

#### South East of Scotland **Transport Partnership**



# Forth Freight Study: Case for Change



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# O1 Executive Summary ↓ □ ↓





# **Executive Summary**

#### Introduction and Background

This report sets out the findings of the Go Forth Freight Study Case for Change, which was commissioned by SEStran in May 2020.

This study looks to investigate existing freight movements, the barriers faced by multimodal freight terminals when trying to target and encourage customers to make the switch and evaluate the potential environmental benefits and commercial viability of sustainable freight/goods movements. It also acknowledges the key role that road freight plays and how it supports other modes such as rail freight. Therefore interventions to support a more efficient road freight sector will also be explored.

This study has been delivered on behalf of SEStran and Forth Ports by consultants AECOM Ltd supported by Napier University and sets out the Initial Appraisal Case for Change against Scot-Tag criteria.

Using Scottish Transport Appraisal Guidance (STAG) principles, the aim of the study is to explore the development of sustainable multimodal freight gateways and potential for freight consolidation centres at key locations to maximise the sustainable movement of freight over regional, national and local movements.

## Literature and Policy Review

A review of policy, research and strategy relating to freight in the There is already a significant amount of activity by non-road freight SEStran area as well as wider trends was undertaken. This will help modes in the region. The ports are a huge asset and fulfil a nationally important role, reducing road and air miles associated with the ensure that the study and associated recommendations align with existing policy and strategy and are informed by the latest research. movement of goods.

However, there is scope to build on this, both by increasing the The review identified potential for the Forth Ports to transition towards a more sustainable freight sector, for the SEStran region. role of shipping and ensuring that ports are able to facilitate further Although there are a number of weaknesses and barriers associated modal shift and consolidation. This can be achieved by introducing with modal shift, the Scottish Government has made a commitment supporting infrastructure to facilitate further rail movements and to help achieve and facilitate the move from road freight towards sustainable last mile deliveries. In particular, the location of Leith rail and sea freight. The electrification of the rail network will provide in such close proximity to Edinburgh City Centre, with extant rail environmental and economic benefits, with 45% of Scottish Rail connections is an opportunity which can be built upon. Freight journey's being electrically hauled from origin to destination.

In addition, it has been acknowledged that a smarter use of the logistics system could contribute to reducing air pollution, with efficient driving saving more than 2.5 megatonnes of CO2 by 20351.



### Multi-Modal Freight

The presence of disused sidings and connections demonstrates that the importance of rail freight has declined in recent years, however opportunities to grow this are clear.

The SEStran area has not only got a diverse range of facilities across modes but also has historically utilised different forms of transport as part of its logistical system. If the conditions can be created, then multi-modal or alternative modes to road freight may again become more important to the region's freight movements.



#### **Road Freight Movements**

Road freight is key to the supply chain, providing resilience and flexibility. It transports the overwhelming majority of goods in the region and it is vital it is supported to be as efficient and sustainable as possible. This can be achieved through reducing traffic volumes and encouraging collaboration.

Congestion is very pronounced in areas across South East Scotland, affecting the reliability of the supply chain and potentially economic performance.

In particular, Edinburgh and neighbouring authorities experience journey time delays over the Scottish average and investigations have shown central routes in Scotland experiencing proportions of HGVs similar to that of more strategic roads.

Therefore, there is a strong case and basis to encourage modal shift and consolidation, particularly in urban areas. This could include through movements from other regions, reducing road miles not just in South East Scotland but elsewhere.

When looking at the types and volumes of goods being transported within the region and between the region and other areas it is also clear that there is a critical mass of certain commodity groups that could be moved by rail, especially those travelling longer distances from regions of the UK outside of Scotland.

To maximise these opportunities the supporting infrastructure needs to be in place to ensure that (for example) rail services can match customer requirements in terms of journey time, service levels and flexibility. These options are explored further in later sections.

The data described here shows an improving picture in relation to

incidents involving goods vehicles, with significant reductions in fatalities and casualties over the last 15 years.

Whilst efforts to reduce this should be applauded, there were still 451 incidents in 2018 involving a goods vehicle with over 300 casualties. Aside from the sometimes-catastrophic human costs, each incident is likely to have caused short term congestion and resulted in costs to those involved including the local highway authority and services required to attend each incident. Due to the extreme dimensions of Heavy Goods Vehicles, incidents involving them are more likely to result in a fatality or serious injury.

#### **Road Freight Emissions**

The Local Air Quality Management information for the local authorities within the SEStran region were reviewed, including air quality monitoring data, Action Plans to improved air quality, and background pollution data published by SEPA / DEFRA.

The Scottish Index of Multiple Deprivation (SIMD) were plotted to determine the geospatial distribution of socio-economic disparity, and specifically health, across the region and how this may correlate to emissions from the strategic road network.

Traffic counts for the strategic road network in the SEStran area were modelled to calculate the emissions from individual road links, and further interrogated to determine the contribution from individual vehicle classes.

The notable outcomes from this were:

number of vehicles.



- Emissions from HGVs are disproportionally significant relative to the

- Emissions from LGVs were considered to be significant overall, and also tended to be disproportionally significant relative to the number of vehicles.
- LGVs are used for freight, but also numerous other commercial and private uses, so this is a potentially complex component of the fleet with regard to strategic management.
- Roads with high emissions pass through some of the areas with lowest score for SIMD, although there is no clear overall correlation between SIMD and high emission rates.

Nominal tests were undertaken to indicate relative emissions from specific components of the fleet to inform the understanding of the emissions profiles and the potential effects of interventions:

- Articulated and rigid HGVs tend to have similar emission profiles, although articulated HGVs have the highest emissions of the modelled vehicle types, per vehicle, at all speeds.
- Emissions from LGVs are significantly lower than from HGVs, although individual vehicles have lower load capacity,
- Emissions typically are highest at low speeds, and decrease significantly at greater speeds, tending to plateau around 40-50 km/hr.
- Emissions from higher (newer) Euro emission classifications tend to be lower. However, there are instances where this varies at different speeds.
- Emissions from HGVs with different loadings were also modelled and indicated some complexity at lower speeds due to operation of exhaust abatement. **D**

In summary, there are clearly opportunities to achieve beneficial air quality effects on the strategic and local networks by targeting freight traffic through the use of different vehicle types (or modal shift), Euro classification or speed controls. This may complement operational priorities, as well as balancing objectives for local air quality and regional greenhouse gas emissions.

Long term effects could include a reluctance for road users to consider active travel due to road safety fears.

The majority of these incidents occurred on strategic roads and urban areas across all authorities in the region, reflecting vehicles undertaking long distance trunking movements or last mile deliveries. If, through modal shift and consolidation these movements could be reduced then the likelihood of further reducing the number of incidents increases.

#### **Stakeholder Consultation**

A key element of this study is the need to consult with stakeholders in the SEStran region, identifying opportunities for improving the efficiency and effectiveness of the freight sector in South East Scotland and reducing wider environmental and societal negative impacts.

This is vital to identify problems and opportunities, inform TPOs and optioneering for specific interventions. It will also ensure that interventions identified are deliverable and likely to have tangible outcomes that reflect the priorities of the study.

As such a wide-ranging stakeholder consultation exercise was undertaken including:

- Freight operators
- Freight customers
- Trade associations
- Local authority officers
- Infrastructure operators

Due to restrictions associated with COVID-19, face-to-face meetings and workshops were not possible, and therefore these were conducted on-line. Where preferred by respondents, written submissions were welcomed. This engagement largely took place between August and October 2020.

Regardless, there are barriers to this growth, particularly capacity and gauge restrictions on the rail network and an acknowledgement that road will always play a central role in transporting freight. Therefore, efforts to encourage more sustainable means of road freight, either through alternative fuels or greater consolidation should be explored. Trends such as the growth in home deliveries Whilst the nature of discussions varied depending on the consultee, the following prompts were used to facilitate the meetings. present challenges to how 'greening' of the sector can be achieved.



- Are there any issues moving goods through the SEStran (South East Scotland) area? Are there any particular locations where freight movements are difficult?
- Is there any potential for modal shift from road to rail or maritime (e.g. short sea shipping)? If yes, what could be moved? If no, what are the barriers?
- What trends are likely to affect how goods are transported in the future?
- Are there specific actions which you would like to see incorporated in the freight study?

Feedback from the Stakeholder Consultation has revealed that there is strong support and potential for growth in sustainable freight in the region with a wide variety of commodities suitable for movement by rail or sea. The case studies identified in this section demonstrate potential applications for rail freight that could be explored for South East Scotland.

There was also a feeling that the freight sector in South East Scotland was too road dominated and that there was a need for greater network resilience. Feedback on the issues caused by congestion support data explored in previous sections, which significantly affects road freight movements in the region.

#### The Transport Planning Objectives (TPOs)

The Transport Planning Objectives (TPOs) developed for this study are focussed on reflecting the identified problems and opportunities, link significantly with the Key Themes and express the outcomes sought for the study. The draft interim TPOs can therefore be traced back through each step of the adopted methodology in a clear and transparent way. This allows their areas of coverage to be demonstrated, and the source of each, to ensure that a robust, evidence-based audit trail is demonstrated.

The TPOs developed for this study are as such:

- TPO1: Enhance regional freight infrastructure, whilst stimulating economic growth
- TPO2: Reduce the adverse impacts of freight movements on public health and the natural and built environment
- TPO3: Maintain and enhance a safe, resilient, reliable and sustainable transport network to aid delivery of consistent conditions for freight operators on the transport network to maximise sustainable business opportunities

## **Problems and Opportunities**

This table below outlines the key problems and opportunities (P&Os) that have emerged from the study findings. Sources used to identify related P&Os in the study area are the policy review, the review of socio-economic conditions, freight trends, transport network (road/rail), the ports (virtual site visit), environmental context, the findings from stakeholder and public engagement.

#### Problems

- Road freight contributing air quality
- Road freight contributing emissions
- Road freight contributing safety issues
- Road freight contributing congestion
- Congestion disrupting the chain
- Significant empty running
- Road freight contributing road surfaces
- Lack of network resilience
- Decline in rail freight in th infrastructure
- Lack of adequate lorry pa facilities



#### **Opportunities**

to poor	-	Enhance the efficiency and sustainability of road freight and ensure it can underpin other modes
	-	Existing rail heads and extant track
to carbon	-	Leith Port's proximity to the City Centre and land availability
to road	-	Critical mass of goods traveling inter region (e.g. NW, NE England, Glasgow City Region)
	-	Bulk and unitised goods
, to	-	Scope for increase in rail freight movements and volumes
vlaque e	-	Consolidate loads to reduce movements in affected areas
	-	Encourage further growth in water freight – Freeport
g of HGVs	-	Development of alternative fuels
to uneven	-	Ensure sufficient parking facilities for freight vehicles
	-	Cycle logistics can scale up quickly
e	-	Committed schemes – Levenmouth Line
ie region	-	LEZ
arking	-	Ensure freight is considered as part of passenger interventions



#### **Potential Interventions**

A number of potential options to address the issues and opportunities have been developed. Each option has been appraised to ensure it is deliverable, targeted on the issues and opportunities identified and aligns with local, regional and national transport policy objectives.

They include:

- Food/Retail hub at major port
- Underwrite a multi-user freight train running a regular circuit along the lines of: Grangemouth > Inverness > Aberdeen
- Passenger trains for freight
- Use maritime craft to transfer spirits from Methil to Grangemouth for onward shipping
- Electric shunter to facilitate low-carbon rail freight movements at terminals
- Consolidation Centre to the West/South of Edinburgh between A702/A70 junction and M8/A720 and East at Leith
- Micro-consolidation centres for Edinburgh city centre
- Development of Canalside consolidation/transhipment centre/ depot
- Freight Tram which will enable movements of goods
- Putting in place the necessary infrastructure for alternative fuels electric for last-mile, CNG/LNG or Hydrogen for inter-urban

#### Conclusion

This report sets out a clear case for change. It demonstrates that the freight sector in the SEStran area is contributing to poor air quality, carbon emissions, road safety and congestion.

However, with investment this can be addressed. The region has the potential to be an exemplar for sustainable freight movements by harnessing the natural advantages that it has, such as a network of ports that can be rail connected and transport infrastructure such as rail (heavy and light) or waterways that enable goods to be transported.

Feedback has shown a strong appetite for moving more goods by sustainable means as well as evidence that consolidation is currently being undertaken successfully by operators in the region. This willingness can be exploited by exploring opportunities to enhance and introduce infrastructure that will facilitate modal shift as well as building on consolidation efforts by providing facilities that enable multiple loads to be transported on the 'last mile' by a single vehicle or cycle logistics.

If progressed, the innovative initiatives described here have the potential to not only make a significant positive contribution to the health and wellbeing of those who live in the region but also economic growth.







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# Introduction

#### Purpose of Study

This report sets out the findings of the Go Forth Freight Study Case for Change, which was commissioned by SEStran in May 2020.

This study looks to investigate existing freight movements, the barriers faced by multimodal freight terminals when trying to target and encourage customers to make the switch and evaluate the potential environmental benefits and commercial viability of sustainable freight/goods movements.

Understanding local, regional and national trends in freight flows, distribution channels, last mile logistics, and details of existing rail freight flows, routes and capacity in/out of Scotland and the Forth Estuary region, will assist in establishing future growth potential and building the investment case for rail freight enhancements in this region.

The study assesses current rail freight services and examines opportunities for maximising and improving existing infrastructure, capacity and the balance of freight / passenger movements as well as road freight interventions that satisfy the objectives of the study.

The study acknowledges the key role that road freight plays in supporting other modes and as such is a vital aspect of the sustainable freight offer. Therefore, the aim is to appraise the

development of sustainable freight gateways and potential for freight The draft RTS has four key strategy objectives: consolidation centres at key locations to maximise the sustainable movement of freight in door-to-door transport chains, with a focus on investigating the increase of rail as a key mode during these 2. Facilitating healthier travel options movements

# **Project Partnership Team**

This study has been delivered on behalf of SEStran and Forth Ports by consultants AECOM Ltd supported by Napier University and sets out the Initial Appraisal Case for Change against Scot-Tag criteria.

The South East of Scotland Transport Partnership (SEStran) is the statutory Regional Transport Partnership for the South East of Scotland. SEStran encompasses eight local authorities: City of Edinburgh, Clackmannanshire, East Lothian, Falkirk, Fife, Midlothian, Scottish Borders and West Lothian.

Within the South East of Scotland there are a number of issues which freight movements contribute to including road safety, air quality and congestion. SEStran aims to address these issues and work towards a more sustainable and efficient transport network. On becoming a statutory body, under the Transport (Scotland) Act 2005, SEStran was tasked with producing a Regional Transport Strategy (RTS) for South East Scotland.



- 1. Transitioning to a sustainable, post-carbon transport system
- 3. Widening public transport connectivity and access across the region

#### 4. Supporting safe, sustainable and efficient movement of people and freight across the region

The RTS also highlights the importance of maintaining existing infrastructure to a standard that ensures that it can be fully utilised and enhancing movement of freight, especially by rail and other nonroad modes.

The GO SEStran Forth Freight Strategy is being funded by Transport Scotland through the Local Rail Development Fund, with the central aim of helping provide the evidence base for local areas to bring forward schemes that can enter the Scottish Government Rail Enhancement and Capital Investment Strategy pipeline.

#### Work Programme

Using Scottish Transport Appraisal Guidance (STAG) principles, the aim of the study is to explore the development of sustainable multimodal freight gateways and potential for freight consolidation centres at key locations to maximise the sustainable movement of freight over regional, national and local movements.

The objective of the study is to build the business case for investment into developing sustainable freight solutions in the River Forth region with a key focus on understanding the existing and potential role of rail freight in this.

This project commenced in May 2020 and as such has been conducted entirely during the coronavirus pandemic and this affected the original programme and timescales. At this current time, there is no available information on travel patterns / systems post COVID, but Transport Scotland are assessing this. We will need Scottish Government guidance on the new scenarios they are adopting. It could be anticipated that the four priorities laid out in the vision for the National Transport Strategy will be valid for any future transport system, supporting a transition to a low carbon transport network.

#### Methodology

The Case for Change follows a clear objectives-led methodology and evidence based approach ensuring interventions are informed by problems and opportunities supported by empirical evidence and reflecting the priorities of local, regional and national Government.

A thorough review of existing policy and research, extensive data relating to freight movements and associated externalities as well as a comprehensive stakeholder consultation. This has provided the basis for identifying problems and opportunities associated with freight in the region.

From this, appropriate Transport Planning Objectives (TPO) have been developed in order to assess potential interventions, with a number of the more positive schemes have been taken forward for further appraisal.

#### **Transport Context**

SEStran covers the area comprised of 8 Scottish local authorities in the South East of Scotland (see map).

- The City of Edinburgh
- Clackmannanshire
- East Lothian
- Falkirk
- Fife
- Midlothian
- The Scottish Borders
- West Lothian

Of note is that six of these authorities are part of the Edinburgh and South East Scotland City Region Deal signed in 2018 (the exceptions being Clackmannanshire and Falkirk Councils).







#### Socio-Economic

The SEStran area is a vibrant and economically active region with a diverse range of sectors from financial services, manufacturing, agricultural, food production and construction. This provides employment across the region and the freight sector is key to ensuring that these industries support the economic well-being of the community.

The region is home to both rural and urban areas and larger towns and cities. Edinburgh is the largest city by an order of magnitude; however Dunfermline and Livingston are also significant urban centres and generators of freight movements.

In terms of economic activity, a comparison of employment between the 8 different authorities and the Scottish and British national averages demonstrates several useful insights from a freight perspective<sup>1</sup>:

- Outside of the City of Edinburgh (and East Lothian) there is a significantly higher proportion of manufacturing employment than either the Scottish or British national average, which generate large volumes of supply chain movements. A reliable freight network is required to provide these manufacturers with good market accessibility.
- A similar analysis holds for the construction sector outside of Edinburgh, although it is not as far above average as manufacturing employment.

- England.

Major employers and freight generators in the region include:

- as Scottish Borders
- Bathgate
- Tesco Distribution Centre at Livingston
- Petrochemical works such as INEOS at Grangemouth
- Retail centres at major towns and cities
- Edinburgh

- West Lothian and Falkirk have above average employment in the transport and storage industrial sector, potentially linked to their location between Edinburgh and Glasgow in the Central Belt, with good onward links north to the Highlands via the A9 and south to

- East Lothian has notably above average employment in the food service and accommodation sector, which point to ensuring there are robust and reliable delivery networks for the hospitality sector including fresh linens, food, drink, etc for hotels and cafes/bars.

- Agriculture and farming, particularly in more rural authorities such

- Drinks manufacturers and distillers such as Diageo and Whyte and Mackay have bottling plants in Fife and Grangemouth respectively

- Amazon, Aldi and Kuehne and Nagel distribution centres at

- Construction and maintenance companies such as Babcock

Occupiers of large Industrial Estates such as Bankhead, west of



<sup>&</sup>lt;sup>1</sup> National Records of Scotland

#### Transport Infrastructure and **Freight Generators**

The SEStran area is a significant generator of freight movements and offers the capacity to move goods by road, sea, rail, inland waterway and air. Edinburgh, as one of the UK's major cities attracts significant freight volumes and as discussed key sectors including manufacturing, food/drink production and agriculture need both raw materials and a means of moving finished products to end markets. The freight sector facilitates this and

ensures that the overall economic wellbeing of the region is supported.

These maps show the key transport infrastructure and freight generators in the SEStran region.







#### **Report Structure**

The Case for Change is structured as follows:

- Section 3 outlines a concise literature review taking in current policy, research and strategy relating to freight in the SEStran area.
- Section 4 provides analysis of multi-modal freight in the region, highlighting water and road freight, as well as cycle logistics.
- Section 5 provides analysis of road freight in the region, looking at key movements and congestion.
- Section 6 provides analysis of the environmental impact of road freight.
- Section 7 looks at incidents involving freight vehicles to establish patterns and hotspots
- Section 8 provides an overview of Stakeholder consultation responses
- Section 9 provides a summary of problems and opportunities
- Section 10 outlines the Transport Planning Objectives
- Section 11 identifies the interventions
- Section 12 provides a summary of the findings



# 03 Literature and Policy Review







# Strategic Fit

#### Introduction 3.1

This section provides insight into the freight sector both in the context of the SEStran area but also further afield, in addition to detailing the strategic context of the sector through a review of relevant policies, strategies and legislation at a national, regional and local level.

#### 3.2 Overview

The UK has one of the most efficient freight systems, ranking ninth in the world. There are around 195,000 freight and logistics enterprises which employs around 2.5 million people, in turn contributing £121 billion GVA to the UK economy. This makes the freight sector key to the UK economy with an estimated 1.6 billion tonnes of goods being transport annually by road, rail, and water. The ability of the freight sector to operate around the clock to distribute these goods to business and consumers is vital. The importance of the freight industry is set to grow further over the next decade with demand expected to increase by at least 30% and as much as 140%<sup>2</sup>.

The highway network in and around Edinburgh is significantly congested and ranked in 2021 as being the most congested city in the UK<sup>3</sup>. Three motorways, the M90, M9 and M8 provide strategic

connectivity and accessibility across the region and beyond, There is an opportunity to facilitate the efficient movement of goods however concern has arisen in recent years with regards to capacity and maintain quality facilities to allow ports such as Grangemouth to continue to be key gateways, facilitating economic growth. on the M9 and M8. Additionally, such operational performance issues are also experienced on arterial routes around Edinburgh such as the Furthermore, they can support the increase in online shopping and A820, A90 and A1 which if current congestion issues continue to be home deliveries. In addition, there is the potential to revive facilities exacerbated such cumulative impacts are likely to impact economic that are underused through the extension and reintroduction of rail performance because of poor journey times and overall journey links to link port facilities to create jobs, boost the local economy and also lower traffic congestion and pollution levels. reliability.

There is a lack of capacity on the rail network, which could Ports are vital to the Scottish economy. They create a base for trade and employment whilst also providing gateways for vital industries reduce the potential of GIZ (Grangemouth Investment Zone) from such as fishing, the cruise sector and offshore energy. Approximately developing new domestic intermodal rail freight services.. This could 20% of Scotland's total freight (excluding rail and pipeline) was limit GIZ's attractiveness as a location for warehousing in comparison handled by Scotland's seaports in 2018. Of Scotland's ports, the with road-based distribution centres and also reduce Scotland's Forth Ports Group, which consists of Rosyth, Grangemouth, Leith ability to reduce carbon emissions from freight transport. and Methil handled 26.6 million tonnes in 2018<sup>4</sup>. Grangemouth is There is a need to update freight handling facilities to enhance Scotland's major container port, with 72% of all containers which business activity, along with improving the site's flood defences to pass through Scottish ports being handled there<sup>5</sup>. It is situated improve the resilience of the site. Currently only 4% of outbound between Scotland's two major cities Glasgow and Edinburgh making and 8% of inbound flows are between GIZ and the rest of Great its location strategically significant with good connectivity via road, Britain<sup>7</sup>. rail and sea. The strength of Grangemouth and Rosyth is likely to increase with the Scottish Government's commitment to work with the haulage sector on alternatives to road freight such rail and water<sup>6</sup>.

<sup>7</sup> Grangemouth Investment Zone: Freight Flow Analysis (2017)





<sup>&</sup>lt;sup>2</sup> Delivering a Better Railway for a Better Britain, Network Rail (2017)

<sup>&</sup>lt;sup>3</sup>TomTom Traffic Index Ranking 2021, TomTom, <u>https://www.tomtom.</u> com/en\_gb/traffic-index/

<sup>&</sup>lt;sup>4</sup>Transporting Scotland's Trade, Transport Scotland (2019)

<sup>&</sup>lt;sup>5</sup>Grangemouth Investment Zone: Freight Flow Analysis (2017)

<sup>&</sup>lt;sup>6</sup> Low Carbon Scotland – Meeting our Emissions Reduction Targets 2013–2027, The Second Report on Proposals and Policies, (2014) (RPP2)

In addition, other notable issues affecting rail freight in Scotland are:

- Lack of flexibility compared to road freight;
- Capacity issues on the East Coast Main Line (ECML);
- Capacity issue on the West Coast Main Lone (WCML) in particular south of Crewe and north of Carlisle;
- Presently the Scottish Borders have no suitable freight terminals to be able to join the rail network and hence complete reliance on road freight;
- The satisfaction with Network Rail's performance, from freight companies, being at 24%<sup>8</sup>

Furthermore, track access charges represent an additional weakness for rail freight with the industry expected to pay out £87 million per year to gain track access<sup>9</sup>.

Data produced by the Department for Transport estimated there was the potential for approximately 20% of the current road freight volumes to be transferred to rail. This provides the freight industry with an opportunity to make the modal switch from road to rail, which is already a low carbon transport system contributing only 1.2% of transport emissions in 2017 (passengers 1% and freight 0.2%) In addition, currently 60% of freight bound for the North of the UK is delivered to the southern Ports, but through the greater use of coastal shipping routes cargo could be moved to the Northern Ports to lower emission levels and ease congestion. A combination of both rail and short-sea has been analytically tested, by the Centre of Sustainable Road Freight (SRF), to suggest that that 2.5 MtCO2 could potentially be saved by 2035 through measures which reduce overall HGV kms travelled across the UK.

In addition to emission levels, noise pollution levels are also In 2019, the National Infrastructure Commission (NIC), forecast an overall increase in road traffic (road vehicle kilometres travelled) of a concern across the UK. According to the Department for Environment, Food and Rural Affairs, (DEFRA) the social cost of between 18% and 54% by the year 2050. In turn they forecast that the rising levels of congestion will likely cost road freight operators noise pollution for road traffic is between £7bn and £10bn per year. Edinburgh City Council have also acknowledged that noise pollution an extra 8%-16% over the next few years. is a problem across the region, due to the increasing presence of One solution is to promote modal shift, however there are a number HGV's and vans. of potential barriers to the success of this such as:

An identified pathway to mitigate these environmental concerns is decarbonisation of the freight sector, particularly the procurement and development of Electric Vehicles (EVs), which results show are 50% cheaper to run than their diesel equivalents alongside delivering significant environmental benefits<sup>10</sup>. EVs will also help to reduce the number of large diesel goods vehicles driving through the city centres and will ultimately improve the air quality, which was confirmed by a review from Amsterdam University on LEFVs (Light Electric Freight Vehicles).

Alternatives to EV/LEFVs are the use of ITS tools that can be used to improve air quality, lower noise levels and reduce adverse effects of traffic congestion. In 2016 the Office for Low Emission Vehicles in conjunction with the Low Carbon Vehicle Partnership (LowCVP) launched an HGV technology accreditation scheme. This scheme is designed to provide independent validation of fuel savings from a range of retrofit technologies, which has the potential to be applied to freight across the SEStran area.

In 2017 transport in Scotland accounted for 35% of Scotland's CO2, with HGVs accounting for 12.6% of all transport emissions. This is likely because around 60% of freight is carried by road over distances less than 50km. Additionally, in the SEStran area transport related CO2 emissions are 95-99% road based, displaying the reliance on HGVs, which currently have no commercially available solution to decarbonisation, to distribute goods in the region.



- coordinating numbers of small hauliers;
- coordinating rail operators;
- providing key infrastructure to remove capacity limitations on the rail network and the associated conflict between passenger traffic and freight; and
- the need for convenient, key rail and port interchanges and associated rail & sea freight services to promote transfer of freight between road and rail and between road, rail and sea.

<sup>&</sup>lt;sup>8</sup> Delivering a Better Railway for a Better Britain, Network Rail (2017) <sup>9</sup> Rail Freight Strategy: Moving Britain Ahead, DfT (2016)

<sup>&</sup>lt;sup>10</sup> Freight and servicing action plan: Making London's streets safer, cleaner and more efficient

#### Policy, Strategy and Legislation 3.3

In addition to key Policies and Strategies at a Local, Regional and National level as well as Legislation which are further detailed within this section, a key enabling mechanism for the Go Forth Freight Study are outcomes of Transport Scotland's Strategic Transport Projects Review 2 (STPR2) process. STPR2 is being progressed based on the Scottish Transport Appraisal Guidance (STAG) and is a comprehensive, multi-modal assessment of the transport network across Scotland, taking into account current and future problems and opportunities. The review takes cognisance of the National Transport Strategy 2 themes around transportation whereby transport proposals should aim to contribute to the following themes: Reduces inequalities, Takes Climate Action, Helps Deliver Inclusive Economic Growth and Improves our Health and Wellbeing.

The STPR2 process outlined the following freight related options in the National Case for Change<sup>11</sup>:

- Decarbonisation of Freight Deliveries;
- Freight Consolidation;
- Freight Rest Stops;
- Freight reliability and efficiency improvements;
- Last-Mile Logistics;
- Sustainable Modal Shift of Freight; and
- Rail Freight Enhancements.

In relation to the SEStran Region, and in particular the Freight Industry, the following recommendations were published in January 2022<sup>12</sup>:

- Perth-Dundee-Aberdeen rail corridor enhancements;
- Edinburgh/Glasgow-Perth/Dundee rail corridor enhancements;
- Sustainable access to Grangemouth Investment Zone;
- Rail Freight Terminals and Facilities; and
- High Speed and cross border rail enhancements.

These recommendations set out a case for the renewal and upgrading of existing infrastructure to improve the accessibility, efficiency and reliability of freight related movements across the region and beyond.

As the Regional Transport Partnership for the South East of Scotland the role of SEStran is to strengthen the planning and delivery of regional transport developments so that it better serves both the needs of people and businesses. Improving connectivity is therefore crucial to facilitate the effective movement of goods and people, increase access to labour and distribution markets and increase the economic competitiveness of the region.

Planning and delivering infrastructure is an extremely complex process and is influenced by a variety of factors, with a primary overarching objective that infrastructure proposals are developed that stem from an identified need as detailed within relevant policy, legislation and other key strategy publications.





<sup>&</sup>lt;sup>11</sup> Strategic Transport Projects Review, Jacobs and AECOM, 2021, <sup>12</sup> STPR2 Summary Report, 2022, Transport Scotland, https://www.transport.gov.scot/media/49080/national-casefor-change-report.pdf

https://www.transport.gov.scot/publication/summary-reportjanuary-2022-stpr2/

Figure 1 highlights the relevant and appropriate policy and strategy documents as well as important pieces of UK and Scottish legislation which have been reviewed for the purpose of the SEStran Freight Strategy.

Figure 3.1:









These identified policies, strategies and plans and their relevance to the SEStran Freight Strategy are discussed further below:

#### National

- Levelling Up White Paper<sup>13</sup>: The flagship document published by the UK Government sets the vision for how opportunity and prosperity will be spread more evenly across the UK. This builds upon the Levelling Up Agenda as outlined within the previously published Levelling Up Fund prospectus with an overarching desire to address existing regional inequalities across the full breadth of the United Kingdom and to ensure that communities can successfully navigate their way out of the COVID-19 Pandemic. The White Paper recognises that a broad range of factors are needed to deliver transformative growth to places and boost local growth and economies in which delivering improved transport systems and boosting productivity are identified as a key pathways to successfully contribute towards delivery of this agenda.
- Build Back Better: Our Plan for Growth<sup>14</sup>: Published in 2021, the Build Back Better strategy outlines a framework for the UK Government which is underpinned by the three core growth pillars of Infrastructure, Skills and Innovation. With infrastructure identified as playing a key role in facilitating this agenda, high-quality infrastructure is recognised as being crucial for economic growth which boosts productivity and competitiveness. High-quality transport networks are recognises as forming foundations for economic activity and prosperity across communities throughout the United Kingdom.
- Net Zero Strategy: Build Back Greener<sup>15</sup>: Published in 2021, the plan sets out the UK Government's ambitions for keeping the UK on track towards net-zero. The plan set outs of a delivery

pathway showing indicative emissions reductions across sectors to meet the targets for the sixth Carbon Budget in 2033–2037. The Government has £26 Billion of capital investment to invest in the green industrial revolution. The Cleaner Air for Scotland 2 strategy, published in 2021, has a similar vision towards lower emissions across sectors. In particular, with relation to the freight industry, the strategy acknowledges the need for mixed spatial planning in tandem with the emergence of zero/ultra-low emission trains as a market solution towards lowering emissions. The strategy aims to engage with the freight industry and retailers to explore options associated with the last/first mile delivery approaches along with collaborating with the private sector to identify solutions on the uptake of zero/ultra-low emission vehicles.

Responding to the declaration of a **Climate Emergency** by the Scottish Government in 2019, the Climate Change (Scotland) Act 2009 was amended through the Climate Change (Emissions Reductions Targets) (Scotland) Act 2019 as well as updating the Climate Change Plan in 2020<sup>16</sup> to set out how Scotland will meet its emissions reduction targets up to 2032. The **Climate Change** (Emissions Reductions Targets) (Scotland) Act 2019 sets targets to reduce Scotland's emissions of all greenhouse gases to net zero by 2045 at the latest, with interim targets for reductions of 75% by 2030 and 90% by 2040 as well as annual targets for other years. The transport-related components of the Plan build upon NTS2, with a specific commitment to reduce car kilometres by 20% by 2030 with a key in which Low Emission Zones being



delivered across Scotland's major cities playing a key role. In 2021, the Scottish Government published **Cleaner Air For Scotland 2:** Towards A Better Place For Everyone and an associated Delivery Plan<sup>17</sup>, setting out how the Scottish Government will deliver further air quality improvements over the next five years to secure the vision of Scotland having the best air quality in Europe – a quality of air that aims to protect and enhance health, wellbeing and the environment.

- Scotland's National Strategy for Economic Transformation<sup>18</sup>: The strategy, published in 2022, sets out the vision for Scotland's economy to significantly outperform the last decade both in terms of economic performance and tackling structural economic equalities. On the International front, Scotland will be recognised as a nation of entrepreneurs and innovators who embrace the opportunities of new technologies. This overarching vision will be underpinned by achieving a fairer, wealthier, and greener economy that builds on the internationally competitive economy Scotland currently has whilst demonstrating leadership towards the net-zero transition. With Scotland occupying itself as a global leader, the strategy highlights potential new market opportunities which will cement Scotland's place internationally: the decarbonisation of transport through high value manufacturing and high value zeroemission vehicles in conjunction with Cluster building to attract inward investment to provide opportunities for local and new business.

ness,	publications/securing-green-recovery-path-net-zero-update-climate-
nment/	change-plan-20182032/
	<sup>17</sup> Cleaner Air for Scotland 2 – Towards a Better Place for Everyone,

Scottish Government, 2020, <u>https://www.gov.scot/publications/</u>

<sup>18</sup> Scotland's National Strategy for Economic Transformation, 2022, Scottish Government, https://www.gov.scot/publications/scotlandsnational-strategy-economic-transformation/documents/



<sup>&</sup>lt;sup>13</sup> Levelling Up White Paper, 2022, UK Government, <u>https://assets.</u> publishing.service.gov.uk/government/uploads/system/uploads/ attachment data/file/1052708/Levelling up the UK white paper.pdf <sup>14</sup> Build Back Better: our plan for growth, HM Treasury, 2021, <u>https://www.</u><sup>16</sup> Securing a green recovery on a path to net zero: climate change plan

<sup>&</sup>lt;sup>15</sup>Net Zero Strategy: Build Back Greener, Department for Busin Energy & Industrial Strategy, 2021, <u>https://www.gov.uk/goverr</u> publications/net-zero-strategy

gov.uk/government/publications/build-back-better-our-plan-for-growth 2018-2032 - update, Scottish Government, 2020 https://www.gov.scot/ cleaner-air-scotland-2-towards-better-place-everyone/

- Infrastructure Investment Plan<sup>19</sup>: The Infrastructure Investment Plan (IIP) sets out the Scottish Government's plan for infrastructure over a 5-year period 2021/22 to 2025/26. The Plan's Vision that 'Our infrastructure supports Scotland's resilience and enables inclusive, net zero and sustainable growth' is underpinned through a desire to enable the Net Zero emissions and environmental sustainability, driving inclusive economic growth and building resilient and sustainable places. The planned commitment of £3.8 billion to improve and decarbonise the rail network for passengers and freight forms part of the wider £24 billion package of planned investment with targeted support in the form of the Freight Facilities Grant providing an opportunity to encourage the shift in road to rail.
- National Planning Framework: Scotland's Third National Planning Framework (NPF3) was published in 2014<sup>20</sup> and presents the Scottish Government's spatial strategy. It is the spatial expression of the Government Economic Strategy and sets out national priorities for development and infrastructure investment with a particular mention with regards to that the rail freight connections to and from the port of Grangemouth and Rosyth will be considered as an integral part of the national developments. This commitment to provide further rail freight facilities will strengthen the Forth Ports ability to connect efficiently and sustainably not only to Scotland but also the rest of the UK. It will also promote the modal shift of road freight to rail freight which is estimated to reduce carbon emissions by 75%, whilst also reducing road congestion.

The National Planning Framework 4 (NPF4)<sup>21</sup> is being developed alongside the IIP and will set out a new plan for Scotland up to 2045, replacing the existing NPF3. A consultative draft of the Framework was laid to Parliament in November 2021. The draft NPF4 sets out a need to "embrace and deliver radical change to tackle and adapt to climate change, restore biodiversity loss,

support the burgeoning express logistics sector.

global markets to tackle congestion.

The Scottish transport network currently supports the function of over 360,000 businesses and in 2018, facilitated the movement of 214 million tonnes of freight (excluding pipeline and rail) of which the overwhelming majority was transported via road (69%) followed by water (31%) with aviation accounting for less than 1%. The number of trips associated with the movement of goods is projected to increase by 44% between 2014 and 2037 which has the potential to negatively impact on journey times which will in-turn impact businesses, particularly those which involve timedependent goods deliveries.



#### improve health and wellbeing, build a wellbeing economy and create great places.". Within the SEStran area specifically, there are identified opportunities for the green economy for ports along the East Coast such as Methil and Rosyth as well as enhanced facilities to enable inter-modal freight handling and passenger facilities at Grangemouth. There is a recognised need to provide new hubs and facilities to decarbonise freight which are also expected to

#### • National Transport Strategy 2<sup>22</sup>: The second National Transport

Strategy (NTS2) published in February 2020, sets out an ambitious and compelling vision for Scotland's transport system for the next 20 years - "We will have a sustainable, inclusive safe and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors". In support of this vision, the strategy sets out four priorities: reduces inequalities, takes climate action, helps deliver inclusive economic growth and improves our health and wellbeing. The strategy realises that freight has challenges and thus has highlighted the importance for improved journey times and connections between Scotland's cities and towns as well as the

From an environmental perspective, an identified challenge is addressing the significant historic increase in emissions associated with road-based goods vehicles (i.e. LGVs and HGVs) as well as the social, transport and wider impacts of Last-Mile activities, particularly in urban areas, and the communities which are impacted by traditional means of transporting goods.

Therefore, key to delivering the NTS2 Vision and in-line with the Sustainable Travel Hierarchy is the commitment to promote more efficient and sustainable freight transport, with a strong focus being placed on encouraging mode shift from road to rail. Furthermore, it has also been identified that the freight sector will play a prominent role in meeting Net Zero and wider environmental targets through decarbonisation.

Scotland's Rail Freight Strategy<sup>23</sup>: Published in 2016 the strategy sets out the Scottish Governments vision for a "competitive, sustainable rail freight sector playing an increasing role in Scotland's economic growth by providing a safer, greener and more efficient way of transporting products and materials". In order to achieve this vision, the strategy outlines the levers of success which are: Innovation though the examination of existing market barriers and proactively identifying new market opportunities; Facilitation through a coordinated approach to ensuring the efficient use and availability of the Scottish network whilst ensuring alignment of the opportunities for cross border flows; Promotion by promoting the benefits of using rail freight along with providing easy access to current information. The strategy details the aspiration to provide investment that will create an environment that attracts inwards investment, facilitates growth and bolsters confidence in the longterm planning of improvements to the network.  $\square$ 

<sup>22</sup> National Transport Strategy 2, Transport Scotland, February 2020 https://www.transport.gov.scot/our-approach/national-transport-<u>strategy/</u> <sup>23</sup> Scotland's Rail Freight Strategy, 2016, Scottish Government, <u>https://</u> www.transport.gov.scot/media/5362/ts-rail-freight-strategy-a4-aw3.pdf















<sup>&</sup>lt;sup>19</sup> A National Mission with Local Impact: Infrastructure Investment Plan for Scotland 2021–22 to 2025–26. Scottish Government, 2021. https:// www.gov.scot/publications/national-mission-local-impact-infrastructureinvestment-plan-scotland-2021-22-2025-26/

<sup>&</sup>lt;sup>20</sup> National Planning Framework 3, Scottish Government, 2014, <u>https://</u> www.gov.scot/publications/national-planning-framework-3/ <sup>21</sup> Scotland 2045: Our Fourth National Planning Framework, Scottish Government, 2021, https://www.gov.scot/publications/scotland-2045fourth-national-planning-framework-draft/documents/

Similar and wider aspirations are set out within the **Union Connectivity Review**<sup>24</sup> which outlines several key policies associated with the improvement of connectivity across the United Kingdom and its devolved nations, with both rail and road improvements identified as playing a key role in improving how goods and people travel across the UK. With Edinburgh and its surrounding area being identified as a critical transport hub that facilitates strategic transport movements across both Scotland and the UK, a significant opportunity has been identified in enhancing the East Coast Main Line. Currently handling over 20million passengers every year and with capacity constraints, enhancement of this corridor has the potential to deliver significant benefits across the UK.

- Scotland's Agenda for Cities<sup>25</sup>: Published in 2016, Scotland's Agenda for Cities sets out the Scottish Government's strategic framework for future interaction with Scotland's cities and sets out the changes in context since the original Scotland's Cities: Delivering for Scotland strategy was published in 2011. The strategy's vision is for 'A Scotland where our cities and their regions power Scotland's economy for the benefit of all'. Within the vision's aims are to increase the internationalisation of Scotland, boost investment, as well as innovation and support inclusive economic growth. Maximising the effectiveness of City Region Deals as well as the particular economic assets for each of Scotland's growth sectors is identified as a means to support inclusive economic growth among Scotland's Cities which as a result of existing significant economic activities within these locations, in-turn provides benefits to wider regions.





<sup>&</sup>lt;sup>24</sup> Union Connectivity Review, 2021, UK Government, <u>https://www.gov.</u> uk/government/publications/union-connectivity-review-final-report

<sup>&</sup>lt;sup>25</sup> Scotland's Agenda for Cities, 2016, Scottish Government, <u>https://www.</u> gov.scot/publications/scotlands-agenda-cities/

#### Regional

- SEStran 2035 Regional Transport Strategy<sup>26</sup>: Published in 2021 the draft strategy seeks to build upon the success of the currently adopted Regional Transport Strategy (RTS) for the South East Scotland Region. The draft publication has a Vision for ""A South-East of Scotland integrated transport system that will be efficient connected and safe, creating inclusive, prosperous, and sustainable places to live, work and visit, affordable and accessible to all, enabling people to be healthier and delivering the region's contribution to net zero emissions targets". The objectives within the strategy are to: transition to a sustainable, post-carbon transport system; Facilitate healthier travel options; widen public transport connectivity and access across the region; and support safe, sustainable efficient movement of people and freight across the region.

Recognised as a strategic sector, there are currently significant operational performance issues associated with freight from a road perspective as well as there being constraints on the rail network, such as gauge clearance, however there are aspirations to develop freight facilities in the region such as at Grangemouth. Forth Ports are recognised as being not only a regional but also a national asset as they account for 43% of the total freight moving through Scottish Ports which are identified as having potential to support further economic growth, particularly between Europe and Scotland. Although the need to rapidly decarbonise transport is recognised, particularly Freight, it is identified that ULEV technology has yet to provide a viability commercial alternative for vehicles to support this transition.

work and do business".

The plan sets out a range of aims in which to deliver the vision for the region most notably, the integration of land use and sustainable modes of transport, reduce the need to travel and cut carbon emissions by promoting sustainable development and reducing development's contribution to climate change through mitigation and adaptation and promote high quality design / development. The Plan highlights the importance of key strategic infrastructure such as the Levenmouth Rail Link and the Halbeath/Inverkeithing Rail Spur and opportunities at Rosyth for a new international container terminal.

investment across Fife and the Scottish Borders.



#### - Strategic Development Plan for Edinburgh and South East

**Scotland**<sup>27</sup>: As the Strategic Spatial Planning Document for a significant proportion of the SEStran area, the 2013 Publication sets out a Vision that "by 2032 the Edinburgh City Region is a healthier, more prosperous and sustainable place with continues to be internationally recognised as an outstanding area in which to live,

**City Region Deal, Edinburgh & South East Scotland**<sup>28</sup>**:** The City Region deal is made up of six local authorities, together with regional universities, colleges and the private sector with a value of over £1.3 billion. The aim is to drive productivity and growth while reducing inequalities and deprivation. Five themes embody this vision: Research, development and innovation, integrated regional employability, transport, culture and housing. The deal states that £156 million will be made available for the Transportation sector as well as £751million set aside for Innovation with the latter supporting development of the Food and Drink Innovation Campus in East Lothian and a programme of economic infrastructure

- <sup>28</sup> City Region Deal Edinburgh & South East Scotland, 2018, <u>https://</u> static1.squarespace.com/static/55c87967e4b05aa55020f656/ t/5c263201898583ec74c01146/1546007049724/
- ESESCR+Deal+Document+6+August+2018+signed.pdf

- **Tay Cities Region Deal**<sup>26</sup>**:** The deal outlines the region's ambition to become one of the most productive knowledge-led economies in Europe, whilst ensuring that, as we become smarter, we also become a fair work region. The deal outlines the investment areas for the period of 2017–2037 where £1.83 billion will be invested to ensure everyone who lives in the region benefits by helping to support inclusive growth. One of the strategic aims of the Region Deal is to invest in improvements for inter-city rail corridors to reduce journey times and increase passenger and freight capacity services between Scotland's cities, whilst seeking to electrify the network.

<sup>&</sup>lt;sup>26</sup> SEStran 2035 Regional Transport Strategy, 2021, SEStran, <u>https://</u> sestran.gov.uk/publications/sestran-2035-draft-regional-transport-<u>strategy/</u>

<sup>&</sup>lt;sup>27</sup> Strategic Development Plan for Edinburgh and South East, 2013, SEStran, <u>https://static1.squarespace.com/</u> static/55c87967e4b05aa55020f656/t/61781377dc9f34083c1 fc147/1635259322167/Strategic+Development+Plan+23+09+%281%29.pdf

#### Local

- Edinburgh Local Development Plan<sup>30</sup>: Published in 2016, the plan has five key aims: support the growth of the city economy, help increase the number and improve the quality of new homes being built, help ensure that the citizens of Edinburgh can get around by sustainable modes, look after and improve the environment and help create strong sustainable and healthier communities. Delivery of improvements to Rail Halts at Portobello, Piershill, Meadowbank and on the south suburban line affirmed as key which are expected to help promote and prioritise travel by sustainable means and minimise the detrimental effects of traffic on the environment. Further developments such as the Northern and Eastern Docks as well as the Western Harbour at Leith are highlighted as key areas for investment.

The City, alongside Glasgow, Aberdeen and Dundee is developing a Low Emission Zone<sup>31</sup> which seeks to protect public health by improving air quality whilst also helping contribute towards delivery of climate change emission reduction targets. Subject to final approval by the Council and Scottish Ministers in Spring 2022, the LEZ will open later in 2022 and will cover a significant proportion of the City Centre. Although implementation may cause some disruption to commercial activities due to the increased cost associated with transporting goods by traditional means (e.g. Goods Vehicles), the LEZ will present an opportunity for moving goods in a more sustainable manner.

- Scottish Borders Council Local Development Plan<sup>32</sup>: The plan's vision, which was published in 2016, is that development is sustainable and meets the challenges of a changing climate. The

plan sets out key criteria which must be met in order to obtain the council's support such as: promote sustainable travel, facilitate the development of allocated sites in ways which promote sustainable travel, enable sustainable movement of goods, particularly by Rail, no unacceptable adverse impact on the natural and built environment and furthermore have no unacceptable adverse impact on the occupiers of adjacent land by virtue of noise, smell and noise pollution.

- cycling.
- environment.



- West Lothian Local Development Plan<sup>33</sup>: Mirroring the regional vision as set out in the Strategic Development Plan for Edinburgh and South East Scotland, the West Lothian LDP has similar Strategic polices to help deliver this aspiration. The LDP acknowledges that to balance the often-conflicting demands of economic growth and reducing carbon emissions and other negative issues arising from transport, the Spatial Strategy prioritises development that reduces the need to travel, facilitates travel by public transport and movement of freight by rail or water on the Union Canal, and provides a safe and convenient environment for walking and

East Lothian Local Development Plan<sup>34</sup>: Mirroring the regional vision as set out in the Strategic Development Plan for Edinburgh and South East Scotland, the East Lothian LDP has similar polices to help deliver this aspiration. In particular, the Plan highlights the need for integration between transport and land use for new developments to minimise the need to travel, which will allow for the protection and conservation of both the natural and built

- Midlothian Local Development Plan<sup>35</sup>: Mirroring the regional vision as set out in the Strategic Development Plan for Edinburgh and South East Scotland, the Midlothian LDP has similar Strategic polices to help deliver this aspiration of a more prosperous area. To achieve this, the Local Authority sets out a desire to support the development of Midlothian's economy especially regarding its competitiveness and sustainability. Sustainability is also acknowledged through the need to respond robustly to the challenges of mitigating climate change and its impacts.
- Fife Local Development Plan<sup>36</sup>: Published in 2014 the strategy outlines key proposals within the Spatial Strategy aims, whereby the development of Port of Rosyth and the safeguarding of the Leven rail link are noted as key proposals for the vision of the plan.
- Falkirk Local Development Plan 2<sup>37</sup>: Published in 2020 the Plan seeks to deliver a Falkirk that is a dynamic and distinctive area at the heart of Central Scotland characterised by a network of thriving communities set within high quality greenspaces, and a growing economy which is of strategic importance in the national context, providing an attractive, inclusive and sustainable place in which to live, work, visit and invest. Strategic objectives within the plan highlight a desire to foster economic growth, investment, and inclusion; support a low carbon circular economy and build resilience to climate change; and provide infrastructure to meet the needs of an increasing population and further improve the area's connectivity.

)17/ldp	<u>Amended - 2020-01-08.pdf?m=637140907284930000</u>
	<sup>34</sup> East Lothain Local Development Plan, 2018, East Lothian Council,
	https://www.eastlothian.gov.uk/downloads/file/27791/local_
<u>t-</u>	development_plan_2018_adopted_270918_
	<sup>35</sup> Midlothian Local Development Plan, 2017, Midlothian Council, <u>https://</u>
sion_	midlothian-consult.objective.co.uk/kse/event/31779/section/

<sup>36</sup> Fife Local Development Plan, 2014, Fife Council, <u>https://fife-consult.</u> objective.co.uk/portal/fife\_ldp/fifeplan -\_adopted\_plan\_13/adopted\_ fifeplan?tab=files

<sup>37</sup> Falkirk Local Development Plan, 2020, Falkirk Council, <u>https://www.</u> falkirk.gov.uk/services/planning-building/planning-policy/localdevelopment-plan/docs/ldp2/LDP2.pdf?v=202101191030

<sup>&</sup>lt;sup>30</sup> Edinburgh Local Development Plan, 2016, City of Edinburgh Council, https://www.edinburgh.gov.uk/downloads/file/25264/edinburgh-localdevelopment-plan

<sup>&</sup>lt;sup>31</sup> Edinburgh Low Emission Zone, Accessed March 2022, <u>https://www.</u> lowemissionzones.scot/local-zones/edinburgh

<sup>&</sup>lt;sup>32</sup> Scottish Borders Council Local Development Plan, 2016 Scottish Border Lothian Local Development Plan - Adopted final Web Ver

Council, https://www.scotborders.gov.uk/downloads/file/20 volume\_1\_policies\_

<sup>&</sup>lt;sup>33</sup> West Lothain Local Development Plan, 2018, West Lothain Council, https://www.westlothian.gov.uk/media/38765/Wes Lothian-Local-Development-Plan-Adopted-2018/pdf/West

- Clackmannanshire Local Development Plan<sup>38</sup>: The plan's vision is for the growth and development of Clackmannanshire to 2035, along with clear strategic objectives. The objectives focus on sustainable economic growth, environmental sustainability, protection of the natural environment and sustainable transport and accessibility.
- City Mobility Plan 2021-2030 (Edinburgh)<sup>39</sup>: Published in 2021 the Mobility plan seeks to ensure Edinburgh is connected by a safer and more inclusive net zero carbon system delivering a healthier, thriving fairer and compact capital city and a higher quality of life for all residents. The City Council aim to achieve the vision, as outlined, by encouraging behaviour change to support the use of sustainable travel modes, reducing harmful emissions from road transport, reducing vehicular dominance and improve the quality of our streets. These notable objectives highlight the city's commitment to lower the affects of transport on our climate and the wellbeing of the local population. The plan highlights how the use of different types of vehicles and alternative fuels will reduce the adverse impacts of freight and good movements. Cargo bikes, the evolution of electric freight technology and the opportunities to use hydrogen fuel cell technology are highlighted a key driver to lowering the adverse impact of freight movements. Consolidation and Micro distribution centres will enable a holistic strategy for freight distribution around the city to ensure less pollution vehicles are used to make deliveries in the city.
- Fife Local Transport Strategy<sup>40</sup>: Published in 2006, the strategy sets out a 20-year plan for the transport across the area, whereby the vision is for fife to have an integrated and sustainable transport system which is accessible to all and contribute towards a strong economy, strong community, and healthy environment. The notable objectives within the strategy's vision include: encouraging more sustainable travel for new and existing development and

the promotion of efficient movement of freight and encouraging transfer of goods from road to rail, sea and pipeline. Focusing specifically on freight transport, the strategy aspiration is to investigate the potential for improved freight interchange facilities to promote convenient transfer to rail. This is carried out through the promotion of rail improvements which improve rail capacity to all greater and more efficient freight movements. Ports are an additional area of interest where the strategy aims to improve the capacity and access of Rosyth Port to promote more efficient and convenient transfer of freight by sea to rail and road. In tandem with these aims the key targets are to maintain appropriate access for freight by road, promote the expansion of Rosyth Port for freight, improve the Fife circle line to accommodate freight access to Rosyth whilst also investigating the potential for expansion of the Thornton rail depot.



**Falkirk Local Transport Plan**<sup>41</sup>**:** Published in 2014, the plan seeks to provide a transport network both within the Council area and linking to the surrounding areas which allows people a reasonable choice of travel options as part of a safe, reliable, convenient accessible and sustainable transport system. In order to achieve Falkirk Council's vision a number of objectives are outlined, such as: to support the growth of the local economy in a sustainable way, contribute to community regeneration through promoting social inclusion, to protect the environment by minimising the impact that transport can have on it and to improve health by promoting more active travel, to improve safety for all those using the transport network, and to improve integration between different forms of transport. Freight is highlighted as a significant attribute to the local and national economy, as they are an integral part of modern life. The plan highlights the current challenge in supporting the freight industry to enable it to function whilst mitigating negative on the wider community. The Grangemouth Docks are acknowledged

as nationally significant freight sources, with the National Planning Framework Project 5 highlighting the importance of freight and Grangemouth including the rail facilities.

Scottish Borders Local Access and Transport Strategy<sup>42</sup>: The Main Issues report published in 2015 sets out the identified key issues for the rural region. Key strategic concerns relate to the lack of access to markets (both national and abroad) across all modes of transport with rail and road improvements being recognised as playing a key role with the Local Authority having aspirations to enhance Borders Rail, particularly to Hawick and across Eastern Berwickshire and targeted road improvements along strategic transport corridors.

#### Policy Summary

The policies, relevant to the study area, highlight a commitment to improving Freight Logistics both across Scotland, through NTS2 and STPR2, and the SEStran region through the SEStran Regional Transport Strategy. The visions acknowledge a commitment to improving freight operations that will improve the transport network's reliability, whilst ensuring the impact on the environment are mitigated and wider goal of tackling climate change.

However, although the policies, outlined above, highlight an acknowledgement and commitment towards improvements to address the current deficiencies in the transport network regarding the freight sector, it is pertinent that these policies receive greater backing. In addition, a range of the reviewed policies, particularly at a regional and local level, lack substance regarding the commitment to ensuring the freight sector is developed sustainability, within Scotland.

<sup>39</sup> City Mobility Plan 2021–2030 (Edinburgh), 2021, <u>https://www.edinburgh.gov.uk/</u> downloads/file/29320/city-mobility-plan-2021-2030

<sup>40</sup> Fife Local Transpot Strategy, 2006, Fife Council, <u>https://www.fife.gov.uk/</u> data/assets/pdf\_file/0026/286082/LocalTransportStrategy-2006-2026.pdf

<sup>41</sup> Falkirk Local Transport Plan, 2014, Falkirk Council, <u>https://www.falkirk.gov.uk/</u>

services/roads-parking-transport/policies-strategies/docs/transport-policy/ Local%20Transport%20Strategy%202014.pdf?v=201906271131

<sup>42</sup> Scottish Borders local Transport Strategy, 2013, Scottish Borders Council, https://www.scotborders.gov.uk/downloads/file/90/local\_access\_and\_ transport\_strategy\_mir

<sup>&</sup>lt;sup>38</sup> Clackmannanshire Local Development Plan, 2015, Clackmannanshire Council, <u>https://www.gov.scot/binaries/content/</u> documents/govscot/publications/factsheet/2018/06/clackmannanshire-council-planning-authority-core-documents/ documents/local-development-plan/local-development-plan-2015/local-development-plan-2015/govscot%3Adocument/ Clackmannanshire%252BLocal%252BDevelopment%252BPlan%252B%2528August%252B2015%2529%252Breduced%252Bsize. <u>pdf</u>

# 04 Multi-Modal Freight in the SEStran Area





# **Multi-Modal Freight** in the SEStran Area

This section outlines the current non-road freight movements that take place in the SEStran area. This will enable assessment of any barriers to further growth and scope for modal shift as well as opportunities to develop use of sustainable modes for freight.

#### Water Freight 4.1

The Forth has 3 ports capable of handling large ships and a range of cargoes. They also all have extant rail connections, although at the Leith and Rosyth locations these have been out-of-use for some time.

Opportunity: The Forth has a number of ports, offering the potential for further growth in water freight, particularly shortsea shipping

> Figure 4.1: Ports in South East Scotland (Source: Transport Scotland)

Kab















#### 4.1.1 Grangemouth

Grangemouth is Scotland's largest port, handling 9 million tonnes of cargo each year through specialist container, liquid and general cargo terminals. This cargo flow represents as much as 30% of Scotland's Gross Domestic Product (GDP), highlighting the port's essential role as an economic facilitator for Scotland.

The port has been developed on reclaimed land and can offer up to 11 metres water draft. However, there are two 4-hour accessibility windows for vessels coming out of the port due to tidal changes.

Grangemouth has the second biggest liquid bulks terminal in the UK in terms of volume moving out the port, primarily operated by Ineos Petrochemical Plant. ED&F Man use a terminal for food grade and animal feed products.

The East Cut has 7 metres draft with the North side the main operational site for cargo. Cargo includes steel pipes, timber, wood chip, fish meal, pulp from the Baltics and Biomass as well as fish meal manufacture. The East Quay wall is used for general cargo and handles a quarter of million tonnes of cargo a year.

The Main Container terminal is Scotland's biggest terminal, handling approximately 150,000 containers a year. There are eight feeder services to some of the biggest hub services in the world including Antwerp, Rotterdam and London Gateway. There is also a container freight station which stores plywood from China and South America. In addition, there is 500,000 square foot of warehousing with a mixture of construction materials and bulk fish meal being stored. The port has a number of tenants including Eddie Stobart, Dyce Carriers, Ineos and a tank wash company. There is also a dry dock which isn't used extensively.



The port is not operating at capacity and there are plans for growth.







#### **Rail Links**

The Port has a 400m rail siding for containers, which handles a weekly Tilbury train and a Monday to Friday service operated in conjunction with DRS. Currently, the siding can only accommodate 5 megafret wagons. The train therefore splits at Fouldubs siding (a 625m passing loop) and is then shunted in 5 megafrets at a time. However, at the time of writing work is underway to deliver a 775m dual rail siding and a 650m rail pad, which will be operational in January 2021

The line is electrified until the end of Fouldubs junction. The train transports domestic freight and calls at Daventry en-route. Some southbound cargo on the train goes out by sea from Tilbury. The rail siding mainly accommodates supermarket and wastepaper products.

only interaction Forth Ports have with this is when the train enters/ exits the port due to the rail line passing through the port into the Ineos Site. The siding is largely single track but there is a dual section to aid loading/unloading goods.

Between July 2019 and June 2020 2,400 TEUs were transported by rail at Grangemouth.

#### **Road Links**

The port is connected to the road network via the A904, approximately 1.5km from M9 Junction 6 on the strategic road network.

Other than the current rail services (and excluding transhipment) all other goods are brought to or collected from the port by road freight. This generates significant traffic movements and there are issues with complaints when the terminal is busy as drivers wait on residential roads to gain access to the port.

Table 4.1 shows the data from the vehicle booking system at Grangemouth, demonstrating that over 300,000 containers were handled by the report in 2019. Whilst there were similar numbers of inbound and outbound containers there were approximately twice as The siding takes aviation fuel through the site from the Ineos site. The many empty outbound containers suggesting a trade imbalance.

	Inbound Containers	Outbound Containers	Total
Empty	38,371	74,207	112,578
Full	117,956	96,127	214,083
Total	156,327	170,334	326,661

Table 4.1 Grangemouth 2019 VBS System

Source: Forth Ports



#### Good lifted at Grangemouth

Figure 4.2 shows the bulk goods lifted at Grangemouth for both 2018 and 2019. It demonstrates how variable the types of goods that are handled at the port can be in different years, with an increase in the amount of fishmeal handled between 2018 and 2019 plus material increases in goods such as timber products. Conversely, the volume of goods such as biomass and wind turbine parts reduced at the port. The biomass is destined for Cowie and Bo'ness, whilst pulp is delivered to Irvine and originates in Russia, Belgium, Finland and Sweden. 🕨

Opportunity: Grangemouth handles a wide variety of commodities, with a significant proportion arriving or leaving the port landside by road. There is scope for further growth in both volumes and sustainable modes

When considering the potential for modal shift, it is important to understand the markets from where the goods originated or their destination (see Table 4.2 below). Any goods with a local and widely dispersed market are likely to have limited scope for movement by rail freight. However, bulk materials such as timber products transported in a single shipment over longer distances can be delivered very competitively when compared to road freight.

Product	Destination
Fishmeal	Deliveries to Bathgate and salmon farms on predominantly North West coastline
Coal & Coke	In by sea and delivered to Longannet
Biomass & Woodpulp	In by sea and delivered to Cowie and Bo'ness
Timber Products	Shipping in via container and delivered to Uddingston
Steel Pipes	In by sea and delivered to Motherwell
Oil Seeds & Nuts	Out by road and delivered to manufacturer in Cambuslang
General Cargo – Other	Port based manufacturer
Glass Cullet	In by sea destined for Alloa
Iron & Steel – Other	In by sea destined for Motherwell
RDF	In by road from Falkirk waste processing facility
Wind Turbine Parts	Completely depends on wind farm project location

#### Goods Lifted at Grangemouth



Figure 4.2: Bulk Goods Lifted at Grangemouth

Source: Forth Ports





#### Intermodal Goods

In 2019 the Grangemouth Vehicle Booking System (VBS) recorded 171,785 containers, both inbound and outbound. Of that figure 61,783 (36%) were empty. The port handled 238,121 TEU in 2019.

Table 4.3 shows the proportion of containers handled at Grangemouth that are empty for both inbound and outbound movements. Almost three quarters of containers are full on arrival at the port from the sea, whilst the majority of containers coming into the port by land are empty, reflecting the imbalance of trade between the UK and the rest of the world. Forth Ports were able to provide the information given by shippers pertaining to the contents of containers moved through Grangemouth. This information is a bespoke description for each consignment (depending on the individual completing the form) and not every shipper provides the information. Nevertheless, it offers an important understanding of container goods moved through the port. By taking the top 30 commodity types reported (representing over 50% of all container movements) a representative sample was achieved.

Movement	Total	Total Combined	Proportion
Inbound Empty	21,623	01100	27%
Inbound Full	59,485	81,108	73%
Outbound Empty	50,517	00 (77	56%
Outbound Full	40,160	90,077	44%

Table 4.3: Container Movements at Forth Ports

Source: Forth Ports

8%

8%





Figure 4.3: Unitised products handled at Grangemouth

Figure 4.3 shows that a significant proportion of container goods were alcoholic products (such as undenatured ethanol, whisky and spirits). Other key movements include food products and paper.

- Alcoholic Products
- Food Products
- Paper
- Wastepaper
- Chemical Products
- Other
- New Pneumatic Tyres/Tyres
- Scrap Metal
- Machinery
- Used Clothing

#### 4.1.2 Rosyth

Forth Ports Rosyth is located in Fife on the north bank of the river Forth, with direct river access to quayside and deep-water berthing facilities. There is a new 200,000 square foot warehouse and crane which forms part of a new AgriHub for Scotland. The new crane has 154 tonnes capacity and is the biggest movable Quayside crane in Scotland. It has been used to lift oil and gas equipment and is capable of lifting locomotives.

The longest berth is the Northwall which is 540 metres long and can take draft of around 9 metres for vessels. There can be oil, cruise and grain vessels on this berth at the same time.

Previously the port was served by a DFDS Ro-Ro service, however this service is no longer operational. Primarily the port handles agricultural products. In addition, the port works with Oceaneering who make umbilicals for subsea projects.

Rosyth was the main port used in the construction of the Queensferry Crossing. This involved the movement in and out of every single piece of the Queensferry Crossing, such as cables and the bridge sections.







#### **Rail Links**

The port has a disused rail link and associated rail shed. This has a junction with the main line at Inverkeithing and routes through third party land. It is single track for the majority of the line, but it splits into a 340m siding within the port with an additional 3 lines for wagon manoeuvring. It is limited to 20mph (W8 gauge) from the Inverkeithing Junction. There is a turning circle at Townhill (near Dunfermline) which is limited to 350m which would flow round via Alloa to Stirling.

The map to the right shows the spur and Network Rail land ownership shaded in Green (note that this is indicative only). Network Rail own and have responsibility as far as the Underbridge.

The port's rail link was last used properly around 15 years ago, but since then it has been closed by Network Rail. This means the port would need to come to an agreement with Network Rail to reopen the line. A reinstated rail link could also serve Babcock Rosyth, one of the largest waterside manufacturing and repair facilities in the UK.

The line is temporarily closed through the Short-Term Network Change Process, but this process requires that the line be returned for operational use, at its previous capacity/capability (1 train in and out a day at 20mph) subject to a formal request and business case to Network Rail. The last freight train is understood to have run in 2006/2007 and in 2010 passenger units were refurbished at Rosyth. As the line has not been used for around a decade, an assessment would be required to determine what work would be required to the infrastructure prior to reopening, and how quickly this work could be carried out. Also required is the clearing of vegetation from 1.3km length of line from M90 tunnel to Inverkeithing station.







#### **Road links**

80,000

Rosyth is located approximately 2km west of the M90 Junction 1B and the Queensferry Crossing. The A985 Admiralty Road provides East-West links. The port experienced slightly higher vehicle movements than Grangemouth, which have fluctuated since 2018 Q1.

2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	Total	No. Hauli
1812	405	2307	2000	2108	1201	1777	1559	13169	214
Table 4.3: Fre	eight Vehicle M	lovements at F	Rosyth						
Source: Forth Po	orts								

### Goods lifted at Rosyth



Figure 4.5: Goods liftted at Rosyth



Figure 4.5 shows the bulk goods lifted at Rosyth for both 2018 and 2019. It demonstrates how variable the types of goods that are handled at the port can be in different years, with a sevenfold increase in the amount of soyabeans handled between 2018 and 2019 and material increases in goods such as marble chips. Conversely, goods such as maize and scrap metal reduced.  $\blacktriangleright$ 

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When considering the potential for modal shift it is important to understand the markets from which the goods originated or their destination. For example, the animal feedstuffs handled by Rosyth are predominantly for a local but dispersed market and therefore there is likely to be limited scope for rail freight in this instance. Maize generally goes to distilleries. However, bulk materials such as aggregates transported in a single shipment over longer distances can be delivered very competitively when compared to road freight.

#### Commodity

Maize

Rapeseed

Soyabeans

Wheat

Marble Chips

Animal Feedstuffs

Sugar Beet Pellets

Rapeseed Meal

Fertiliser

Salt

Scrap Metal

Biomass

NSO Supplies

Pipes

Table 4.4. Origin/Destination of goods lifted at Rosyth

Source: Forth Ports



Origin/Destination
Edinburgh based distillers
To a wide range of locations across Scotland
To a wide range of locations across Scotland
To/from a wide range of locations across Scotland
To wide variety across Scotland – local merchants, central belt
To a wide range of locations across Scotland
To a wide range of locations across Scotland
To a wide range of locations across Scotland
Unknown
Council road salt depots
Tenant in port
Glenrothes plant
Variety, generally local or tenant in port
Motherwell, Bathgate and Fife



#### 4.1.3 Leith

Forth Ports Leith is Scotland's largest enclosed deep-water port with the capability of handling vessels up to 50,000 deadweight tonnes. Located to the north east of Edinburgh, less than 3 miles from the city centre, the port has access to Scotland's road and rail networks and is well positioned for all North Sea shipping activities. The site is very extensive and can take vessels up to 210 metres long with a 10 metre draft and 13 metre beam. It also has a drydock facility.

Imperial Dock is the deepest area of the port and where the largest vessels come into dock. It is also the site of a cement terminal. It also has road salt and grain silos (although the latter is now redundant).

Cruise vessels operate out of the port and the main cruise terminal sits next to the ADM Flour Mill. Leith and Edinburgh docks are restricted by the beam of vessel and used for small vessels only, such as oil supply ships and glass carrying vessels.

The Seafield site was originally used for pipe storage and comprises 25 acres.

#### Opportunity: Leith's proximity to Edinburgh City Centre






### **Rail Connection**

A rail connection serves the port where it splits into 4 passing loops (close to the DB Cargo yard), each 480 metres long. The stretch of line through the port is 1.2km in length. The line is mostly owned by Network Rail and despite not having been in use for a number of years is still live. Craigentinny is the nearest line with an electric overhead line (25 Kilovolt), which is around 2 miles away and the East Coast Main Line (ECML) gives good access to other sites. Stakeholder feedback suggested that the track layout is inadequate and this leads to inefficient movements of freight.

In the past, pipes and steel products have been transported on the rail line. Figure 4.5 shows the spur with Network Rail land ownership shaded in Green (note that this is indicative only).



Figure 4.5: Rail Link to Leith





### **Road Connection**

Freight vehicles exit the port along Bass Road and join Seafield Road, before heading out towards Harry Lauder Road and the A1 or Queensferry Road then towards the bridges. Given the port's proximity to Edinburgh and ability for goods to arrive by rail or sea there is potential for the port to operate as a type of consolidation centre/depot that serves the city centre.

Port gate movements in 2018–19 are around twice those at Grangemouth and Rosyth. This suggests greater potential for generating the critical mass needed to justify a shift to rail freight.

2018 Q1	2018 Q2	2018 Q3	2018 Q4	2019 Q1	2019 Q2	2019 Q3	2019 Q4	Total	Tota Opera
2,514	2,036	3,764	3,890	4,145	3,642	2,730	2,880	25,601	278

Table 4.5. Freight Vehicle Movements at Port of Leith Source: Forth Ports



Figure 4.6: Products handled at Leith

### Goods lifted and activity at Leith

There is significant Oil and Gas activity with a company on site specialising in concrete linings for associated pipes which are exported around the world. Agriculture and construction products are also a key import and export into the port. Figure 4.6 shows that in 2019 maize (predominantly for the drinks industry), salt, cement and wheat all represented commodities with over 100,000 tonnes lifted with at the port, with big growth in maize, salt and pipes.  $\mathbf{D}$ 



Issue: Road freight the dominant land-side mode for port movements





Table 4.6 shows that much of the goods brought into Leith is bulk product destined for the local market and Edinburgh in particular. Other than port tenants, the final leg of these journeys will be undertaken by road.

### Commodity

Iron Ore Malting Barley Feed Barley Malt Maize Rapeseed Wheat Wheat Aggregate Aggregate – Other Animal Feedstuffs Sugar Beet Pellets Rapeseed Meal Cement Salt Crushed Class Cullet General Cargo Steel Rails

Table 4.6. Origin/Destination of Goods lifted at Leith

NSO Supplies

Source: Forth Ports



Origin/Destination
Tenant in port
Local/variety
Local/variety
Local/variety
Edinburgh
Local/variety
Local/variety
Chancelot Mill – Tenant in port
Red Chips from Lanark
Variety, some to tenant in port, some to Dunbar
Local/variety
Local/variety
Local/variety
Tenant in port, presume Edinburgh
Council depots
Local council exported to Portugal
Variety
 Edinburgh from Germany
 Variety



### 4.1.4 Smaller Facilities

In addition to the ports capable of accepting larger ships outlined above, smaller vessels can and have previously used the additional locations of:

Historical Freight Ports & Harbours

- Kincardine, Alloa, Longannet Jetty, Culross, Charlestown, Limekilns, North Queensferry, Aberdour, Carron, Brucehaven, Inverkeithing, Pettycur, Dysart, West Wemyss
- Blackness, Bo'ness, Port Edgar, South Queensferry, Hawes Pier, Long Craig, Cramond, Granton, Newhaven, Musselburgh

However, whilst the number of historical cargo ports on the Forth showcase the area's deep links with marine freight movements, none of these harbours or ports are thought to now be in a condition for more than recreational use, relating either to the condition of the infrastructure itself or the facility's access arrangements.

There are five existing facilities in this category, three of which are operated by Forth Ports under the "Fife Ports" grouping and two of which are operated by the fossil fuel industry in relation to their North Sea operations. These are:

### **Burntisland**

The Port of Burntisland is the Forth's most natural harbour and one of its oldest. It is located on the northern side of the River Forth. The port houses two major tenants including Burntisland Fabrications (BiFab), and Briggs Marine who use the port as a base to service ships coming in and out of the Forth.

Recent years has seen port traffic driven upwards through increased Whilst not rail connected, the Levenmouth Line offers an opportunity coastal shipping and opportunities within the offshore renewable to provide rail services to the port. energy sector.

### **Kirkaldy**

Kirkcaldy Harbour, positioned on the northern side of the Firth of Forth regularly handles a wide variety of bulk goods, including high volumes of grains and cereals in particular.

In 2011, following a 20-year gap, the tidal harbour re-opened for commercial business and to serve the local flour mill, Hutchisons Mill - part of the Carr's Milling Group - with the mill offering a highcapacity silo intake facility, positioned directly adjacent to the quayside.

Kirkcaldy Harbour can easily handle grains and cereals, timber, aggregate, and many other bulk commodities.

### Methil

Situated on the northern shore of the Firth of Forth, Methil is the most easterly of the Fife Ports. Operating as a national timber, aggregate, The terminal is made up of two sea-island berths that can load and general bulk commodity distribution centre, Methil offers ample vessels of up to 350,000 DWT and a vapour recovery platform. timber storage as well as facilities to handle grains and cereals along Crude oil from the Forties pipeline undergoes stabilisation and gas with other bulk commodities. processing and treatment at the Kinneil Terminal at Grangemouth before being pumped to a tank farm at Dalmeny on the southern The port also benefits from facilities accommodating the repair, shore of the Firth. The oil is then pumped to the Hound Point terminal maintenance, and supply of offshore drilling rigs and tankers. This where it is loaded onto tankers.

is made possible taking advantage of the deep, sheltered water of Largo Bay and the specialist services in Methil and its locality.



### **Braefoot Terminal (Shell)**

Located between St. David's and Aberdour, the tanker terminal at Braefoot Bay is a base for the export of liquefied petroleum gas. The gas is piped to an inland site direct from the North Sea, broken down to form ethane and then converted into ethylene, the basic hydrocarbon 'building block' of the petrochemical industry. the products are then piped the final three-mile journey to the Terminal where they are fed into tankers and gas carriers for markets in Europe and the USA. The terminal is operated by Shell. Hound Point Terminal (Ineos)

Hound Point is a marine terminal off a rocky headland of that name on the southern shore of the Firth of Forth, Scotland, just east of the Forth Bridge at South Queensferry. Opened in 1975, it is owned and operated by Ineos as an oil-export terminal for North Sea oil and is the largest such facility in Scotland.

> **Opportunity: Committed infrastructure offers** potential for modal shift

### Inland Waterways 4.2

Whilst the SEStran area does feature both the Forth & Clyde Canal and the Union Canal there is little freight on them beyond that needed for its own maintenance and renewal. Closed in 1962 and re-opened in 2001 (Millennium Link) and 2002 (Falkirk Wheel) there is potential for freight to be moved from road and rail networks to the canal network.

This case was proven in 2019 by the Veg Boat, which transports over 15 types of vegetables from an organic farm to Linlithgow, a distance of approximately two miles.

The Union Canal routes through the centre of Edinburgh to the Lochrin Basin, approximately 1km from Edinburgh Old Town, offering opportunities for the movement of goods to customers across the city, potentially in conjunction with a last mile provider (e.g. cycle logistics).

It's ability to offer a traffic free route from the City of Edinburgh Bypass (and further afield) and waterside industrial units which could be used as transhipment depots suggests there may be scope for a greater role in the movement of freight by canal. Importantly the Union Canal is a contour canal, and largely lock free, meaning less potential for disruption.

Opportunity: Inland waterways offer traffic free, sustainable routes into and out of major urban areas





Figure 4.7: Canal Network in SEStran region

Source: Wikipedia Commons







### Rail Freight 4.3

Rail freight plays an important role in the economy of Scotland, the longer distances between ports in Southern England and the 'Golden Triangle' in particular meaning rail is competitive against road freight.

In a typical week, 147 freight trains into/out of and across Scotland moved 100,000 tonnes of products bound for supermarkets and warehouses.

59 freight trains ran cross-border into Scotland carrying 50,000 tonnes of essential goods to fill shelves.

- Scotland's supermarkets rely on goods by rail from Daventry, Tees Port, Felixstowe, London Gateway and Liverpool
- Royal Mail post goes by rail between London and Glasgow<sup>43</sup>

There are many successful examples of how the rail sector has responded to customer requirements and created new and enhanced services between England and Scotland.

Service

Royal Mail

Slurry for th

Automotive

Table 4.7: Examples of cross-border rail services



	<b>Details</b> <sup>44</sup>
	DB Cargo operate a bespoke service based at Shieldmuir (North Lanarkshire) carrying both first and second class mail between London (Willesden), Warrington (Dallam) and Shieldmuir. There are two trains daily in each direction, (Monday-Friday), given equal priority to passenger trains on the West Coast Main Line. They use Class 325 units that are owned by Royal Mail and operate at speeds of up to 100 miles per hour. Additional services operate at peak times and at short notice according to mail flows
he paper industry	DB Cargo operate a service twice a week from Aberdeen Waterloo, carrying slurry for the paper industry at Irvine and Warrington.
	This uses bulk wagons owned by the customer, Omya. The slurry arrives in Aberdeen by ship from Norway. GB Railfreight carry clay slurry from Antwerp once a week through the Channel Tunnel direct to Irvine. It is conveyed in bulk wagons owned by Imerys.
e	DB Cargo operate services from Portbury (Port of Bristol) and Dagenham five days a week to Mossend.
	These trains convey Honda and Renault cars (from Portbury), operating twice a week, and Ford cars (from Dagenham), five days a week.



<sup>&</sup>lt;sup>43</sup> https://www.networkrailmediacentre.co.uk/news/key-freight-routes-in-focus-on-scotlands-railway Accessed 14/07/20

<sup>&</sup>lt;sup>44</sup> Delivering your goods: Benefits of using Rail Freight, Transport Scotland (2017)

### 4.3.1 Background to rail freight in South East Scotland

In 1846 the Edinburgh, Leith and Newhaven railway (with a later extension to Granton) linked the city to the ports on the Forth, and parts of this line were still in use for rail freight as recently as 2016 until the closure of the Powderhall waste facility.

The vast majority of Edinburgh's historical rail freight depots have either been built on or connected to railways that have long since been placed beyond use (or both). However, the city has three currently disused rail freight terminals in Leith which could be brought back into operation:

- The terminal on the Forth Ports estate associated with Leith docks
- The disused DB Schenker site en-route to Leith Docks accessed off Albert Road
- The former Leith South Goods Yard alongside Salamander Street operated by the Russell Group

### 4.3.2 Gauge Clearance

Figure 4.8 shows gauge clearance in the SEStran area (and surrounding regions). As is common elsewhere on the network, clearance is mixed with the ECML providing for the largest freight movements on the network at W12. As discussed, Grangemouth has a W9 clearance which allows 2.9 m (9 ft 6 in) high Hi-Cube shipping containers to be carried on "Megafret" wagons that have lower deck height with reduced capacity.

The network around Leith and Edinburgh Waverley is also largely W9, whilst that in the vicinity of Rosyth and Fife ports is largely W7/ W8 (W7 to accommodate the transport of 2.44 m (8 ft 0 in) ISO containers and the W8 loading gauge has an even larger notch spanning outside of the curve to accommodate the transport of 2.6 m (8 ft 6 in) ISO containers).



Figure 4.8: Gauge Clearance

Source: Scotland Market Study, Network Rail (2018)





### Electrification of SEStran rail network

A number of lines that run through the study area are electrified including that which serves Grangemouth, Glasgow to Edinbugh line and the ECML. The Portabello-Leith line is not electrified, nor is the network around Rosyth and the Fife ports. This limits the type of freight locomotives that can use these lines.

### Issue: Gauge restrictions on sections of the network limit the types of wagons that can be used



Figure 4.9: Electrification of Rail in Scotland Source: Scotland Market Study, Network Rail (2018)



### 4.3.3 Intermodal Facilities

The main rail freight terminal in the SEStran area is that operated at Grangemouth. Outside the SEStran area Scotland has a number of intermodal facilities, which range from terminals with gantry cranes (Coatbridge) to relatively 'lightweight' installations such as that used at Inverness which utilises a reachstacker:

Terminal Name	Operator	Access to Mainline
Aberdeen Craiginches	Direct Rail Services	Direct
Coatbridge	Freightliner	Direct
Deanside (Hillington)	JG Russell	Direct
Dyce Raiths Farm	DB Schenker	Direct
Elderslie	WH Malcolm	Direct
Grangemouth (1)	DB Schenker	Direct
Grangemouth (2)	WH Malcolm	Direct
Inverness	Direct Rail Services	Direct
Mossend	PD Stirling	Via DB Schenker
Mossend EuroTerminal	DB Schenker	Direct

Table 4.8 Intermodal Rail Facilities in Scotland

The facilities at Mossend and Coatbridge represent the key rail however there are daily intermodal movements between Teesport freight terminals in the Central Belt and provide connections to and Mossend that travel through the area as well as diverted West locations further north such as Inverness as well as major ports in Coast movements if there are issues elsewhere on the network. England and other Strategic Rail Freight Interchanges. Other than Movements such as the recently introduced Colas Rail Aberdeen to the Tilbury-Grangemouth service, intermodal rail freight movements Spalding Calcium Carbonate slurry train also route through the area. originating in the SEStran area (or destined for) will be transported by road to these terminals. Additional services in existing or new facilities within the area would reduce road miles.

### 4.3.4 Bulk Terminals

In addition to containerised goods, the railways carry significant bulk loads across a number of different sectors, including coal & biomass, construction materials, metals, petroleum/oil, chemicals, automotive, industrial minerals, domestic waste and ore.

Within the study area there is a Tarmac Cement plant at Oxwellmains, east of Dunbar, which is rail connected. There are currently approximately 2–3 services per day to locations such as Hunslet (Leeds), Carlisle, Seaham Harbour, Craiginches (Aberdeen), Inverness and West Thurrock. The Oil Terminal at Grangemouth is also rail connected, with movements passing through the port.

### 4.3.5 Through Flows

The SEStran area includes much of the network used by rail freight flows in Scotland, and whilst these do not use terminals in the area, it is important that they are enabled and encouraged to grow so as to provide opportunity for modal shift and reduced CO2 emissions.

Given capacity constraints on the East Coast Main Line there are limited through movements of rail freight in the SEStran area,



Opportunity: New rail terminals and/or services would reduce road miles associated with intermodal freight using facilities elsewhere







### 4.3.6 Proposed and Aspirational Rail schemes in the SEStran area

Table 4.9 demonstrates a number of schemes in the SEStran area which are confirmed or proposed and subject to funding. Any measures to improve the network would benefit rail freight movements, however of particular note is SETEC (Scotland East to England Connectivity), which is discussed below and would open up additional freight paths, and the Levenmouth line, which could support rail freight movements to/from Methil Port and Diageo's Cameron Bridge Distillery and Bottling Plant. In addition, whilst there are no firm plans, there are aspirations to improve gauge clearance between Aberdeen and the Central Belt and introduce additional passing loops.

### Levenmouth Rail Campaign

### (https://levenmouth.co.uk/about/)

There is very significant potential for freight traffic, taking goods off the inadequate roads serving Levenmouth.

One mile of the line (Thornton to Earlseat) is already open since 2012 and transporting coal, thus the key mainline connection is already established. Cameron Bridge station adjoins Diageo's Cameron Bridge Distillery, the largest in Scotland and is 1.4 miles from Diageo's major Leven bottling plant. Multi-user rail freight facilities are proposed for this site with dual rail line for loading.

The line continues intact to Leven (adjoining Sainsburys), and thence to Methil Docks adjoining the Fife Energy Park. Improved accessibility would support the employment opportunities at the 55 hectare

Energy Park investment zone, as well as the proposed Low Carbon a Rail Division and state that they would wish to ship 60% of Diageo input and output to and from Levenmouth by rail. Investment Park Methil Docks Business Park and Fife Renewable Innovation Centre by providing access to a wider labour market It Finally, there are opportunities to support approximately 150 farm would also support the workforce for existing employers such as holdings in central-east Fife growing 2,500 ha of fruit and vegetables Diageo, NHS Fife, James Donaldson and Sons Ltd, Silberline and and fruit to supply UK supermarkets. Possibilities for supplying the Pfaudler- Balfour Ltd. Major logistics company Malcolm, responsible huge Biomass plant at Markinch have been mooted. for all Diageo movement, is strongly in favour of rail reconnection and have sought to reinstate services in recent years. They operate

Proposed Infrastructure Change	Level of service implications
Looking to increase capacity on the ECML including enabling freight growth.	Journey time improvement, performance and operational improvements, capacity increase
2 new unmanned stations on ECML. East Linton – 2 × 6 car platforms. Reston – 2 × 8 car platforms with passive provision for another 2 cars.	Service pattern still being developed. Potential detriment to end to end journey times from stopping services.
Portobello Junction currently constrained – looking at options to improve capacity. This will increase flexibility & JTI into Edinburgh from Newcastle. Millerhill becomes signalled for pass operation so can use as diversion via Edinburgh Suburban line.	Flexibility & journey time improvement, diversion route
Transport Scotland have published a Decarbonisation Action Plan. A programme is being developed. This will consider the best approach for all non-electrified lines in Scotland.	Potential use of Edinburgh Sub for Empty Coachi Stock moves and as a diversionary route improvi capacity into Edinburgh Waverley at the East
	Potential for capacity improvements and Journey time improvements.
Re-instatement of a passenger service on the Methil Branch to serve Leven. Two new stations at Leven and Cameronbridge.	Provision of new service will impact on the Fife Circle and services into Edinburgh.
Freight options being explored but this does not include a line as far as Methil Docks.	
	<ul> <li>Proposed Infrastructure Change</li> <li>Looking to increase capacity on the ECML including enabling freight growth.</li> <li>2 new unmanned stations on ECML. East Linton - 2 × 6 car platforms. Reston - 2 × 8 car platforms with passive provision for another 2 cars.</li> <li>Portobello Junction currently constrained - looking at options to improve capacity. This will increase flexibility &amp; JTI into Edinburgh from Newcastle. Millerhill becomes signalled for pass operation so can use as diversion via Edinburgh Suburban line.</li> <li>Transport Scotland have published a Decarbonisation Action Plan. A programme is being developed. This will consider the best approach for all non-electrified lines in Scotland.</li> <li>Re-instatement of a passenger service on the Methil Branch to serve Leven. Two new stations at Leven and Cameronbridge.</li> <li>Freight options being explored but this does not include a line as far as Methil Docks.</li> </ul>

Table 4.7. Network Null Committee and Aspirational Schemes



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### 4.4 Air Freight

Edinburgh Airport is Scotland's busiest airport and serves a hinterland beyond the SEStran boundary. It serves 158 destinations and in 2019 14.7m passengers per year travelled through the airport<sup>45</sup>. It has one 2,560m runway and an associated terminal.

The airport is located to the west of Edinburgh close to the M9. It is served by a tram stop and regular bus services. There is a cargo terminal at the airport on Turnhouse Road. Freight and operators such as TNT have operations there.

Table 4.10 shows airfreight at Edinburgh Airport in 2019. It demonstrates that over 19,000 tonnes were lifted at the airport, with a significant proportion being moved on scheduled cargo flights to or from international or domestic destinations. The airport also handles nearly 22,968 tonnes of mail, the highest outside of London. The airport is therefore a significant generator of freight, with road freight transporting the first or last mile.

Opportunity: Explore the potential for land-side airfreight volumes to be moved by sustainable means

Type of Aircraft Movement	Tonnes Lifted	
Scheduled passenger aircraft foreign/EU	0.04	
Scheduled cargo aircraft foreign/EU	9,527.54	
Charter cargo aircraft foreign/EU	324.53	
Scheduled passenger aircraft foreign non-EU	0.10	
Scheduled passenger aircraft UK	34.09	
Scheduled cargo aircraft UK	7,176.83	
Charter cargo aircraft UK	2,346.81	
Total	19.409.93	





Table 4.10: Goods Movements at Edinburgh Airport Source: CAA





<sup>&</sup>lt;sup>45</sup> https://corporate.edinburghairport.com/about-us/facts-and-figures

### Cycle Logistics 4.5

Cycle logistics has the potential to help decarbonise the road freight sector, encourage active travel, reduce congestion and improve air quality. Journey times can be quicker than it's motorised equivalent and parking and delivery issues are less pronounced.

There are cycle logistics operators in Edinburgh, with Zedify operating from a site close to Haymarket Station using electricassist cargo bikes, employing 3 people part-time. They generally deliver parcels on contract from major parcel companies but also undertake ad-hoc deliveries. Zedify were part of the SURFLOGH (https://northsearegion.eu/surflogh/), a project co-funded by the North Sea Region Programme 2014 – 2020. The core challenge of the project is to achieve more efficient cargo distribution in urban areas, and thereby maintain efficiency in long distance transport. To promote efficient logistics sustainably, the focus is on optimising the interaction between hubs and urban logistics system in smaller and medium-sized cities and city networks.

The project team understands that a further cycle logistics operation called Farr Out has recently commenced trading, suggesting scope for growth in this sector.





### 4.6 Summary

This section has shown that there is already a significant amount of activity by non-road freight modes in the region. The ports in particular are a huge asset and fulfil a nationally important role, reducing road and air miles associated with the movement of goods.

However, there is scope to build on this, both by increasing the role of shipping and ensuring that ports are able to facilitate further modal shift and consolidation. This can be achieved by introducing supporting infrastructure to facilitate further rail movements and sustainable last mile deliveries. In particular, the location of Leith in such close proximity to Edinburgh City Centre, with extant rail connections is an opportunity which can be built upon.

The presence of disused sidings and connections demonstrates that the importance of rail freight has declined in recent years, however opportunities to grow this are clear.

This outline of facilities and infrastructure, including the historical overview, demonstrates that the SEStran area has not only got a diverse range of facilities across modes but also has historically utilised different forms of transport as part of its logistical system. If the conditions can be created, then multi-modal or alternative modes to road freight may again become more important to the region's freight movements.



# 05 Road Freight







This section describes the road network in South East Scotland and how it pertains to road freight movements. A significant proportion of and the main heavily trafficked local roads in the SEStran area are: freight in the region is moved by road and this section describes the strategic highway network, as well as the quantity and type of goods being moved within and outwith the area. From this we can assess the opportunities for consolidation and modal shift and determine if there is critical mass to move to more sustainable modes and improve the operation in general as a mode.

### Road Network in SEStran area 5.1

South East Scotland is an important gateway to Scotland for imported and exported goods for both UK and international origins and destinations, the area is well served by a number of strategic routes including east-west links such as the M8 (which feeds traffic directly to Edinburgh Airport, is the busiest motorway in Scotland and among the most heavily used routes in the UK) as well as north south links such as the A1, M90 and M9.

The A720 City of Edinburgh bypass is a vital East-West link and a key route for strategic freight movements. As with other roads in the network, it experiences heavy traffic at peak times.

Figure 5.1 to the right shows the main road network in the area distinguished by class of road and trunk/non trunk road. This network of roads links the area's ports and airports and the most important of these are Grangemouth, Leith, Rosyth and Methil docks, and Edinburgh Airport.

- A90 (M90 Junction 1 to Edinburgh)
- A921 Kirkcaldy to M90
- A915 Kirkcaldy to St Andrews
- A91 Stirling to St Andrews
- A907 Alloa to Dunfermline
- A803 Linlithgow Falkirk Bonnybridge
- A801 M8-M9
- A71 West Calder Edinburgh
- A89 Bathgate Edinburgh
- A7 Edinburgh Galashiels
- A703 Edinburgh Peebles
- A68 Edinburgh to Border
- A68/A697 Edinburgh Coldstream
- A701 Edinburgh Moffat
- A198 Prestonpans North Berwick
- A199 Musselburgh Wallyford



- Most of the local road network in SEStran is single carriageway

Potential pinch points on the network include:

- Sheriffhall Roundabout and Gogar Roundabout on the A720 City of Edinburgh Bypass (although there are proposals to address Sheriffhall Roundabout)
- Single-carriageway sections of the A1 between Berwick and Edinburgh.



Figure 5.1: SEStran area road network



<sup>&</sup>lt;sup>46</sup> <u>https://www.sestran.gov.uk/wp-content/uploads/2017/01/SEStran\_Regional\_Transport\_Strategy\_Refresh\_2015\_as\_</u> published.pdf

### 5.2 Congestion

Table 5.1 demonstrates that several authorities within the SEStran area have more prevalent journey delays than the Scottish average, with Edinburgh and West Lothian having approximately one in five journeys delayed.

Area	Percentage of Driver Journeys Delayed Due to Traffic Congestion 2018
Scotland	12.5
City of Edinburgh	19
Clackmannanshire	8
East Lothian	14
Falkirk	14
Fife	9
Midlothian	14
Scottish Borders	7
West Lothian	19

### Table 5.1 Journey delays due to congestion

### Source: statistics.gov.scot

Edinburgh is one of the most congested cities in Europe (and a world rank of 33)<sup>47</sup> with a congestion level of 41%, an increase of 1% on 2018. During morning and evening peak a 30-minute trip is typically delayed by over 20 minutes.

Any efforts to encourage consolidation and modal shift will help to reduce these delays, to the benefit of freight operators and all other road users, in particular public transport.

<sup>47</sup> <u>https://www.tomtom.com/en\_gb/traffic-index/edinburgh-traffic/</u>

Delays come at a significant cost to the freight sector (as well as The database includes the following data fields: other road users) and road congestion costs the UK nearly £8billion per year. Having a large HGV stuck in congestion costs £1 per minute - Year - Business Type to the operator<sup>48</sup>. Four of the UK's worst traffic bottlenecks occur on the Edinburgh bypass. It found that the jams could cost drivers in - Vehicle ID - Journey ID Scotland £5.1bn in wasted time over the next decade and the impact - Vehicle year of of Edinburgh's 455 traffic hotspots was second only to London and - Origin was likely to cost drivers 2.8 bn by  $2025^{49}$ . registration

Issue: Edinburgh and neighbouring authorities experience congestion well over the national average

### 5.3 Road Freight Movements

In order to understand the scope for modal shift, it is vital to understand what types of goods are being transported to, from and through the region.

The Department for Transport (DfT) collects data on the activity of Great Britain (GB)-registered HGVs (vehicles weighing 3.5+ tonnes) operating in the UK through its survey, Continuing Survey of Road Goods Transport Great Britain (CSRGT GB). The survey is usually based upon a sample of approximately 230 vehicles per week. The operator of the HGV is asked to provide details of all domestic trips undertaken by that vehicle during a one-week period. The survey data is then grossed up to the GB-registered HGV population through grossing factors calculated using population data for HGVs, from DVLA licensing records. For this study data from 2018 has been assessed.



- Artic or Rigid
- Gross vehicle weight

- Destination
- Commodity

- Grossed Goods Lifted
- Grossed Vehicle kms
- Grossed Goods Moved
- Journey Type ID
- Total Collections & Deliveries

<sup>&</sup>lt;sup>48</sup> Road Haulage Association

<sup>&</sup>lt;sup>49</sup> BBC News https://www.bbc.co.uk/news/uk-scotland-38156700 Accessed 15/12/20

For the commodity type some of the naming conventions are very descriptive causing the labelling in graphs and tables to be cut off. The full details of the commodity type categories can be found seen below:

- A code with 'n.e.c.' (Not elsewhere classified) in a description should only be used if no other appropriate code can be found.
- Basic metals; fabricated metal products, except machinery and equipment
- Chemicals, chemical products, and man-made fibers; rubber and plastic products; nuclear fuel
- Coke and refined petroleum products
- Empty vehicle
- Equipment and material utilized in the transport of goods
- Food products, beverages and tobacco
- Furniture; other manufactured goods n.e.c.
- Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non-market goods n.e.c.
- Grouped goods: a mixture of types of goods which are transported together
- Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks

- Mail, parcels
- and thorium ores
- Other non-metallic mineral products
- products

- Transport equipment
- printed matter and recorded media

This section presents the findings of the analysis. This looks at the wider study before delving deeper into each area. The data presents the flow of goods and vehicle kilometres by their movement type (internal, inbound and outbound) followed by the commodities involved for the total amount of goods lifted, moved and travelled. For each area it then provides the top five commodities followed by the data for the total amount lifted, moved and travelled.

Figure 5.2 shows the movements between the SEStran area and other regions of Scotland and the UK. It shows that the key movements are between the region and West Central Scotland and other regions of the UK (which subsequent analysis shows to be principally the North West and the North East of England).



- Metal ores and other mining and quarrying products; peat; uranium

- Products of agriculture, hunting, and forestry; fish and other fishing

- Secondary raw materials; municipal wastes and other wastes

- Textiles and textile products; leather and leather products

- Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.

- Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;





Source: statistics.gov.scot



### 5.3.1 Wider SEStran area

This section outlines the key findings from the analysis of goods movements for the SEStran area as a whole.

The predominant flow of goods lifted is completed internally within the local authority areas at over 18.4 million tonnes (39 per cent) lifted within the study area followed by over 14.3 million tonnes of goods being lifted into the study area. Figure 5.3 provides a breakdown of the total tonnes lifted (internal within the local authorities, internal between the local authorities, outbound and inbound) within the study area by commodity type and the proportion of this commodity against the total lifted (secondary axis).

Grossed vehicle kilometres for inbound movements totalled 294 million kilometres (30 per cent), outbound movements totalled to 288 million kilometres (29 per cent), internal movements within the local authorities totalled to 307 million kilometres (31 per cent) internal movements between the local authorities totalled to 93 million kilometres (10 per cent) (Figure 2).

Out of the total distance travelled, over 190 million kilometres were related to empty vehicles and over 150 million related to food products, beverages and tobacco. The empty vehicle running shows a significant number of unutilised loads that are on the road network, causing congestion and environmental damage without a payload. Furthermore, this suggests that loads are making long distance journeys from outside of the study area.

Grossed goods moved throughout the study area shows that goods are being moved further distances by the inbound and outbound movement types (as opposed to internal). This is expected with the inbound flow being the dominant flow type at 3.1 billion vehicle tonne kilometres (VtKMs) (45 per cent) (Figure 5.5).

Total Grossed Vehicle KMs (Kilometres) by movement type for For the SEStran study area, Figure 5.6 shows over 15.5 million tonnes of food products, beverages and tobacco, around 8.5 million tonnes the South East Scotland (6x area study identified) during 2018 of products of agriculture, hunting, and forestry; fish and other fishing products and around 4.9 million tonnes of secondary raw materials; 186,921,858 municipal waste and other wastes were lifted. These correlate to key industries featured within the South East of Scotland. 27% 267,852,533 39% Figure 5.7 shows that the majority of Gross goods moved are food products, beverages and tobacco (2.4 billion VtKMs) followed by products of agriculture, hunting, and forestry; fish and other fishing 34% products (726 million VtKMs). This relates to the dominance of the food industry with goods being transported out the study area and 238,606,957 vice-versa imported in for the tourism sector. Figure 5.4: Grossed vehicle kilometres for the 6x study area Total Grossed Goods Lifted (tonnes) by movement type for







Outbound

Inbound









e machinery id apparatus i equipment i and optical s and clocks	Mail, parcels	transport of goods	t equipment	ucts, except 1 equipment	ld and office companying ed for repair; goods n.e.c.	eason cannot led to groups 01-16.	and leather products	goods n.e.c.	npty vehicle
inery and equipment n.e.c.; office omputers; electrical machinery and dio, television and communication and apparatus; medical, precision instruments; watches	2	Equipment and material utilized in the t	Transport	Basic metals; fabricated metal produ machinery and	Goods moved in the course of household removals; baggage and articles acc travellers; motor vehicles being move other non-market g	Unidentifiable goods: goods which for any re be identified and therefore cannot be assigne	Textiles and textile products; leather	Furniture; other manufactured g	E

### 100%





Figure 5.7: Total Grossed Vehicle KMs (Kilometres) by commodity divsion category for South East Scotland (6x area study identified) during 2018



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percentage of total vehicle kilometres



Figure 5.8: Total Grossed Goods Moved (VtKMs) by business divsion category for the South East Scotland (6x area study identified) during 2018



											9( 8( 7( 6( 5( 4( 3( 2)
oer and plastic products; nuclear fuel	other mining and quarrying products; peat; uranium and thorium ores	Transport equipment	nd material utilized in the transport of goods	id equipment n.e.c.; office machinery s; electrical machinery and apparatus vision and communication equipment aratus; medical, precision and optical instruments; watches and clocks	ods: goods which for any reason cannot therefore cannot be assigned to groups 01-16.	ls; fabricated metal products, except machinery and equipment	in the course of household and office baggage and articles accompanying otor vehicles being moved for repair; other non-market goods n.e.c.	Furniture; other manufactured goods n.e.c.	Textiles and textile products; leather and leather products	Empty vehicle	10
rubk	Metal ores and o		Equipment ar	Machinery an and computers n.e.c.; radio, telev and appa	Unidentifiable god be identified and	Basic meta	Goods moved i removals; travellers; m	Opportunity: Critical mass of goods such as alcoholic products, food and paper products could be moved t and from port by rail			s c r tc



### 00%

0%

30%

0%

50%

50%

40%

0%

20%

0%

%





For each local area within the study area we looked at the top commodities transported by vehicle kilometres. Table 5.2 shows that empty vehicles were very prevalent in the study area.

Further analysis of the movements by local authority area can be found in Appendix A.

Table 5.3 features the top five routes and commodities in and out of study area by gross goods lifted.

The data has shown that the food sector is one of the key commodities that is both imported and exported on a large scale from South East of Scotland region, showing the ports provide food to other regions across the UK. Furthermore, the significant amount of goods moved for the region (6.8 billion VtKMs) suggest there is scope to involve more modal shift to rail, particularly for commodities such as coke and petroleum products and secondary raw materials which both feature highly for the region in regard to imports and exports and can easily be transported by rail.  $\square$ 

Local Area	Top 3 Commodities Transported			-		
	(Venicle Kilometres)	Rank number (1=highest)	Origin	Destination	Grossed Goods Lifted (tonnes	
Clackmannanshire and Fife	Empty Vehicle Food Products etc. Mail/Parcels	1	North West England	West Lothian	Various Food Products And Tobacco Products In Parcel Service Or Grouped	
Falkirk	Food Products etc.				530,2	
	Empty Vehicle Non metallic minerals	2	Clackmannanshire and Fife	West Central Scotland	Stone, Sand, Gravel, Clay, Peat And Other Mining And Quarryir Products	
West Lothian	Food Products etc.				452,4	
	Empty Venicle Grouped items (mix)	3	West Lothian	North East England	Various Food Products And Tobacco Products In Parcel	
Edinburgh	Mail/Parcels				Service Or Grouped	
	Empty venicle Food Products etc.	Empty Vehicle Food Products etc.	4	West Lothian	Southern Scotland	Various Food Products And Tobacco Products In Parcel
Scottish Borders	Empty Vehicle Food Products etc.				Service Or Grouped 331.	
	Agricultural products etc.	5	Falkirk	North East England	Liquid Refined Petroleum	
East Lothian and Midlothian	Empty Vehicle	5	I dikirk	NOITH LAST LIIGIANG	306,8	
	Food Products etc. Secondary raw materials and waste	Table 5.3. Top five reutes and	commodities in and out of study area	by gross goods lifted	<b>.</b>	

Table 5.2: Top commodities transported by local authority area



Table 5.3: Top five routes and commodities in and out of study area by gross goods lifted.



Undertaking this analysis of CSRGT data has highlighted the significant amount of empty vehicles that moving to, from and within the South East of Scotland region.

A top 50 empty vehicle routes in and out and within study area by gross vehicles kilometres can be found in Appendix B. This provides an indication of the inefficiency that is typical within the freight sector of vehicles often driving back to depots without any loads. This can cause unnecessary congestion on the network and environmental damage as the HGVs route back to base. This inefficiency means that fuel and maintenance costs are not offset by the carrying load (empty running).

Using information from Table 5.4 and Figure 5.9 this shows that the Study area was a net exporter of goods with 7.1 million tonnes (57 per cent) of goods lifted moved out of the area. Almost 7 million tonnes of goods lifted were moved between the Study area and West Central Scotland, followed by Southern Scotland with 3.1 million tonnes. The reason for there being more Goods lifted between these two NUTS II zones and the Study area is due to their close proximity to the study area. West Central Scotland is also highest and most likely to be due to it containing the most heavily populated city within Scotland, Glasgow.

Origin	Destination	Grossed Goods Lifted (tonnes)
Study area	Highlands and Islands	670,483
Highlands and Islands	Study area	638,655
Study area	North Eastern Scotland	921,243
North Eastern Scotland	Study area	258,344
Study area	Southern Scotland	1,914,263
Southern Scotland	Study area	1,211,526
Study area	West Central Scotland	3,679,622
West Central Scotland	Study area	3,291,687

Table 5.4: Gross Goods Lifted between study area and other NUTS II zones in Scotland

> Figure 5.9: Gross Goods Lifted between study area and other NUTS II zones in Scotland (and rest of the UK)







Table 5.5 breaks down Table 5.4 into more detail, showing the top three commodities in terms of Gross Goods Lifted, moved between the study area and the other NUTS II zones in Scotland.

From this we can see that a significant amount of (4 million tonnes) of Food products, beverages and tobacco were moved to and from the study area to the other NUTS II zones, with 30 per cent of that being moved from West Central Scotland to the study area.

When comparing top commodity types between the study area and other NUTS I zones in the UK Food products, beverages and tobacco is once again the top commodity with 4.9 million tonnes (38 per cent) of Goods moved. This is in keeping with the general trend in the UK with Food products being the top commodity moved in 2018.

Stu	Grossed Goods Lifted (tonnes)	Destination	Origin
\	373,019	East Midlands (England)	Study Area
Stu	817,545	Study Area	East Midlands (England)
West (Ei	137,094	East Of England	Study Area
Stu	224,719	Study Area	East Of England
Yorksh H	1,999,050	North East (England)	Study Area
Table 5.5	1,882,334	Study Area	North East (England)

Origin	D
Study Area	North
North West (England)	S
Study Area	South
South East (England)	S
Study Area	South
South West (England)	S
Study Area	
Wales	S
Study Area	We
West Midlands (England)	Ç
Study Area	York
Yorkshire And The Humber	S
Table 5.5: Gross Goods other NUTS I zones in t	s Lifted he UK:



Destination	Grossed Goods Lifted (tonnes)
th West (England)	2,035,840
Study Area	2,264,716
th East (England)	7,450
Study Area	102,814
th West (England)	53,195
Study Area	44,663
Wales	105,039
Study Area	11,214
West Midlands (England)	317,423
Study Area	1,254,847
orkshire And The Humber	464,521
Study Area	703,633

ifted between study area and



Products of agriculture, hunting, and forestry; fish and other fishing products with 1.9 million tonnes (15 per cent) followed Food products as the second highest commodity moved and the, maybe more surprisingly as it does not appear it the top 3 commodities for many of the NUTS I zones, is Mail, parcels with 971,000 tonnes (eight per cent).

Origin	Destination			
Origin	Destination	1	2	3
Study Area	East Midlands (England)	Food products, beverages and tobacco – <b>225,212</b>	Products of agriculture, hunting, and forestry; fish and other fishing products – <b>53,612</b>	Wood and products of wood and cork - <b>53,612</b>
East Midlands (England)	Study Area	Grouped goods: a mixture of types of goods which are transported together - <b>295,732</b>	Food products, beverages and tobacco – <b>195,481</b>	Other non-metallic mineral products – <b>118,846</b>
Study Area	East Of England	Food products, beverages and tobacco – <b>87,237</b>	Products of agriculture, hunting, and forestry; fish and other fishing products – <b>31,911</b>	Transport equipment – <b>17,946</b>
East Of England	Study Area	Food products, beverages and tobacco – <b>166,845</b>	Wood and products of wood and cork - <b>57,874</b>	
Study Area	North East (England)	Food products, beverages and tobacco – <b>820,519</b>	Coke and refined petroleum products - <b>306,893</b>	Other non-metallic mineral products – <b>229,772</b>
North East (England)	Study Area	Food products, beverages and tobacco – <b>1,019,894</b>	Products of agriculture, hunting, and forestry; fish and other fishing products – <b>423,692</b>	Chemicals, chemical products, and man-made fibers; rubber and plastic products; nuclear fuel – <b>245,356</b>
Study Area	North West (England)	Food products, beverages and tobacco – <b>481,514</b>	Products of agriculture, hunting, and forestry; fish and other fishing products – <b>464,814</b>	Coke and refined petroleum products - <b>347,535</b>
North West (England)	Study Area	Food products, beverages and tobacco – <b>1,019,894</b>	Products of agriculture, hunting, and forestry; fish and other fishing products – <b>423,692</b>	Chemicals, chemical products, and man-made fibers; rubber and plastic products; nuclear fuel – <b>245,356</b>
Study Area	South East (England)	Goods moved in the course of household and office removals - <b>7,450</b>		
South East (England)	Study Area	Food products, beverages and tobacco – <b>102,814</b>		



### Grossed Goods Lifted (tonnes)

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cts

	Destination		Glossed Goods Lilled (tolilles)				
Origin	Destination	1	2	3			
Study Area	South West (England)	Grouped goods: a mixture of types of goods which are transported together – <b>53,195</b>					
South West (England)	Study Area	Food products, beverages and tobacco - <b>26,806</b>	Machinery and equipment – <b>17,857</b>				
Study Area	Wales	Products of agriculture, hunting, and forestry; fish and other fishing products – <b>59,322</b>	Wood and products of wood and cork – <b>36,226</b>	Mail, parcels – <b>9,490</b>			
Wales	Study Area	Transport equipment – <b>10,273</b>	Machinery and equipment – <b>941</b>				
Study Area	West Midlands (England)	Mail, parcels – <b>209,688</b>	Wood and products of wood and cork – <b>53,612</b>	Grouped goods: a mixture of types of goods which are transported together – <b>51,149</b>			
West Midlands (England)	Study Area	Transport equipment – <b>10,273</b>	Machinery and equipment – <b>941</b>				
Study Area	Yorkshire And The Humber	Food products, beverages and tobacco – <b>155,081</b>	Metal ores and other mining and quarrying products; peat; uranium and thorium ores – <b>59,976</b>	Products of agriculture, hunting, and forestry; f and other fishing products – <b>56,179</b>			
Yorkshire And The Humber	Study Area	Food products, beverages and tobacco – <b>358,596</b>	Products of agriculture, hunting, and forestry; fish and other fishing products – <b>83,034</b>	Other non-metallic mineral products – <b>69,301</b>			

Table 5.6: Top 3 commodities and volume (Gross Goods Lifted) between study area and other NUTS I zones within the UK



### Grossed Goods Lifted (tonnes)



\_\_\_\_\_

fish

### 5.3.2 Through Movements

The nature of the geography and the strategic highway network across the UK means that freight vehicles travelling between England and other areas of Scotland are most likely to travel using routes in the West via M74/M6, including those in Yorkshire, East Anglia and the South East. Even movements bound for Scotland (and vice versa) from Tyneside/Teesside and North Yorkshire tend to use east-west routes such as the A66 and A69 due to lower journey times and journey time reliability (the A720 being particularly congested).

Therefore, a significant majority of freight movements in the SEStran area will have originated or have a destination in the area (other than a relatively short section of the M80 for movements to North East Scotland).

The exception to this is likely to be movements between North East Scotland (Aberdeen City and Aberdeenshire' and 'Angus and Dundee City zones) and North East England using the A1-A720-M90 through the region.

This table demonstrates that agricultural products are the top commodities transported between the two regions, with cereals and fruit and vegetables going in both directions. Processed fish and fish products go south from North East Scotland (coming under the Food products, beverages and tobacco category) as well as paper and paper products. Steel, is most likely from plants such as Lackenby at Teesside.

This suggests there may be a critical mass (and therefore scope) of goods that could utilise freight facilities in the SEStran area, to shift modes to complete the journey by rail/short sea shipping or consolidate into fewer vehicles.









### Northbound

Products of agriculture, hunting, and forestry; fish and other fishing products

Grouped goods: a mixture of types of goods which are transported together

Basic metals; fabricated metal products, except machinery and equipment

Food products, beverages and tobacco

Machinery and equipment

Furniture; other manufactured goods n.e.c.

### Southbound

Products of agriculture, hunting, and forestry; fish and other fishing products

Food products, beverages and tobacco

Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media Grouped goods: a mixture of types of goods which are transported together

### #N/A

### **Grand Total**

Table 5.7: Through Movements of Road Freight in the SEStran area



Sum of Grossed Lifted	Goods Sum of Trips	Sum of Grossed Vehicle kms
257,559	9,968	5,883,377
 125,294	4,320	1,944,346
60,133	2,850	1,874,139
38,882	1,341	614,798
 23,385	806	908,732
 5,129	177	512,946
 4,736	474	28,415
 247,042	8,881	5,788,340
111,533	3,846	915,496
 79,327	2,735	1,589,252
39,004	1,345	680,553
 17,178	954	517,055
 _	_	2,085,984
 504,601	18,849	11,671,717



### 5.4 Edinburgh Road Freight Movements

As discussed, congestion is a pronounced issue in Edinburgh with some of the most congested roads in Europe. This is due in part to its role as a key freight attractor, particularly in relation to the service sector and hospitality/tourism and its role as a major employer.

Therefore, it is necessary to undertake further investigation into the nature of road freight movements within the city to identify particular pinch-points and assess the contribution of the sector to congestion.

In 2019, Tracsis were commissioned to undertake junction turning counts across Edinburgh's key road network. AECOM have assessed the data to understand what insights can be determined for the movement of freight within the city.

Data from 117 sites was shared, the location of these sites are shown on the map.



Figure 5.10: Tracis Data Sites







All sites included a 12-hour count of movements at the junction (07:00 – 19:00) whilst a small number of selected sites were studied from 00:00 - 23:59. Unless otherwise stated, all data referenced below considers the total seen during the 12-hour period.

Percentage of Total Traffic	# of Junctions
0.0% - 0.5%	13
0.5% - 1.0%	18
1.0% - 1.5%	21
1.5% - 2.0%	18
2.0% - 2.5%	21
2.5% - 3.0%	16
3.0% - 3.5%	8
3.5% - 4.0%	1
4.0% - 4.5%	0
4.5% - 5.0%	1

### Table 5.8: Percentage of Total Traffic by Junction Source: Tracsis (2019)

Of the 117 junctions, the observed percentages of HGVs (incorporating both rigid and articulated vehicles) across the entirety of the count are shown.

Percentages of freight traffic underneath 3.0% indicate that, whilst the road is used by freight vehicles and may be a key part of a route for that given vehicle, it is not a junction where more specialised analysis needs to be undertaken at this level.

In total there were 10 count sites where a larger percentage of traffic (3.0% – 5.0%) was made up of HGVs. 5.0% of traffic being composed of HGVs is more akin to the strategic road network rather than busy and multi-purpose urban streets. These are shown in Figure 5.11.



Figure 5.11: Junctions with the highest proportion of traffic identified as freight (HGV)

![](_page_63_Picture_8.jpeg)

![](_page_63_Picture_9.jpeg)

In Figure 5.10 the numbers indicate the "rank" of the top 10 locations in terms of percentage of traffic classified as HGVs. Therefore, the junction of Portobello High Street and Seafield Road to the extreme right of the map is the location with the 10th highest percentage of HGVs.

It is of interest to note that of the 117 junctions analysed, the junction with the largest proportion of HGVs as part of traffic composition was the entrance to Leith Docks at Salamander Street / Bath Street, which is shown here in more detail.

Whilst a significant number of vehicles entered (197) and exited (200) the port on the day the count took place, more vehicles went past the port entrance, indicating that whilst a significant generator of HGV traffic in the area, the port is not the only source of truck traffic through Leith.

An alternative approach is to look at the total number of lorries moving through a junction within the 12 hour count window and assessing which of the 117 count sites see the highest absolute number of HGVs (shown below in Figure 5.12):

### **Entering Port** From East or West Articulat Rigid From East: 47 36 From West: 53 61

![](_page_64_Figure_6.jpeg)

Figure 5.12: Junctions with the highest absolute numbers of freight (HGV)

	<b>Exitin</b> East or W	<b>g Port</b> 'estbound	Pass (Wes	ing Port tbound)	Passi (East	sing Port stbound)		
ed	Rigid Articulated		Rigid Articulated Rigid		Rigid	Articulated		
	To East: 57	32	221	52	210	47		
	To West: 47	64						

Table 5.9: Salamander Street / Bath Street HGV Movements

![](_page_64_Picture_11.jpeg)

When these two maps are combined (see Figure 5.13) it becomes clear that there are 3 key areas for further analysis:

- Ferry Road Route count sites along Ferry Road across the north of Edinburgh
- Leith Docks East Route count sites linking the Docks with the A1 via Portobello
- Gorgie Road Cluster a cluster of sites around the Western Approach Road and Gorgie Road

These are each considered briefly in turn on the following pages

![](_page_65_Figure_5.jpeg)

Figure 5.13 Combining Figure 5.10 and Figure 5.11 demonstrates three key clusters for further analysis

![](_page_65_Picture_7.jpeg)

![](_page_65_Picture_8.jpeg)

### Ferry Road Route

The route to the west of Leith Docks, along Ferry Road, Queensferry Road and out to both the A90 and M8 sees a large number of lorries in the count window. These highlighted junctions are shown below, with the key flows of HGVs shown inbound and outbound. Where there is a split in the road with significant flows of HGVs, these are shown using the road's initials. Inbound traffic is from these roads, and outbound traffic to them:

### A199 – Commercial Street / Shore

Perhaps surprisingly, the location where freight traffic makes up the second-largest percentage of traffic in the data is where Commercial Street (A199) crosses the Water of Leith and meets the Shore Road. These numbers are also significantly higher than the following sites (outbound) on Ferry Road.

This is due to the confluence of not only port traffic, but also servicing activity for the centre of Leith's shops, bars and restaurants (as shown by the large number of smaller rigid vehicles used in distribution) and further additional traffic related to the servicing of the nearby Ocean Terminal shopping centre (the larger articulated vehicles).

### Ferry Road

The three count locations on Ferry Road are relativ consistent, suggesting that much of the traffic at the count locations could be considered to be travelling the full length of the link.

There is also a slight imbalance with a few more vehicles travelling westbound across the locations eastbound. The percentage of traffic composed of identified at the count sites also decreases, in line expected reduced servicing and maintenance acti further from the centre of Leith.

### **Telford Road to Glasgow Road**

These four count sites show a steady increase in H numbers as they get closer to the motorway and strategic road network. Significant flows of traffic depart from/join to these flows at junctions with t A90 for traffic from Fife and beyond and also on th A8, where significant amounts of HGV traffic contir straight into the city on the A8 Glasgow Road / Corstorphine Road.

In this latter example, this traffic is generally rigid vehicles suggesting servicing activity around the city and local centres, whilst articulated vehicles tend to travel via Maybury Road and around the north.

		Inbound (	(Eastbound)	Outbound	(Westbound)	HGVs as %	LGVs a	
hese	JUNCTION	Rigid	Articulated	Rigid	Articulated	all traffic	%all traf	
ng	Commercial Street / Shore	220	98	223	100	4.7%	13.8%	
s than	Ferry Road / Newhaven Road	131	68	133	76	3.3%	14.0%	
f vans with	Ferry Road / Inverleith Row*	155	73	145	82	3.2%	12.7%	
vity	Ferry Road / Telford Road	138	69	157	77	2.6%	10.6%	
	Telford Road / Hillhouse Road	209	139	249	136	2.9%	10.3%	
IGV	Queensferry Road / Clermiston Road North	291	170	437	174	2.7%	11.3%	
he Ie	Queensferry Road / Maybury Road	MR:162 QR: 143	MR:111 QR: 55	MR:178 QR: 200	MR:109 QR: 64	2.6%	11.2%	
nue	Maybury Road / Glasgow Road	MR:262 GR: 171	MR: 108 GR: 32	MR: 390 GR: 228	MR: 191 GR: 24	3.2%	11.4%	

Table 5.10 Junctions with the highest absolute numbers of freight (HGV) traffic

\* this junction is not highlighted in the map but is included in the table for completeness, even though it is technically not in the "top 10" junctions measured either by percentage HGV traffic or absolute HGV numbers.

![](_page_66_Picture_15.jpeg)

![](_page_66_Figure_16.jpeg)

### Leith Docks East Route

These two count sites on Seafield Road indicate that a significant amount of traffic is travelling into the Interestingly, none of the "top ten" locations are on the Western Approach Road proper, instead freight Leith area from the A1. traffic is higher (as a percentage of total traffic) on A71 Gorgie Road.

Junction	Inbound	(Eastbound)	Outbound	(Westbound)	HGVs as %	LGVs as	tum ettern	Inbound	Inbound (Eastbound) Outbound (Westbound)		HGVs as %	HGVs as % LGVs as															
	Rigid	Articulated	Rigid	Articulated	all traffic	%all traffic	Junction Rigid Articulated Rigid Articulated	Articulated	all traffic %all traffic																		
Salamander Street /	0/0	70	07/	0.0	/ 0.0/	1/ 10/	Gorgie Road /	A70: 89	A70: 7	A70: 81	A70: 8	7 / 0/	1/ 50/														
Seafield Place	248	19	2/0	õõ	4.8%	4.8%	14.1%	Henderson Terrace	HT: 118	HT: 10	HT: 112	HT: 8	5.0%	14.5%													
Seafield Road /							Gorgie Road /	209	36	193	34	4 1%	15 3%														
Portobello High	235	112	280	113	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	.3% 13.2%	Westfield Road207301753	04	4.170	10.070
Street							Gorgie Road /	0/7	1.0	00/		0.00/	15 00/														
Portobello High							Chesser Avenue	263	48	224	45	2.9%	15.2%														
Street / Brighton	68	5	60	8	1.5%	11.5%																					
Place*							Table 5.12 Goraie Road	d Cluster H(	GV Movements																		

### Table 5.11 Leith Docks East Route Movements

\* this junction is not highlighted in the map but is included in the table for completeness, even though it is technically not in the "top 10" junctions measured either by percentage HGV traffic or absolute HGV numbers.

As can be seen from the table above, whilst the number of rigid vehicles remains probably the same at the two count sites on Seafield Road, there are significantly more articulated vehicles further out, potentially servicing much of the out of town retail locations on Seafield Road to the East of Marine Esplanade. The third count site at Portobello High Street demonstrates that very little inappropriate freight traffic is using the High Street, with it broadly being vehicles appropriate for local centre servicing.

![](_page_67_Picture_6.jpeg)

### Gorgie Road Cluster

### Iddle 5.12 Gorgie Rodd Cluster HGV Movements

In addition to the three count sites on Gorgie Road itself, there are two additional count sites which also are featured in the top ten by percentage, these are on McLeod Street and also Fountainbridge at Viewforth. Whilst the Dundee Street / Viewforth location isn't unexpected, the Mcleod Street count site is a result of the council corporate fleet services depot located here on former railway land, and as such it has been discounted from further analysis.

	Inbound (Eastbound) Outbound (Westbound) Junction		HGVs as %	LGVs as			
<u>!</u>	JUNCTION	Rigid	Articulated	Rigid	Articulated	all traffic	%all traffic
	Dundee Street / Viewforth	133	13	169	14	3.6%	13.9%

### Table 5.13 Dundee Street/Viewforth HGV Movements

On Viewforth, again a preponderance of rigid HGVs suggests a large amount of servicing activity, and also construction traffic, potentially linked with the nearby regeneration of Edinburgh Quay on the Canal and the new Boroughmuir High School.

### Summary of Edinburgh City Freight Movements

The presence of key freight corridors into the city from the east and west highlights the key role freight plays in Edinburgh, with strategic movements arriving (and leaving the city) via the A720 and A71 to the west and the A1 to the east.

The port is clearly a major trip generator for freight movements, and this is shown by high proportions of traffic on the A902 Ferry Road and the A199, whilst central east-west routes such as the A71 are similarly important.

This suggests there is scope for consolidation centres to serve these movements, with depots on key approaches enabling the same volume of goods to be transported by fewer vehicles, alleviating congestion and other negative externalities.

### 5.5 Summary

This section has shown that congestion is very pronounced in areas across South East Scotland, affecting the reliability of the supply chain and potentially economic performance.

In particular, Edinburgh and neighbouring authorities experience journey time delays over the Scottish average and investigations have shown central routes in Scotland experiencing proportions of HGVs similar to that of more strategic roads.

Therefore, there is a compelling case and basis to encourage modal shift and consolidation, particularly in urban areas. This could include through movements from other regions, reducing road miles not just in South East Scotland but elsewhere.

When looking at the types and volumes of goods being transported within the region and between the region and other areas it is also clear that there is a critical mass of certain commodity groups that could be moved by rail, especially those travelling longer distances from regions of the UK outside of Scotland.

To maximise these opportunities the supporting infrastructure needs to be in place to ensure that sustainable modes and methods can match customer requirements in terms of journey time, service levels and flexibility. These options are explored further in later sections.

![](_page_68_Picture_10.jpeg)

![](_page_68_Picture_11.jpeg)

# **06** Environmental Impact of Road Freight

![](_page_69_Picture_1.jpeg)

![](_page_69_Picture_2.jpeg)

This section incorporates a review of relevant national and local air quality guidance and legislation, and evidence and data from local authorities' Local Air Quality Management (LAQM) activities. The study is focussed on emissions from road transport and includes commentary on the emission source contribution from distinct types of vehicles on the strategic network.

The study supplies evidence to inform the development of methods of reducing emissions from freight transport as part of the wider development of the strategic freight strategy and the Regional Transport Strategy.

A breakdown of the policy framework for this area can found in Appendix C.

The scope of the study incorporates a baseline review of LAQM undertaken by local authorities, a national policy review, interrogation of regional background atmospheric pollutant sources and the Scottish Indices of Multiple Deprivation (SIMD) to indicate areas of socio-economic disparity.

LAQM reporting was reviewed for the local authorities in the SEStran area.

### **Air Pollution** 6.1

Air pollution includes a wide range of particle sizes and different chemical constituents. It consists of both primary components, which are emitted directly into the atmosphere, and secondary components, which are formed within the atmosphere as a result of chemical reactions. Of greatest concern to public health are the particles small enough to be inhaled into the deepest parts of the lung.<sup>50</sup> Poor air quality is the largest environmental risk to public health in the UK. Epidemiological studies have shown that long-term exposure to air pollution (over years or lifetimes) can cause chronic

conditions such as cardiovascular and respiratory diseases as well as lung cancer, leading to reduced life expectancy. Short-term exposure (over hours or days) to elevated levels of air pollution can also cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in respiratory and cardiovascular hospital admissions and mortality.

The UK Health Forum and Imperial College London, in collaboration with and funded by Public Health England (PHE), estimated that a 1 μg/m3 reduction in fine particulate air pollution in England could prevent around 50,900 cases of coronary heart disease, 16,500 strokes, 9,300 cases of asthma, and 4,200 lung cancers, over an 18 year period (PHE, 2018). In Scotland, fine particulate matter (PM) was associated with around 2,000 early deaths and a total of around 22,500 life years lost across the population. In the UK, the total economic costs of air pollution may be as high as £54 billion per annum (WHO, 2015). Improving air quality is clearly a high priority for government and society.

The continued economic growth of the South East of Scotland region has led to consistent growth in road traffic, which contributes to increased emissions and resultant areas of poor air quality. This is illustrated by the marked growth of LGV mileage across the UK and the south east of Scotland, with activity being driven by the increased demand for internet shopping and home delivery, as well as less strict regulation on the operation of LGVs (SEStran, 2010).

### 6.2 Pollutants of Concern

There are a number of pollutants associated with emissions from road transport, but the primary pollutants of concern for LAQM comprise exhaust emissions; NO2, PM10 and PM2.5, and non-exhaust emissions of PM10 and PM2.5, along with CO2 as a regional pollutant due to the contribution to climate change.

![](_page_70_Picture_13.jpeg)

### 6.2.1 Nitrogen Dioxide

The UK Government and the Devolved Administrations adopted two Air Quality Objectives for nitrogen dioxide (NO2) which were to be achieved by the end of 2005. In 2010, mandatory EU air quality limit values on pollutant concentrations were to apply in the UK, although it continues to be breached in locations throughout the UK. The EU limit values for NO2 in relation to human health are the same as the national objectives (Defra, 2011):

- An annual mean concentration of 40  $\mu$ g/m3 (micrograms per meter cubed); and
- An hourly mean concentration of 200  $\mu$ g/m3, to be exceeded no more than 18 times per year (99.79th percentile).

In practice, meeting the annual mean objective has been and is expected to be considerably more demanding than achieving the 1-hour objective. The annual mean objective of 40  $\mu$ g/m3 is currently widely exceeded at roadside sites throughout the UK, with exceedances also reported at urban background locations in major conurbations. Exceedances are associated almost exclusively with road emissions.

There is considerable year-to-year variation in the number of exceedances of the hourly objective, driven by meteorological conditions which give rise to winter episodes of poor dispersion and summer oxidant episodes. Analysis of the relationship between 1-hour and annual mean NO2 concentrations at roadside and kerbside monitoring sites indicate that exceedances of the 1-hour objective are unlikely where the annual mean is below 60  $\mu$ g/m3 (Defra, 2016).

![](_page_70_Figure_20.jpeg)

<sup>&</sup>lt;sup>50</sup> Defra definition <u>https://uk-air.defra.gov.uk/air-pollution/glossary</u>

### 6.2.2 Particulate Matter

Particulate matter is composed of a wide range of materials arising from a variety of sources. Particulate matter is typically assessed as total suspended particulates or as a mass size fraction.

This assessment considers the annual mean and daily mean air quality objectives, as specified in the AQS for England, Scotland, Wales and Northern Ireland (Defra, 2011). Two objectives have been adopted in Scotland for PM10 (fine particulate matter), which were to **(LAQM)** be achieved by the end of 2004:

- An annual mean concentration of 18  $\mu$ g/m3 (gravimetric); and,
- A 24-hour mean concentration of 50  $\mu$ g/m3 (gravimetric) to be exceeded no more than 7 times per year.

One objective has been adopted in Scotland for PM2.5, of an annual mean concentration of 10  $\mu$ g/m3 (gravimetric) to be achieved by 2020.

Both short-term and long-term exposure to ambient levels of particulate matter is consistently associated with respiratory and cardiovascular illness and mortality as well as other ill-health effects. Particles of less than 10 micrometres (µm) in diameter have the greatest likelihood of reaching the thoracic region of the respiratory tract.

It is not currently possible to discern a threshold concentration below which there are no effects on the whole population's health.

Reviews by World Health Organisation and the Committee on the Monitoring Data Medical Effects of Air Pollutants (COMEAP, 1998) have suggested exposure to a finer fraction of particles (PM2.5, which typically make The air quality monitoring undertaken by the local authorities are up around two thirds of PM10 emissions and concentrations) give provided in Appendix C. These data are predominantly recording a stronger association with the observed ill health effects, but also annual mean NO2. warn that there is evidence that the coarse fraction (between PM10 -PM2.5) also has some effects on health.

## 6.3 Local Air Quality Management

### Overview

Local authorities have an important role in ensuring there are improvements in air quality. Their local knowledge and ability to engage with the communities they serve mean they are best placed to identify the air quality problems they face and develop the most fitting solutions.

Through the LAQM system local authorities are required to monitor pollutants of concern as outlined by national and European legislation in order to assess the air quality within their jurisdiction. If the air quality is deemed poor enough that it needs to be improved, then the local authority must declare an Air Quality Management Area (AQMA). Where an AQMA is designated, a local authority is required to produce an Air Quality Action Plan (AQAP) describing the pollution reduction measures it will put in place.

![](_page_71_Picture_13.jpeg)

The data indicates the baseline conditions in the region tend to be clustered around the areas of greatest concern for the local authorities as they are used to evidence compliance with the limit values.
## Air Quality Management Areas (AQMAs)

An Air Quality Management Area (AQMA) may be declared where a local authority identifies high pollution concentrations in excess of a relevant air quality objective. Therefore, where a strategic road with high volumes of freight traffic passes through an AQMA it indicates where it may represent a specific priority for the local authority stakeholders.

There are a number of AQMAs declared throughout the south east of Scotland. In total there are sixteen and they are within the local authority boundaries of: East Lothian Council; Edinburgh City Council; Falkirk Council; Fife Council; and West Lothian Council. There are no AQMAs declared within Clackmannanshire, Midlothian or Scottish Borders.

A summary of the AQMAs in the south east of Scotland is presented including the pollutant of concern that triggered the declaration. These AQMA are all related to emissions from road transport, and so will be potentially affected by changes to freight management that may arise as an outcome from this study.

#### Name of AQMA

High Street, Musselburgh

St John's Road

City Centre

Inverleith Row

Great Junction Street

Glasgow road

Salamander Street

Grangemouth

Banknock & Haggs

Falkirk Council AQMA #5 (Banknock) Falkirk Town Centre

Bonnygate

Appin Crescent Dunfermline Broxburn

Newton

Linlithgow

Table 6.1 Air Quality Management Areas Declared in the South East of Scotland



Local Authority	Pollutant of Concern	Area of AQMA / km2
East Lothian Council	NO2 Annual Mean	0.01
Edinburgh City Council	NO2 Hourly Mean and Annual Mean	0.02
Edinburgh City Council	NO2 Hourly Mean and Annual Mean	0.94
Edinburgh City Council	NO2 Annual Mean	0.01
Edinburgh City Council	NO2 Annual Mean	0.04
Edinburgh City Council	NO2 Annual Mean	0.04
Edinburgh City Council	PM10 Annual Mean	0.43
Falkirk Council	SO2 15-minute Mean	18.61
Falkirk Council	PM10 24-hour Mean and Annual Mean	0.21
Falkirk Council	NO2 Annual Mean	2.14
Falkirk Council	NO2 Annual Mean; PM10 24-hour Mean and Annual Mean	0.45
Fife Council	NO2 Annual Mean; PM10 Annual Mean	0.27
Fife Council	NO2 Annual Mean; PM10 Annual Mean	0.02
West Lothian Council	NO2 Annual Mean; PM10 Annual Mean	0.13
West Lothian Council	PM10 Annual Mean	0.04
West Lothian Council	NO2 Annual Mean; PM10 Annual Mean	4.83



# Air Quality Action Plans (AQAPs)

An Air Quality Action Plan (AQAP) is published by a local authority where they have declared an AQMA, and which outlines the defined actions to improve air quality.

Every year local authorities are required to publish an Annual Progress Report (APR) which provides an update on the progress made in improving air quality within AQMA and the effectiveness of the various policies outlined in the local authorities AQAPs.

The information in Table 6.2 presents a thematic summary of the policies implemented by the local authorities in the SEStran area and the frequency with which they appear in the AQAP.

These themes may provide an opportunity to complement, or inform, proposed measures to reduce emissions from road transport, and may encourage engagement with existing stakeholders within local authority areas.

> CLK = Clackmannanshire EAL = East Lothian EDB = Edinburgh FAI = Falkirk FIF = Fife MIO = Midlothian SCB = Scottish Borders WEL = West Lothian

#### Policy

Improve links between Air C Improve links between Air ( Use Micro-Simulation and A Management proposals Enforcement of anti-idling n Electrification of public tran Establishment/developmer commercial fleet recognitio Expansion of train station ar Increase awareness of the e Traffic calming measures to East Scotland Vehicle Emiss service for members of the Promotion of active travel ( integration of walking/cycli Green Travel Plans for large organisations Development and implement Managing of council fleet er driver training Electric Vehicle charging inf E-MOTES real-time pollutan management methods Controlled parking/priority the city Manage road freight emission by SEStran Development of park and ri Facilitation of car club imple Using trees, and other vege

Table 6.2 - Summary of Themes from Local Authorities across South East Scotland that Address Poor Air Quality



	CLK	EAL	EDB	FAI	FIF	ΜΙΟ	SCB	WEL	To
Quality Action Plan and Local Transport Strategy									5
Quality Action Plan and Local Development Plan									6
ir Quality Dispersion Modelling to assess Traffic									4
neasures									3
nsport bus fleet									3
nt of Scottish 'Eco Stars' scheme (council and on scheme)									4
nd train capacity									4
existence of AQMAs									2
ensure improved flow									6
sions Partnership (vehicle emissions testing public)									4
provision of dedicated walk/cycle lanes; ing with public transport etc.)									7
institutions and businesses and other external									4
ntation of a Low Emissions Zone (LEZ)									1
missions e.g. emission reduction technology,									5
frastructure									3
t monitoring to assess efficacy of traffic									1
parking measures to deter car commuting into									2
ons with Freight Quality Partnership. Established									1
ide facilities									4
ementation									3
etation, as Green Infrastructure									1



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## Methodology

This section focuses on emissions from road transport, using the DEFRA emissions calculation tool and published traffic count data to predict emissions from the major roads in the SESTran area. The classified count data was used to inform the source apportionment and to understand the major sources of emissions, and the contribution from different components of the fleet.

The emissions calculations tools were also used to appraise the rate of emissions resultant from different vehicle speed and Euro classification. This enables a greater understanding of how different components of the fleet contribute to the overall emission rates.

## **Regional Network Emissions**

The Department for Transport (DfT) publishes road traffic statistics including Annual Average Daily Traffic (AADT) flow as counted at various traffic count points around the country. These are published online as classified counts for each year based on the latest available data (https://roadtraffic.dft.gov.uk/#6/55.254/-6.053/basemap-regions-countpoints).

The data for this study were obtained from the DfT automatic traffic counts (ATCs) for the whole of South east of Scotland, grouped by the individual local authorities in the SEStran region.

The ATC census points were correlated with the coarse alignment of the DfT Major Highways Network and processed using the EFT (see below) to assign a geospatial extent to the road emissions within the study area. Where several census IDs correlated with a network link then the central location was used, and where no network link was identified then this count ID was not assigned in the presented results.

## **Rail Emissions**

Emissions from rail were not appraised in this study. However, the Rail Safety and Standards Board (RSSB) has recently launched an Air Quality Strategy Framework that is intended to provide a risk based approach to reducing air quality impacts from rail emissions (RSSB, 2020). Therefore, it is expected that any modal shift of freight from road to rail may incorporate the baseline evidence and recommendations outlined in this Strategy and associated documents.

## **Emission Profiles**

The emission factor toolkit (EFT) version 9.1.a was used to calculate the emission rates in g/s for  $NO_x$ ,  $PM_{10}$ ,  $PM_{2.5}$  and  $CO_2$  for each of the road links in the traffic model.

The EFT uses drive-cycle data from the European COPERT 5 model for various vehicle types and ages to determine speed / emission relationships. The emission profiles are used in conjunction with the traffic flow data to assign rates to each modelled road link.

The EFT assigns a Euro emissions profile to each component of the fleet, which is nominally based on national data for different regions. AECOM experience with regional studies indicate that the fleet breakdown on strategic roads tends to be broadly representative of local profiles, although minor roads and those affected by specific local conditions may diverge significantly.

The EFT includes the Euro profile and fuel-type breakdown for each vehicle classification operating on the network, with projections for future year, wherein it is expected the Euro classification with increase and alternative technologies may have increased adoption.



The data in Figure 6.1 indicate that the regional fleet profile used in the model is predominantly in the Euro VI classification but with approximately 15% Euro V with Selective Catalytic Reduction (SCR), and decreasing proportions with older Euro classifications.

and decreasing proportions with older Euro classifications. This study included emission tests to indicate the emissions at different speeds and Euro classifications, which are incorporated within the overall fleet profiles applied within the EFT These tests indicate how changes to the speeds and fleet composition may alter resultant emissions attributed to specific components of the fleet.

Further tests were also undertaken to consider the effects of different loading and speed on HGVs, which has an effect on the exhaust abatement systems (SCR and EGR) that require higher temperatures to operate effectively.



Figure 6.1 National HGV Euro Profiles Used in 2018 EFT, v9.1.a

## Scottish Index of Multiple Deprivation (SIMD)

Air quality impacts influence the health and wellbeing of the population via a complex matrix of interactions. These factors have been considered using the Scottish Indices of Multiple Deprivation (SIMD). Households in the poorest areas emit the least nitrogen oxide The total emissions are presented in Figure C15 to Figure C17, where (NOx) and particulate matter (PM), whilst the least poor areas emitted the highest, per kilometre vehicle emissions per household. This was due to these richer households having higher vehicle ownership, owning more diesel vehicles and driving further, the study said. The research also found that traffic pollution within poor areas is likely to be caused by those living in relatively more affluent areas, further compounding the environmental injustice.<sup>51</sup> The SIMD uses 6,976 'data zones' of roughly equal population, using a single indicator of deprivation categorised under seven domains: Income; Employment; Education; Health; Access to Services; Crime; and Housing. Once these indicators have been considered it is possible to rank the 6,976 data zones from most (1) to least (6,976) deprived (SG, 2016a).

Human health is the only domain listed above where air quality has a reported impact, and is the outcome from a number of indicators: Standard Mortality Ratio; Hospital Stays Related to Alcohol Misuse; Hospital Stays Related to drug Misuse; Comparative Illness Factor; Emergency Stays in Hospital; Proportion of Population Being Prescribed Drugs for Anxiety, Depression of Psychosis; Proportion of Live Singletons Births of Low Birth Weight (SG, 2016b).

# **Regional Network Emissions**

The emissions from the major roads in the SESTran area were modelled to calculate the emission rates from each count location aligned to a section of the road network. These data are presented in Appendix C

the emissions are clearly highest on the major strategic routes, such as the M8 and Forth crossing.

The source contribution from Heavy Duty Vehicles are presented in Figure C18 and Figure C19 for the roads with the highest total emissions.

## Background Sources

For any modelling exercise the ideal situation is to estimate emissions from all known sources (road, rail, industry, etc.). In practice, information will only be available for those sources under the consideration; i.e. the road traffic component on the roads for which data is available. Under these circumstances all other sources are collectively considered to be a 'background component'.

Defra publish estimates of 'background' pollutant concentrations for each square kilometre, based on national modelling studies (DEFRA, 2020). The most recent background concentration maps, based on a reference year of 2017, have informed this section and plotted in Appendix C.



The background emissions contribution is distinct from the local road sources, and in the case of PM it may also comprise different composition and shape compared to road-source emissions, and so have different health effects. Background annual mean NO2 in 2018 was highest within the City of Edinburgh, between 30 and 35  $\mu$ g/m3 near the junction of the M8 and the M9 motorway, and between 20 to 30  $\mu$ g/m3 near the junction of the A71 and A720 Edinburgh By-Pass, and within

Edinburgh city centre, likely attributable to road transport.

The highest PM10 annual mean background concentrations were between 14 and 16  $\mu$ g/m3 in 2018 along the M8 motorway and junctions with A720 Edinburgh By-Pass and M90, whilst many urban areas had a background of 12–14  $\mu$ g/m3 across the study area.

The highest background annual mean PM2.5 is 8.4  $\mu$ g/m3, located to the south east of Broxburn is potentially associated with industrial facilities. Elsewhere the highest is between 7 and 8  $\mu$ g/m3, which follows numerous large road networks, Edinburgh city centre, and Forth Ports; all likely to be attributable to road transport, with exception of the latter.

<sup>&</sup>lt;sup>51</sup> Air Quality News <u>https://airqualitynews.com/2019/06/19/poor-most-exposed-</u> to-air-pollution-caused-by-rich-study-finds/ Acesed 15/12/20

## **Road Transport Emissions**

The plots below present the total emissions of NO<sub>X</sub>, PM<sub>2.5</sub> and CO<sub>2</sub> from the modelled road network. The roads with the highest emissions correlate to those with highest traffic flows, as expected, and include the M8 motorway and major radial routes feeding the main urban centres.

Emissions from private cars, and specifically diesel cars are the most significant source on the network.

NO<sub>x</sub> emissions from HGVs are disproportionally significant relative to the traffic flows. The data in Figure 6.2 indicates the average emissions breakdown across the whole model network, wherein HGVs were predicted to be responsible for approximately 10% of emissions. This was representative of the major roads, as expected, as the higher flows on these roads bias the average value, whereas the pattern on minor roads with lower overall emissions were more variable.



Figure 6.2 Average NO<sub>X</sub> Emissions Source Contribution on Model Network





Figure 6.3 Average PM<sub>2.5</sub> Emissions Source Contribution on Model Network



Figures 6.4 and 6.5 demonstrate the contribution of HGVs to NOx emissions on the major highway network in South East Scotland, demonstrating that on key routes such as the A1 and more local distributors such as the A977 the percentage contribution is over 20%. Efforts to reduce trunking movements could therefore make a significant contribution to overall emissions.



Figure 6.4 NO<sub>x</sub> Emissions Contribution from HDVs (Rigid and Articulated HGVs)





Figure 6.5 NO<sub>x</sub> Emissions Contribution from HDVs, Detail Around Edinburgh (Rigid and Articulated HGVs)





lower the proportion from HDVs is very high.



Figure 6.6 Average CO2 Emissions Source Contribution on Model Network

HGV emissions are most significant on the major A-roads and motorways within the study area whilst buses/coaches are significant on several roads within Edinburgh ring road and the A9000, where they make up a vast majority of the emissions – up to 84% of NOx and Figure 6.7 NO<sub>x</sub> Source Contribution on Highest Emission Link, Census up to 80% of PM2.5. A few urban centres also have a small number of ID 74392, M8 West of Edinburgh Airport road links with high proportions of emissions from buses.

Figure 6.7 indicates the source contribution on the link with the highest NOX emission rates, the M8 motorway, which is very similar to the average emissions breakdown for the whole network, although HGVs on this link contribute approximately 12% of the total associated with freight movements are more significant on the major routes.

It was also noted that LGVs contribute a significant proportion of the overall NO<sub>x</sub> emissions; approximately 37% on the overall network. This was of specific interest in terms of air quality, as there is potential uncertainty with regard to the age profile for this fleet due to the large numbers of owner-operators and wide range of realemissions and LGVs approximately 40%. This indicates that emissions world applications as LGVs are used for multiple purposes, including freight transport, commercial and personal use, and so not al LGV can be categorised for a use comparable to heavier goods vehicles.



The source contribution from buses was recognised on the eastern forth bridge, which is currently used solely for bus access and is not used by public traffic. Similarly, several urban routes within the city of Edinburgh are bus-only, and so whilst total emissions are relatively

These data indicates that LGVs contribute approximately twice the percentage of NO<sub>x</sub> to annual emissions relative to the proportion of vehicles, which is potentially significant when considering any modal shift of freight to, or from, heavy vehicles on the strategic or local road networks.

These emission breakdowns can also be interpreted with reference to the speed vs emission profiles in Appendix C, wherein the effects of using different vehicles types on different roads (i.e. with different operating speeds) may be a consideration in the promotion of specific vehicle types:

- Emissions from HGVs are highest at low speeds, and decease at higher speeds.
- Emissions from LGVs are also highest at low speeds, but achieve the lowest emission rates at approximately 40–50 km/hr.

A model artefact at very low speeds represents the uncertainty of modelling emissions <5 km/hr, where rapid variable engine loading and acceleration can have significant transient effects and contributes to relatively high emission rates associated with realworld congestion and queuing traffic conditions.



## 6.4 Freight Fleet Data

As discussed, a series of tests were undertaken to interrogate the emission profiles for various speeds, Euro classifications and (in the case of HGVs) loading for rigid and articulated HGVs and LGVs.

The detailed review of emissions from specific components of the fleet are outlined in Table 6.3 and in plots in Appendix C demonstrating how emissions change with different speeds.

Articulated HGVs have the highest emissions at all speeds and consequently have the most potential to improve emissions, especially at lower speeds. However, LGVs may be more favourable for some applications compared to HGVs within built up areas where air quality is already poor such as in AQMAs. The emissions of smaller vehicles tend to be lower, although individual vehicles have relatively low load-carrying capacity and so more vehicles will be required to carry the same load.

CO<sub>2</sub> emissions have been described separately where the profiles are significantly different than for NO<sub>x</sub> and PM emissions.









Fleet Class	S	ummary
Articulated and rigid HGVs	-	Euro V SCR have much higher $NO_X$ emissions than other classes a types as presented in Figure C23.
	-	Switching from a Euro I/II/III (particularly Euro I) to a Euro VI woul occur at lower speeds i.e. below 30kph.
	-	Optimum speed is above 50–60 km/hr for all pollutants.
Goods Loading (HGVs)	-	Improvements to articulated HGVs may achieve greater emission Goods loading is modelled in the EFT to indicate the effect of va specifically, SCR and exhaust temperatures.
	-	The NO <sub>x</sub> and PM emissions impact of variable loading is more sig
	-	The NO <sub>x</sub> emissions impact of loading is not uniform for Euro V SC for articulated, and by 30 kph for rigid), the highest emissions occertions are from a load of 50%. See Figure C20. This is due to t
	-	The NO <sub>x</sub> emissions impact of loading is not uniform for Euro VI. T once the vehicle goes higher than 85 kph for articulated (80 kph
LGVs	-	The overall pattern indicates highest emissions at very low and h
	-	Euro 5 and Euro 6 (plus Euro 6c and 6d) $NO_x$ emissions follow a d at 5kph to a lower emission at 10kph, with the Euro 6c and 6d fol
	-	$NO_X$ emissions from Euro 5 are the most significant at the lowest
	-	Euro 1 and 2 are most significant for PM emissions at all speeds.
	-	Euro 6c and 6d class have the lowest NO <sub>x</sub> and PM emissions. Swi as shown earlier in Figure 6.1, there are significantly fewer older (j
CO <sub>2</sub> emissions	-	CO <sub>2</sub> emissions are a function of fuel consumption.
	-	An effort to encourage speeds to sit at mid-level (between approbiggest difference achievable when targeting articulated HGVs.
	-	With the potential exception of LGVs, there is minimal difference efficiency between the Euro categories.
	-	

Table 6.3. Freight fleet emission profiles summary



at very low speeds (<10 km/hr), although relatively higher emissions at low speeds are demonstrated in all Euro

Id provide the largest improvement for NO<sub>x</sub> and PM emissions at all speeds, although the largest impact would

is benefits than rigid HGVs, without considering the actual numbers on the roads. arying the amount of goods carried with corresponding engine-loading and resultant exhaust abatement tuning;

gnificant at lower speeds for HGVs, and more so for articulated HGVs.

CR. The largest impact at lowest speeds is at 100% load however immediately after picking up speed (by 20kph) cur with 0% load. At the highest speeds, (above 80kph for articulated, and above 85 kph for rigid), the lowest the exhaust temperatures with low engine-loading being insufficient to trigger the emissions abatement system.

The largest impact at lowest speeds is at 100% load with a reduction once the vehicle reaches 10 kph, however for rigid) HGVs, the largest emissions result from a 100% load. See Figure C21. high speeds for all Euro classes, with lowest emissions between 45 to 65 km/hr.

different NO<sub>x</sub> emission profile. At lower speeds, these two classes sharply decline from a relatively higher emission llowing the same pattern, but at around half of the emissions.

and higher speeds, although between 10 and 45 kph, Euro 1 and 2 emit more.

itching Euro 1 and 2 LGVs to Euro 6c and 6d would likely have the greatest impact per individual vehicle, although pre-Euro V) HGVs in the fleet.

oximately 45 to 65 kph) would be favourable (or just higher speeds rather than lower), for all freight, with the

in the profile of Euro classes, as shown in Figure C23 to Figure C25, indicating minimal differences in fuel

# 6.5 Scottish Indices of Multiple Deprivation

The SIMD ranking for the data zones in the study area are presented in Figure 6.8, and roads with the highest emissions are correlated geospatially with the zones in the SIMD in Figure 6.9 to indicate where road emissions may be a contributing factor to poor health.

The proportions of emissions attributed to the different vehicle classes on the roads with highest emissions are broadly similar across each of these links, with approximately 10–12% emissions from HGVs and 40% from LGVs, as indicated above. These links are generally the strategic motorway or trunk



Figure 6.8 SIMD Ranking for SEStran Region



routes and so represent a consistent class of road where the same vehicles, or segment of the fleet, are contributing to the overall emissions. Therefore, a strategic approach to managing these emissions may have a broad benefit, whilst targeted interventions on single key links (e.g. Forth Bridge) may also have a wider cumulative effect through the network.

The SIMD ranking in the affected zones varies between the upper and lower ranges, with notable lower-scoring areas around Dunfermline, Grangemouth and Bathgate. Therefore, it does not indicate a consistent relationship between the roads with highest emissions and socio-economic disparity, although there are clearly some areas where reducing emissions may support tangible benefits.



Figure 6.9 SIMD Adjacent to High Emissions Links



#### Summary 6.6

The Local Air Quality Management information for the local authorities within the SEStran region were reviewed, including air quality monitoring data, Action Plans to improved air quality, and background pollution data published by SEPA / DEFRA.

The SIMD were plotted to determine the geospatial distribution of socio-economic disparity, and specifically health, across the region and how this may correlate to emissions from the strategic road network.

Traffic counts for the strategic road network in the SEStran area were modelled to calculate the emissions from individual road links, and further interrogated to determine the contribution from individual vehicle classes.

The notable outcomes from this were:

- Emissions from HGVs are disproportionally significant relative to the number of vehicles.
- Emissions from LGVs were considered to be significant overall, and also tended to be disproportionally significant relative to the number of vehicles.
- LGVs are used for freight, but also numerous other commercial and private uses, so this is a potentially complex component of the fleet with regard to strategic management.
- Roads with high emissions pass through some of the areas with lowest score for SIMD, although there is no clear overall correlation between SIMD and high emission rates.

Nominal tests were undertaken to indicate relative emissions from specific components of the fleet to inform the understanding of the emissions profiles and the potential effects of interventions:

- modelled vehicle types, per vehicle, at all speeds.
- km/hr.
- different speeds.
- of exhaust abatement.

In summary, there are clearly opportunities to achieve beneficial air quality effects on the strategic and local networks by targeting freight traffic through the use of different vehicle types (or modal shift), Euro classification or speed controls. This may complement operational priorities, as well as balancing objectives for local air quality and regional greenhouse gas emissions.



- Articulated and rigid HGVs tend to have similar emission profiles, although articulated HGVs have the highest emissions of the

- Emissions from LGVs are significantly lower than from HGVs, although individual vehicles have lower load capacity,

- Emissions typically are highest at low speeds, and decrease significantly at greater speeds, tending to plateau around 40–50

- Emissions from higher (newer) Euro emission classifications tend to be lower. However, there are instances where this varies at

- Emissions from HGVs with different loadings were also modelled and indicated some complexity at lower speeds due to operation



# Freight Movements 07 and Road Safety





This section has been developed to investigate road traffic incidents involving freight vehicles. This will help determine the extent of the issue and inform where and how interventions should be targeted.

#### It is acknowledged that roads authorities have a statutory responsibility delivered through Accident Investigation and Prevent (AIP) work to investigate road casualties. It is not intended to replicate this work, however any efforts to reduce the volume of HGVs and vans on the road may reduce the chances of an incident occurring.

By looking at trends and locations of incidents we can assess the extent to which freight movements are contributing to road safety issues and how and where interventions should be targeted. For example, incidents in city centres could be addressed by promoting micro-consolidation whilst those on strategic routes could be reduced by modal shift from road to rail.

DfT data shows that aside from the potential catastrophic human cost of incidents there are economic impacts too, with an average cost per accident of £2,260,633 for fatal accidents, £261,498 for serious and £26,840 for slight.<sup>52</sup> Subsequent delays can also have wide ranging impacts, with time sensitive consignments affected and delivery windows missed. Reducing the number of road freight movements will not only reduce the likelihood of an incident but lower traffic volumes will result in congestion associated with an incident clearing more quickly.

Data was derived from STATS19 for the period 2005–18, the Department for Transport database of incidents across the UK for the study area.

In 2019, Scottish police forces adopted the CRASH (Collision 7.1 Headline Statistics Recording and Sharing System) system for recording reported road traffic collisions. When this was adopted in 2015/2016 by half Out of the 2,624 incidents resulting in a casualty in the SEStran area of English police forces, there was an increase in the number of in 2018, 451 were goods vehicle-related incidents, a considerable seriously injured reported, which may have previously been reported reduction from a high of 610 accidents in 2016 and in line with a longas slight injuries. It's therefore possible that in 2019 STATS19 data, term decrease since 2008. a similar result will occur with serious injuries increasing, but slight injuries falling further.

Goods vehicles were involved in 17% of road accidents causing a casualty, a lower proportion than the number of miles covered by goods vehicles within the SEStran local authority area. (21%).

The number of fatal casualties involving goods vehicles in 2018 (8) was similar to 2017 (7), and the minimum value reported in this dataset recorded in 2009 (6). This is a significant decrease from the 43 casualties recorded in 2016. Whilst the number of incidents recorded has generally been lower than recorded in 2008 (33), its possible that most of the year on year changes are either explained by one-off causes (sustained period of bad weather) or natural variation.

The number of seriously injured casualties involving goods vehicles in 2018 (90) was a slight increase in comparison to 2017 (78), and similar to figures recorded in 2015 (84) and 2016 (88). Since a significant decrease in 2009, probably associated with lower traffic levels due to the recession, the long-term trend has been broadly flat.

In 2018, the lowest number of slightly injured casualties was recorded Figure 7.1: Casualties involving HGVs in SEStran LAs 2005-2018 (353), a substantial reduction from the figure recorded in 2006 (641), and a continuation of a long-term downwards trend.





<sup>&</sup>lt;sup>52</sup> Average value of prevention1 per reported casualty and per reported road accident, GB 2019, Department for Transport

#### Casualties by Mode in Goods Vehicle Accidents 7.2

Car occupants are the group most affected in incidents with goods vehicles, both in terms of the number of casualties (48%) and the number of fatalities (50%), reflective of the proportion of traffic which is made up by private cars. However, van occupants were also significantly affected. When looking at fatalities, a greater proportion of pedestrians were affected, reflective of the severe consequences of an HGV colliding with a vulnerable road user.



Figure 7.2: Proportion of Casualties by Mode 2005–2018





Figure 7.3: Proportion of Fatalities by Mode 2005–2018



#### **Vulnerable Road Users** 7.3

Vulnerable Road Users are particularly exposed when involved in an incident with HGVs and as we have seen this can often result in a fatality or serious injury. Road safety issues also have a dampening effect on efforts to encourage active travel, exacerbating wider health problems. Figure 7.4 demonstrates the trends between 2005 and 2018.

Casualties involving HGVs in SEStran LAs 2005-2018 700 600 500 400 300 200 100 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 Year Seriously Injured Slightly Injured

and fatal casualties involving goods vehicles and pedestrians, with no fatalities recorded. However, due to the very low figures being presented, it's likely this figure will vary over the upcoming years rather than demonstrating the start of a long-term trend.

2018 saw a record low for pedal cyclists and goods vehicle casualties. This is particularly significant considering a number of recent high-profile incidents involving cyclists in urban areas, combined with an increasing level of freight traffic. No pedal cyclist fatalities have been reported in 4 of the last 5 years, and the number of serious injuries is a joint-low. Similar to pedestrians, the decline has been driven by a fall in slight injuries, with a 43% decrease from 2017 to 2018.

Motorcyclist casualties have been slowly declining since 2014, however, the number of reported incidents in recent years has been low, so it's possible that further year-on-year changes will be due to natural variation.



#### Figure 7.4: Vulnerable Road User Casualties per Annum 2005–2018

To explore this trend further, there has been a 44% reduction in the number of pedestrian casualties since 2016 after minimal changes in rates between 2010–2015. This was primarily driven by a significant decline in the number of slight injuries, which accounted for 81% of the total. 2018 saw the joint lowest level reported for serious



#### Private Car Casualties per Annum 2005-2018

As evident in Figure 7.5, the number of casualties involving goods vehicles and private cars has remained reasonably consistent since 2011, with an uptick in 2016. The number of fatalities and serious injuries has remained consistent since the beginning of the dataset, indicating no long-term trends and natural variation. In terms of the number of slight injuries, this looks to be gradually reducing since a peak of 382 casualties in 2006, with another 7% decrease from 2017 to 2018.



Figure 7.6: HGV ( > 3.5tn) Casualties per Annum 2005–2018

HGV annual mileage within the SEStran area has remained broadly the same over the 14-year study period, so its unsurprising that casualties have fallen as greater safety measures have been introduced on roads and to vehicles. This number of casualties has remained consistent since 2013, with minor year-on-year changes. HGV fatalities are rare, with only 1 in the last 5 years.



#### Figure 7.7: LGV (<3.5tn) Casualties per Annum 2005–2018

Annual mileage by Light Goods Vehicles (LGV) has seen the largest increase (125%) over the study period. Despite this, there has been a gradual decline in the number of casualties, with 1 less casualty in 2018 compared to 2017. LGV occupants have a minimally higher fatality rate than HGV occupants in terms of absolute counts, but in proportion to the vehicle class mileage they have a comparable rate to private cars.

Figure 7.8 demonstrates that incidents relating to HGVs are focused on urban areas and key 'trunking' routes, Fatalities have occurred throughout the region but roads such as the A1 and M9 have experienced a number if incidents leading to death, reflective in part of higher flows of HGVs.







#### Local Authority Areas 7.4

To explore casualties at a more micro level, case studies have been identified for incident 'hotspots' for some local authority areas.

#### **Scottish Borders - Galashiels**





When examining potential "hotspots" within the Scottish Borders local authority, the town of Galashiels, with a population of 12,600, stands out. Positioned in the middle of the area, the town is situated on the A7, an important trunk route which connects Edinburgh to Carlisle, and the A68 to the NE of England. Therefore, it seems inevitable that there will be an increased level of goods traffic around this small urban centre.

#### Casualties involving Goods Vehicles within the Galashiels Area



Galashiels Area

#### Figure 7.9: No. of Casualties per 10,000 People by Local Authority 2005-2018

Scottish Borders has been the worst performer in the majority of the study period for the number of casualties relative to its population. The area has the lowest population density in the SEStran area (0.2 persons per hectare), and therefore urban areas within the local authority are connected by 60mph A roads and B roads. These fastmoving roads accounted for 78% of the goods vehicle related road casualties within Scottish Borders. Furthermore, Scottish Borders has a greater than SEStran average level of goods vehicles on its roads, with 19% of the vehicle "fleet" being LGVs and 6% HGVs.<sup>53</sup>

GO SEStran

#### Figure 7.10: Casualties involving Goods Vehicles within the

There has been a decrease in the number of casualties per year in the Galashiels area over the study period. In 2005 and 2006, there were a number of pedestrian incidents within the Town Centre which have now been completely diminished. This is possibly due to a reduction in traffic through the centre thanks to the completion of

One area that could be potentially examined for future intervention is the number of road traffic incidents involving goods vehicles around junctions in Galashiels. 61% of the casualties within the area occurred at junctions, of which 55% were give ways or uncontrolled. It's possible that drivers struggle with visibility at junctions within the

#### West Lothian



## Figure 7.11: Junction Details of Road Traffic Incidents



Figure 7.12: Junction Controls of Road Traffic Incidents





the Inner Relief Road in 2012.

town.

<sup>&</sup>lt;sup>53</sup> Road Traffic Statistics by Local Authority, Department of Transport

West Lothian has also performed poorly relative to its population, however, in contrast to the Scottish Borders, the largest proportion of accidents occurred on 30mph roads, reflecting the fact that the area is more urbanised. West Lothian also has a high amount of its incidents occurring on the 60/70mph motorways and A roads, which are key routes carrying a significant amount of through traffic across the Central Belt.

This area near the town of Bathgate perfectly demonstrates the different flows of traffic that West Lothian services, with a high number of casualties around the town and the connection with the M8. 30% of traffic travelling northbound on the A801 near to the west of Bathgate is goods vehicle traffic, which would explain a large amount of goods vehicle related casualties in the area.



Figure 7.12: Junction Controls of Road Traffic Incidents





#### City of Edinburgh

In terms of absolute counts, City of Edinburgh is the worst performing local authority for the number of casualties involving goods vehicles. This is because the local authority accounts for 23% of traffic and has the highest level of population density in the SEStran area (18.1 persons per hectare), as well as the fact that 63% of road casualties in GB occur in urban areas, which the City of Edinburgh is mostly composed of.



Figure 7.13: No. of Casualties by Local Authority 2005–2018 involving HGVs

Road casualties within City of Edinburgh have declined significantly over the study period, both overall and across a number of different variables. However, in contrast to this, the number of casualties in 20mph areas involving goods vehicles has increased quite considerably in recent years.

	Accident Severity by Speed Limit	Speed Limit - 20mph	Ci	rgh	
	Year	Fatal	Seriously Injured	Slightly Injured	20mph Speed Limit Total
	2005	0	0	2	2
	2006	0	0	1	1
	2007	0	0	1	1
	2008	0	0	2	2
	2009	0	2	3	5
	2010	0	0	2	2
	2011	0	1	1	2
h	2012	0	1		1
	2013	0	0	6	6
	2014	0	0	4	4
	2015	0	0	8	8
5	2016	0	2	15	17
	2017	3	9	47	59
g	2018	0	3	37	40
	Grand Total	3	18	129	150

Table 7.1: Goods vehicle incidents in 20mph zones



The implementation of the "20mph for Edinburgh" scheme, leading to an expansion of the number of 20mph zones in the City. 20mph zones have been introduced in Edinburgh to reduce the likelihood of road accidents and improve community safety. However, more interventions may be required to ensure that drivers are more alert to potential conflicts with pedestrians, reduce overall vehicle numbers and potentially more safety measures are put in place to allow safer walking and cycling activity. The long-term impact of the 20mph zones is currently unknown, and something that will needed to be examined in the 2019 data.



#### Fife

Fife has the highest proportion of road traffic in SEStran with 24%, however, it has a much lower casualty count than the City of Edinburgh LA. This may be because Fife has a much lower population density (2.8 persons per hectare) and provides through connections to the Tay Cities and Far North of Scotland. It scores the lowest for the number of casualties per 10,000 people in the SEStran area.

Fife has a similar traffic pattern to West Lothian, with the majority of accidents occurring on A roads at either 30 or 60mph, demonstrating the increased urbanisation of the area and the use of the area as a through route.

#### East Lothian

East Lothian carries a substantial amount of through traffic to the Central Belt from the North East of England via the A1. A large proportion of goods vehicle related incidents occur on or around this carriageway, with a number of incidents concentrated around the urban areas in the west of the local authority.

There has been a high number of incidents occurring around the Old Craighall Junction, connecting the A1 to the A720, in the study period. A number of these incidents occurred approaching the junction or waiting/parked at the junction approach. Given that there is a high amount of freight traffic utilising the junction (22% freight traffic prior to the junction, 15% after).



HGVs

#### Falkirk

Falkirk contains a large industrial area, including Grangemouth, intermodal freight facilities and one of the largest petrochemical sites in Europe. Consequently, the site has a high amount of goods vehicle traffic in proportion to other roads, from a variety of different locations.



Figure 7.14: No. of Casualties by Local Authority 2005–2018 involving

Over the study period, Grangemouth has had 12 casualties involving vehicles that are left-hand drive, over 50% of the recorded casualties involving left-hand drive vehicles in SEStran area, suggesting vehicles travelling long distances using cross-Channel routes.



#### Falkirk

Falkirk contains a large industrial area, including Grangemouth, intermodal freight facilities and one of the largest petrochemical sites in Europe. Consequently, the site has a high amount of goods vehicle traffic in proportion to other roads, from a variety of different locations.

Over the study period, Grangemouth has had 12 casualties involving vehicles that are left-hand drive, over 50% of the recorded casualties involving left-hand drive vehicles in SEStran area, suggesting vehicles is likely to have caused short term congestion and resulted in costs travelling long distances using cross-Channel routes.

#### Summary 7.5

The data described here shows an improving picture in relation to incidents involving goods vehicles, with significant reductions in fatalities and casualties over the last 15 years.

Whilst efforts to reduce this should be applauded, there were still 451 incidents in 2018 involving a goods vehicle with over 300 casualties. Aside from the sometimes-catastrophic human costs, each incident to those involved including the local highway authority and services required to attend each incident. Due to the extreme dimensions of Heavy Goods Vehicles, incidents involving them are more likely to result in a fatality or serious injury.

Long term effects could include a reluctance for road users to consider active travel due to road safety fears.

The majority of these incidents occurred on strategic roads and urban areas across all authorities in the region, reflecting vehicles undertaking long distance trunking movements or last mile deliveries. If, through modal shift and consolidation these movements could be reduced then the likelihood of further reducing the number of incidents increases.





# **08** Stakeholder Consultation







A key element of this study is the need to consult with stakeholders in the SEStran region, identifying opportunities for improving the efficiency and effectiveness of the freight sector in South East Scotland and reducing wider environmental and societal negative impacts.

This is vital to identify problems and opportunities, inform TPOs and optioneering for specific interventions. It will also ensure that interventions identified are deliverable and likely to have tangible outcomes that reflect the priorities of the study.

As such a wide-ranging stakeholder consultation exercise was undertaken including:

- Freight operators
- Freight customers
- Trade associations
- Local authorities
- Infrastructure operators

Due to restrictions associated with COVID-19, face-to-face meetings and workshops were not possible, and therefore these were conducted on-line. Where preferred by respondents, written submissions were welcomed. This engagement largely took place between August and October 2020.

Whilst the nature of discussions varied depending on the consultee, the following prompts were used to facilitate the meetings.

- Are there any issues moving goods through the SEStran (South East Scotland) area? Are there any particular locations where freight movements are difficult?

- are the barriers?
- future?
- in the freight study?

Including the one-to-ones, e-survey, local authority workshop and the SEStran Logistics and Freight Forum over 65 organisations participated in the study. These names can be found in Appendix E.

#### Local Authority Officer Workshop 8.1

A local authority officer workshop was undertaken to obtain the Network resilience was also reported as an issue, with a lack of views of those responsible for decision making and policy at the alternative routes meaning that a wide area is impacted if there are local level. This ensures that specific interventions and issues at each incidents on the network. Road links to strategic roads such as the authority are included in the study and that outputs reflect local as M8 were also reported to be substandard. well as regional and national objectives.

One note of concern was that there was a chance that the In September 2020 an online workshop was held that covered study Levenmouth line extension would not be built for freight. progress and using a online whiteboard resource an interactive SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis was undertaken and guidance on potential interventions sought. There was representation from each of the local authorities within the SEStran area.



- Is there any potential for modal shift from road to rail or maritime (e.g. short sea shipping)? If yes, what could be moved? If no, what

- What trends are likely to affect how goods are transported in the

- Are there specific actions which you would like to see incorporated

## Strengths

Respondents felt that having three strong ports in the region was a big strength, with good road and rail links into Grangemouth. These ports provide important access to the North Sea and Europe. The Queensferry Crossing has also provided network resilience in the region.

## Weaknesses

The dominance of road freight was described as a weakness, which causes damage to carriageway surfaces and congestion. Congestion in the Stirling area has an impact on freight traffic trying to access the motorway network to the west.

## Threats

Capacity constraints, particularly on the ECML, were seen as a particular barrier to rail freight movements, although the proposed SETEC upgrade would potentially alleviate this. The limited transport corridors from the east (A1, A199 and ECML) were also identified as a threat to the efficient movement of freight. The road system in certain areas was described as being unable to accommodate additional road freight movements.

Impacts of climate events on freight were reported as a major concern. Recent landslips on both road and railway were cited and it was felt that freight is often blamed for some of the issues on the road network e.g., in snow events. However, road haulage operators face financial penalties if late in delivering and hence do all they can to minimise problems.

It was also stated in previous discussions with road freight operators that the lack of freight facilities for drivers can be an issue. There are very few parking places with toilets and food in the area for drivers of HGVs.

In addition, conflicting land-use aspirations may affect those living and working near proposed freight infrastructure schemes.

The table demonstrates that delegates felt there were significant opportunities to encourage modal shift with targeted actions (particularly improving rail access to ports) and that the dominance of road freight was an issue in the area, causing congestion and other negative externalities. There is a lack of resilience in the transport network in the region and significant issues arise when major routes are closed or have reduced capacity.

Mirroring the data analysis, **congestion** was reported as being a significant issue for freight operators and all road users in the region and network resilience again highlighted as an issue, with the collapse of the A68 at Fala resulting in severe delays for drivers travelling to Edinburgh highlighted as an example. The Edinburgh Bypass was identified as a particularly congested road causing problems for hauliers.

There was strong support for measures to encourage modal shift, particularly those related to active travel and rail as well as efforts to consolidate loads and 'green' the 'last mile'. However, efforts to encourage modal shift will have to be mindful of rail capacity constraints and the potential for impinging on adjacent land-uses.

## 8.2 Wider Stakeholder Consultation

In addition to the local authority officer workshop, the project team Consultation with the Purvis Group demonstrated that consolidation undertook extensive one-to-one engagements with a cross section was already being undertaken, with two pallet networks and arrangements with other hauliers to deliver to their depot in of industry and in December 2020 a presentation was given to the SEStran Logistics and Freight Forum. This was attended by delegates Lochgelly for distribution around Fife. This proves the viability of representing over 40 organisations and the interim findings of the consolidation in South East Scotland and if a more collaborative approach can be encouraged, there are few real barriers for greater project were presented, with an opportunity to feed in comments and observations. Feedback is discussed below. roll-out across the region. It was felt that there was much more scope for consolidation, especially relating to home deliveries **Road Freight** and that neutrality was key, which again supports the case for a dedicated consolidation centre. This was echoed by WH Malcolm's, who felt that taking HGVs out of city centres would be advantageous It was clear from feedback that road freight is vital to the freight to operations.

sector and the only method of moving freight that doesn't require transfer between modes (e.g. reliant on another mode). Road freight has become ever more efficient, with fewer vehicles transporting greater volumes and an increasing number of vehicles being powered by the cleanest Euro VI engines.

Road freight has a vital role to play in underpinning sustainable modes and providing resilience when there are issues with, for example, rail freight.



A lack of quality driver rest facilities was also identified as an issue in the region.

# Rail Freight

**Rail capacity** was described as an **issue** in the region, with (eventually successful) efforts to find a second daily path for movements between Teesport and Mossend hampered by limited capacity on the East Coast Main Line and around Edinburgh Waverley. Careful consideration will be needed to ensure services can align with any proposed infrastructure improvements.

Respondents stated that current services were too infrequent, and that short-sea shipping was more attractive.

However, several respondents also felt that rail was a key growth area, including those currently involved in the movement of goods by rail. Network Rail were strongly supportive of measures to enhance and increase rail freight in the sector.

The strength of existing services between the Midlands and Scotland was described as a positive and something which could be developed, with potential growth in the parcel sector supported by passenger trains.

It was felt that other Rail Freight hubs just outside of the region are well established (such as Mossend) and offer the opportunity to utilise existing services to achieve the critical mass needed to make a rail service viable. Any new or existing rail facility in the SEStran area would to some extent compete with these hubs without initially being able to offer a similar range of destinations and services.

## Commodities which have potential for modal shift

There are a number of commodity groups which have the potential for modal shift. In particular, those travelling longer distances (150 miles plus) are competitive against the often more flexible road freight alternative, however even shorter distances can be viable, particularly in the bulk sector. Aside from goods already being transported by rail including cement, domestic and deep-sea intermodal the following commodity groups were reported as having strong potential for the movement by rail.

#### Whiskey and Spirits

The Scotch Whisky industry is extremely successful and exports significant quantities overseas as well as for the UK market. The associated distilleries, maturation and bottling plants create significant volumes of freight including raw materials as well as finished products. Outputs are not just restricted to whisky, with many distilleries also producing drinks such as gin.

Within the study area there are bottling plants at Grangemouth (Whyte and Mackay) and Cameron Bridge (Diageo) both of which generate significant volumes of product, which is generally either transported by road to distribution centres in the UK or the continent (via the Dover Strait) or out through ports including Grangemouth.

Consultation with producers suggested there was **appetite for** moving product by rail and that the former Lifting the spirit trial had proven the potential for rail freight in the sector.



#### Case Study: Lifting the Spirit

HITRANS, in partnership with Scotch Whisky Association (SWA) Highlands and Islands Enterprise (HIE), Moray Council and the EU Food Port, initiated a trial to test the feasibility of moving bulk spirit and other food products by rail between Elgin and Grangemouth. The trial took place during autumn 2013.

The objective was to offer rail transport between Elgin and Grangemouth on a cost neutral basis as many distillers had not used rail to transport bulk supplies from the north of Scotland in the last 20 years.

The project sought to assess the feasibility of moving bulk spirit from Elgin to Grangemouth and to identify the benefits and barriers to using rail transport. Bulk spirit was loaded into ISO tanks (26,000 litre capacity) at the participating distillery sites and was moved by road to the rail terminal at Elgin. From there, the tanks were transported by rail, via Aberdeen, to Grangemouth. Road haulage was then used to transport the tanks to their final destinations.

A separate report analysing the environmental benefits of the trial was produced by the Transport Research Institute, based at Edinburgh Napier University. It concluded that for each round-trip lorry load displaced by rail, approximately half a tonne of CO2 is saved and approximately £200 of marginal social benefits accrue. For each train laden with 20 containers, this amounts to 10 tonnes of CO2 saved and £4000 of marginal social benefits to society.

Source: Lifting the Spirit – Report on 2013 Rail Trial, Hi-Trans (2014)



#### Food

Food is a product which it was felt could be moved by rail to a greater extent.

Seafood in Scotland is usually landed at the fishing ports of Peterhead, Lerwick and Fraserburgh, processed nearby and then shipped from those locations to end markets overseas or moved by road to key markets such as London or the continent. The lack of rail connections to either Peterhead or Fraserburgh dampens the case for movement of seafood by rail but there may be scope to move it to a railhead in the Central Belt (with those in SEStran area being the closest) and then onward by rail. However, this produce is time critical, as if a sailing at (for example) Dover is missed then it has to be sold to the domestic market at lower cost.

Other respondents felt that agricultural products such as potatoes could be moved south from a rail head for the markets in England and Wales, with rail freight operators reporting that this was an area which they see as a growth area for rail.

The large Quaker Oats plant in Cupar also generates significant volumes of food products, which could be moved to markets in England and Wales by rail.

#### Aggregates

With the demise of coal, aggregates are the single biggest commodity on rail. Aggregates and minerals are a rail freight success story and can be competitive with road freight, even over shorter distances. Given sufficient services and terminal access this could be a growth rail freight area for SEStran, supporting the construction sector, particularly in Edinburgh.

Representatives of the sector felt that there was scope for further growth, but there was a need for infrastructure such as rail heads at quarries and terminals at destination sites as the economic case for moving aggregates by rail has been proven.

#### Timber

As demonstrated by the case study, the movement of timber by rail is currently being explored elsewhere in Scotland and as such there may be scope for an extension of that trial or the exploration of new routes. Finished products from the Norbord plant could be transported by rail to terminals such as Grangemouth for export.

#### Bulk – Other

It was felt that a rail connected Port of Leith could act as a hub for bulky items such as tanks, pipes, steel/metals, aggregates and grain. Other respondents felt there was also scope for sand to be brought up from England by rail.

#### Parcels

It was reported that parcels were an area of interest for Scotland, with the distances travelled making cross border movements potentially economically viable against road freight.

#### Summary

Whilst further exploration of potential markets is required, this section has outlined that stakeholders and respondents felt there is much potential for the movement of a wide range of commodity types via rail.

Much of this potential depends on overall volumes and wagon and equipment availability.





#### **Case Study: Timber Trial**

In August 2020 Victa Railfreight was awarded a Freight Fund Grant by Transport Scotland which is enabling it to undertake a comprehensive trial of the movement by rail of timber, primarily from forests in Caithness to the Norbord Plant at Dalcross near Inverness during August and September.

The objective of the trial is to re-establish rail as a potential means of transporting timber from forests to the main users of timber, to reduce the pressure on fragile rural roads and to help reduce carbon emissions.

Victa is leading a cross industry effort, with active support from Network Rail and Highlands and Islands Transport Partnership (HITRANS). Wagons are being supplied by DB Cargo and train operation, including locomotives and drivers, is being provided by West Coast Railways (WCR).

The main flow will be from the freight terminal at Georgemas Junction in Caithness to Inverness freight yard for onward delivery by road to Norbord, with timber coming from Munro Harvesting. But other potential loading points may be used, once the Georgemas trial has become established

Source: Logistics Business, <u>www.logisticsbusiness.com/</u> <u>transport-distribution/railfreight/victa-railfreight-trials-timber-</u> <u>movement-in-scotland/</u> Accessed 28/10/20





## Brexit

The potential disruption at the Dover Straits associated with Brexit was reported as an opportunity for ports on the Forth, as the spare capacity and fewer delays means that they could increase market share. Should Lo-Lo become more widely used then that also means that the requirement to drive goods across the UK to southern ports is less pronounced, again favouring ports such as Grangemouth.

Freeport status was described as an opportunity to grow volumes of goods handled at ports that are successful in applying for that designation and if one of the Forth Ports were designated as a Freeport then that could see activity increase.

## Covid-19

The coronavirus pandemic had both positive and negative on freight, with initial reductions in demand affecting the sector and leaving vehicles and drivers unutilised.

However, reduced passenger movements increased scope and capacity for rail freight, with 40-wagon freight trains being able to run and proving highly efficient. In addition, road freight benefited from lower overall traffic volumes, with improved fuel efficiency, drivers hours and employee morale.

## Low Emission Zone

Feedback from the stakeholders suggested the impact of the LEZ would be more pronounced for vans, with fewer HGVs going into the city centre and a newer age profile than light goods vehicles

meaning less would be affected. Therefore, it is likely that vans, with an older age profile and load factors would continue to contribute disproportionately to poor air quality.

## Trends

#### Home Shopping

The restrictions associated with COVID-19 has accelerated home The hub will be installed at Heriot Watt University's Edinburgh shopping trends, with Amazon a significant driver of this growth. This campus in early 2021 to service specially adapted vans from has led to the increase in vans observed in recent years. Operators both City of Edinburgh Council and Heriot-Watt's estates team. spoken to as part of this consultation were exploring the potential for The technology will be supplied by specialist firm, Momentum growth in this area, suggesting it will be an increasingly important Dynamics. element of the supply chain (Business to Customer).

#### Aging Driver Workforce

It was reported that operators were struggling to attract younger drivers into the sector. By reducing demand for road freight, the driver shortages could become less pronounced.

#### Alternative fuels

Feedback from the road freight sector suggests that operators were unsure where and when to invest in alternative fuels, with Central and devolved Governments needing to provide advice on future requirements. There was a reluctance to invest in often expensive vehicles and infrastructure. LNG was a fuel which was being trailed but further infrastructure is needed to fully support the shift to alternative fuels.



#### The first UK trial of wireless charging technology for light commercial vans (LCVs) will launch in Edinburgh, Scotland in spring 2021.

Heriot-Watt University, Flexible Power Systems (FPS) and City of Edinburgh Council have been awarded £1.6m to explore how wireless charging at shared logistics hubs can reduce the cost of decarbonising last-mile transport.

The consortium will also test how shared infrastructure and fulfilment equipment at urban hubs on a large scale can enhance vehicle and staff productivity. This involves developing a largescale simulation of the behaviour of charging hub users using real world data to understand the impacts on their business.

Source: City Transport & Traffic innovation



## Levenmouth

Respondents felt that the Levenmouth Line had significant potential for freight and that aside from existing facilities such as that of Diageo, new investment such as Fife Energy Park means that there is potential for rail freight to play a role in the development of new infrastructure and subsequent outputs.

## Summary

Feedback from the Stakeholder Consultation has revealed that there is strong support and potential for growth in sustainable freight in the region with a wide variety of commodities suitable for movement by rail or sea. The case studies identified in this section demonstrate potential applications for rail freight that could be explored for South East Scotland.

There was also a feeling that the freight sector in South East Scotland was too road dominated and that there was a need for greater network resilience. Feedback on the issues caused by congestion support data explored in previous sections, which significantly affects road freight movements in the region.

Regardless, there are barriers to this growth, particularly capacity and gauge restrictions on the rail network and an acknowledgement that road will always play a central role in transporting freight. Therefore, efforts to encourage more sustainable means of road freight, either through alternative fuels or greater consolidation should be explored. Trends such as the growth in home deliveries present challenges to how 'greening' of the sector can be achieved.

The findings of this consultation have been used to inform the TPOs and interventions described in the following sections.





# 09 Problems and Opportunities







This section outlines the key problems and opportunities (P&Os) that have emerged from the study findings. Sources used to identify related P&Os in the study area are the policy review, the review of socio-economic conditions, freight trends, transport network (road/ rail), the ports (virtual site visit), environmental context, the findings from stakeholder and public engagement.

This analysis will inform the Transport Planning Objectives and potential interventions.

#### **Problems** 9.1

## Road freight contributing to poor air quality

Section 6 has demonstrated that road freight in the region is contributing to poor air quality, including areas which are experiencing particularly high levels of PM10 and NOx. This is often the most deprived areas, further affecting the well-being of the most disadvantaged.

Vans in particular are contributing to poor air quality, often being older and more numerous than larger freight vehicles.

### Road freight contributing to carbon emissions

Again, Section 6 has demonstrated that freight vehicle movements in the SEStran area are contributing to overall carbon emissions. The contribution of HGVs with regards to CO2 emissions is greater than that of particulates, as whilst Euro VI engines emit less particulates, improvements in fuel economy are much less pronounced. Reducing the number of road freight vehicles, through consolidation and modal shift would help improve air quality and reduce carbon emissions.

## Road freight contributing to road safety issues

Section 7 demonstrated that there were 451 incidents involving a freight vehicle in 2018, with over 300 casualties. Vulnerable road users were disproportionally affected.

### Road freight contributing to congestion

We have seen that the SEStran area contains some of the most congested places in Scotland and in the case of Edinburgh, Europe. Any reduction in road freight volumes will assist in alleviating congestion and associated negatives, including economic and societal externalities. Modal shift onto more sustainable modes would help alleviate this issue.

## Congestion disrupting the supply chain

Operators reported one of the key issues affecting them was congestion, increasing journey times and reducing journey time reliability. This affects not just the operator but those at either end of the supply chain, affecting productivity and economic performance.

## Road freight contributing to uneven road surfaces

During the consultation it was reported that heavier loads being transported by road were damaging carriageway surfaces, particularly timber movements on rural roads.

### Empty vehicle running

The CSRGT data has shown that a significant number of freight vehicles are running empty, adding to environmental, safety and congestion issues. This is likely due in part to not being able to identify a backload or a return to depot following final drop off.



#### Lack of network resilience

Due in part to the limited number of crossing points across the Forth as well as increasing number of severe weather incidents (e.g. flooding causing landslides) network resilience is an issue in the region, with severe congestion caused when bridges close or the highway network is affected, particularly the Queensferry Crossing. By developing alternative means of transporting goods to key locations the reliance on the highway network for the movement of freight is reduced.

#### Decline in Rail Freight in the region

Extant infrastructure and disused terminals demonstrate that rail freight played a much bigger role in the past than at present, with non-through movements now limited to terminals at Grangemouth and Oxwellmains Siding at Dunbar. This limits the scope for growth in this area reducing the potential for modal shift.

#### Lack of adequate lorry parking facilities

It was reported by road freight operators and industry representatives that there is insufficient formal lorry parking in the region, affecting drivers' ability to properly rest and potentially resulting in inappropriate parking. Tired drivers are more likely to have accidents and with freight vehicles being larger and heavier this has more chance of resulting in severe injuries or fatalities.















#### Opportunities 9.2

#### Changing Travel Patterns due to COVID-19

As this study developed, it has been seen that the COVID-19 pandemic has had a significant impact on travel patterns for all sectors. The most pronounced effect has been passenger movements, with a significant reduction in public transport use meaning fewer services and less demand on capacity. This has opened up the possibility of more rail paths or the utilisation of spare capacity in carriages for goods. In addition, the accelerated growth in home deliveries has meant a significant increase in the parcel sector further driving demand for freight movements.

#### Enhance the efficiency and sustainability of road freight and ensure it can underpin other modes

Road freight is vital to the economy of South East Scotland and the sector has made great strides towards better efficiency, safety and sustainability. There is a willingness to do more and help underpin the viability of non-road modes such as water and rail by undertaking 'last mile' movements.

#### Inter-regional goods movements

Significant flows of goods travel longer distances between Scotland and other regions, particularly the North East and North West of England and West Central Scotland. These volumes could be consolidated or transported by different modes, particularly rail freight or coastal shipping.

#### **Consolidation of loads**

As discussed, the CSRGT data shows that there is a significant Reinstating the Levenmouth Line offers an opportunity to reconnect amount of empty running of freight vehicles in the SEStran area. Cameronbridge Distillery and Methil Port to the rail network, This suggests scope for consolidation and improved load factors of reducing associated road freight movements. Without the passenger freight vehicles. Freight vehicles make up a significant proportion of movements the business case for this infrastructure would be less overall vehicle movements in Edinburgh and any efforts to reduce persuasive, however the proximity of both the port and the distillery this should be welcomed. to the line offer opportunities to reinstate connections and enable raw materials and finished products to be moved by rail.

The case study of Purvis Group demonstrates that consolidation is already taking place in Fife, benefiting operators and the local area. Consolidation Centres close to Edinburgh City would have the potential of further increasing consolidation of consignments in the region and reducing overall traffic volumes.

#### Rail heads and extant tracks

All three major ports have either operational or existing rail environmentally friendly. connections which have been retained for future use. Therefore, there are few significant barriers to increasing rail use at Leith Port's proximity to Edinburgh City Centre Grangemouth or reinstating connections at Leith and Rosyth. Land is Leith Port is unusual in that it is less than two miles from Edinburgh available at both ports to enable trains to be loaded and unloaded City Centre and therefore is well placed to act as a hub for onward without negatively affecting other port operations. In addition, there movement to the principal market for FMCG and food/drink in the are no competing land-use types on rail connections on which rail region. In addition, Edinburgh is a centre for construction activity movements would impinge. and there are also opportunities to encourage its development as a consolidation centre for construction materials and the on-site Scope for increase in rail freight movements and volumes concrete plant also opens up opportunities for movements by rail.

Consultation with potential customers, terminal operators and a review of the commodities transported between the region and longer distances suggests there is appetite and potential for growth in rail freight. This may require improvements to gauge, electrification and infrastructure to improve capacity.



#### Levenmouth Line extension

### Development of alternative fuel infrastructure

The freight derived air quality and carbon emissions could be addressed by increasing use of alternative fuels, by providing additional charging points for vans and smaller freight vehicles and hydrogen fuelling and LNG/LPG for HGVs. This could be tied into consolidation centre infrastructure to ensure associated vehicles are

#### Available Land at Leith Port

Leith Port is an expansive site with significant scope for development. Therefore, should a consolidation centre or logistics hub be considered viable then there is sufficient land to develop the necessary warehousing, ancillary buildings and internal access to create this.

#### Further Rail Freight Movements at Grangemouth

Grangemouth currently experiences one train movement a week, an intermodal service that connects the port to Tilbury. It also has a Mon-Fri service operating to/from Aberdeen. There is significant scope to increase use of rail and reduce road freight movements in the vicinity of the port.

# Significant local, regional and national support for measures to encourage modal shift

The literature and policy review outlined in this report highlighted strong support for measures to encourage modal shift and deliver a low emission, carbon neutral transport sector. Therefore, any measures to encourage sustainable freight are aligned with the current policy framework.

#### Water freight in the region

The Forth Estuary is well served by a number of ports bringing in significant quantities of a variety of goods. All ports have capacity to increase volumes lifted and connections at ports mean easy access to local and wider markets.

In addition, the canal network has recently been used for (albeit low volumes) of freight and the ability to move freight by barge into Central Edinburgh to the Lochrin Basin. This could be increased and this important traffic-free link utilised for the movements of goods, returning to it's original purpose.

## Scalability of cycle logistics

Cycle logistics is a small but growing aspect of freight in Edinburgh. Given the right conditions there is scope for rapid growth in the sector, either in its own right or as a supporting element of a wider initiative such as a consolidation centre.

#### Low Emission Zone (LEZ)

The proposed LEZ for Edinburgh is likely to change the way freight operators service the city, with older vehicles subject to a charge which may make existing movements uneconomic. This may support efforts to consolidate movements, uptake of alternatively fuelled vehicles and encourage modal shift. revitalisation of extant infrastructure offer the opportunity to great enhance the sustainability of freight in South East Scotland These findings have informed the development of the Transport Planning Objectives (TPOs) described in the next section, against which the list of interventions is assessed.

#### Integrate freight into passenger thinking

Where passenger interventions are being considered there is an opportunity to integrate freight into the process, for example where a new Park and Ride is being considered on a strategic route of drop boxes at a new rail station.



## 9.3 Summary

The section has demonstrated that there is a clear case for change and in particular a strong requirement to de-carbonise and 'green' freight movements in South East Scotland. Without efforts to address this, then freight's contribution to issues such as road safety, emissions and congestion will continue.

However, there are clear opportunities to address this and play to the natural strengths of the region. Committed schemes and the revitalisation of extant infrastructure offer the opportunity to greatly enhance the sustainability of freight in South East Scotland

# 10 Transport Planning **Objectives**







The Transport Planning Objectives (TPOs) developed for this study are focussed on reflecting the identified problems and opportunities, first and last 'mile' role at rail terminals and ports. link significantly with the Key Themes and express the outcomes sought for the study. The draft interim TPOs can therefore be traced back through each step of the adopted methodology in a clear and transparent way. This allows their areas of coverage to be demonstrated, and the source of each, to ensure that a robust, evidence-based audit trail is demonstrated.

The process followed to derive these Objectives was as follows:

- Stakeholder Engagement and Data Analysis Identification of Problems and Opportunities.
- Categorisation Problems and Opportunities distilled into common categories.
- Data Validation Identified Problems verified through data analysis.
- Initial Key Themes & Validation Against Other Studies Initial key themes identified and compared against appraisal themes identified in other key studies within the region.
- Final Key Themes Identification of final key themes and completion of the problem / opportunity / theme mapping.

The TPOs developed for this study are as such:

#### TPO1: Enhance regional freight infrastructure, whilst stimulating economic growth

The study has shown that there is significant scope for modal shift for freight in the region and that that by creating a more sustainable supply chain with better resilience and reliable journey times economic growth will be stimulated. Road freight has a key role to play by not only building on efforts to reduce fuel consumption and

increase efficiencies but also support modal shift by performing the

Each TPO needs to conform to SMART (Specific Measurable This can be measured by assessing the relative movement of goods Attainable Relevant and Timed) criteria to ensure that benefits can be by road, rail and water and the way transportation is powered. assessed. A SMART objective will be: TPO2: Reduce the adverse impacts of freight movements on

# public health and the natural and built environment

Evidence has shown that road freight contributes to poor public health through emissions and road safety issues. It also impinges on the surrounding environment, both natural and built.

Therefore, it is of vital importance that that an objective of the study addresses this.

#### TPO3: Maintain and enhance a safe, resilient, reliable and sustainable transport network to aid delivery of consistent conditions for freight operators on the transport network to maximise sustainable business opportunities

Data and feedback have emphasised the issues that freight operators and other road users have when using the highway network in the SEStran area. Network resilience is poor and significant congestion causes issues affecting journey time reliability and the effectiveness of the supply chain. Non-road-based freight can play a key role in enhancing resilience, offering new routes to market, reducing congestion and incidents which can also cause delays.

Therefore, it is important to include an objective to ensure interventions capture this requirement, which can be measured through improved road safety data and journey time reliability on key freight routes.



## **SMART Assessment Criteria**

- Specific, it will say in precise terms what is sought;
- Measurable, there will exist means to establish to stakeholders' satisfaction whether or not the objective has been achieved;
- Attainable, there is general agreement that the objective set can be reached;
- Relevant, the objective is a sensible indicator or proxy for the change which is sought; and
- Timed, the objective will be associated with an agreed future point by which it will have been met.

Whilst the specific targets will be finessed when there is further development on the interventions to be taken forward, Table 10.1 gives an indication of how these could be measured.

#### Transport Planning Objective **Example of SMART Assessment** Criteria Compare CSRGT change in road TPO1: Enhance regional freight infrastructure, whilst stimulating freight volumes to goods lifted economic growth at ports, other water freight and rail freight volumes to determine change in proportions moved Assess the number of road freight TPO2: Reduce the adverse impacts of freight movements on trips replaced by sustainable public health and the natural and mode(s) and calculate (using built environment established ready reckoners) the likely reduction in emissions Number of employees in TPO3: Maintain and enhance a safe, resilient, reliable and susitable freight roles sustainable transport network to aid delivery of consistent conditions for freight operators on the transport network to maximise sustainable business

# Mapping of problems, opportunities and **STAG Criteria to TPOs**

As discussed, it is important that proposed interventions are objectives-led rather than solutions led and that objectives are informed by evidence-based problems and opportunities and align with local, regional and national government priorities. The table overleaf demonstrates the clear linkages between these elements, ensuring that a robust methodical approach has been applied. The following section discusses the Options Development on which the TPOs are based.

Table 10.1: Example of potential SMART Assessment Criteria

opportunities





# STAG Criteria

Opportunities	TPO1	TPO2	TPO3	Environment	Safety	Economy	Integration	Accessibility and Social Inclusion
Road freight contributing to poor air quality					1			
Road freight contributing to carbon emissions	~~~				4			
Road freight contributing to road safety issues	*						*	*
Road freight contributing to congestion				*			**	*
Congestion disrupting the supply chain	*			*			*	*
Road freight contributing to uneven road surfaces								*
Empty vehicle running								
Lack of network resilience	1							
Lack of adequate lorry parking facilities						*		
Inter-regional goods movements								*
Consolidation of loads								
Reintroduce rail heads and extant tracks						14		
Scope for increase in rail freight movements and volumes						*		*
Levenmouth Line extension							**	*
Development of alternative fuel infrastructure								*
Available Land at Leith Port						*		
Further Rail Freight movements at Grangemouth						*		
Water freight in the region					1			
Scalability of cycle logistics					1	*		
Low Emission Zone (LEZ)								
Integrate freight into passenger thinking	~~~			*	*	*	~~~	~~~

Table 10.1 TPO Mapping


# **Option Development** 11 and Appraisal





This section has been developed to outline potential options to address the issues and opportunities outlined in the previous chapter. Each option has been appraised to ensure it is deliverable, targeted on the issues and opportunities identified and aligns with local, regional and national transport policy objectives.

Rail options relating to gauge improvements, capacity and the freight use of the Levenmouth Line are being considered as part of other workstreams (STPR2 and the Levenmouth Line project).

#### Do Minimum 11.1

There are a number of planned interventions that represent a Dominimum scenario for this project.

These include:

- The introduction of a Low Emission Zone for Edinburgh
- Levenmouth line reopening
- Extension of sidings at Grangemouth Port to allow 775m trains (completed 2021)

These initiatives support a number of the interventions outlined in this chapter including reintroducing a rail connection to Cameron Bridge and a connection to the port of Methil, whilst the LEZ may encourage operators to consolidate loads or change the types of vehicle they use when serving Edinburgh.

The extension of the sidings at Grangemouth will also make rail freight movements more efficient at that location and impact less on the surrounding rail network.

# 11.2 Rail and Water Freight

The following initiatives are related to measures to encourage rail and water freight.

# Food/Retail Hub

Attract a major retailer or grocer to set up a port-centric warehousing operation for their imported merchandise at **Potential Location: Throughout** Grangemouth, so the retailer uses Grangemouth as their distribution Potential Risks: The key success factor for this initiative is centre for Scotland and northern England. Particularly targeting a critical mass of goods and working with often competing short sea cargo from northern and eastern Europe. This is what has customers to ensure the service is viable. The rail network in the driven growth of rail volumes at Teesport. If a similar approach is North East of Scotland is less developed, with less of the network taken at Tilbury, Tilbury – Grangemouth trains could be filled with gauge cleared to higher standards. that retailer's cargo moving between the two distribution hubs and loaded both ways, with for example, fresh produce imported via Tilbury and furniture and other merchandise from northern Europe imported via Grangemouth.

Freeport status may encourage this initiative and a duty-free zone could stimulate foreign direct investment, Research and Development and manufacturing activities.

## Potential Location: Grangemouth (or rail connected Leith)

Potential Risks: This requires a critical mass of goods and willing partner to support. Suitable paths will also need to be found for associated rail movements, which are likely to need to travel through a congested rail network, particularly around Edinburgh.



# Multi-User Freight Train Service

Similar to the whisky oriented Lifting the Spirit service, a multiuser freight train running a regular circuit serving locations such as Grangemouth, Inverness, and Aberdeen could be introduced. The train would be able to move goods arriving at port around the region and to/from North East Scotland. Funding would be required to procure wagons and support initial trial.



## Passenger trains for freight

The use of mainline railway stations as hubs for freight, utilising carriages to deliver parcels into the city and town centres, and therefore integrating freight and passenger services. has a long history in the UK, with British Rail's Red Star Parcels service performing such a role. Changes in carriage and locomotive design as well as increased focus on security and higher passenger numbers meant that this service ceased, however reduced passenger demand through changes to working patterns could allow spare capacity to be utilized off-peak for parcels or other types of freight. This could then be collected by vehicles or cycle logistics from platforms to be taken to their destination.

## **Potential Locations: Edinburgh Waverley**

Potential Risks: Further investigation is needed to ascertain associated costs, infrastructure requirements and impact on movements and capacity.

## Use maritime craft to transfer spirits from Methil to Grangemouth for onward shipping

The Diageo bottling plant in Leven produces significant volumes of spirit, much of which is bound for export via Grangemouth. A service from the nearby Port of Methil to Grangemouth would negate the need for HGVs to travel across Fife and the Queensferry Crossing with finished product and instead travel the approximate 27 nautical miles over the Forth by barge or dedicated ship. Grant funding would be required to acquire a suitable vessel and equipment for the

operation (ro-ro / electric barge / cranage).

#### Potential Locations: Methil/Grangemouth

Potential Risks: Suitable craft availability and cost effectiveness need to be assessed.

# Electric shunter to facilitate low-carbon rail freight movements at terminals

The ECML is electrified, as are east-west routes across the central A702 from North West England. belt. However, the rail spur into Grangemouth is not, and as such this A consolidation centre located close to the A720 City of Edinburgh restricts trains to those diesel powered, usually Class 66 locomotives. Bypass between its junctions with the M8 and A720 could serve The use of an electric/battery shunter to pull wagons between the freight vehicles from both regions, such as at Bankhead. From there, port and the electrified line would allow greener freight movements, a dedicated consolidation centre vehicle(s) could serve Edinburgh. albeit with some efficiency trade off. Alternatively, dual-fuel Ideally, this would be powered using alternative fuels. Further locomotives are being introduced which offer enhanced flexibility support could be provided for the consolidation centre vehicle(s) such as the Class 88 which is a powerful electric locomotive with a through the permitted use of bus lanes. small diesel engine for non-electrified last mile sidings.

A further efficiency would be the identification of backhaul, which Potential Locations – Grangemouth/Rail connected Leith could then be picked up and taken on by operators serving wider Potential Risks: Availability/cost of electric 'shunter' locomotive Scotland and other UK destinations.

# 11.3 Road Freight Measures Linked Measures

The following measures could be progressed individually or as a linked system of supporting measures. For example, a microconsolidation centre could be located at a tram stop or alongside the canal to move goods from those locations to their final



destination (and vice-versa). Similarly, a city-region consolidation centre could also be located to take advantage of water freight potential or the opportunity to link to light rail.

# **Consolidation Centres**

CSRGT data has shown that the majority of goods travelling between South East Scotland and other regions arrive from either North West England or West Central Scotland. For those goods destined for the city centre, that means that they will likely approach using the M8 or

For goods from the south and North East England, Leith Port could act as Eastern consolidation centre, potentially rail connected where goods could be brought in by road or rail. Whilst the CSGRT data suggests there is a critical mass of goods which could be moved in by rail further investigation into potential users of the service is required. This is likely to include food products, parcels and minerals.



Given the port's proximity to Edinburgh City Centre, the 'last mile' could be undertake by cycle logistics or electric temperature-controlled vans. Leith could act as Regional Distribution Centre for e-commerce businesses, not just for the city centre but the surrounding residential areas to support home deliveries. A successful example of this is the Bristol and Bath Retail Consolidation Centre. Formerly subsidized, it is now operated on a commercial basis by DHL.

# **Canal Served Consolidation** Centre

As discussed, the Union Canal provides a traffic free east-west link into Edinburgh to the Lochrin Basin. If a canal-side industrial unit or warehouse could be identified in the area described above (e.g. Hermiston) then the five-mile journey could be undertaken by barge, with cycle logistics and/or electric vans able to take advantage of the wide areas of hard-standing to load from the barge.

Developments at Winburgh, with a new motorway junction and opportunity for movement of goods by canal may also be appropriate.

Whilst the barge (at approximately 5 miles per hour covering a distance of approximately five miles from Hermiston) would be slower than road freight, journey time reliability would be much better as the Union Canal is a contour canal with no locks.

## **Micro-consolidation Centres**

As the name suggests, micro-consolidation centres are smaller facilities that can be placed close to the areas that they serve. Often no bigger than a shipping container, they are particularly suited to high density urban areas where space is at a premium.

Usually served by cycle logistics and smaller electric vans, these can be sited in locations such as squares or car parks. If served by cargo trikes they can virtually eliminate CO2eq emissions per parcel. Locating close to train stations (or tram stops) offers the opportunity to link with main line services carrying parcels could bolster the case for those interventions.

This presents an opportunity to support the SEStran Strategic Mobility Hub Study, which offers the possibility of linking (semi) urban deliveries to pick-up points (click&collect) at Mobility Hubs and other key interchanges/destinations, such as railway stations.

Potential Locations – Car Parks/Squares close to city centre, links to other modes (e.g railways stations), small industrial units close to key customers

Potential Risks: Not being able to secure critical mass of goods required to make option viable, not being able to appoint operator, local opposition and a lack of suitable sites. <sup>5</sup>



## **Case Study: Bristol and Bath Consolidation Centre**

Bristol Freight Consolidation Centre was initially set up as a pilot scheme in 2004 with European funding to help alleviate issues associated with freight in Broadmead, Bristol. It was then known as Broadmead Freight Consolidation Scheme and was the first project of its kind in the UK. Bristol was one of a handful of European cities to have a consolidation centre and was seen as an example of best practice throughout Europe.

Following on from the successful pilot, the operation grew and the service extended to retailers in other parts of the central Bristol area.

## Annual figures 2016 (Calendar Year)\*

## Deliveries

## **Emission Reductions (KGS)**

CO <sub>2</sub>	11034.57
NOx	358.62
PM10s	10.71
CO	69.05

\* This was the last full calendar year when both electric vehicles were operating, noting that Bath and North East Somerset withdrew from contract in 2016

Bristol City Council continued to subsidise the operation through various funding streams until 2017, when a variation to the contract was agreed by both parties. Once the contract with Bristol City Council came to its natural end in 2018, DHL continued to offer a freight consolidation service serving both Bristol and Bath from the Avonmouth/ Severnside area on a commercial basis.

At its peak, a 70% to 80% reduction in the number of onward trips was seen by the freight consolidation scheme. This meant that for every 10 vehicles that made a delivery to the consolidation centre, just 2 or 3 onward journeys to the central Bristol area were made.<sup>54</sup>





<sup>&</sup>lt;sup>55</sup> Source: https://www.bable-smartcities.eu/explore/use-cases/use-case/ useCase/microdistribution-of-freight-in-barcelona.html

## Case Study: SURFLOGH, SEStran

All cities and regions face challenges related to freight flows entering and leaving the city and thus having negative impacts on air quality, noise, road safety, climate and attractiveness of the cities.

SURFLOGH aims to improve the role of logistics hubs in the network of urban logistics through connecting long-distance freight transport and last mile distribution in strategically located urban freight centres.

The project provides partners with best practices regarding the development of urban freight hubs in cities, the successful introduction of zero-emission vehicles for last-mile transport and innovative strategies for cooperation in the logistics chain.

The partners are addressing the shared challenges of the uptake of green transport solutions in regional freight and the need for positive business cases in green freight transport solutions in urban areas.

SEStran are leading on a work package along with Napier Transport Research Institute (TRI), developing business models for urban freight hubs. Associated business models focus on the scalability and applicability of models for different locations are identified, and how these overcome some of the economic and circumstances. Practical lessons and insights from our work package will be published via case studies.

SEStran is also working with ZEDIFY Scotland to design an e-cargo bike last mile delivery pilot in the City of Edinburgh.

Establishing and being involved in the running of the Edinburgh pilot has been an interesting and rewarding experience for the Edinburgh Surflogh partners, and has provided the opportunity to be involved in action research which has presented the opportunity for insights not usually open to those involved in research. Over the two and a half years of the running of the pilot, the critical factors in its operation have clearly emerged over the period, and there is no doubt that what has been established is a clear viable commercial business model that has a very strong foundation to continue to develop and evolve once the pilot phase has been completed.

Much research and funding has been devoted to identifying the key factors that lead to a financially sustainable urban freight consolidation centre. Despite much 'success' with this at the academic level, to date no EU funded pilot has survived beyond the project termination date. This paper takes a critical overview of the whole area of urban freight consolidation centres, and in doing so identifies the key areas where the economics of the market and the logistical operation of delivery are found to be particularly challenging. A case study is then undertaken of a cycle logistic provider in Edinburgh, which through a franchise/license agreement, is part of the wider UK Zedify distribution network of franchises. Key organisational and operational elements within the business issues discussed. Key to success is found in a business model that enhances existing delivery outlets rather than one that attempts to subjugate them.

https://northsearegion.eu/surflogh/







# Freight Tram

Edinburgh Tram offers a direct east-west link between the airport and the city centre with an extension under construction to Leith. The line routes alongside the City of Edinburgh Bypass at its western edge, offering potential for freight vehicles on strategic roads to unload at stations such as Edinburgh Park for movement into the city centre, reducing road miles and congestion.

The link to the Airport also has the potential to move airfreight quickly to locations across the city and ultimately the port. As tram stops do not have a raised platform it is relatively easy to transfer to/ from a tram.

Further investigation is required as to the appropriate way of moving goods, either by a dedicated freight tram or repurposed space in a passenger tram. The headway of trams at peak times (up to one every three minutes) means that any loading and unloading activity then would have to take place quickly, with lighter, less bulky items (such as parcels) potentially more appropriate. Items could be collected by cycle logistics which would be able to easily park next to stops.<sup>56</sup>

## Potential Locations – Wider Edinburgh Tram network (including committed and proposed extensions)

## Potential Risks: Lack of capacity on trams, lack of support from key stakeholders, insufficient turnaround time on trams

## Case Study: Amsterdam Cargo Tram

CityCargo operated two cargo trams for a testing phase on the existing Amsterdam tram network between 7 March and 3 April 2007.

Trucks supplied the trams during the pilot at de Aker, the end stop of tram 1 in Osdorp. The trams run along a specially selected route through the city between 7am and 11pm. Two transfer points were located on the route between Plantage Parklaan and Frederiksplein, where the goods were unloaded onto small electrically powered vehicles (E cars) which enabled the delivery of the goods to their final delivery address.

During the test, two specially adapted GVB trams operated between Osdorp and the city centre. For the first two weeks the trams travelled empty, to assess the traffic situation along the route. Passenger tram schedules were not affected by the cargo trams because the cargo trams did not use passenger stops.

During the second phase the trams transported actual goods. Since the pilot was successful, CityCargo Amsterdam was allowed to use the Amsterdam tram network to transport goods with a 10 years concession from the Municipality.

As a result of this testing phase, CityCargo estimated around 50 special cargo trams and around 400 E cars to be operated in 2008 in order to supply shops, supermarkets and the catering industry in the centre of Amsterdam. The system was also presented as very cost efficient: 1 cargo tram can transport the same amount of goods as 4 (7.5 ton) trucks.







<sup>&</sup>lt;sup>56</sup> https://www.eltis.org/discover/case-studies/delivering-goods-cargo-tramamsterdam-netherlands

# Putting in place the necessary infrastructure for alternative fuels

The introduction of a comprehensive network of charging and refuelling infrastructure could significantly address emissions from freight vehicles, supporting efforts to improve air quality and decarbonise the economy.

Whilst electric charging points are already in place across the SEStran area, the sector could be consulted to determine where new facilities should go and identify a location(s) for hydrogen fuelling, a growing source of fuel for HGVs in Europe.

Potential Locations – TBC, strategic locations around the region.

## Potential Risks: Lack of clarity on future technology in this area

## **Further Measures**

In addition to the measures described here, a number of further options were suggested by stakeholders. Due to their positive alignment with the TPOs and potential for addressing the problems identified.

These can be found in Appendix F.

## Linkages between study findings, TPOs and interventions

Table 11.1 demonstrates the links between the proposed interventions and the problems identified during the course of the study. All of the

interventions would help address multiple issues and as such should be further appraised.

Figure 11.1 shows that there are clear linkages between the problems and opportunities, TPOs and the interventions described here. This demonstrates the objectives led approach we have taken, ensuring that interventions reflect wider priorities and address the issues identified.

## Intervention

Food/Retail Hub

Multi User Freight Service

Passenger trains for freight

Use maritime craft to transfer spirits from Methil to Grangemouth for onward shipping Electric shunter to facilitate low-carbon rail

freight movements at terminals

Consolidation Centres

Freight Tram

Alternative fuels

Table 11.1 Problems/Interventions mapping



Air Quality	Carbon Emissions	Road Safety	Uneven road surfaces	Congestion	Empty Vehicle Running	Network resilience	Decline in rail freight	Lorry parking facilities
-		-	-		-			
		-			-	-		
		-			-	-		
		-			-	-		
							**	
				*	-			
		-		-	-	-		
•	•							





Figure 11.1: Linkages between study findings, TPOs and interventions





# 11.4 Soft Supporting Measures

There are a number of soft measures which could be introduced to support the interventions identified here, strengthening positive impacts and further contributing to their success. Table 11.1 outlines these measures and how they can support initiatives described in the previous section.

# **Road Safety**

## Measure

SEStran region to support CLOCS

SEStran region to support FORS

Support TfL's Direct Vision Standard

## Explanation

Safety measures could be introduced in order to support measures such as the introduction of a consolidation centre, where associated vehicles are required to adhere to the Construction Logistics and Community Safety (CLOCS) standard, the Fleet Operator Recognition Scheme (FORS) or TfL's Direct Vision Standard, further strengthening positive outputs from these interventions.

# Land Use Planning

## Measure

Look at integrating freight and the focus on freight into Statutory

Planning Documents such as Local Plans

Scope and identify monitoring process for implementing CLPs

"Freight Awareness Training" for LA planning officers

Inclusion of a formal freight access document (including information on DSPs, freight parking areas etc.) with each new development in SEStran, with large-scale mixed-use areas including consolidation.

Safeguarding of land use transfer points for logistics usage, particularly last mile within urban areas

Implementation of a DSP strategy to understand the nature of freight going in and out of SEStran, with the goal of implementing "Smart" loading zones

Stipulating in the planning process that a minimum level of freight must be transported by a sustainable mode, if connected to rail or water freight infrastructure, or through electric vehicles

Logistics sites above a certain size should include access to rail/ water freight access, and would only be approved if there is no suitable alternative to be put in place

Be proactive in the safeguarding of wharves to allow the development of water freight sites, as part of being a consultee on certain projects

Promoting grants in place to encourage the installation of sustainable mode infrastructure at logistics sites

## Explanation

Land use planning and measures that can be introduced through conditions can be powerful tools in ensuring sustainable freight



is considered, protecting potential sites and ensuring wider developments utilise sustainable modes during the construction phase where possible.

# **Behavioural Change**

## Measure

Establishing a Clean Freight Fund to support businesses

Trialing behavioural change techniques to raise awareness of the impact of next-day delivery services on the environment, and collaborating with Central Government to levy on home deliveries

Improving efficiency in the freight sector by introducing a retimed deliveries programme, allowing for quiet, out of hours deliveries that is beneficial for the freight operator and other road users

## **Explanation**

Behavioural change can have a significant impact on road freight movements ensuring a greener fleet and changing delivery patterns. Again, these could be tied into a consolidation centre to further increase the impact of such an intervention.



# Collaboration

## Measure

Setting up mutually-beneficial data sharing schemes with private businesses to better understand how freight moves around South East Scotland, allow improved demand management, levels of service, and cost reductions

SEStran region will need the necessary digital infrastructure in place to facilitate autonomous vehicles, as well as the necessary regulatory structure in place

Collaborating with other Combined Authorities/LAs/Central Government to deliver a standardised approach to polluting vehicles

## Explanation

Better understanding of movements to encourage consolidation and Partnership working to maximise opportunities for reducing road freight trips which can be achieved through consolidation.

# **Skills and Conditions**

## Measure

Collaboration with Central Government on improving regulation that governs driver's working conditions

Launching Skills & Apprenticeships initiatives for people coming into the sector, and pairing them with employers Co-ordinating with Central Government and trade associations, to provide funding, guidance on skills and increased availability of apprenticeships to promote a clear pathway into the industry.

## Explanation

Improved skills can help achieve compliance with standards and enhance road safety

Other

## Measure

The shared usage of Guided Busways and Bus Lanes, would allow a more reliable freight service

Exploring options for the increased use of existing assets (rail, waterway, trams) for servicing and delivery activities

Promote and facilitate the use of locker banks, click and collect and collection/return points





# **12 Case for Change:** Conclusion







This report sets out a clear case for change. It demonstrates that the region has the potential to be an exemplar for sustainable freight movements by harnessing the natural advantages that it has, such as a network of ports that can be rail connected and transport infrastructure such as rail (heavy and light) or waterways that enable goods to be transported.

Feedback has shown a strong appetite for moving more goods by sustainable means (for all modes including road) as well as evidence that consolidation is currently being undertaken successfully by operators in the region. This willingness can be exploited by exploring opportunities to enhance and introduce infrastructure that will facilitate modal shift as well as building on consolidation efforts by providing facilities that enable multiple loads to be transported on the 'last mile' by a single vehicle or cycle logistics.

Subject to approval, the Initial Appraisal stage will explore in greater detail the infrastructure requirements and potential customers of proposed interventions, identifying and mapping manufacturers, retailers, and merchants within the study area to locate freight generators and relate tonnages to specific transport hubs/business parks

If progressed, the innovative initiatives described here have the potential to not only make a significant positive contribution to the health and wellbeing of those who live in the region but also economic growth.

















# Appendix A Literature Review Documents







## Literature Review Documents

- Better Delivery: The Challenge for Freight, National Infrastructure Commission (2019)
- Borders Transport Corridors: Pre-Appraisal, Transport Scotland (2019)
- Carbon Account for Transport, Transport Scotland (2019)
- City Logistics: Light and Electric, Amsterdam University (2018)
- Clackmannanshire Fife Edinburgh STAG Study (2010)
- Clackmannanshire Local Transport Strategy (2009–2014)
- Coatbridge: Scotland's Dry Port, SEStran (2012)
- Company rail connections back in fashion
- Consultation on Building Scotland's Low Emission Zones, Transport Scotland (2018)
- Delivering a Better Railway for a Better Britain, Network Rail (2017)
- Delivering the Goods Scotland's Rail Freight Strategy, Transport Scotland (2016)
- East Coast Main Line Route Study: Technical Appendix, Network Rail (2017)
- East Lothian Local Transport Strategy (2018-2024)
- Edinburgh Local Transport Strategy (2014–19)

- Fact-finding studies in support of the development of an EU strategy for freight transport logistics Lot 1: Analysis of the EU logistics sector
- Falkirk Economic Strategy (2015 2025)
- Falkirk Local Transport Strategy (2014)
- Fife Local Transport Strategy (2006 2026)
- Freight and servicing action plan: Making London's streets safer, cleaner and more efficient
- Freight Carbon Review 2017 Moving Britain Ahead
- Future Intelligent Transport Systems Strategy, Transport Scotland (2017)
- Government Economic Strategy, Scottish Government, (2011) (GES)
- Grangemouth Investment Zone: Freight Flow Analysis (2017)
- Infrastructure Investment Plan, (2011) (IIP)
- Initial Appraisal: Case for Change Forth Valley Region 2020
- Initial Appraisal: Case for Change Edinburgh and South East Scotland Region 2020
- Levenmouth Sustainable Transport Study, Transport Scotland (2019) Scottish Planning Policy, (2014) (SPP)
- Low Carbon Scotland Meeting our Emissions Reduction Targets 2013–2027, The Second Report on Proposals and Policies, (2014) (RPP2)



- Low Emissions Strategy: Scottish Government is currently (March 2015) consulting on a Low Emissions strategy (LES)
- Midlothian Transport Strategy (2007 2010)
- National Planning Framework 3, July 2014 (NPF)
- National Transport Strategy: Protecting our climate and improving lives, Transport Scotland (2019)
- Rail Enhancements & Capital Investment Strategy, Transport Scotland (2018)
- Rail Freight Strategy: Moving Britain Ahead, DfT (2016)
- Rail Freight: Delivering for Britain
- Rail Freight: Working for Britain, Rail Delivery Group (2018)
- Rail Services Decarbonisation Action Plan
- Regional Transport Strategy Refresh, SEStran (2015)
- Route Business Scotland Route Strategic Plan, Network Rail (2018)
- Scotland's Cities: Delivering for Scotland, (2012) (SCA)
- Scottish Borders Local Transport Strategy (2007 2008)
- Sustainable Road Freight in Port Cities, Aberdeen and CIVITAS PORTIS (2019)
- Transporting Scotland's Trade, Transport Scotland (2019)

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# Appendix B CSRGT Analysis





# **Clackmannanshire and Fife**



Figure B1: Grossed goods lifted for Clackmannanshire and Fife (tonnes)

Figure B2: Grossed vehicle kilometres for Figure B3: Grossed goods moved for the Clackmannanshire and Fife

movement type for for

15,277,0

58,115,6

95,45%



kilometres)

# Analysis

Clackmannanshire and Fife have a predominant outward flow bias with over 4.2 million tonnes of goods lifted (38 per cent) moving out of the area (Figure B1). The main commodities transported in terms of goods lifted are food products, beverages, agriculture, hunting, and forestry products; fish and other fishing products and secondary raw materials; municipal waste and other wastes (Table B1).

The vehicle kilometres travelled to, from and within Clackmannanshire and Fife are predominantly outward, 45% and inward 43%, meaning very little moves within the region. The most prominent commodity for grossed vehicle kilometres, by some way, is empty vehicles. This would imply that port related traffic is likely to be contributing to these empty vehicle movements, with HGVs coming to the port to collect goods then transporting them out of the region.

The goods moved for Clackmannanshire and Fife is dominated by outbound movement with 739 million VtKMs (54 per cent) of goods moved out of the area (Figure B3). This suggests that goods going outbound from the area are travelling long distances and as such may be well-placed for possible modal shift to rail.





Table B1: Top five commodities and total amount by data field category for Clackmannanshire and Fife

# East Lothian and Midlothian



# Analysis

Telling a similar story to Clackmannanshire and Fife, East Lothian and Midlothian is a net exporter of goods with 2.2 million (48 per cent) of goods being lifted out of the area. This is followed by inbound movements equating to 1.7 million tonnes (37 per cent) of goods lifted into the area (Figure B4). Of the total goods lifted the majority of this related to secondary raw materials; municipal wastes and other wastes followed by products of agriculture, hunting, and forestry; fish and other fishing products (Table B2).

Outbound and inbound movements also dominate the split of vehicle kilometres, having 47 per cent and 42 per cent of the total respectively. Of the total distance this primarily related to empty vehicles and food products, beverages and tobacco.

Goods moved for the area is primarily related to outbound movements equating to 251 million VtKMs (59 per cent) (Figure B6). Of the total goods moved the main commodities moved include Products of agriculture, hunting, and forestry; fish and other fishing products and food products, beverages and tobacco and Secondary raw materials; municipal wastes and other wastes.



Table B2: Top five commodities and total amount by data field category for East Lothian and Midlothian

		Total (Internal, <u>Outbound</u> and Inbound)					
Area	Rank number (1=highest)	Grossed Goods Lifted (tonnes)	<u>Grossed_VehicleKMs</u> (kilometres)	Grossed Goods Moved (Vehicle tonne kilometre			
East Lothian and Midlothian	1	Secondary raw materials; municipal wastes and other wastes	Empty vehicle	Products of agriculture, hunting, and forestry; fish ar other fishing products			
		1,411,357	16,803,553	109,192,6			
East Lothian and Midlothian	2	Products of agriculture, hunting, and forestry; fish and other fishing products	Food products, <u>beverages</u> and tobacco	Food products, <u>beverages</u> a tobacco			
		766,441	11,923,916	101,771,2			
East Lothian and Midlothian	3	Other non-metallic mineral products	Secondary raw materials; municipal wastes and other wastes	Secondary raw materials; municipal wastes and other wastes			
		755,360	7,281,224	91,752,2			
East Lothian and Midlothian	4	Food products, <u>beverages</u> and tobacco	Products of agriculture, hunting, and forestry; fish and other fishing products	Other non-metallic mineral products			
		710,521	6,701,215	66,013,5			
East Lothian and Midlothian	5	Metal ores and other mining and quarrying products; peat; uranium and thorium ores	Other non-metallic mineral products	Grouped goods: a mixture o types of goods which are transported together			
		278,447	3,368,206	16,542,2			



# Edinburgh



# Analysis

Edinburgh is a net importer of goods with 2.8 million tonnes (40 per cent) of goods lifted into the area (Figure B7). This is likely to be due to its much higher population and associated consumption. Of the total goods lifted the top commodity moved was other non-metallic mineral products followed by food products, beverages and tobacco (Table B3).

Vehicle kilometres travelled in, out and within Edinburgh are all quite similar, with 43 million vehicle kilometres (37 per cent) travelling inbound to the area (Figure B8). This is closely followed by outbound (32 per cent) and internal (31 per cent) movements equating to roughly 36 million vehicle kilometres each (Figure B8).



## Table B3: Top five commodities and total amount by data field category for Edinburgh

Of the total vehicle kilometres, a high proportion of these were related to mail and parcels . This is due to many mail and parcel distribution centres being located in and around the region (Figure B10) and the fact that Edinburgh is the second highest populated city in Scotland, meaning there are many people using mail and parcel services.

Goods moved are mainly inbound with 64 per cent 413 million VtKMs of goods moved (Figure B9). The top outbound commodity was food products, beverages and tobacco (114,033,681 VtMs) which can again be linked to having to feed Edinburgh's large population.





Figure B10: Screenshot showing Mail and Parcel distribution centres and related facilities in and around Edinburgh





# Falkirk



# Analysis

In Falkirk 4.4 million tonnes (36 per cent) of goods lifted stay internally in the area (Figure B11). This is closely followed by outbound goods of 4.2 million tonnes of goods lifted (34 per cent). The top commodity lifted overall was Coke and refined petroleum products (Table B4), likely associated with the Refinery at Grangemouth However, food products, beverages and tobacco was the highest imported commodity type.

Falkirk vehicle kilometres travelled have a higher inbound movement (41 per cent) of 61.7 million vehicle kilometres. Once again of the total distance travelled this is dominated by the commodity types food products, beverages and tobacco and empty vehicles (Table B4).

Goods moved inbound and outbound averages at 38.5 per cent with 1.4 billion VtKMs of goods moved in total (Figure B13). The top commodity for the total is food products, beverages and tobacco (445 million VtKMs) (Table B4), despite coke and refined petroleum products being top commodity for outbound and internal movements. This suggests food and drinks products are being transported over significant distances.





Table B4: Top five commodities and total amount by data field category for Falkirk

# **Scottish Borders**



# Analysis

Scottish Borders is a heavy net exporter with it dominating all three categories. For goods lifted 2.1 million tonnes (46 per cent) were exported out of the area (Figure B14). The top commodity's again including food products, beverages and tobacco and other non-metallic mineral products (Table B5).

For grossed vehicle kilometres exports from the area were 25.6 million vehicle kilometres (48 per cent) to regions outside of the area (Figure B15). The predominant commodity for the total distance travelled is empty vehicles with 16 million vehicle kilometres travelling in, out and within the area (Table B5) although products of agriculture, hunting, and forestry; fish and other fishing products was the top outbound commodity for the area.

Goods moved in the Scottish Borders is significantly dominated by the outbound movements with 361 million VtKMs of good moved (63 per cent) into the area (Figure B16). The top commodities for this are dominated by food and agricultural products.





# Table B5: Top five commodities and total amount by data field category for Scottish Borders

# West Lothian



# Analysis

West Lothian is a net importer of goods with 5.5 million tonnes of goods lifted (48 per cent) into the area (Figure B17). Food products, beverages and tobacco commodity types dominates all three of the movement categories for West Lothian, with it overall being significantly higher than the commodity in second place respectively (TableB 6).

West Lothian is also a net importer of vehicle kilometres travelling with around 98 million vehicle kilometres (44 per cent) from other regions to the area (Figure B18). Food products, beverages and tobacco is the main commodity for total distance travelled being moved in, out and within the region.

Goods moved in West Lothian is significantly dominated by the inbound movements with 1.3 billion VtKMs of goods moved (55 per cent) into the area (Figure B19). The top commodity moved in and out is food products, beverages and tobacco, at 1.1 billion VtKMs, this figure is far higher for gross goods moved, than any other study area observed as part of this study. This would imply that there is not only a significant amount of food products coming in and out of West Lothian, but it is also travelling long distances to and from the area. However, grouped goods: a mixture of types of goods which are transported together was the top commodity for internal movements.





Table B6: Top five commodities and total amount by data field category for West Lothian

Top 50 routes and commodities in and out of study area by gross good lifted.

Rank	Origin	Destination	Commodity Type Group	<b>Gross Goods Lifted</b>	Rank	Origin	Destination	Commodity Type Group	Gross Goods Lifte
1	North West	West Lothian	Various Food Products And Tobacco Products In Parcel	530,750	13	Falkirk	Angus And Dundee City	Basic Plastics And Synthetic Rubber In Primary Forms	234,311
			Service Or Grouped Stone Sand Gravel Clay Peat		14	West Central Scotland	Edinburgh, City Of	Other Raw Materials Of Animal Origin	233,450
2	Clackmannanshire And Fife	West Central Scotland	And Other Mining And Quarrying Products N.E.C	452,430	15	West Lothian	West Central Scotland	Pallets And Other Packaging In Service, Empty	217,875
3	West Lothian	North East (England)	Various Food Products And Tobacco Products In Parcel Service Or Grouped	445,224	16	West Central Scotland	West Lothian	Various Food Products And Tobacco Products In Parcel Service Or Grouped	214,500
4	West Lothian	Southern Scotland	Various Food Products And Tobacco Products In Parcel	331,745	17	North West (England)	East Lothian And Midlothian	Products Of Forestry And Logging	213,935
<u>5</u>	Falkirk	North East	Service Or Grouped Liquid Refined Petroleum	306.893	18	Clackmannanshire And Fife	North Eastern Scotland	Other Waste And Secondary Raw Materials	212,585
6	North East	(England) West Lothian	Products Various Food Products And Tobacco Products In Parcel	296,806	19	Falkirk	Highlands And Islands	Grain Mill Products, Starches, Starch Products And Prepared Animal Feeds	207,186
7	East Midlands (England)	West Lothian	Service Or Grouped Grouped Goods	295,732	20	Clackmannanshire And Fife	North West (England)	Grain Mill Products, Starches, Starch Products And Prepared Animal Feeds	206,536
8	Clackmannanshire And Fife	North West (England)	Gaseous, Liquefied Or Compressed Petroleum Products	282,797	21	North East (England)	Scottish Borders	Cereals	204,461
9	Southern Scotland	West Lothian	Stone, Sand, Gravel, Clay, Peat And Other Mining And Quarrying Products N.E.C	258,896	22	Angus And Dundee City	West Lothian	Various Food Products And Tobacco Products In Parcel Service Or Grouped	199,675
10	West Lothian	West Central	Various Food Products And Tobacco Products In Parcel	245,939	23	West Midlands (England)	West Lothian	Mail	191,626
	West Central	East Lothian And	Service Or Grouped		24	Falkirk	Southern Scotland	Liquid Refined Petroleum Products	187,046
12	Scotland West Central Scotland	Midlothian Falkirk	Beverages	240,028	25	North West (England)	Scottish Borders	Grain Mill Products, Starches, Starch Products And Prepared Animal Feeds	185,608





Rank	Origin	Destination	Commodity Type Group	<b>Gross Goods Lifted</b>	Rank	Origin	Destination	Commodity Type Group	Gross Goods Lifte
26	Falkirk	West Central Scotland	Other Waste And Secondary Raw Materials	170,595	40	West Central Scotland	Edinburgh, City Of	Various Food Products And Tobacco Products In Parcel	140,533
27	Clackmannanshire And Fife	Southern Scotland	Grain Mill Products, Starches, Starch Products And Prepared Animal Feeds	170,309	41	East Lothian And Midlothian	West Central Scotland	Service Or Grouped Containers And Swap Bodies In Service, Empty	136,662
28	Scottish Borders	North East (England)	Various Food Products And Tobacco Products In Parcel	169,592	42	West Midlands (England)	Falkirk	Fruit And Vegetables, Processed And Preserved	136,427
	North West	Edipburgh City Of	Service Or Grouped	147.079	43	West Midlands (England)	West Lothian	Grouped Goods	135,195
	(England)	Eainburgh, City Oi	Various Food Products And	107,078	44	Scottish Borders	North East (England)	Products Of Forestry And	125,328
30	Yorkshire And The Humber	West Lothian	Tobacco Products In Parcel Service Or Grouped	165,348	45	Clackmannanshire And Fife	West Central Scotland	Potatoes	124,166
31	Falkirk	Southern Scotland	Grouped Goods	163,902				Nitrogen Compounds And	
32	West Midlands (England)	Falkirk	Glass And Glass Products, Ceramic And Porcelain Products	161,630	46	West Central Scotland	Clackmannanshire And Fife	Fertilizers (Except Natural Fertilizers)	121,300
33	Perth & Kinross And Stirling	Clackmannanshire And Fife	Products Of Forestry And Logging	156,245	47	East Lothian And Midlothian	North East (England)	Other Construction Materials, Manufactures	121,032
34	North West (England)	Falkirk	Glass And Glass Products, Ceramic And Porcelain Products	149,908	48	West Midlands	West Lothian	Various Food Products And Tobacco Products In Parcel	119,064
35	West Central Scotland	Falkirk	Cement, Lime And Plaster	145,343		(England)		Service Or Grouped Other Food Products N.E.C. And	· · · · · · · · · · · · · · · · · · ·
36	North East (England)	Clackmannanshire And Fife	Other Waste And Secondary Raw Materials	145,262	49	North East (England)	Scottish Borders	Tobacco Products (Except In Parcel Service Or Grouped In	118,343
37	East Lothian And Midlothian	North East (England)	Other Waste And Secondary Raw Materials	144,239		North East	Coottich Doublous	Bulk)	1171//
38	Angus And Dundee City	West Lothian	Meat, Raw Hides And Skins And Meat Products	142,873	50	(England)	Scottish Borders	Beverages	/, 44
39	West Lothian	Angus And Dundee City	Various Food Products And Tobacco Products In Parcel Service Or Grouped	141,719					





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Top 50 empty vehicle routes in and out and within study area by gross vehicles kilometres.

Rank	Origin	Destination	Commodity Type Group	<b>Gross Vehicle KMs</b>	Rank	Origin	Destination	Commodity Type Group	<b>Gross Vehicle KM</b>
1	NORTH WEST	Clackmannanshire	Emptycychicle	5 700 040	17	Southern Scotland	West Lothian	Empty vehicle	2,057,761
	(ENGLAND)	and Fife EAST MIDLANDS		J,70Z,249	18	Scottish Borders	NORTH WEST (ENGLAND)	Empty vehicle	1,996,833
2	West Lothian	(ENGLAND)	Empty vehicle	4,/16,012	19	West Lothian	Southern Scotland	Empty vehicle	1,939,902
3	Edinburgh, City of	NORTH WEST (ENGLAND)	Empty vehicle	4,109,010	20	Clackmannanshire and Fife	East Lothian and Midlothian	Empty vehicle	1,858,720
4	North Eastern Scotland	East Lothian and Midlothian	Empty vehicle	3,464,425	21	West Lothian	NORTH WEST (ENGLAND)	Empty vehicle	1,817,370
5	West Central Scotland	Falkirk	Empty vehicle	2,755,956	22	Falkirk	West Central Scotland	Empty vehicle	1,801,250
6	West Central Scotland	West Lothian	Empty vehicle	2,669,834	23	West Central Scotland	Scottish Borders	Empty vehicle	1,749,884
7	NORTH EAST (ENGLAND)	West Lothian	Empty vehicle	2,668,731	24	Angus and Dundee City	Falkirk	Empty vehicle	1,699,431
8	Clackmannanshire and Fife	West Central Scotland	Empty vehicle	2,601,891	25	West Lothian	NORTH EAST (ENGLAND)	Empty vehicle	1,668,051
9	West Lothian	YORKSHIRE AND THE HUMBER	Empty vehicle	2,585,458	26	Southern Scotland	Clackmannanshire and Fife	Empty vehicle	1,628,085
10	Edinburgh, City of	West Central Scotland	Empty vehicle	2,492,693	27	Highlands and Islands	Falkirk	Empty vehicle	1,572,252
11	NORTH EAST	Falkirk	Empty vehicle	2 /√2 ∩11	28	Southern Scotland	Falkirk	Empty vehicle	1,512,799
10	(ENGLAND) Clackmannanshire	Clackmannanshire			29	Clackmannanshire and Fife	Perth & Kinross and Stirling	Empty vehicle	1,478,603
	and Fife	and Fife	Empty venicle	2,340,505	30	Angus and	Clackmannanshire	Emptycychicle	1 /.00 109
13	West Lothian	West Central	Empty vehicle	2.273.158		Dundee City	and Fife	Linpty venicle	1,420,190
		Scotland			31	Southern Scotland	Scottish Borders	Empty vehicle	1,405,408
14	NORTH WEST (ENGLAND)	Falkirk	Empty vehicle	2,175,302	32	West Lothian	Perth & Kinross and Stirling	Empty vehicle	1,321,184
15	WEST MIDLANDS (ENGLAND)	Clackmannanshire and Fife	Empty vehicle	2,147,149	33	Highlands and Islands	Clackmannanshire and Fife	Empty vehicle	1,306,634
16	West Lothian	WEST MIDLANDS (ENGLAND)	Empty vehicle	2,104,182	34	Clackmannanshire and Fife	NORTH EAST (ENGLAND)	Empty vehicle	1,304,965



# <u>Ms</u>

Rank	Origin	Destination	Commodity Type Group	<b>Gross Vehicle</b>
35	West Central Scotland	Clackmannanshire and Fife	Empty vehicle	1,264,697
36	East Lothian and Midlothian	Edinburgh, City of	Empty vehicle	1,242,996
37	Falkirk	North West (England)	Empty vehicle	1,216,432
38	East Lothian and Midlothian	Perth & Kinross And Stirling	Empty vehicle	1,190,384
39	Perth & Kinross and Stirling	Edinburgh, City Of	Empty vehicle	1,185,290
40 North Eastern Scotland		Edinburgh, City Of	Empty vehicle	1,155,131
41	Falkirk	West Midlands (England)	Empty vehicle	1,087,493
42	Perth & Kinross and Stirling	Scottish Borders	Empty vehicle	1,085,909
43	Angus and Dundee City	Edinburgh, City of	Empty vehicle	1,084,006
44 West Central Scotland		Edinburgh, City of	Empty vehicle	1,068,715
45	Scottish Borders	Scottish Borders	Empty vehicle	1,058,161
46	East Lothian and Midlothian	Scottish Borders	Empty vehicle	1,049,216
47	Clackmannanshire and Fife	East Midlands (England)	Empty vehicle	1,040,321
48	Scottish Borders	North East (England)	Empty vehicle	1,036,988
49	Perth & Kinross and Stirling	Clackmannanshire And Fife	Empty vehicle	1,015,200
50	NORTH WEST (ENGLAND)	Scottish Borders	Empty vehicle	975,719



# KMs



# Appendix C Air Quality





# National Legislation and Policy European Air Quality Directives

The Air Quality Framework Directive (96/62/EC) on ambient air quality assessment and management defines the policy framework for 12 air pollutants known to have a harmful effect on human health and the environment. Ambient concentration limit values for the specific pollutants are set through a series of Daughter Directives.

Following the Daughter Directives, Council Directive 2008/50/EC on ambient air quality and cleaner air for Europe came into force in 2008 and was transposed into national UK legislation in 2010 (The Air Quality (Scotland) Regulations 2010 (Defra, 2010)). It consolidated existing air quality legislation and made provisions for Member States to postpone limit value attainment deadlines and allow an exemption from the obligation to limit values for certain pollutants, subject to strict conditions and assessment by the European Commission (EC).

# National Air Quality Legislation

The provisions of Part IV of the Environment Act 1995 establish a national framework for air quality management, which requires all Local Authorities to conduct local air quality reviews. Section 82(1) of the Act requires these reviews to include an assessment of the current air quality in the area and the predicted air quality in future years. Should the reviews indicate that the objectives prescribed in the UK Air Quality Strategy (AQS) (Defra, 2011) and the Air Quality (Scotland) Regulations 2010 (Defra, 2010) (henceforth referred to as the "Air Quality Regulations") will not be met, the Local Authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level to ensure that air quality in

the area improves.

Framework (NPF3) The UK AQS (AQS) (Defra, 2011) identifies nine ambient air pollutants that have the potential to cause harm to human health. These pollutants are associated with local air quality problems, with the Scotland's Third National Planning Framework was published in exception of ozone, which is instead considered to be a regional June 2014 and brings together the Scottish Government's plans problem. Similarly, the Air Quality Regulations set objectives, but for and strategies in economic development, regeneration, energy, just seven of the pollutants that are associated with local air quality. environment, climate change, transport and digital infrastructure These objectives aim to reduce the health effects of the pollutants to to provide a coherent vision of how Scotland should evolve over negligible levels. the next 20 to 30 years. A number of potential local air quality and emissions effects were recognised in the Framework:

The air quality objectives and limit values currently applicable to the UK can be split into two groups. Each has a different legal status and is therefore handled differently within the framework of UK air quality policy. These are:

- UK air quality objectives set down in regulations for the purposes of local air quality management; and
  Environmental impacts arising from transport infrastructure enhancements;
- European Union (EU) limit values transcribed into UK legislation for which compliance is mandatory.

# Brexit

There is some uncertainty related to the departure of the UK from the EU. However, at this time it is expected that existing air quality legislation and objectives will continue to be applied.



# Scotland's Third National Planning Framework (NPF3)

- Air quality impacts arising from increased transport movements;
- Localised impacts arising from housing development;
- Localised impacts arising from improved gateways; and
- Climate change impacts from improved global connectivity.
- Scottish Planning Policy (SPP)

The purpose of the Scottish Planning Policy (June 2014) is to set out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land. The NPF3 and the SPP share a vision for the planning system in Scotland:

'We live in a Scotland with a growing, low-carbon economy with progressively narrowing disparities in well-being and opportunity. It is growth that can be achieved whilst reducing emissions and which respects the quality of environment, place and life which makes our country so special. It is growth which increases solidarity - reducing inequalities between our regions. We live in sustainable, well-designed places and homes which meet our needs. We enjoy excellent transport and digital connections, internally and with the rest of the world.'

In terms of air quality, the SPP states that:

- This SPP introduces a presumption in favour of development that contributes to sustainable development. This means that policies and decisions should be guided by principles, including:

Avoiding over-development, protecting the amenity of new and existing development and considering the implications of development for water, air and soil quality.

- Local development plans should safeguard all workable mineral resources which are of economic or conservation value and ensure that those are not sterilised by other development. Plans should set out the factors that specific proposals will need to address, including:

Disturbance, disruption and noise, blasting and vibration, and potential pollution of land, air and water.

# Scottish Low Emission Strategy

The Low Emission Strategy for Scotland (Scottish Government, 2015) outlines a framework and accompanying air quality modelling

**Building Scotland's Low Emission Zones,** methodology for implementing Low Emission Zones (LEZ). **Consultation 2017** The purpose of the Low Emission Strategy is intended to 'draw together the various policies being implemented and developed across a range of central and local government portfolios which Transport Scotland has opened a consultation regarding how to have the potential to improve air quality, and present these within effectively deliver a national approach to the implementation of Low a coherent overall framework, setting a new refocused agenda for Emission Zones (LEZ), whereby coordinated standards would apply action. The Strategy sets out the contribution that better air quality to the cities of Aberdeen, Dundee, Edinburgh and Glasgow. can make to sustainable economic growth and quality of life for the citizens of Scotland.' The consultation focuses on the use of LEZs to improve air quality, and to improve road network operations and tackle congestion, Cleaner Air for Scotland: The Road to a

# Healthier Future

The City of Edinburgh LEZ was originally planned to be implemented The Cleaner Air for Scotland: The Road to a Healthier Future strategy by the end of 2020 and apply to the city centre for all vehicles, and document (Scottish Government, 2015) sets out measures by which city wide for only commercial vehicles (buses, coaches, heavy goods Scotland can improve its air quality. vehicles, light goods vehicles, vans, taxis, and private hire cars).

Measures pertinent to freight and haulage include:

feature in the transition to net zero by 2050.



- Switched on Scotland: A Roadmap to Widespread Adoption of Plug-in Vehicles - reducing the damaging effects of petrol and diesel vehicles felt by Scottish towns and cities; phasing out half of all petrol and diesel movements in cities by 2030. This also involves engaging key industry partners to establish how hydrogen, liquid natural gas (LNG), compressed natural gas (CNG) and biofuel

- Encourage local authorities with AQMAs to establish a Freight Quality Partnership and consider appropriate measures to improve air quality by 2017 – these partnerships should consider the environmental impact of freight transport.

support modal shift to active travel and public transport, support climate change mitigation and support improving town and city spaces.

## Local Authority Monitoring Data

Figure C1 Local Air Quality Monitoring in Clackmannanshire







## Figure C2 Local Air Quality Monitoring in East Lothian





Figure C3 Local Air Quality Monitoring in Edinburgh



## Figure C4 Local Air Quality Monitoring in Falkirk







Figure C5 Local Air Quality Monitoring in Fife



## Figure C6 Local Air Quality Monitoring in Midlothian











## Figure C8 Local Air Quality Monitoring in West Lothian





# Local Authority Air Quality Action Plans

Each of the below Tables list the policies outlined in the respective local authority's Air Quality Action Plan and the level at which the policy is considered to be employed.

## Table C1 – Summary of Policies Adopted by Clackmannanshire

	Action\measure\policy	Level
-	Control of new developments through integrating air quality into development control	Strategic
	Provision of electric 'pool' vehicles for use by council staff	Emission Reduction Technology
	Provision of eleven EV charging bays for use by members of the public	Behavioural Change
	Promotion of cycling and walking through the Smart Choices, Smaller Places initiative	Behavioural Change
	Council utilises the TripShare Clacks website aiming to promote car sharing accessed here <u>https://www.clacks.gov.uk/transport/</u> <u>tripshare/</u> [last accessed 06/07/2020]	Behavioural Change
	Development of cycle infrastructure	Behavioural Change
	Cycle to work scheme for the council	Behavioural Change

Sources: Clackmannanshire Council, 2019 Air Quality Annual Progress Report (2019)

## Table C2 – Summary of Policies Adopted by East Lothian

## Action\measure

Improve links with Local Tra ensure AQ is referenced in Improving links with Local [ ensure AQ is referenced in Construction of micro-simu of the strategic and local ro Modelling of traffic-related measures Bus stop relocations on Hig - split bus service between stops Enforcement of idling provi Traffic (Vehicle Emission) (Fi (Scotland) Regulations 2003 Electrification of Lothian Bu Establishment of Eco Stars recognition scheme to rewa try to reduce fuel consumpt Applies to both council and Longer trains and platforms Station – increase capacity station Improved AQMA signage Local Development Plan SCOOT – Split Cycle Offset Technique. Traffic managem light adjustment. Focus on flow.



<b>X</b>	
e\policy	Level
ansport Strategy – future LTS	Strategic
Development Plan – future LDP	Strategic
llation traffic model bad network	Traffic Management
mitigation	Traffic Management
gh St, Musselburgh n additional bus	Traffic Management
isions of the Road ixed Penalty) 3	Traffic Management
uses in Musselburgh	Emission Reduction Technology
fleet – a fleet ard operators who tion and emissions. d commercial fleet	Emission Reduction Technology
s at Musselburgh of train and train	Behavioural Change
	Behavioural Change
	Strategic
Optimisation nent through traffic smoothing traffic	Traffic Management

Action\measure\policy	Level
East Central Scotland Vehicle Emissions Partnership – work in conjunction with Midlothian, West Lothian and Falkirk councils to provide a voluntary vehicle emissions testing program	Behavioural Chang
Provision of information regarding air quality and travel options – AQ on council website	Behavioural Chang
Promotion of active travel – ensure cycle network and facilities provided as a matter of course; integration of cycling/walking and public transport; new footpaths and crossings	Behavioural Chang
Green Travel Plans for large institutions and businesses	Behavioural Chang
Sources: East Lothian Council, Musselburgh Air (2017)	Quality Action Plai

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## Table C3 – Summary of Policies Adopted by Edinburgh

#### Action\measure\policy Level Local Transport Plan – new Manage bus emissions – reduce emissions through Voluntary Emissions Reduction Emission Reduction Local Transport Plan – cycle Partnership. Retrofitting/upgrading/ Technology electrification Reduce emissions of other vehicular sources of pollutants - implementation of a Low Behavioural Change flow. Emission Zone Manage road freight emissions – Freight Quality Partnership. Established by Strategic SESRegional Partnership Continuation of Eco Stars fleet – a fleet flow recognition scheme to reward operators who Emission Reduction New/improved road schem try to reduce fuel consumption and emissions. Technology Applies to both council and commercial fleet Emission Reduction Cleaner Council Fleet Vehicles Technology Council Fleet develop eco driver training Behavioural Change programme – use of telematics Local Transport Plan – park and ride sites Strategic/ established. Continue to support and expand Behavioural Change this. Further improvements to bus stands Local Transport Plan – Differential parking Behavioural Change Local Transport Plan – Controlled Parking Zones (CPZ) and Priority Parking Zones (PPZ). Behavioural Change Deter car commuting into the city Strategic/ Emission Reduction Local Transport Plan – tram Technology

Action\measure

SCOOT – Split Cycle Offset Technique. Traffic managem light adjustment. Focus on E-MOTES (Real-time Remote - run in conjunction with SC qualitative real-time measur can be compared alongside

Electric Vehicle charging inf

Development of city-wide L Traffic (LUTi) model – more modelling of air quality impa

Sources: City of Edinburgh with Actions 2015 (2015)

## Table C4 – Summary of Poli

## Action\measure

Renewal/upgrade of council fleet vehicle fleet driver training/help local fuel statio provide alternative low emission fuels Review of school buses to look at improv emissions standard



e\policy	Level	Action\measure\policy	Level
rail line/station	Strategic/ Emission Reduction	Road infrastructure changes to improve traffic flow	Traffic Management
e initiatives	Technology Behavioural Change	Traffic signalling changes to improvement traffic flow	Traffic Management
Optimisation nent through traffic smoothing traffic	Traffic Management	'Take the Right Route' – modal shift away from cars through promoting walking; cycling and using public transport	Behavioural Change
		Council Service based work travel plan	Behavioural Change
e Sensor System)		Introduce quality bus corridors	Traffic Management
COOT so that		Bike hire scheme	Behavioural Change
rements of NOx e managed traffic	Traffic Management	Travel planning for large organisations (businesses/schools/universities)	Behavioural Change
nes	Traffic Management	Consideration of AQ in Local Development Plan	Strategic
frastructure	Emission Reduction Technology/	Continuation of air quality monitoring in AQMAs	Strategic
and Use and	Behavioural Change	Promotion of ECO stars	Emission Reduction Technology
accurate	Strategic	Review of park and ride facilities	Behavioural Change
acts <mark>Council, Air Quality</mark>	Action Plan Progress	Taxi licensing – influence choice of emissions standard of vehicle	Emission Reduction Technology/ Behavioural Change
icies Adopted by Fa	alkirk	Vehicle Emissions Partnership – emissions testing for vehicles belonging to members of the public	Behavioural Change
e\policy	Level	Introduction of car clubs	Behavioural Change

	· · · · · ·	
es/	Emission Reduction	
ons to	Technology/	Sources: Falkirk Council, Air Quality Management Action Plan
	Behavioural Change	(Falkirk Town Centre and Haggs) (2015)
ving	Emission Reduction	

Technology






# Table C5 – Summary of Policies Adopted by Fife

# Action\measure

Action\measure\policy	Level
Target reductions in emissions from the council fleet, contract vehicles and target estate	Emission Reduction Technology/ Behavioural Change
Provide clear information and guidance on local air quality across the council, to the public and developers	Strategic
Reducing the need to travel, especially by car	Behavioural Change
Optimise the management of traffic to reduce congestion and associated emissions e.g. urban traffic management and control system	Traffic Management
Integrate air quality considerations into related council plans, including: Council Plan; Structure Plan; Community Plan; Local Plans; Local Transport Strategy; Climate Change Strategy	Strategic
Raising awareness of local air quality to encourage the public and local businesses to act e.g. AQMA awareness signs, air quality and travel options	Behavioural Change
Travel plans for large institutions and organisations	Behavioural Change
Liaise with Scottish Government regarding the consideration of national measures to reduce background concentrations of PM	Strategic



Action\measure\policy	Level	Table C6 – Summary of Policies Adopted by M	lidlothian
Adopt a strategic approach to air quality for new infrastructure	Strategic	Action\measure\policy	Level
Depending on results of air quality modelling/ feasibility study, development of new roads	Traffic Management	New Borders railway linking Edinburgh, Midlothian and the Scottish borders, supported by park and ride facilities	Behavioural Chang
Ensure active travel networks are provided as a matter of course and improve integration of active travel and public transport	Behavioural Change	Ensuring new developments can easily access new rail (and other transportation infrastructure)	Strategic
Sources: Fife Council, An Air Quality Strategy for Fife 20 Fife Council, Air Quality Action Plan for Appin ( 2013 (2013)	015-2020 (2015) Crescent, Dunfermline	Midlothian council travel plan – vehicle fleet efficiency e.g. electric vehicles for staff to use, eco-driver training, tax free bike purchase scheme available	Emission Reductio Technology/ Behavioural Chang
Fife Council, An Update on the Bonnygate Air Quality Action Plan	Quality Action Plan	Enforcement of anti-idling measures	Behavioural Chang
2010 (2010)		Incorporating air quality considerations into local development plan e.g. highspeed broadband, cycle parking into new developments, extension of national cycle network, dedicated walking and cycling routes	Strategic
		New road/bypass to improve traffic flow	Traffic Manageme
		Sources: Midlothian Council, 2019 Air Quality A Report (2019)	Annual Progress

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# Table C7 – Summary of Policies Adopted by West Lothian

# Action\measure

Action\measure\policy	Level
Updating the Local Transport Strategy and incorporating considerations of air quality	Strategic
Improving links with Local Planning and Development Framework	Strategic
Encourage integration of AQ with other Council Strategies	Strategic
Liaise with Scottish Government regarding additional National Policy	Strategic
Traffic signal phasing and junction modification	Traffic Management
Changes to pedestrian crossings and junctions to reduce congestion	Traffic Management
New roads and road infrastructure	Traffic Management
Provision of railway station at Winchburgh	Behavioural Change
Development of local bus quality partnership	Emission Reduction Technology
Contact ECO stars regarding feasibility of setting up local scheme	Emission Reduction Technology
Green procurement (council), fuel management, eco-driving training and assessment of new technology	Emission Reduction Technology/ Behavioural Change
Taxi quality partnership e.g. preferential licensing for taxis with lower emissions	Behavioural Change
Electric vehicle charging points in conjunction with climate change tool	Emission Reduction Technology/ Behavioural Change
Encourage private and public operators to pursue cleaner vehicle and abatement	Emission Reduction Technology

Vehicle emissions testing an enforcement Provision of information rega Promotion of alternative mod including walking e.g. inform public transport, cycle netw provided as a matter of cour integration between cycling transport, encourage installa council buildings Encourage developers to inc paths and walkways Travel plans for large institut businesses Utilise powers conferred und the Environmental Protection minimise contributions to po domestic combustion and s Home energy efficiency – de as to the use of biomass for and similar Greening area with trees Investigate feasibility of park Decriminalise parking in Wes introduce high street parking enforcement Introduce car club



Level	Sources:
Behavioural Change	West Lothian Council, Broxburn Air Quality Action Plar West Lothian Council, Draft Linlithgow Air Quality Acti
Behavioural Change	[draft]
Behavioural Change	West Lothian Council, Draft Newton Air Quality Action [draft]
Behavioural Change	
Behavioural Change	
Behavioural Change	
Strategic	
Strategic	
Strategic	
Behavioural Change	
Behavioural Change	
	Level Behavioural Change Behavioural Change Behavioural Change Behavioural Change Behavioural Change Strategic Strategic Behavioural Change



# **Background Pollutant Concentrations**

Figure C12 Annual Mean Background NO2, 2018





## AECOM PROJECT SEStran Freight Strategy erth CLIENT South East of Scotland ch Lomond e Trossachs Transport Partnership onal Park CONSULTANT AECOM Limited 2 City Walk Leeds LS11 9AR T: +44 0113-391-6800 www.aecom.com LEGEND Local Authority Boundaries Annual Mean PM<sub>10</sub> mbart **Background Concentrations** / µg m-3 <8 8-10 10-12 12-14 14-16 Kilmarnock ISSUE PURPOSE DRAFT PROJECT NUMBER lorthum berland 60630786 National Park SESTRANS FREIGHT STRATEGY SHEET TITLE Regional Study Area PM<sub>10</sub> Background Concentration 24,000 12,000 0 24,000 Meters 1:814,010.92 @ A3 SHEET NUMBER umfries

# Figure C13 Annual Mean Background PM10, 2018





Figure C14 Annual Mean Background PM<sub>2.5</sub>, 2018



# **Regional Network Emissions**

Figure C15 Total NOx Emissions on Model Network, 2018











# Figure C17 Total PM<sub>2.5</sub> Emissions on Model Network, 2018





# **Emissions Profiles**



Figure C18 NOx emissions for Articulated HGVs for all Euro Classes





# Figure C19: NOx emissions for Rigid HGVs for all Euro Classes





# Figure C20 NOX emissions for LGVs for all Euro Classes





# Figure C21. NOX emissions for Euro V SCR Articulated HGVs at Various Loads











# Figure C23. PM10 emissions for Articulated HGV for all Euro Classes





Figure C24 PM<sub>10</sub> emissions for Rigid HGV for all Euro Classes





# Figure C25. PM<sub>10</sub> emissions for LGV for all Euro Classes





Figure C26. PM<sub>2.5</sub> emissions for Articulated HGV for all Euro Classes





# Figure C27. PM2.5 emissions for Rigid HGV for all Euro Classes





Figure C28 PM<sub>2.5</sub> emissions for LGV for all Euro Classes





# Figure C29 CO2 emissions for Articulated HGV for all Euro Classes





Figure C30. CO2 emissions for Rigid HGV for all Euro Classes









# Appendix D Local Authority Officer Workshop Feedback





# Strengths

Three strong ports in the region

Good road and rail links into Grangemouth

Key rail infrastructure available for access

Access to North Sea and Europe

Queensferry Crossing has provided resilience

# **Opportunities**

Economic opportunity around Cockenzie which has a rail head and potential affordable housing under CRD

Electrification of the railway line between Alloa and Longannet – redevelopment of Longannet as major economic development site. However, this will also include passenger trains

Chance to improve direct links between West Lothian Distribution centres and Grangemouth doc

Factory to door, transit. Opportunity to link all modes to minimise carbon footprint, with electric bikes and walking building on freight business case.



## Weaknesses

Dominance of road freight

Most direct route to distribution centres on M8 corridor via poor quality A801. Alternative route increases road mileage and impact on climate

Clackmannanshire lacks alternative (road) routes i.e. two main east west roads – A907 and A91, therefore is vulnerable in case of emergencies such as accidents, flooding, closures etc. Bounded to north and south by Ochils and River Forth. Badly impacted during closure of Forth Road Bridge for example etc

Local roads in rural areas being badly damaged by freight especially timber. Ongoing maintenance is an issue.

New rail line to Leven may not be built to accommodate freight (no future proofing)

Tidal ports in Forth

Congestion in Stirling area has an impact on freight traffic trying to access motorway network to the west. Gartarry and Kilbagie Roundabouts to the east are congested in the peak periods.

Poor road resilience east coast. Single carriageway heading south.

## Threats

site	Capacity constraints on ECML. Potential SEtEC upgrade
s a	In previous discussions with road freight operators the lack of freight facilities can be an issue. There are very few parking areas with toilets and food in the area for trucks.
I	Competition from passenger rail services for track capacity limiting frail freight opportunities
cks vans	Site still safeguarded in LDP2 for future possible railway station in Grangemouth. Will impact on future available track capacity
	Brexit

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# **Opportunities**

Freight interchange to green the last mile has been discussed in the past, however successful ex are generally limited to similar freight generating uses on a small scale. Freight interchange is qu some hauliers.

Opportunity to link ports across Scotland through key rail infrastructure

New/revamped consolidation centres in "out of town/city" locations could reduce bulky freight

Main opportunity from Midlothian land use planning point of view would be to use Millerhill as fre

Pipeline from Grangemouth all the way to Aberdeen

Potential increased congestion post Covid as commuters reluctant to use public transport may

Shawfair and ELC Old Craighall settlement may impose constraints viz. sensitive receptors in pro-

Improved access to the port has been included in the Falkirk Council Investment Zone Growth d

Low/zero emission vehicles won't solve all freight issues but will help to reduce emissions/carbo

Opportunities may arise from the new Dalmeny link/EGIP studies that are about to restart with N

Alloa – Longannet – onward rail connection to Edinburgh via Fife possible, however Charleston C Dunfermline. Provides some resilience into the rail network e.g. recent closure of rail network at

Try to consolidate number of small LGV movements and to seek transition away from diesel – this general decarbonisation agenda than particular actions through this strategy

Half of former marshalling yard site in new non freight rail use, about a quarter used for waste processing, remainder could have new freight use



	Threats
xamples are few are far between. Those that are successful uite a complex issue, with some very niche requirements for	Limited transport corridors from East. A1, A199 and ECML only
movements in populated areas eight transhipment point – rail freight to road for final delivery	Impacts of climate events on freight a major concern. Recent landslips on both road and railway an example. Freight often blamed for some of the issues on the road network in snow events, however road haulage operators face financial penalties if late in delivering.
make rail/sea more attractive to freight operators	Increase in freight from Decom activity (Methil) Road system is already may not be capable of extra vehicle movements.
leal.	Competition from passenger rail services for track capacity limiting frail freight opportunitie
on etc	
letwork Rail.	
Chord would require to be constructed to avoid reversing at Falkirk/Polmont area.	
is may be tied up with the Scottish Governments more	

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# Appendix E Stakeholder Engagement List





Organisation	Name
Allan Rail Solutions	David Prescott
British International Freight	Len Hobbs
Association (BIFA)	
Campion Homes	Dougie Herd
CILT	Douglas Norris
CILT (Rail Freight Forum)	Julian Worth
Clackmannanshire	Lesley Deans
Diageo	Jill Chesnutt
East Lothian	Peter Forsyth, Andrew Stewart
Edinburgh	Greg McDougall
Falkirk Council	Colin Frame, Donald Campbell,
	Bernard Whittle, Kevin Collins,
	Laura McIntyre
Federation of Small Businesses	Garry Clark
Fife Council	Gordon Mole,
Fife Council	Dot Smith
Fife Council	Graeme ferguson
Fife Council	Altany Craik
Fife Council	Jane Findlay
Forth Ports	Stuart Holmes
Forth Ports	Alyson Good
Friends of Far North Line	lan Budd
FTA	Margaret Simpson
G&W	Richard Mannion
Highland Spring	Morwen Mands
Malcolm's Logistics	Ronnie McCrone
Malcolm's Logistics	Andrew Malcolm
Midlothian	Alan Heatley, Colin Davidson
Mineral Products Association	Robert McLevan
(MPA)	



Organisation	Name
Napier University	Eoin Plant-O'Toole
Network Rail	Richard Malloy
Network Rail	Cal Logan
Network Rail	Richard Malloy
NFU	Lyndsey Brown
Ocean Terminal	Centre Manager
Oxford Rail Strategies	John Holwell
Plymouth University	Stavros Karamperidis
Purvis Group	David Murray
Rail Freight Group (RFG)	Maggie Simpson/Mike Hogg
RHA	Martin Reid
Scotch Whisky Association	Karen Betts
Scotrail	Ewan Tait
Scottish Borders	Ian Aikman
Scottish Seafood Association	Jimmy Buchal
SDS	Elaine Ellis
Smith Anderson	Michael Longstaffe
Street Dock	Ian Richardson
Transport Scotland	Rose Tweedale
Transport Scotland	Fiona Hesling
Transport Scotland	David Kerr
Transport Scotland	Jim May
Victa Rail Freight	Neil Syme
VIVES University College	Michiel De Meyere
VIVES University College	Hanne Van den Berghe
West Lothian	Wendy McCorriston, Jim
	Henderson, Chris Nichol
Whyte & Mackay	Pierluigi Ratti
Zedify	Charlie Mulholland



# Appendix F Other Interventions





- Hydrogen trains (Zero emission Hydrogen trains have the potential to replace diesel power)
- New port on former Longannet power station site
- Improve direct links between West Lothian Distribution centres and Grangemouth docks
- Explore use of Pipelines Grangemouth-Aberdeen, Braefoot Bay pipeline to Mossmorran, taking deliveries from sea tankers
- A720/A68 junction.
- Half of former Marshalling yard site in new non freight rail use, about a quarter used for waste processing, remainder could have new freight use



- Road access upgraded as part of Millerhill energy from waste plant, but links to trunk road network poor. Potentially may be improved through upgraded junction at QMUC A1 junction, or new access route from

# Contact us

To discuss this study further, please contact:

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