Strategic Transport Projects Review (STPR2)
Consultancy Support Services Contract

National Case for Change Report

DRAFT

February 2020

Jacobs AECOM

STRATEGIC TRANSPORT PROJECTS REVIEW#2

Project No:	B2356701
Document Title:	Initial Appraisal: Case for Change – National
Document No.:	2
Revision:	4
Date:	27/02/20
Client Name:	Transport Scotland

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List of Acronyms

BRES	Business Register and Employment Survey
CAA	Civil Aviation Authority
CMAL	Caledonian Maritime Assets Limited
CRWIA	Child Rights and Wellbeing Impact Assessment
DfT	Department for Transport (UK)
DUKES	Digest of UK Energy Statistics
EqIA	Equality Impact Assessment
EU	European Union
FBC	Full Business Case
FLAGS	Far North Liquids and Associated Gas System
FSDA	Fairer Scotland Duty Assessment
HGV	Heavy Goods Vehicle
HMRC	Her Majesty's Revenue and Customs
HS2	High Speed Rail Phase Two
ICIA	Island Communities Impact Assessment
LGV	Light Goods Vehicle
NOx	Nitrogen Oxides
NPF4	National Planning Framework 4
NRS	National Records of Scotland
NTS2	National Transport Strategy 2
OBC	Outline Business Case
OECD	Organisation for Economic Co-operation and Development
PFM	Planet Framework Model
PM10	Particulate Matter 10 micrometres or less in diameter
PPM	Public Performance Measure
SAGE	Scottish Area Gas Evacuation
SBC	Strategic Business Case
SEA	Strategic Environmental Assessment
SIMD	Scottish Index of Multiple Deprivation
SMART	Specific, Measurable, Attainable, Relevant, Timed
STAG	Scottish Transport Appraisal Guidance
STPR2	Strategic Transport Projects Review 2
TELMoS	Transport/Economic/Land-use Model of Scotland
TMfS	Transport Model for Scotland
TPO	Transport Planning Objective
UK	United Kingdom
VRDP	Vessel Replacement and Deployment Plan

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1. Introduction

1.1. Background

This Chapter provides the background and context for undertaking the second Strategic Transport Projects Review (STPR2). STPR2 will guide the Scottish Government's transport investment programme in Scotland for the next 20 years and help to deliver the vision, priorities and outcomes that are set out in the new National Transport Strategy (NTS2)[1], published in February 2020. The aim of STPR2 is:

To conduct a Scotland wide, evidence-based review of the performance of the strategic transport system, across all transport modes, against multiple criteria including safety, environment, economy, integration, accessibility and social inclusion whilst fundamentally supporting Scottish Government's aims, including sustainable inclusive growth and the move to a low and zero carbon transport system.

In so doing, STPR2 will make recommendations for potential transport investments for Scottish Ministers to consider as national investment priorities, in an updated 20-Year transport investment plan for Scotland.

The primary objectives of STPR2 are:

- To recommend to Transport Scotland a programme of interventions to the strategic transport network and systems which will make a significant contribution to delivering the new NTS2 over the period 2022- 2042;
- To ensure that the outcomes of STPR2 align with other Scottish Government national plans, policies and strategies, such as the fourth National Planning Framework (NPF4)[2] and the Climate Change Plan Update[3];
- Using the established Scottish Transport Appraisal Guidance (STAG) methodology, to re-consider the extant recommendations of the first STPR and other candidate interventions and, in the light of NTS2 policies, as part of the initial optioneering exercise.

The NTS2 sets out the Scottish Government's *Case for Change*, to achieve a more sustainable, inclusive, safe and accessible Scottish transport system which helps to deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors. The NTS2 has four priorities, which are each underpinned by three outcomes, as displayed in Figure 1.

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

[2] National Planning Framework 4 – The Essentials!, Scottish Government, 08 October 2019 https://blogs.gov.scot/planning-architecture/2019/10/08/national-planning-framework-4-the-essentials/

[3] Climate Change Plan: Third Report on Proposals and Policies 2018-2032 – Summary, Scottish Government, September 2018 https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018-9781788516488/

Figure 1: NTS2 Priorities and Outcomes

The NTS2 is set within the context of a Climate Emergency[4], with the Scottish Government committed to transitioning our transport system to one that is net-zero in carbon emissions by 2045. Set against a backdrop of increasing amounts of travel in Scotland over recent years, particularly vehicular travel, the NTS2 clearly outlines the need for change in transport provision in Scotland. STPR2 has a key part to play in supporting the delivery of the priorities and outcomes by outlining a range of targeted measures to achieve fundamental change in overall travel demand, a mode shift to more sustainable modes such as walking, cycling and public transport, and in transitioning to a net-zero economy.

STPR2 is being developed within a period of rapid policy change across Scottish Government and is working collaboratively with the teams developing the Climate Change Plan Update and NPF4 during the course of 2020.

[4] The Global Climate Emergency - Scotland's Response: Climate Change Secretary Roseanna Cunningham's statement, Scottish Government,14 May 2019 https://www.gov.scot/publications/global-climate-emergency-scotlands-response-climate-change-secretary-roseanna-cunninghams-statement/

1.2. Overview

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/Transport Scotland policies and strategies.

Specifically, this will include:

- Any transport project that plays a significant part in supporting the four 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 options considered within the STPR2 may include:

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

A strategic project will not include:

- Changes in vehicle regulation and taxation;
- Planning led initiatives (e.g. changes to the statutory planning process);
- Changes to the governance framework within which transport delivery and operation takes place;
- Concessionary fares; or
- Routine and cyclic maintenance measures.

Scotland's geography is unique and varied, ranging from rural lowlands to remote uplands, and from large cities to sparsely inhabited islands, meaning no two parts of Scotland are the same nor are their travel patterns and demands. For that reason, STPR2 is being progressed at both a national and regional level in order to appraise options in the context of place.

Following discussions with a range of regional transport stakeholders and partners, a total of eleven regions have been established for STPR2 as follows, and shown in Figure 2:

1. Argyll and Bute
2. Ayrshire and Arran Region
3. Edinburgh and South East Scotland City Region
4. Forth Valley Region
5. Glasgow City Region
6. Highlands and Islands Region
7. North East Scotland[5]
8. Scottish Borders[5]
9. Shetland Islands Region
10. South West Scotland Region[5]
11. Tay Cities Region

[5] A Pre-Appraisal/Case For Change report has already been published for the Scottish Borders, North East Scotland and South West Scotland regions respectively.

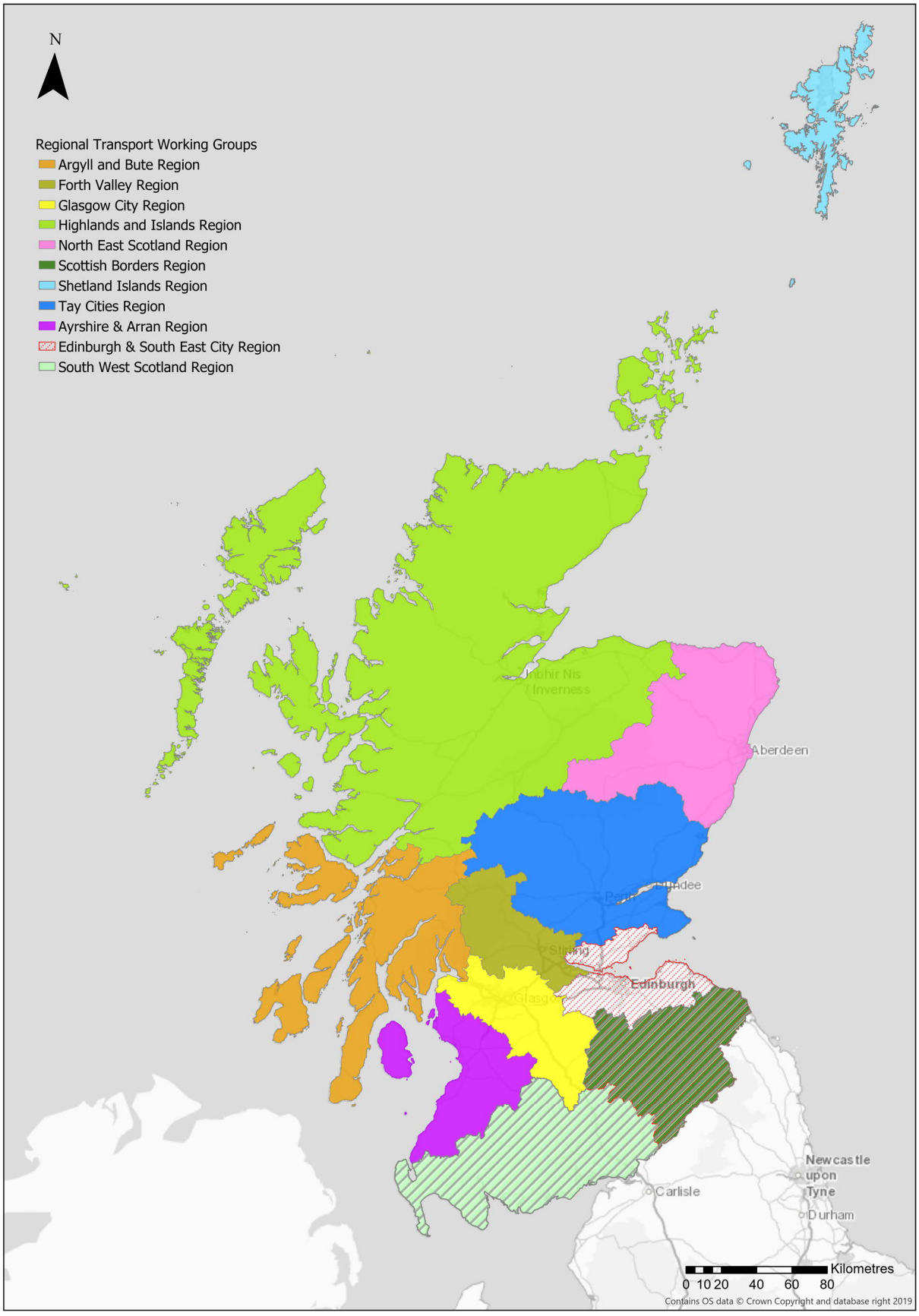


Figure 2: STPR2 Regions

1.3. Methodology

STPR2 is being carried out in accordance with the Scottish Transport Appraisal Guidance (STAG)[6], Transport Scotland's transport appraisal guidance which includes advise on the application of the HM Treasury Green Book[7] to transport projects in Scotland. This represents best practice in transport appraisal guidance adopting an evidence based and objective led process. The four key phases of STAG are illustrated in Figure 3.

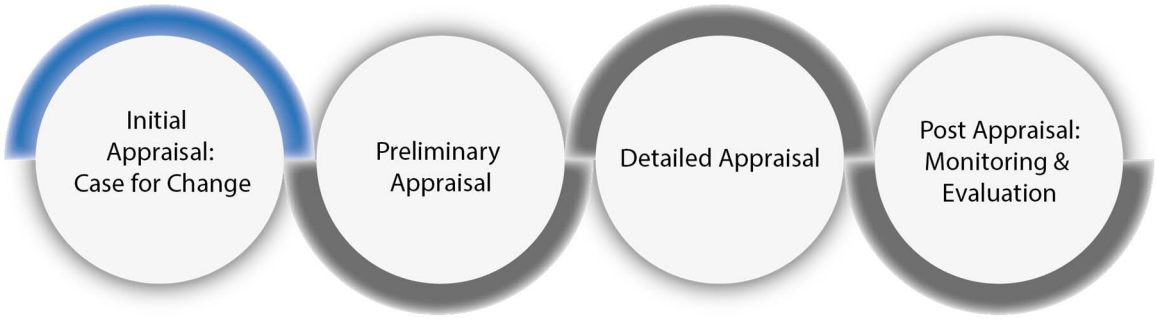


Figure 3: The Four Key Stages to the Scottish Transport Appraisal Guidance

The Initial Appraisal: *Case for Change* constitutes the first stage of STAG. This report summarises the national *Case for Change* as laid out within the new NTS2, drawing upon additional relevant data analysis and stakeholder engagement as necessary. The report outlines a framework of national Transport Planning Objectives (TPOs), which are designed to clarify the aims of any options and guide the appraisal of options through STPR2. The national TPOs will be used to align the TPOs being developed across the eleven STPR2 regions, which will each reflect their own specific regional problems and opportunities.

STAG requires the following key components when developing an Initial Appraisal *Case for Change*:

- Analysis of Problems and Opportunities – the key challenges facing the Scottish transport industry as identified within NTS2; validation that these challenges align with the national and regional themes identified through the STPR2 process; and provision of a summary of current and future transport network issues.
- Objective Setting – outlining the approach to developing TPOs for STPR2 and how they relate to the draft NTS2; presentation of the proposed national TPOs and how the emerging regional TPOs could be incorporated alongside the national TPOs to provide consistency across the appraisal process.
- Option Generation – an overview of the proposed process to help identify, develop and sift STPR2 options.

[6] Scottish Transport Appraisal Guidance (STAG), Transport Scotland, www.transport.gov.scot/media/41507/j9760.pdf

[7] The Green Book: Appraisal and Evaluation in Central Government, HM Treasury, April 2013 https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent

A long list of multi-modal options to address the identified problems and opportunities is currently being developed and will be sifted in line with the proposed approach presented in this report. Subsequent stages 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. The STAG process results in potential solutions to a transport problem and provides the information required for decision makers, in this case Scottish Ministers, to choose a preferred set of options.

The completion of the first three stages of the STAG process can be seen as forming a Strategic Business Case (SBC). The SBC should provide a rationale for intervention and provide enough evidence for an intervention to proceed to development. It should detail the need for intervention and propose a variety of options with which to deal with the issue(s), in the context of Government objectives. Options that proceed to the development stage (i.e. beyond STPR2) will be subject to the development of a more detailed Outline Business Case (OBC) and then, should the intervention proceed further, a Full Business Case (FBC)[8].

1.4. Impact Assessments

Supporting and informing the development of STPR2 are a series of complementary Statutory Assessments. These consist of:

- Strategic Environmental Assessment (SEA);
- Equality Impact Assessment (EqIA);
- Child Rights and Wellbeing Impact Assessment (CRWIA);
- Fairer Scotland Duty Assessment (FSDA) and;
- Island Communities Impact Assessment (ICIA)

Early work is currently being undertaken on these assessments, including baseline data analysis and policy review, and this has informed the *Case for Change* work to date, ensuring that due consideration is given to all the statutory requirements.

Formal SEA and EqIA Integrated Assessment Scoping Reports were issued to the Consultation Authorities and wider stakeholders for a seven-week consultation that closed on 7th February 2020. The purpose of these reports is to define the level of detail to be covered in each assessment and to set out a proposed approach to undertaking these impact assessments alongside the STAG appraisal process to ensure an integrated approach. The feedback received during the scoping period will be used to inform and refine the appraisal methodology.

[8] Guidance on the Development of Business Cases, Transport Scotland, March 2016 https://www.transport.gov.scot/media/39497/j422084.pdf

2. National Case for Change

2.1. Approach to Problem & Opportunity Identification

The NTS2 has been developed over a two-year period and has involved a comprehensive review of the key transport challenges facing Scotland and has included extensive engagement across the country to gather the views of a wide range of users of the transport system. STPR2 has supplemented this by adopting a twin-track national (top down) and regional (bottom up) approach to the identification of problems and opportunities. As part of this twin-track approach, a comprehensive review of national, regional and local policies, plans and strategies has been undertaken, together with a wide-ranging programme of stakeholder engagement and data analysis. This Chapter summarises problems and opportunities and details the approach to their identification at a national level.

Key National Themes

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: reducing inequality; taking climate action; helping deliver inclusive economic growth; and improving health and wellbeing.

The development of NTS2 has involved a comprehensive review of the key transport challenges facing Scotland and has included extensive engagement with a network of partners and areas across the country comprising individuals, businesses and third sector organisations, to gather the views of a wide range of users of the transport system. Through this process, it has been identified that Scotland's transport system continues to face a number of challenges: many people encounter problems when trying to access the services they need; vehicles continue to emit greenhouse gases and pollute the places residents live and work; businesses still face congestion and delays when reaching their customers; and people still face barriers when wanting to cycle or walk to their destination. Current and future challenges can be summarised as follows (presented in the same order as they appear in NTS2):

REDUCES INEQUALITIES

POVERTY AND CHILD POVERTY

Public transport is very important to those on low incomes, yet in many areas of high social deprivation public transport options can be limited and relatively expensive. A key challenge is providing fair and affordable access to the services people need.

SOCIAL ISOLATION

Globally, advances in technology now mean we feel more connected than ever. However, despite this, many people still feel socially isolated, with 6% of adults having contact with family, friends or neighbours less than once or twice a week[9]. Many disabled people feel trapped due to the lack of accessible transport, particularly on islands and in remote and rural areas. There is increasing recognition of social isolation and loneliness as major public health issues that can have significant impacts on a person's physical and mental wellbeing.

GENDER INEQUALITIES

Evidence across the UK and Europe shows that women are constrained by a number of barriers that shape how they travel and their experiences of those journeys. Over 75% of Scotland's part-time workforce is female[10], and women are more likely to be in low-paid work, with 64% of people paid below the Living Wage being female[11]. Lone parents, the vast majority of whom are women, are more likely to be living in poverty than other single working age adults in Scotland. Women who work part-time are more likely to have a multi-stop journey (e.g. to drop off / pick up children to / from school) than women that work full-time or men, whatever their working status.

Women are more likely to feel very or fairly worried about being sexually assaulted and are also less likely to report feeling very or fairly safe walking alone at night compared to men (66% compared to 89%)[12].

THE CHANGING TRANSPORT NEEDS OF YOUNG PEOPLE

Many young people are communicating more by social media rather than in person and therefore have less need to travel. More young people are in further and higher education, having to spend more on housing and delaying entering employment, therefore having less resources to spend on travel. Key issues for young people include the availability and cost of public transport, particularly to further and higher education, and personal safety when using services.

MEETING THE NEEDS OF AN AGEING POPULATION

Scotland's population is ageing: in 2018, 455,000 people in Scotland were aged 75 or over. By 2043, this figure is projected to grow to 776,000, an increase of just over 70%[13]. Older people are healthier, fitter, wealthier and more mobile compared with previous generations: they are likely to want to travel more and the transport system needs to support this to ensure older people, wherever they live, are not socially isolated. Factors impacting on older people include inaccessible vehicles (particularly taxis, buses and trains), journey comfort, frequency of bus services and poor integration between different transport services.

[9] Scottish Household Survey 2017 edition, 2018
[10] Briefing paper: Women and the Economy, House of Commons Library, 2019
[11] The Living Wage: Facts and Figures, SPICe, 2016
[12] Sexual Harassment of Women and Girls in Public Places, House of Commons Women and Equalities Committee, 2018
[13] Projected Population of Scotland, National Records of Scotland (NRS), 2018-based

THE TRANSPORT NEEDS OF DISABLED PEOPLE

The proportion of adults with a long-term limiting mental or physical health condition or disability is increasing as the population ages. Between 2008 and 2017, the proportion of women who had a long-term limiting mental or physical health condition or disability increased from 28% to 34%. Over the same period, the proportion of men increased from 23% to 29%[14]. Furthermore, a lower proportion of disabled people are in employment compared to those who are not disabled and are more likely to be affected by poverty than those who are not disabled[15]. Key challenges disabled people face on the transport system include: being able to access accurate and relevant travel information both before and during the journey; being able to access public transport interchanges; being able to access public transport vehicles; being able to interchange between all modes; and concerns regarding safety and comfort on the public transport network.

SCOTLAND'S REGIONAL DIFFERENCES

Transport challenges differ across areas and regions of Scotland. Limited supply of affordable city centre housing has led to more suburban areas with greater numbers of housing developments impacting on travel needs and patterns, particularly to city centres. If past trends continue, Scotland's cities will see increases in housing and population over the next 20 years[16].

Rural households tend to drive more frequently than urban households, in many cases due to the limited public transport options available. A particular issue for rural areas is the lack of public transport acting as a barrier for young people accessing education, training and employment and the link to long-term outmigration.

The minimum income that households require for an acceptable standard of living in Scotland's island communities is well above that required in the rest of the UK, and in many cases higher than in other areas of rural Scotland[17]. Factors resulting in additional costs for households in island communities compared to the rest of the UK include longer commuting distances compounded by higher fuel prices, issues around integrated timetabling, the additional cost of the need to make occasional trips to the mainland, and additional ferry/air costs for inter-island travel. Island communities can also face additional delivery and freight costs. Similar to remote and rural areas, transport can have an adverse impact on the long-term sustainability of island communities.

[14] Scottish Health Survey 2018 edition, 2019 (latest data available)
[15] Poverty in Scotland 2018, Joseph Rowntree Foundation October 2018 https minimum-incomestandard-://www.jrf.org.uk/report/poverty-scotland-2018
[16] National Records of Scotland (NRS) Population Projections
[17] A Minimum Income Standard for Remote Rural Scotland, 2013, http://www.hie.co.uk/regional-information/economic-reports-and-research/archive/a- for-remote-rural-scotland.html

TAKES CLIMATE ACTION

GLOBAL CLIMATE EMERGENCY

The Scottish Parliament committed to an ambitious target of net-zero emissions by 2045 and transport needs to play its part. Transport is currently Scotland's largest sectoral emitter, responsible for 37% of Scotland's total greenhouse gas emissions in 2017[18]. Since 2013 there has been an increase each year, despite more efficient vehicles, due to an increase in vehicle kilometres driven. The largest source of transport emissions are cars, at 40%, followed by aviation and shipping which are both 15%, with a further 25% of emissions generated by a combination of Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs)[19]. In addition to minimising the future impacts of transport on our climate, our transport system needs to adapt to climate change impacts.

ADAPTING TO CLIMATE CHANGE

Climate change directly affects the transport sector through the increasing number of more severe and frequent extreme weather events and the disruption they cause to the transport system. Disruption often disproportionately impacts on vulnerable communities with fewer and less resilient transport options. In recent years, there have been several weather events which have led to significant disruption and resulted in high economic costs. The 'Beast from the East' in February 2018 cost the UK economy at least £1 billion per day as gridlocked roads, no trains and no buses meant many workers were unable to access employment[20].

AIR QUALITY

Transport generates just over one-sixth of Scotland's total particulate matter (PM10) and over one-third of the total emissions of nitrogen oxides (NOx). The majority of these emissions are caused by road transport. Transport, and road transport in particular, remains a significant contributor to poor air quality. Air pollution increases the risks of diseases such as asthma, respiratory and heart disease, particularly for those who are more vulnerable such as the very young and the elderly or those with existing health conditions. Air quality is often worse in areas of deprivation and is a health inequality issue.

[18] National Atmospheric Emissions Inventory 1990-2017
[19] National Atmospheric Emissions Inventory 1990-2017
[20] Freezing Weather Costs UK Economy £1bn a Day, P Inman, G Topham, and A Vaughan, 2018

CHANGING COMPLEX BEHAVIOUR

To tackle emissions, a key challenge will involve getting people to change their travel behaviour, both in terms of reducing demand for travel and how particular journeys are made. People's travel choices are complex and influenced by a number of factors. Choices can reflect, for example, personal characteristics (e.g. age, sex and income), and can depend on where people live/work, geography, availability of transport, convenience and the built environment. The activities for which people travel are changing. In addition, the changing nature and location of work, land use, technology, housing and the move to more online retailing have impacted on and transformed people's behaviour in recent years. Changing people's travel behaviour to use more sustainable modes will have a significant impact on the environment, as well as our health and wellbeing.

DECLINE IN BUS USE

Bus is the dominant public transport mode in Scotland, accounting for three-quarters of all public transport trips[21]. It is particularly important to areas which are not served by the rail network, including much of rural Scotland. It can be an important element in multi-modal journeys and bus continues to be a sustainable and space-efficient mode of travel.

In 2017-18, 388 million journeys were made on local bus services in Scotland[22]. This is down from 487 million (-20.3%) in 2007-08. This trend coincides with an increase of 7.4% in road traffic (vehicle kilometres) in Scotland between 2007-08 and 2017-18[23]. Reducing passenger numbers risks driving down revenues and making some services unviable, resulting in cancellations and, in some cases, communities being isolated[24].

HELPS TO DELIVER INCLUSIVE ECONOMIC GROWTH

PRODUCTIVITY

The latest evidence reveals that Scotland's productivity is ranked 16th out of 37 amongst the Organisation for Economic Co-operation and Development (OECD) member countries. This is in the second quartile but below other comparator countries such as Ireland, Belgium and Denmark. Whilst Scotland's productivity level is not solely driven by the efficiency of its transport system, improvements in transport connectivity between businesses reduces costs and increases productivity, thus generating higher levels of economic growth[25,26].

[21] Scottish Transport Statistics No. 37, 2018 Edition, Chapter 11 headlines, Transport Scotland
[22] Scottish Transport Statistics No. 37, 2018 Edition, Table S1, Transport Scotland
[23] Scottish Transport Statistics No. 37, 2018 Edition, Table S1, Transport Scotland
[24] Trends in Scottish Bus Patronage,KPMG for CPT Scotland, 2017
[25] Scotland's Big Mo: Industrial Strategy, Inclusive Growth and the Future of Mobility, SCDI's Connectivity Commission, June 2018
[26] Transport's Role in Sustaining UK's Productivity and Competitiveness: The Case for Action, Sir Rod Eddington 2008

LABOUR MARKETS

People need transport to access employment, education and training and therefore help reduce the numbers out of work and support Scotland's ambitions for growth. Transport can also make sure that the skills and experience of those in the labour force are effectively matched with the needs of businesses, helping to increase incomes and improve productivity. There is evidence[27] that some people out of work see high transport costs – as well as physical barriers to access to transport - to employment locations as a barrier, particularly for those in more rural areas, people with disabilities and long term health conditions, the young, those on low incomes and families with children, thus limiting the employment opportunities and options available.

FUTURE SKILLED WORKFORCE

An increasing number of workers in the transport sector are retiring or leaving the industry. With a lower number of young people entering the industry to replace them, a skills shortage is developing. The labour market also faces potential disruption through uncertainties related to the European Union (EU) Exit. There are also concerns related to the loss of technical and commercial skills and expertise, an ageing workforce and how new staff can be attracted and retained.

TRADE AND CONNECTIVITY

Transport is crucial for trade and competitiveness, within Scotland, across the UK and internationally. Trade and connectivity with EU and global markets is impacted by uncertainty around Scotland's future relationship with the EU as a result of the UK EU Exit. There is a particular challenge with the lack of direct freight and logistics routes to the continent, with Scotland currently being dependent on key routes via England for the majority of imports and exports.

AVIATION

To be productive, competitive and successful economically it is important for Scotland to be well-connected and it is recognised that aviation will continue to play a key role in Scotland's connectivity, both in international terms and within Scotland and the UK. However, the environmental impacts of aviation need to be recognised and mitigated if climate change targets are to be achieved. Opportunities for reducing emissions from the aviation sector for people travelling to, from and within Scotland must continue to be explored.

[27] The Poverty Alliance Poverty and Transport Event, February 2019

FREIGHT

Freight is transported around Scotland by road, rail, air, sea and inland waterways. The number of goods vehicle trips, if left unchecked, is forecast to increase by 44% between 2014 and 2037[28], which will negatively impact on journey times and peak-period delays. Given the economic importance of Scotland's freight haulage industry, these factors will ultimately impact on the performance of the economy if not tackled. There will also be an impact on the environment. In 2017, HGV emissions were 3.5% higher than in 2016 and 5.2% above the 1990 baseline figure[29]. LGV emissions were 6.5% more than 2016 and 95.6% higher than the 1990 baseline figure. The increase in emissions from light goods vehicles reflects increasing vehicle-kilometres.

Whilst recognising the importance of freight within Scotland's economy, a key challenge will be to ensure that the negative impacts generated by the movement of goods vehicles are tackled.

TOURISM

Transport plays a vital part in supporting tourism. In 2018, Scotland welcomed over 3.5 million overnight visitors from overseas, and increase of over 10% on the previous year[30]. Since 2002, the number of international visitors travelling to Scotland by air has more than doubled (+150%), whilst travelling by sea and via the Channel Tunnel have remained fairly stable over the same period, although there has been a marked increase in the number arriving by cruise vessels, rising from 369 calls with 268,481 passengers in 2010 to an estimated 912 calls with 920,000 passengers during 2019[31]. Ensuring Scotland can continue to welcome a growing number of international visitors requires retaining important air links and also developing new routes, whilst taking measures to minimise the environmental impacts that international tourism generates.

People in a number of Scotland's remote, rural and island communities are witnessing deteriorating road networks as traffic increases, with larger and heavier cars, caravans and motorhomes, and vehicle capacity constraints on ferries. Whilst the benefits of tourism are recognised, tourists should be encouraged to visit and travel within Scotland using more sustainable means.

[28] Transport Forecasts, Transport Scotland, 2018
[29] Carbon Account for Transport No. 11: 2019 Edition, Transport Scotland, September 2019
[30] Scotland's Tourism Summary Report, Visit Scotland, 2019. https://www.visitscotland.org/binaries/content/assets/dot-org/pdf/research-papers-2/2018-national-tourism-stats-summary.pdf
[31] https://www.cruisescotland.com/

DIGITAL AND ENERGY

It is recognised that transport needs to be considered alongside other strategies and initiatives, including digital and energy. The choices that people make about where and when they work, and how companies trade, will be driven as much by changing digital technologies and communications as it will be by transport. Availability of mobile connectivity across the transport system is a key enabler in the adoption of new digital technologies, whilst the availability of ubiquitous connectivity is fast becoming an expectation. Improvements in digital technology and connectivity could impact on ways in which people work and travel, and these links could be an essential part of how transport is able to contribute to Scotland's emissions targets. Access to digital communications is also a vital factor in decisions made by disabled people about location and transport options.

Scotland is taking a leading role in promoting electric and other low-emission vehicles[32], with a commitment to phase out the need for new petrol and diesel cars and vans by 2032. In meeting this ambition, Scotland will need to develop and manage the necessary charging and other network infrastructure, whilst building consumer awareness and confidence.

RELIABILITY

Some of Scotland's cities experience considerable congestion and associated disruption[33]. Whilst the volume of traffic on Scotland's road network declined between 2007 and 2011 in line with the economic downturn, there have been increases each year since then. Forecast increases in traffic volumes will impact negatively on reliability through increased congestion and more roadworks as greater pressure is placed on the operational efficiency of the network. Reliability is also an issue on the rail network and data shows that reliability has declined from a peak of 93% in 2013 to just over 87% in 2019[34].

FUNDING AND RESOUCES

The way in which the transport system is paid for and funded is complex, but it needs to be fair and sustainable and support wider outcomes. The costs of delivering Scotland's transport system are significant. In 2017-18, total public sector expenditure on transport amounted to £2.95 billion[35]. This compares with a figure of £2.72 billion in 2007-08, an increase of 8.4%. Going forward, there will continue to be competing demands and difficult funding choices to be made for both central and local government. This includes decisions about priorities within the transport infrastructure, and also between transport and other policy areas such as housing, health, education and energy. In addition,

[32] Switched on Scotland Phase 2: An Action Plan for Growth, Scottish Government, 2017
[33] INRIX 2018 Global Traffic Scorecard http://inrix.com/scorecard/
[34] The Public-Performance-Measure (PPM) is the standard industry measure for reporting performance. It counts all trains which arrive within five minutes of the scheduled performance time (ten minutes for the long-distance Train Operating Companies), compared with the number of trains planned to run. The Office of Rail and Road's data reported for Scotland are for the ScotRail franchise proper, which covers 95 percent of the trains run in Scotland.
[35] Scottish Transport Statistics No. 37, 2018 Edition, Table 10.1, Transport Scotland

achieving the net-zero target will put further pressure on limited budgets, as increasing focus is placed on areas where greenhouse gas emissions need to be reduced. A key challenge will relate to managing transport assets effectively and investing efficiently in the resources needed to maintain and safely operate them and to make better use of existing capacity.

IMPROVES OUR HEALTH AND WELLBEING

SPATIAL PLANNING

Spatial planning can play a key role in addressing a number of challenges for places. The places where people live and work can have important impacts on health and wellbeing. As land use has continuously evolved, some places have become less sustainable and would benefit from renewal and improvement. Buildings located in areas that are hard to reach and not well served by public transport can result in long journeys to access shopping and work, therefore discouraging walking and cycling and encouraging more car use. The current and future transport needs of people should be at the heart of planning decisions to ensure sustainable places.

SAFETY AND SECURITY

Scotland's transport system needs to be safe. Whilst the number of road accident casualties reduced by 11% between 2017 and 2018[36], the number of fatalities has increased. There are considerable inequalities: children in Scotland's 20% most deprived areas are more than three times as likely to be injured in a traffic accident than those in the 20% least deprived areas[37].

Women and disabled people are more likely to experience affordability barriers to transport: they are less likely to drive and more likely to use public transport, particularly buses. Many women and disabled people feel vulnerable when using public transport – particularly at bus stops, train stations or other transport interchanges.

PHYSICAL ACTIVITY

The importance of active travel is becoming more evident as the consequences of physical inactivity are studied. Over the last few decades increasing reliance on cars has contributed to Scotland becoming less active as a nation. Over two-thirds of commuters travel to work by car or van compared to just 12% who walk and 3% who cycle[38]. Research shows that around one-quarter of children in all age groups between 5 and 15 do not meet physical activity guidelines over an average week and this declines with age[39]. There are links between poverty and the availability of bicycles: household access to bicycles increases with household income. It is recognised that one of the most effective ways to secure the required 30 minutes of moderate activity per day is to reduce reliance on motorised transport, changing the means of everyday travel to walking and cycling[40].

[36] Key Reported Road Casualties Scotland 2018, Transport Scotland Statistical Bulletin
[37] Sustrans, Scottish Transport Applications Research Conference May 2019
[38] Transport and Travel in Scotland, 2018 Table 7
[39] 2016 Scottish Health Survey, Scottish Government, October 2017
[40] Preventing Overweight and Obesity in Scotland Strategy, The Scottish Government, 2010

INFORMATION AND INTEGRATION

High-quality journey planning information, both digital and physical, is important to enable a resilient transport system that allows people and goods to get to where they need to get to. Many people choose to travel by car instead of active transport and/or public transport due to the number of necessary interchanges on their journey. In some cases, journeys are not possible due to a lack of connections or accessible modes of transport. In addition, long wait times, the need for multiple tickets and complex connections deter people from some public transport services resulting in many running below capacity. This is a particular issue for wheelchair reliant transport users.

RESILIENCE

When there are extreme weather incidents and planned or unplanned events which result in network disruption, it is vital that information is given to the public as early as possible so that they can act accordingly. Extreme weather leads to uncertainty about travel conditions for people and businesses. Dedicated walking and cycling infrastructure must be maintained to encourage use. Both trunk and local roads face considerable maintenance backlogs and need significant investment to ensure they are appropriately maintained[41] Both mainland to island and intra-island ferry fleets are ageing. The effective maintenance of transport networks is important in reducing disruption and delivering a resilient and reliable transport system. A key challenge is providing a transport system that is resilient and speedily recovers from disruption, thus minimising impacts of delayed journeys on networks and users. This requires strong planning in relation to physical resilience of the transport system, how disruption is managed and the speed of recovery, together with effective maintenance regimes and investment.

Figure 4, below, illustrates how each of the 27 key challenges set out above align with the four key priorities identified within NTS2. It demonstrates that the key challenges are interlinked and can be grouped under several, if not all, of the four NTS2 priority areas.

[41] Maintaining Scotland's Roads, Audit Scotland, 2016 https://www.audit-scotland.gov.uk/uploads/docs/report/2016/nr_160804_maintaining_roads.pdf

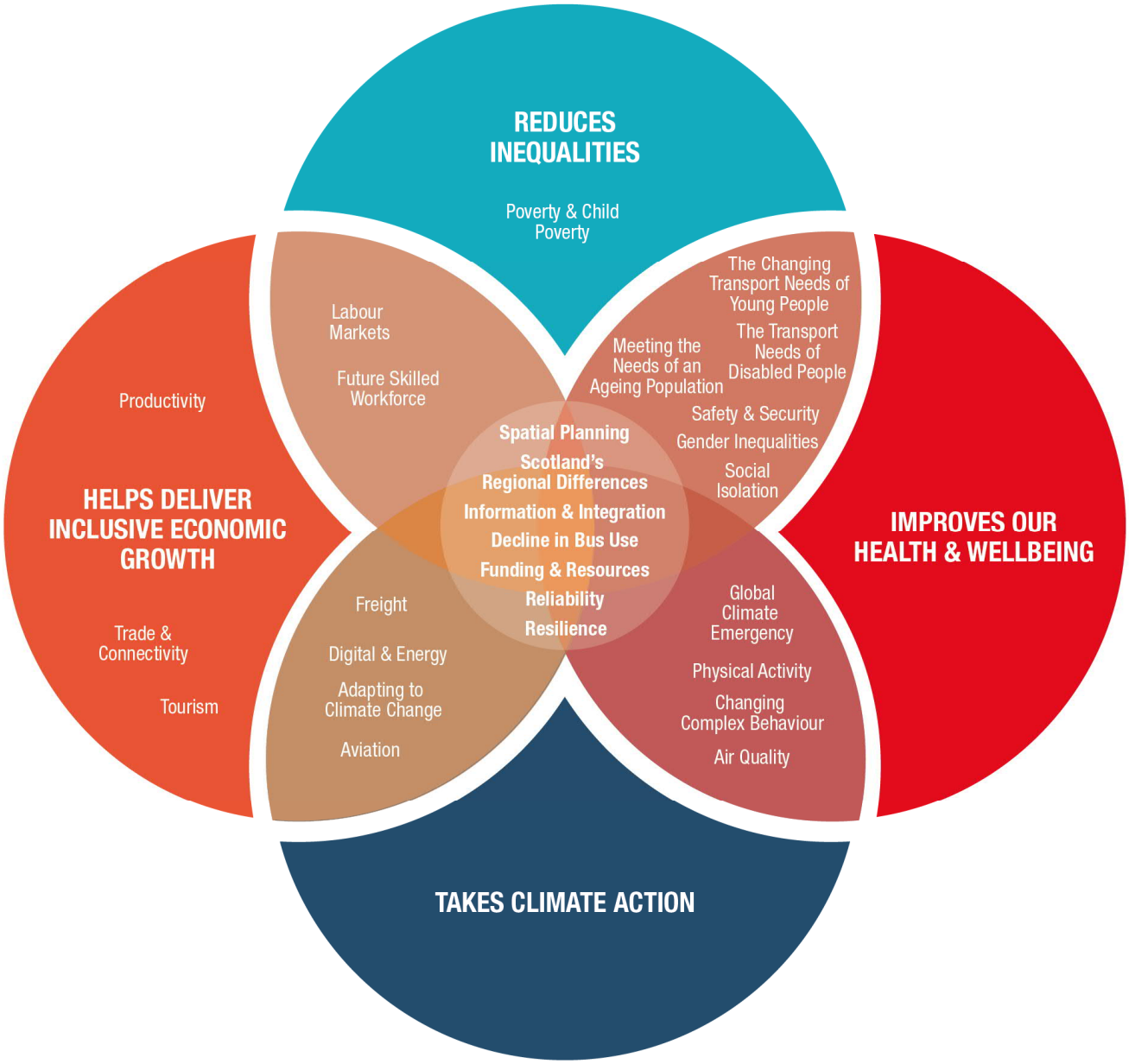


Figure 4: NTS Priorities and Associated Challenges

Stakeholder Engagement

In developing the NTS2 and hence the *Case for Change*, Transport Scotland engaged widely with more than 6,500 people at over 100 engagement events that took place in rural, island and urban communities across Scotland. The collaboration extended to over 60 partners across Scotland, including the third sector, passenger representatives, academic experts, business, transport operators and local government.

Building on the NTS2 engagement, STPR2 extended and focused engagement to further validate the findings of NTS2, collect views on both national and regional problems and opportunities, key themes and on suggestions for transport options to address the key problems and opportunities. The STPR2 engagement process included:

- Over 60 **Workshops** undertaken across all regions of Scotland;
- Over 100 **Stakeholder Interviews**;
- Schools Engagement with over 23 schools (to date); and,
- A **National Survey** that received over 3,025 responses.

Data Analysis

A wide range of data sources have been used to evidence, where possible, problems and opportunities identified through stakeholder engagement and also identify any new problems and opportunities. Figure 5 outlines a number of data sources used, including primary data sources such as the Transport/Economic/Land-use Model of Scotland (TELMoS), the Transport Model for Scotland (TMfS) and TRACC accessibility data, as well as data gathered from recent reports and studies.

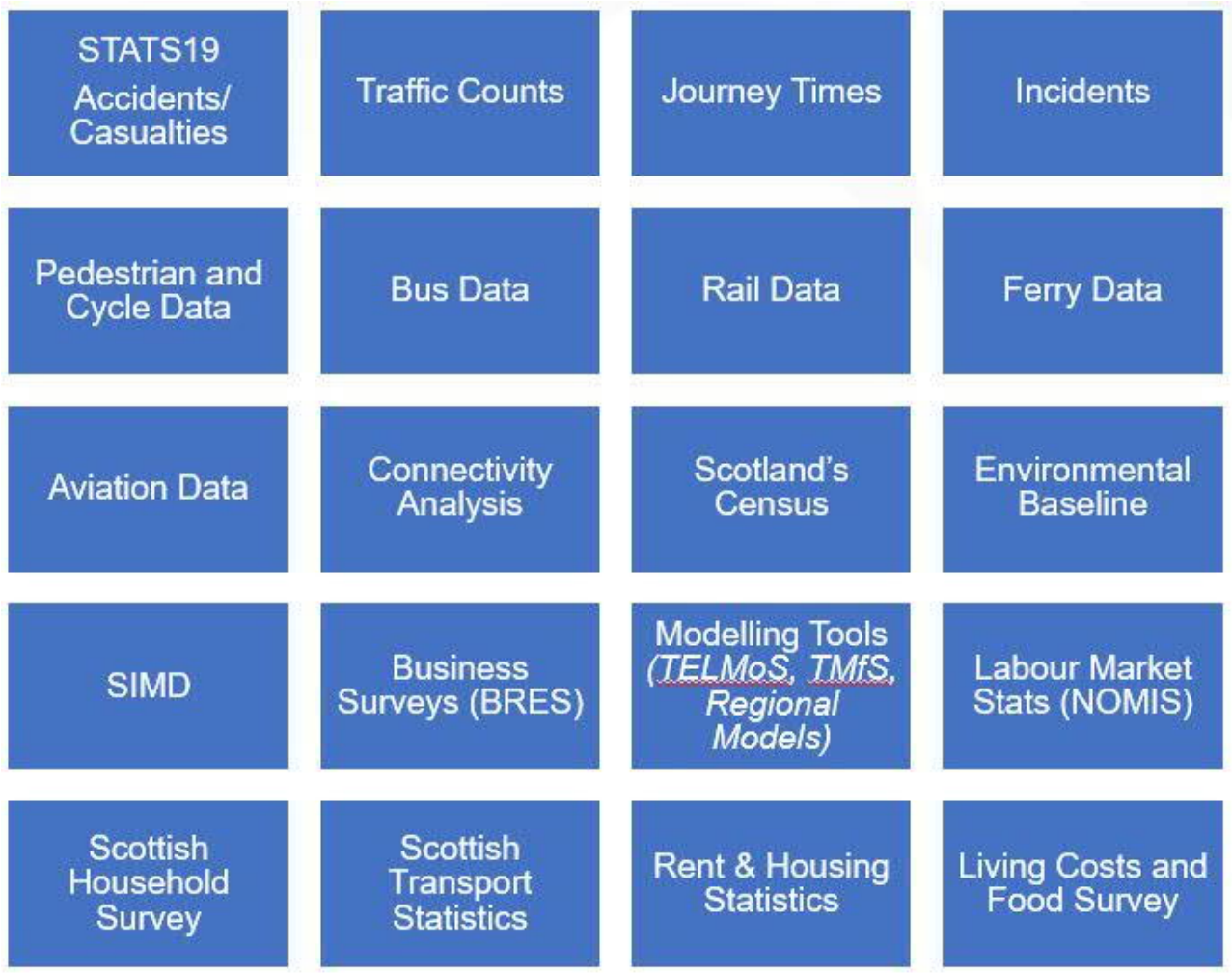


Figure 5: A Selection of STPR2 Data Sources

2.2. Regional Themes

As identified earlier, for the purpose of the STPR2, Scotland has been split into eleven regional groupings. In three of these, Scottish Borders, South West and North East Scotland, advanced work has already taken place and *Case for Change* reports have been finalised and published[42]. Collectively these are referred to as STPR2 Advanced Studies.

Each of the remaining eight regions sets out its own *Case for Change* report covering themes relevant to each region and aligning to this national report. Analysis of the regional problems identified a strong alignment with the key national challenges and related trends identified in the previous section.

Themes related to capacity, policy and governance, and quality are consistently raised across the majority of regions. Further thematic analysis shows that issues relating to quality of the road infrastructure and resilience are most frequently raised in the more rural areas such as Highlands & Islands, Ayrshire and Arran and Argyll and Bute, and less prominent in the urban areas. Similarly, travel times were frequently reported as a problem in the same three regions; Ayrshire & Arran, Highlands & Islands and Argyll & Bute. General issues around connectivity were more frequently reported in rural and island areas. For the city regions, there was a general alignment around policy and governance. There was also a general alignment around congestion and lack of quality infrastructure for active travel, particularly for the Edinburgh and South East and Tay Cities regions.

In terms of the opportunities identified, key themes included development opportunities, inward investment, growth deals, policy, technology, rail freight, and tourism. There were also several opportunities which aligned with problems, but with a focus on how the problem could be addressed. Additionally, a significant proportion of the opportunities highlighted were recognised as potential options and have been taken forward for consideration at the option generation and sifting stage.

Whilst the review of regional themes has largely validated the 27 key challenges identified by NTS2 at a national level, the following themes have been identified from the bottom up regional analysis and engagement that do not naturally align directly to the 27 key challenges identified within the NTS2, albeit there is an indirect link in most instances.

LACK OF OWNERSHIP/GOVERNANCE/COLLABORATION

Several of the problems categorised under the lack of ownership sub-theme related to a lack of collaboration. Specific issues included the separate responsibilities of local roads and trunk roads preventing a whole-route perspective; and similarly, the lack of local authority influence over trunk road planning preventing the consideration of active travel for key routes between communities (particularly in rural areas). Lack of collaboration between public transport operators was also seen as a barrier to integration. In addition, it was considered that the planning process for new developments does not have

[42] Scottish Borders Region: https://www.transport.gov.scot/publication/borders-transport-corridors-pre-appraisal/;
South West Scotland Region: https://www.transport.gov.scot/publication/draft-report-initial-appraisal-case-for-change-south-west-scotland-transport-study/;
North East Scotland Region: https://www.nestrans.org.uk/wp-content/uploads/2019/08/20180824-Aberdeen-STAG-Pre-Appraisal-v2.2.pdf

enough focus on public transport and active travel.

Whilst not identified as a key challenge, NTS2 does identify that transport governance and collaboration will be improved through a continuation of the work initiated through the Roles and Responsibilities Group which undertook a review of transport governance. In the context of the review of regional themes, governance issues can currently be viewed as a constraint.

SERVICE CAPACITY

The capacity of transport services was raised as a problem across several modes: rail station capacity; rail network capacity; park and ride capacity for stations; freight capacity by rail and ferry; passenger capacity for ferries including for lifeline inter-island services.

This theme may not directly map across to the 27 key challenges, but it clearly has a strong indirect or implicit linkage to issues around affordability, accessibility, connectivity and congestion which are all highlighted as symptoms of the key challenges.

VESSEL AND VEHICLE QUALITY

The main concern in this category related to the quality of ferries, with poor reliability and resilience considered to result in cancellations, ultimately leaving users (both islanders and tourists) unable to complete their journey. There were some concerns about the quality of trains and buses, mainly in rural/island areas with perceived implications on reliability. The quality of aircraft was raised as an issue in the Highlands & Islands region.

Quality was a key issue identified in the original NTS in 2006 but is not identified as a key challenge in NTS2. However, there are strong indirect or implicit linkage to issues including regional variances, resilience, reliability, safety and tourism.

2.3. Current and Future Land Use and Transport Network Issues

Introduction

A comprehensive data collation and analysis exercise has been undertaken to support STPR2 in the identification of problems and opportunities. This section provides a short overview of a number of current and past trends, and predicted trends/forecasts using various tools[43], related to the supply and demand of transport in Scotland. Whilst the data analysis exercise has used established tools and models based on well-developed methodologies, it should be recognised that the future is uncertain and will be affected by, for example, the global climate emergency and the Government's commitment to net-zero alongside a wide range of possible disruptors.

As such, a degree of caution should be applied to the future forecasts of demand and performance of the transport network presented in this section as they are based on forecasts that assume that travel demand continues along broadly similar lines to the last 10-20 years. This would result in a general trend of increasing traffic levels, more congested networks and greater emissions. Therefore, the forecasts provide a useful indication of what will happen if we do little or nothing to deliver the outcomes of NTS2 and

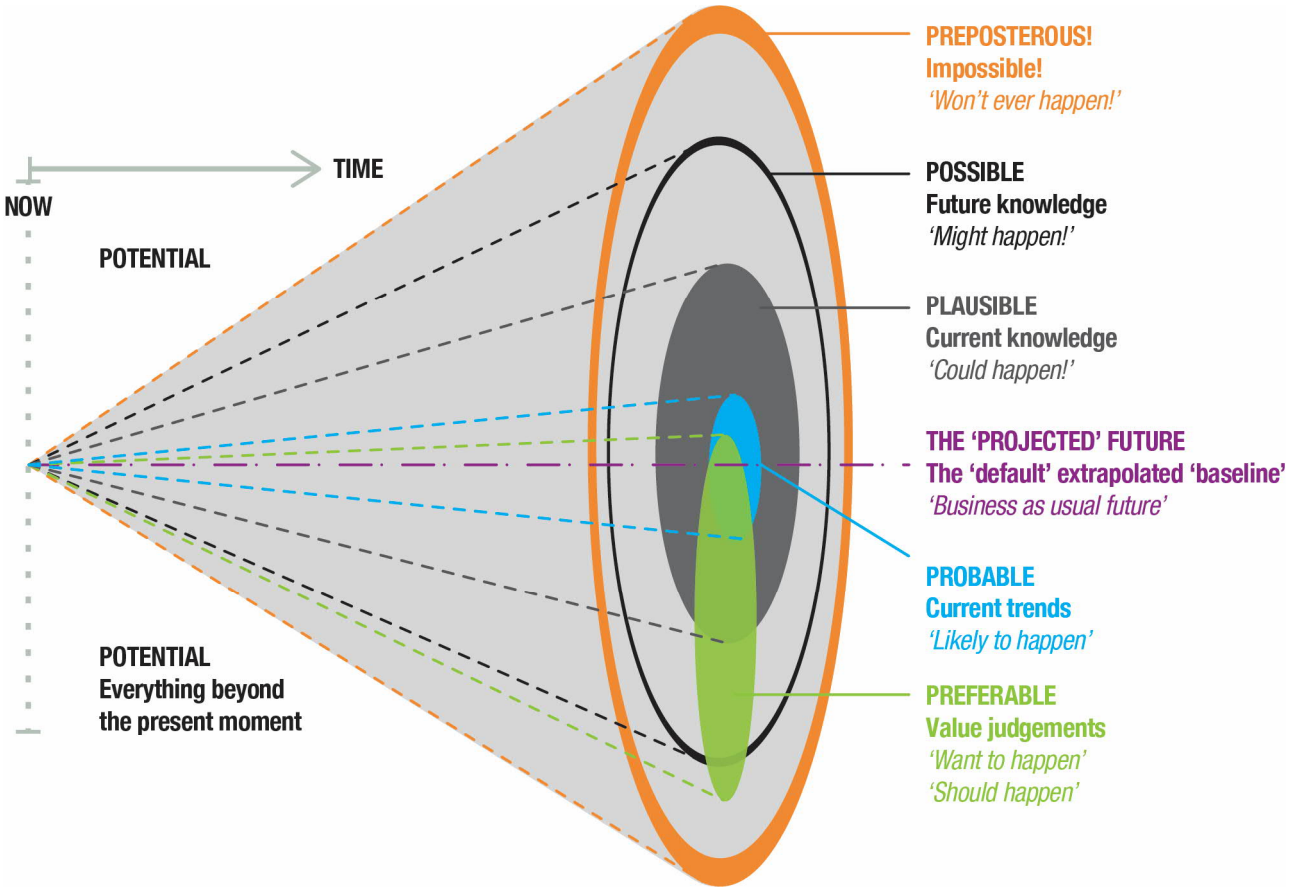
[43] Including TELMOS and TMfS

specifically tackle the climate emergency and net-zero commitments.

Going forward, Transport Scotland is in the process of reviewing and updating the transport modelling and appraisal tools and processes required to appraise, monitor and deliver the vision of the transport system outlined in NTS2.

Dealing with Uncertainty

As outlined above, most transport models and tools assume continuing trends and static behaviours in forecasting. However, these assumptions are becoming less tenable in a world of increasing environmental, political, socio-demographic, and technological change. There is therefore a need to understand how sensitive potential interventions are to a range of possible futures. To date, valuable work has been undertaken as part of the NTS2 process to develop a scenario based approach to help understand potential different futures and their impact on transport outcomes in Scotland. The STPR2 will build on this work to help test the resilience of potential interventions.



National Trends Summary

The next few pages present forecasts of land use pattern changes across Scotland over the next 20 years in terms of households and employment. The data has been extracted directly from Transport Scotland's land-use model TELMoS14[44] and presents an indication on how travel demands may change with time across Scotland.

Further mode specific trends and forecasts are then presented from a range of sources and models including TRACC[45] accessibility analysis software which presents information in a geographically referenced way.

[44] TELMoS18 expected early-2020
[45] TRACC: Transport Accessibility is a tool provided by BaseMap and used to determine public transport travel times between points.

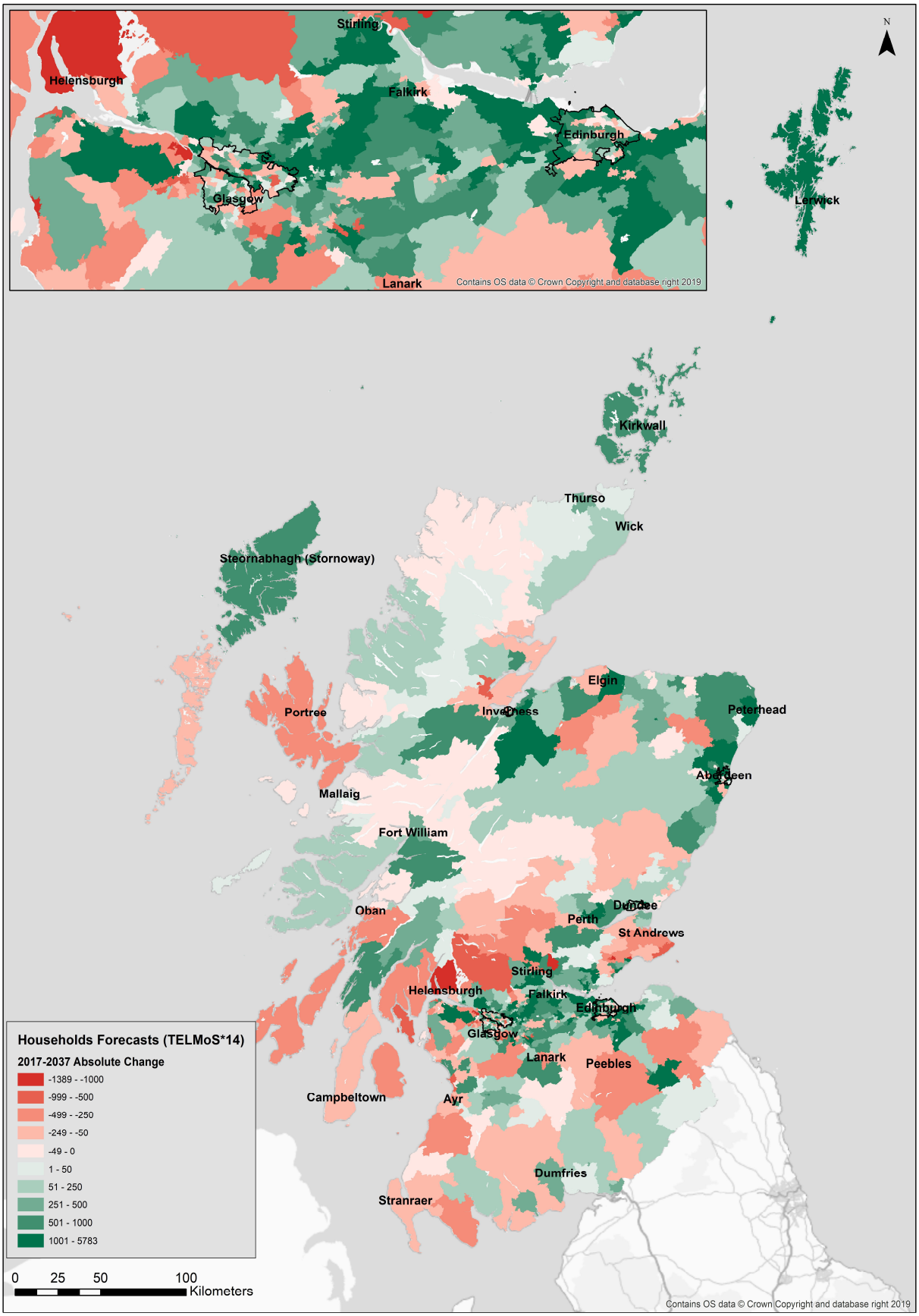


Figure 6: Households Forecasts 2017-2037 Absolute Change
(*Transport/Economic/Land-use Model of Scotland)

As can be seen from Figure 6, the key areas of change in households are predominately located in and around the main cities, and on certain island communities. Dunfermline Millerhill, Craigmount, Perth North, Gartcosh and Dunfermline South East zones are forecast to have the largest increases in housing by 2037, whilst Glenrothes Centre, Garelochhead/Rhu, Largs, Leven, and Erskine zones are forecast to display the largest decreases in housing by 2037.

The key areas of change in employment over the same time period are shown in Figure 7 and are predominately located on the outskirts of the main cities. Edinburgh Airport, Aberdeen Central, Provan, Craigmount, and Edinburgh Park zones are forecast to display the largest increases in employment by 2037, whilst East Kilbride – Kelvin, Glenrothes Centre, Garelochhead/Rhu, Forthside, and Kirkintilloch West zones are forecast to display the largest decreases in employment by 2037.

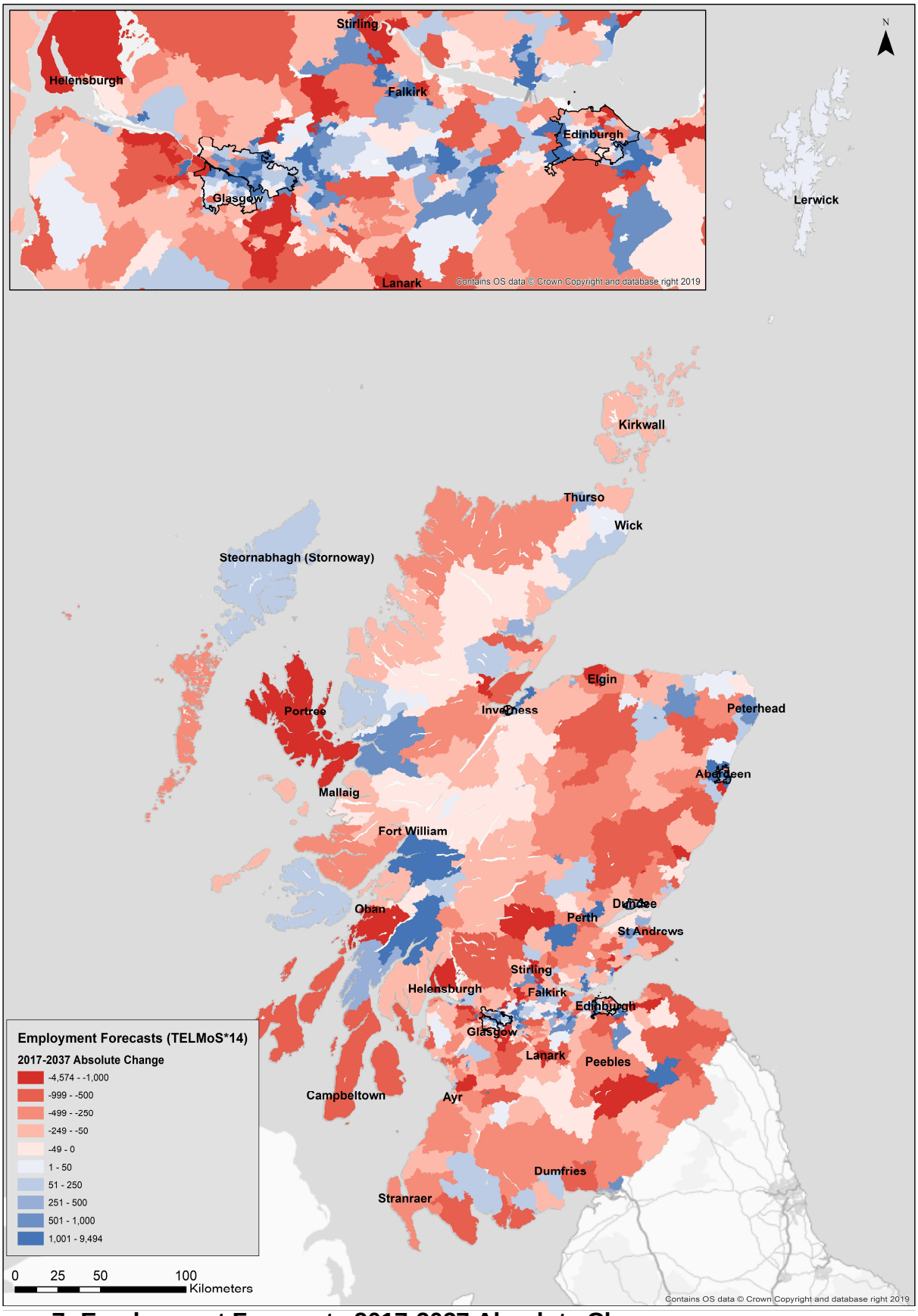


Figure 7: Employment Forecasts 2017-2037 Absolute Change
(*Transport/Economic/Land-use Model of Scotland)

Active Travel Trends

In Scotland in 2011, the national Census showed 9.9% of people travelled to work on foot[46]. The STPR2 region with the highest level of walking to work was Argyll & Bute, with 14.5%. The STPR2 region with the lowest level of walking to work was Forth Valley, with 7.4%. In terms of individual local authorities, City of Edinburgh had the highest proportion of travel to work on foot, at 16.3% with East Renfrewshire having the lowest proportion at only 3.5%.

In Scotland in 2011, 1.4% of people travelled to work on a bicycle. For cycling to work, the STPR2 region with the highest proportion was Highlands & Islands, with 2.3%, and the STPR2 region with the lowest proportion was Shetland Islands with 0.4%. The local authority with the highest level of cycling to work was City of Edinburgh at 4.3%, with North Lanarkshire having the lowest proportion at only 0.3%.

Figure 8 shows the proportion of travel to work in Scotland in 2011 made by active modes for each distance band[47].

	5km or less	Between 5km and 10km	Between 10km and 20km	20km or more
Bicycle	1.7%	1.0%	0.4%	0.3%
On_foot	17.2%	1.0%	0.6%	2.0%

Figure 8: National Active Travel to Work by Distance Band

Walking was significantly more common for travel to work journeys of less than 5km (17.2%) than for journeys over 5km. Cycling was also slightly more common for shorter distances: 1.7% for travel to work less than 5km and 1.0% for travel to work between 5km and 10km, compared to between 0.3% and 0.4% for journeys between 10km and 20km and 20km or more respectively.

Figure 9 shows that the proportion of people travelling to work by bicycle during Autumn 2017 remained constant over the ten-year period from 2007 to 2017. The proportion of people travelling to work on foot increased slightly from 11% in 2008 to 12% in 2009. This remained at 12% between 2009 and 2014, except in 2013 when it increased to 13%, before dropping back to 11% in 2015, where it remained to 2017.

[46] Scotland's Census 2011: Table QS701SC https://www.scotlandscensus.gov.uk/
[47] Scotland's Census 2011: Table WU03EW https://www.nomisweb.co.uk/census/2011/wu03ew

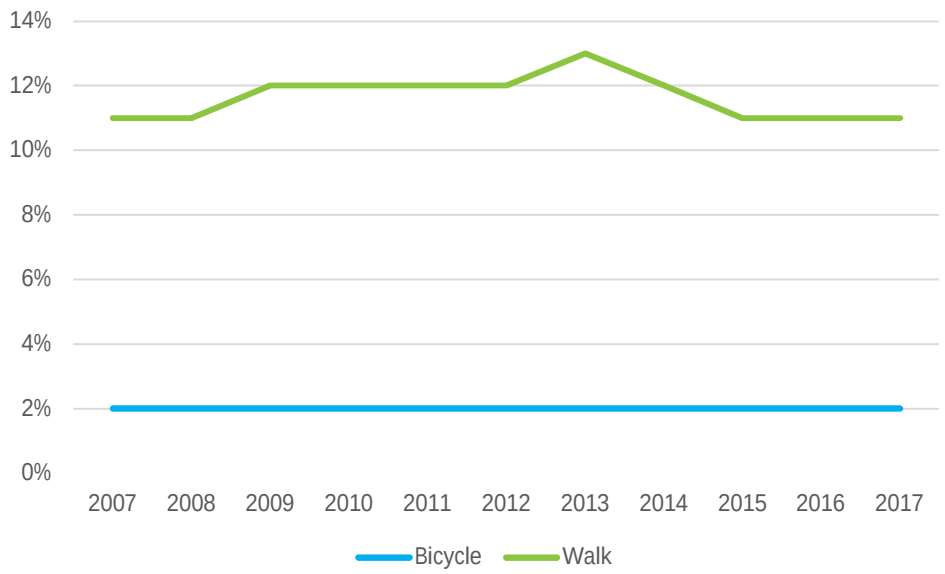


Figure 9: Usual means of travel to usual place of work (in Autumn) - Active Modes[48]

Figure 10 shows the proportion of people walking and cycling, by area type, in 2017.[49]

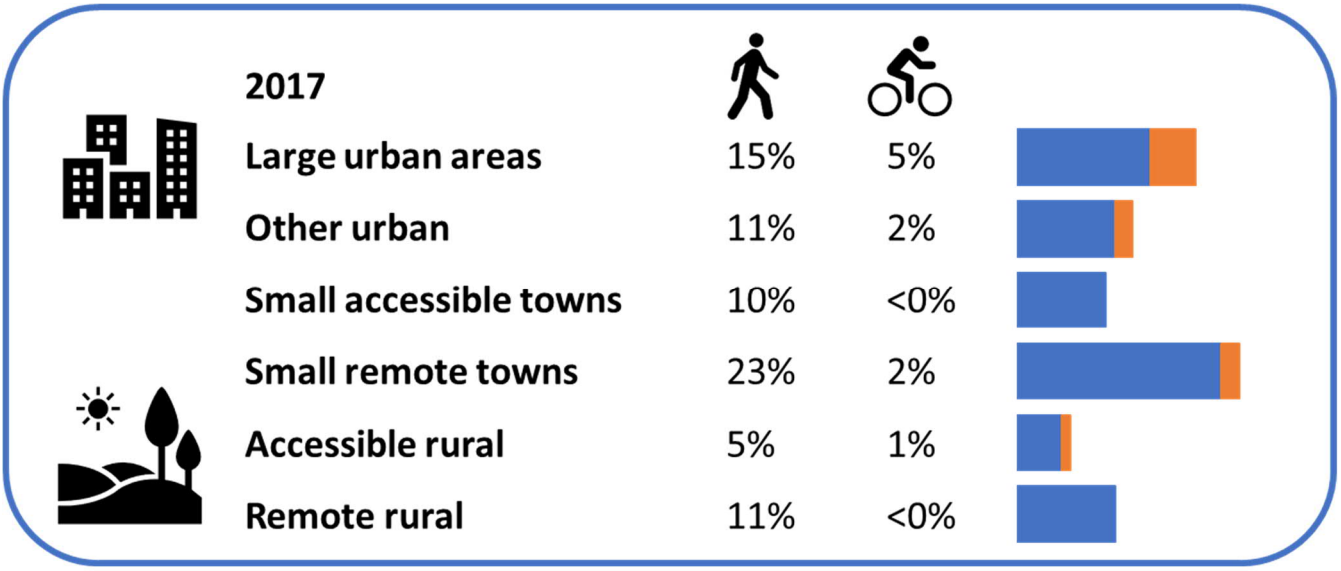


Figure 10: Proportion of Walking and Cycling Trips, by Area, 2017

As can be seen in Figure 10, small remote towns display the highest proportion of walking trips (23%), followed by large urban areas (15%). The lowest proportion of walking trips is displayed in accessible rural areas (5%). The highest proportion of cycling trips is displayed within large urban areas (5%), with small accessible towns and remote rural areas displaying the lowest proportion of cycling trips (<0%).

[48] Scottish Transport Statistics No. 37, 2018 Edition, Table 11.14, Transport Scotland
[49] Scottish Transport Statistics No. 37, 2018 Edition, Transport Scotland

Figure 11 displays recent trends in participation in physical activity and sport, between 2013 and 2017.

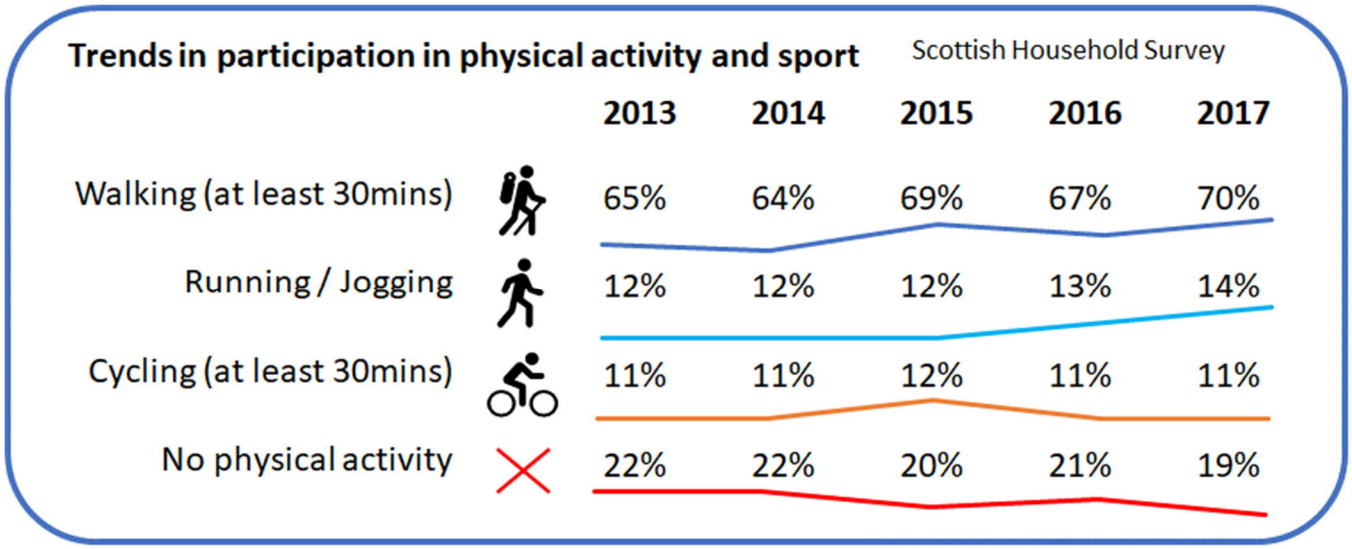


Figure 11: Trends in Participation in Physical Activity and Sport

As can be seen from Figure 11, participation in walking and running/jogging have both increased between 2013 and 2017, whilst people undertaking no physical activity has decreased. Within the same time period participation in cycling has remained relatively static.

Key active travel (walking and cycling) themes coming out of the analysis of problems and opportunities at a regional level relate to poor road quality and maintenance; safety for cyclists and pedestrians, particularly at junctions; connectivity of the active travel network to key destinations; availability of cycle parking and facilities; and the lack of regulation and standards for active travel infrastructure. Figure 12 shows the coverage of the active travel network across Scotland as a whole.

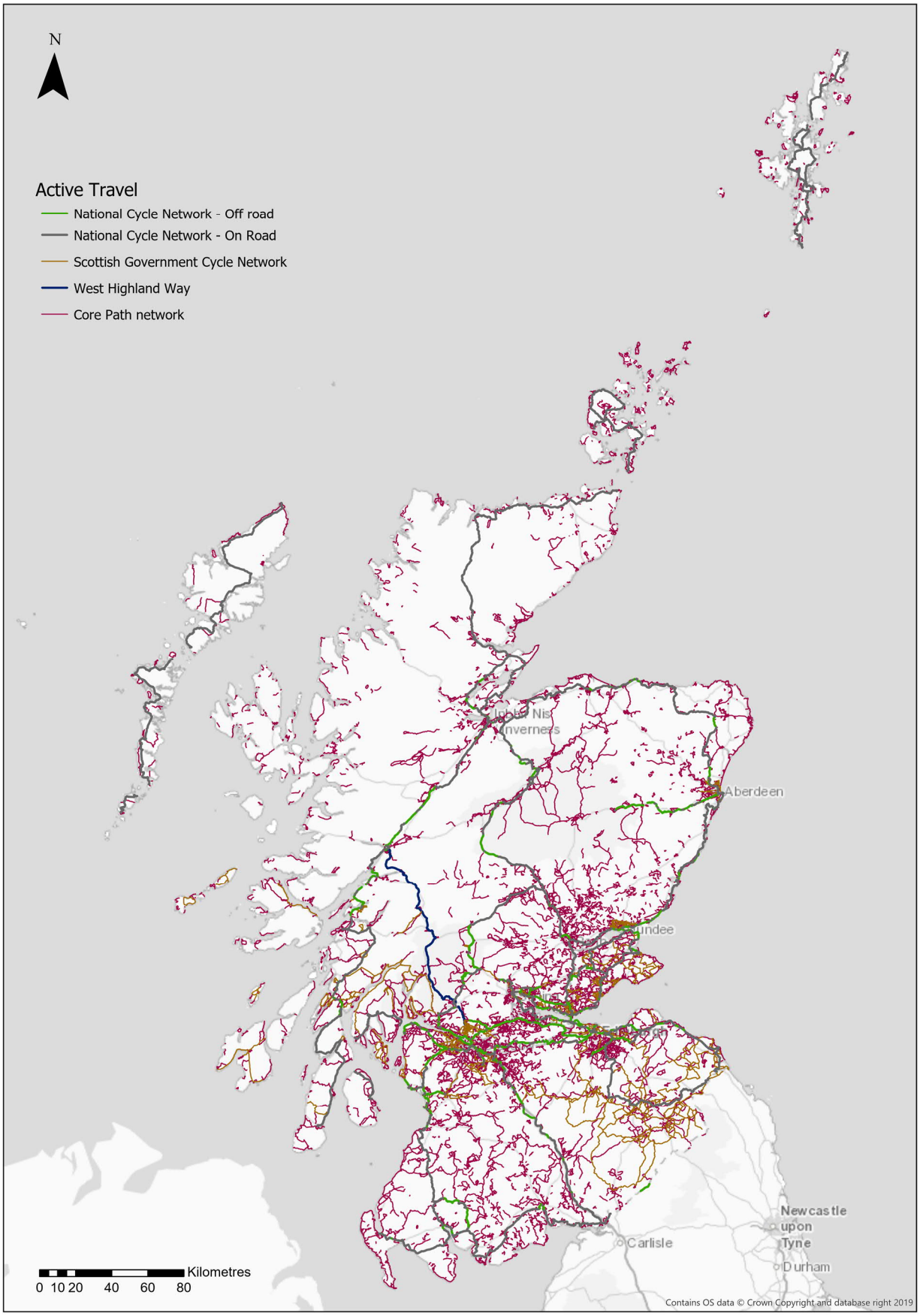


Figure 12: Key Active Travel Network / Paths Coverage

Public Transport Coverage

To assist with the identification of public transport coverage, extensive analysis of the accessibility of the current public transport has been undertaken using TRACC. TRACC is a multi-modal transport travel time tool used in public transport analysis and uses travel time analysis (using public transport timetable information) to plot how people can travel between origins and destinations, at particular times of a day, i.e. during the peaks. TRACC has been used to analyse travel patterns across Scotland, to a range of destinations. On the following pages some examples are set out.

In terms of public transport coverage, Figure 13 and Figure 14 show overall accessibility by coloured contours identifying journey time bands to main towns and cities and schools respectively. The darkest areas show shortest journey times and lighter areas longest. Areas with no shading cannot be reached by public transport, during the AM peak period, within the maximum journey time set (i.e. 180 minutes for journeys to main towns and cities and 60 minutes for journeys to schools).

It can be seen that the best served areas of Scotland, in terms of lowest public transport journey times to destinations, are the central belt in general, and around the key urban areas such as Perth, Dundee, Aberdeen and Inverness. These areas tend to benefit from higher availability of public transport options, i.e. bus and rail, and coverage of bus networks, as opposed to more rural areas where network coverage is more sparse such as the central and northern highlands, parts of the Borders and Dumfries and Galloway and a number of the island communities.

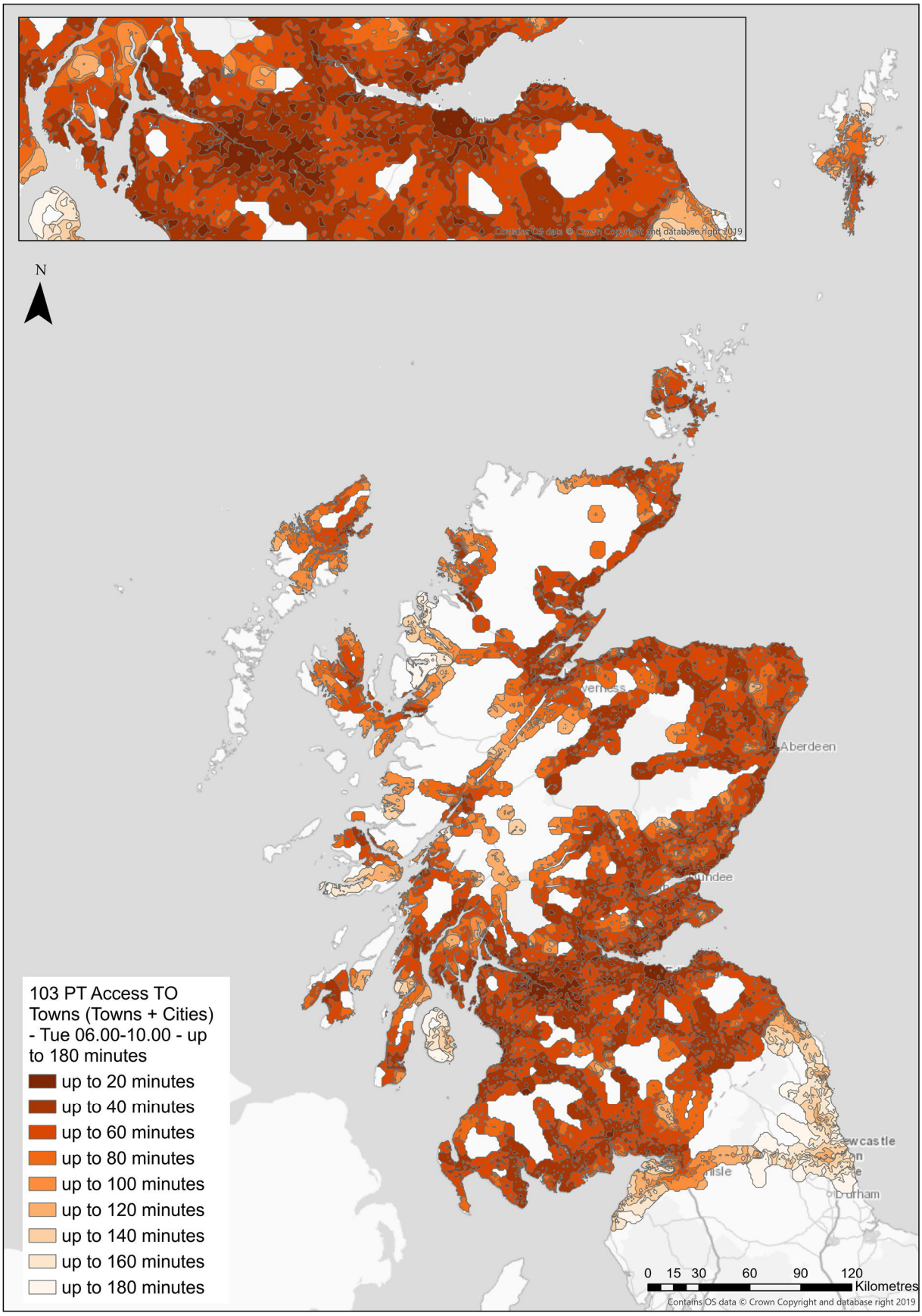


Figure 13: Public Transport Accessibility to Main Towns and Cities

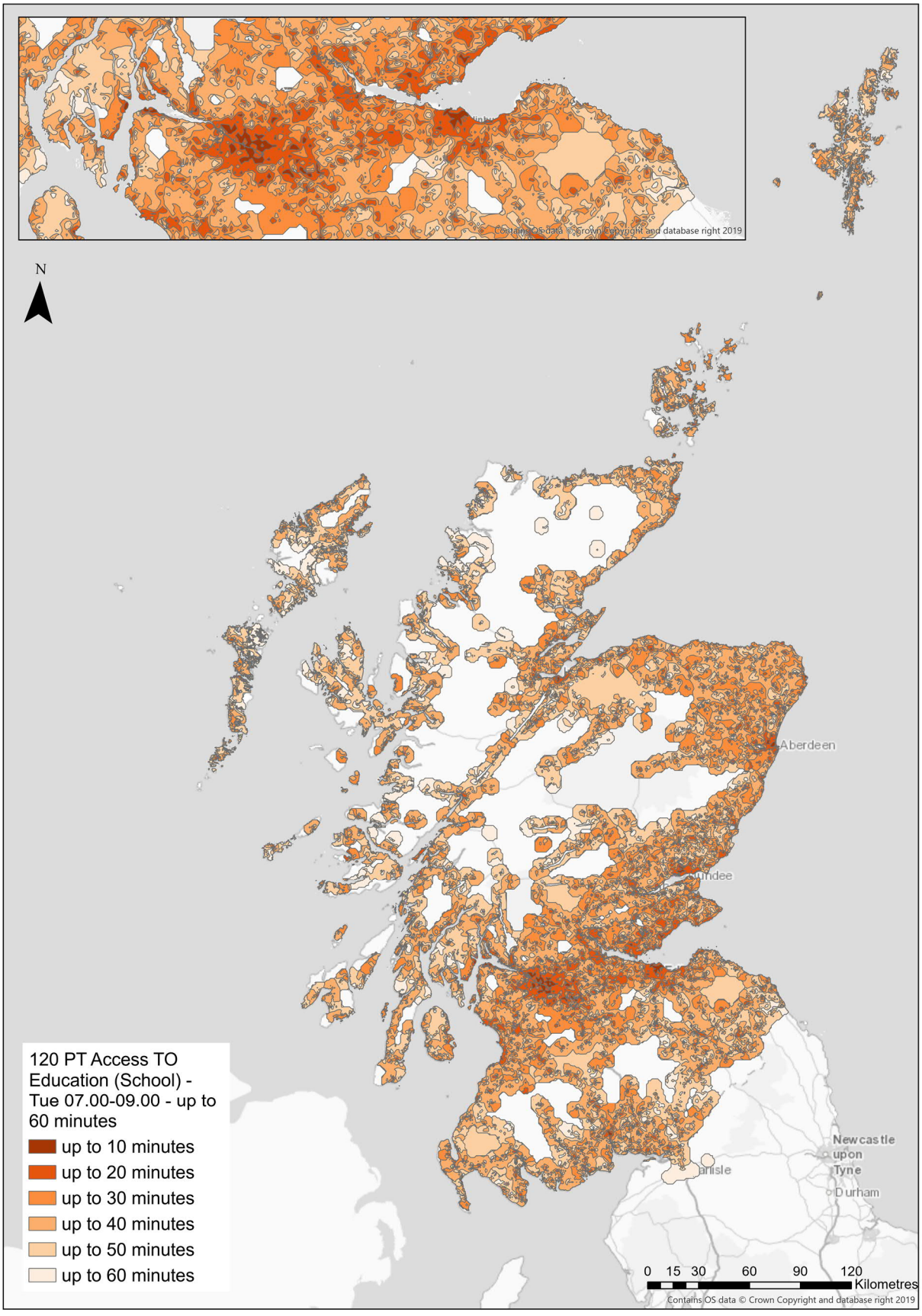


Figure 14: Public Transport Accessibility to Schools

Bus

In relation to travel by bus, key themes coming out of the analysis of problems and opportunities relate to bus decline, high fares, commercial viability of services, long journey times, and lack of services in the early morning or evening. Figure 15 below shows bus patronage on local bus services in Scotland from 2004 to 2018. Key findings are:

- The Highlands, Islands and Shetland have seen the greatest variation in bus demand, albeit from the lowest base (c12m trips in 2004/05). Following an initial increase in demand to 2006/07, there has been a subsequent decline that has now reduced usage back to 2004/05 levels.
- Passenger journeys in the South East have remained relatively consistent throughout the period (c159m trips in 2004/05).
- After a period of relatively consistent usage to 2008/09, demand for buses in the North East, Tayside and Central region (c65m trips in 2004/05) has subsequently been in decline, particularly from 2014/15.
- The greatest decline in bus use since 2004/05 has been in the South West and Strathclyde region, from c223m trips in 2004/05 to c165m trips in 2017/18. Despite the decline, this remains the region with the highest level of bus use.

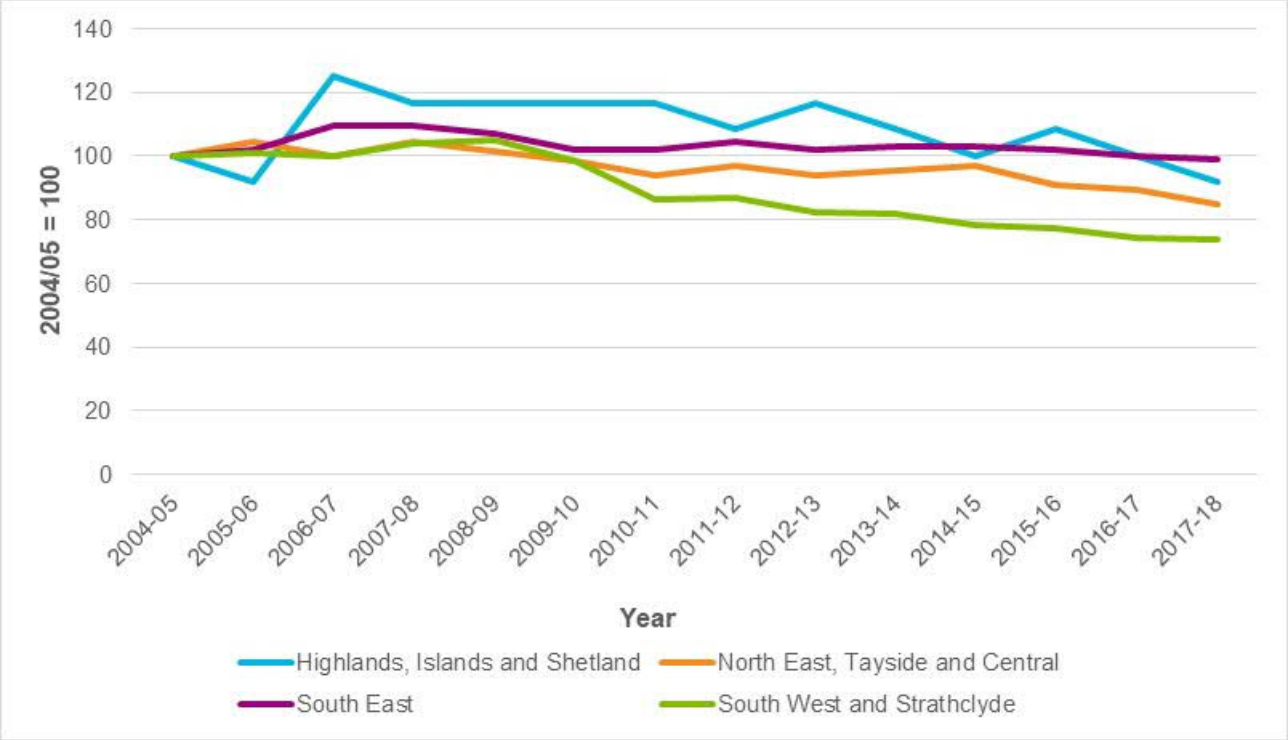


Figure 15: Passenger journeys on local bus services, Scottish regions index[50]

[50] Scottish Transport Statistics 2018

Rail

The TMfS14[51] is a multi-modal transport model for the whole of Scotland. Analysis of the outputs for rail journeys are outlined in Figure 16, which outlines the absolute change in the number of rail passenger boardings between 2017 and 2037, for the Weekday AM peak hour. This suggests that the main changes (based on AM passenger boardings) are to occur at the key city and related inter-urban stations including Glasgow Queen Street, Edinburgh, Haymarket, Glasgow Central, Aberdeen, Perth, Stirling and Falkirk Grahamston.

Other stations forecast to experience higher levels of growth include Hillfoot, Dunblane, Lenzie, Springburn, and Cumbernauld. The Glasgow to Edinburgh routes are expected to experience higher growth levels, particularly routes via Falkirk and Cumbernauld but also the route via Airdrie and Bathgate. The more rural routes, for example the Far North Line and the West Highland Line, are forecast to experience a marginal reduction in patronage.

The forecast increase across the rail network, especially in the Central Belt, will further heighten the current terminal station capacity issues within and on approach to Scotland's two largest cities.

[51] TMfS18 expected Spring 2020

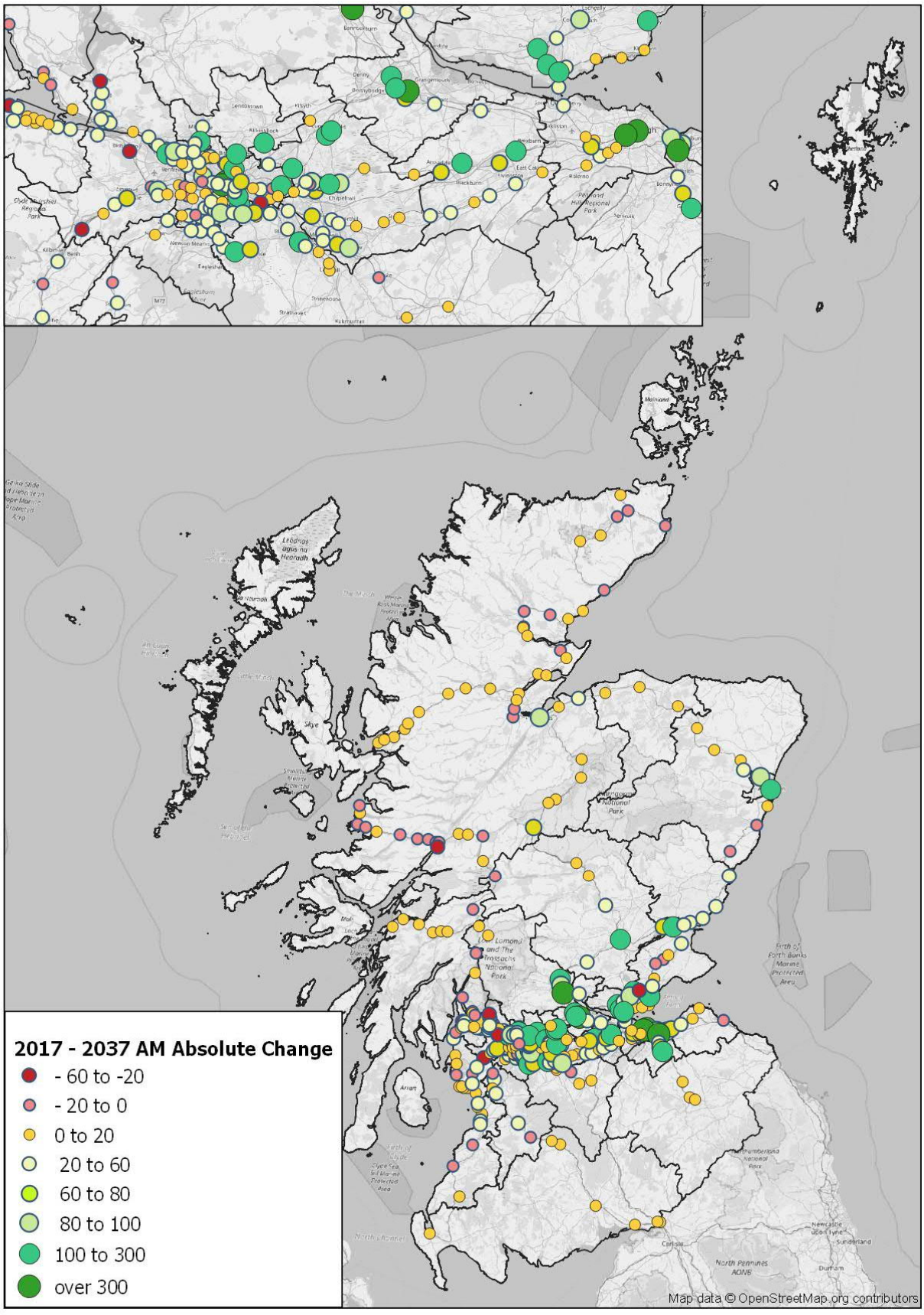


Figure 16: Absolute Change in Rail Passenger Boardings, 2017 – 2037, AM Peak Hour

Ferry

As part of Transport Scotland, CalMac Ferries and Caledonian Maritime Assets Limited (CMAL)'s annual report on the Vessel Replacement and Deployment Plan (VRDP)[52], actual and forecast passenger and vehicle deck capacity utilisation is measured. The latest version of the VRDP is currently in draft.

Figure 17 shows the peak 9-weeks vehicle deck capacity utilisation (using actual peak consecutive 9 weeks) for major vessel routes, as set out in the draft of the next VRDP Report.

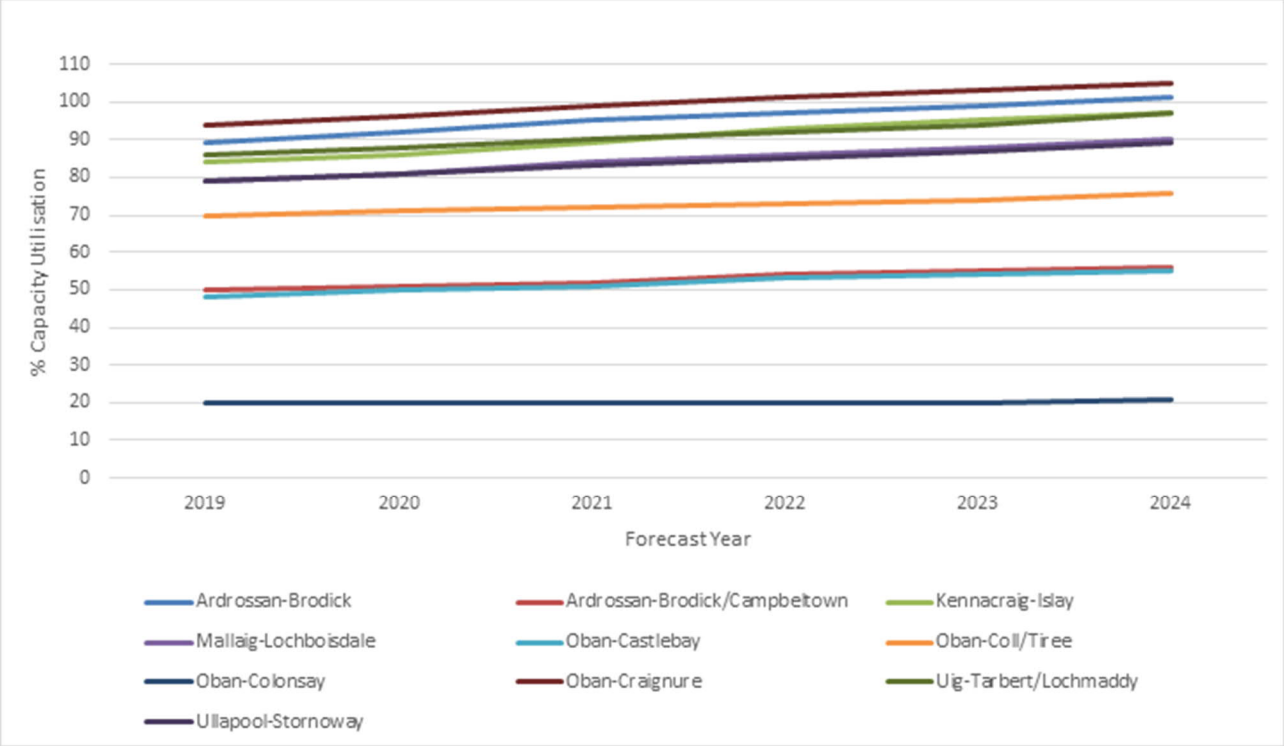


Figure 17: Peak 9 Weeks Vehicle Deck Capacity Utilisation – Major Vessel Routes

[52] Working Draft of Vessel Replacement and Deployment Plan, Transport Scotland, CalMac, CMAL

On major vessel routes, there are vehicle deck capacity utilisation issues on a number of routes including Oban – Craignure, Ardrossan – Brodick, Uig – Tarbert/Lochmaddy, Kennacraig – Islay, Mallaig to Lochboisdale and Ullapool to Stornoway. Other routes are forecast to experience an increase in patronage which will increase vehicle deck utilisation.

Figure 18 shows the peak 9-weeks vehicle deck capacity utilisation (July and August) for non-major vessel routes, as set out in the draft of the next VRDP Report.

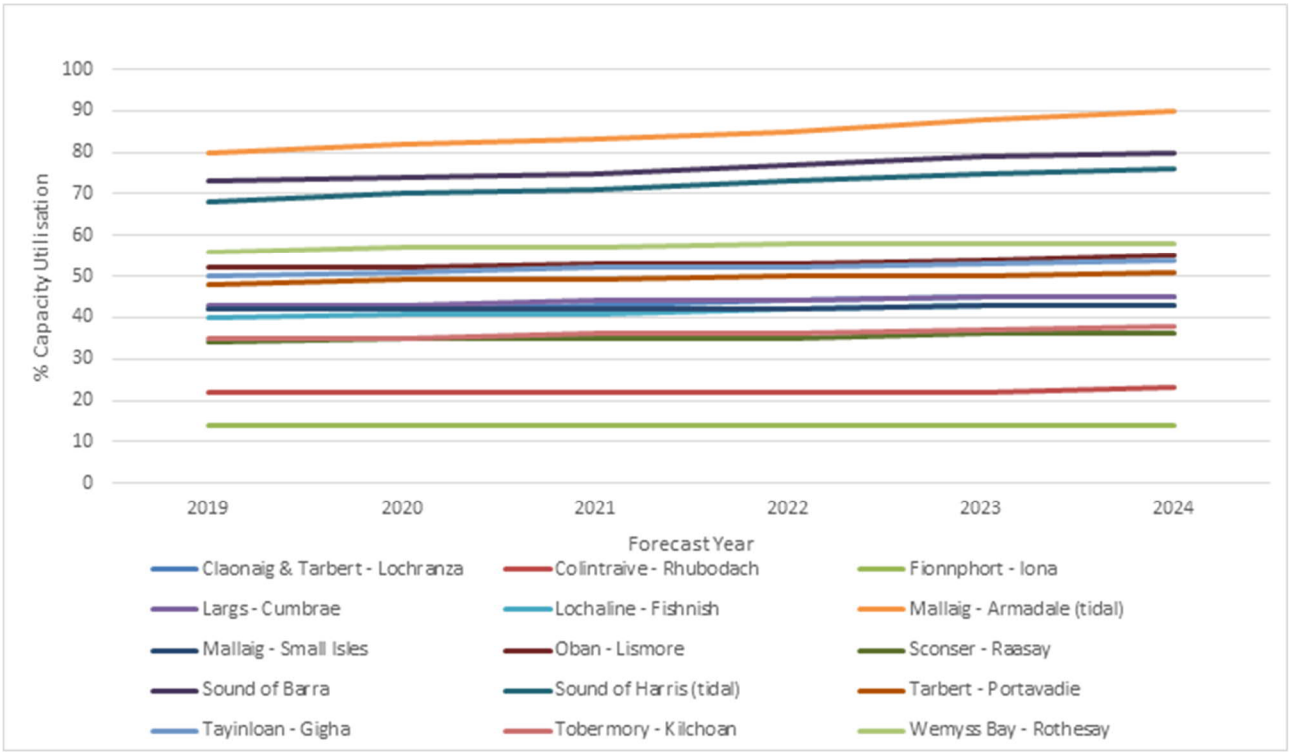


Figure 18: Peak 9 Weeks Vehicle Deck Capacity Utilisation – Non-Major Vessel Routes

Non-major vessel routes, in comparison to the major vessel routes, are not as well utilised, although there are vehicle deck capacity utilisation issues on the Mallaig – Armadale (tidal) route.

As can be seen from Figure 17 and Figure 18 there are several routes with vehicle deck capacity utilisation of less than 30%. The Draft VRDP[53] indicates that on these routes' customers are almost always able to travel on their first choice of sailing. Full sailings on these routes are infrequent and overall utilisation levels are not a barrier to travel. Several routes experience between 30% to 50% vehicle deck capacity utilisation, indicating that customers will almost certainly be accommodated on the next sailing if their first sailing is full. Full sailings are more frequent; however, customers are not deterred from travelling as a result. Where routes experience vehicle deck capacity utilisation of between 50% and 70% full sailings are even more frequent and some customers may find that their choice of available sailings is limited. Some customers may choose not to travel as a result;

[53] Working Draft of Vessel Replacement and Deployment Plan, Transport Scotland, CalMac, CMAL

however, volumes are not considered significant. On routes experiencing vehicle deck capacity utilisation above 70%, of which there are several, full sailings are a regular occurrence and an increasingly significant number of customers choose not to travel as alternative sailing times are not suitable. In some cases, customers may displace to another route if an alternative is available.

Road

The TMfS14[54] is a multi-modal transport model for the whole of Scotland. Analysis of the outputs for road based journeys are outlined in Figure 19 and Figure 20 which provide forecast growth in road based distance (vehicle-km) and vehicle-time (vehicle-hours) travelled in 2037. It is noticeable that based on current traffic trends and behaviours there would be an estimated increase of 39% in distance travelled by 2037, however there is a corresponding 55% increase in time (in-vehicle). This highlights that, based on current trends, drivers will spend more time in-vehicle relative to the distance travelled, indicating slower average vehicle speeds in 2037.

Figure 21 and Figure 22, provide a graphical representation of trunk and other key road network capacity constraints[55] as a baseline in 2017 and the forecast in 2037 if traffic growth continues in line with recent trends and behaviours. By 2037 more extensive constraints are expected in and around the two largest cities and there are several areas of capacity constraint across the Central Belt and the other Scottish cities, such as the A720, and the M8 through Glasgow.

It should be noted that the forecasts presented within Figure 19, Figure 20, Figure 21 and Figure 22 represent scenarios which would occur if there is no change to current traffic trends and behaviours, and do not take account of the global climate emergency and measures to achieve net-zero emissions by 2045 outlined within NTS2.

[54] TMfS18 expected Spring 2020
[55] Recorded as 'Volume Over Capacity' – i.e. volume of traffic over the capacity of the road.

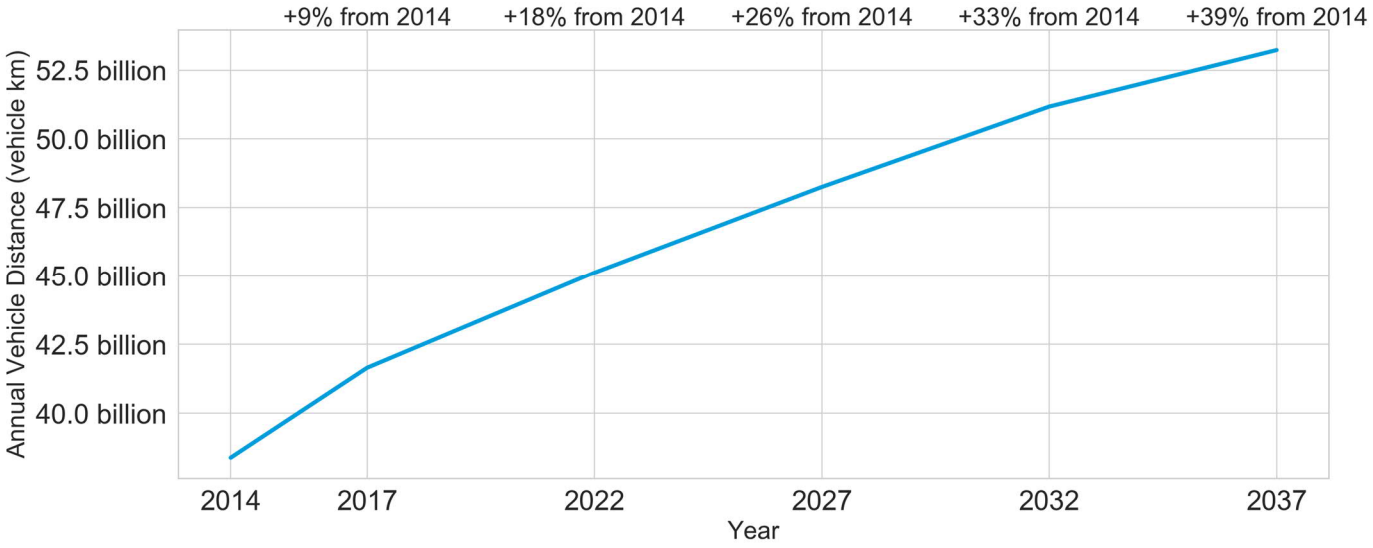


Figure 19: Trunk and Other Key Roads Annual Vehicle Distance Forecasts in 2014 - 2037

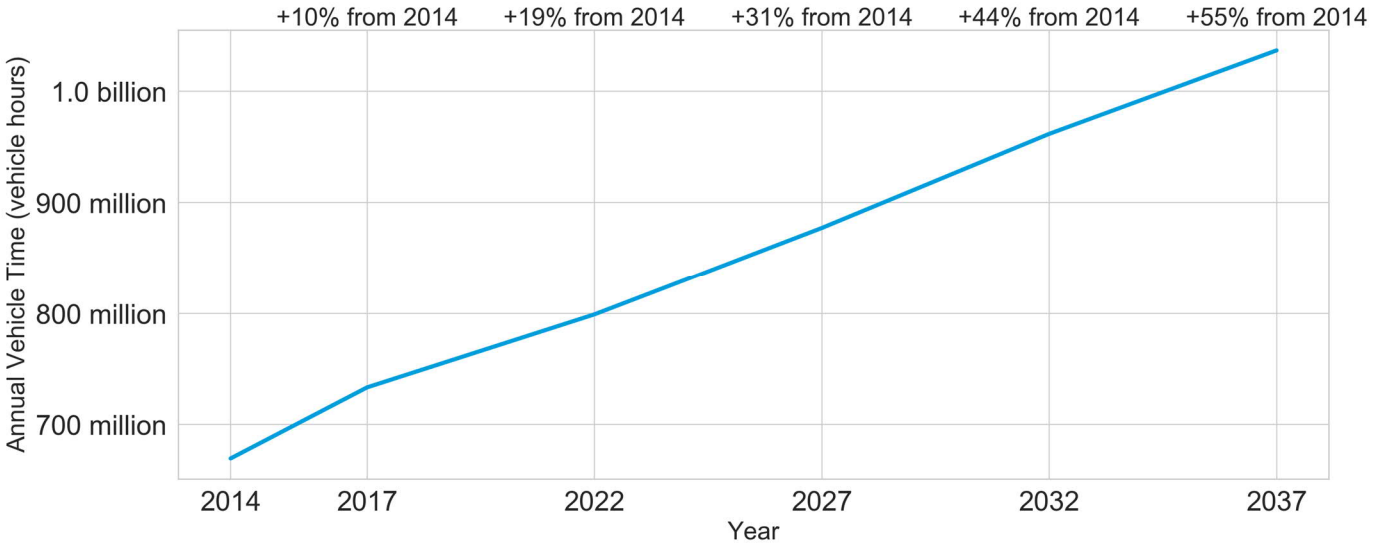


Figure 20: Trunk and Other Key Roads Annual Vehicle (In-Vehicle) Time Forecasts in 2014 - 2037

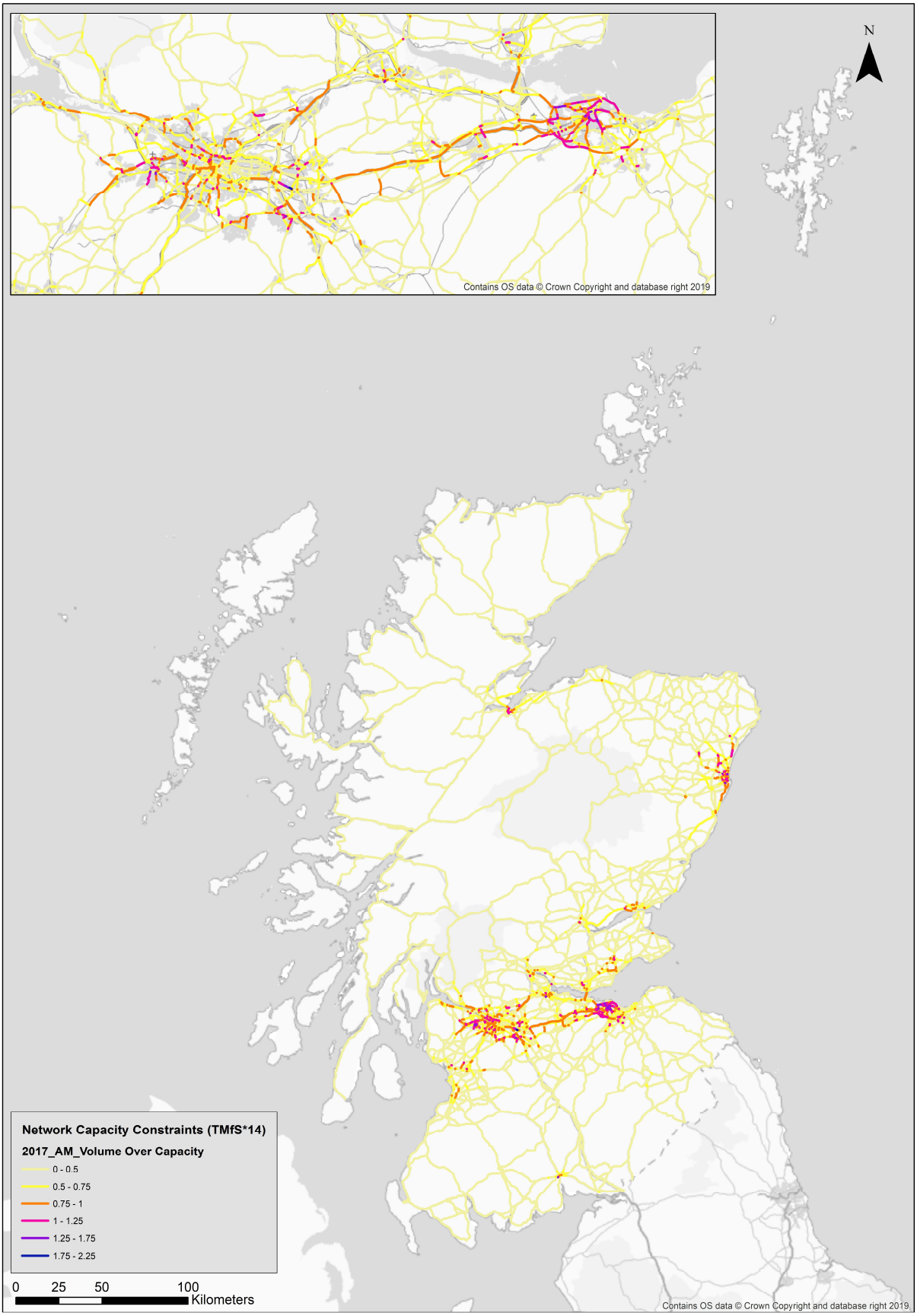


Figure 21: Trunk and Other Key Road Network Capacity Constraints 2017 (*Transport Model for Scotland)

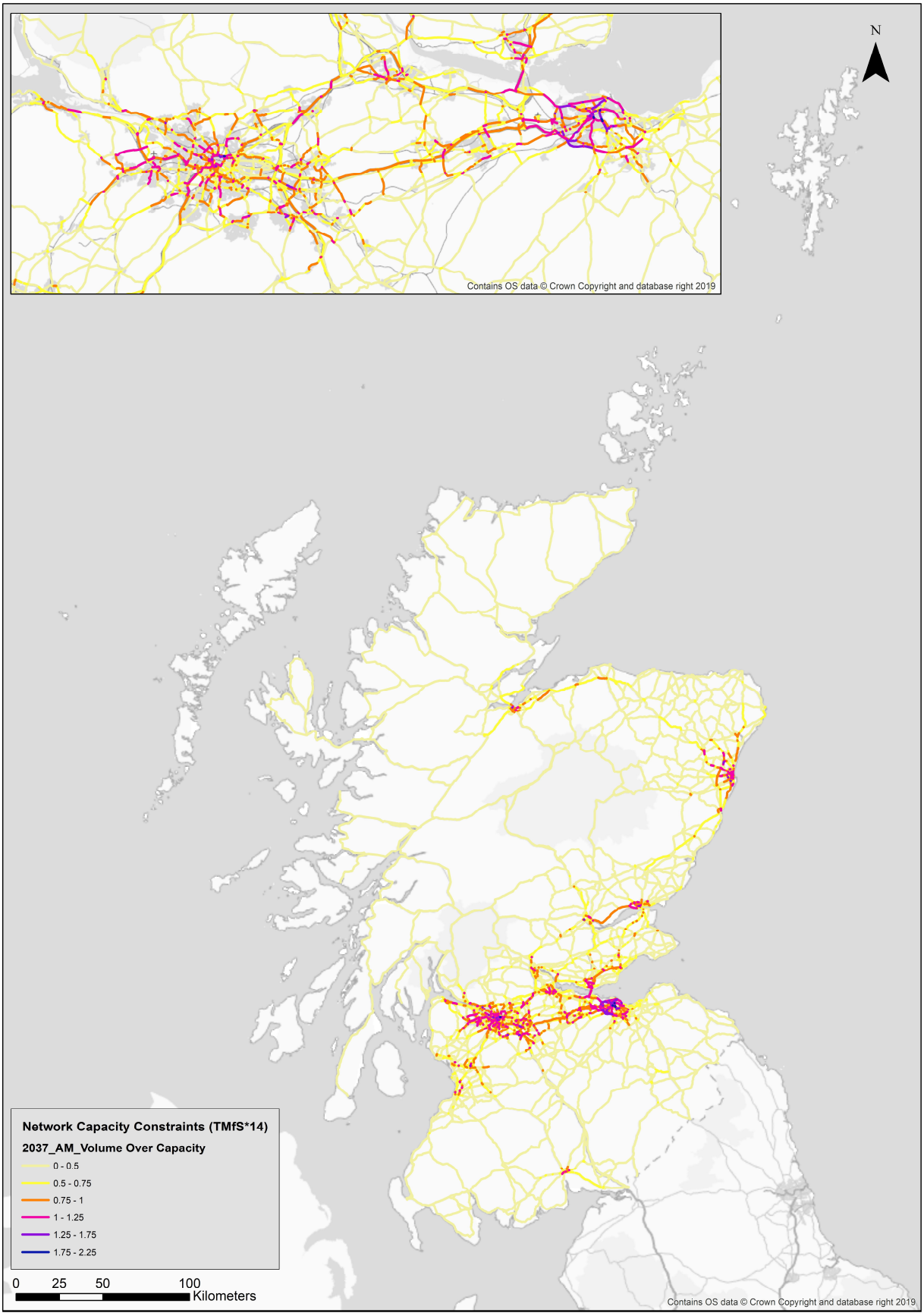


Figure 22: Trunk and Other Key Road Network Capacity Constraints 2037 (*Transport Model for Scotland)

Freight

Figure 23, below, shows the volume of freight traffic (in tonnes) at major Scottish ports between 2004-2018[56].

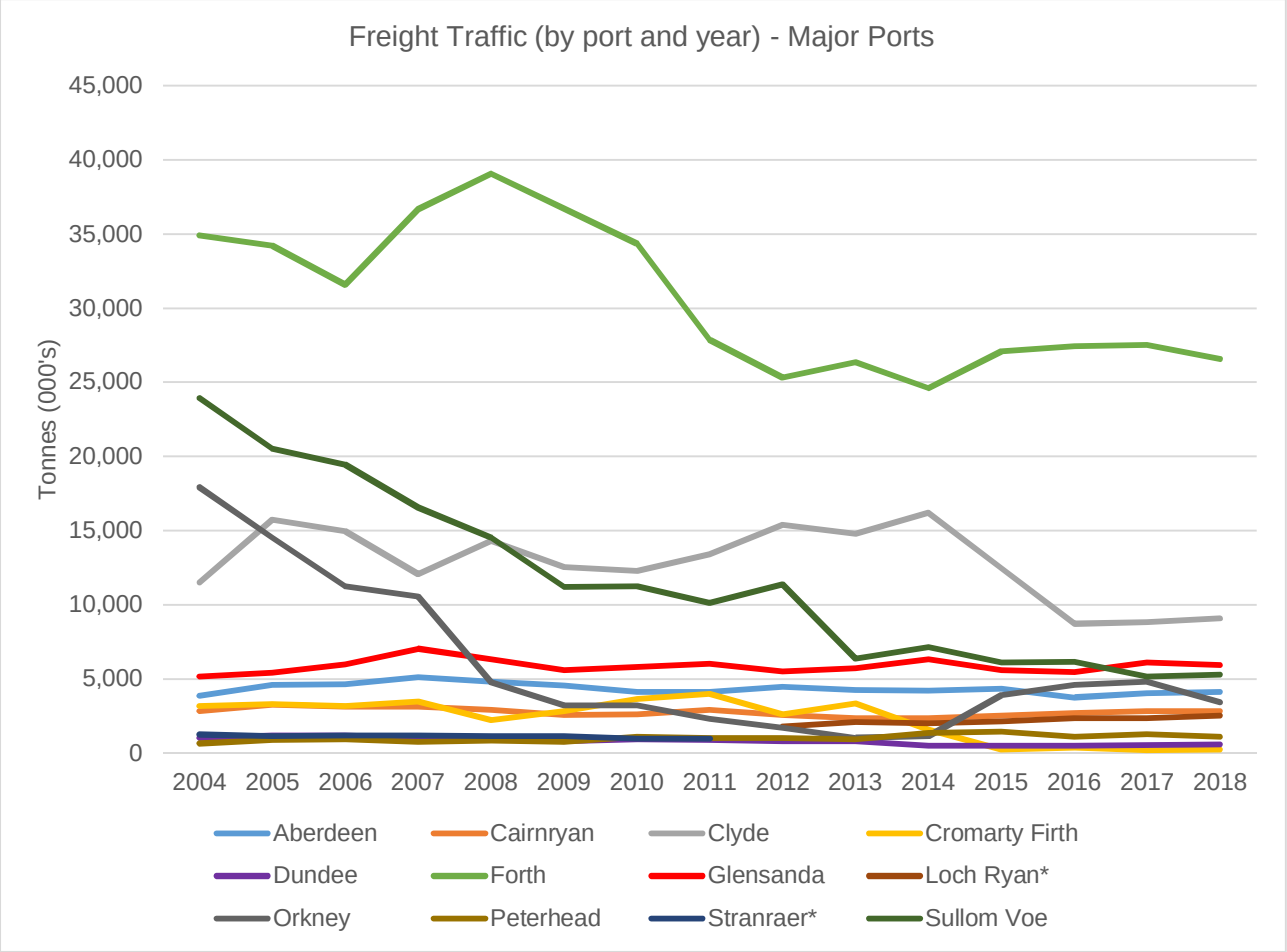


Figure 23: Volume of Freight Traffic at Major Scottish Ports, 2004-2018

**Stranraer port closed in November 2011 and its operations were transferred to neighbouring Loch Ryan Port*

Several ports experienced large decreases in freight traffic over the period, particularly at the ports in Orkney and Sullom Voe (Shetland). Ports in the Cromarty Firth also saw a large decrease in percentage terms, although it is noted that the absolute volume of freight traffic at these ports is relatively low compared to the average across Scotland.

The largest increases (in percentage terms) over the period occurred at Peterhead and Stranraer/Loch Ryan (the 2018 volume at Loch Ryan has been compared to the 2004 volume at Stranraer). However, it is again noted that the absolute volumes at these ports are relatively low compared to the Scottish average.

[56] Data has been obtained from the 2018 Port Freight Annual Statistics published by the Department for Transport (DfT).

Within the central belt, Clyde and Forth ports saw a slight reduction in freight traffic over the time period, although in absolute terms they have the largest volume of freight traffic in 2018, with the volume of freight traffic at Clyde ports now exceeding both Orkney and Sullom Voe.

Figure 24 and Figure 25, overleaf, provide a graphical representation of volumes of HGVs on the road network in the AM peak hour as a baseline in 2017 and the forecast in 2037 if traffic growth continues in line with recent trends and behaviours. By 2037 larger volumes of HGVs are expected across the trunk road network in general, and in and around the two largest cities. Freight carried by air is covered in the next section. Further import and export data is outlined within Chapter Three.

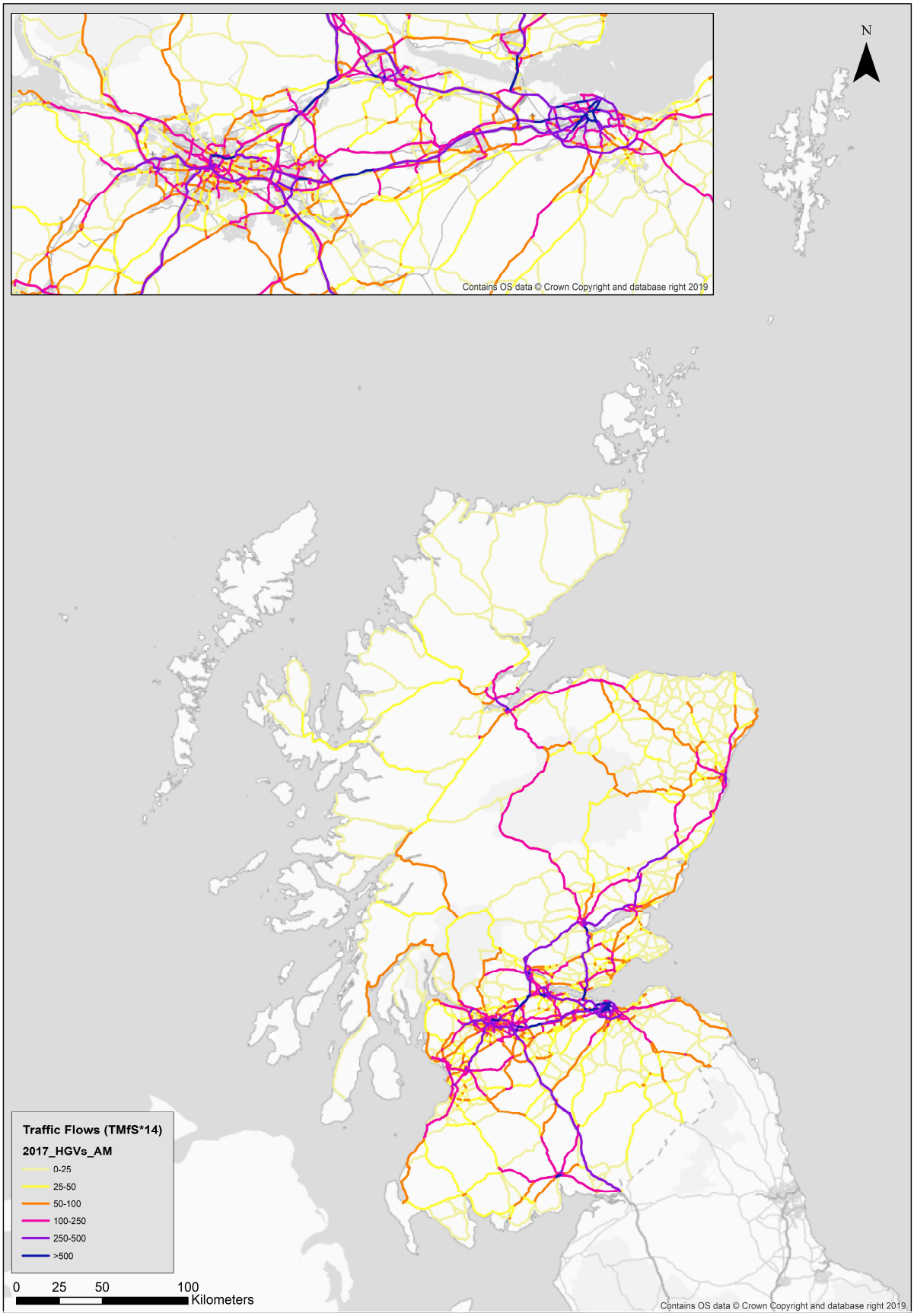


Figure 24: Volumes of HGVs on Road Network 2017 (*Transport Model for Scotland)

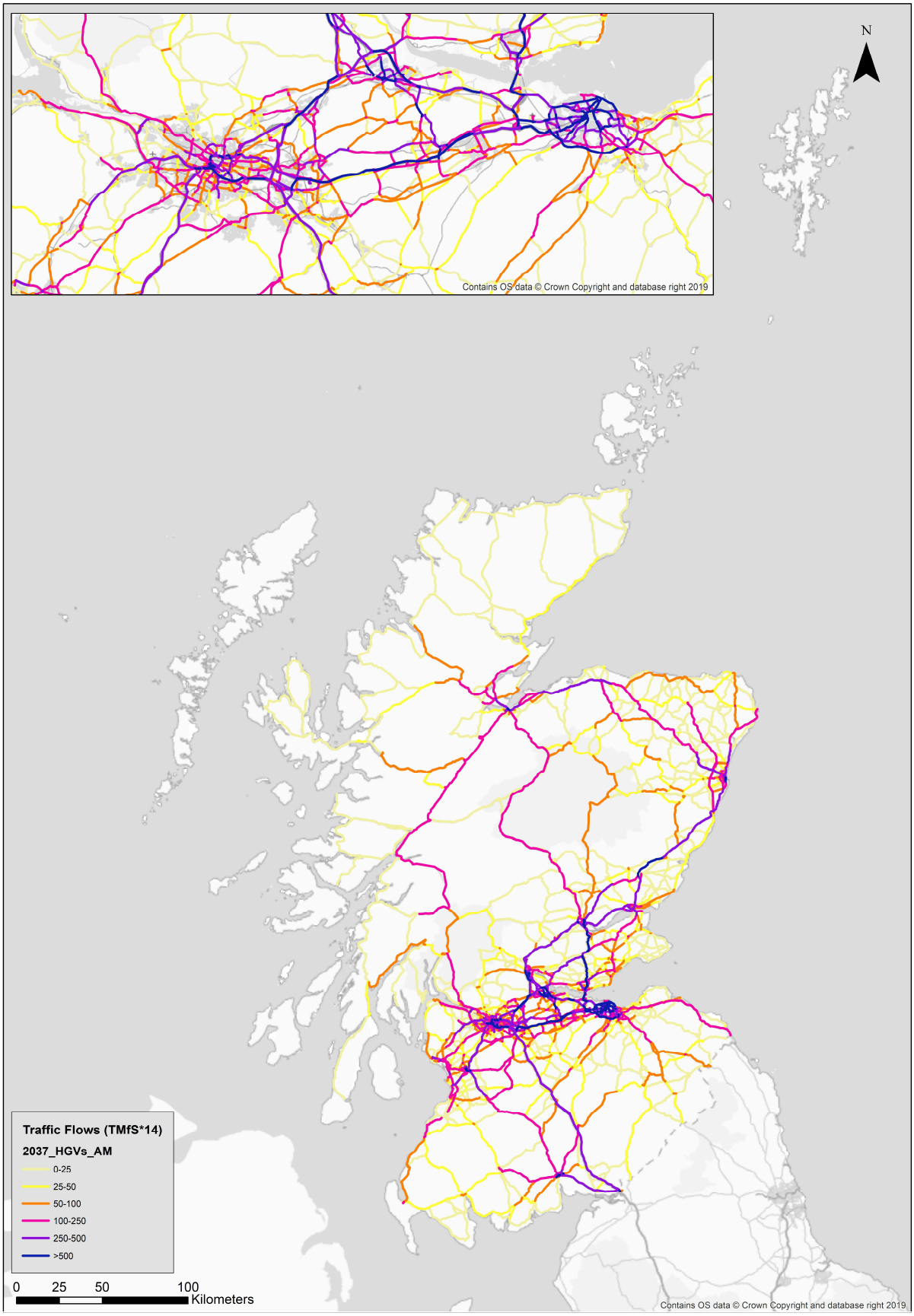


Figure 25: Volumes of HGVs on Road Network 2037 (*Transport Model for Scotland)

Aviation

Figure 26 and Figure 28, show publicly available airport data from the Civil Aviation Authority (CAA), who obtain the data from either Handling Agents or the Airlines themselves via the different Airport Authorities. Figure 26 shows the five largest Scottish airports in terms of number of passengers between 2015 and 2018. Passengers are defined as 'terminal passengers' - a passenger joining or leaving an aircraft at the reporting airport.

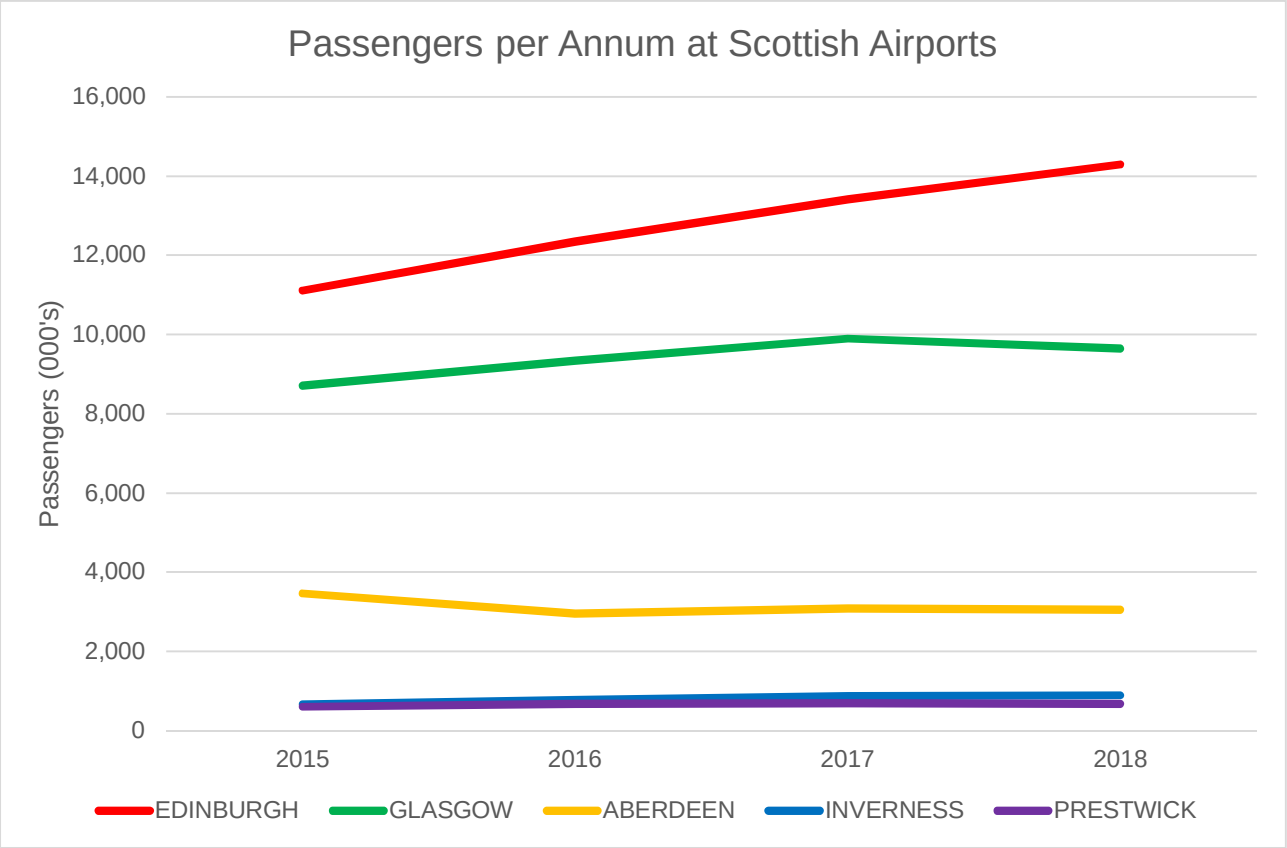


Figure 26: Passengers per Annum at Scottish Airports

Between 2015 and 2018, Inverness (+34%), Edinburgh (+29%), Prestwick (+12%) and Glasgow (+11%) have all seen a rise in passenger numbers, with a decrease at Aberdeen (-3%). Edinburgh was the largest airport in terms of passenger numbers in 2018, with approximately 14.3 million passengers.

Figure 27 shows the total domestic terminal passenger traffic for the top 10 UK airports (in terms of domestic passenger numbers).

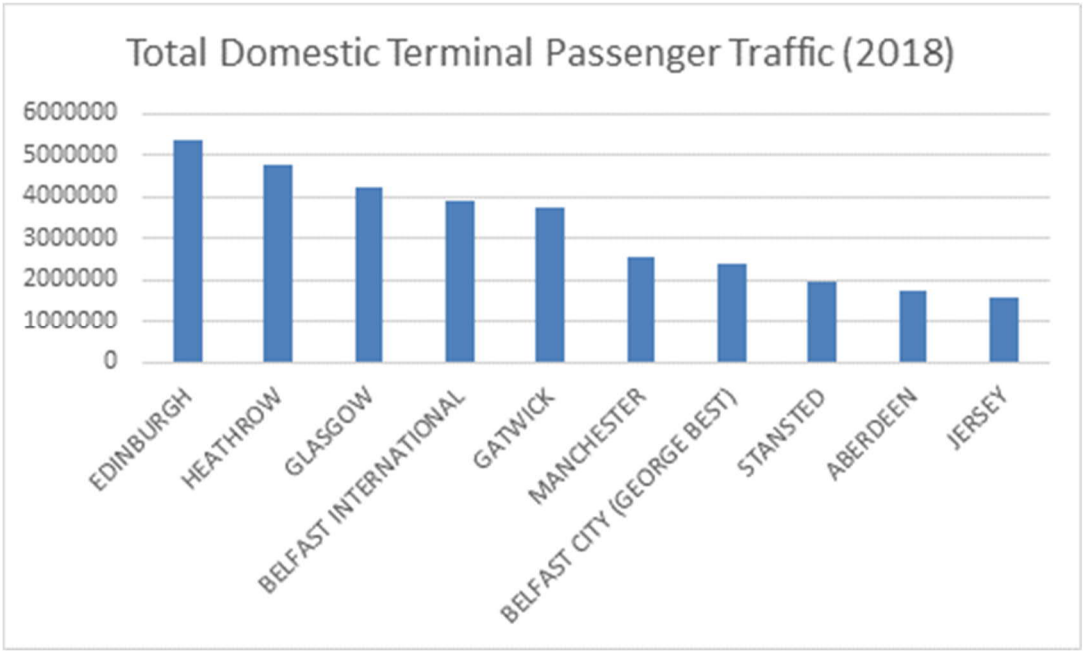


Figure 27: Total Domestic Terminal Passenger Traffic (2018)[57]

As can be seen from Figure 27, airports at Edinburgh and Glasgow have high levels of domestic terminal passenger traffic. The bulk of domestic flights are from Scotland to the rest of the U.K., with low volumes of internal trips within Scotland.

Figure 28 shows the five largest Scottish airports in terms of cargo between 2015 and 2018. Cargo is defined as the sum of freight and mail carried (in tonnes), although freight in transit through an airport on the same aircraft is not included.

[57] Civil Aviation Authority data: https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-2018/

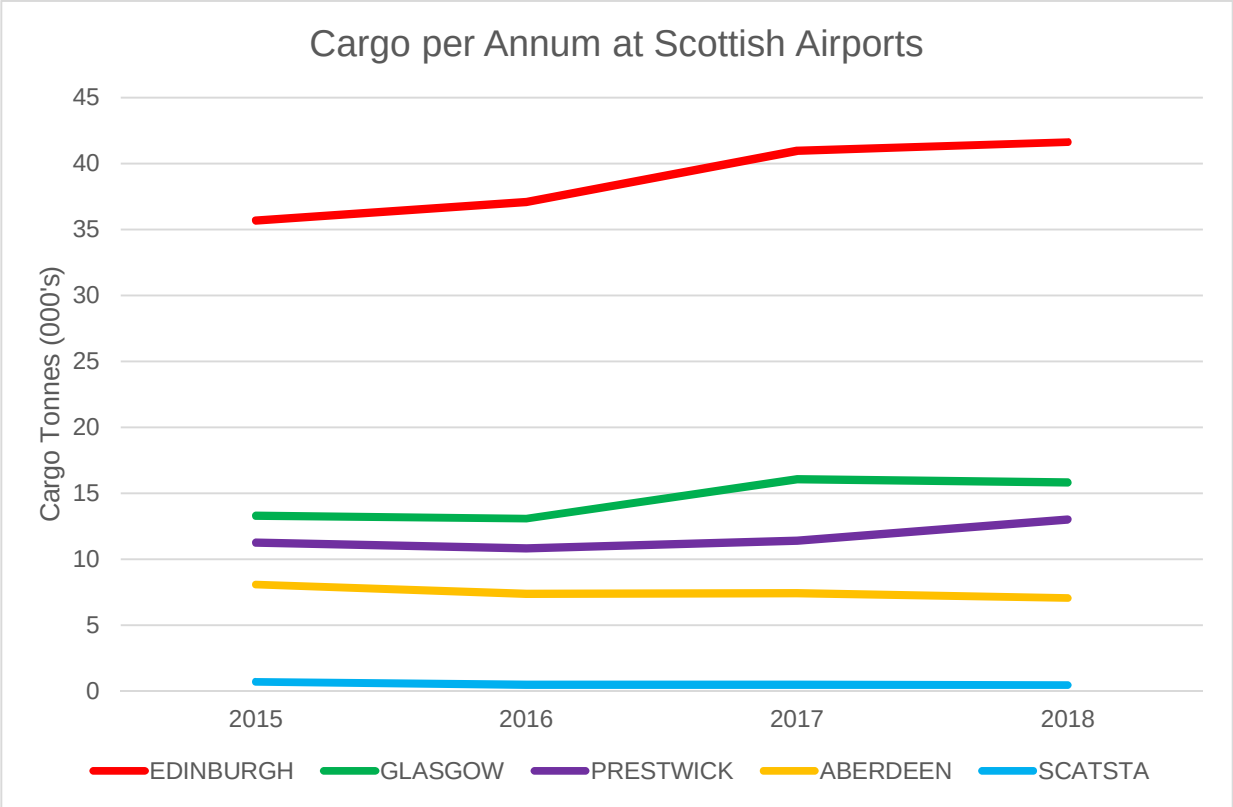


Figure 28: Cargo per Annum at Scottish Airports

The changes to the weight of cargo carried at these airports between 2015 and 2018 is broadly comparable to the changes in passenger numbers. There were increases at Glasgow (+19%), Edinburgh (+17%) and Prestwick (+16%) and decreases at Aberdeen (-13%) and Scatsta (-36%). Edinburgh is the largest airport in terms of cargo carried with approximately 41,600 tonnes in 2018. Glasgow airport and Prestwick airport are comparable, at 15,800 tonnes and 13,000 tonnes respectively. Aberdeen airport recorded approximately 7,000 tonnes in 2018 and Scatsta airport recorded approximately 450 tonnes of cargo in 2018.

2.4. Summary

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: reducing inequality; taking climate action; helping deliver inclusive economic growth; and improving health and wellbeing.

The challenges outlined in NTS2 form the context for STPR2, particularly in relation to the national perspective, and provide a clear direction on the issues to be addressed through the option generation and appraisal process. Through the early stages of STPR2, a number of common themes have emerged, largely aligning with NTS2, around the need to have a connected, affordable and accessible sustainable transport system. To achieve this it is clear that work is required to increase the number of short trips undertaken by active modes, to address declining bus patronage and encourage the use of public transport for medium-distance trips and to encourage longer-distance trips to be made by rail or by taking advantage of low emission vehicles when travelling by road. All of this must be considered within the context of maintaining a safe, reliable and resilient transport system that can meet the climate change commitments.

3. Scotland's External Links

3.1. Overview

Scotland has strong trade links with over 100 countries across nearly 100 different industries and sectors. Over the coming years, Scotland's economic success will be increasingly realised through its ability to compete in a global market. Strengthening links with the global economy brings with it increased trade, attracts investment and creates an environment for sharing skills, expertise and collaborating with others to support the economy. International markets offer significant potential for Scottish companies to grow their exports.

Scotland has a large amount of goods which are shipped via a number of countries before arriving at their final destination. Scotland's transport network supported nearly £53 billion worth of trade in goods in 2017; representing a 15% increase in value in one year[58].

Tracing Scotland's exports and imports and how they are transported is difficult due to the range of data sources and methods of collection, however the Sections below provide an overview based on published datasets.

3.2. Exports

Scottish goods have a strong presence in international markets. Recent data from Her Majesty's Revenue and Customs[59] (HMRC) shows that in 2017 goods exported from Scotland totalled £28.7 billion. This was an increase of 18.6% compared to 2016. Of this total, non-EU partner countries accounted for 51%, a slight decrease from the previous year (53%). Over the same period, the value of Scotland's exports to the EU increased by 23% and to non-EU countries by 14%. Over £14 billion of trade was with EU member states.

The top 5 export destinations in 2017 for Scottish goods were:

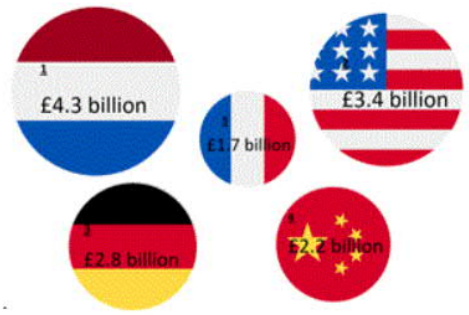
(1) Netherlands (£4.3 billion);

(2) USA (£3.4 billion);

(3) Germany (£2.8 billion);

(4) China (£2.2 billion); and

(5) France (£1.7 billion).



[58] Transporting Scotland's Trade, Transport Scotland, December 2018
[59] Note this includes oil and gas.

The Netherlands has been Scotland's largest export partner for 4 out of 5 years (2013-2017). Its dominance as Scotland's main export partner is due, in part, to the Dutch port of Rotterdam being an important international shipping hub[60]. In 2017, the USA was Scotland's main non-EU export destination with whisky being a key export commodity. Whilst most high density freight to the USA is carried by ship, some direct flights which operate from Scotland also carry low volumes of freight.

Both Northern Ireland and the Republic of Ireland remain core trading partners with Scotland. In 2017 nearly £1.3 billion of exports went to the Republic accounting for 4.5% of Scotland's total exports. A proportion of these goods are transported via daily sailings from Cairnryan/Loch Ryan.

The top 5 goods exported in Scotland in 2017 (using the Standard International Trade Classification) were:

(1) Petroleum products (£8.5 billion);

(2) Beverages (£4.1 billion);

(3) Power generating machinery (£2.2 billion);

(4) General industrial machinery (£1.3 billion); and

(5) Transport equipment (£1.2 billion).

3.3. Imports

Scotland's total goods imports were valued at £24.2 billion in 2017. Total imports to Scotland increased in value by £2.6 billion (12%), during the year 2017, however this growth was below the growth in exports, thus continuing Scotland's trade surplus in goods[61].

The percentage of goods imported into Scotland from the EU in 2017 was 38% (£9.1 billion). The top 5 countries which Scotland imports from remained unchanged over the 5 years to 2017, with Norway leading Scottish imports every year since 2013:

[60] Many of the goods transported to Rotterdam will be transported on to another country rather than residing in the Netherlands. However, the final destination of these goods is not routinely collected which artificially inflates the value of exports to the Netherlands.

[61] Transporting Scotland's Trade, Transport Scotland, December 2018

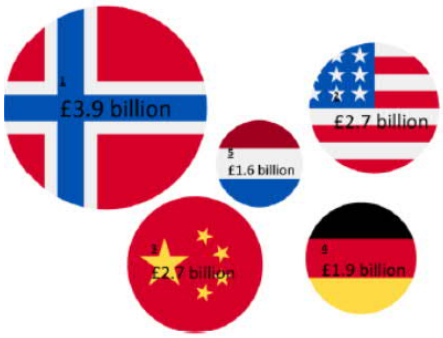
(1) Norway (£3.9 billion);

(2) USA (£2.7 billion);

(3) China (£2.7 billion);

(4) Germany (£1.9 billion); and

(5) Netherlands £1.6 billion).



Since 2013, Scotland has imported more goods from Norway than any other nation. Over that time, imports from Norway have totalled more than £19.4 billion. Norway accounted for 16% of all imports into Scotland in 2017, up from 12% in 2016. The largest increases in terms of value were from Norway (up 44%, £1.1 billion) followed by the USA (up 21%, £475 million). The largest decreases by value were in imports from South Korea (down 80% or £494 million) followed by the Falkland Islands (down 99% or £70 million)[62].

Whilst the composition of Scottish exports has changed over time, Scotland's main import goods have remained in similar industries over the past 5 years. The exceptions have been in the 'machinery & transport equipment' industry (which has grown in value) and the 'mineral fuels, lubricant & related materials' industry (which has fallen in value). In 2017, Scotland's top 5 import goods were:

(1) Gas, natural & manufactured (£3.1 billion);

(2) Office and automatic data processing machinery (£2.3 billion);

(3) Power generating machinery (£2.2 billion);

(4) Machinery & Transport equipment (£1.8 billion); and

(5) Apparel and clothing accessories (£1.0 billion).

The largest proportion of goods imported from Norway (Scotland's number one import market) are categorised under the 'Mineral fuels, lubricants & related materials' Standard International Trade Classification category (of which 'Gas, natural & manufactured' is a sub-category) and was valued at £3.9 billion in 2017 - 16% of total Scottish imports. Almost 80% of that figure (£3.1 billion) was attributed to 'Gas, natural and manufactured'.

Gas imports from Norway currently come predominantly via the Far North Liquids and Associated Gas System (FLAGS) pipeline[63]. Other key pipelines include the Langeled and Vesterled pipelines and the Scottish Area Gas Evacuation System (SAGE) pipeline to St. Fergus near Peterhead in Scotland.

[62] Transporting Scotland's Trade, Transport Scotland, December 2018
[63] Digest of UK Energy Statistics (DUKES), July 2018

Linking the other top five goods with the top five import destinations shows that Scotland imported most of its 'Office & automatic data processing equipment' from China and 'Power generating machinery' and 'Transport equipment' from USA and the Netherlands. Clothing and apparel was spread across a number of countries including Hong Kong and Vietnam.

The recent decline in imports from the 'Mineral fuels, lubricant & related materials' industry is consistent with the performance of the wider Scottish economy in 2015 and 2016 alongside the slowdown in the Scottish oil and gas industry as a result of the sharp decline in the global price of oil. Trade in this commodity is closely linked to the global price of oil.

3.4. Tourism

The International Passenger Survey[64] produces estimates of overseas visitors to the UK, with disaggregated data available for Scotland. Data shows that overseas visitors typically come from countries that Scotland have a strong trade link with. In 2017, over 46% of visitors to Scotland came from one of the countries in Scotland's top 5 importers or exporters (China, France, Germany, Netherland, Norway, USA), and spent a combined total of £1.2 billion – over half of all visitor spend in 2017.

Travel by air is by far the most prevalent mode of transport for visitors to Scotland (see Figure 29 below). Since 2002, the number of visitors travelling to Scotland by air has more than doubled (+118%), whilst sea and tunnel travel have remained fairly stable.

[64] Visitors do not include UK visitor holidays but do include UK citizens that are resident overseas. Further information on methodology can be found at: https://www.ons.gov.uk/peoplepopulationandcommunity/leisureandtourism/methodologies/internationalpassengersurveybackgroundnotes

Figure 29: Scottish Tourism: Number of Visits by Mode of Transport[65]

Respondents to the International Passenger Survey stated that good air links within the UK and abroad were crucial. All respondents mentioned the importance of direct links and the need for good connectivity. Air travel benefits businesses across Scotland by providing connections and access to wider markets; by reducing transport costs, allowing for quicker deliveries and facilitating inward investment.

3.5. Key Export/Import Gateways and Networks

Scotland's key transport gateways for the export and import of goods includes travel by road, rail, air and water.

Eurocentral, located between Motherwell and Coatbridge in the Central belt of Scotland with close proximity to the rail and trunk and motorway network, is Scotland's largest commercial site and is one of Scotland's key transport logistic facilities.

[65] Transporting Scotland's Trade, Transport Scotland, December 2018

Road

Scotland's primary trunk road link to the rest of the UK and onwards to mainland Europe (via the Channel Tunnel) is along the M74/A74(M)/M6 corridor. Other routes that cross the border include the, A1 north of Berwick, the A697 at Coldstream, the A68 at Carter Bar and the A7 north of Longtown.

In 2016 three-quarters (75.3%) of freight in Scotland was carried by road (204 million tonnes). The vast majority of this (82% or 166.9 million tonnes) remained in Scotland. In total, only 18% of freight journeys originating on Scottish roads left Scotland for other UK destinations, 97% of which had a final destination in England. The volume of Scottish road freight bound for/coming from international (non-UK) destinations was very small (less than 1 million tonnes in total in 2016: approximately 0.15%).

Rail

The Scottish railway network is primarily used for passenger travel, with over 94 million passenger journeys being made between April 2016 and March 2017. Of these journeys (91.4%) had a destination within Scotland, highlighting the importance of Scotland's rail network for internal connectivity.

Cross-border passenger journeys to and from Scotland have been increasing since 1995-96, with 9.6 million journeys of this type being made in 2017-18 a 110% increase since 1995-96.

Figure 30 shows Scotland rail passenger journeys to/from other regions over the period 2008 to 2018[66].

[66] Office of Rail and Road, Regional Rail Journeys - Scotland - Table 15.7, https://dataportal.orr.gov.uk/statistics/usage/regional-rail-usage/regional-rail-journeys-scotland-table-157/

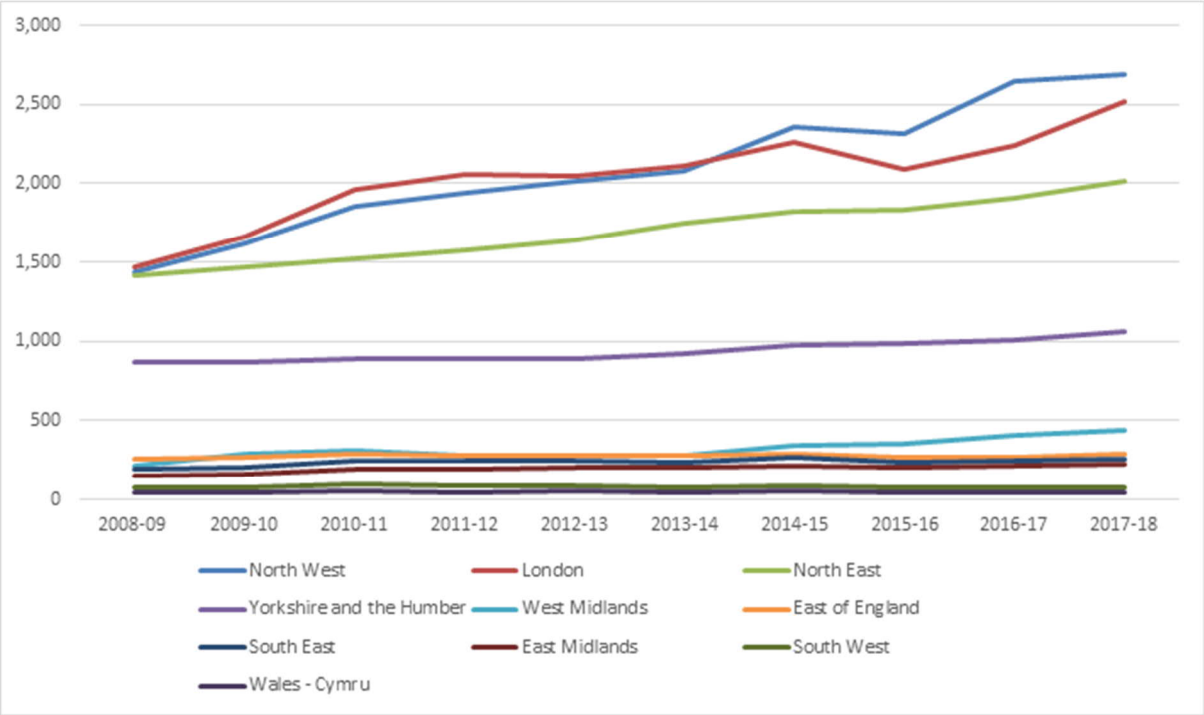


Figure 30: Scotland Rail Passenger Journeys To/From Other Regions 2008 to 2018

As can be seen from Figure 30, over the last 10 years there has been a general increase in rail trips across the UK, with particular growth in trips to/from the West Midlands, North West, and London which grew 105%, 87%, and 71% respectively over the ten year period from 2008 to 2018. In the year between 2016-2017 and 2017-2018, there was a 3% growth in internal trips within Scotland, with a 6% growth in trips between Scotland and the rest of the UK.

With the currently proposed High Speed Rail Phase Two (HS2) network, the Planet Framework Model (PFM) estimates that by 2036 there will be around 163,000 trips per day between stations in Scotland and stations in England and Wales (including trips in both directions)[67]. Figure 31 illustrates this, showing how demand for cross-border trips using all modes (rail, air and highway) varies across regions. The regions creating the greatest demand for cross-border trips to and from Scotland are London, the North East and the North West, which together make up more than half of the total demand.

As can be seen from Figure 32, London is the largest source of forecast demand for travel to and from Scotland from England and Wales, and London stations are estimated to be responsible for around 30% of cross-border rail trips once the proposed HS2 network is in place. Newcastle is the second key market, with more than 3,000 daily cross-border rail trips forecast. Carlisle, Manchester, York,

[67] Broad Options for Upgraded and High Speed Railways to the North of England and Scotland, Department for Transport, March 2016

Birmingham and Preston also have relatively high numbers of forecast cross-border rail trips.

Within Scotland, Edinburgh is estimated to account for 46% of cross-border rail trips and Glasgow 27%. Of the cities listed above, Carlisle is an exception in having greater demand for cross-border trips to and from Lockerbie, than to and from Edinburgh or Glasgow; this reflects its close proximity to the border and more local/regional travel. More than 60% of forecast cross-border rail trips are for leisure purposes, with most of the rest being for business and a small share for commuting.

Figure 31: Cross-Border Movements To and From Scotland[68]

[68] Broad Options for Upgraded and High Speed Railways to the North of England and Scotland, Department for Transport, March 2016

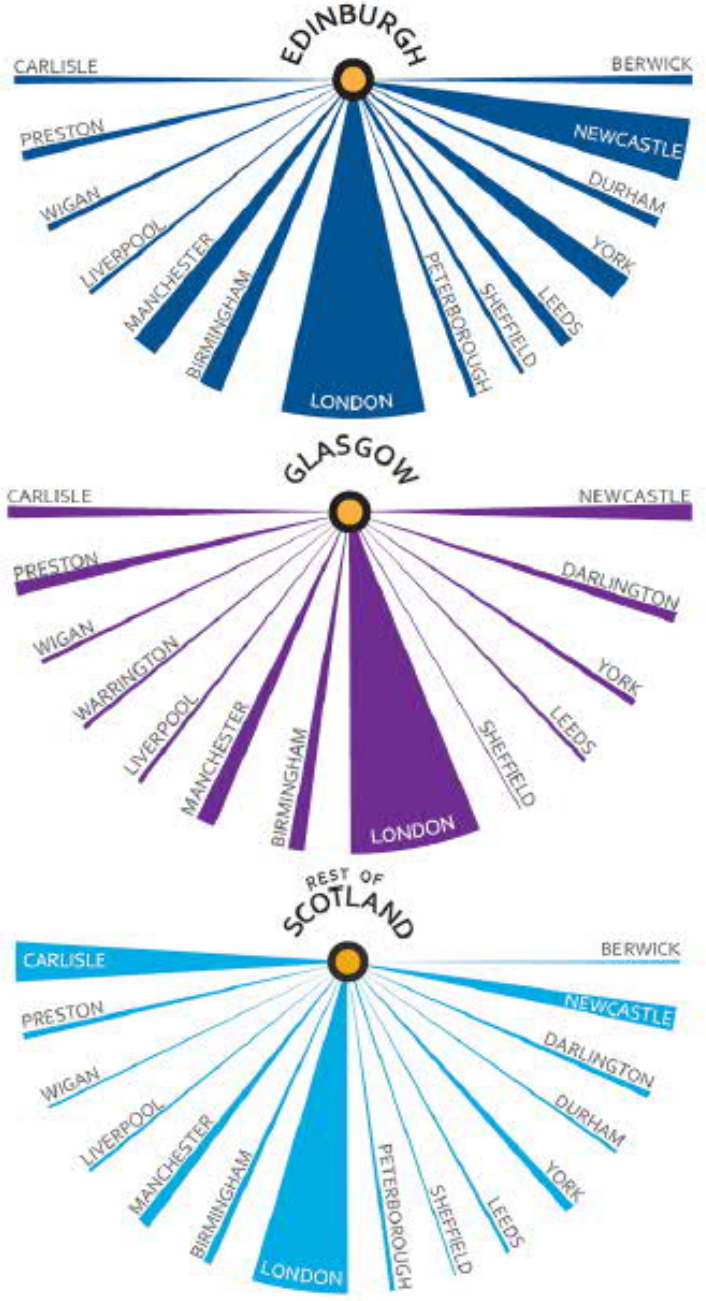


Figure 32: Relative Demand for Cross-Border Rail Trips[69,70]

[69] Note: Based on forecast volumes of passengers for 2036 with Phase Two

[70] Broad Options for Upgraded and High Speed Railways to the North of England and Scotland, Department for Transport, March 2016

Scotland's main rail freight terminals are located across the central belt. Going from East to West these are in Grangemouth, Mossend, Coatbridge, Hillington and Elderslie.

Figure 33 shows the main rail freight route out of Scotland via Carlisle.

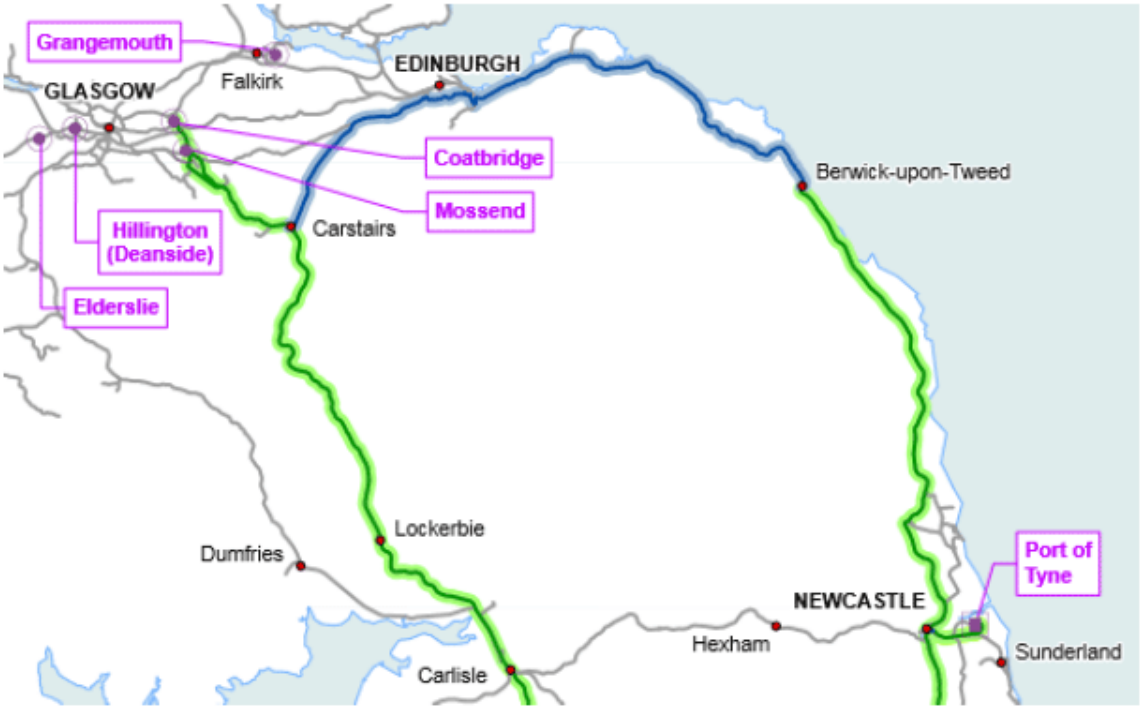


Figure 33: Rail Freight Network Connecting Scotland with England

Daily rail freight services connect Scotland to hubs and ports in England such as Felixstowe, Southampton, London and Liverpool.

In 2012-13, 8.4 million tonnes of freight was lifted in Scotland by rail, 15% less than the previous year, and 41% less than the 2005-06 peak. Since 2005-06 minerals and coal have fallen by 63% while other goods have increased by 25%. Of all freight lifted in Scotland, 34% was delivered elsewhere within the UK and approximately 5% was delivered outwith the UK.[71,72]

A total of 1.65 million tonnes of freight lifted elsewhere in the UK with a destination in Scotland in 2012-13, along with 0.40 million tonnes of freight from outwith the UK (the latter figure includes imported freight which was lifted at ports in England or Wales). The total amount of freight with a destination in Scotland fell by 18%, from 8.77 million tonnes in 2011-12 to 7.16 million tonnes in 2012-13. The reduction is a

[71] Due to the way that the statistics are compiled, this figure includes freight for export which was delivered to a port in Britain, as well as Channel Tunnel traffic.
[72] Scottish Transport Statistics No. 37, 2018 Edition, Transport Scotland

result of a fall in freight lifted in the UK, as freight lifted in Scotland saw a slight increase on the previous year.[73]

Air

In terms of passenger movements, from Scotland's airports it is possible to access approximately 55 countries (international, excluding UK) and over 220 destinations directly[74]. Scotland's most popular destination in 2016 was Spain, with 2.4 million journeys, accounting for 16% of air passengers of direct journeys abroad that year. Other popular origins/destinations were the Netherlands (1.4 million passengers), the Republic of Ireland (1.2 million passengers) and Germany (around 1.0 million passengers).

Out of the total air passenger traffic in Scotland in 2018, 43% was domestic within the UK, and 57% was international[75]. It is important to recognise that Edinburgh has the largest number of domestic air passengers in the UK, with Glasgow in 3rd place, behind London Heathrow, highlighting the strong links to London and the dominance of air travel in catering for this market (see Figure 27 in Chapter 3).

Table 1, on the following page, displays the top international passenger origin/destination countries for 2018, for the 5 top Scottish airports based on total international passenger traffic.

[73] Scottish Transport Statistics No. 37, 2018 Edition, Transport Scotland
[74] Transporting Scotland's Trade, Transport Scotland, December 2018
[75] Civil Aviation Authority UK Airport Data

Table 1: Top International Passenger Origin/Destination Countries for Scottish Airports (2018)[76]

GLASGOW		EDINBURGH		ABERDEEN		PRESTWICK		INVERNESS	
SPAIN	19.5%	SPAIN	14.0%	OIL RIGS	29.2%	SPAIN	52.3%	NETHERLANDS	83.5%
SPAIN (CANARY ISLANDS)	10.2%	GERMANY	8.9%	NETHERLANDS	22.3%	SPAIN (CANARY ISLANDS)	25.1%	IRISH REPUBLIC	13.3%
IRISH REPUBLIC	9.7%	IRISH REPUBLIC	8.2%	NORWAY	12.9%	PORTUGAL (EXCL MADEIRA)	8.7%	NORWAY	3.2%
UNITED ARAB EMIRATES	8.4%	NETHERLANDS	8.2%	SPAIN	8.1%	ITALY	6.2%		
NETHERLANDS	7.7%	FRANCE	8.1%	FRANCE	6.9%	POLAND	5.1%		

[76] Civil Aviation Authority UK Airport Data

Out of the total domestic (within the UK) air passenger traffic in Scotland in 2018, 5% was within Scotland, and 95% was between Scotland and the rest of the UK. Of the internal trips within Scotland, 24% was related to Aberdeen, 17% to Glasgow, 13% to Kirkwall, 13% to Sumburgh, 10% to Stornoway and 9% to Edinburgh. For passenger traffic between Scotland and other UK destinations, 65% was from/to London airports, 8% to Belfast airports, 7% to Bristol, 6% to Birmingham and 4% to Manchester.

Whilst Scotland's airports are primarily used for passenger journeys, air freight remains important to Scotland's trade market. Although relatively small in gross terms, the quantity of air freight in Scotland continues to grow. Approximately 78,000 tonnes of air freight were carried at Scottish airports in 2018. Between 2015 and 2018 there were changes in the weight of cargo carried as follows: Glasgow (+19%), Edinburgh (+17%) and Prestwick (+16%) and decreases at Aberdeen (-13%) and Scatsta (-36%)[77]. Edinburgh Airport handles the most air freight in Scotland and is also the country's busiest passenger airport. As Scottish companies require the timely movement of certain types of goods, it is likely that the air freight industry will continue to be important to Scotland's export industry and therefore a crucial part of Scotland's wider transport network.

Maritime

The ports at Cairnryan in the South West of Scotland provide ferry sailings to Larne and Belfast in Northern Ireland. Table 2, below, provides an overview of traffic volumes at the ports at Cairnryan.

Table 2: Ferry Traffic Volumes 2017[78]

TYPE	P&O (CAIRNRYAN-LARNE)	STENA LINE (LOCH RYAN-BELFAST)	TOTAL
Passengers	551,000	1,202,000	1,753,000
Cars	136,300	276,300	412,600
Goods vehicles	144,200	129,100	273,300
Unaccompanied goods vehicles (trailers)	64,900	64,100	129,000

As shown in Table 2, between the two operators, 1.75 million passengers, 413,000 cars, and over 400,000 goods vehicles were moved in 2017. These figures underline the freight-focussed nature of the Irish Sea routes with the total number of commercial vehicles carried almost matching the number of cars carried at around 400,000. Averaged across the year, approximately 1,100 commercial vehicles per day are therefore using the ports at Cairnryan, and in approximate terms, on average each ferry sails with around 45

[77] Civil Aviation Authority UK Airport Data
[78] Sea Passenger Statistics, Department for Statistics, Table SPA S0201 https://www.gov.uk/government/statistical-data-sets/sea-passenger-statistics-spas

commercial vehicles on board, thus 45 alight and 45 disembark each time a ferry calls at the ports.

Approximately one-quarter of Scotland's freight (excluding rail and pipeline) was handled by Scotland's sea ports in 2016, with the vast majority (95%) of this being carried through the 11 major commercial ports[79].

Between 2006 and 2016, overall freight volumes have fallen by 34%, with only three out of the 11 major ports growing. This is illustrated in Figure 34, below, which highlights the locations and changes in freight carried over the last 10 years.

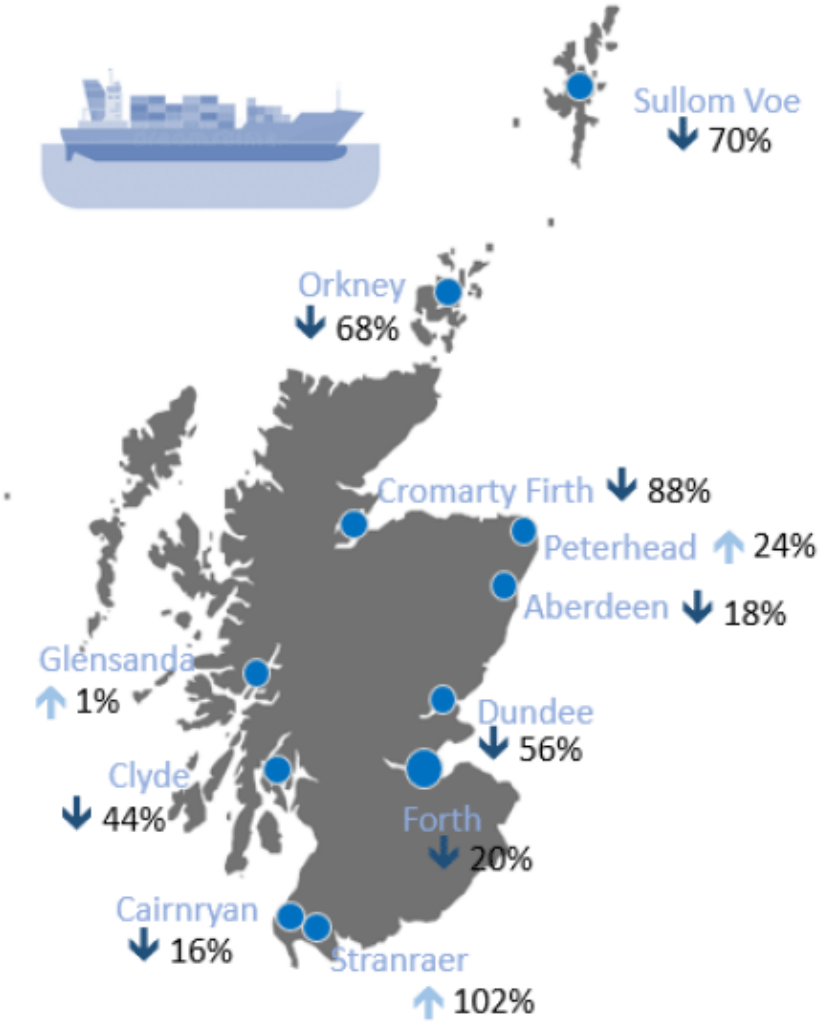


Figure 34: Change in Freight Handled by Scotland's 11 Major Ports 2006-2016[80]

[79] Ports are classed as major ports by the UK Department for Transport when they regularly handle over 1 million tonnes of freight per year. The total combined weight of freight lifted in Scotland in 2016 (excluding rail and pipeline) was approximately 271 million tonnes.

[80] Transporting Scotland's Trade, Transport Scotland, December 2018

The 11 major ports connect to over 100 destinations worldwide, including other ports in the UK, mainland Europe, and further afield in China, South America and the Southern Hemisphere. As highlighted above, the majority of goods handled by Scottish sea ports are outbound (export goods). For example, Glensanda only ships outwards (bulk granite aggregates) to destinations elsewhere in the UK and to mainland Europe. Forth Ports is Scotland's largest port with 27.5 million tonnes being handled by the port in 2017. Cairnryan/Loch Ryan is Scotland's main port for carrying goods and passengers to Northern Ireland.

Scotland has limited container connectivity from the two terminals at Grangemouth and Greenock now that the Rosyth/Zeebrugge route is no longer operating. As a result, many products manufactured in Scotland for export to international markets must be transported to deep water ports such as Liverpool, Felixstowe or Southampton for onward shipping[81].

3.6. Summary

This Chapter has provided an overview of Scotland's key exports and imports, and how they are transported from, into and within Scotland. It has demonstrated that Scotland's international presence is only possible through the connections that Scotland's transport infrastructure provides and which underpin and determine the capacity to build economic prosperity and social cohesion.

The export/import of goods in Scotland consists primarily of four modes (excluding pipelines which are not in scope for STPR2): road, rail, air and water. Scotland trades in a diverse range of imports and exports and maintaining a safe, efficient, effective and sustainable transport system, for both passengers and freight, remains one of the key enablers of sustainable and inclusive economic growth.

Scotland's Trade

- Scotland has strong trade links with 105 countries across nearly 100 different industries and sectors.
- Scotland traded nearly £53 billion worth of goods in 2017, with more than half (54%) being exports. Of the £28.7 billion worth of exports destined for international markets, nearly half (49%) went to the EU and 51% went to non-EU partner countries.
- The top 5 countries which Scotland imported from in 2017 were Norway (£3.9 billion), USA (£2.7 billion), China (£2.7 billion), Germany (£1.9 billion) and Netherlands £1.6 billion.
- The top 5 destinations for Scottish exports in 2017 were the Netherlands (£4.3 billion), the United States (£3.4 billion), Germany (£2.8 billion), China (£2.2 billion) and France (£1.7 billion).
- Scotland's key exports markets include Petroleum, petroleum products & related materials, Food & Drink and Power Generating machinery and equipment.

[81] Phase 1: Key Findings Report A Blueprint for Scotland, Infrastructure Commission for Scotland, January 2020

- Whilst the amount of freight carried by road to mainland Europe is small, the strategic road network is essential for the transporting of Scotland's perishable goods to markets in Europe.

Scotland's Key Transport Hubs

- Forth Ports is Scotland's largest port with 27.5 million tonnes being handled by the port in 2017.
- Edinburgh Airport handles the most air freight in Scotland and is also the country's busiest passenger airport.
- As well as being Scotland's largest commercial site, Eurocentral is one of Scotland's key transport logistic facilities.
- Cairnryan/Loch Ryan is Scotland's main port for carrying goods and passengers to Northern Ireland. Based on observations and valuations of the type of goods being transported during two weekdays in November 2017, approximately £26 million worth of goods per day is estimated to use the A75 East of Dumfries, £20 million on the A75 West of Dumfries with approximately £10 million moving on the A77 south of Ayr[82].

Transport Links to Key Trade Destinations

- Scotland's number one international export destination is the Netherlands. This is a result of the Dutch port of Rotterdam being an international shipping hub with goods exported to other global destinations from there.
- In 2017, the USA was Scotland's main non-EU export destination with whisky being a key export commodity. Although most high density freight to the USA is carried by ship, some direct flights which operate from Scotland also carry low volume freight.
- Both Northern Ireland and the Republic of Ireland remain core trading partners with Scotland. In 2017 nearly £1.3 billion of exports went to the Republic accounting for 4.5% of Scotland's total exports. A proportion of these goods are transported via daily sailings from Cairnryan/Loch Ryan.
- Since 2013, Scotland has imported more goods from Norway than any other nation. Over that time, imports from Norway have totalled more than £19.4 billion. As a result of both countries involvement in the North Sea oil and gas fields, the top commodities are related to petroleum and gas. These are typically transported by either boat or pipeline.

[82] South West Scotland Transport Study - Initial Appraisal - Case for Change, Transport Scotland, January 2020 https://www.transport.gov.scot/publication/south-west-scotland-transport-study-initial-appraisal-case-for-change/

4. Key Challenges for Transport and Infrastructure

4.1. Overview

Building on the NTS2 and the extensive data analysis and stakeholder engagement undertaken during the first stages of STPR2, has identified the key challenges that need to be considered when planning for strategic transport and investment. These include:

- Transport's contribution to the climate emergency and net zero targets, means that **there is a need to reduce travel and deliver modal shift towards walking, cycling and public transport.** If we continue as we are now, forecasts suggest a 40% increase in vehicular travel by 2037. However, recent work by the Committee on Climate Change[83] set out the need for a 10% reduction in car mileage with a modal shift from car to walking, cycling and public transport.
- To achieve a modal shift of the scale required to address the climate emergency, will require significant changes to the complex travel behaviours of users, operators and the public and private sectors. In accordance with the sustainable travel hierarchy, **STPR2 should prioritise interventions that increase the modal share of shorter everyday trips by walking, wheeling and cycling; short to medium length trips by public transport and longer trips by rail and low emission vehicles**.
- Transport is a derived demand[84] and therefore key decisions and investments are required across several other sectors to meet net zero targets and in so doing put 'place' at the heart of the decision making process. **Land use planning and digital connectivity are two areas not within the scope of STPR2 that will both have a significant part to play in meeting our net zero targets.** This will help develop more sustainable and inclusive communities that encourage walking, wheeling and cycling as well as public transport as the preferred choice of travel. This will increase physical activity and realise health and wellbeing benefits.
- It is clear that efforts over the last decade have not had a sustained impact on the increase in walking and cycling particluary as a means to travel to work or education. In recent years, the Scottish Government, working with a number of key partners, has committed significant investment into active travel to help address this issue. Whilst the outcomes of this investment are still to be realised, it is clear that to make the sort of transformational change required, **significant ongoing commitment to active travel investment is necessary, to not only deliver improved infrastructure and systems but to encourage the change needed in travel behaviours**.

[83] Net Zero: The UK's contribution to stopping global warming, Committee on Climate Change, May 2019

[84] Users of transport services are primarily consuming the service not because of its direct benefits, but because they wish to access other services (i.e. derived demand) such as jobs, health, education and leisure services.

- The decades of decline in bus use across most of Scotland is linked to a range of complex factors. Despite this, bus use makes up three quarters of trips by public transport in Scotland. It therefore has a vital role to play in delivering our interim net zero targets by 2030. **STPR2 should prioritise interventions that increase the modal share of journeys by bus over the next decade and beyond.**
- Whilst bus use in Scotland has been in decline, rail use has increased by over 30% in the last decade. Based on current forecasts for future housing and employment land uses there will continue to be **strong demand for rail services particularly within the key corridors to, from and between Edinburgh and Glasgow. This will further heighten the current terminal station capacity issues within Scotland's two largest cities.**
- The safe, efficient and resilient movement of goods is vital for Scotland's economy and related import/export market. Most freight in Scotland is moved by road. Maintaining efficient and resilient connections will continue to be important to business. However, the movement of goods and the freight industry in general will need to play its part in meeting net zero targets by 2045. Advances in low carbon technology for the movement of goods by aviation, maritime, rail and road will play a significant part and **STPR2 will explore further opportunities to increase rail freight and reduce the level of goods transported by road.**
- Scotland has strong trade links with over 100 countries across nearly 100 different industries and sectors. **Over the coming years, Scotland's economic success will be increasingly realised through its ability to connect with and compete within a global market.** Strengthening links with the global economy will mean increased trade, inward investment and create an environment for sharing skills, expertise and collaborating with others to support sustainable inclusive growth.
- The maintenance of safe and resilient transport networks and systems is also a vital part of the daily lives of all communities, businesses and visitors to Scotland. Recent examples of this include the A83 Rest and be Thankful, Winchburgh Junction and tunnel on the main rail line connecting Edinburgh and Glasgow, and the CalMac ferry network which all require further investment to maintain safe and resilient transport connections to all parts of Scotland. **The sustainable investment hierarchy outlined within NTS2 makes clear that interventions should be prioritised firstly by their ability to reduce the need to travel and secondly their ability to help maintain and safely operate existing assets. This investment hierarchy will be imbedded within the STPR2 appraisal process.**
- Fundamental to the delivery of an inclusive net zero economy and thus improve health and wellbeing, is the requirement to **support and accelerate the just transition to low emission vehicles**. A collaborative public and private sector relationship will be crucial in achieving this just transition.

5. Objective Setting

5.1. Overview

The evidence outlined in the previous Chapter highlights that, without intervention, current issues around higher private vehicle usage, more unreliable journey times, increasing congestion, poor air quality and climate change will continue to increase or deteriorate. Traditionally infrastructure planning has sought to predict this increase and then plan infrastructure provision to provide for it (known as 'Predict and Provide'). However, in order to realise the vision and priorities set out within the NTS2 - particularly around climate change and net-zero - a different approach to planning infrastructure provision is required. As such, a more outcome led approach is proposed that will link infrastructure planning to the vision and priorities set out within NTS2. This approach will be more aligned with a 'Decide and Provide' process that will more closely support the vision sought by NTS2, and in so doing provide the infrastructure and assets best placed to achieve the vision. The strategic transport options needed to support the NTS2 vision will be determined by applying a framework of objectives that clearly set out how this future will be achieved.

5.2. Objectives

STAG is an objective led appraisal process, requiring Transport Planning Objectives (TPOs)[85] to be developed that take full account of evidence pertaining to the particular problems and opportunities identified by the study, within the context of the relevant policies and strategies and evidenced by stakeholders and data. They should:

- Provide a clear indication of what STPR2 is trying to accomplish;
- Introduce clarity where there may exist strong vested interests and entrenched views on priorities; and
- Allow the proper appraisal of candidate options to allow the decision makers to make informed choices on investment priorities.

At the national level, the NTS2 sets out the *Case for Change* for Scotland and is at the heart of the objective setting process for STPR2. The agreed way forward is to develop a consistent set of Transport Planning Objectives that are used across the country during the appraisal process. These objectives are directly linked to each of the NTS2 priorities and outcomes. Sitting below the five TPOs are a set of national aims.

Within this approach there is a need to reflect the regional focus from the analysis and stakeholder engagement undertaken to date. Therefore, each region has developed a set of specific aims to reflect the issues within their specific area.

It should be noted that in STAG, it is recognised that TPOs may not be entirely SMART (**S**pecific, **M**easurable, **A**ttainable, **R**elevant and **T**imed) at the *Case for Change* stage. However, they should be set in a way to facilitate the establishment of SMART TPOs in later stages of the appraisal. As such the STPR2 TPOs, at the national and regional levels, have been created in a way that allows for 'SMARTening' following this *Case for Change* stage.

[85] Transport Planning Objectives are used to express the desired transport related outcomes in a study area

5.3. National Transport Planning Objectives

As stated, the TPOs are based on the NTS2 priorities and associated outcomes, which are outlined in Figure 35.

Figure 35: NTS2 Priorities and Associated Outcomes

Using these as building blocks, a framework of TPOs was created that also take account of the issues that impact on travel patterns across the country, which have been identified. A total of five TPOs have been derived, the first four of which align directly to each of the NTS2 priorities, and a final objective that aligns with the reliability, resilience and safety of the transport network; a theme that has come out strongly through the problems and opportunities analysis.

Sitting under each TPO are a series of outcomes that are intended to better define and 'SMARTen' the overarching objectives and aid their application in appraisal.

The STPR2 TPOs are as follows:

- **A sustainable strategic transport system that contributes significantly to the Scottish Government's net-zero emissions target**
  - Reduce the consumption of fossil fuels through a shift to more sustainable modes of transport.
  - Increase the share of active travel for shorter everyday journeys.
  - Increase the share of public transport by providing viable alternatives to single occupancy private car use.
  - Reduce emissions generated by the strategic transport system.

- **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.
  - Improve mobility and inclusion, recognising the specific needs of disadvantaged and vulnerable users.
  - Reduce transport poverty by increasing travel choice.
  - Reduce the reliance on private car for access to key centres for healthcare, employment and education.

- **A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing**
  - Reduce demand for unsustainable travel by embedding the place principle in the changes to the strategic transport system.
  - Increase the share of active travel for shorter everyday journeys.
  - Reduce demand for unsustainable travel arising from nationally significant growth areas, taking cognisance of Local Development Plans and the emerging NPF4.
- **An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland**
  - Increase sustainable access to labour markets and key centres for employment, education and training.
  - Increase competitiveness of key domestic and international markets, by reducing costs and improving journey time reliability for commercial transport.
  - Increase resilience of accesses to key domestic and international markets to encourage people to live, study, visit and invest in Scotland.
  - Make better use of existing transport infrastructure through the adoption of beneficial transport innovations.
  - Increase the mode share of freight by sustainable modes.
- **A reliable and resilient strategic transport system that is safe and secure for users**
  - Improve resilience from disruption through adaption of Scotland's trunk road, rail, strategic ferry and aviation infrastructure.
  - Reduce transport related casualties in line with reduction targets.
  - Improve resilience through climate change adaptation within the management and

maintenance of trunk road, rail and ferry infrastructure.
- Improve perceived and actual security of the strategic transport system.

5.4. Regional Transport Planning Objectives

As previously stated, a top down bottom up approach was adopted to inform the creation of regional aims that not only align directly to the outcomes sought by the NTS2 for Scotland as a whole, but that also reflect the unique regionality, related to transport, of each of the eleven STPR2 regions.

Each regional *Case for Change* report[86] outlines the TPOs and the associated regional outcomes. In general terms these were derived by identifying key regional problem and opportunity themes and linking, adjusting or removing them with the relevant national outcomes sought.

[86] Copies of which can be found here: **www.transport.gov.scot/our-approach/strategy/strategic-transport-projects-review-2/**

6. Option Development and Approach to Sifting

6.1. Overview

This section sets out the proposed approach to option development and sifting.

It should be noted that Initial Appraisals have been completed, for the three Advanced Study regions: the North East Region, the (Scottish) Borders and the South West Scotland Region, and the options short listed by these studies will contribute to the STPR2 Preliminary Appraisal stage.

The initial 'long list' of options for STPR2 as a whole is in development, informed by a range of sources and activities, these are summarised as follows:

- The project team is currently completing consultation with a wide range of stakeholders using the following engagement activities:
    - Regional workshops held across Scotland;
    - National workshops - a series of mode and sector-specific workshops covering a range of issues at a national level;
    - Elected Members workshops, and
    - An online public engagement survey.

- The engagement activity is also complemented by:
    - A review of the 29 recommendations from STPR;
    - The City Region and Growth Deals;
    - Relevant regional and national policies; and
    - Internal workshops involving experts from the STPR2 consultant team.

The approach to the generation of interventions for STPR2 is summarised in Figure 36 overleaf.

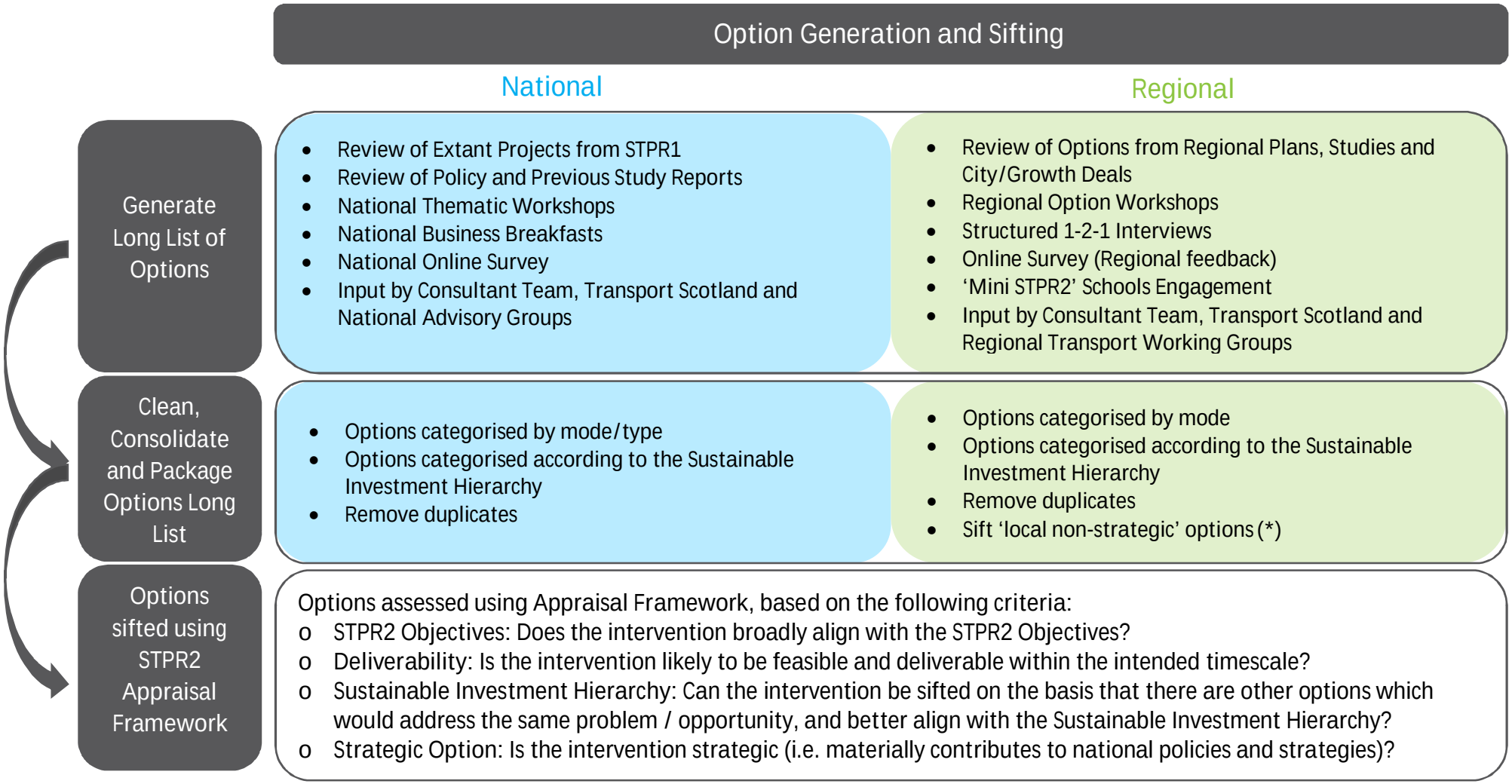


Figure 36: Approach to Option Generation and Sifting

(*) Local options which could become strategic as part of a national programme of interventions or could be packaged to become strategic would be taken forward. Other, local options specific to an issue in a region would be sifted from STPR2 and the evidence shared with the respective regional/local transport organisation for further consideration.

The option generation for STPR2 is informed and structured around the sustainable investment hierarchy which is embedded within NTS2 and shown in Figure 37:

Figure 37: The Sustainable Transport Hierarchy

6.2. Option Sifting Approach

Following the generation of a long list of options for the study, these will be sifted in line with a standardised approach. The approach proposed allows for options being sifted based upon the combination of a four-stage check:

Firstly, candidate options will be checked in terms of their compliance with the STPR2 TPOs. This assessment will be undertaken at a high level, whereby the option should be sifted out if:

- It would contribute negatively to more than one objective;
- It would not contribute positively to any of the objectives and would contribute negatively to at least one objective.

Secondly, the sifting will be informed by a high-level assessment of deliverability, sifting any candidate intervention which:

- Clearly has delivery constraints which would pose significant risk to delivery.
- Could not be directly delivered, operated, financed or facilitated by Transport Scotland or supported by policy which could be introduced by Transport Scotland.

Thirdly, any candidate options for which there is an alternative approach, which would address the same problem / opportunity equally as well and better align with the sustainable investment hierarchy, should be sifted.

Finally, candidate options will be checked in terms of whether or not they are 'strategic', i.e. does the option materially contribute to Scottish Government / Transport Scotland policies and strategies:

- Materially supports the four NTS priorities and related outcomes; AND EITHER
- Related to transport networks owned, operated and funded directly by Transport Scotland; OR
- Passenger and freight access to major ports and airports of national significance; OR
- The inter-urban bus and active travel networks and principal corridors within urban areas.

Candidate options deemed to be strategic should be progressed. Candidate options which are not deemed to be strategic, but which could be combined with other similar options to form a strategic option should be considered for Option Packaging.

Going forward, the long list of options will be developed and sifted in line with the approach set out in this section, with the resulting short list of options appraised in line with the STAG-based Appraisal Framework being developed for STPR2.

6.3. Your Feedback is Important

As part of our ongoing engagement, we welcome your feedback on this draft *Case for Change* Report and your comments can be submitted on the feedback form accessed here. The closing date for comments is midnight on Wednesday 8th April 2020.