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How Scotland's Transport Network Supports the Growth Sectors

Acknowledgements
Transport Scotland would like to thank all of the organisations and companies that participated in and supported this research. In particular Aecom who carried out the research and the four companies who took part in the case studies: Summer Harvest Oil, the Scottish Salmon Company, Diageo and Mackays.

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Executive Summary

The transport network in Scotland supports the functioning of over **360,000 businesses**. In Scotland, **45%** of these registered enterprises are part of one of the six Growth Sectors, identified in Scotland's Economic Strategy.

These are:

- Food and Drink (including agriculture & fisheries)
- Creative Industries (including digital)
- Sustainable Tourism
- Energy (including renewables)
- Financial and Business Services
- Life Sciences

The most recent Growth Sector statistics show the Food and Drink Sector contributed £5.3 billion in Gross Value Added (GVA) in 2014.

In the same year, Creative Industries and Sustainable Tourism each contributed £3.7 billion in GVA.

Energy contributed £17 billion to GVA in 2014.

Life Sciences' value to the economy is £1.2 billion in 2014. Figures are not available for Financial and Business Services.

Together, the Growth Sectors employed over 700,000 people in Scotland in 2015.

Transport Scotland commissioned research to investigate how the Growth Sectors use the transport network. This summary report presents the findings of 26 interviews with leading industry and transport organisations, and four in-depth company case studies from companies in the food and drink sector. This report is based on research undertaken by consultants Aecom.

Key Message

Of those interviewed, the view was that transport is **not the main issue** experienced by businesses in Scotland at the moment. Although, all respondents indicated that a strong, **resilient** transport network was **crucial for growth and attracting investment**, as well as promoting innovation.

Respondents acknowledged recent improvements to the transport network and highlighted pinch points on the network.

The four Case Studies provide on-the-ground evidence of how the transport network enables companies to carry out essential business: moving inputs and products between sites and to market, with all companies relying on a mix of modes. Companies spoke positively about the transport network which is seen as **flexible** and is instrumental in helping companies to **meet the needs** of their customers. The network has also **helped them to expand their business** into new locations. The case studies highlight the importance of the network to the rural economy.

Trunk Road Network

Overall, respondents thought that the coverage of the network was acceptable and recognised that there had been improvements made with a view that *'most of the major [improvements] have been, or are being, addressed'*.

The road network was felt to have a **positive impact on the economic viability of all businesses**. Key issues highlighted included: capacity, congestion, single carriageways, poor quality of local roads, and safety.

Rail Network

Those companies already using rail freight had found it **met their needs**. Challenges raised by respondents included: limited capacity and overcrowding on some passenger services from the Central Belt north (to Aberdeen and Inverness) and across the north of Scotland. Improved functioning of 3G/4G mobile connectivity would remove a barrier to train travel and improve competitiveness.

The main barrier to using rail freight was a **lack of knowledge** and therefore a lack of understanding to what the real barriers would be. Perceived challenges included: the distance to the railhead, infrastructure at terminals, capacity issues, gauging and reliability and cost when compared to road haulage. For passenger rail, issues included capacity and sensitivity to poor weather.

Aviation

Air travel can benefit businesses across Scotland by providing connections and access to wider markets, reduced transport costs, quicker deliveries and facilitate inward investment. For all sectors the view was that *'the more connectivity we have **the more international trade** will become an easy thing for businesses to do'*.

Perceived challenges included cost, particularly on internal flights and flights to the Islands. Also, it was felt that the frequency of flights was not appropriate for business travel, for example for trips across the UK respondents wanted to travel there and back in a day.

Water Transport

Ferries are considered a lifeline service providing access to essential services for island residents and are used to **access a wider market** for the exportation of goods. Oban Harbour and harbours in the Moray area were mentioned by those in the tourism sector as having had particular investment.

On occasion the ferry was felt to be unreliable due to the weather and mechanical failures. **Limited capacity** was perceived as a problem for the Tourist Industry and the Food and Drink sectors. The 'last [road] mile' to ports and harbours was thought to be particularly problematic by some as the roads were not wide enough to cope with heavy freight.

Case Studies

The Food and Drink sector provides a substantial and growing contribution to the Scottish economy and companies in this sector heavily rely on transport to move goods to market. All these companies are either based in or have sites in **rural communities**. Many use the transport network on a **daily basis**. Therefore, four Food and Drinks companies were chosen to participate in depth interviews and provide one example end-to-end journey of one of their products.

Follow the Farm Produce – Summer Harvest Oils

One of a small number of producers of cold-pressed rapeseed oil in Scotland, Summer Harvest Oils was established in 2008. Located on Ferneyfold Farm, near Crieff in Perthshire, Summer Harvest grow the oilseed rape, press the seeds and bottle the oil on site.

Key supplies are brought in by **road** and they use wholesale distribution companies to take orders from the majority of their retail customers and use hauliers or their own van to transport products to the food service industry. An export and consolidation firm **ship** goods out to the overseas market. **Rail freight** would be considered if there was a convenient terminal or siding close by.

The end-to-end journey involved two legs, both on the road network from Perthshire, to Edinburgh and then to St Andrews.

Key points raised in study:

- Disruption to transport network can add to journey times e.g. closure of **Forth Road Bridge**.
- Joining the **dual carriageway** between Stirling and Perth from smaller farm roads can be difficult.
- **A9** dualling welcomed and described as essential; currently, unlit areas of A9 make it difficult to see passing places.
- Work to improve **M8** has made drive to Glasgow better.
- The **Forth Replacement Crossing** is welcomed, particularly the opportunity to factor in the requirements of high-sided vehicles.
- All necessary links are there to enable Summer Harvest to meet needs of customers.

Follow the Fish – The Scottish Salmon Company

Salmon is the number one food export for Scotland and the UK. The Scottish Salmon Company (SSC) operates across the West coast of Scotland and the Hebrides, with sites ranging from the shores of West Loch Roag on Lewis to Lamlash Bay on the Isle of Arran.

Due to the loch-based location of the sites, **sea** and **road** are used for internal journeys. To get products to markets, **road** and **air transport** are used.

There are five legs in the end-to-end journey: beginning at the hatchery in North Uist onward to a distribution centre in Larkhall, before being sent to wholesalers, buyers and consumers in the UK and overseas.

Key points raised in study:

- A key factor which can affect the method of transport used by SSC is the **weather**, this can also cause delays.
- Logistics is a key part of the operations both in rearing the fish and delivery of short shelf life perishable product from remote areas of Scotland.
- Improvements to infrastructure are welcomed as freshness is a key feature and delivery is of paramount importance to ensure optimum customer service.

Follow the Whisky – Diageo

Existing in its current form since 1997, Diageo is one of the largest international companies in the beverage alcohol trade, producing a wide variety of brands in over 200 sites, across more than 30 countries. Diageo's business in Scotland encompasses a large number of sites across the country.

The various stages of Diageo's whisky production operation necessitate the movement of the product between different sites and the use of vehicles with specific features and capabilities including **road tipper trucks** and **road tankers**. Whilst movements during the production process and within Scotland are predominantly undertaken by road, **rail freight** services are used to transfer finished goods to English ports and **sea transport** is the main means of moving whisky and other spirits produced to international destinations.

Seven legs are detailed in the end-to-end journey log starting at Burghead, Moray before moving on to Speyside, Auchroisk and Dufftown. Mature part blend spirit is then taken to Leven and, once bottled, to Grangemouth and onwards to a distribution centre in Crick, England.

Key points raised in study:

- On occasion, the **ferry service** between Islay and the mainland can be unreliable; due to bad weather, repairs, competition with tourist traffic.
- Road closures: **A83** at the Rest and Be Thankful pass and the **A95**.
- **Accessibility and connectivity** issues between road and rail.
- **A9** *'isn't a big problem for us...we have contingency plans'*. Dualling work welcomed: increasing capacity and making the road faster and safer.
- **Forth Replacement Crossing** was seen as beneficial in terms of reliability for the transport of finished goods by HGVs.
- Improvement works at **M80** improved traffic flow.
- Other improvements are beneficial: **M8, M74 extension, M74/M73/M8 junction**.

The Shipping Manager spoke positively about the present transport network within Scotland and the benefits to Diageo regarding movement of goods and supporting the business.

Follow the Fruit Preserves – Mackays

Marmalades, preserves and curds company, Mackays, is located in Arbroath and was founded in 1938. Since its acquisition by the Grant family in 1995, Mackays developed quickly from a relatively small firm supplying jam for United Biscuits' Jammie Dodgers into a leading brand in the UK preserves industry.

The vast majority of transport used by Mackays within Scotland is on the **road** with a sizeable proportion of Mackays finished goods **shipped** overseas.

Key points raised in study:

- Delivery of goods from England – morning deliveries cannot be guaranteed.
- **Weather:** lack of snow clearance, ships unable to sail and bring in supplies.
- **Proximity** on the road network of Arbroath to Aberdeen and Dundee is advantageous.
- Reliable and efficient transport network makes possible **access to export market**.
- Road improvement projects e.g. **Forth Replacement Crossing, M8** and **M74** will help traffic to flow more efficiently, ensuring that deliveries arrive without delay.

Introduction

Transport Scotland set out to investigate how the transport network supported the Growth Sectors in Scotland. This report presents how businesses use the transport network, what is working well for them and any challenges they are facing.

Scotland's Economic Strategy identifies **six Growth Sectors** where Scotland has a distinct comparative advantage:

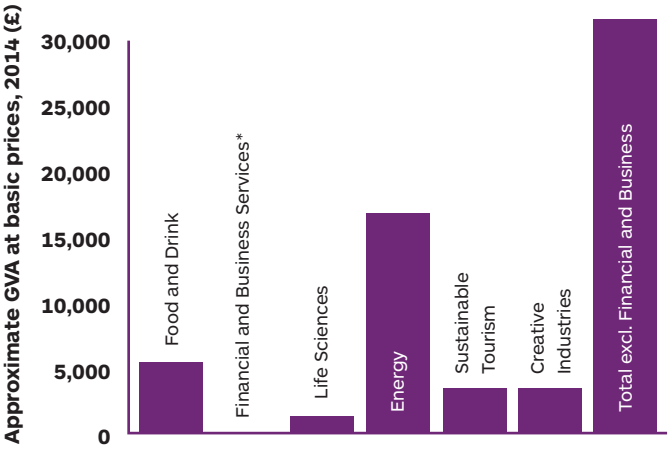
- Food & Drink (including agriculture & fisheries)
- Creative Industries (including digital)
- Sustainable Tourism
- Energy (including renewables)
- Financial & Business Services
- Life Sciences

Employing over **700,000** people across Scotland, these Growth Sectors contribute approximately **£31 billion in 2014** to the Scottish economy (excluding the financial and businesses sector). **45%** of the 360,000 registered enterprises in Scotland in 2015, formed part of the six Growth Sectors. Statistics, including GVA and employment figures, can be found on the Growth Sector Statistics Database.

All six sectors heavily rely on the transport network for attracting and retaining employees and clients, importing raw materials and transporting goods to market. Transport Scotland recognises its vital role in supporting these sectors and by contributing to the achievement of the High Level Objective to:

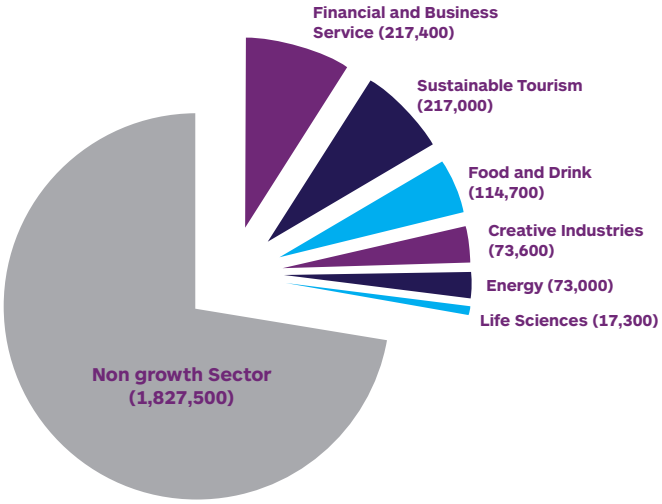
'Promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency' (National Transport Strategy, 2016).

Figure 1 below shows the Gross Value Added (£m) of 5 of the 6 sectors. Figures for Financial and Business Services were not available.



* Data unavailable

Figure 2 below shows the most recent employment figures in the Growth Sectors (2015):



The origin of the research was around the Trunk Road Network but interest extended to cover all modes, particularly including opportunities for rail freight.

Aim

The aim was to gather evidence on three key questions:

1. How are the Growth Sectors using the transport network?
2. What are the benefits of the transport network to the Growth Sectors?
3. What are the challenges faced by the Growth Sectors when using the transport network?

Method

Owing to the scale of the sectors involved, a qualitative approach was taken. The research began with six interviews with Scottish Enterprise and Highlands and Islands Enterprise, before interviewing 20 key industry and transport organisations.

To gather 'on-the-ground' information, four Case Studies were undertaken with businesses in the Food and Drink sector, as this sector uses the network heavily to transport goods.

This summary report presents evidence by mode – road, rail, aviation and water (ferries and port and harbours) – followed by the four Food and Drink Case Studies.

The findings presented here are taken from research undertaken by Aecom.

Statistics have been taken from Scottish Transport Statistics 2015 publication, unless otherwise stated.

Key Themes

This chapter presents the key themes emerging from the 26 interviews with industry and business organisations; and the four Food and Drink case studies.

Findings from Interviews

Although not the main issue experienced by businesses in Scotland at the moment, it was stated across the board that a strong and resilient transport network is **crucial for promoting growth**. The network is crucial for:

- the movement of goods;
- recruitment and retention of staff;
- business travel;
- attracting investment; and
- encouraging Innovation.

*'A strong transport infrastructure is **critical for the competitiveness of Scotland** going forward and we have to keep improving it for all of our sectors.' (Food and Drink Organisation)*

Businesses in Scotland recognised there had recently been several improvements made to the transport network such as the planned dualling of the A9, the Forth Replacement Crossing, the Borders Railway and the works on the Aberdeen bypass. These were all welcomed.

However, there was some critical perceived **pinch points** mentioned (shown in Figure 3) such as parts of the A9 and A96 which were considered to have road safety issues. Also, the A83 was said to be frequently closed owing to land slips and roads in the Central Belt (M8/M74/M77) suffer severe congestion.

In terms of rail, passenger services travelling north of the Central Belt and across the north of Scotland (Aberdeen to Inverness and Dundee) could be enhanced to better meet the needs of business.

Ferries not only offer lifeline services but also play a crucial role for businesses; however the perception is that capacity can be an issue on some services and a lack of resilience to weather presents challenges to businesses.

Ports and harbours and aviation offer connectivity to the global markets and it is essential that efficient road and rail links to them are created and maintained. Many respondents recognised the need for strong links to key hubs to enable efficient movement of goods in and out of Scotland.

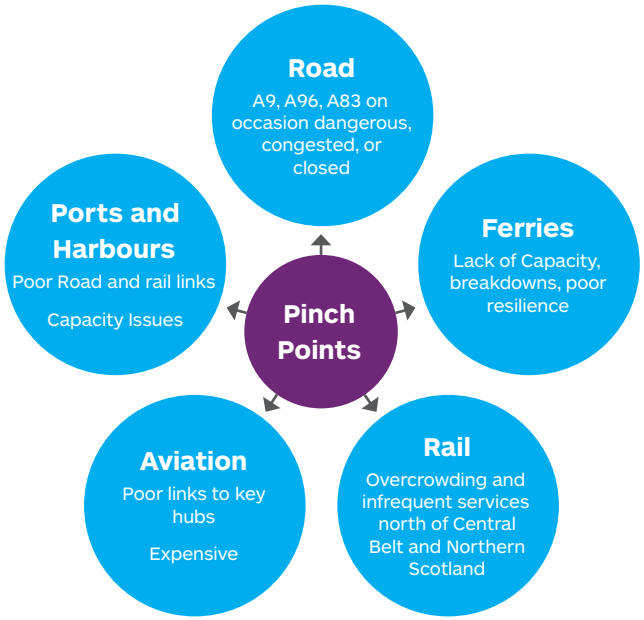


Figure 3: Perceived pinch points on the transport network

Findings from Case Studies

All participating companies spoke positively about the transport network and there is the general view that 'nowhere in Scotland is inaccessible'. The network is seen as flexible and is instrumental in helping companies to meet the needs of their customers. All these companies are either based in or have sites in **rural communities**. Many use the transport network on a **daily basis**. The network has also helped them to expand their business into new locations.

Influences on transport mode choices and use of the transport network in Scotland are:

- cost-effectiveness;
- access to the necessary experience, expertise and vehicles with specific attributes;
- the nature of the load/product and associated risks;
- flexibility and convenience; and
- the nature, locations and accessibility of sites.

Overwhelmingly, the most challenging factor is the weather which can affect the **resilience** of all modes of transport and, in particular, the road network and sea transport. The consequent delays can cause problems, particularly when the transport of raw materials or products is of a time critical nature.

Road closures are a challenge due to their impact on journey time and road miles travelled.

Improving the connectivity between road and rail would be beneficial, especially if there is a desire to encourage greater use of rail freight.

Trunk Road Network

3,570
Kilometres of trunk road

17.1 billion
Vehicle kilometres in 2014

38%
Share of all vehicle kilometres on the trunk road network

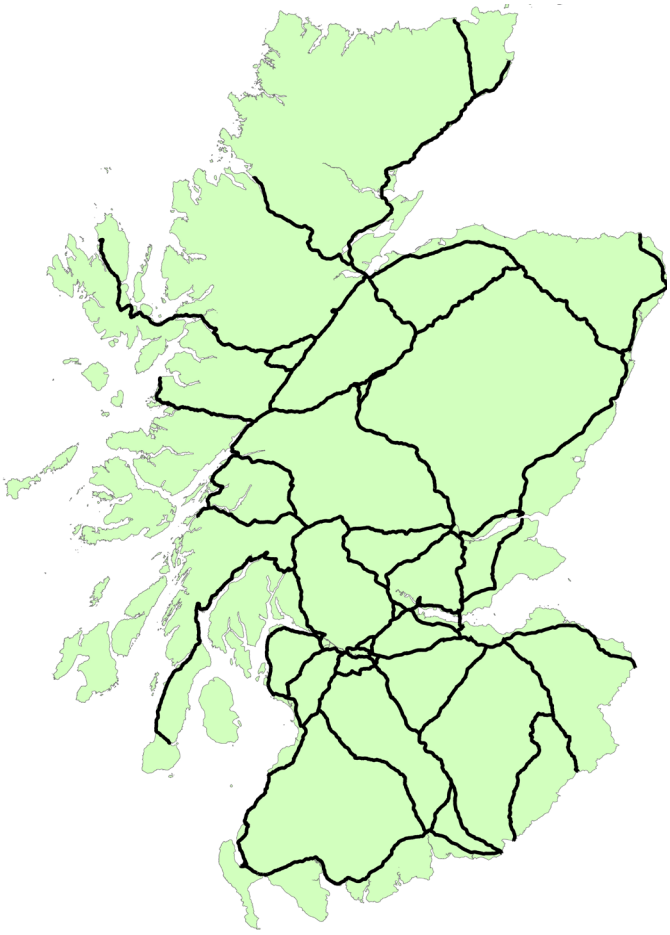
Introduction

Transport Scotland is responsible for the trunk road and motorway network in Scotland. Since 2007, the Scottish Government has invested over £6.5 billion to ensure the strategic road network is safe, available for use, efficient, well maintained and allows effective movement of people, goods and services around and to and from Scotland.

The current road investment programme is the largest that Scotland has ever seen, including the £1.35 billion **Forth Replacement Crossing** project, the **dualling of the A9** between Perth and Inverness by 2025 (approx. £3 billion), the **dualling of the A96** between Inverness and Aberdeen by 2030 (approx. £3 billion), the £745 million **Aberdeen Western Peripheral Route** project (scheduled to open to traffic in winter 2017) and the £500 million **M8 M73 M74 Motorway Improvements Project** (scheduled to open to traffic in spring 2017). Over £250 million is spent annually in the maintenance and safe operation of the trunk road network.

Further information about road and bridge projects, trunk road maintenance, policy development and planning and road safety in Scotland is available on the Transport Scotland website.

This chapter presents a summary of the responses from the interviews with business and industry organisations concerning the trunk road network.



Perceived Benefits

A strong trunk road network can benefit businesses by supporting efficient and reliable freight movements and creating a link between markets and suppliers. Businesses can also be connected to a wider labour market and a strong road link makes an area more attractive for investment.

Overall, respondents thought that the coverage of the network was acceptable and as good as it could be given the geography of Scotland.

Viewpoint: Trunk Road Network

*'I think it's generally quite good, it's **improved significantly** over the last twenty years and there are a number of current major improvements happening at the moment. ... I think there are always concerns about certain roads and certain **pinch points**... I think there are always improvements you would want to see on the road network, but I think **most of the major [improvements] have been, or are being, addressed.**'*
(Business Organisation)

Most respondents recognised there had already been improvements made to the A1, A9 and A96 and in general the Scottish Government's commitment to dualling between all cities by 2030 was very well received. However, most respondents wanted to see an acceleration of the process to bring forward the proposed completion date.

The section of the A9 with speed cameras and associated change in speed limit from 40mph to 50mph for HGVs was thought to have had a positive effect on safety as well as journey time reliability.

Other improvements recognised by respondents were changes to the M80 and the construction of the Queensferry Crossing.

Viewpoint: Queensferry Crossing

*'The Queensferry Crossing should deliver additional capacity and I think importantly a **more reliable capacity**, because it's got a hard shoulder, unlike the existing bridge, it's going to be wind shielded, unlike the existing bridge, so areas like that should make it a bit more resilient in terms of the bad weather and accidents.'*
(Business Organisation)

Respondents recognised that investment in the road network does, and would in the future, encourage wider investment in the areas where improvements had been made.

Perceived Challenges

Although many respondents thought there had been improvements to the road network and that it generally met their needs there were a number of key issues highlighted by respondents:

- Capacity
- Congestion
- Type of road
- Resilience of road surface
- Condition of road surface
- Safety
- Severe weather
- Local roads

The road network was felt to have an impact on the economic viability on all businesses. The implications for three Growth Sectors are highlighted below.

Impact on: Food and Drink

Production in the Food and Drink sector is impacted by the road network at several key points of the process. Delays in receipt of delivery of raw materials can cause production/processes to slow or even cease altogether, and delays to the despatch of products to end user markets have obvious cost implications.

Additionally, a delay to the distribution of perishable goods, such as shellfish, reduces the amount of time that they are viable for sale. Again, this results in clear financial implication for producers.

*'**Delays add to the cost:** there's an increased transport cost that has to be built into the product costing, but there's two ways you can look on it, a lot of the produce that Scotland produces is premium produce, so that's I suppose an easier cost to subsume into your product costing, but at the same time you still want **to be able to compete** against your competitors who maybe aren't having to go through some of the same logistical barriers.' (Food and Drink Organisation)*

*'...in some cases **penalty clauses** come in and if you're thinking about if you're transferring shellfish or something like that that have a very short lifespan or usage, delays cause a real problem.' (Transport Organisation)*

Impact on: Sustainable Tourism

It was reported that tourists are being deterred by the perception that accessing the north east of Scotland and the west by road is difficult.

*'It obviously impacts on potential visitors choosing not to go, **causes frustrations**, the whole tourism strategy ambition is to deliver, for Scotland to be recognised as a destination as first choice for a high quality memorable experience and the memorable bit, we would rather it be a good memorable than something that's pretty sort of poor when it comes to experience of rough travel, **lack of provision of services** in certain key areas on some of the roads and **general maintenance shortfall**.' (Tourism Organisation)*

*'I think in terms of tourism anywhere, accessibility is a key ingredient to a visitor's stay and I think when we promote Scotland, whether that's domestically or internationally it tends to be the destination and the themes of the destination that we would promote, but **the next question that a visitor would always ask is how do I get there** and that can often be the green light for go or I can't actually get there because there'd be limited opportunities for **access** or whatever.' (Tourism Organisaton)*

Impact on: Energy

The impact of the road network on the Energy Sector is significant. Moving large oversized goods is essential to this sector, and delays due to inefficiencies in the transport infrastructure add to the cost of producing energy which the industry is desperately trying to reduce.

*'Being able to transport hardware and equipment from fabrication bases to their kind of departure points is important, so we've harbours in Aberdeen, Peterhead, Cromarty, Firth, Edinburgh and so **being able to access those harbours is important**, but then there are a lot of people involved in oil and gas, not all of them live in Aberdeen and Aberdeenshire, but a lot of them will need to get to Aberdeen and Aberdeenshire and Inverness, so connectivity between them is important.' (Energy Organisaton)*

Rail

£670 million
Estimated Gross Value Added to the Scottish economy by the rail industry and its supply chain

93 million
ScotRail passenger journeys in 2014/15 (45% increase since 2004/05)

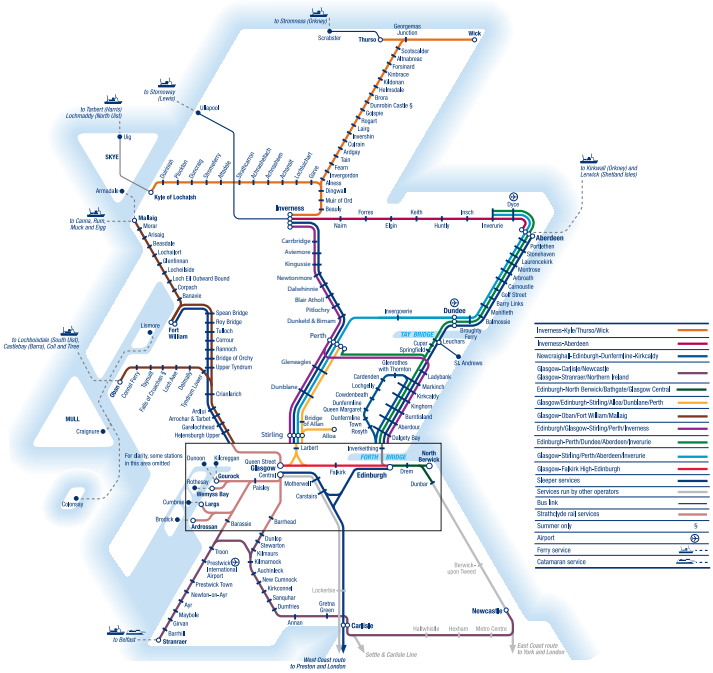
£64 million
Estimated value of benefits from sharing knowledge and technology due to firms locating in clusters near rail links

Introduction

There is **2,763** kilometres of rail network in Scotland, with **351** stations as reported in Scottish Transport Statistics.

Scotland's railways are a mixed traffic network, supporting the operation of passenger services (over **2,270 train** services each day, delivering over **90 million journeys** each year) and freight services. The Scottish Government has invested over £7 billion in rail since 2007, delivering new and improved infrastructure and services to better connect communities, integrate journeys, and support sustainable economic growth across Scotland. This investment has supported new lines, new services, new stations, new electrified routes, additional gauge clearance, and other enhancements which have improved the effective operation of passenger and rail freight services.

Demand for passenger rail travel in Scotland continues to increase. To support this, the current £5 billion investment programme in infrastructure and services to 2019 includes the **Edinburgh to Glasgow Improvement Programme (EGIP), Highland Main Line Phase 2, Aberdeen to Inverness Phase 1**, and a wider rolling programme of network electrification. Within the current investment programme a £30 million Scottish Strategic Rail Freight Investment Fund – administered by the industry through the Scotland Freight Joint Board – has been made available for specific enhancements projects.



In recognition of the importance of rail freight to the economy and following an extensive consultation process the Scottish Government published *Delivering the Goods*, Scotland's rail freight strategy in March 2016. The strategy recognised some of the issues detailed in this research report and it set out a series of actions under the levers of innovation, facilitation, promotion and investment to realise our vision for rail freight – 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.

Further information about rail freight, passenger rail, rail policy and strategy, and current rail projects is available on the Transport Scotland website.

This chapter presents a summary of the responses from the interviews with business and industry organisations concerning the rail network.

Perceived Benefits

Freight

With lower CO_2 emissions than alternative modes, rail freight provides a green alternative and is most competitive for distances over 300 miles. The use of rail freight could also bring savings through reduced road congestion. Those companies already using rail freight had found it met their needs.

Passenger

A few respondents recognised that there were currently changes underway to the rail network such as improvements to stations. It was also recognised that the Glasgow to Edinburgh line was well served and that these links had been and were being improved. Other benefits of travelling by train included: productivity through being able to use travel time to do work, and also a good level of route coverage.

Perceived Challenges

Freight

The biggest barrier for most respondents was a **lack of knowledge**; most knew very little about rail freight as an option and therefore did not actually know what the 'real barriers' would be. The main barrier mentioned by those whose knowledge of rail freight was limited was **the distance to the railhead**. It was felt that the arduous process of using road to get to the railhead, then loading the train before another transfer back to road meant it was easier and cheaper to use road alone.

Other barriers to using rail freight include **infrastructure**: for example the cranes used at rail heads were reported as old and not efficient enough. Rail freight was considered to be slow because of scheduling issues between freight and passenger rail leading to **capacity** issues.

Viewpoint: Capacity

*'I think we would certainly like to see rail freight extended more and just a kind of common aspiration to support the **modal shift** away from road onto rail, but there are clearly **capacity issues** there as well that are not easily overcome.' (Business Organisation)*

Gauging, the spacing of rails on a railway track, was mentioned as a problem when transporting goods to Europe but also along the East and West Coast mainlines.

Viewpoint: Gauging

*'So we have a situation where a trucker who wants to move a 9' 6" container around Scotland and trunk roads, he basically tells his driver to get in his vehicle and get up the road, whereas with rail there's an **enormously complex matrix of combinations of loading gauge clearance**, container height and width, wagon height etc., which determines whether or not a particular type of container can go on a particular route.' (Transport Organisation)*

Reliability is an issue as business organisations reported freight companies do not guarantee loads will be taken if there is no demand for a return leg. This is because the trip becomes unprofitable for the freight provider. This is not an acceptable risk for most businesses to take.

Compared to road, freight rail is also particularly **inflexible** and restricted in terms of its scheduling. Respondents also found that rail freight is not currently competitive on cost compared with road haulage.

Viewpoint: Cost

'If rail really has ambitions to take more freight and to win more freight from the road ... it's got to do that ***by becoming more efficient and competitive with road****.' (Transport Organisation)*

Additional issues arise when rail tankers do not fit loading bays, rail links to ports and harbours are limited and road access to rail freight terminals requires travelling on local roads.

Passenger

A number of barriers were raised by respondents: limited **capacity** and **overcrowding** on some services from the Central Belt north (to Aberdeen and Inverness) and across the north of Scotland. Services from the Central Belt north were thought to be **unreliable** and particularly sensitive to poor weather. Improved functioning of 3G/4G mobile **connectivity** would remove a barrier to train travel and improve competitiveness.

Other main challenges include: cost of train being higher than driving, ageing rolling stock makes travelling unattractive for tourists and business travel, and the speed or services between the Central Belt and Aberdeen and Inverness.

Suggested Improvements

It was perceived that improvements to rail infrastructure are happening more slowly than improvements to the Scottish road network and this was causing frustration for those who were directly affected. Suggested improvements include:

- direct freight services through the channel tunnel
- double tracks and longer loops to increase capacity especially for rail freight
- gauging enhancements
- fast non-stop service between Edinburgh and Glasgow
- improved Wi-Fi connectivity
- greater resilience to the weather
- double tracking
- integrated ticketing

'If you had really good rail networks and fast ones to Inverness and Aberdeen and Dundee [from the Central Belt], I have no doubt that would open up opportunities for businesses, not just ones in Scotland but internationally.' (Creative Industries)

Aviation

96%
Share of total journeys at 5 airports: Glasgow, Edinburgh, Aberdeen International and Glasgow Prestwick and Inverness

25.5 million
Air terminal passengers from Scottish airports in 2015

52 thousand
Tonnes of air freight carried at Scottish airports in 2015

Introduction

Scotland has five main airports and over 20 local airports.

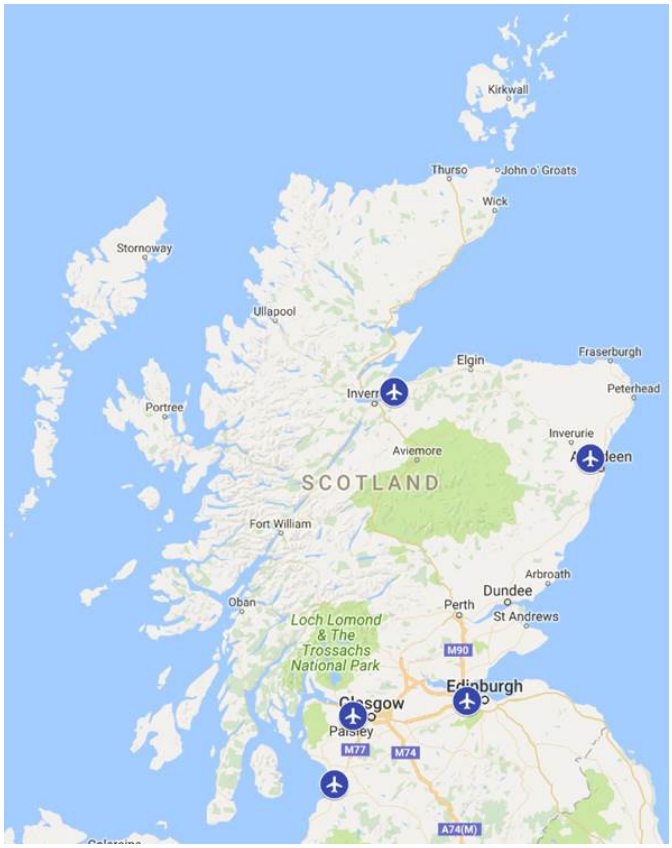
Increasing the number of direct flights from Scotland to international destinations is one of Transport Scotland's key objectives.

Transport Scotland is keen to support Scotland's airports **in expanding the number of destinations** they offer and recent successes include new services from Edinburgh to New York, Glasgow to Toronto, and Aberdeen to Reykjavik. Inverness has also seen new links to both Amsterdam and London Heathrow recently launched.

Transport Scotland also remains committed to **supporting air services to our remote communities** and are investing over £35 million per year through the subsidy of Highlands and Islands Airports Limited, the Air Discount Scheme and the supported air services.

Further information about air route development, aviation and the environment, lifeline air services and Scotland's airports is available on the Transport Scotland website.

This chapter presents a summary of the responses from the interviews with business and industry organisations concerning aviation.



Map data ©2017 GeoBasis-DE/BKG (©2009), Google.

Perceived Benefits

Respondents mainly used air travel for business trips. All respondents said good air links within the UK and abroad were crucial for any growth in all sectors. All respondents mentioned the importance of direct links and the need for good connectivity.

Air travel benefits businesses across Scotland by providing connections and access to wider markets; by reducing transport costs, allowing for quicker deliveries and facilitating inward investment.

All sectors were mainly using air travel for business trips to either sell their products overseas and/or attracting investors to Scotland. The Food and Drink sector and Life Sciences also used air to transport freight.

Several respondents felt cheap flights to London had given greater access to finance and other businesses etc.

Viewpoint: Flights to London

*'One of the things that have **transformed the industry** is cheap flights to go down to London.' (Creative Industries)*

Perceived Challenges

These include **cost** as some flights were thought to be prohibitively expensive, particularly internal flights and flights to the Islands.

Viewpoint: Cost

'I do think that the air service in the Highlands area is pretty good for getting to the Islands, quite a regular service, it doesn't seem to be affected too much by weather and it seems very well used. Sometimes I think though it's maybe a bit overpriced as you'd actually go on a package holiday for what we've paid for flights up there but it's a good service and I know okay, it's remote, but the plane's never empty.' (Energy Organisation)

It was felt that the **frequency** of flights was not appropriate for business travel, for example for trips across the UK respondents wanted to travel there and back in a day. Many destinations did not have daily flights and so extended the amount of time a person had to be away.

Lack of rail links to Edinburgh/Glasgow airports or Aberdeen airport was thought to contribute to general access issues. This was also thought to give a bad impression to overseas investors and tourists visiting Scotland.

Impact on Growth Sectors:

Sustainable Tourism: General connectivity to/from European hubs including Heathrow were thought to be vital for the tourism industry. Ease of getting to and from the airport was also thought to be crucial to attracting tourists.

Energy: Good connectivity to Central Hubs such as Heathrow and direct links from Aberdeen to Norway and to other key destinations is crucial to the energy industry in terms of the recruitment and retention of staff, getting staff to and from work and attracting investment.

Financial: Quick links to London were considered to be essential for overall competiveness.

'I think there's two aspects to that, one is it just makes it harder to do business if you've got to go through another airport and probably maybe you'll lose a day, depending on where you're going.' (Finance Organisation)

Life Sciences: The general cost of air travel was an issue for those in this industry.

Impact on all sectors:

*'Well, international trade has got huge potential in Scotland, you know, we're a bit short in terms of the number of businesses who are trading internationally at the moment, we can do better in that regard and the more connectivity we have **the more international trade will become an easy thing for businesses to do**, particularly for smaller businesses to get involved in, so we need to build up those links. The better our international links, the easier it will be for smaller businesses to be able to break into new markets and that's absolutely a priority for us, so our airport development and development of services and routes is going to be absolutely key to us with international trade.' (Business Organisation)*

Water Transport

7.9 million
Number of passengers carried on ferry routes in Scotland in 2014. **2.6 million** vehicles carried

71 million
Tonnes of freight handled by ports in Scotland in 2014

25%
Share of total freight tonnage, including exports, transported by water (45 million tonnes)

Introduction

Scottish Ministers are clear about the significant contribution lifeline ferry services make to the social, cultural and economic wellbeing of Scotland's islands. Over £1 billion has been invested in these ferry services since 2007. Road Equivalent Tariff fares were fully implemented on all Clyde and Hebrides Ferry Services routes in October 2015 and Transport Scotland is currently conducting a comprehensive review of ferry freight fares across Scotland's entire ferry network.

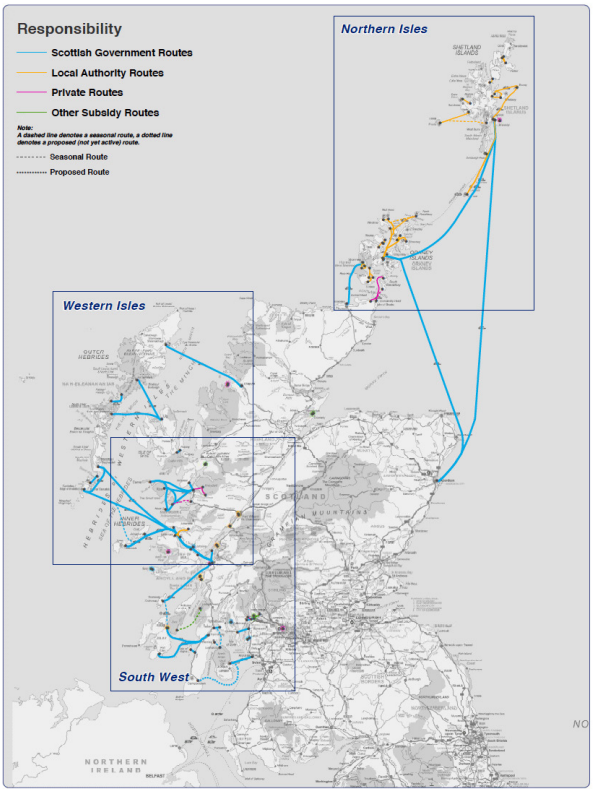
Transport Scotland is currently considering how ferry fares to the Northern Isles can be reduced, in order to meet a key manifesto commitment. Ministers have also established a Strategic Islands Transport Forum to consider strategic transport issues affecting the Islands.

Ports and harbours add to the local, regional and national Scottish Economy. They not only provide a base for trade and employment but also connect communities. They operate in a commercial environment and the market driven approach taken for ports policy is one that is welcomed by the industry. This is demonstrated by proposals being brought forward such as the Aberdeen Harbour Expansion project.

In May 2015 the Oxford Economics Study published an update report which flagged that in 2013 the maritime sector in Scotland generated an estimated **£1.8 billion** in value added to the economy with ports supporting over **24,000 direct jobs**.

More information about the Scottish Ferries Plan, Road Equivalent Tariff, the Freight Fares Review and other ferries related issues can be found on the Transport Scotland website.

This chapter presents the findings concerning water transport and the Growth Sectors from the interviews.



Scottish Ferry Routes
National Overview

Perceived Benefits

For people living on Scotland's islands, ferries are considered a lifeline service providing residents with an access to services, to education, to employment and to leisure.

For businesses, ferries are used to access a wider market for the exportation of goods, some of which are time sensitive or vital imports, such as supermarket goods.

For tourists arriving by sea, Oban Harbour and harbours in the Moray area were mentioned by those in the tourism sector as having had particular investment and it was felt that giving a good impression to tourists arriving by sea was important.

Recent examples: Water Transport

- The introduction of reduced ferry fares was mentioned by some respondents and was thought to have **increased both the popularity and usage** of the Clyde and Hebrides ferry service.
- It was also recognised that a **new vessel** had been introduced to Stornoway which reflected the increasing demand for services.
- In the energy industry, sea transport was considered **more efficient** than other modes. Recent examples were given of the movement of turbine equipment and pipes being moved through Wick Harbour.

Perceived Challenges

Ferries

The ferry service was felt to be unreliable sometimes owing to two main factors; **the weather and mechanical failure**.

Limited capacity was perceived as a problem for the Tourist Industry and the Food and Drink sector with both seeing each other as the issue, with both freight and tourist traffic travelling on the same ferries.

Viewpoint: Capacity

It was reported by the tourist respondents that businesses in the Food and Drink sector often block booked space for commercial vehicles on the ferries and this prevented tourists from booking. However, they felt the space booked for freight was not always used. It was felt sometimes tourists were not booking accommodation on the islands because they could not book a ferry and this was having a negative effect on tourism and businesses based on the islands.

*'One of the biggest issues at the moment with the ferry bookings is the **live booking platforms**, so a haulage company rebooks, they block out space and then they don't turn up.' (Tourism)*

However, Food and Drink representatives felt that freight wasn't always allowed on the ferries due to tourists taking up the space. It was felt this was going to become a bigger issue in the future.

'If the industry grows it's going to put more pressure on the ferry service. Tourism on the islands is growing, so what we're seeing is real pressures put on the industry **to get both raw materials onto the island and products off it** as well, so the ferry issue is very sensitive, certainly the Islay ferry where we've got this sort of clustering... Sometimes freight transport gets taken off if there's **a demand for passenger transport**. Sometimes if one of the ferries on that route is needed to go on another route, because of **a breakdown elsewhere**, then you can lose capacity as well.' (Food and Drink)

It was felt the **timetabling** of some ferry services could be better suited to meet the needs of tourists, such as more services on accommodation changeover days. Those using the ferries for freight also mentioned an issue with the timings and the clash with driver hours.

Ports and Harbours

The 'last mile' was thought to be particularly problematic by some as the **roads** were not wide enough to cope with heavy freight and some were residential. The A801 towards Grangemouth was mentioned in particular.

There was felt to be a **limit to how far goods can travel** beyond Scottish ports and therefore better road links to ports in England such as Southampton and Felixstowe were needed to enable them to transport goods further afield.

Wick was thought to be suffering a **capacity** issue due to the volume of shipments transiting there at the moment. Invergordon (Cromarty Firth) was also thought to be suffering due to oil rigs needed to use the port, thus blocking ships entering it. Grangemouth was also raised as having, and likely to have, capacity issues in the future owing to the increasing size in vessels.

Impact on Growth Sectors

Food and Drink: It was felt businesses had adapted around existing ferry network. However, **unforeseen cancellations** meant that it is sometimes not possible to move goods on and off the Islands resulting in manufacturing delays and delays in getting to market.

Ports and harbours are currently meeting the needs of the Food and Drink industry however, in the future, issues such as limited capacity and poor efficiency could negatively affect this industry. To enable growth in this sector, stronger connections to key hubs in the UK and Europe would allow timely export of product to a global market.

Tourism: Local economies on the Islands tend to comprise of small enterprises, therefore if tourists cannot visit them the financial implications tend to be significant.

Energy: Getting staff to and from work via ferry was crucial.

*'The Aberdeen to Orkney/Shetland ferry services are **really critical**, a really important part of the overall infrastructure within the North East.' (Energy Organsation)*

Getting large oversized material into Scotland through ports and harbours is crucial for the sector. **Delays** have cost implications for the Energy Industry in terms of loss of productivity. For the renewables sector, not having the **infrastructure** in place to be able to receive and move large oversized material could prevent investment and therefore future developments in this area.

Introduction to Case Studies

Follow the Food and Drink

Why the Food and Drink Sector?

Recent statistics illustrate that the sector provides a substantial and growing contribution to the Scottish economy. Considering the entire **supply chain** including agriculture, aquaculture and fishing through to manufacturing, the sector:

- has a turnover of **£14.4 billion** in 2015;
- provides **114,700 jobs** in 2015;
- represents gross value added (GVA) of **£5.3 billion** in 2015;
- **25% increase** in turnover between 2008 and 2015, most of which is from food manufacturing;
- contributed **£9.8 billion** in total exports in 2014; and
- fish and seafood made up the biggest proportion of food exports, with international sales reaching **£613 million**, up by 6.6% on the previous year.

The latest facts and statistics produced by the Scottish Food and Drink Federation show that:

- **19%** of all Scottish manufacturing jobs are in food and drink manufacturing;
- food and drink manufacturing accounts for **18.5%** of total manufacturing turnover in Scotland (compared to 16% in the UK as a whole); and
- **97%** of businesses in the sector are micro to medium-sized.

Methodology

Four companies were selected through consultation with Food and Drink policy colleagues and Food and Drink industry organisations.

The Case Studies are as follows:

Case Study 1: Summer Harvest Oils

Follow the Farm Produce

Case Study 2: The Scottish Salmon Company

Follow the Fish

Case Study 3: Diageo

Follow the Whisky

Case Study 4: Mackays

Follow the Fruit Preserves.

The case study research was carried out by way of site visits and interviews by Aecom.

The following information was gathered:

- General information about the firm, including how the company uses transport.
- Views of how the transport network has and will enable growth of the company.
- Several of the businesses provided detailed information about a typical end to end journey; detailing the transport and movement of a specific commodity produced by the company.
- Benefits, opportunities and challenges that the company faces using the transport network.

Case Study 1: Summer Harvest Oils

Follow the Farm Produce

Background and Introduction

When considering the total planted area, oilseed rape, with wheat and barley, is one of the three most popular crops grown in the UK. Figures for the harvest in Scotland show a substantial increase in recent years, from 106 thousand tonnes in 2012 to 148 thousand tonnes in both 2014 and 2015 (+39.6%).

In common with the rest of the UK, the vast majority of oilseed rape grown in Scotland is exported for the manufacture of biofuel. However, a small but increasing proportion is used in the production of edible rapeseed oil. Recent research conducted by Kantar Worldpanel indicates that an increasing number of UK consumers are swapping olive oil for cold pressed rapeseed oil, equating to a £430,000 switch in spend. Sales of rapeseed oil rose by more than 24% in the 12 months to March 2015.

One of a small number of producers of cold-pressed rapeseed oil in Scotland, **Summer Harvest Oils** was established in 2008. Located on Ferneyfold Farm, near Crieff in Perthshire, Summer Harvest grow the oilseed rape, press the seeds and bottle the oil on site. The cold-pressed oil is distributed widely to independent retailers across Scotland (and a number in England), the Waitrose supermarket chain in Scotland and several major companies within the food service industry.

Summer Harvest has expanded considerably since its launch, has recently started exporting to Dubai and is now looking to move into the American market.

The Founder and Managing Director explained that following a very successful trial in May 2008, the business has grown quickly, as awareness and demand have increased. In 2012 and 2013, Summer Harvest extended its product offering, developing a range of infused oils, dressings and mayonnaises in collaboration with other local producers and manufacturers. He estimates that these additional products now represent 50% of Summer Harvest's total business.

Initially, when Summer Harvest began, the harvested oilseed rape was transported to Northumbria to be pressed, however receipt of a Scottish Rural Development Programme grant helped the company to purchase its own presses. As a consequence, the whole end-to-end oil production operation now takes place at Ferneyfold Farm, with the 'waste' seed pulp used as feed for the farm's livestock.

Use of Transport and the Transport Network

Choice of Site

The Managing Director was very clear about the reasons why Summer Harvest has remained on its current site at Ferneyfold Farm; highlighting the self-contained and sustainable production operation, including access to the requisite equipment along with the good storage facilities. A key positive is the farm's location in relation to the transport network. Upwards of one million people can be accessed within an hour's drive of the Perth city region.

Viewpoint: Access

'We are a little bit rural but we're very well connected. ***We've got good access to the major hubs*** *– Edinburgh, Glasgow and the A9 north to Inverness. We're an hour and forty minutes from Aberdeen.'*

Movement of Goods

Whilst for the most part production is focused on the Ferneyfold Farm site, Summer Harvest do need to bring in various key supplies from elsewhere including bottles and jars, lids, labels and boxes. Suppliers are located in Scotland and northern England. All use the **road network** to transport and deliver their goods to Summer Harvest.

When asked about how Summer Harvest had made decisions about how to deliver their products to their customers, the Managing Director described how initially they had been 'busy fools' working hard to service and deliver all orders received themselves. He soon realised that it was far wiser, both in economic and environmental impact terms, to work collaboratively with others to distribute products to market. Summer Harvest now uses a range of options to achieve this.

They use **wholesale distribution** companies to take orders from the majority of their retail customers. The companies inform Summer Harvest what quantity is needed of which products, for pick up a week later. The wholesalers then palletise the Summer Harvest goods with other commodities and deliver to outlets across Scotland, parts of northern England and London. As well as representing a cost-effective option, the Managing Director highlighted that using dedicated distribution firms has expanded the range of contacts they have, meaning that Summer Harvest products are now stocked in close to 200 of the estimated 300 independent outlets, delicatessens and farm shops in Scotland. All of the collection and distribution takes place by road.

Until recently, Summer Harvest made use of the Scottish Food and Drink Hub as a cost effective way of coordinating orders from and delivering to its supermarket customers in Scotland. When this service came to an end in January 2016, the company began to use a **logistics company** to hold stock and make deliveries. All transport is through Scotland's road network.

Depending on the size of the order, Summer Harvest either uses **hauliers** or its **own van** to transport its products for delivery to the food service industry (e.g. restaurants, hotel chains and ferry services). Again, collection and delivery is via the **road network**.

The diversification of Summer Harvest's range to include dressings, infused oils and mayonnaises has necessitated the transport of batches of pressed oil to other sites for additional production processes to take place (e.g. addition of ingredients to make flavoured oils, mixing with vinegars to create dressings, creation of mayonnaises). The finished products are then brought back to Ferneyfold Farm for packaging. All elements of transportation are undertaken by **road**.

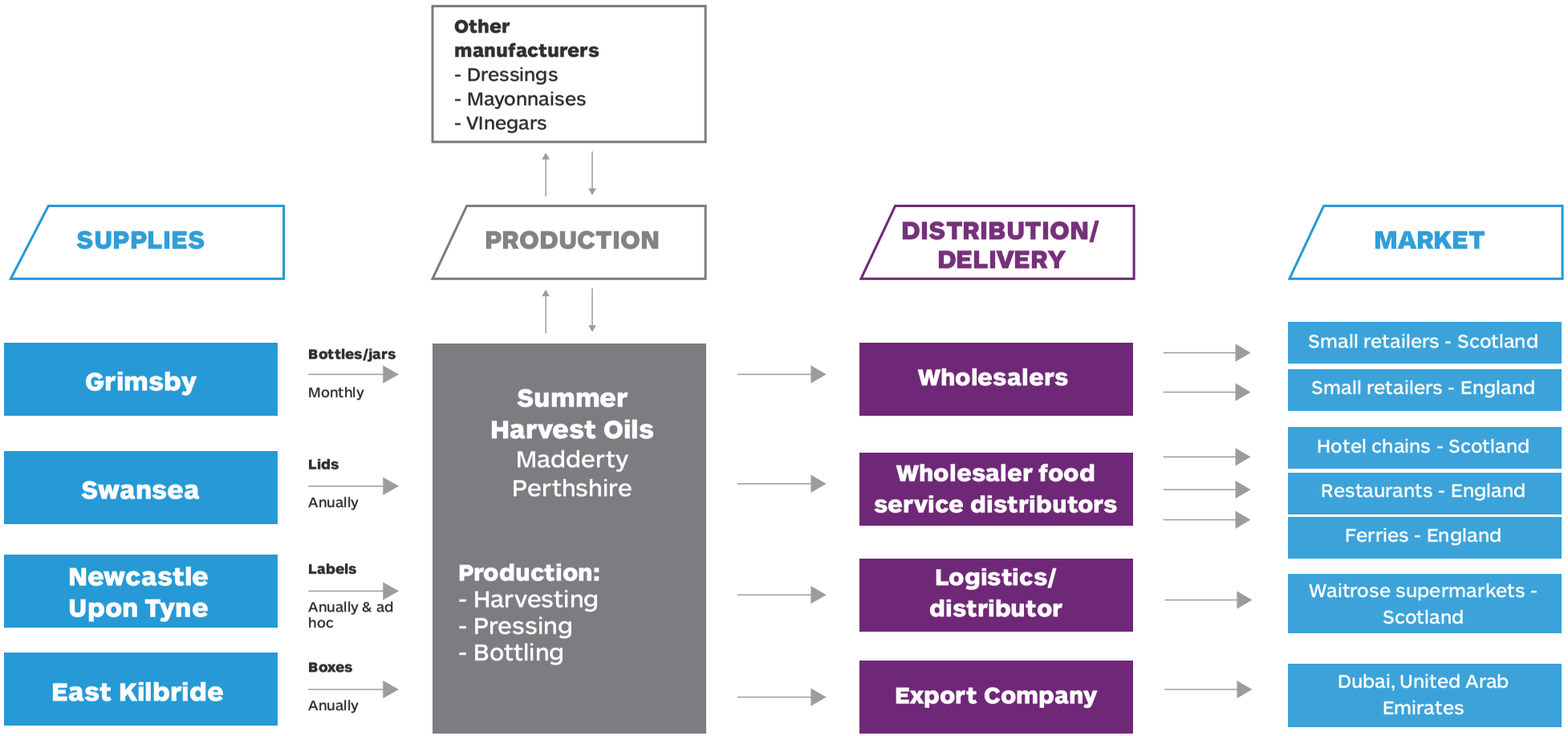
In 2015 Summer Harvest began to expand its business into the overseas market, using an **export and consolidation firm** based in the West Midlands to coordinate orders and ship goods out to Dubai in the United Arab Emirates and on to Bahrain. The company's current export aspirations include gaining a foothold in the American market.

Movement of Staff

In terms of how Summer Harvest staff use transport for work purposes, the Managing Director explained that he is in the enviable position of being able to **walk** from his home to work at Ferneyfold Farm. Any visitors, or staff working on the site, tend to use their **own vehicles** as, although there is a bus route running between Perth and Crieff which goes through Madderty, the service is relatively infrequent. When attending food shows and events, there is clearly a requirement to take supplies of Summer Harvest products so, for practical reasons, the company's **small van** is used in these circumstances.

The figure overleaf provides a high level summary of the goods in-out movement for Summer Harvest Oils.

Summer Harvest Oils – Summary of Goods In-Out Movements

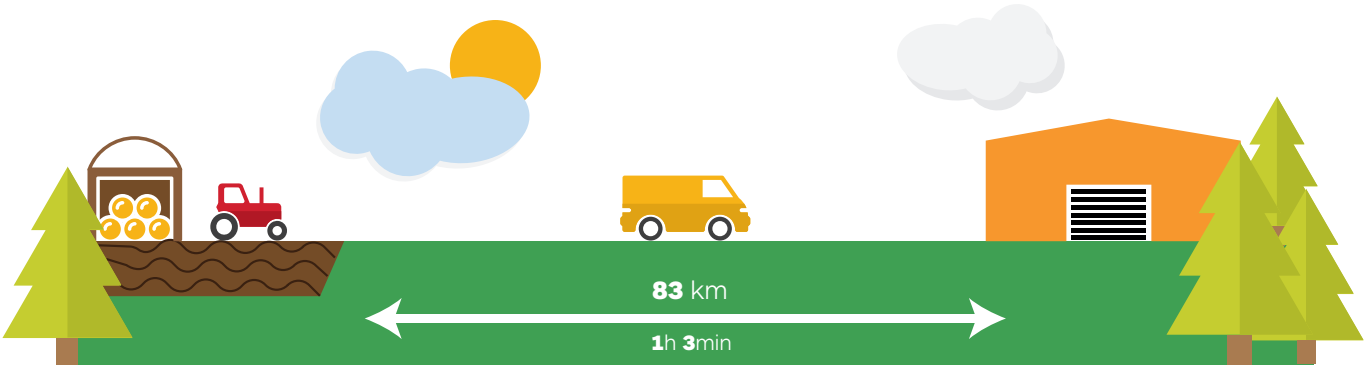


End-to-End Journey Log

The journey log provides one example of the movement of specific goods relating to the main focus of Summer Harvest Oils' business. A number of journey stages ('legs') are described in turn, including transport modes used, routes taken and any delays or breaks experienced.

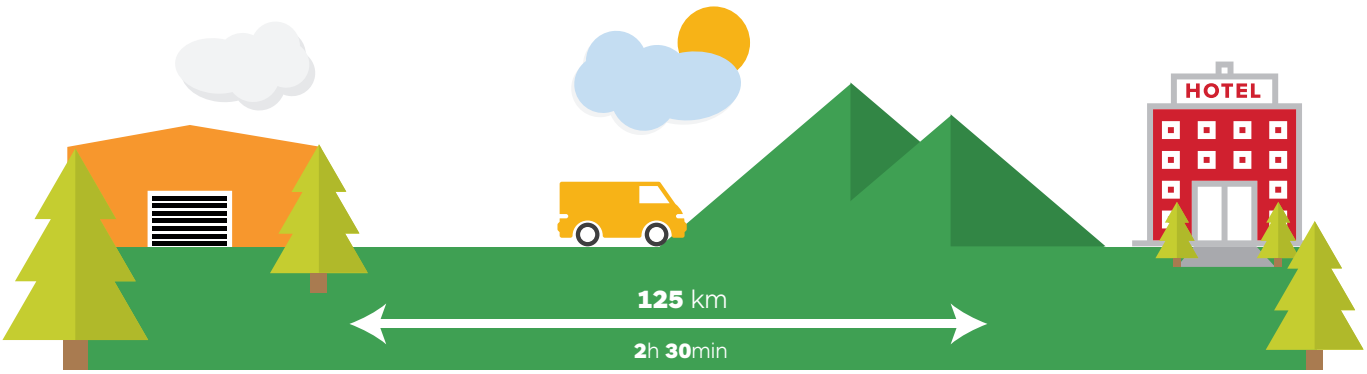
The example selected in this instance focuses on the journey of one load of cold-pressed rapeseed oil from Ferneyfold Farm to one of the wholesalers and ending with delivery by the wholesaler to a hotel in St. Andrews.

Leg 1: Summer Harvest, Perthshire to Wholesaler, Edinburgh



The consignment of labelled and packaged rapeseed oil is taken by **road** from Ferneyfold Farm in Madderty to the wholesale distributor at Newbridge Industrial Estate, just to the west of Edinburgh. The Managing Director uses the **Summer Harvest van** to make this 83 kilometre journey which takes a little over an hour. He travels on the **A9, M90, A90**, crossing the **Forth Road Bridge** and completing the journey on the **A89**. He encounters a 40mph speed restriction on the bridge, lasting six miles and adding eight minutes onto the journey time. This delay is due to ongoing roadworks and the speed restriction will be in place until the opening of the new Queensferry Crossing. The value of goods moved is £612.91 and the Managing Director makes this journey once per month.

Leg 2: Delivery from Wholesaler, Edinburgh to Hotel, St Andrews



A part of the consignment delivered to the wholesaler (one five-litre bottle) is taken by the **haulage company** as part of a main load of fruit and vegetables for delivery to the Fairmont Hotel in St. Andrews. The 125 kilometre journey is made using a **7.5 tonne truck**, setting off at 4.00am and arriving at 6.30am. The journey is undertaken mostly on dual carriageways (**A90** and **A92)** and motorways (**M9** and **M90**). From central Fife, the coastal route (**A92**) is taken. Bar a slight build-up of traffic on the **Forth Road Bridge**, no delays are experienced. It is suggested that the absence of delays or hold-ups is due to the early start time and minimal traffic. The value of Summer Harvest goods moved is £12.50. This journey is made by the **haulier** six days per week.

Use of Sustainable Modes of Transport

When asked about how Summer Harvest make use of sustainable modes of transport, the Managing Director highlighted that if he needs to travel to one of the major cities for a meeting, he will use the **train** whenever he can. **Rail services** from Perth and Stirling are reliable and frequent, however, the closest station to Summer Harvest, Gleneagles, offers a more limited service outside peak hours.

Viewpoint: Train Connectivity

'It's a great new station which offers a good service for commuters but if I'm going to a meeting in Glasgow or Edinburgh, I'd go from Perth or Stirling. ***Trains are great, you can just get on and even if you're just reading reports or something, it's not dead time****. If you're driving, even if you get stuck in traffic, you can't really prepare for a meeting.'*

When asked whether Summer Harvest had considered using the **rail network** to transport their products to market, the Managing Director said this would be something they would definitely consider if there was a convenient terminal or siding close by. Using **rail services** that run from say, Edinburgh to London, would not make commercial sense as Summer Harvest would have to pay for the costs of transportation to Edinburgh. Using a **haulage company** to make the whole journey by **road** is more convenient and cost effective.

The most recently purchased tractor at Ferneyfold Farm makes use of **diesel exhaust fluid** (i.e. the 'blue additive') which effectively reduces harmful exhaust emissions. The Managing Director and his family have recently built a new house and he outlined how, when a garage is built, he is considering equipping it with a charge point for an electric vehicle.

The Transport Network – Challenges

When outlining a number of minor challenges that he feels the transport network can pose, the Managing Director highlighted that some companies class Summer Harvest's location as being in the Highlands. This means that deliveries to the farm can attract an additional charge. This charge is purely based on postcode and is not applied 'across the board' as not all companies apply it.

The temporary closure of the **Forth Road Bridge** in December 2015 did affect the movement of goods for Summer Harvest. Although there is a clear alternative route via Stirling, the closure meant that this route was much busier than it would normally be and added to journey times. The Managing Director believes that they were fortunate not to have had any events or shows to attend whilst the closure was in place as this would have had a greater impact on their business.

Speaking about the section of the **dual carriageway between Stirling and Perth**, the Managing Director explained that there are a number of small farm roads that are linked to it and joining the road can be difficult. This had been exacerbated by the introduction of average speed cameras. The cameras' impact has been to standardise the speed of vehicles travelling on the carriageway. This in turn had effectively lessened the number of gaps in the traffic, meaning it is more difficult for drivers to join from minor roads.

The Transport Network – Benefits and Opportunities

Since starting business in 2008, Summer Harvest has not only extended its range of products but also its market. The Managing Director confirmed that the transport network in Scotland has been instrumental in helping Summer Harvest's expansion into new locations. Determining how they reach customers, some in quite remote areas, has been given careful consideration; key influential factors being cost, capability, flexibility and logistics.

Viewpoint: Wholesalers

'Scotland is a very large area and sparsely populated. ***We rely on businesses that have the facilities and the logistics to get around****. We've looked at using our own vehicles to move goods around but, for our low ticket items, it's just not feasible. To get to the four corners of Scotland and beyond, it's best to work with a wholesaler because they take ownership of the product and have the logistics.'*

The Managing Director described the edible rapeseed oil market as 'very young'. Decisions about where the best markets are for their products have been influenced by the locations of other producers in different parts of the UK. The resulting marketing trend is fairly local meaning that, certainly in Scotland, cold-pressed rapeseed oil has 'low food miles' compared with other oils.

The major projects currently in progress to improve the network were viewed extremely positively. Discussing the **A9**, the Managing Director explained that the unlit stretches of the road can make it difficult to see where the passing areas are located, particularly for people who are unfamiliar with the road. As a consequence, the dualling work between Perth and Inverness was welcomed and described as essential.

The work to **improve the M8 motorway** that has taken place over recent years was also approved of and hailed a 'massive improvement.' The Managing Director highlighted that prior to these enhancements he would not have driven into Glasgow but since the developments he is now happy to do so. Also welcomed is the **Forth Replacement Crossing** – in the shape of the new Queensferry Crossing – particularly the opportunity to factor in the particular requirements of high-sided vehicles from the outset.

Speaking generally about the network, the Managing Director believes all the necessary links are there to enable Summer Harvest to meet the needs of their customers. The **wholesalers, distributors and logistics companies** he uses are very familiar with the **road network** and experienced in employing various 'work arounds' if there are problems on particular sections.

Viewpoint: Accessibility

'No areas of Scotland are inaccessible *– there are no pockets of Scotland that we can't get to.'*

Experience of the international export market has led the Managing Director and a number of other Scottish producers to start looking into the feasibility of setting up a consolidation facility in Scotland. Following on from research undertaken with Scottish Development International (SDI); the international arm of Scotland's enterprise agencies. The group of producers, as a first step, have employed an export manager who is working to market their products abroad and help them break into new markets, including the USA. This approach means the expertise in exporting is focused in one place and costs can be consolidated and shared. The support from Scotland Food and Drink and SDI has been particularly instrumental in helping this initiative to progress.

Case Study 2: The Scottish Salmon Company

Follow the Fish

Background and Introduction

Salmon is the number one food export for Scotland and the UK, with trade extending to more than 65 countries across the world. As well as being supplied to established markets in the USA, France and Germany, Scottish salmon has started to reach newer markets in Asia and the Far East. Salmon makes up more than 40% of total food exports from Scotland, with exports of whole fresh salmon representing £494 million in 2014. See The Scottish Salmon Company online.

Over 6,500 people are employed in the Scottish salmon industry with the number of full-time staff in marine salmon production growing by 10% in 2014 (up from 1,081 to 1,191) and the part-time figure increased by 35% (up from 99 to 134). Statistics provided by the Scottish Council for Development and Industry (SCDI) show that a very significant proportion of the estimated 2,257 direct jobs supported by salmon farming are located within the Highlands and Islands (2,131; 94%).

The Scottish Salmon Company (SSC) is the leading Scottish producer of salmon with 100% focus on Scotland; it operates across the west coast of Scotland and the Hebrides, with sites ranging from the shores of West Loch Roag on Lewis to Lamlash Bay on the Isle of Arran. SSC operates 60 sites; providing employment to 480 people across its operation and supporting local suppliers in remote and rural locations, some of which are economically fragile.

Market-led and customer driven, SSC is engaged in all stages of the supply chain, from its broodstock development programme through freshwater and marine farming to processing, sales and marketing. It is a leading business in the Scottish aquaculture industry and produces approximately 20% of Scotland's total salmon output, delivering the finest sea loch fresh salmon to leading retailers, up-market smokers and superior restaurants in over 25 countries around the world.

Since its formation in 2010, SSC has proved it is a robust, sustainable business with strong growth opportunities. Harvesting volumes are now at 30,000 tonnes annually and last year exports accounted for about half of the company's revenue.

Proud of its provenance and heritage, SSC is one of the few salmon farming companies in Scotland whose strategic corporate decisions are made in Scotland, with its headquarters in Edinburgh. It has two processing plants in Stornoway, Isle of Lewis and Cairndow, Loch Fyne and is considered to be the largest private employer in the Outer Hebrides.

In 1992, Scottish salmon was the first non-French and the first fish product to achieve Label Rouge status, requiring participation in a comprehensive independent audit and compliance with a wide-ranging and stringent set of criteria.

The company recently achieved the prestigious Label Rouge accreditation – official recognition from the French Ministry of Agriculture for the exceptional quality of a food or farmed product, in particular with regard to taste. This accreditation must meet strict criteria for fresh salmon and also for smoking, with regards to salmon quality, husbandry, feed and traceability. SSC expanded its Label Rouge product range in Spring 2016, with the launch of fresh Scottish salmon fillets.

The company has also developed a unique strain of Scottish salmon – Native Hebridean. This unique strain of salmon reinforces SSC's commitment to provenance and guarantees the finest quality Scottish salmon with 100% traceability to the Hebrides.

SSC won the 2016 'Made in Scotland', Exporter of the Year award. It also received two industry accolades at the 2015 Scottish Food and Drink Excellence Awards – Business of the Year and Export Company of the Year.

The following information is from published sources and an interview with the Head of Planning and Supply Chain for SSC. By careful management of the complete integrated supply chain the Head of Planning and Supply Chain ensures that the finest quality salmon is consistently achieved at every stage along with total supply chain integrity, full traceability and food security.

Use of Transport and the Transport Network

The majority of transport between the hatcheries, farms and processing plants is undertaken by **boat**. There is a north and south hub each supported by the infrastructure of processing, farms and freshwater facilities.

The operating parameters are unique for each of the 60 sites, as they are all located in different remote and rural locations, each with their own unique set of logistical requirements.

Due to the loch based location of the sites, **sea** and **road** are the dominant transportation methods. When the young salmon aged 10-12 months (smolt) are ready to be transferred from the freshwater hatcheries to seawater fish farms, they are typically transferred by **boat**.

Once the adult salmon are ready to be taken from marine sites to the processing plant, **sea transport** is used. The fish are transferred on larger vessels known as '**well boats**' which are equipped with large compartments allowing the fish to travel in chilled, oxygenated seawater, which is monitored throughout the journey.

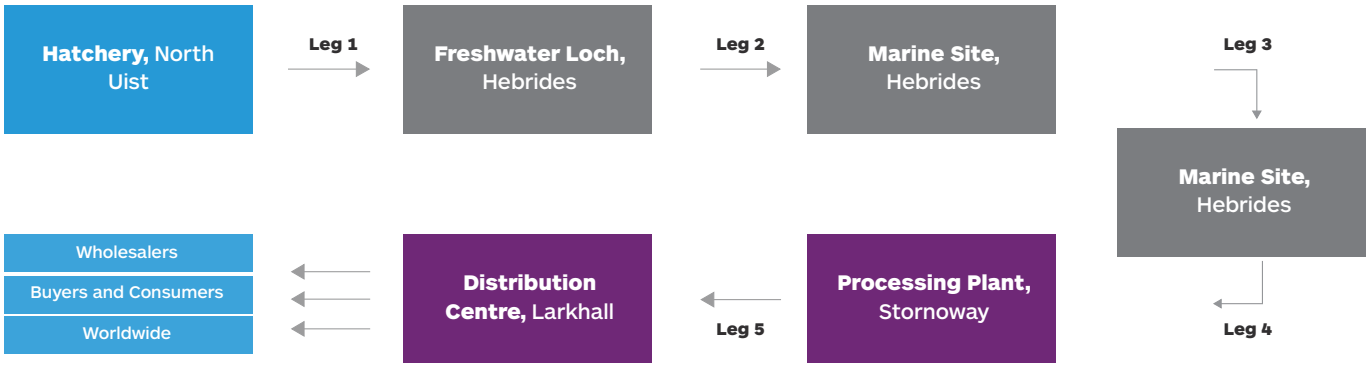
Using **trucks**, the fish are transported at optimum temperatures, which are maintained throughout the journey to ensure maximum freshness, as the fish move from Lewis to Ullapool and then by **road** to the distribution hub located south of Glasgow. From the distribution centre, products are then routed to customers, predominantly by **road** for UK and mainland Europe and by air freight to international customers in locations further afield such as Japan and the USA.

SSC is proud to be a Scottish business and is committed to using local Scottish suppliers wherever possible, recognising the economic benefit to the region.

End-to-End Journey Log

This section provides an overview of the movement of specific goods relating to a developing area in the business - Native Hebridean salmon. A series of journey stages ('legs') are described, including transport modes used.

The log provides illustrative information on the Native Hebridean salmon's journey, from hatchery to marine site, on to the processing plant, distribution centre and on to wholesalers, buyers and consumers.



Leg 1: SALMON EGGS from Hatchery in North Uist to Freshwater Lochs in the Hebrides

Once hatched, the Native Hebridean salmon eggs are transferred by **truck** in batches from the hatchery on North Uist and transferred into pens in one of the freshwater lochs in the Hebrides, where they remain for 10-12 months while they grow into juvenile salmon (smolt). This transfer takes place during two periods of the year.

Leg 2: YOUNG SALMON from Freshwater Loch to Marine Site

Once the Native Hebridean salmon reach the smolt stage they are transferred to a marine site in the Hebrides by **well boat**.

Leg 3: MATURE SALMON from Marine Site to Processing Plant, Stornoway

When the Native Hebridean salmon are mature, they are moved from the marine sites across the Hebrides using a **well boat** to the processing site in Stornoway. On arrival, the harvested fish are immediately graded and boxed with ice for onward movement, via air or **road freight**. Harvests take place throughout the year.

Leg 4: SALMON from Processing Plant, Stornoway to Distribution Centre, Larkhall

The Native Hebridean salmon are transferred by **road** to the Stornoway ferry terminal for the **overnight freight ferry** to Ullapool, and then taken by **road** to the distribution hub south of Glasgow, this takes approximately 12 hours.

Leg 5: SALMON from Distribution Centre, Larkhall to Wholesalers, Buyers and Consumers, Worldwide

At the distribution centre, consignments of Native Hebridean salmon are sent on to wholesalers, buyers and consumers by **road** or **air**. Customers are located in the UK, as well as overseas.

Use of Sustainable Modes of Transport

When transferring fresh seafood, temperature control is vital. SSC uses specifically designed controlled temperature **trucks**, to maintain optimum conditions for the salmon throughout the journey.

The Transport Network – Challenges

A key factor which can affect the method of transport used by SSC is the weather as this can also cause delays.

The Transport Network – Benefits and Opportunities

Logistics is a key part of the operations both in rearing the fish and delivery of short shelf life perishable product from remote areas of Scotland. Improvements to infrastructure are welcomed as freshness is a key feature and delivery is of paramount importance to ensure optimum customer service.

Case Study 3: Diageo

Follow the Whisky

Background and Introduction

The latest figures from the Scottish Annual Business Statistics publication illustrate that the spirits sector contributed £2.1 billion to GVA in the food and drink manufacturing sector in 2015.

Drilling down further into the beverage industry within Scotland shows that the spirits sector made up 88% of GVA, 80% of turnover and 72% of the employment total. The figures also demonstrate the significance of spirit manufacturing in Scotland to this particular area of manufacturing in the UK as a whole: 94% of GVA and 93% of turnover.

In 2014, there were around 8,200 jobs in spirit drink production in Scotland; 87% of all GB spirit drink positions. Spirit drink exports made up one-fifth of all food and drink exports to the other parts of the UK, and close to four-fifths of food and drink exports to the rest of the world.

Statistics produced by the Scotch Whisky Association estimate that the whisky industry provided more than £5 billion of value to the UK economy in 2014. The industry provides work for 10,800 employees, more than 7,000 of whom are in rural communities. Examining the export picture for Scotch Whisky shows that whilst international exports have decreased slightly when 2014 is compared with the previous year, both in terms of volume (-3%: 334 million, down from 344 million litres of pure alcohol) and value (-7%: £3.95 billion down from £4.26 billion), it still accounted for approximately a quarter of all UK food and drink exports.

Existing in its current form since 1997, Diageo is one of the largest international companies in the beverage alcohol trade, producing a wide variety of brands in over 200 sites, across more than 30 countries. A key focus of Diageo's business in Scotland, England, Ireland, Italy and the Netherlands is on exports, with this aspect of the company's business operating from over 55 sites and employing in excess of 4,000 people. The company operates in 21 geographically-based markets around the world and has a presence in over 180 countries. As well as Guinness and leading brands of vodka, gin, rum and other spirits, Diageo is the largest whisky producer with labels including Johnnie Walker, J&B, Bell's, Crown Royal, Haig Club, Buchanan's and Windsor. The firm also produces a wide variety of products specifically for local markets in different countries around the world (e.g. Bundaberg rum in Australia, Yeni Raki in Turkey, Ypióca Cachaça in Brazil). Diageo describes the growth of its business through a model which emphasises, '...investment in our brands and route to consumer, and by acquisitions to broaden our geographical footprint and our category depth and range.'

The information which follows is drawn from interviews with and information provided by key personnel from Diageo Scotland and concentrates mainly on the company's whisky operation. Interviews took place with the following postholders.

- The Spirit Supply and Logistics Manager in Scotland.
- The Shipping Manager, Transport and Warehousing Manager and Transport and Warehouse Coordinator.

Use of Transport and the Transport Network

Choice of Sites

Diageo's business in Scotland encompasses a large number of sites across the country.

The sites vary in purpose, size and location. Diageo's whisky operation includes the following.

- Maltings plants at Burghead, Roseisle, Glen Ord and Port Ellen.
- 28 malt whisky distilleries in diverse locations such as Speyside, Islay, Oban, Perthshire, Deeside and Skye.
- One grain whisky distillery at Cameronbridge.
- The company's spirit filling, warehousing, disgorging and blending functions mainly take place at premises in Cambus, Menstrie, Blackgrange Blythswood, Bonnybridge, Bonhill, Glenlossie, Leven, Auchroisk and Shieldhall (N.B.: not all functions take place at each location).
- Product packaging is carried out at Shieldhall and Leven.
- Diageo's main cooperage (barrel manufacture) operation is located at Cambus, along with two externally operated sites at Glasgow and Craigellachie.

The Spirit Supply Manager explained that, in common with many large firms, Diageo's current sites in Scotland reflect, 'the consolidation of several smaller businesses and sites', some of which date back to the 18th century.

Viewpoint: Diageo's Scottish footprint

'Diverse...with malt distillation primarily in the north; with filling, warehousing and blending in the south, near to the packaging plants.'

When asked about choice of sites and the role that transportation has played, the Shipping Manager explained that as a consequence of a rationalisation programme, one of the consolidation warehouses at Kilmarnock had closed around five years ago. This had been in part due to other sites being better positioned and thus having superior transport links. The Transport and Warehousing Manager highlighted that the rationale behind the recent expansion of the Leven site in the shape of a new bottling hall was primarily concerned with making best use of the footprint and space available.

Movement of Goods

The various stages of Diageo's whisky production operation necessitate the movement of the product between different sites and the use of **vehicles with specific features and capabilities**. Malted barley is delivered to distilleries using **road tipper trucks**, designed to carry and unload grain, and compliant with Feed Materials Assurance Scheme (FEMAS) standards.

Newly made spirit is transferred from the distilleries to filling stores using 32.5 thousand litre **road tankers**. The tankers are designed so that they can be regularly cleaned and are purposely equipped to carry food grade loads. Due to the highly flammable nature of the alcohol being transported, the tankers must also comply with European and domestic regulations governing the safe carriage of dangerous goods by road (e.g. having vent pipes, hatches which can be sealed down) and are regularly tested and inspected. The by-products of the distillation process, known as draff (i.e. moist spent grain from the mashing process) and pot ale (i.e. the waste water from the distillation process), are taken by **road** to 'dark grains' processing plants to be dried and transformed into pellets which are used for animal feed.

Filled casks are transported to and from the maturation warehouse in specially designed double-deck, highly secure, metal sided vehicles known as **TLVs (trader locked vehicles)**. The TLVs have a moving floor which is designed to minimise the manual handling of the casks.

Mature bulk spirit is disgorged from casks and taken by **road tanker** to be packaged (i.e. decanted into bottles and packed into cases), after filtering and blending, where this applies. The Spirit Supply Manager highlighted that the movement of empty casks is a key consideration for Diageo in Scotland and forms a significant proportion of the overall transport budget. He estimates that the company has in the region of nine million casks in Scotland and during peak demand periods are moving around 25,000 casks per week.

Cased whisky is transferred to a consolidation warehouse and then onto distribution centres by **road** using **curtain-sided heavy goods vehicles**. The warehousing and distribution centres in Scotland are operated by **a third party logistics company** with sites at Linwood in the west and Grangemouth in the east.

Staff explained that **rail transport** is used to transfer cased goods from the **Coatbridge railhead** to **ports** in England for onward transfer by **sea** to both the European mainland and destinations further afield. The ports used are the London Gateway, Tilbury, Felixstowe, Southampton, Liverpool and Teesport. The Transport and Warehouse Coordinator outlined that the movement of finished goods by **rail** to the **sea ports** represented the cheapest and convenient option. There is also an **alternative rail option from Grangemouth** which can be used if capacity and demand dictate.

Other consignments destined for international export are moved by **road** to **ports in Scotland**, for the most part to Grangemouth on the east coast and less frequently to Greenock in the west. Goods are transferred by **feeder vessels** to larger 'mother' vessels (i.e. with capacity to carry 20,000 twenty foot containers) at the **sea hubs** in Rotterdam and Antwerp. Staff emphasised that sea transport is the most cost efficient, and thus the default, option for moving finished goods to international destinations. The more costly alternatives of **road transport** to Europe and air freight to destinations further afield are occasionally used, but restricted to situations where a particular consignment of goods may be needed 'in quick time'.

Diageo use a third party distribution centre in Derby as the southern locus of distribution within Great Britain, with a northern site at Newhouse, outside Glasgow. Movements of cased whisky for distribution within Scotland and locations on the wider British mainland are undertaken by **road**.

Whilst the company used to operate its own transport, in recent years Diageo has found that the most cost effective option has been to contract out this part of its operation, forging positive and fruitful partnerships with a number of key suppliers of **logistics and transport services** in the process. Personnel from the **external haulage companies** also undertake work at production sites (e.g. driving shunt units and cask handling) as well as looking after the loading operation at Shieldhall and Leven.

Viewpoint: Haulage Companies

'They're good and they're skilled; they're a capable and skilled resource. The haulage companies have been with us a long time and they've developed and grown their fleet to meet our specifications.'

It is clear that Diageo Scotland's use of different transport modes is principally influenced by the desire to make the best use of the current network using the most cost effective option available. The Shipping Manager stressed that the company makes every effort to minimise the number of movements, applying logic to the links between sites (i.e. use Greenock for Shieldhall movements and Grangemouth for Leven), using looped routes to keep empty running to a minimum.

Whilst movements during the production process and within Scotland are predominantly undertaken by **road**, rail freight services are used to transfer finished goods to English ports and sea transport is the main means of moving whisky and other spirits produced to international destinations. Speaking about the movement of product to different locations during the various stages of the manufacturing process, the Spirit Supply Manager was clear on the three main factors which determined transport decisions: 'risk, cost and service'; using a reliable and flexible service which represents the most cost efficient option, whilst at the same time, ensuring that risks are minimised. A key element of his logistics role has involved significant work to minimise the number of movements between sites, where possible and practicable, saving a sizeable amount of money in the process.

Viewpoint: Streamlined Logistics

'My job from a logistics perspective is to make the movement of bulk spirit as streamlined as possible. Bearing in mind we've inherited quite a diverse geography, it's never going to be simple, but if we can be smart about it then that's what we'll try and do. We're making best use of the sites where different functions are performed.

For example, we'll send a lot of the whisky which is destined to be single malt, such as Cardhu, straight down to Leven, where there's a filling store, warehouse, disgorging unit and bottling operation all on the same site – one journey instead of four, saving a lot of miles.'

Movement of Staff

Speaking about staff transport, the Spirit Supply Manager explained that people working at Diageo sites on the islands and more remote locations (e.g. some distilleries), tend to live locally and thus use their **own vehicles** or sometimes commute on foot. He also surmised that staff working in locations in the south of Scotland tend to **drive**, but highlighted that people employed at offices in city centre locations (e.g. Edinburgh and Glasgow) have more public transport choices at their disposal. Staff like himself whose role means they need to travel between sites, sometimes at short notice, will generally **drive** for flexibility reasons. Interviewees spoke about the successful car share scheme which operates at the Glasgow office and confirmed that many staff working there use public transport (e.g. bus to and from Glasgow Queen Street station). The Diageo office in central Edinburgh and the head office at Edinburgh Park are served by the tram system and many staff travel into the city by train. Diageo also participates in the 'Cycle to Work' scheme.

End-to-End Journey Log

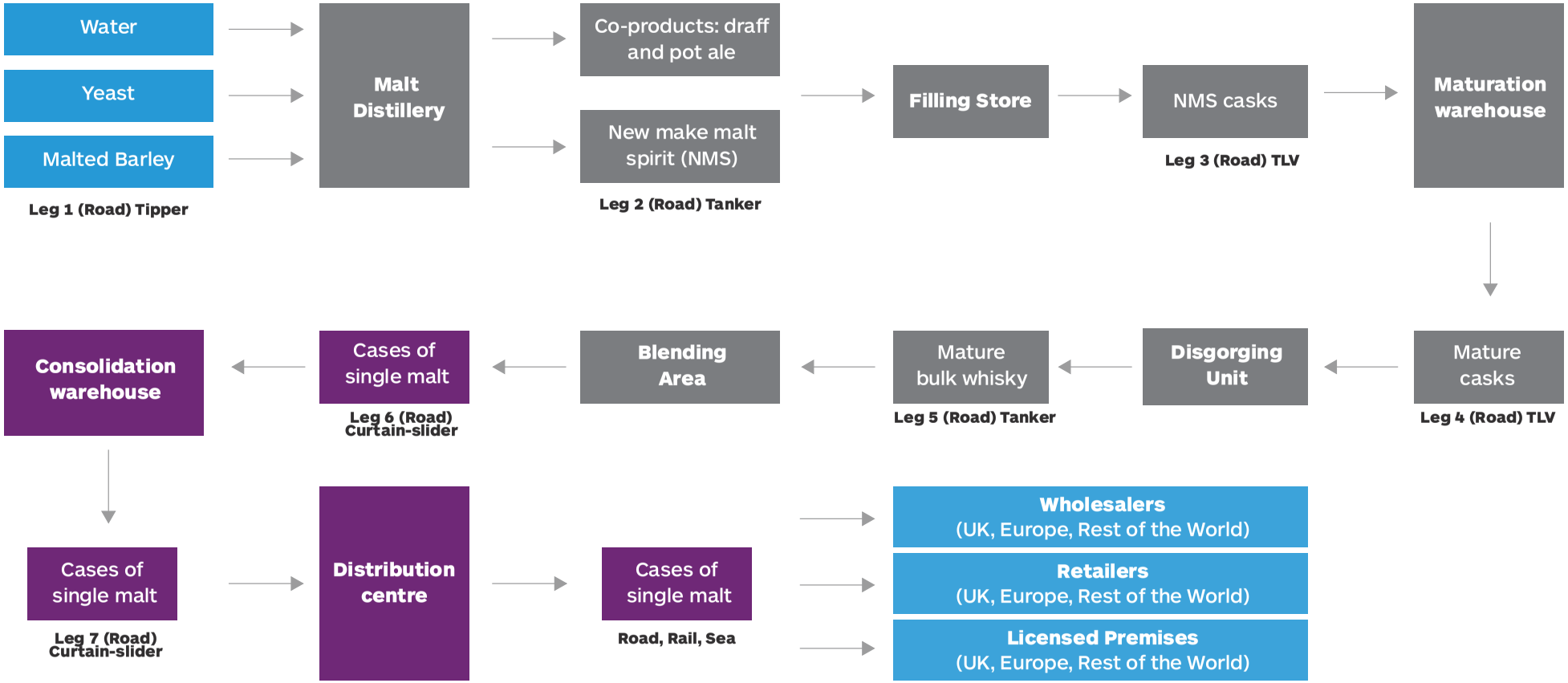
The journey log provides information on the movement of specific goods relating to a key area of Diageo Scotland's business: the production of malt whisky, in this example, Cragganmore. A number of journey stages ('legs') are described in turn, including transport modes used, routes taken and any delays or breaks which may potentially be experienced.

The log provides illustrative information on transportation involved at different stages of the production journey, from maltings to distillery, through to filling store and then maturation, on to the disgorging unit, movement to the bottling plant, and ending with distribution to market.

A key issue which emerged from the interviews was that the high degree of control and regulation associated with the alcohol production industry has an impact on journey times. This is because completing and checking the necessary documentation relating to loads and the transportation of alcohol at each stage of the journey can take some considerable time. These requirements are linked to key health and safety elements and the regulatory conditions necessitated by Her Majesty's Revenue and Customs.

The figure on the next page provides an overview of the journey from start to finish.

Diageo - End-to-End Journey Log



Leg 1: MALTED BARLEY from Maltings, Burghead to Cragganmore Distillery, Ballindalloch, Speyside

A 28 tonne load of malted barley is transported a distance of 48 kilometres from the Burghead Maltings on the Moray Firth to the Cragganmore Distillery in Ballindalloch village. The barley is conveyed using a **road tipper truck** and takes two hours, travelling on A and B roads from the coast through Moray to Cragganmore (i.e. **B9013, A96, A941, A95, B9137**). No delays are encountered and no breaks are taken. The journey is made three times per week.

Leg 2: NEW MAKE SPIRIT from Cragganmore Distillery, Ballindalloch, Speyside to Filling Store at Auchroisk

'New make' (i.e. newly made) spirit is collected from the Cragganmore distillery and transported using a **road tanker** to the filling store at Auchroisk where it is emptied into wooden casks. The journey takes 45 minutes (excluding loading and tipping), travelling 40 kilometres along the **A95**. The journey is undertaken three times per week.

Leg 3: NEW MAKE CASKS from Filling Store at Auchroisk to Maturation Warehouse at Dufftown

New make spirit in casks is moved by **road** to the maturation warehouse at Dufftown in secure, hard-sided double deck vans (i.e. **TLVs – trader locked vehicles**) where it remains for 12 years or more. This 32 kilometre journey takes around 30 minutes (excluding loading and tipping). The roads used are the **A95** and then the **A941**. The journey is made five times per week.

Leg 4: MATURE CASKS from Maturation Warehouse at Dufftown to Disgorging Unit at Auchroisk

Following the period of maturation, the casks of Cragganmore single malt whisky make the return journey by **road** to the Auchroisk disgorging unit, again via a **secure trader locked vehicle**. The whisky is emptied from the casks and loaded into a **road tanker**. This journey is undertaken five times a week.

Leg 5: MATURE PART BLEND SPIRIT from Disgorging Unit at Auchroisk to Blending Area at Leven

The **road tanker** containing mature Cragganmore single malt whisky travels south to the blending area at Leven where it is blended with **other tankers** of Cragganmore single malt and sent for bottling. The journey is 275 kilometres and takes approximately five hours. The route taken is via the **A95** to Aviemore, the **A9** to Perth and then the **M90** to Dunfermline and Leven. With the exception of a driver break, there are no delays. This journey is made three times per week.

Leg 6: CASED MATURE SINGLE MALT from Bottling Hall at Leven to Malcolm's Warehouse at Grangemouth

Cases of Cragganmore mature single malt whisky are taken by **curtain-sided HGV** from the bottling hall at Leven to Malcolm's Warehouse at Grangemouth for intermediate storage where loads for the GB market are consolidated prior to transport south. The journey is 75 kilometres and the route is principally via the **A92** and **M9**. This journey is made 70 times per week and takes approximately two hours. The journey is generally free of delays, other than congestion at the **Forth Road Bridge**.

Leg 7: CASED MATURE SINGLE MALT from Malcolm's Warehouse at Grangemouth to Distribution Centre, Crick

After consolidation with other loads, the cased Cragganmore is taken by **curtain-sider** for the journey south to Crick for onward GB distribution. This 550 kilometre journey is made approximately 60 times per week and takes in the region of five hours. The main roads on the route taken are the **M9, M80, M73, M74** and **M6**. Barring slow traffic at the **Forth Road Bridge**, the journey is usually free of hold-ups.

Use of Sustainable Modes of Transport

The information provided shows ample evidence that Diageo Scotland make good use of **rail freight** for the movement of finished goods down to **English ports** for onward **sea transportation**. The Spirit Supply Manager outlined that, for the transport of raw materials and bulk product within Scotland, using the **road network** is more practicable than the rail option.

Viewpoint: Rail Freight

'I'm a great fan of rail but because of our geography and the fact that we don't have railheads on any of our sites, rail isn't all that convenient. We've had two rail projects, neither of which proved particularly viable, however, we have tried it and it can be done. I would say that ***rail is much more suitable for moving big volumes, steady flows, long distance and point to point*** *– from one railhead to another railhead and activity at either end is very near there.'*

When asked whether it would be possible to make increased use of **rail** for finished goods transportation, the Shipping Manager identified that whilst Diageo make the best use of the services available, there are two main factors standing in the way of this: capacity and cost. It was pointed out that **rail capacity** has decreased over recent years and there is a perceived lack of investment in **rail freight** operations. He also maintained that moving goods using **rail** is actually more expensive than by **road** and that using **sea-going feeder services** is more economical and arguably, equally environmentally friendly.

The Spirit Supply Manager added that, whilst there is more flexibility with new make spirit in terms timescales for its transportation, movements of mature spirit are much more time critical; some may be required in a particular location at a certain time because it has been ordered to make up a specific blend. This means that using **rail freight** would be problematic, due to the lesser degree of flexibility in comparison with **road**, the additional journey legs and thus time, involved. Using **rail** would also incur extra costs due to the need to hire additional tanks (N.B.: rail tanks are smaller than those on the road). He estimates that these factors would represent a minimum additional cost of 40%. Using a greater number of tanks naturally means more activity in the shape of additional work and thus increased risk (i.e. associated with loading and unloading, risk of losing documentation).

The Spirit Supply Manager explained that whilst the majority of bulk spirit transport within Scotland takes place by **road**, and that a key consideration is movements going largely from more northern sites to locations in the south, Diageo has made some positive strides to **reduce the frequency of 'empty running'**. A further complicating factor influencing these efforts is the bespoke nature of the vehicles used to move the product around (i.e. food grade but highly dangerous loads): 'It's not like we can fill the empty tankers with petrol'. In the south of Scotland, with liquid spirit moving backwards and forwards between sites, it is possible to **'back load'** to a large extent. Though with the movements from south to north, this is more of a challenge, the company does try to create **looped journeys** to minimise the time that empty vehicles spend on the road. In a further effort to address this issue, the Spirit

Supply Manager has worked to schedule the pick-up and drop off of waste products on route using **innovative jumbo 'three pot' tankers** (i.e. carrying pot ale in the two outer tanks after dropping off liquid spirit which has been transported in the central tank). Another pioneering idea which is under consideration revolves around a vehicle which is designed to carry a mixed load of grain and liquid; this too would help to reduce the degree of empty running.

Acknowledging the predominant use of **road transport**, as outlined earlier, the Spirit Supply Manager has a key responsibility to make the most economic and sensible use of the vehicles, approach to loading and routes planning. He has worked hard to **minimise the number of 'touch points'** (i.e. calling points) where possible. Sending part blends directly into packaging sites for completion and bypassing former blending sites has assisted with these efforts, saving considerable time and road miles. He has challenged the approach to loading practices and stressed the need to **make best use of vehicle capacity** wherever possible (e.g. filling tankers to full capacity, ensuring that the maximum number of casks are carried on TLVs). Similarly, the movement of finished goods by **road** had been made more efficient through the use of hauliers' **new larger 50 foot trailers**. In addition, the Shipping Manager spoke about successful work being undertaken over the past two years looking to make the **best use of container space and weight**; steps which again mean fewer vehicles on the road and decreased route miles.

Viewpoint: Road Freight Loads

'Fuller loads mean fewer loads and less miles, which means there are savings in there as well.'

The Transport Network – Challenges

Ferry

The Spirit Supply Manager outlined that probably the greatest challenge presented by the transport network for his area of Diageo's business focuses around Islay. On occasions the **ferry service** to and from the mainland can be unreliable in that it does not operate, usually because of bad weather; or the service may be less frequent because one of the **vessels** has been moved to cover another route or is in dry dock for repair. These issues can also affect the delivery of finished goods to other islands via **ferry**. In addition, the growing popularity of Islay as a tourist destination means that businesses are in competition with visitors for the use of ferries and the **road network**.

Road

Closure of the **A83 at the Rest and Be Thankful pass** can also cause transport problems for Diageo, as loads have to be diverted up to Dalmally and round, adding an additional 50 miles to journeys down to Cambus or Blythswood. It was suggested that attempts to make repairs and ameliorate the problems with landslides at this location have not really addressed the issue any more than temporarily.

Speaking about other road closures, and specifically the **A9**, the Spirit Supply Manager highlighted that when closures do occur, these generally take place overnight and Diageo have plans in place to work around the closure.

Viewpoint: The A9

*'The A9 isn't a big problem for us. Occasionally yes, if the weather is really bad it might be shut for a day or two, but these things can happen quite frequently so **we have contingency plans** when they do. We can hold distilleries back and hold back the spirit a bit, we can go the other route and if things get really bad we can ask for assistance from another supplier to get things moving – there's ways round about it. The A9 for me isn't a problem.'*

By contrast, the **A95** is perceived by hauliers to be more problematic and more of a challenge (e.g. travelling north from Aviemore into Speyside), in part due to the steep camber of the road. Though he had never seen it himself, the Spirit Supply Manager had heard of instances where a large vehicle making room to pass another sizeable vehicle on narrow sections of the road had tipped over.

Interestingly, Diageo's new maturation warehouse complex at Cluny near Kirkcaldy in Fife had presented some unforeseen transport issues. The easiest routes to the Cluny complex from a number of other Diageo sites, such as Cambus, Menstrie and Leven, had greatly increased the volume of **heavy goods traffic** through Kincardine village, occasioning complaints from local residents. The Spirit Supply Manager has now changed the route so that the village is avoided.

Viewpoint: Heavy Goods Traffic

'Sometimes our footprint changes, which creates new routes for us and increases the volume of traffic through particular places; this is obviously a change for the people who live there and that they might not be too happy about.'

Rail

The trial movement of bulk spirit by **rail** that Diageo had participated in: 'Lifting the Spirit', referred to in the previous section, had highlighted some of the accessibility and connectivity issues between **road** and **rail** within Scotland, along with the additional costs that this option had presented.

Viewpoint: Rail Freight

'Taking spirit from Speyside, where you've got something like a fifteen mile tortuous route heading north to get to a railhead, and then going all the way south again, just doesn't make sense. If all our distilleries were concentrated around Elgin, then fine, but they're not, they're up in Speyside. At the other end you've got a road leg from Grangemouth to Cambus, plus the train costs, cost of your additional lifts, tank hire. Comparing this with the costs of a road run from point to point and beating it would be very difficult to do.'

The Transport Network – Benefits and Opportunities

The Shipping Manager spoke positively about the present transport network within Scotland and the benefits to Diageo regarding movement of goods and supporting the business.

The **A9 dualling work** currently taking place was viewed as a very positive development in terms of increasing capacity and making the road faster and safer. As well as benefitting the movement of bulk products, it was anticipated that this improvement will also be advantageous for the movement of cased goods to the highlands and islands. Raising the speed limit for HGVs from 40mph to 50mph was also seen as a favourable measure because of the better traffic flow, decrease in driver frustration and improved fuel consumption. In common with the dualling work, there was a perception that this change had served to enhance safety because drivers are less tempted to overtake.

Turning back to the use of **rail freight** for the movement of new make spirit in bulk, the Spirit Supply Manager said if Diageo were able to 'piggy back' on an established run and there was no risk of additional costs being incurred, this might be an option worthy of consideration.

The Transport and Warehousing Manager highlighted the negative influence that adverse weather can have on the movement of goods in Scotland and cited the closure of the **Forth Road Bridge** to high-sided vehicles as a cause of delays and increased journey times. **The Forth Replacement Crossing** was seen as beneficial in terms of reliability for the transport of finished goods by HGVs, particularly for journeys between Grangemouth and Leven. The Spirit Supply Manager also highlighted that the new Queensferry Crossing would be used for the transfer of neutral spirit from Selby in North Yorkshire and Manchester up to Leven for the production of gin and vodka. This particular movement of goods was identified as having the potential to be achieved by way of **rail freight**.

Speaking about the movement of goods from Blackgrange to Shieldhall and Blythswood, the Spirit Supply Manager stated that the completion of **improvement works on the M80** had helped to enhance traffic flow and reduce journey times considerably. **Improvements to the M8** were seen as beneficial to Diageo staff commuting from Edinburgh to Glasgow and vice versa.

The Shipping Manager outlined that Diageo's transport operation in the west of Scotland had gained some flexibility with **the M74 extension**. Previously, if there had been problems with the Kingston Bridge this would have had a negative impact on journeys to and from Shieldhall – the extension has provided another route option. **Improvements to the M74/M73/ M8 junction** were also seen as beneficial, as were any other developments which 'cut down congestion will help us in that central corridor'.

Case Study 4: Mackays

Follow the Fruit Preserves

Background and Introduction

Looking ahead to 2018, research agency Canadean forecasts that the UK syrup and spreads market will grow by 22.5%. Sales of jam and honey dominate the market which, it is anticipated, will have a value of £613 million.

Marmalades, preserves and curds company, Mackays, is located in Arbroath and was founded in 1938. Since its acquisition by the Grant family in 1995, Mackays developed quickly from a relatively small firm supplying jam for United Biscuits' Jammie Dodgers into a leading brand in the UK preserves industry. In 2012, Mackays won a major expansion of its contract to supply Tesco stores throughout the UK. The firm, which also supplies a number of other supermarket chains and online grocery retailer, Ocado, has seen annual increases in profitability, growth and turnover in recent years. Chairman Paul Grant credits this success to, 'the introduction and development of new products and expansion into markets coupled with efforts to ensure growth also continues in existing areas, both geographic and product-related.'

Following Paul's receipt of the Scottish Government's first Food and Drink Outstanding Achievement award in May 2013, the following year Mackays won *The Courier's* 'Business of the Year' Award, posting pre-tax profits of £836,554 in the year to 31 December 2014; an increase of just over £100,000 when compared with the previous year. Whilst more than 70% of Mackays' sales during that year were made in the UK, the company has a very successful international export arm, with sales reaching 78 countries across the world.

Employing 150 staff, Mackays is very much a Scottish firm and the soft fruits (i.e. strawberries, raspberries and blackcurrants) for its preserves and conserves are home-grown by local producers in Fife, Perthshire and Angus. The company's marmalades and preserves are made as they always have been; in locally manufactured copper pans using traditional methods.

Mackays leading brands in the UK are its Scottish Strawberry Preserve and two varieties of marmalade: Seville Orange and the Dundee Orange. By contrast, the export market demonstrates slightly different tastes, for example, in Scandinavia, Mackays' Lemon Curd is the best seller with its new Raspberry Curd proving extremely popular. Other new lines currently in production include a cherries and berries preserve, blueberry and pomegranate preserve and a Christmas marmalade.

Mackays also manufacture the Mrs. Bridges range which includes preserves, marmalades, honey, curds, chutneys, mayonnaises, mustards, relishes, dressings, sauces and salsas.

The following details are drawn from an interview with and information provided by the Factory Manager at Mackays. She is responsible for the day-to-day running of all elements of the factory's operation including purchasing, planning, manufacturing, packing, warehousing, dispatch, engineering and technical.

Use of Transport and the Transport Network

Choice of Sites

Mackays operates all aspects of the business from production of preserves through to packaging and dispatch, from one location in Arbroath. The Factory Manager explained that when the Grant family purchased the business, it had been operating from a small Victorian factory site in Carnoustie. The site in Arbroath was primarily chosen because it was available, an appropriate size for a company with immediate plans to expand and for its close proximity to Carnoustie; of key importance to the existing workforce. Arbroath was also selected because of its ready pool of labour.

The site itself is located close to a **main road**, the **A933 Forfar Road**, which forms the main arterial route between Arbroath, Forfar and Brechin. It has good **public transport** links with a number of bus routes running close to the factory site. Arbroath is also well served by **rail transport** with regular services running to and from key locations such as Edinburgh, Glasgow, Stirling, Perth, Dundee and Aberdeen.

Movement of Goods

Mackays uses **external haulage companies** for the main bulk of goods movements relating to its business operation. With one or two minor exceptions, **third party hauliers** are used for the delivery of raw goods and materials to the Arbroath site and for the transportation of finished goods to market.

The company does have its **own van** which is used for minor movements of goods and materials to and from an off-site storage facility; active during busy periods such as the lead up to Christmas. The **van** is also utilised to carry out pick-ups and drop-offs that are needed in quick time.

In summary, the vast majority of transport used by Mackays within Scotland is on the **road**. In making this choice, the company's primary consideration is moving goods in and out of its Arbroath location in the most efficient, expeditious and cost effective way possible.

Whilst most of the fruit for Mackays products is locally grown and sourced, the nature of the business means that certain ingredients and commodities originate from outside Scotland. For example, the oranges for the firm's marmalades come from Seville and are transported by **road** to Bilbao and then by **sea** to Rosyth. On arrival, the fruit is moved by truck up to Arbroath. Mackays buys jars from Ireland and other parts of the UK, jar lids from France and jute from India to make bags for some of its gift sets.

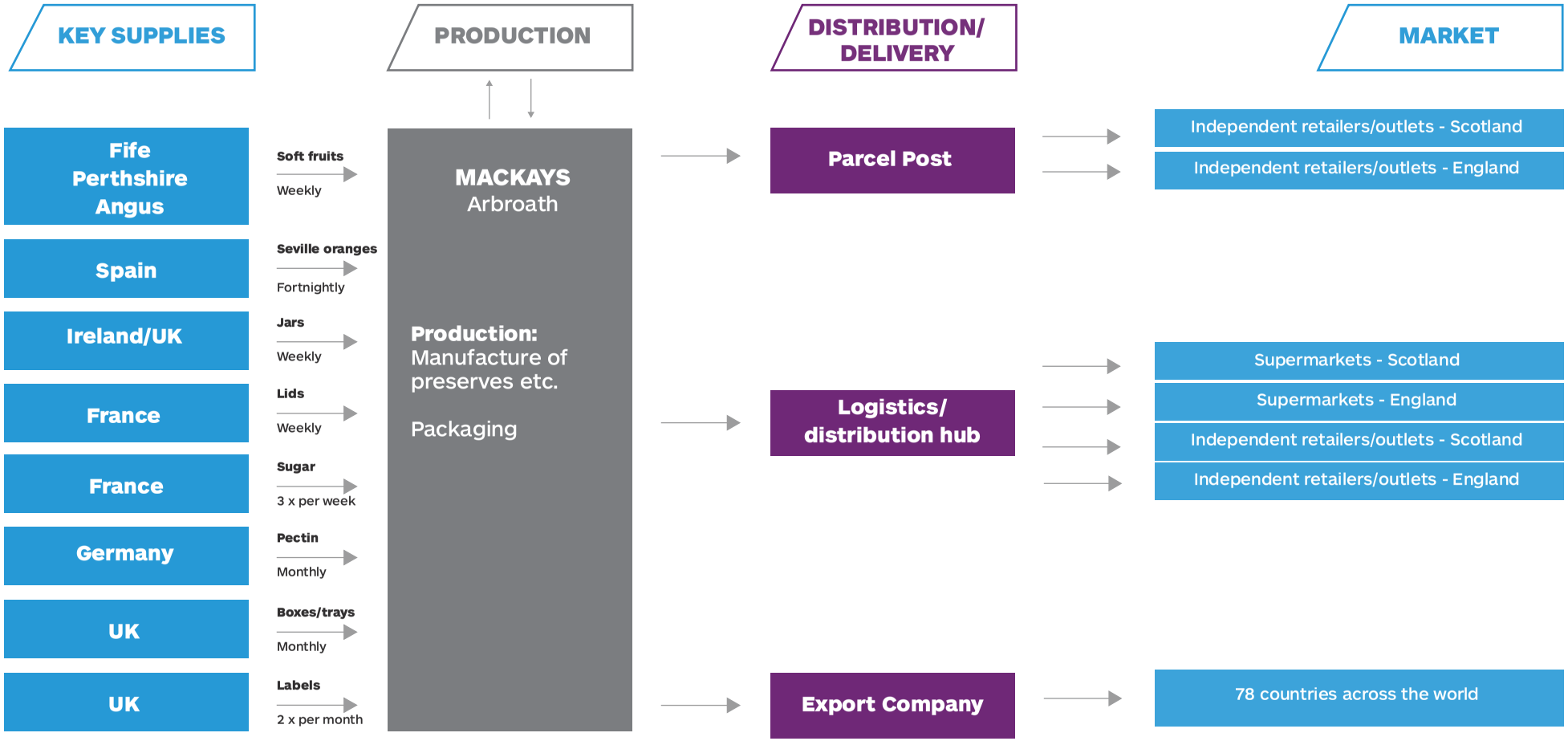
A sizeable proportion of Mackays finished goods are destined for the export market and are packed into containers for **shipping overseas**, with loads leaving both **Scottish and English ports**. Consignments of products for distribution to the UK grocery market are transported by **road** to a central distribution hub in England for onward delivery as part of consolidated loads. A proportion of finished goods, mainly from the Mrs. Bridges range, is destined for independent markets across the UK, distributed by **parcel post** and to some customers in full loads.

Movement of Staff

Speaking about how staff commute to the Arbroath site, the Factory Manager outlined that this tends to be a mixture of people using their **own vehicle** or travelling on **foot**, as many staff live within **walking distance** of their workplace.

The figure overleaf provides a high level summary of the goods in-out movement for Mackays.

Mackays – Summary of Goods In-Out Movements



Use of Sustainable Modes of Transport

The Factory Manager highlighted that whilst Mackays currently use **road transport** as the primary means of moving goods and materials to and from its site in Arbroath, the company would certainly be open to looking at the possibility of using **rail freight** in the future. None of the raw materials and packaging that Mackays use, nor any of its products, requires special storage or transportation conditions that **rail freight** would not be able to meet.

Viewpoint: Rail

'Of course. We'd be happy to consider anything that would improve the efficiency within the process. There's a railway station in Arbroath so the foundations are there.'

The Factory Manager outlined that whilst there is nothing standing in the way of Mackays using sustainable modes of transport, the company is content with the way its transport is organised at present; the arrangements are effective and economic.

The Transport Network – Challenges

Whilst Mackays' Arbroath location has positive transport benefits which are outlined in the next section, the Factory Manager identified some challenging aspects to this locale, particularly in relation to the delivery of goods from England; challenges which are not an issue for businesses located further south in Scotland. Deliveries come up from England by **road** usually to a hub in the central belt before further transport up to Angus. Because deliveries are made during the journey further north to Angus, the time this takes means that a.m. deliveries cannot be guaranteed.

Viewpoint: Deliveries by road

'Trying to get deliveries to Arbroath can be quite frustrating. You can't get an a.m. delivery for example. Most haulage companies and couriers can't guarantee that we will get a delivery a.m. In some cases you can get a.m. delivery, but only if you are willing to pay a hefty premium.'

The weather in winter time can present another issue linked to transportation, mainly due to a perceived lack of road clearing when snowfalls are experienced.

Viewpoint: Weather affecting roads

'We can be cut off from the rest of civilisation because of a wee drop of snow. It can be quite frustrating. We know the bad weather is coming but the local council aren't very quick at reacting. You're trying to get goods in and the lorries can't physically get into Arbroath or through Dundee. That can be a bit of a challenge. We had snow last week and I saw just one tractor and snowplough out clearing the roads.'

The weather can also have an impact in terms of deliveries of Seville oranges required for Mackays marmalades from Spain and the Factory Manager pointed out that the company are 'at the mercy of the seas' to an extent. If the weather conditions are such that a ship is unable to sail, this will disrupt the production process as Mackays will have to wait for the delivery of oranges.

She described that whilst the temporary closure of **Forth Road Bridge** in December 2015 had been an issue at first, people became accustomed to this quite quickly, making sure that additional travel time was incorporated into planned journeys relating to the delivery of raw materials and the transport of finished goods.

Speaking about the accessibility of different parts of Scotland and the wider UK, the Factory Manager said that whilst overall, Mackays can get finished goods to the vast majority of locations, there are one or two areas that the company does not physically deliver to because of the cost involved in

doing so. As well as the company's 'bulk business', Mackays also services the needs of smaller businesses which may order a few cases of finished goods. The firm uses parcel post to fulfil these orders, which can be quite expensive, particularly for locations in the Highlands.

The Transport Network – Benefits and Opportunities

The Factory Manager outlined that the proximity on the **road network** of Arbroath to Dundee and Aberdeen is advantageous transport-wise in terms of loads being picked up and dropped off.

Viewpoint: Road network

'In Arbroath we tend to be the "inbetweenies". If there's wagons going up to Aberdeen they can pop in on their way and pick goods up or drop them off, and we're only 20 minutes away from Dundee. We're quite central on the east coast which is good.'

She maintains that access to the export market has only been possible with the aid of a transport network which is reliable and efficient. Mackays work in conjunction with distributors and transport companies, both in the UK and abroad; arrangements which have allowed the company to access and grow their business in 78 countries worldwide.

The Factory Manager believes that the new **Forth Replacement Crossing** will have clear benefits for Mackays in terms of the positive impact it should have on the flow of traffic.

Viewpoint: Road traffic delays

'We don't really have many hold-ups just now, but there are times when there are tail-backs on the bridge and traffic is slow, so another crossing is going to help that. It'll certainly help traffic flow freer and reduce any delays on the way up I would have thought.'

The Factory Manager also spoke positively about other **road improvement projects** (e.g. **M8** and **M74**) and the benefits to Mackays' business. She highlighted that **any improvements to the main arterial roads** will help traffic to flow more efficiently with fewer hold ups, ensuring that deliveries arrive without delay, whether this be finished goods going out to the customer or raw materials and packaging being delivered to the Arbroath site.

Annex

Organisations interviewed

In addition to the six interviews with Scottish Enterprise and Highlands and Islands Enterprise, the following organisations were interviewed:

1. Scottish Games Network
2. Creative Scotland
3. Oil and Gas UK
4. Energy North
5. Scottish Financial Enterprise
6. Scotch Whisky Association
7. Scotland Food and Drink
8. Association of British Pharmaceutical Industries
9. Chemical Industries Association
10. Scottish Tourism Alliance
11. VisitScotland
12. Scottish Chambers of Commerce
13. Federation of Small Businesses
14. Institute of Directors
15. SCDI (Scottish Council for Development & Industry)
16. CBI (Confederation of British Industry)
17. STUC (Scottish Trade Unions Congress)
18. RHA (Road Haulage Association)
19. FTA (Freight Transport Association)
20. RFG (Rail Freight Group)

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