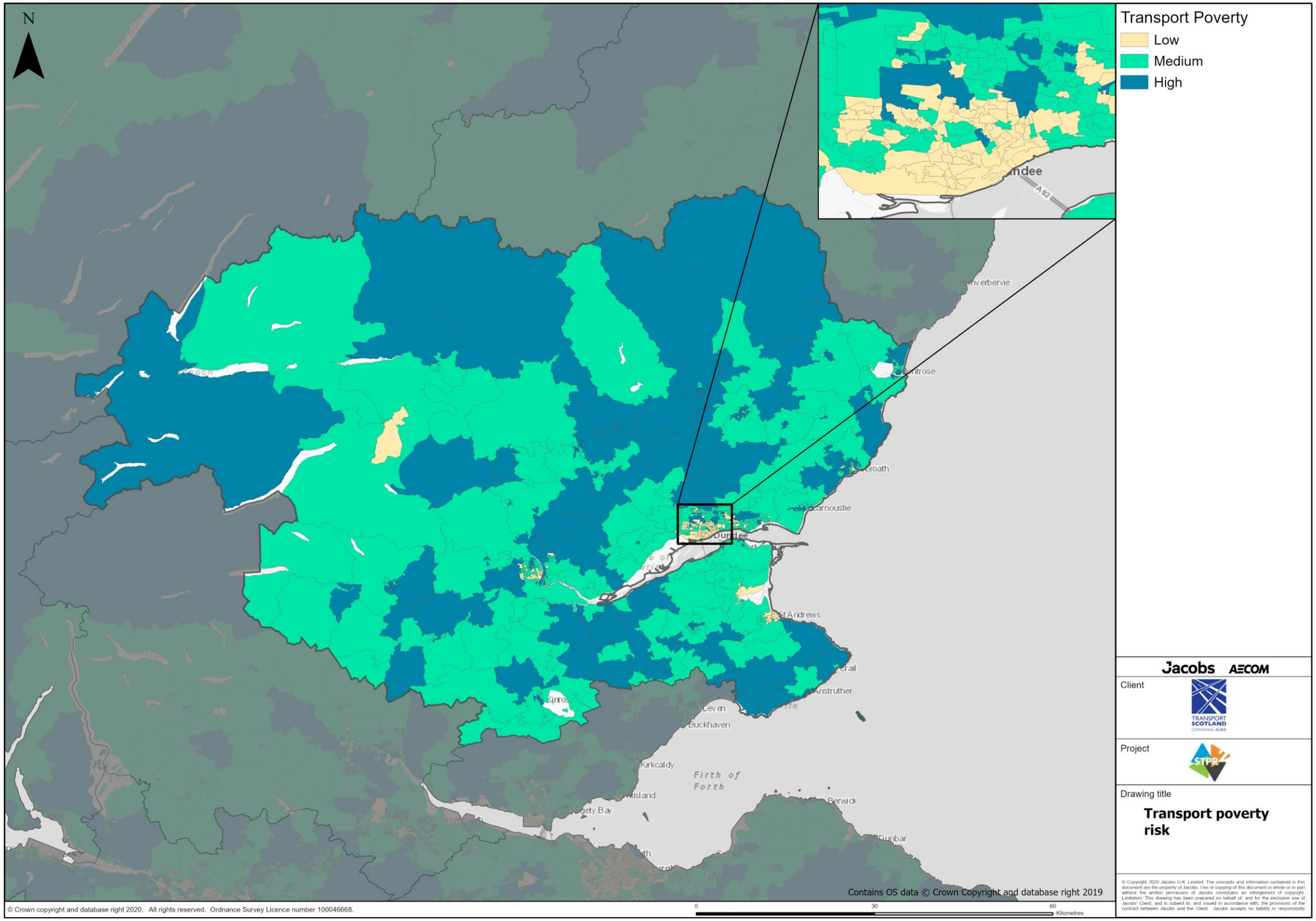


Figure A. 14 – Risk of transport poverty in the Tay Cities region (click image to go back to main report)

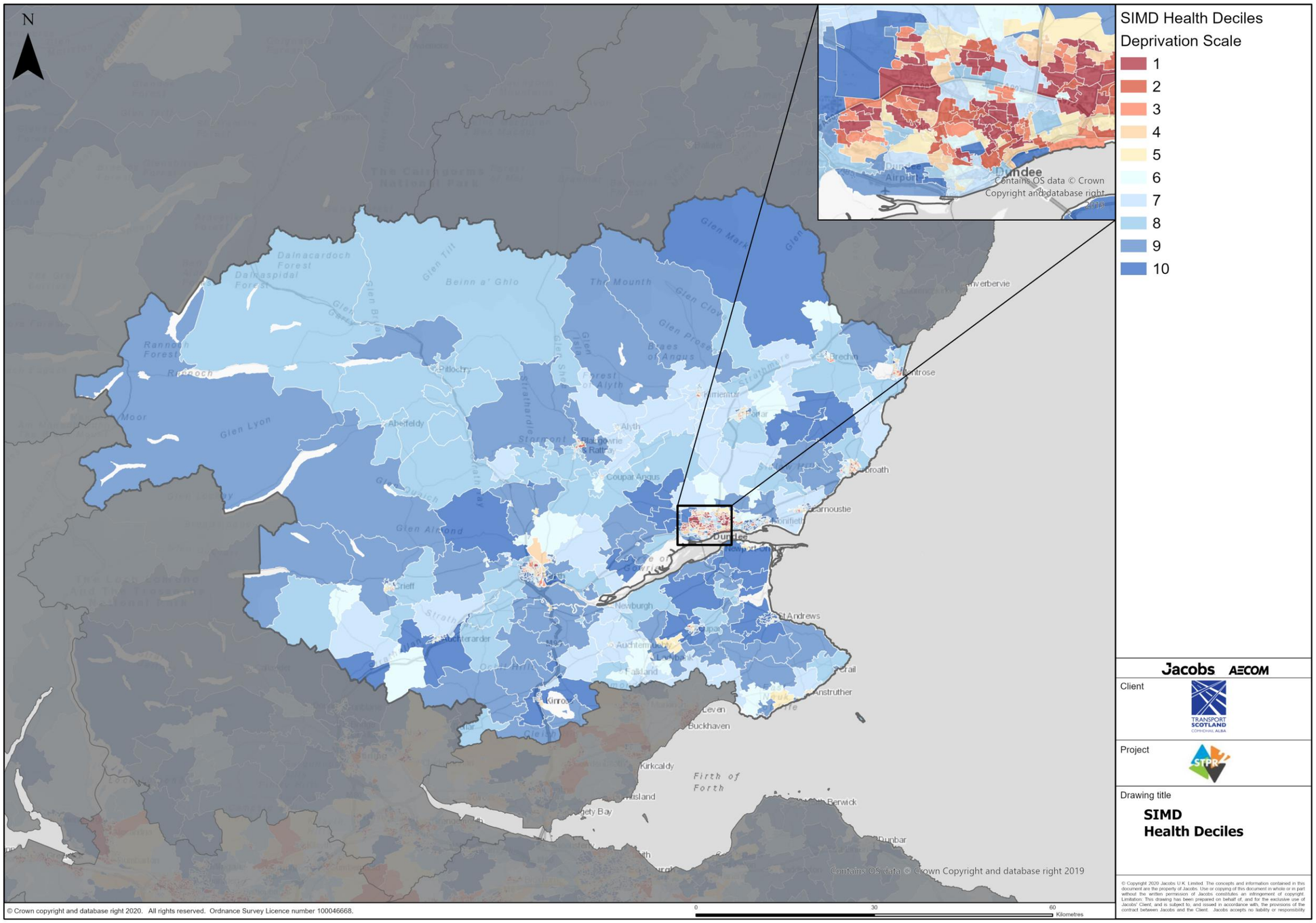


Figure A. 15 - SIMD health rankings Tay Cities region, coloured by decile ranking (click image to go back to main report)

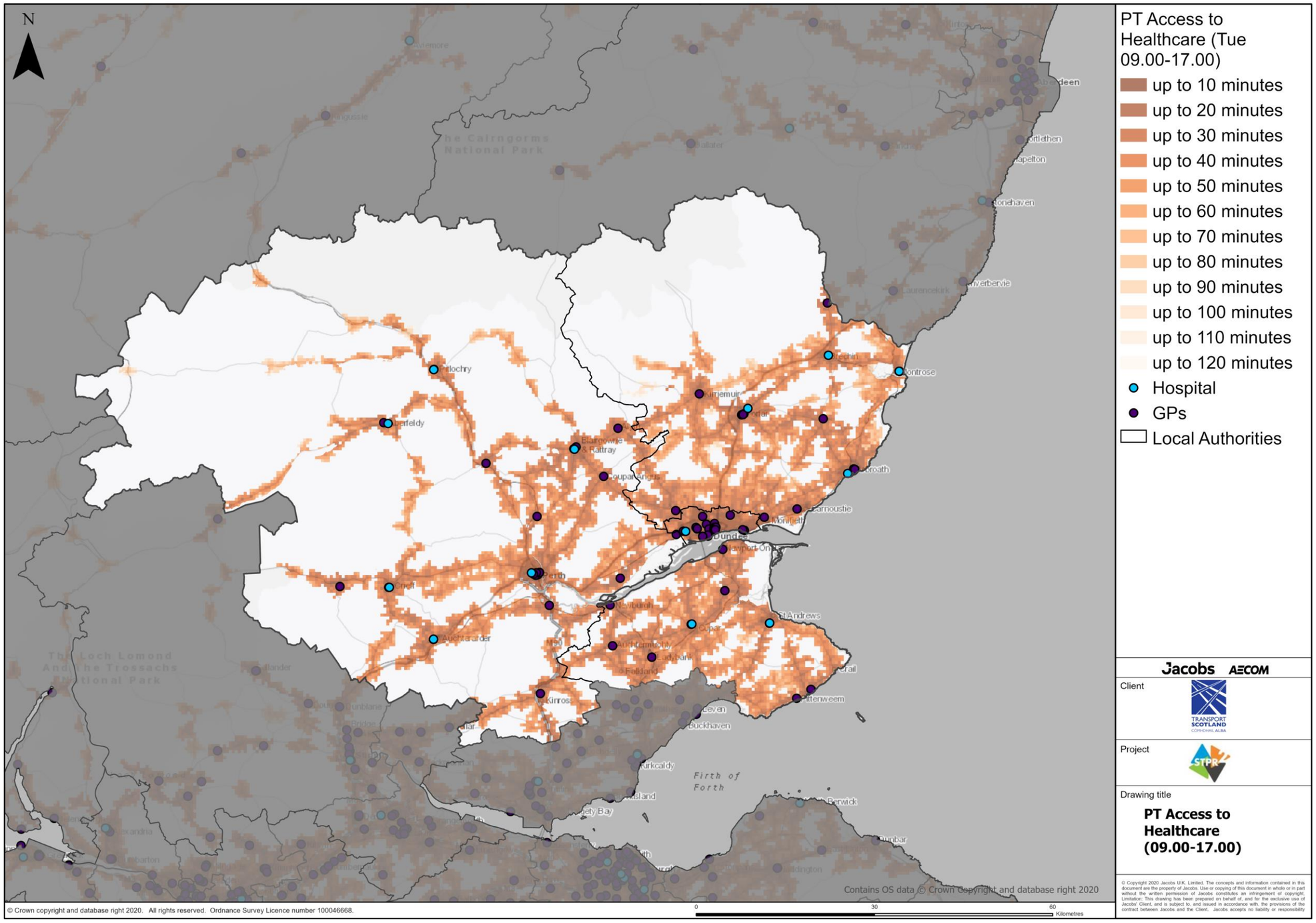


Figure A. 16 - Public transport accessibility to health facilities (09:00-17:00) (click image to go back to main report)

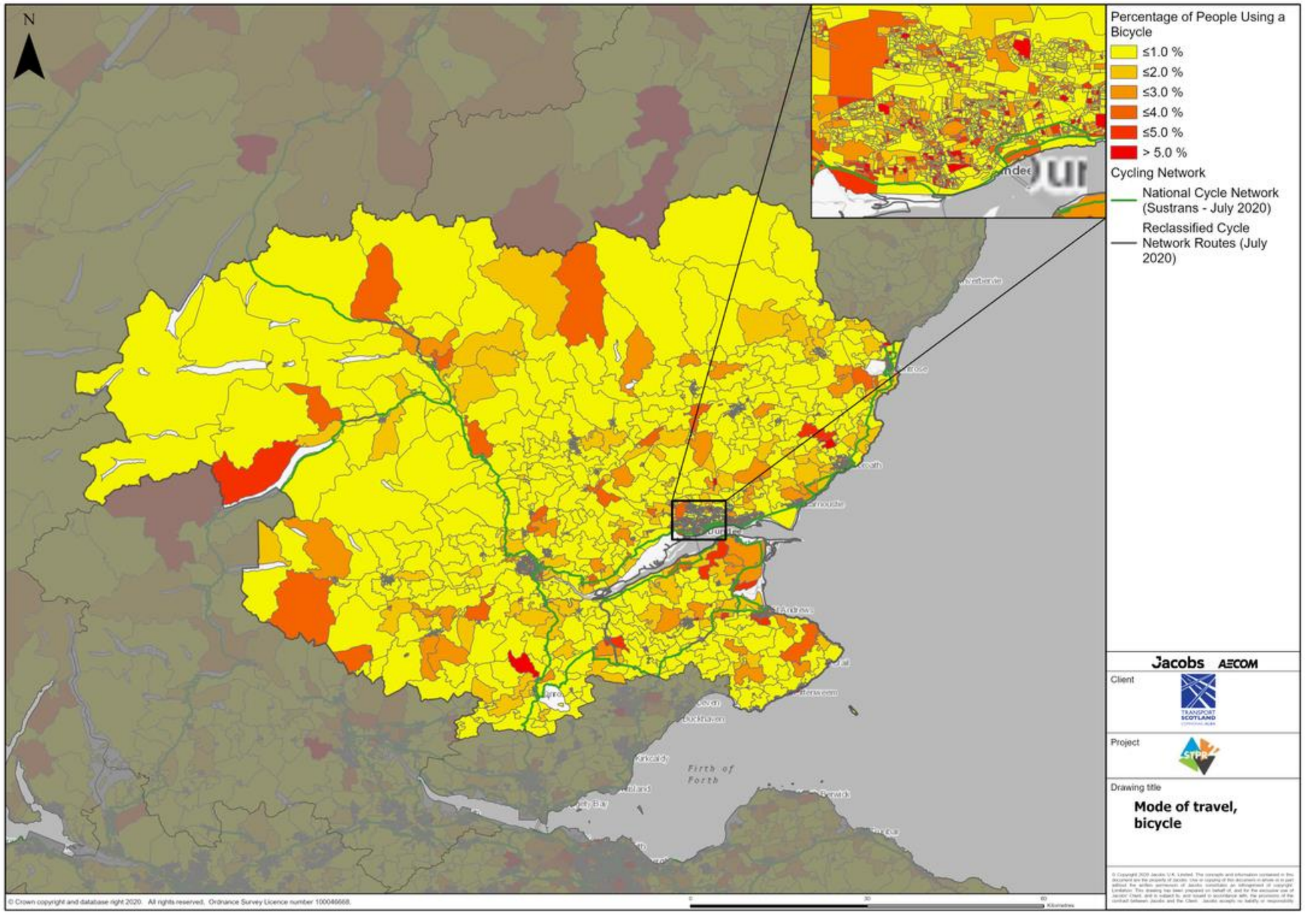


Figure A. 17 - Mode of Travel to Work (Bicycle) (click image to go back to main report)

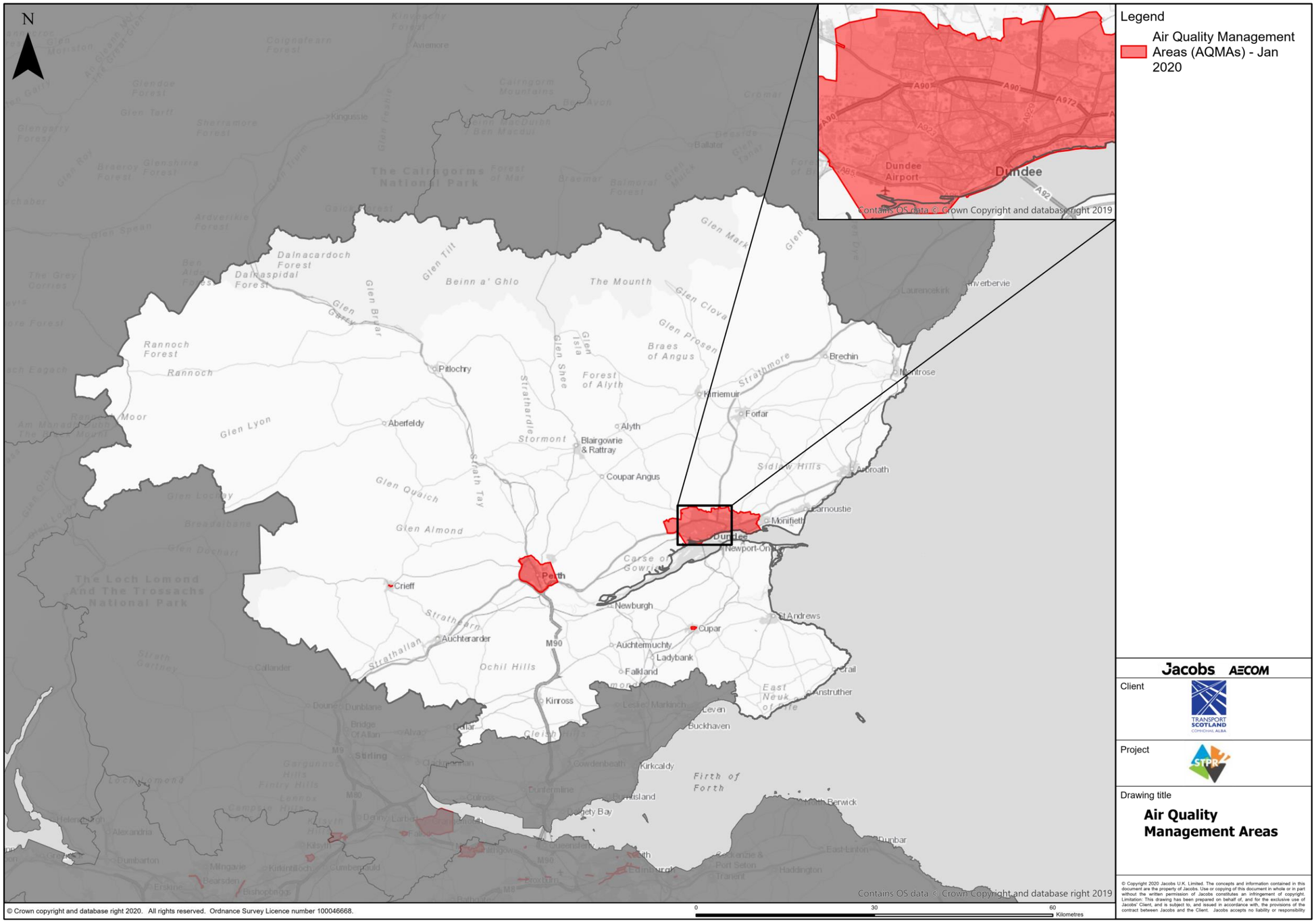


Figure A. 18 - Locations of AQMAs (click image to go back to main report)

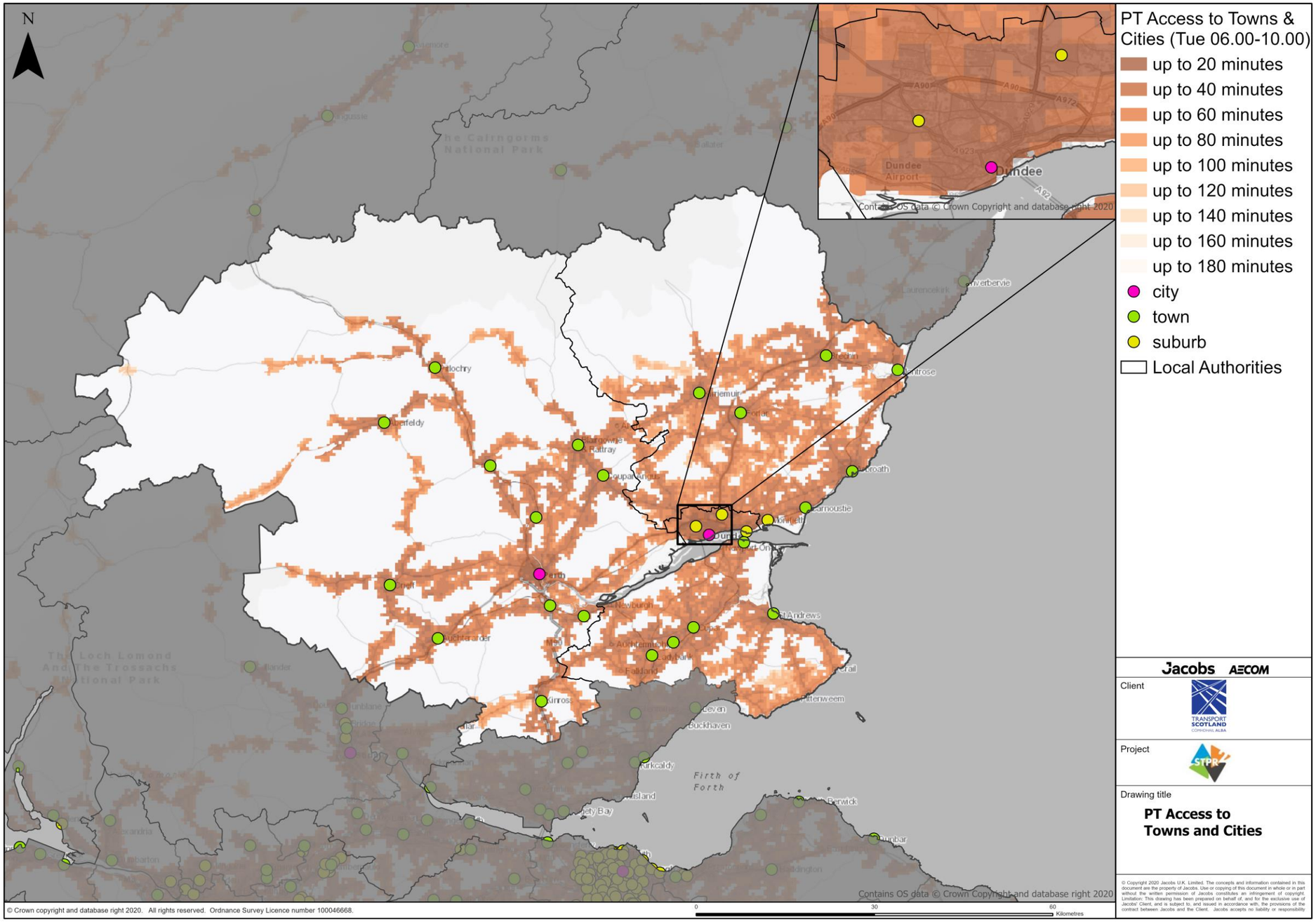


Figure A. 19 - Public transport accessibility to town centres (0600-1000) (click image to go back to main report)

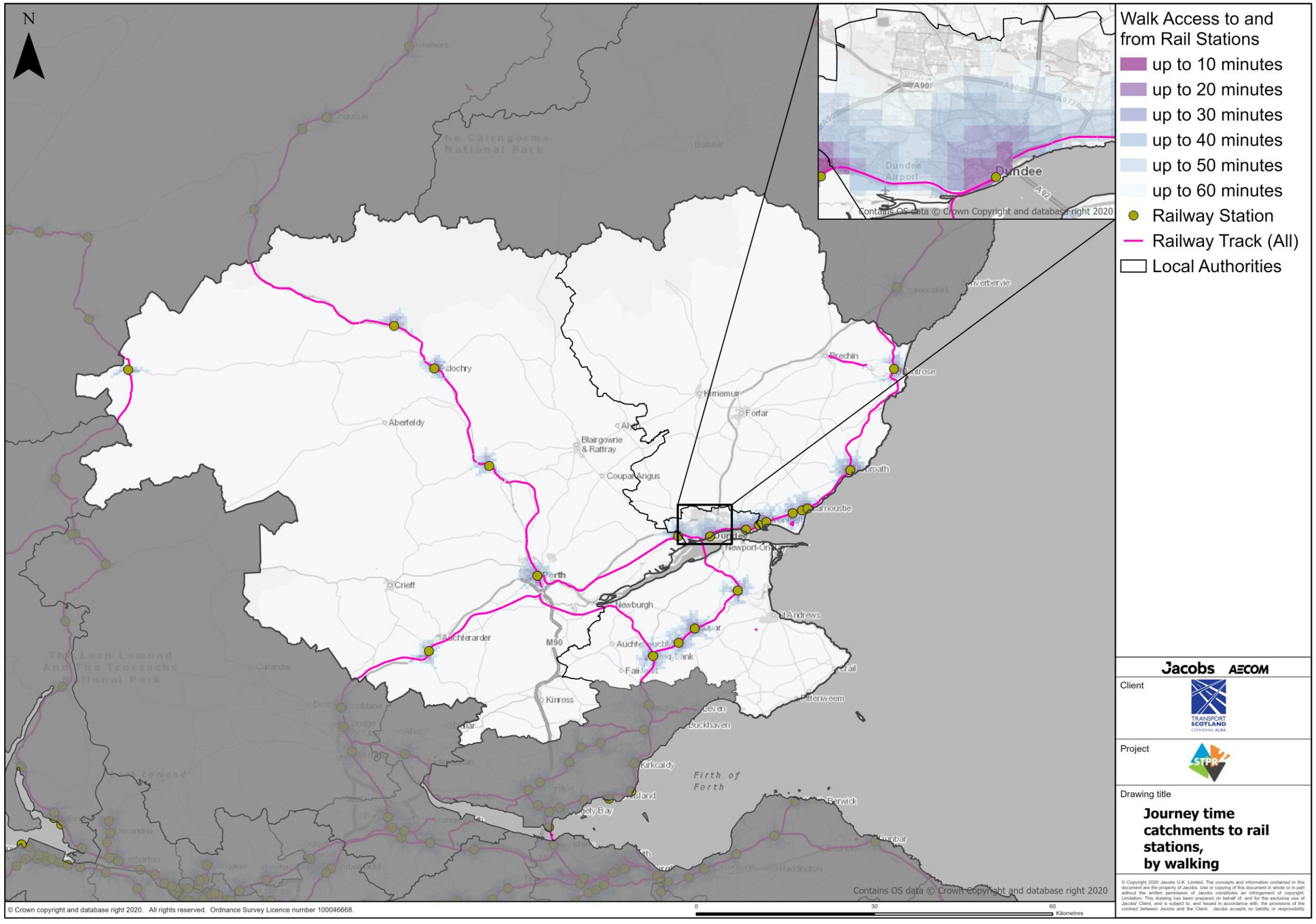


Figure A. 20 - Journey time catchments to rail stations, by walking (click image to go back to main report)

Appendix B: List of Policy Documents

Theme	Title	Author	Year
Development	The Tay Cities Deal	Tay Cities RWG	2017
Development	Strategic Development Plan	TAYplan	2016
Development	Angus Local Development Plan	Angus Council	2016
Development	Dundee Local Development Plan	Dundee City Council	2019
Development	FIFEplan	Fife Council	2017
Development	Perth & Kinross Local Development Plan	Perth & Kinross Council	2014
Development	Draft Infrastructure Investment Plan 2021-22 to 2025-26	The Scottish Government	2020
Development	National Planning Framework 3	The Scottish Government	2014
Development	Programme for Government	The Scottish Government	2020
Economy	The Tay Cities Region Economic Strategy	Tay Cities RWG	2019
Economy	Angus Economic Strategy	Angus Council	2013
Economy	Capital Investment Strategy	Dundee City Council	2018
Economy	Fife's Economic Strategy	Fife Council	2017
Economy	Perth City Plan	Perth City Development Board	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
Tourism	Tay Cities Region Tourism Strategy	Tay Cities RWG	2019

Transport	Regional Transport Strategy	Tactran	2015
Transport	Tay Estuary Rail Study	Tactran	2009
Transport	Regional Transport Strategy	SEStran	2016
Transport	Local Transport Strategy	Angus Council	2010
Transport	Dundee Local Transport Strategy	Dundee City Council	2000
Transport	Local Transport Strategy for Fife	Fife Council	2006
Transport	Shaping Perth's Transport Future	Perth & Kinross Council	2010
Transport	Local Transport Strategy	Perth & Kinross Council	2010
Transport	Strategic Transport Projects Review	Transport Scotland	2009
Transport	National Transport Strategy 2	Transport Scotland	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	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
Transport	Let's Get Scotland Walking	The Scottish Government	2014
Transport	Scotland's Road Safety Framework to 2030	Transport Scotland	2020
Other	Protecting Scotland, Renewing Scotland: Programme for Scotland 2020-21	Scottish Government	2020

Appendix C: Stakeholder Engagement

Engagement Type	Date	Venue	Purpose and Details	No. of Attendees
Problems & Opportunities Workshop	Friday 21st June 2019	Birnam Arts & Conference Centre, Birnam	Workshop with stakeholders including representatives from public, private and third sector organisations, in addition to local authority officers, to identify transport-related problems and opportunities in the region.	9
	Wednesday 26th June 2019	Malmaison Hotel, Dundee		35
Structured Interviews	August – October 2019	-	Interviews with senior officers from the Tay Cities local authorities and Regional Transport Partnerships, to identify transport-related problems and opportunities and potential options for the region.	8
Interventions Workshop	Thursday 21st November 2019	Dewars Centre, Perth	Workshop with stakeholders including representatives from public, private and third sector organisations, in addition to local authority officers, to identify potential interventions to address problems and opportunities previously identified.	9
	Monday 25th November 2019	Malmaison Hotel, Dundee		17
Elected Members Briefing / Workshop	Friday 17th January 2020	City Chambers, Dundee	Key elected members with a transport portfolio, selected by the RTWG, were invited and it was an opportunity for them to hear first-hand about the project and its programme, problems and opportunities gathered, the interventions generated, as well as putting forward their views for interventions to be considered	15
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.	284 responses