



Identifying Options for Developing the Transport Infrastructure for the Food and Drink Supply Chain to Strengthen its Resilience



AGRICULTURE, ENVIRONMENT AND MARINE

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Executive Summary

This report presents the outputs of a study investigating existing Scottish food and drink export logistics, and in particular the resilience of those logistics to ensure the reliable, timely delivery of products to markets. Our work has been based on evidence provided by representatives from the key food and drink markets and transport/logistics sectors and also informed by reviews of published information and studies.

It should be noted that many stakeholders engaged during this research are highly concerned about the post-Brexit lack of capacity available for customs checks and food standards checking, and resulting delays to transportation. This report does not focus on these customs and regulatory issues, as separate investigation of them is underway by the Scottish Government, and instead considers in detail only matters directly relating to the transport system.

The transport resilience of the main sectors of Scotland's food and drink industry can be summarised as shown in the table 1, overleaf.

Table 1 Food and Drink Industry Summary

Food/drink sector	Whisky ¹	Seafood	Meat
Value of exports (2017)	£4,368M	£944M ²	£99M ³
Proportion of exports to EU27	32%	69% ⁴	97.5% of beef sales ⁵
Perishability of product	None	High for fresh produce	Limited pre-processing, high post-processing
Proportion requiring processing in England (for which direct exports from Scotland is less helpful)	Virtually none	Some processing undertaken around English east coast ports	A substantial proportion of Scottish red meat relies on slaughter and/or processing in England
Main transport modes and routes	Containerised loads, some leaving directly from Scottish ports, but most by truck or rail to English ports	EU fresh exports are almost all taken by road, through the Channel Tunnel. Non-EU fresh exports are mostly taken by road from Scotland to Heathrow, then airfreighted. Containers, moved by ship, used for frozen exports	Road vehicles, some making collections in England on their journeys to the continent from Scotland or originating in Northern Ireland/Republic of Ireland.
Main transport risk points	Rail freight network availability	M74/M6/M40 then Channel Tunnel route to EU markets: delays result in missed delivery windows Reliance on Heathrow for non-EU exports	Largely reliant on road transport, albeit with significant flexibility on route, but much dependent on English supply chain
Resilience of export potential to transport network shocks	Generally good: alternative routes can be found relatively readily	Weak: the sector is heavily reliant on just two transport routes	Moderate: transport flexibility is available, but the sector is almost entirely reliant on the EU for its export market

¹ Scotch Whisky Association, *Scotch Whisky 2017 Export Analysis*, 2018

² Scottish Government Food and Drink Statistics, <https://news.gov.scot/news/exports-hit-record-gbp-6-billion> accessed on 26/02/2019

³ As 2

⁴ HMRC, Regional Trade Statistics, <https://www.uktradeinfo.com/Statistics/BuildYourOwnTables>

⁵ International Trade Fair Signals Strong Demand from Overseas Buyers, <https://www.gmscotland.co.uk/news/international-trade-fair-signals-strong-demand-overseas-buyers> accessed on 11/04/2019

Our work has also reviewed the potential for Scottish ports and airports to cater for a greater proportion of food and drink exports. This has found that:

Container traffic:

- Food and drink (and particularly whisky) comprises a large proportion of current containerised exports from Scotland.
- Extant ports at Grangemouth and Greenock have capacity to handle more container traffic, potentially handling some of the traffic that currently travels to English ports by rail and road.
- However, some stakeholders questioned whether there could be sufficient demand to encourage more container vessels to call at Scottish ports.
- All non-EU-bound containers moved from Scottish ports are transhipped (at Rotterdam, Liverpool, Felixstowe or elsewhere), so some resilience risks remain even if the British port of exit is changed.
- Shipping routes and transshipment points are also determined at least as much by which company is transporting the cargo as its origin and destination locations, and are largely outwith the direct control of the customer.

RoRo⁶ traffic:

- Scotland has had no RoRo international ferry capacity since the cessation of the Rosyth-Zeebrugge service in 2018, though the infrastructure remains available for use.
- When operating, food and drink exporters made little use of Rosyth-Zeebrugge: the inflexibility of its relatively infrequent service (in comparison with the short sea crossings of Dover-Calais and the Channel Tunnel) and, especially for perishable fish produce much of which is heading for the main market in Boulogne-sur-Mer, longer travel time than driving south and using a short crossing, counted against it.
- No other extant Scottish ports offer more attractive locations for RoRo traffic to the main continental markets.

Airfreight:

- EU markets are currently mostly served by road freight, not air, and non-EU drink and frozen products mostly carried in containers by sea. Airfreight is instead suited to long-distance (non-EU), perishable food exports.
- UK airfreight is dominated by Heathrow: Scotland's top four airports for airfreight (Edinburgh, Glasgow, Prestwick and Aberdeen) between them combined carry only 4% of the freight carried through Heathrow.
- Heathrow benefits both from direct flight connections to many destinations and a mature network of facilities to handle freight.

⁶ 'Roll-on roll-off' (where road vehicles are transported on ferries)

- Most Scottish produce being exported from Heathrow is taken there by truck; this is typically more flexible than airfreight between Scotland and Heathrow, and often quicker.
- Scottish airports have capacity to handle more airfreight, but facilities at the airports and the accompanying services are much more limited than at Heathrow. This is a particular constraint for handling perishable food exports; of Scottish airports, only Glasgow currently provides any permanent refrigerated storage capacity. To address short term pressures Prestwick has previously hired refrigeration containers.
- The increasing number of flights from Scottish airports direct to non-EU destinations provides opportunities for more airfreight; there is, generally, spare capacity for freight on these flights.
- Scottish airports have the capacity to cater for charter freight flights, which could be provided in the event of disruptions to other networks. But some food and drink industry consultees questioned the effectiveness of these; the industry relies on getting a relatively small volume of its produce to many destinations on a regular basis; charter flights might swamp relatively few locations with large amounts of produce.

Option generation and appraisal

The research team undertook a high level option generation and appraisal based on the evidence gathered. Eight options regarding how to improve resilience in the food export sector have been identified as worthy of further investigation and are summarised below.

1: Modifying supplier/buyer expectations:

- Benefits to seafood industry: to build in resilience in the transport system, a review of the buyer/supply expectations and market destinations could be considered.
- Deliverability: Short term. Would require negotiation between processors and customers
- Investment required/affordability: Low level of investment but potential impact on market price and transport costs and negotiating terms may impact on the viability and attractiveness of Scottish produce.

2: Explore new markets and customers for seafood in addition to Boulogne sur Mer:

- Benefits to seafood industry: Would increase flexibility and routes to different markets and supplying other markets distributes the risk.

- Deliverability: A study has recently been commissioned to investigate internal UK transport issues and other destinations apart from Boulogne-sur-Mer which may address this option.⁷
- Investment required/affordability: Low level of investment but potential impact on market price and transport costs. Increasing the routes to different markets will improve the resilience of the export market.

3: Incentives to increase HGV driver numbers in the UK:

- Benefits to all exports: The industry has an ageing workforce and an existing shortage of approximately 45,000 drivers UK-wide.
- Deliverability: Incentives to increase HGV drivers could include better driver facilities, raising awareness of the logistics sector and increased support for apprenticeships.
- Investment required/affordability: Low level of investment. Government or haulier incentives to attract and retain drivers.

4: Increased storage capacity at airports:

- Benefits to all exports: Improved storage facilities, including refrigeration, at airports could support exporting seafood and other goods by air.
- Deliverability: Short to medium term. Edinburgh Airport is starting a review of their facilities, including storage and refrigerated lorries could provide short term storage.
- Investment required/affordability: Medium level of investment by airports. Care would be needed to avoid giving unfair competitive advantage to one location.

5: Scottish Exports Working Group:

- Benefits to all exports: Regular Working Group with representatives from industry, hauliers, freight forwarders and Scottish Government. The group could respond quickly and provide details of issues faced and solutions in emergencies.
- Deliverability: Short term. Build on existing relationships to formalise a working group representing all aspects of the export market. Could provide an opportunity to develop pilot schemes to investigate and test new markets and routes.
- Investment required/affordability: Low level of investment. Would require a commitment from industry and Scottish Government.

6: New technology for transporting products:

- Benefits to seafood industry: New technology for seafood storage may extend the shelf life of products.

⁷ Seafood Scotland have commissioned a study into potential new markets for exports of seafood. Completion in early summer 2019.

- Deliverability: Short term. Recent research includes monitoring of seafood in transit to ensure freshness with schemes piloted in Norway and Iceland.
- Investment required/affordability: Increased cost of transport.

7: Increased chartered flights or scheduled flights with bellyhold capacity for freight:

- Benefits to all exports: Increasing the range flight destinations and improved storage facilities and market development at Scottish airports could open up new markets and routes.
- Deliverability: Issues to be considered include: consolidating products, consistency and seasonality, the backloading implications and a large consignment might temporally flood a market, reducing the price it could command.
- Investment required/affordability: Medium level of revenue support required to pump prime what would hope to be a viable new export option for Scottish produce.

8: Enhanced Scotland – Europe rail freight capacity:

- Benefits to all exports: Direct connection to Europe and reduced requirement for in demand HGV drivers.
- Deliverability: Rail freight improvements could include a direct connection through the Channel Tunnel from Scotland and increased rail use for internal movements to England ports.
- Investment required/affordability: Medium level investment. Government funded pilot scheme to test the route.

1 Introduction

The Scottish Government's Scotland's Economic Strategy recognises the Food and Drink industry as one of six key Growth Sectors (alongside Financial and Business Services, Life Sciences, Energy, Tourism and Creative Industries). The significance of the sector to the economy is underlined by recent growth, with annual food and drink export sales accounting for £6bn in 2017, a rise of over £550m compared to 2016 and a more than doubling in food sales (+130%) since 2007.⁸

Significant opportunities for long-term growth are foreseen. 'Ambition 2030. A growth strategy for farming, fishing, food and drink', published by Scotland Food & Drink Scotland in 2018⁹, sets out plans to double the value of the sector to the Scottish economy by 2030.

The 'How Scotland's Transport Network Supports the Growth Sector' report, published by the Scottish Government in 2016¹⁰, considered how Scotland's six Growth Sectors collectively use the transport network and reported that, while transport is not the main issue experienced by businesses in Scotland at the moment, a resilient transport network is crucial to promoting growth.

Recent events, such as the Channel Tunnel/Calais route disruptions in 2015, severe winter weather in 2018 and potential disruptions associated with Brexit, highlight the vulnerability of the transportation network for the reliable movement of goods and people. Resilience of the transport network is particularly pertinent when handling time-critical perishable goods which are integral to the Scottish food and drink industry, and to all others for which customers insist on reliable, timely deliveries. Any loss of capacity on the transport network can lead to delays which could have significant consequences to onward trade, with goods either ruined or their market value significantly eroded.

This report presents the outputs of a study investigating existing Scottish food and drink export logistics, and in particular the resilience of those logistics to ensure the reliable, timely delivery of products to markets. Our work has been based on evidence provided by representatives from the key food and drink markets and transport/logistics sectors and also informed by reviews of published information and studies. Seventeen stakeholders have been involved in the study. The evolving and fast-moving political landscape in which this study has been conducted is considered throughout this study and we recognise that views of stakeholders may also evolve as Brexit discussions continue.

⁸ Scottish Government Food and Drink Statistics, <https://news.gov.scot/news/exports-hit-record-gbp-6-billion> accessed on 26/02/2019

⁹ Scotland Food and Drink, *Ambition 2030, A growth strategy for farming, fishing, food and drink*, 2018

¹⁰ Transport Scotland, *How Scotland's Transport Network Supports the Growth Sectors*, 2016

It should be noted that many stakeholders engaged during this research are highly concerned about the post-Brexit lack of capacity available for customs checks and food standards checking, and resulting delays to transportation. This report does not focus on these customs and regulatory issues, as separate investigation of them is underway by the Scottish Government, and instead considers in detail only matters directly relating to the transport system.

1.1 Methodology

At the first stage of the study, key stakeholders were identified and a series of face-face meetings were held. Alongside the initial discussions the research team undertook a review of previous studies and data including maritime, aviation and food and drink studies. These initial discussions and our concurrent review of published information were used to help develop structured interviews with a range of transport, food and drink and logistics organisations. The stakeholders contacted as part of this study evolved and was led by information gathered from the initial stakeholders. There were seventeen interviews (some undertaken face-to-face and some by telephone) and a number of follow up discussions to clarify or investigate points further. The purpose of these interviews was to understand the current and anticipated routes of food and drink and explore relevant issues and constraints.

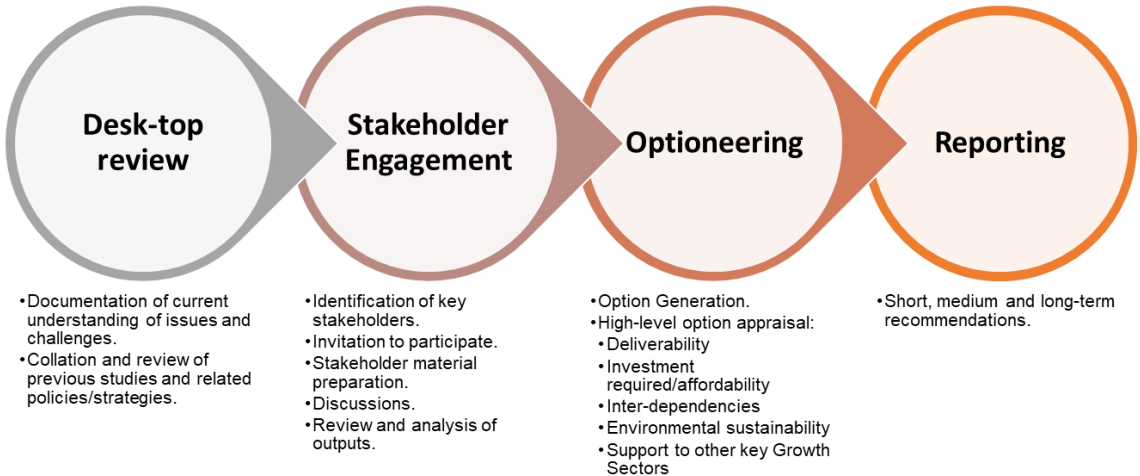


Figure 1. Study methodology

The research team, which included personnel with expert knowledge of the Scottish maritime, aviation and seafood industries collated the outputs of the information gathering stage and undertook a high level option generation. The option generation was informed by outputs from discussions with stakeholders, previous studies and the project team contributing further options for consideration.

The options were considered through a high-level appraisal. The appraisal was largely qualitative in nature and took account of different criteria:

The potential of different options has been considered through a high-level appraisal. This appraisal has been largely qualitative in nature, incorporating quantitative information where feasible and takes account of different criteria:

- Deliverability:
 - Deliverability will consider the feasibility, acceptability and timescales of options;
- Investment required/affordability:
 - Details of the investment required, where available, including capital and revenue funding, subsidies and any state aid conflicts;
- Inter-dependencies:
 - Inter-dependencies will appraise the impact an option would have on existing operations, for example, processing hubs in England;
- Environmental sustainability:
 - Environmental sustainability will consider the environmental impact associated with the option;
- Support to other key Growth Sectors:
 - Whether the option is considered to provide benefit to Scotland's other Growth Sectors (Financial and Business Services, Life Sciences, Energy, Tourism and Creative Industries)

Recommendations for further investigation were concluded following this appraisal.

1.2 Report structure

The next section of this report summarises the main sectors of Scottish food and drink, their markets and transport routes currently used. The following chapter on the broader transport context explains the impacts transport issues can have on the industry and its potential to grow. A review of the facilities and capacity of Scottish ports and airports in relation to their ability to handle a greater proportion of Scotland's food and drink exports is then presented. The outputs from the initial chapters were then considered as part of the option generation, appraisal and development to provide recommendations to improve resilience in Scotland's food and drink sector.

2 Scottish food and drink production, markets and transport routes

In 2017 Scottish food and drink exports were worth approximately £6 billion; almost £570 million more than 2016.¹¹ Drink was the largest proportion, valued at £4.36 billion (73% of total food and drink exports) with Scotch Whisky comprising almost all that value. Fish and seafood accounted for the majority of food exports and were worth approximately £944 million, up 23% from the previous year and 16% of total food and drink exports.

This section identifies the key markets and transport routes on which the main food and drink sectors in Scotland rely.

The source of the export data is the Her Majesty's Revenue and Customs (HMRC) Regional Trade Statistics and Overseas Trade Statistics and Export Statistics Scotland. This provides a comprehensive overview of Scotland's export market; however, there are cases in which Scottish production for export is poorly attributed in the data due to the location of processing and / packaging etc. or data has been processed differently for the HMRC and Scottish Government Export Statistics Scotland.¹²

When the entire production process for Scottish produced goods (the majority of whiskies, for example) is completed on Scottish soil, the origin of goods exports is better known. However, some goods may be moved across internal UK boundaries for packaging and further processing prior to export (for example, whitefish landed in Scotland but processed in Grimsby). This level of cross-border processing is not easily quantified and makes it difficult to determine the origin of some goods. This effect is not limited to seafood exports: dairy, meat and other Scottish products can also originate in Scotland with further production and value added in the rest of the UK.

Export data reliability is further compromised by the transshipment of goods which results in the 'Rotterdam effect'. The largest importing country is Netherlands largely because Rotterdam acts as a major distribution hub as well as a port. This means that Rotterdam is often recorded as the destination of many goods exported from Scotland (and the rest of the UK) which are then subsequently re-exported to other destinations.¹³

As such, the figures given below should be considered as indicative, rather than definitive.

¹¹ Scottish Government Food and Drink Statistics, <https://news.gov.scot/news/exports-hit-record-gbp-6-billion> accessed on 26/02/2019

¹² Scotch Whisky Association reports a different 2017 whisky export figure compared to Export Statistics Scotland for example

¹³ Transport Scotland, *Transporting Scotland's Trade*, 2018

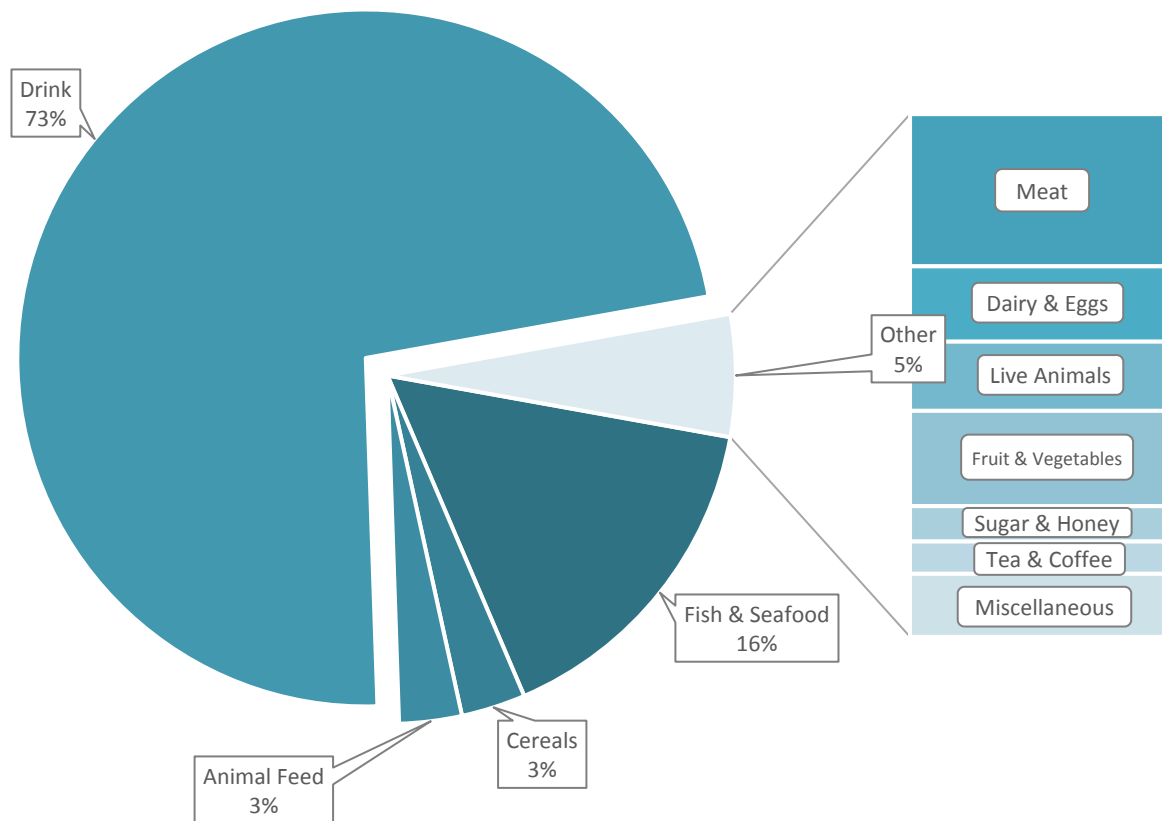


Figure 2. Scotland's Food and Drink Exports, by product type, 2017¹⁴

2.1 Whisky

2.1.1 Production and markets

In 2017, exports of Scotch Whisky rose to £4.37 billion, which represents a volume of 1.23 billion bottles, exported to 180 markets worldwide. With over 10,000 employees directly involved in the Scotch Whisky industry and over 40,000 jobs across the UK supported by the industry, 7,000 of them in rural areas, whisky is a key product and export for the economy.¹⁵ Gin also represents a growing industry in Scotland.

The main markets for whisky are the EU, North America and Asia, as shown below.

¹⁴ Scottish Government Food and Drink Statistics, <https://news.gov.scot/news/exports-hit-record-gbp-6-billion> accessed on 26/02/2019

¹⁵ Scotch Whisky Association, *Scotch Whisky 2017 Export Analysis*, 2018

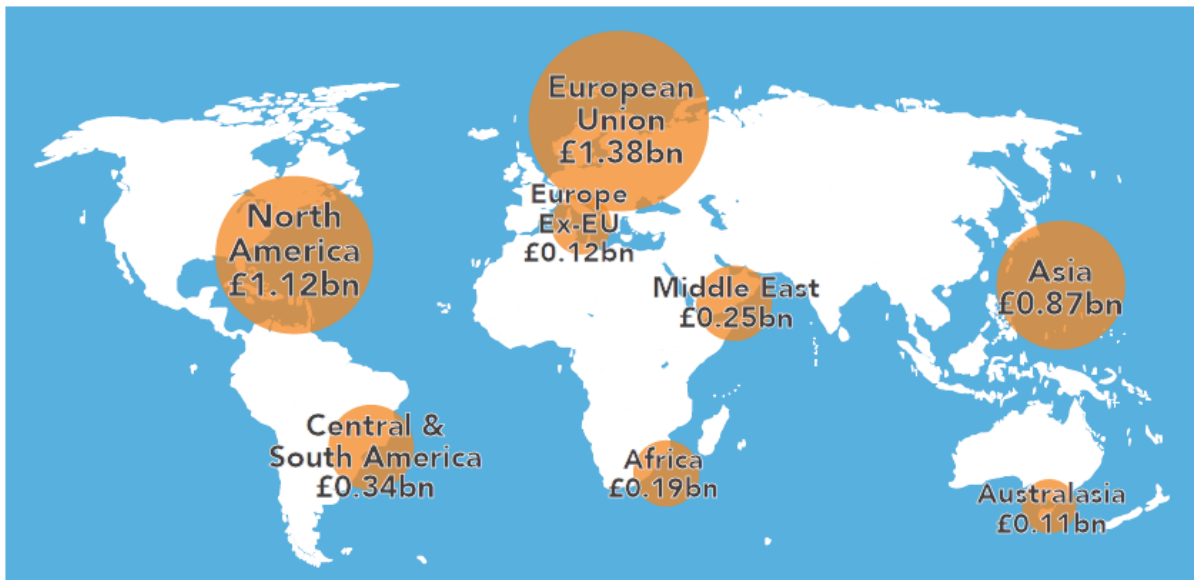


Figure 3. Regional Scale and Performance of Scotch Whisky exports, 2017¹⁶

These key markets continue to see increased volumes and valuations alongside emerging markets in Africa, the Middle East and some non-EU European markets. The EU is the main export region for Scotch Whisky with 32% of the total export, £1.38 billion. Within Europe, France is the largest market with 31.5% of total EU exports.

Outside of the EU, North America accounted for £1.1 billion worth of Scotch Whisky exports and for 25% of all Scotch Whisky exports by value. Values in Asia represented 20% of the export market.

2.1.2 Transport routes

After distilling, most whisky is sent to third party warehouses for maturing for at least three years and often significantly longer. After maturation, it is transported to bottling plants prior to transportation to the customer. The production of whisky is wholly contained in Scotland.

Bottling plants operate on a just in time basis and once bottled the product is sent to the port for export. If there are delays there is little storage on-site to hold the product. There is the potential to hold whisky in the maturation warehouse prior to bottling but not for a significant period of time and given the long lead times associated with whisky production, changes in the supply chain, market or logistics requires significant advanced planning.

The majority of whisky exports are transported in intermodal containers; and whisky comprises a large proportion of containerised exports leaving Scottish ports. The final bottled product is typically taken by road and rail to ports across the UK including Grangemouth, Greenock, Liverpool, Teesport and Felixstowe.

¹⁶ Scotch Whisky Exports Analysis 2017, SWA

Whisky is therefore relatively unsusceptible to potential delays at RoRo¹⁷ ports such as Dover (ferry and Channel Tunnel), which accounts for only a small proportion of whisky exports going to France.¹⁸ Exports destined for outside of the EU typically move via Rotterdam or other major ports, transhipped from the relatively small container ships serving Scottish ports to larger ocean-going ships for onward movement to international destinations.

There may be the potential to make greater use of the Channel Tunnel for rail freight to Europe, which could come directly from Scotland via the rail halts at Coatbridge, Mossend or Elderslie. There is the potential for customs issues associated with this but the product could potentially be cleared for export away from the terminal to minimise delays.

Greater use of the railways for freight highlight the importance of reliability on the mainline network, and especially the West Coast Main Line which provides the main route for Scottish exports. Floods in early 2015 resulting in the closure of the Lamington Viaduct showed the impact of incidents on the line. A number of diversionary railfreight routes are not W8 gauge¹⁹ cleared or 24hr, and this resulted in other export routes being explored, including the greater use of Greenock port, marine services from which were soon operating at close to maximum capacity. Had a similar incident occurred during the peak whisky period of August-December it is not clear how significant disruption could have been prevented.

There is little use of aviation for transporting whisky on a large scale. Its weight makes transport by air costly, whilst its long shelf life makes it unnecessary however it is used for high value bottles or to meet tight delivery timescales. Whilst increasing Scottish airport capacity and capability is not necessary to support export volumes, improving global connectivity is important for the industry both in allowing executives to reach new and growing markets, as well as increasing the number of tourists visiting Scotland and its distilleries.

2.1.3 Transport resilience

The whisky industry is relatively resilient to transport system shocks in comparison to other Scottish food and drink sectors. Its products are already transported in large volume to many countries across the world, meaning that its reliance on any one market is relatively small. It already utilises a relatively large number of UK ports as export points, reducing its reliance on single ports or routes.

¹⁷ 'Roll-on roll-off' (where road vehicles are transported on ferries)

¹⁸ Scotch Whisky Association consultation

¹⁹ The standard requirement for carriage of containers

2.2 Seafood

2.2.1 Production and markets

Seafood is one of the two dominant export products in the Scottish food and drink industry alongside whisky, with an export value of £944m in 2017.²⁰

Within this section, 'seafood' accounts for two broad sectors: fishing (wild caught fish) and aquaculture (farmed product comprising mostly salmon and mussels). Within fishing there is a broad distinction between inshore (boats under 12m in length, near the shore, largely shellfish) and offshore fishing (white and pelagic fish). These sub-sectors have been identified as they have fairly distinct supply chain routes, operational models and timescales to market.

Relative to the rest of the UK, Scotland accounts for 80% of catch by weight of total landings, and is the fourth largest sea-fishing nation in Europe.²¹ In 2015, Peterhead, Lerwick and Fraserburgh accounted for 48% of volume and 32% of value of all seafood landed in the UK²² with north eastern Scotland processing dominated by fish landed by vessels engaged in offshore activity.

Around 341,000 tonnes of sea fish and shellfish were landed into Scottish ports by inshore and offshore vessels in 2017, carrying a value of £505m, a 2% decrease in both value and volume from 2016 levels.²³

Inshore fishing typically focusses on nephrops norvegicus (langoustine/ scampi) and scallops²⁴, brown crab (growing in demand in the Far East), European lobster, and the velvet crab are also prominent. In 2017, £63.66m of value was landed by the inshore fishing sector at Scottish ports.²⁵

Aquaculture in Scotland broadly includes the farming of finfish (mostly salmon), shellfish (mostly mussels) and, to a small extent, seaweed.²⁶ An estimated 40% of farmed seafood is currently exported.²⁷ Salmon is the largest food export from both Scotland and the UK more widely; salmon exports have grown rapidly over

²⁰ Scottish Government Food and Drink Statistics, <https://news.gov.scot/news/exports-hit-record-gbp-6-billion> accessed on 26/02/2019

²¹ Assessment of Socio-economic and Cultural Characteristics of Scottish Inshore Fisheries – (not yet publicly available)

²² FAI, *Brexit and the sectors of the Scottish economy*, 2017

²³ Marine Scotland, *Scottish Sea Fisheries Statistics 2017*, 2017

²⁴ Assessment of Socio-economic and Cultural Characteristics of Scottish Inshore Fisheries – (not yet publicly available)

²⁵ Billing, S.-L. et al., *Scottish Inshore Fisheries Integrated Data System (SIFIDS): Assessment of Socio-economic and Cultural Characteristics of Scottish Inshore Fisheries*, 2018 (currently in draft)

²⁶ Imani Development, Westbrook, S., *The Value of Aquaculture to Scotland: A report for Highlands and Islands enterprise and Marine Scotland*, 2017

²⁷ Marine Scotland, *Topic Sheet Number 40, The Value of Aquaculture in Scotland*, 2017

the past decade, from a total of 128,606 tonnes of farmed salmon in 2008, to a total of 189,707 in 2017, an increase of nearly 50%.²⁸

In terms of volume, France and the Netherlands are the biggest destination markets for Scottish seafood produce once leaving the UK. This is due to the importance of Boulogne-sur-Mer, northern France, as a key auction market for onward buyers into other European centres (it is estimated that 80% of Scottish seafood exports to Europe are through Boulogne²⁹), and of Rotterdam as the major transshipment hub towards large Asian markets. As such, much of the produce categorised as exported to France or the Netherlands has final destinations in other countries. The third largest destination is the United States; mainly for fresh salmon.

Scottish salmon is exported to over 65 countries; the top five export destinations in 2017 were:

- USA (sales worth £193M);
- France (£188M);
- China (£69M);
- Republic of Ireland (£34M);
- Taiwan (£16M).

Germany, Poland, Canada, Belgium and the Netherlands make up the next five export destinations.³⁰

The share of exports to the Far East is on the rise, and Scottish Seafood has identified emerging market opportunities for Scottish exports in the six major Asian cities of Shanghai, Beijing, Hong Kong, Seoul, Tokyo and Singapore.

Lanarkshire is an important logistics hub for Scotland's shellfish and farmed salmon, with large scale temporary chill and cold storage facilities available on site for consolidating relevant loads before onward delivery. The Lanarkshire sites are well located to reach south England ports within one lorry driver shift. Increased congestion en route and potential increases in delays at ports will impact on the viability of completing the journey with one driver.

Bellshill, south of Glasgow, is strategically positioned next to the motorways and has developed into a processing cluster. As a result, it has become a staging post for consolidation of Scottish fish products.³¹

DFDS's site at Larkhall holds a significant strategic position in the aquaculture logistics chain. The transport hub and chilling facility handles at least 140,000

²⁸ Marine Scotland Science, *Scottish Shellfish Farm Production Survey 2017*, 2017

²⁹ Market Driven Supply Chains, *Export Resilience Research Project Report*, 2016

³⁰ <http://scottishsalmon.co.uk/salmon-exports-reach-record-600m/> accessed on 26/02/2019

³¹ Transport Research Institute, *Synthesis report of Freight flow mapping – Scotland Part*, 2012

tonnes of fresh seafood for exports annually – the vast majority of all Scottish salmon, likely over 90% of the total – and is not yet at capacity.³²

Deliveries of fish are particularly time sensitive. Consignments typically have a maximum of around 60 hours to reach customers following dispatch. If product demanded live (typically shellfish) arrives dead there is a significant reduction in price and if it arrives at commercial market after midday the price drops by around 50%. This places a premium on ensuring speed and reliability of transport connections.

Destinations and routes for frozen produce vary due to the demand in new markets. For example, a large volume of pelagics landed at Shetland are directly exported to Russia, Nigeria and East Asia by sea, while brown crab is in increasing demand in China.

2.2.2 Transport routes

Almost all seafood bound for export leaves Scotland on road vehicles, as this provides the most flexible mode for time-sensitive goods.

Trade with Europe is dependent on the Channel Tunnel as journey times for ferries are too slow for time-critical produce.³³ The primary destination is the fish market at Boulogne-sur-Mer, which is a 13-hour journey from Larkhall, the same time that it takes to reach the London markets from Peterhead with a stop-off at Larkhall for packing. Orders are taken until 16:00 and the client expects the product to be in Boulogne-sur-Mer by 08:00 the following morning giving a short window for transport³⁴.

DFDS's timescales from Larkhall to Boulogne allow for up to a 45-minute delay to journey times, and have calculated that just a 7-minute delay attributed to paperwork at the border would take the trip over the limits permitted for a single driver and would necessitate either a second driver or result in the spoiling of the product.³⁵

Given the importance of road transport in the supply chain, the standard of infrastructure is critical. Issues with the M74/M6/M40/M25/M20 route to the Channel Tunnel remain, especially when delays are caused by roadworks.

The Channel Tunnel is generally considered to work well, though there are often high levels of congestion, particularly at weekends when maintenance takes place. But there is no current alternative route that can be used between the

³² DFDS consultation

³³ DFDS consultation

³⁴ MDSC, *Export Resilience Research Project Report*, 2016

³⁵ Seafood Scotland state that this could arise from a 7-minute additional delay in paperwork processing for export

Scottish seafood processing centres and the Boulogne market without the shipment being late.³⁶

A glimpse of the impact that delays can have on lorry movements was experienced during the introduction of Operation Stack on the M20 in 2015 as the result of industrial action in France by ferry workers. Consideration had been given to the issuing of permits to give priority to perishable goods, though such action was never taken.

Fresh seafood exported outside the EU is transported by air, almost all via Heathrow. Almost all Scottish seafood destined for export from Heathrow is taken there by road; interconnecting flights from Scottish airports rarely provide a time-competitive route.

Most seafood exported from Heathrow will travel as bellyhold cargo in scheduled passenger planes. There are reported to be regular capacity issues and difficulty securing space on flights from Heathrow, which must be booked several weeks in advance. During times of peak demand, preference can sometimes go to other products due to the smell associated with transporting fish.

A small amount of Scottish seafood is exported to non-EU countries directly from Scottish airports. The planes used for the Emirates service to Dubai from Glasgow are sufficiently large to carry palletised salmon, though we understand from aquaculture industry stakeholders that seafood consignments are flown from Glasgow only irregularly. Some small consignments of high value shellfish are transported from Edinburgh Airport.

Amongst Scottish airports, only Glasgow has any refrigeration infrastructure in place to store chilled produce prior to its export. At other airports, roadfreight hauliers must operate just in time deliveries to meet flights. There have also been discussions in the past about utilising Prestwick airport for seafood airfreight, but these have not been pursued to any conclusion.

Some frozen seafood (mainly prawns and scallops) leaves Scotland in containers, either on road vehicles or directly from Scottish container ports³⁷. These will often be destined for Far East locations, and rely on transshipment in Rotterdam or other major ports. There is reported to be a small proportion of direct shipments to the continental ports from Shetland.³⁸

It is reported³⁹ that, when the daily (and, latterly, every other day) Rosyth-Zeebrugge ferry service was in operation, little use of it was made for seafood haulage. This was partly the result of primary export auction markets being

³⁶ Market Driven Supply Chains, *Export Resilience Research Project Report*, 2016

³⁷ Transport Research Institute, *Synthesis report of Freight flow mapping – Scotland Part*, 2012

³⁸ As 37

³⁹ As 37

located in France, 35km from Calais but 160km from Zeebrugge, and the logical preference for the Channel Tunnel route by consequence. Furthermore, the Rosyth-Zeebrugge route was seen as ill-equipped to meet the strict time demands of Scottish seafood exports to the continent due to its limited frequency and the arrival times of the service.

2.2.3 Transport resilience

The Scottish seafood industry is heavily dependent on just two transport options to access export markets: the Channel Tunnel for export to Europe and Heathrow for other markets. No alternative transport route is available to the important European fish markets that enables current ordering and delivery expectations to be met.⁴⁰ Use of other transport routes would require longer lead times between customer orders and deliveries than the industry currently operates to (for example, Dover-Calais ferries).

Direct ferry services from Scottish ports to Europe have not, in the past, offered an attractive alternative. Scottish airports do not currently have capacity to handle significant volumes of refrigerated goods, and direct flights from Scotland connect to relatively few destinations in comparison with Heathrow.

2.3 Meat and Meat Products

2.3.1 Production and markets

Meat and meat products accounted for £99M of Scottish food and drink exports in 2017.⁴¹ The Scottish meat processing sector sends less of its produce overseas than the UK as a whole, and exports tend to be of higher value products, particularly for beef and lamb, with pork exports negligible. Fifth quarter products (which includes organs, hides and bones) make up a significant proportion of exports and play an important part for Scottish cattle and sheep processors, helping achieve better returns.

A huge proportion of meat exports from Scotland are bound for the EU; Quality Meat Scotland estimate the proportion of exports to EU countries to be 97% of the total.

Ireland, the Netherlands and Germany the largest markets within the EU. The USA and Brazil are the main destinations outwith the EU.

Parts of the Scottish meat industry are heavily dependent on supply chains into England. Significant proportions of Scottish-reared pigs and lambs are transported to England for slaughter. Almost all produce has some level of

⁴⁰ Market Driven Supply Chains, *Export Resilience Research Project Report*, 2016

⁴¹ Scottish Government Food and Drink Statistics, <https://news.gov.scot/news/exports-hit-record-gbp-6-billion> accessed on 26/02/2019

secondary production between slaughter and the market. Much of this processing, especially for animals slaughtered in England, though also of a significant proportion of those slaughtered in Scotland, takes place south of the border. A small proportion of Scottish meat is processed in Ireland.

Meat is not particularly time sensitive pre-processing, as time spent during transportation can be included as part of the maturation process. Post-processing, the perishability increases markedly, so fast and reliable transportation becomes more important.

Demand for scotch meat is growing in non-EU countries, but is such a small proportion of exports at present that it would take a wholesale shift in demand and transport networks before market substitution could that from the EU. Accreditation for exporting to China is being sought, though this is expected take a number of years to be approved.

2.3.2 Transport routes

Most meat exports are believed to be transported by truck, though some are understood to be moved in containers. Given the ability to include transportation time in the maturation process, transport is not usually considered a problem for the industry, unless faced with a short-term issue such as industrial action or a prolonged period of bad weather.

Regulations mean that consignments cannot be mixed, so different meats and meats at different stages of maturation must be kept apart on separate vehicles. As a result, some hauliers make multiple collections of the same types of product from different locations during their journeys, and these sometimes include loads of Scottish, English and Irish meat on a journey to the continent.

Rerouting these exports to leave from Scottish ports would be relatively inefficient, as would using Scottish ports to export Scottish meat that has been slaughtered and/or processed in England.

Some meat is flown from Edinburgh Airport to Heathrow for onward transport as belly cargo on commercial passenger flights.⁴² Interviews conducted for this research suggest that air freight operators have investigated the potential for new Prestwick or Edinburgh air links to the Far East, though the case has not yet been made, and a current constraint is the lack of refrigerated storage at Scottish airports, though general freight handling capacity exists.

⁴² Though we understand that this is only a proportion of the approximately 3% of meat exports that travel outside Europe, so a small part of total transport requirements

2.3.3 Transport resilience

Meat products are, particularly pre-processing, much less perishable than seafood, so the meat industry has less risk of lost value from short-term transport delays.

But the meat export market is highly reliant on demand in the EU and on Dover-Calais/Channel Tunnel routes to get there. Its ability to move away from those short crossings is constrained by the reliance of much of the industry on processing capacity at sites in England, and on the inability to mix consignments of different products on a single vehicle.

2.4 Other food and drink products

Airfreight is currently used by a range of Scottish gourmet foods. The 2012 Highlands and Islands Transport Partnership (HITRANS) Air Freight in the Highlands and Islands study found that products included.⁴³

- Wild mushrooms (with Dalcross Logistics (Inverness) reporting several tonnes each year being exported through their system and the US being mentioned as a frequent destination for this product).
- Vacuum packed wildfowl, game, North Ronaldsay lamb and Aberdeen Angus beef.

Orkney has a sophisticated agricultural sector with range of gourmet and organic food with organic beef and lamb collectively marketed under the Orkney Island Gold label. Currently, road and ferry transport has been optimised to move goods to Glasgow and Manchester for onward air freight journeys however the report noted that Orkney exporters have had many frustrations with attempts at air freighting directly from Orkney itself.

There is a range of specialist game producers. However, this market sector is quite small and dispersed with many relatively small producers. It still has much growth to achieve in serving the UK market, let alone reaching out to world markets, and it appears the UK can usually be adequately served by road transport.

⁴³ HITRANS and HIAL, Highlands and Islands Air Freight Study, 2012

3 The broader transport context

This report focusses on the resilience of the Scottish food and drink sector to potential shocks to the transport network's ability to deliver its export products.

But our evidence review and discussions with stakeholders highlight that it is inappropriate to include export transport options entirely in isolation, and that there are a range of broader issues to consider. This section introduces the effects that have been identified.

3.1 The effects of transport delays

Delays to transportation of exported goods will affect different parts of the food and drink export industry in different ways.

Perhaps most obviously, a large proportion of Scotland's food exports are perishable, with those of fresh/live fish and shellfish the most time-sensitive. Fishing/aquaculture producers will typically seek to ensure that their products reach their customers with 60 hours of dispatch.⁴⁴ Each day of delay reduces the freshness of the product and hence its value; a day's delay on delivery of fresh salmon is reported to reduce typical market prices by around 30 pence per kg (approximately 10% reduction).⁴⁵

Furthermore, the time at which consignments arrive at markets can have a significant bearing on their value. Most wholesale markets rely on deliveries and sales in the early hours of the day. Seafood Scotland estimates that transport delays which mean that a consignment does not arrive at a market until midday would typically reduce values by a half.

But it is not only perishable products which are affected by transport delays. Stakeholders from both food and drink sectors highlight that contracts for the purchase of any product will usually place conditions on its volume, quality and delivery time. This is of particular importance for deliveries to larger customers (such as supermarkets), who seek regular deliveries so that they can retain product on shelves without extensive warehousing requirements.

Scotland Food & Drink have highlighted that if transport delays mean that Scottish products are regularly missing delivery windows at customers' premises, those customers are likely to lose confidence in Scottish produce and may seek alternative supplies from elsewhere.

Seafood Scotland anticipates that in the short-term producers can adjust their salmon, shellfish and white fish harvesting and catching to a degree in response to transport issues or changes in the market conditions. In the longer term, they feel this would disproportionately impact on smaller food producers. Delays to

⁴⁴ Transport Research Institute, *Synthesis report of freight flow mapping*, 2012

⁴⁵ Scottish Salmon Producers Organisation; indicative estimate

farmed salmon harvesting would also require approval from SEPA due to stocking densities and biohazard issues.

Regular delays will reduce the capacity of the transport industry. As an example, a lorry can typically carry a consignment of Scottish salmon from the DFDS consolidation centre in Larkhall to the main fish market at Boulogne-sur-Mer in one driver shift, so making the return trip in two days. If a delay of just 45 minutes per journey were introduced on each cross-Channel journey⁴⁶, this is no longer possible, meaning that three days (or a second driver) is required to deliver a single consignment; a 50% increase in time, and so a 50% increase in the number of drivers needed to get any given volume of product to that market. An increase in standby vehicles and drivers would be required to complete journeys.

This concern is amplified by the views of the Freight Transport Association. They noted in consultation undertaken as part of this research that if the business case for import / export to the EU becomes unviable for haulage firms, or it is administratively too burdensome, some may well scale back their operations to UK-only. This reduction in haulage supply would likely increase costs of exporting to the EU.

They also note that there is already a fairly severe driver shortage in the UK market. The industry has an ageing workforce and an existing shortage of approximately 45,000 drivers nationwide. Some hauliers are stated to be already turning away work due to a staffing shortage and around 15% of drivers working in the UK are European; there are concerns that some may no longer be able to, or choose to, work in the UK.

3.2. Exports are reliant on imports

The efficient production and export transportation of Scottish food and drink products depends, in some instances significantly, on imports.

In part, this arises from transport system efficiencies. As highlighted by the Freight Transport Association, logistics companies (using all modes) seek to ensure their vehicles are operating loaded, and hence fee-earning, for as much of their mileage as possible. This includes always seeking backloads, whereby a vehicle or container will return loaded from as close as possible to the delivery point to collection point of its primary load. For lorries returning from mainland Europe, or planes/ships returning from more distant destinations, to Scotland, these backloads ensure that the total cost of the round trip is shared between customers.

⁴⁶ Seafood Scotland state that this could arise from a 7-minute additional delay in paperwork processing for export

If no backloads are available, Scottish food and drink exporters would end up being liable for the whole cost of the round trip. Barriers or delays to in-bound movements will therefore tend to increase the transport costs of Scottish exports.

Furthermore, some Scottish food and drink exports are directly reliant on imports. Stakeholders have identified examples of some Scottish shortbread manufacturers making use of Irish butter for some of their produce, and of salmon producers purchasing imported boxes (in which exported produce is carried, and which also provides a backload for hauliers).

Restrictions on the movements of these items, or increased costs, would have a direct impact on Scottish producers' ability to produce (and hence export) their products.

3.3. Other potential causes of delays to shipments

Stakeholders report that direct transport issues are only one of their potential concerns relating to delays to consignments. All of the aquaculture industry stakeholders we spoke to have highlighted the limited capacity of Environmental Health Officers to certify perishable products for export, and the meat industry the limited capacity of vets to check consignments. At present, these Officers have sufficient capacity to certify exports to non-EU countries. If, post-Brexit, there was a similar need to certify exports to EU27 countries, their workload would increase substantially, and to a point where significant delays are anticipated before consignments could be dispatched and there would be increasing documentation-related costs for producers.

Stakeholders also report significant concerns about the capacity for Border Inspection Posts to handle increased volumes of checks.

We understand that the Scottish Government has parallel work underway to investigate options around these issues.

4 Current capacity to export from Scotland

4.1 Aviation

According to the Freight Transport Association (FTA), airfreight accounts for approximately 40% of the total value of Britain's trade with countries outside the eurozone but only 0.5% of the volume of freight moved. The high value, low volume freight is transported in a range of ways within the UK and exported out of it.

This section summarises how airfreight operates in the UK with freight forwarders and integrators, the main airports and capacity and facilities at Scotland's airports.

4.1.1 UK Airfreight

In 2016, around 2.4 million tonnes of airfreight was moved through UK airports with the vast majority (80%) on flights to/from countries outside the EU. Airfreight to/from countries outside the EU is dominated by bellyhold cargo on scheduled passenger services. These flights account for 85% of total airfreight volumes. In contrast, short-haul markets are largely served by cargo planes.⁴⁷

The figure below shows that five airports, and Heathrow in particular, dominate freight volumes at UK airports. The five (none of which are in Scotland) account for almost all (95%) of UK air freight traffic, with Heathrow alone seeing two-thirds of the total. Thus, the volumes through Scottish airports are insignificant in UK terms.

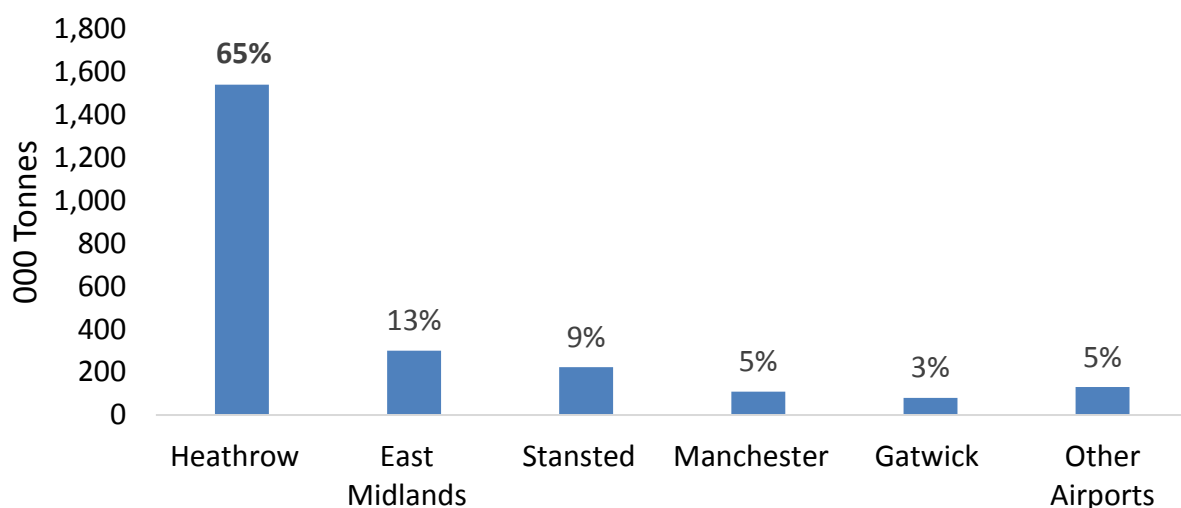


Figure 4. Freight volumes at UK airports: 2016⁴⁸

⁴⁷ CAA published data, <https://www.caa.co.uk/Data-and-analysis/>

⁴⁸ CAA published data, <https://www.caa.co.uk/Data-and-analysis/>

It is clear that freight continues to concentrate at a few airports where there are extensive freight handling facilities.

The characteristics of demand at the five leading UK airports are:

- Heathrow, Manchester and Gatwick: almost all freight is to/from non-EU countries and almost all of it uses scheduled passenger services.
- East Midlands: has the biggest volume of domestic freight of any UK airport. Almost all freight through the airport is on cargo planes, largely through integrator services (commonly known as parcel delivery companies).
- Stansted: most air freight is to/from countries outside the EU, and almost all air freight uses cargo aircraft.

As for supply, the introduction of long-haul services from secondary cities has accelerated with the expansion of the Middle Eastern hub carriers and new aircraft designs with large bellyhold capacities. It has been estimated that the belly capacity of Middle Eastern hub carriers flying into Europe equalled the capacity of more than 100 weekly Boeing 777 freighter flights. Some regional airports (e.g. Glasgow, Edinburgh, Newcastle) have seen air freight growth due to the introduction of local long-haul passenger services (e.g. Emirates and Qatar).

Fifteen per cent of volume handled at Heathrow is air to air transshipments, though only a small fraction of this is believed to be of domestic origin. The vast majority of UK regional freight flowing through Heathrow is trucked between the airport and its point of origin/destination. Heathrow is the centre of the air freight industry in the UK, not only in terms of volume, value and the range of destinations covered, but also in terms of handling and broking companies. Analysis of UK trade data by MAG Group suggests that 7% of the value of export freight handled at Heathrow originates in Scotland.

Airlines UK analysis identifies that seafood represents 11% of all UK airfreight exports. Prestwick Airport senior management noted that, because of its small packaging, seafood is ideally suited to bellyhold airfreight on scheduled flights. The benefit of using scheduled aircrafts is that there are frequent flights giving the ability to break the load into small consignments to multiple destinations. In contrast, a charter plane is often held until the charter is full, which can age early deliveries and potentially flood a destination with a specific product, which may impact on market price.

4.1.2 Scottish Context

The four main Scottish airports with relevance to freight are Edinburgh, Glasgow, Prestwick and Aberdeen. Across these, most freight is on flights to/from

countries outside the EU, followed by flights to/from other EU countries and each airport plays a distinct role (2016 freight volumes).⁴⁹

- Edinburgh (20,400 tonnes): almost wholly a mix of mainland EU and domestic freight on integrator flights but with a growing volume on scheduled flights to China.
- Glasgow (13,000 tonnes): almost 90% of freight is to/from outside the EU all of which is flown on scheduled passenger services and, particularly, appears on the twice-daily Emirates flights to/from Dubai.
- Prestwick (10,800 tonnes): three-quarters of freight is to/from outside the EU. Almost all freight through the airport uses cargo aircraft with a new twice weekly cargo flight recently secured for Prestwick.⁵⁰
- Aberdeen (5,700 tonnes): more than 75% of freight is on domestic integrator services.

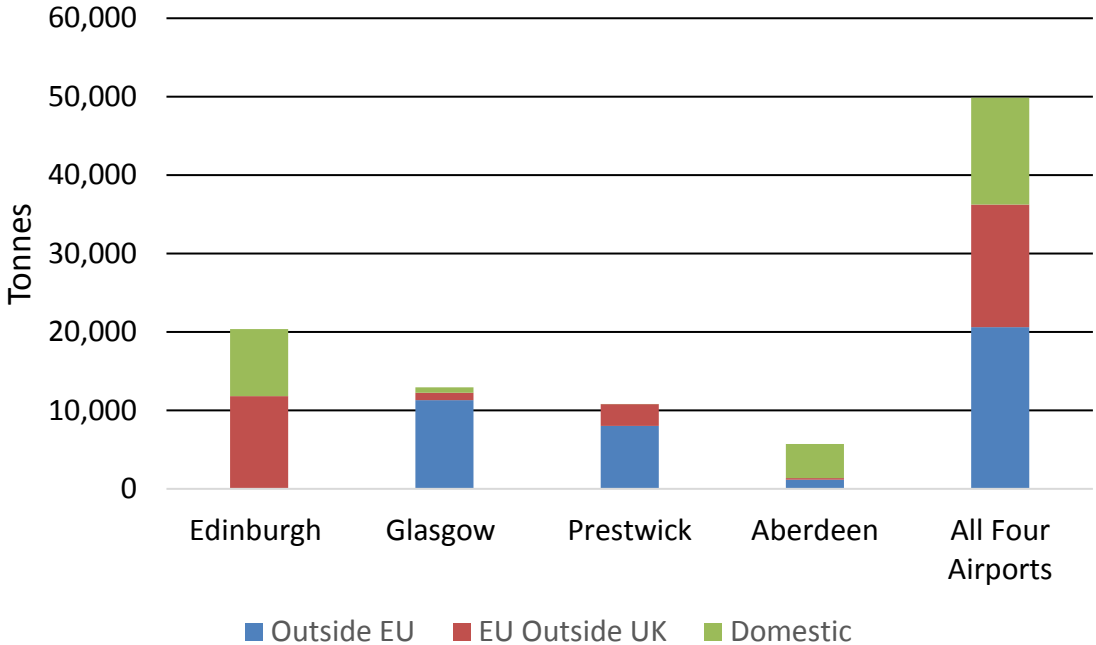


Figure 5. Freight volumes by flight origin/destination area (2016)⁵¹

Traffic across the four Scottish airports grew by around 11,000 tonnes (29%) between 2011 and 2016. However, this growth was not evenly spread and was largely driven by the more than five-fold increase at Glasgow. The growth of over 10,000 tonnes at Glasgow was almost all on non-EU scheduled passenger services.

⁴⁹ CAA published data, <https://www.caa.co.uk/Data-and-analysis/>

⁵⁰ CargoLogicAir (CLA) B747F flight beginning in Houston, flying into Prestwick and then onwards to Frankfurt, and from Germany to the Middle East and/or Asia. Air Cargo News, 01/03/2019

⁵¹ CAA published data, <https://www.caa.co.uk/Data-and-analysis/>

Demand also grew, albeit much more modestly, at:

- Aberdeen: 8%, mostly on domestic integrator services.
- Edinburgh: 5%, with EU volumes doubling but mostly offset by a decline in domestic traffic.

In contrast, volumes at Prestwick fell by 9%.

However, the total volume of airfreight handled by these top four Scottish airports in 2016 amounted to only 4% of the volume passing through Heathrow.

But it appears that there is spare capacity for bellyhold cargo on long-distance routes from Scottish airports. As an example, Emirates estimates total daily freight capacity on their services to Dubai to be nearly 70 tonnes, so around 24,000 tonnes per annum (though this is relatively modest in comparison with total food exports; the total weight of exported salmon alone, to all markets, is around 72,000 tonnes per annum).⁵²

With the demand surge from North America and Far East markets for seafood, Glasgow Airport is also utilised for fresh salmon and high valued shellfish exports⁵³. The introduction of the Edinburgh to Beijing flight has also opened up a market to China for high value shellfish exports.

Amongst the Scottish airports, only Glasgow currently has any refrigerated storage capacity, limiting the potential for regular handling of perishable goods. Edinburgh are currently undertaking an internal review of freight as they recognise it is an important component in underpinning any new long-haul services.

To increase freight handling capacity at Scottish airports in the short-term, one stakeholder engaged in this research stated that charter aircraft could be used to clear backlogs of goods, and that temporary refrigeration units could be installed at airports to enable easier handling of perishable goods. It was noted that Scottish airports have a good track record of responding flexibly to short-term changes in demand, and that there is capacity for more flights from Scottish airports.

4.1.3 Freight Forwarders and Integrators

Freight forwarders (brokers between shippers and consignees and the airlines) will organise most airfreight consignments moving from the UK; the end customer is highly unlikely to organise the details of the transportation or to be involved in the detail of route planning.

⁵² Marine Scotland *Topic Sheet Number 40, The Value of Aquaculture in Scotland, 2017*

⁵³ Transport Research Institute, *Synthesis report of Freight flow mapping – Scotland Part, 2012*

The most notable feature of the UK air freight market is the huge importance of Heathrow and its surrounding freight facilities, with most forwarders having major consolidation centres near the airport. Heathrow Airport Limited state that there are approximately 450 freight forwarders located within five miles of the airport.⁵⁴ Very significant volumes of air freight are trucked to such facilities near Heathrow, processed and then trucked to another airport, either in the UK or in continental Europe, without ever flying in or out of Heathrow itself.

Historically, this concentration around Heathrow can be explained as a result of its significantly more extensive intercontinental passenger network compared to those of other UK airports. Although this remains the case, new intercontinental passenger connections at regional UK airports have increased possibilities for transporting long-haul freight as bellyhold cargo.

The vast majority of regional freight flowing through Heathrow is trucked to or from its point of origin or destination. Only 15% of freight by volume handled at Heathrow is transhipped between planes and an even smaller fraction is transferred from planes of a domestic origin to longer distance international flights. Dedicated freighter services to other parts of the UK only typically make financial sense for logistics companies when the market is focussed around those areas and there is little to no network transfer requirements. Prestwick has captured some of this market and there may be opportunities for other regional airports to also do so. An exception to this rule is fresh seafood from Scotland, a small proportion of which flies in the bellyhold of some Glasgow – Heathrow services.

Improved regional passenger airfreight services are unlikely to cause a step change in the way freight is routed to Heathrow because:

- The way Forwarders have developed and operate their businesses favours continuing use of road haulage for domestic movements;
- “Change of Gauge” (i.e. from narrow to wide-body containers, which can be required for freight to be transhipped between planes of different type) is unattractive and the handling time/costs make any benefits over trucking marginal particularly as trucking operates around-the-clock.

Seabury, in their study for the National Connectivity Task Force (NCTF), illustrated the challenge that domestic airfreight into Heathrow faces and highlights why the majority of Scottish goods exported by air from Heathrow are trucked to/from Scotland.⁵⁵ The illustration below shows relationship typical comparison for journeys to Heathrow from Glasgow, however, the balance is likely to shift in favour of domestic airfreight for longer distance trips, such as Inverness.

⁵⁴ Airlines UK, *Assessment of the value of air freight services to the UK economy*, 2018

⁵⁵ Seabury, *Heathrow Regional Freight Connectivity Study*, February 2015

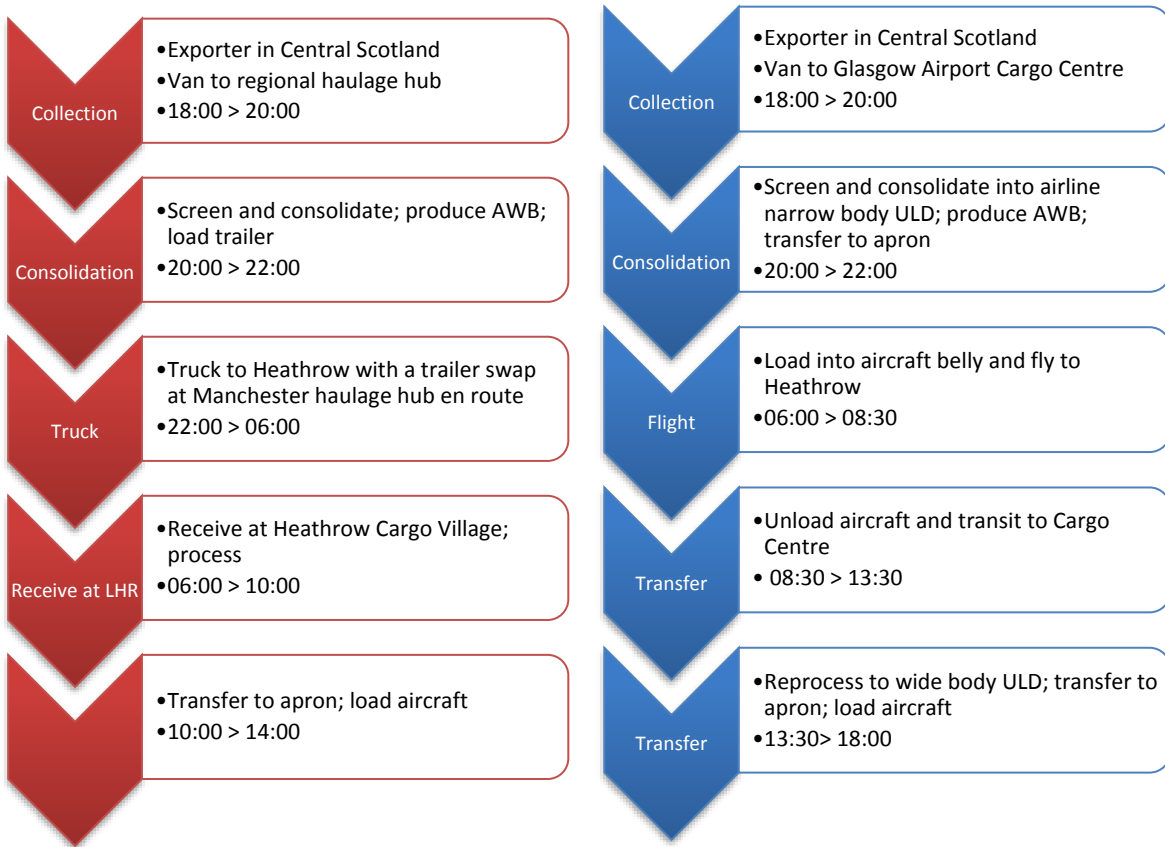


Figure 6. The UK Regions and Heathrow – Road vs Air – Timings

Integrators are global carriers that incorporate the whole transport process: they manage all means of transport and the customs, freight and mail traffic. The Global integrators of TNT, UPS, Fedex and DHL all have a presence in Scotland with concentrations at East Midlands (c.50%) and Stansted (c.25%) and only a small number of dedicated cargo freighter flights operating at Heathrow.

4.2 Ports and Shipping Services

Scottish food and drink exporters make use of maritime services. Containers are used to transport cargoes that are less time sensitive, and mostly on longer-distance export routes. Some of these containers leave directly from Scottish ports (Greenock and Grangemouth), but these ports do not have the capacity to cater for the super-sized containerships, so most of these will be transhipped at Rotterdam, Southampton, Liverpool, Felixstowe or other northern European ports onto large ships for the majority of the journey. Other containers may be taken directly by road to these ports, or make use of smaller English ports, such as Teesport, for movement to the transshipment hub, but containers are mostly transported by rail on daily services from Freightliner's Coatbridge terminal to the major ports such as Felixstowe, Southampton, London Gateway and Liverpool.⁵⁶ DB Rail also runs a 5-times a week rail service between Teesport and Mossend.⁵⁷

The choice of departure and transshipment port is affected as much by which commercial carrier is moving the load as the origin or final destination of the product.

Much of the produce bound for continental Europe is carried on road vehicles, making use of RoRo⁵⁸ ferries (we include the Channel Tunnel within this classification for simplicity). Shorter crossings will typically be used by accompanied services (where the tractor unit and driver remains with the trailer), but trailers on longer-distance ferries are often transported unaccompanied (without the tractor unit).

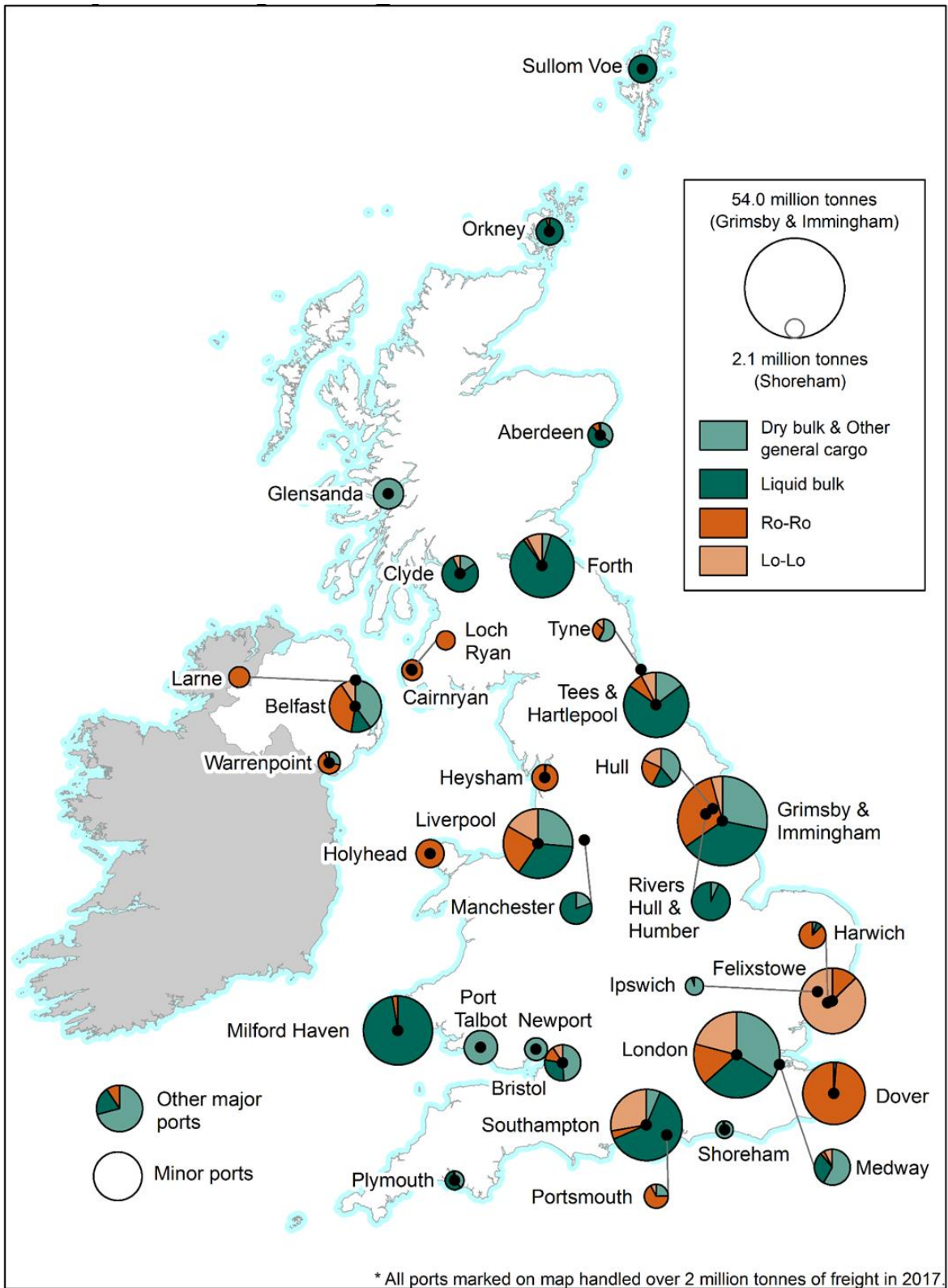
Since the cessation of the Rosyth-Zeebrugge ferry service in 2018, there has been no direct RoRo connection to Scotland. With the exception, therefore, of the containers exported from Scottish ports (which is believed to be only a modest proportion of all food and drink exported from Scotland in containers) and some exports to Ireland leaving from Cairnryan, the Scottish food and drink industry is entirely dependent on English ports.

The products handled at the UK's principal ports are shown in the figure below:

⁵⁶ Freightliner Rail Services, <https://www.freightliner.co.uk/rail-intermodal/our-services/rail-services/> accessed on 26/02/2019

⁵⁷ PD Ports Newsletter, <https://www.pdports.co.uk/corporate/news-events/news-articles/dates/2018/10/second-teesport-rail-link-provides-further-trade-connection-for-scotland/> accessed on 26/02/2019

⁵⁸ Roll-on, roll-off, where road vehicles are carried on a vessel



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Figure 7. UK ports by cargo 2017⁵⁹

⁵⁹ DfT, *Port freight annual statistics: 2017 final figures tables, 2017*

Export data for all freight shows that Scottish ports carried 42.5 million tonnes of export goods in 2016. Between 2006 and 2016 overall waterfreight volumes (internal and export movements) have fallen by 34% which represents a trend of decline across Scottish ports.⁶⁰

4.2.1 Existing ports in Scotland

Scotland's main container port is Grangemouth, handling 236,000 TEUs⁶¹ in 2017. Much of the containerised product exported is whisky and other drinks but exports also include shortbread, frozen fish and seed potatoes. The return loads contain maturation casks from Spain and the US, packaging and glass for whisky, household products, textiles and food raw materials. Many empty containers are also returned to feed the export market. Grangemouth has easy road and rail connections, but is some 50 miles from the open sea. The lock entrance means that larger ships cannot enter or leave the port at high tide, and limits the size of container ships to around 1,500 TEU (for comparison, the very largest ships have a capacity of over 19,000 TEU).⁶²

Regular container services are also available from Greenock. This handled 88,000 TEU in 2017, with again the large majority of export containers reported by stakeholders engaged in this research to be carrying whisky with smaller quantities of potatoes and fish.

Aberdeen is currently building a new (south) port at Nigg Bay, which is due to open in 2020. The new south port will offer 1,400m of berthing quay for ships up to 300m length with a draft of up to 10m. This would provide for added capacity.

Due to the relatively small size of the ports, there are no direct connections for container traffic from Scotland to non-EU destinations: longer-distance traffic relies on transshipment to ocean-going vessels at Rotterdam, Liverpool, Felixstowe or elsewhere.

Apart from Grangemouth, Greenock and Aberdeen no other Scottish ports currently have the capability to handle container traffic. It is understood, however, that there is significant underutilised capacity for container handling at the existing container ports, though one stakeholder engaged in this review cautioned that it may be difficult to build demand for container traffic to a level where the business case for more container shipping capacity from Scotland would be proven.

⁶⁰ Transport Scotland, *STS No. 36*, 2017 edition

⁶¹ Twenty-foot container equivalents

⁶² DfT Maritime and Shipping Statistics <https://www.gov.uk/government/statistical-data-sets/port-and-domestic-waterborne-freight-statistics-port#all-port-traffic-totals-major-and-minor>

RoRo facilities for large vessels are available in mainland Scotland at Cairnryan (currently in use for services to Northern Ireland), Aberdeen (the Northern Isles), and Rosyth (not in regular use since cessation of the Zeebrugge service).

Grangemouth is unsuitable for ferry services which typically only call at coastal ports and depend on rapid turnaround of just a few hours. Ferries also prefer to avoid ports with narrow lock entrances or tidal delay due to shallow entrance channels.

Rosyth has been used as a ferry port, however it suffers from the constraint of several hours steaming distance from/to the open sea. Whilst the DFDS Rosyth-Zeebrugge RoRo service was discontinued in 2018, the service latterly primarily carried containers; the lack of a daily service and relatively long transit time, plus the lack of accompanied trailer or refrigerated trailer capacity, made the service unattractive to other types of traffic. In 2015, 414 lorries passed through Rosyth port, in comparison with over four million which used the short crossings of Dover-Calais and the Channel Tunnel combined.⁶³

The EU Interreg Foodport Study (2015) also found that most driver-accompanied freight on North Sea routes prefers a Dutch port rather than Zeebrugge in part due to faster access afforded to Germany and beyond. Arrival times of the ferry in Belgium, and the relatively (compared to that from Calais) long road journey to Boulogne, made the service unattractive for serving seafood export traffic.

Sailing times are lengthy for any potential ferry connection between Scotland and mainland Europe, with vessels able to make only one one-way journey per day, so a return journey every 48 hours. The experience from Rosyth-Zeebrugge showed that most customers preferred the greater speed or flexibility offered by longer road journeys and shorter crossings. As a comparison, the Port of Dover states that (between all operators) they offer an average of a sailing to France every 30 minutes. P&O, one of the operators on that route, operate up to 25 sailings per day with a fleet of six vessels, so each making a return journey every six hours on average. A vessel employed on the Dover-Calais route is therefore able to provide eight times the total vehicle carrying capacity than if used on Rosyth-Zeebrugge or other similar overnight service.

Many other Scottish ports offer dry bulk handling, but this is not demanded by the industry. Aberdeen harbour has RoRo facilities, but being further from the main exports markets of Europe and north of much of the production and storage facilities of most Scottish exports, does not appear to offer any benefit over services from Rosyth. Stranraer is only a little further from mainland Europe than Rosyth, an estimated sailing distance to Roscoff in France of 500nm, in comparison with 450nm from Rosyth to Zeebrugge, but journeys to Roscoff or

⁶³ PD Ports Newsletter, <https://www.pdports.co.uk/corporate/news-events/news-articles/dates/2018/10/second-teesport-rail-link-provides-further-trade-connection-for-scotland/> accessed on 26/02/2019

other locations on the Brest peninsular are distant from the main markets of Europe, most of which are better served from the low countries ports.

5 Appraisal Findings, Recommendations and Next Steps

The need for this study was identified following events in 2015 impacting on Scotland's overseas trade. The aim was to provide various options for how to strengthen the resilience of Scotland's transport infrastructure to facilitate more overseas exports leaving from Scottish hubs, by use of existing transportation hubs or development of new hubs.

The data gathering stage identified the varying needs across Scotland's export markets: the time critical nature of Scotland's seafood with one major destination is very different to the long shelf life and wide-ranging destinations of Scotland's whisky market. The options generated and appraised take cognisance of this variance and the appropriateness of the measure to each industry has been identified.

The output of this study is a range of options with recommendations to investigate the following eight options further. Appendix A lists all options that were considered.

1: Adjusting supplier/buyer expectations

As identified previously, the time constraints associated with some of Scotland's food and drink exports, primarily the seafood industry, limit the viability of alternative transport options. Seafood orders are taken until 16:00 and the client expects the product to be in Boulogne-sur-Mer by 08:00 the following morning giving a short window for transport (Day 1 for Day 2 delivery)⁶⁴. Previous studies have considered the current routes to market and concluded that there are limited transport options to satisfy the time constraints determined by the market. This was reinforced through our discussions with industry representatives and hauliers. The transport system currently works well for the industry and in times of short term disruption adjustments can be made to limit the impact, for example, delayed harvesting. To build in resilience to the system a review of the buyer/supplier expectations and market destinations could be considered.

The review may cover a number of changes which would reduce the time pressures on travel and could include:

- Day 1 for Day 3 delivery;
- Earlier deadlines for orders;
- Technological advancements such as electronic auctions;
- Earlier opening times at Scottish markets to allow more time for onward travel.

⁶⁴ MDSC, *Export Resilience Research Project Report*, 2016

This is a measure which could be implemented in the short term with the onus on processors to negotiate with buyers to agree a mutually agreeable way forward to ensure reliable delivery. The demerits associated with this option are potentially lower market prices negotiated with buyers and higher travel costs if two driver shifts are required. However, this could be outweighed by more flexible packing and travel time and the possibility of products being consolidated to reduce costs.

Scottish Government role: Support the seafood industry in initiating discussions with major buyers.

2: Explore new markets and customers for seafood in addition to Boulogne-sur-Mer

Boulogne-sur-Mer is Europe's seafood sector's primary fish market and distribution hub. Even if the product is not sold at the market it is often routed through there given the warehousing and processing sites in the surrounding area. It is estimated that 80% of Scottish seafood exports to Europe are through Boulogne-sur-Mer.

Increasing the routes to different markets would improve the resilience of the export market. Seafood Scotland has recently commissioned a study into potential new markets for exports of seafood which will include investigating the impact of Boulogne-sur-Mer. This study may inform the development of this option. Completion is expected in early summer 2019.

Scottish Government role: Review the outcomes of study and work with suppliers to understand whether there are alternative markets available.

3: Incentives to increase HGV driver numbers in the UK

The UK is facing a driver shortage. The industry has an ageing workforce and an existing shortage of approximately 45,000 drivers nationwide. Some hauliers are stated to be already turning away work due to a staffing shortage and around 15% of drivers working in the UK are European; there are concerns that some may no longer be able to, or choose to, work in the UK. Some of the issues and options discussed in this report will result in a greater need for drivers and increasing HGV drivers will be key to building resilience into the export market.

Incentives to increase HGV drivers could include better driver facilities, raising awareness of the logistics sector and increased support for apprenticeships or up-front costs for training.

Scottish Government role: Work with the UK Government to support campaigns raising awareness of the logistics sector, investigate financial support for training up-front costs and review HGV facilities.

4: Increased storage capacity at Scottish airports

Airport storage in Scotland is still in the development stage. Edinburgh Airport will shortly be undertaking a review of the aviation export market which will consider the facilities required. Glasgow Airport has an 80-cubic metre chiller which is currently used for storing seafood prior to export in bellyholds. Prestwick Airport does not currently have any permanent chilled storage facilities but has previously hired refrigerated containers (from lorry operators) which can be configured at short notice in hangars to provide significant capability.

This is a short-term solution with the opportunity to provide immediate capacity at ports and airports with refrigerated containers. The investment in storage capacity, especially at airports, needs to be considered alongside an export aviation strategy to drive demand for the facilities through increased flights and destinations.

Consideration also needs to be given to the competing market demands of the current main players in the export industry. For example, shellfish is very price sensitive and in response to a growing market from Glasgow Airport there have been reports of Heathrow dropping prices to compete with regional airports. The role of freight forwarders is also key and they should be involved in discussions as their current logistic centres and relationships will impact on the mode and route chosen. Investment in airport storage may also give an unfair competitive advantage to one location.

Scottish Government role: Provide input to Edinburgh Airport's freight strategy and support other airports to review their approach to freight where desired. Consider developing a business case for investing in airport storage in addition to Option 7.

5: Scottish Exports Working Group

The food and drink export market has a number of inter-dependencies. These can include, but are not limited to, producers, processors, markets, freight forwarders, hauliers and customers. To make improvements to the way food and drink is exported requires good communication between the various parties. Many of the organisations we spoke with represent many aspects of their industries (e.g. Quality Meat Scotland and Seafood Scotland) and have good relationships with the Scottish Government and relevant logistic companies but this option proposes formalising those relationships. A Working Group with representatives from industry, hauliers, freight forwarders and Scottish

Government would provide the platform to discuss issues and propose initiatives. In times of emergencies the group could respond quickly and provide details of the challenges faced and potential solutions.

Sub-groups for individual trade, e.g. seafood and whisky, would be beneficial with an over-arching group to recognise inter-dependencies and cost savings between industries.

Working Groups would also provide a good opportunity to develop Government supported pilot schemes to investigate and test new markets and routes to market.

Scottish Government role: A commitment from Scottish Government to develop and administer a Working Group with industry representatives.

6: New technology for transporting products.

The shelf life of some Scottish products, for example seafood, has a considerable impact on the routes to market available. Delays to delivery often reduce the quality and therefore the sale price for the product. Technological improvements to the storage of products being transported may allow for a longer shelf life and open up new transport routes. There have been a number of recent studies and pilots into ensuring the freshness of the product including the monitoring of seafood in transit to ensure freshness. The scheme was recently piloted in Norway and Iceland⁶⁵. New developments also include new ways of transporting live seafood in containers with the environment monitored and optimised⁶⁶.

Scottish Government role: Financial support for pilot projects for new technology.

7: Increased chartered flights or scheduled flights with bellyhold capacity for freight.

Most food exports using air currently travel as bellyhold produce on long haul aircraft from Heathrow and to a lesser extent UK regional airports. The alternative of a dedicated charter aircraft may possibly be made to be viable but a range of issues would need to be understood:

⁶⁵ <https://thefishsite.com/articles/a-cool-idea-for-seafood-transport> accessed on 25/03/2019

⁶⁶ <http://www.eurofishmagazine.com/sections/equipment/item/279-well-tried-methods-alongside-new-technologies> accessed on 25/03/2019

- The portfolio of produce that could be combined on such a flight and the logistics of both gathering and holding the produce in a timely manner for loading.
- Consistency and seasonality would have to be considered as would the potential for symmetrical backloads.
- The demand and distribution at the destination end of the route would also need to be understood as a large consignment might temporarily flood a market and hence reduce the price it could command.
- Potential carriers and optimal Scottish departure airport would have to be considered.

Scottish Government role: Work with suppliers to develop the business case for increased chartered flights or scheduled flights with bellyhold capacity for freight.

8: Enhanced Scotland – Europe rail freight capacity

Rail freight infrastructure is currently available, providing capacity for freight movements to major ports in Scotland, England and onwards to Europe through the Channel Tunnel. This option proposes a number of rail freight improvements including the consideration of a direct connection through the Channel Tunnel from Scotland and increased rail use for internal movements to the main English ports.

Investigation of the operational feasibility and business case of any rail freight improvement would be required but potential benefits include the reduced reliance on HGV drivers and reduced CO₂ emissions associated with rail freight compared to HGV journeys.

Scottish Government role: Financial support for pilot projects testing new rail freight connections.

Bibliography

Air Cargo News, *CargoLogicAir (CLA) B747F flight beginning in Houston, flying into Prestwick and then onwards to Frankfurt, and from Germany to the Middle East and/or Asia.* (Accessed 01/03/2019)

Airlines UK, *Assessment of the value of air freight services to the UK economy, 2018*

Billing, S.-L. et al., *Scottish Inshore Fisheries Integrated Data System (SIFIDS): Assessment of Socio-economic and Cultural Characteristics of Scottish Inshore Fisheries, 2018* (currently in draft).

CAA, <https://www.caa.co.uk/Data-and-analysis/> (Accessed 26/02/2019)

DfT, *Port freight annual statistics: 2017 final figures tables, 2017*

DfT Maritime and Shipping Statistics <https://www.gov.uk/government/statistical-data-sets/port-and-domestic-waterborne-freight-statistics-port#all-port-traffic-totals-major-and-minor> (Accessed 26/02/2019).

Euro Fish Magazine, *279 well tried methods alongside new technologies* <http://www.eurofishmagazine.com/sections/equipment/item/279-well-tried-methods-alongside-new-technologies> (Accessed 25/03/2019).

FAI, *Brexit and the sectors of the Scottish economy, 2017.*

Freightliner Rail Services, <https://www.freightliner.co.uk/rail-intermodal/our-services/rail-services/> (Accessed 26/02/2019).

HITRANS and HIAL, *Highlands and Islands Air Freight Study, 2012*

HMRC, *Regional Trade Statistics,* <https://www.uktradeinfo.com/Statistics/BuildYourOwnTables>

Imani Development, Westbrook, S., *The Value of Aquaculture to Scotland: A report for Highlands and Islands enterprise and Marine Scotland, 2017.*

Quality Meat Scotland, *International Trade Fair Signals Strong Demand from Overseas Buyers,* <https://www.qmscotland.co.uk/news/international-trade-fair-signals-strong-demand-overseas-buyers> (Accessed 11/04/2019).

Marine Scotland, *Scottish Sea Fisheries Statistics 2017, 2017.*

Marine Scotland, *Topic Sheet Number 40, The Value of Aquaculture in Scotland, 2017.*

Marine Scotland Science, *Scottish Shellfish Farm Production Survey 2017, 2017.*

Market Driven Supply Chains, *Export Resilience Research Project Report*, 2016.

PD Ports, *Newsletter*, <https://www.pdports.co.uk/corporate/news-events/news-articles/dates/2018/10/second-teesport-rail-link-provides-further-trade-connection-for-scotland/> (Accessed 26/02/2019).

Scotch Whisky Association, *Scotch Whisky 2017 Export Analysis*, 2018.

Scotland Food and Drink, *Ambition 2030, A growth strategy for farming, fishing, food and drink*, 2018.

Scottish Government, *Food and Drink Statistics*, <https://news.gov.scot/news/exports-hit-record-gbp-6-billion> (Accessed 26/02/2019).

Scottish Salmon, *Salmon exports reach record 600m*, <http://scottishsalmon.co.uk/salmon-exports-reach-record-600m/> (Accessed 26/02/2019).

Seabury, *Heathrow Regional Freight Connectivity Study*, February 2015

The Fish Site, *A cool idea for seafood transport*, <https://thefishsite.com/articles/a-cool-idea-for-seafood-transport> (Accessed 25/03/2019).

Transport Research Institute, *Synthesis report of Freight flow mapping – Scotland Part*, 2012.

Transport Scotland, *How Scotland's Transport Network Supports the Growth Sectors*, 2016.

Transport Scotland, *Transporting Scotland's Trade*, 2018.

Transport Scotland, *STS No. 36*, 2017 edition

Appendix A – Option Generation and Appraisal

Table 1: Options recommended for further investigation

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
1: Adjusting supplier/ buyer expectations -	Seafood primarily Managing the supplier and buyer expectations could include negotiating longer delivery times which would increase the flexibility for transportation.	Short-term. Would require negotiation between processors and customers. Technological advancements could assist in this option including the use of electronic auctions. Other approaches could include changing the opening hours at markets to relieve pressures on the transport logistics (e.g. early opening of Peterhead market)	Low level of investment but potential impact on market price and transport costs. Negotiating terms will potentially impact on viability and attractiveness of Scottish produce.	Longer delivery times could open up more transport routes for hauliers.	N/A	N/A	Yes – further consideration given alongside Option 2

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
2: Explore new markets and customers for seafood in addition to Boulogne sur Mer	Seafood Increase flexibility and routes to different markets. Supplying other markets distributes the risk.	A study has recently been commissioned to investigate internal UK transport issues and other destinations apart from Boulogne-sur-Mer which may address this option.	Low level of investment but potential impact on market price and transport costs.	Boulogne sur Mer is Europe's seafood sector's central fish distribution hub with warehousing in close proximity. Using a different market will impact on the location of the warehousing and potentially processing.	Dependent on the new markets and routes.	N/A	Yes – further consideration given alongside Option 1.

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
3: Increase HGV driver numbers in UK	All exports. Driver shortages in the UK – the industry has an ageing workforce and an existing shortage of approximately 45,000 drivers nationwide. 15% of drivers working in the UK are European and the current political situation increases the challenge of attracting drivers to the UK.	Short and medium term. Government or haulier incentives to attract and retain drivers. The FTA recommendations include 1) student style loans for vocational training, 2) better driver facilities and 3) a campaign to raise awareness of the logistics sector.	Low level of investment. Government or haulier incentives to attract and retain drivers.	N/A	N/A	Increased driver numbers would potentially be of benefit to other growth sectors relying on road transport (e.g. Life Sciences, Energy).	Yes – further consideration to be given to increasing the number of HGV drivers in the UK.

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
4: Increased storage capacity at Scottish airports.	All exports. Improved storage facilities, including refrigeration, at airports could support exporting seafood and other goods by air.	Short to medium term. Edinburgh Airport is starting a review of their facilities, including storage. Short term solutions could be the hiring of refrigerated lorries.	Medium level of investment by airports. Edinburgh Airport review may include details of costs required for development. Care would be needed to avoid giving unfair competitive advantage to one location.	Investment in storage capacity needs to be considered alongside an export aviation strategy to drive demand for the facilities through increased flights and destinations.	Increased and improved storage facilities will increase freight being transported by air. Environmental impact will be dependent on the method: bellyhold of scheduled flights (marginal additional impact) or chartered flight	Improved facilities at airports would potentially be of benefit to other growth sectors relying on refrigeration (e.g. Life Sciences).	Yes

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
5: Create a Scottish Exports Working Group	<p>All exports. Regular Working Group with representatives from industry, hauliers, freight forwarders and Scottish Government. Sub-groups for individual trade, e.g. seafood and whisky with an over-arching group to recognise inter-dependencies and cost savings between industries. Group would also be able to respond to emergencies with speed and accuracy.</p>	<p>Short term. Build on existing relationships to formalise a working group representing all aspects of the export market. Working Groups would provide a good opportunity to develop Government supported pilot schemes to investigate and test new markets and routes to market.</p>	<p>Low level of investment. Would require a commitment from industry and Scottish Government.</p>	<p>Working Group would provide a platform for recognising inter-dependencies and cost-savings between industries</p>	<p>N/A</p>	<p>N/A</p>	<p>Yes</p>

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
6: New technology for transporting products.	Seafood primarily. New technology for seafood storage may extend the shelf life of products.	Short term. Recent research includes monitoring of seafood in transit to ensure freshness with schemes recently piloted in Norway and Iceland. New developments also include new ways of transporting live seafood in containers with the environment monitored and optimised.	Increased cost of transport.	N/A	New technology may reduce the time pressures for deliveries and open up the possibility of sea freighting instead of air freighting in some instances with associated environmental benefits.	N/A	Yes

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
7: Increased chartered flights or scheduled flights with bellyhold capacity for freight. Or market development on existing routes.	<p>All exports. Most seafood currently travels as bellyhold produce on long haul aircraft from Heathrow and to a lesser extent UK regional airports. Increasing the range flight destinations and improved storage facilities and market development at Scottish airports could open up new markets and routes.</p>	<p>The following points would need to be considered: The portfolio of produce that could be combined, consistency and seasonality and the backloading implications and a large consignment might temporarily flood a market, reducing the price it could command.</p>	<p>Medium level of revenue support required to pump start what would hope to be a viable new export option for Scottish produce.</p>	<p>Dependent on the development of improved storage facilities at Scottish airports. Might require increased marketing effort to build demand in new locations</p>	<p>Environmental impact will be dependent on the method: bellyhold of scheduled flights (marginal additional impact) or chartered flight.</p>	<p>Increased flights and destinations would potentially be of benefit to other growth sectors (e.g. Life Sciences).</p>	<p>Yes</p>

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
8: Enhanced Scotland – Europe rail freight capacity	All exports Direct connection to Europe and reduced requirement for in demand HGV drivers.	Potential rail freight improvements could include a direct connection through the Channel Tunnel from Scotland and increased rail use for internal movements to English ports.	Low level investment. Government funded plot scheme to test the route.	Inter dependencies with freight forwarders.	Rail freight produces 76% less CO2 emissions than the equivalent HGV journey ⁶⁷ .	N/A	Yes – Investigation of operational feasibility and business case is required

Table 2: Options not recommended for further investigation

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
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⁶⁷ DfT, *Rail Freight Strategy*, 2016

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
9: Improved feeder short sea shipping services to EU markets and deep-sea ports	Whisky primarily.	Scottish ports have capacity for container traffic but limited boats and services. This would be a commercial response given demand for increased services. The creation of a transshipment port to bypass deep sea ports such as Rotterdam would require vast investment and a significant increase in demand over current levels.	Revenue for operating services. Improved short sea shipping would be a commercial response to a market need but could be supported by a government led pilot scheme. Care would be needed to avoid giving unfair competitive advantage to one location.	Inter-dependencies with European deep-sea ports and land transport to Scottish ports.	Environmental impact for short sea shipping and road is dependent on the route, the vehicles and the efficiency of the loads with no clear benefit for either ⁶⁸ .	Improved feeder short sea shipping would potentially be of benefit to other growth sectors (e.g. Life Sciences).	No – improved short sea shipping would be a commercial response given demand for increased services.

⁶⁸ Transport and Mobility Leuven, *Road versus short sea shipping: comparing emissions and external costs*, 2012

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
10: Extension to HGV Driver's Hours	Seafood and other short shelf life exports.	Short term. The Emergency Exemption and Temporary Relaxation of Drivers' Hours and Working Time Rules include details of exemptions in emergencies (e.g. heavy snow). The EU has been lobbied unsuccessfully in the past to grant temporary exemptions.	Low level of investment.	N/A	N/A	Exemptions and extensions would potentially be of benefit to other growth sectors relying on road transport (e.g. Life Sciences).	No – existing legislation can be used however this is a short-term solution to emergencies and not of relevance for improving resilience.

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
11: New, central Scotland airport.	All exports. A single airport with improved storage facilities and air connections.	Long term. Acceptability and feasibility anticipated to be very low.	High investment cost.	Inter-dependencies with freight forwarder facilities.	Substantial construction implications. Consolidation of flights may reduce the number of flights and associated environmental aspect, however, the combined market may make new routes viable thus increasing the flights. Increased passenger land transport from Glasgow and Edinburgh to a central airport.	One central airport would potentially be of benefit to other growth sectors.	No – due to the anticipated acceptability of such an option.

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
12: RoRo service from East Scotland to Europe	All exports. The Rosyth to Zeebrugge RoRo service stopped in 2018. Infrastructure remains at Rosyth and could be reinstated given demand, either to Zeebrugge or potentially other northern Europe ports. A new European 'gateway' port for Scotland could be developed at Preston Links in East Lothian for passenger travel, freight and cruise liners.	When operating, food and drink products made little use of Rosyth-Zeebrugge due to the inflexibility of its relatively infrequent service for perishable goods. Currently backloads are often destined for the Home Counties (DFDS deliver fruit, bread etc). A balance of loads for imports and exports would be required to progress the option. Other European ports (Rotterdam, Ijmuiden, etc) may	Capital cost for a new port facility – £25million. In the short term, a RoRo service could be reinstated from Rosyth with support initially from a Route Development Fund. Care would be needed to avoid giving unfair competitive advantage to one location/service.	A new crossing would provide a direct RoRo link to Europe, a cruise liner terminus (with financial benefits of stocking a cruise liner). Many of Scotland's exports are processed in England, e.g. seafood in Grimsby. Exporting direct from Scotland would require additional infrastructure.	Environmental impact for short sea shipping and road is dependent on the route, the vehicles and the efficiency of the loads with no clear benefit for either ⁶⁹ .	Positive benefit for tourism.	Not as part of this study. As a driver for food and drink export resilience this option does not meet the objectives, however, combined with other benefits such as a direct RoRo link to Europe, a cruise liner terminus (with associated financial benefits of stocking a cruise liner) and duty-free sales, this option could be developed further.

⁶⁹ Transport and Mobility Leuven, *Road versus short sea shipping: comparing emissions and external costs*, 2012

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
		offer a closer connection to Dutch and German markets, though issues of inflexibility and backloads remain for food transportation					

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
13: Gourock to Spain RoRo	All exports. The Dublin to Santander service could be extended to Scotland and provide a connection to Europe.	Short term. The service could potentially operate twice a week which would not be attractive to the seafood industry but could provide a route for other exports. Currently backloads are often destined for the Home Counties (DFDS deliver fruit, bread etc). A balance of loads for imports and exports would be required to progress the option.	Medium level revenue support required to extend the service from Dublin to Gourock. Support could initially be part of a Route Development Fund.	A new crossing would provide a direct RoRo link to Europe and duty-free benefits. Many of Scotland's exports are processed in England, for example seafood in Grimsby and meat products. Exporting direct from Scotland would require additional transport or the development of processing sites in Scotland.	Environmental impact for short sea shipping and road is dependent on the route, the vehicles and the efficiency of the loads with no clear benefit for either ⁷⁰ .	Positive benefit for tourism.	Not as part of this study. As a driver for food and drink export resilience this option does not meet the objectives, however, combined with other benefits such as a direct RoRo link to Europe and duty-free sales, this option could be developed further.

⁷⁰ Transport and Mobility Leuven, *Road versus short sea shipping: comparing emissions and external costs*, 2012

Option	Benefit and Industry	Deliverability	Investment required/ affordability	Inter-dependencies	Sustainability	Support to other key growth sectors	Recommended for further investigation
14: Increased storage capacity and warehousing at Scottish ports.	All exports. Warehousing at ports provides opportunities to address Brexit concerns. Capacity exists and products could be consolidated prior to exporting.	Short to medium term. Scottish ports currently have spare capacity for warehousing which could be utilised – additional capacity is not required.	Low level of investment by ports.	Inter dependencies with freight forwarders.	N/A	Improved facilities at ports would potentially be of benefit to other growth sectors.	No



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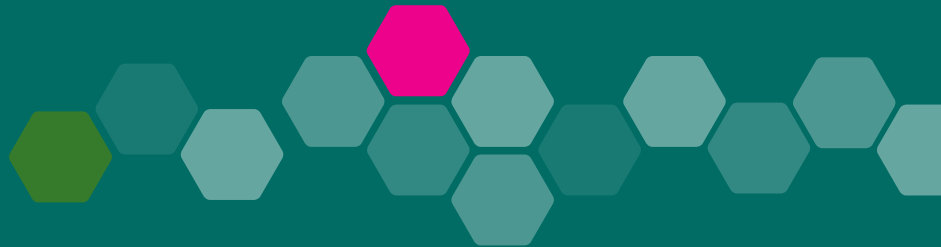
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