



The socio-economic
impact of CalMac ferry
services:
Phase 2 Report

Authorship and acknowledgements

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London, September 2022

Executive Summary

Introduction

This report was commissioned by CalMac and the Ferries Community Board to better understand the needs of ferry users, island communities, and the economic and social value of Hebridean and Clyde ferry services. The ultimate purposes of the research are to:

- Identify island needs as part of an ongoing strategic conversation;
- Help better reflect the value of service improvements to island communities;
- Inform the ongoing debate about value for money from ferry expenditure; and
- Provide information to help prioritise investment or plan services to deliver improved island outcomes.

The project is divided into two Phases as follows:

- **Phase 1:** Qualitative exploration of how ferry service characteristics are linked to island outcomes, based on a programme of virtual interviews with Community Board members, businesses, public service providers and residents across the network. The Phase 1 report can be found [here](#).
- **Phase 2:** Quantitative analysis of the impacts of CalMac as a company (employment, GVA, turnover, and employee compensation supported directly and through the supply chain) and of impacts of service levels on island communities (ferry users' welfare, economic activity, employment, population), based on Phase 1 findings, desk research, analysis, fieldwork, and socio-economic modelling. This report is the outcome of Phase 2.

Hebridean and Clyde ferry services operate in a very distinct context and are not a typical economic activity. **Island life is reliant on ferry services**, for:

- Residents who need to access mainland services, employment, social and leisure opportunities.
- Businesses and public services which move goods to and fro, generate business travel, and need access to visitors and staff.
- Tourists who want to visit these distinctive locations, and who in doing so support island economies.

In recent years, **capacity and reliability challenges** have become evident on parts of the network. These reflect the enormous and growing popularity of the islands as tourist destinations, residents' changing needs for access to travel (for example as an ageing population needs to reach mainland health services), and increases in demand brought about by lower prices under RET – a popular policy, but one which has created pressure for capacity growth. Moreover, CalMac's existing fleet is ageing, with associated growth in maintenance requirements.

Scenarios

The headline impacts estimated in this report are based on a comparison of two future scenarios for CalMac's operations in 2032:

- In the **Optimistic scenario**, an ambitious Vessel Replacement and Deployment Plan enables the growth and modernisation of the fleet and retirement of the oldest vessels, delivering capacity and reliability enhancements across the network.
- In the **Pessimistic scenario**, only commitments already delivered or underway come to fruition: Hull 801 and Hull 802 enter service on the Ardrossan-Brodick and Uig Triangle routes respectively, and MV Loch Frisa joins the Oban-Craignure route. Meanwhile the fleet as a whole continues to age, reducing reliability in most of the network.

Full specifications are detailed in the main report.

CalMac's economic footprint

Direct, indirect, and induced impacts for CalMac's operations between FY 2016-17 and FY 2020-21 were estimated. In the key analysis year of FY 2019-20, CalMac directly:

- Generated **£227.2 million in turnover**, with an aggregate footprint of **£350.6 million**; a multiplier of **1.54**.
- Generated **£95.8 million in Gross Value Added (GVA)**, with an aggregate impact of **£162.9 million**; a multiplier of **1.70**.
- Supported **1,513 FTE jobs**, with a total of **2,527** across the economy; a multiplier of **1.67**.
- Supported **£92.9 million in employee compensation**, with a total of **£127.5 million** across the economy; a multiplier of **1.37**.

CalMac also supported significant business turnover and GVA across its network through provision of ferry services to business users.

Table 1 summarises direct, indirect, and induced impacts under the future scenarios.

Table 1. Aggregate national economic impacts, £m and FTE jobs, 2032

Metric	2032 Scenario	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
Turnover (£m)	Optimistic	£246.1	£65.0	£68.8	£379.9
	Pessimistic	£232.0	£61.3	£64.8	£358.0
GVA (£m)	Optimistic	£114.7	£34.2	£46.2	£195.1
	Pessimistic	£107.4	£32.0	£43.2	£182.6
FTE employment (jobs)	Optimistic	1,819	556	664	3,039
	Pessimistic	1,693	518	617	2,828
Employee Compensation (£m)	Optimistic	£112.7	£22.8	£19.2	£154.7
	Pessimistic	£104.8	£21.2	£17.9	£143.9

Source: CalMac, ONS, and Cebr analysis

Socio-economic impacts

Our socio-economic modelling of the two future scenarios estimated the following benefits associated with realisation of the Optimistic rather than Pessimistic scenario in 2032:

- **Annual passenger journeys 6.1% higher**, at 6.1 million rather than 5.7 million.
- **Generalised cost savings to travellers of £67.7 million** annually (15-year present value of **£571.9 million**¹). These benefits mainly represent value of time savings from improved capacity, reliability, and frequency.
 - The biggest relative increases by journey purpose are for business and tourist travellers.
 - The biggest growth in absolute demand is for Ardrossan-Brodick, with almost 100,000 additional passenger journeys made.
 - Big reliability improvements also deliver large growth in passenger numbers for the Islay routes and routes out of Mallaig to Skye and the Small Isles.
- The 172,000 additional tourist journeys are estimated to result in **£13.8 million of additional tourism spending per year**, resulting in over 200 more tourism jobs with associated earnings of £4.3 million.
- Growth in freight journeys would support an additional **10 million bottles of whisky** production (roughly half the current output of Islay's largest distillery), associated with 46 jobs and £1.6 million of earnings.
- **Agglomeration benefits of £1.5 million** per year and **competition benefits of £1.2 million** per year, directly increasing GVA.
- **429 jobs** (including the tourism/whisky jobs estimated separately), with an earnings impact of **£11.9 million**.
- In 15-year present value terms, the combined value of generalised cost savings, agglomeration benefits, competition benefits, and earnings impacts is **£695.0 million**.
- **Over 1,000 additional island residents** attracted by improved connectivity and quality of life – around 2% of the islands' current population.

¹ This present value figure and the £695.0 million figure including other benefits are for 2032-2046, so implicitly assume realisation of full benefits throughout this period. Caveats around these figures are explained more fully in the main report.

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1. Introduction

The context and purpose of this study

The Centre for Economics and Business Research (Cebr) and Connected Economics were commissioned by CalMac Ferries Ltd (CFL) and the Ferries Community Board to produce a study into the socio-economic impacts of the Hebridean and Clyde ferry services they provide across the west coast of Scotland.

The focus of this study is:

- An assessment of **economic activity and employment directly generated by CalMac**, and indirectly through its supply chain activities; and
- An assessment of **how the connectivity provided by CalMac supports islands' prosperity**, and how different levels of service could affect island development.

The provision of ferries to island and remote mainland communities is not a 'typical' economic activity. It fundamentally enables island life and enables island businesses to operate. These impacts can be difficult to quantify but are undoubtedly important and include the policy benefits of sustainable island communities, social and cultural benefits of greater choice over where to live, and greater access to leisure, culture, and services. Our analysis considers both the wider economic value of improvements to services, and the wider economic costs of service limitations such as limitations in capacity or imperfect reliability.

A Phase 1 study produced in late 2021 and published in early 2022 provided detailed qualitative insights, based on the project team's desk research and online or telephone conversations with stakeholders across the network (mainly community representatives but also some businesses and public service providers). **The Phase 1 report therefore details the impacts of the ferry services in a qualitative way** and describes the island and remote mainland communities which depend on them.

This report represents the output of the Phase 2 work, building on the Phase 1 report by quantifying socio-economic impacts for CFL services today, and for alternative future scenarios using input-output and socio-economic modelling. These draw on:

- Further meetings, mainly with businesses, conducted either virtually or during two fieldwork trips in March and April 2022.
- Passenger survey responses collected during fieldwork.
- Financial and operational data provided by CFL.
- Secondary desk research.

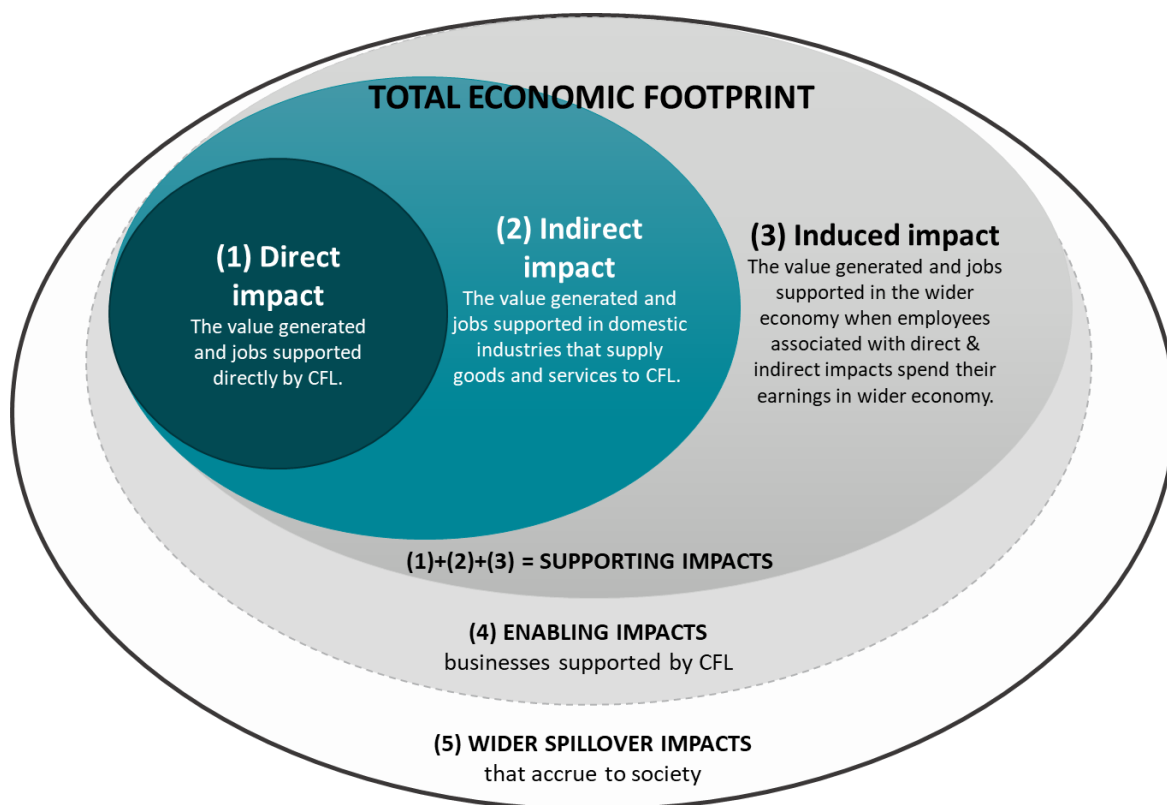
Anatomy of economic impacts

The aim of this study is to produce the most comprehensive and wide-ranging assessment possible of the economic impacts of Hebridean and Clyde ferry services provided by CFL. These can be categorised into:

- **Supporting impacts** (further divided into direct, indirect, and induced)
- **Enabling impacts**
- **Wider spillover impacts**

Figure 1 summarises these components, which reflect a progression from immediate impacts over which there is a high degree of certainty to broader impacts, which are less direct and sometimes harder to quantify – nevertheless it is these latter impacts which are most important in CFL's lifeline role.

Figure 1: Representation of CFL's total economic footprint



Study geography

The geographical area of interest for our study is the island and remote mainland locations served by CalMac. These can broadly be categorised as follows (key inhabited islands listed):

- **Outer Hebrides:** Lewis and Harris, Uist (six islands, some linked by causeways, including North Uist, Benbecula, and South Uist), and Barra
- **Inner Hebrides:** Skye, the Small Isles (Eigg, Muck, Rum, and Canna), Coll, Tiree, Mull, Iona, Lismore, Colonsay, Islay and Jura, Gigha
- **Clyde and South:** Arran, Bute, Cumbrae, plus mainland locations in Kintyre and the Cowal and Rosneath peninsulas

Future scenarios

Our analysis estimates the impacts of CalMac today and for future scenarios which reflect different profiles for service provision, operations, reliability, and capacity. These are described in a separate section after the next chapter.

Report structure

This document reports our quantitative findings on the impacts of Hebridean and Clyde ferry services provided by CFL. It is structured as follows:

- **CalMac's operations**
A brief overview of CalMac's geographic scope, inputs, and outputs
- **Future scenarios**
Setting out the CalMac operational scenarios for which socio-economic impacts will be estimated

- **Current economic footprint of CalMac**
Direct, indirect, induced, and downstream impacts of CalMac today
- **Economic footprint under alternative scenarios**
Exploring impacts of different future ferry service patterns on economic footprint
- **Connectivity: enabling island activities**
Core outputs of the socio-economic modelling by scenario
- **Supporting prosperity**
Exploring further socio-economic impacts and drawing the research together
- **Appendices**
 - Islanders' feedback
 - List of consultees
 - Full results tables

The Phase 1 report, which provides a detailed qualitative view, can be found [here](#).

2. CalMac's operations

In this chapter we set out the basic structure of CalMac's activities. We first briefly describe the places and routes served, before setting out the vessels, ports and other inputs and activities that are used to deliver these services. Finally, we sketch out the outputs that CalMac deliver with the current level of resources, including some basic information describing service frequencies, crossing times, capacity provided and reliability characteristics. This sets the stage for analysis in subsequent chapters where we explore the economic impacts of these operations and of the connectivity provided and explore how this could change under different future service development scenarios.

The route network

CalMac services are predominantly RORO ferries, able to carry foot passengers and a mix of all traffic including large commercial vehicles, though there are some exceptions and limitations. Services out of Gourock into Dunoon and Kilcreggan are passenger only, whilst for the Small Isles and Kerrera carriage of vehicles is available only for residents and essential services. As well as general vehicle services, the Ullapool-Stornoway route includes dedicated freight-only services.

Oban serves as a major mainland hub, with services from there to Barra, South Uist (winter only), Lismore, Coll and Tiree, Mull, and Islay via Colonsay (continuing to Kennacraig on the mainland).

Mallaig acts as a further hub, with services to Skye, the Small Isles, and South Uist.

Other islands are generally connected to the mainland by one ferry connection, though in some cases multiple routes are available – for instance both Port Askaig and Port Ellen on Islay have services into Kennacraig, Mull has services to the Ardnamurchan peninsula as well as into Oban, and Arran has a seasonal service to Kintyre.

There are also some island-to-island connections, for instance between Coll and Tiree, and between Uist and neighbouring Harris and Barra. For some smaller locations like Iona or Raasay, access to the mainland is via a larger neighbour only².

Finally, some routes connect one part of the mainland to another, including Kintyre and Cowal (Tarbert-Portavadie), and the seasonal service connecting Campbeltown to Ardrossan via Arran.

Whilst CalMac is the dominant operator in the Hebrides and Clyde, there are also private and local authority-provided services. Like CalMac, Western Ferries runs a Gourock-Dunoon service – it offers poorer interchange with public transport but does carry vehicles. Council-operated services provide further connections, for instance between Islay and its neighbour Jura.

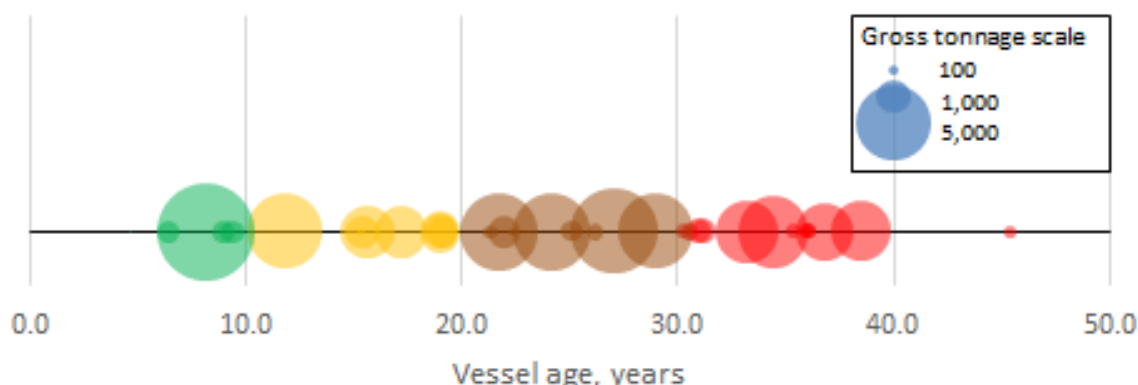
Fleet and infrastructure

CalMac currently operate a fleet of 34 vessels, ranging from the smallest – MV Carvoria, a 12 metre, 11 gross tonne landing craft which serves Kerrera, to the largest – MV Loch Seaforth, a 118 metre, 8,680 gross tonne RORO ferry with 376 lane metres of car deck space plus two hoistable mezzanine decks, serving the Ullapool-Stornoway route. Some vessels in the CalMac fleet are interoperable and the fleet is redeployed to provide a different service level

² In the case of Raasay, only one ferry journey is required as Skye is connected to the mainland by a bridge as well as by the Mallaig-Armadale ferry service.

during the quieter winter season when vessels go through their annual maintenance period. Vessels are also redeployed when relief cover is need – for example if there is a breakdown.

Figure 2: Age profile of the CalMac fleet



The average age of the fleet is now 24 years, with the oldest vessel in service (the MV Isle of Cumbrae) now 46 years old. The majority of vessels are now more than 20 years old, with implications for reliability and maintenance spend. Two large new ferries are due to be completed shortly to serve Arran and the Uig Triangle, allowing a vessel cascade which will benefit other routes. Further plans will see other new vessels added to the fleet over the coming years. These plans contribute to the scenarios that we have developed for future services described below.

CalMac manage 19 harbours across their network and operate from 35 other ports which are managed by others.

Key activities

Roughly 1,200 of CalMac's 1,900 staff serve on board vessels, with crews numbering as little as 2 on the smallest vessels and 30 or more on the largest. On major vessels, crew tend to follow weeks-on and weeks-off shift patterns and sleep on board. Other frontline staff manage arrivals and departures at ports. Over 70% of CalMac's staff live in the island and coastal communities located around their network, and competitive pay and conditions make them a desirable employer, with staff often serving long tenures at the company.

CalMac's Gourock headquarters employs over 300 staff including management functions and customer call centre.

Levels of service provided

With the vessels, port infrastructure, staff and other resources available to them CalMac had scheduled 147,000 sailings in 2021.

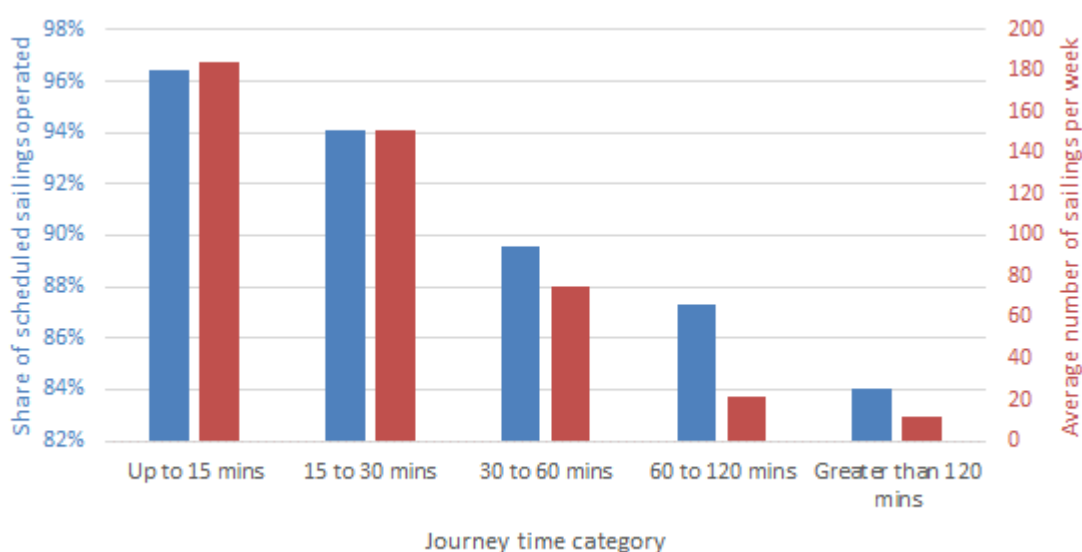
Different routes operate quite different frequencies with shorter routes tending to have much more frequent sailings. For instance, on the current summer 2022 timetable:

- Sailings between Largs and Cumbrae Slip (a 10-minute journey) depart as often as every 15 minutes on peak days, and every 30 minutes on off-peak days.
- 4 or 5 sailings per day in each direction are scheduled between Kennacraig and Port Askaig or Port Ellen on Islay (journey times are between 115 and 140 minutes).
- On the 285-minute journey between Oban and Castlebay on Barra, there is just one sailing per day in each direction (with a second via Coll and Tiree on Wednesdays).

Destinations with smaller populations also tend to see less frequent services. The Small Isles, for example, together get a daily service but each of the individual islands sees a complex timetable with opportunities to travel to or from the mainland around four days per week on average, and with connections between different island pairs on different days.

Overall, around 96% of services operate as planned. Shorter crossings are usually more reliable as they tend to be more sheltered with less complex operational considerations. **Reliability is generally lower on services with longer journey times** – particularly as these crossings are often exposed to heavy Atlantic swells and strong winds. Disrupted sailings on longer and more remote routes are likely to have a larger impact on travellers because there are fewer service alternatives; for instance, whilst a journey within the mainland (or between the mainland and Skye) can be replaced by a longer car journey, travellers needing to get to the mainland from remote islands may have to wait a day or more for another sailing, or fly at considerable expense. Figure 3 shows how journey times, reliability, and frequency interact.

Figure 3: Properties of sailings split by journey time group, 2021



Fares are set by Transport Scotland. For most passengers these are based on the Road Equivalent Tariff (RET) which had been rolled out across the network by 2018. Reduced fares following RET have boosted demand on most routes – a Transport Scotland study estimated that in 2018 RET had increased total passenger carryings by 11.6% and car carryings by 20.6%³. Freight and coach fares are set separately.

On parts of the network, **capacity pressures are evident and securing a booking can at times be difficult**. This reflects the popularity of island locations for holidaymakers, freight demands to serve households and businesses, increased demand under RET, and delays in the arrival of new capacity. Whilst booking as a foot passenger is almost always possible, many travellers do need to bring a vehicle – either because they are transporting freight or equipment, or because public transport options are sparse – so vehicle deck capacity is the constraint. For island residents, this can mean an inability to plan at short notice for social, leisure, work, or medical travel, especially in the busy summer months.

³ Evaluation of Road Equivalent Tariff on the Clyde and Hebridean Network, Transport Scotland, March 2021. Chapter 3, *How did this change travel behaviour?*. [Link](#).

Future scenarios

Two scenarios for CalMac operations in 2032 are considered in our modelling. The first reflects the results of an ambitious investment programme, and the second reflects the meeting of existing commitments only, with much of the fleet continuing to age. In both scenarios, common assumptions on underlying or exogenous demand growth relative to today's baseline are made. These scenarios drive different levels of turnover and employment in the economic impact analysis, and different levels of user benefits and wider benefits in the socio-economic analysis.

Optimistic scenario

In this scenario, an ambitious Vessel Replacement and Deployment Plan enables significant growth of the fleet through new vessel construction, with retirement of some of the oldest major and minor vessels.

- Hull 801 (Glen Sannox) and Hull 802 enter service on the Ardrossan-Brodick route and Uig Triangle respectively
- Two new Islay vessels enter service in response to continued rapid growth in demand generated by the whisky industry and associated tourism
- Cascade of other major vessels across network enabled by addition of MV Loch Frisa to Oban-Craignure route
- Oldest vessels (major and minor) across network replaced with new, larger alternatives
- Infrastructure enhancements, focused on those ports which frequently experience harbour-related disruptions
- Increased digitisation and streamlining of booking and marshalling systems

This ambitious programme would enable significant improvements in capacity, reliability, and frequency on those routes benefitting from new vessels – but not just on those routes.

Under this scenario, the average age of the fleet falls from 24 years to just under 18. Some spare vessels are also assumed, increasing redundancy through having at least one in hot lay-up, and improved interoperability. Therefore, reliability and effective capacity would be improved across the network, especially for those non-lifeline routes which frequently lose their service in response to disruption elsewhere. On selected routes receiving new vessels, investments support timetabling and service development, enabling longer days on the mainland (which benefits business and commuting travellers in particular).

Pessimistic scenario

This scenario sees much more limited improvements, based on commitments already delivered or underway. The two new Islay vessels are not included – though given that contracts have been signed it is highly unlikely they will not be delivered.

- Hull 801 (Glen Sannox) and Hull 802 enter service on the Ardrossan-Brodick route and Uig Triangle respectively
- Addition of MV Loch Frisa to Oban-Craignure route, cascade of MV Coruisk to Mallaig-Armadale

Whilst the addition of new vessels provides welcome capacity uplifts on certain routes, the generalised reliability improvements seen in the Optimistic scenario are not realised. The continued ageing of the fleet (from 24 years on average to 32) and lack of new investment in harbour infrastructure leads to worsening of reliability and therefore effective capacity.

3. Current economic footprint of CalMac

Our starting point is to identify the contributions directly made by CalMac to the Scottish economy. Our analysis considered four key performance indicators:

- **Turnover** – This represents the business revenue generated by CalMac.
- **Gross Value Added (GVA)** – While turnover captures the entire cost of sales and provides an indication of the size of CalMac’s operations in Scotland, GVA contributions represent the ‘value-added’ to the economy by CalMac. In this report, we take the income approach to estimating GVA and define it as the total compensation paid to employees plus total operating profit. Subsidies (where not already recorded as an income source) are added in, on the logic that they are paid to induce a societally desirable outcome, generating at least the monetary value of the subsidy paid. For taxes on products for which the reverse is true, this tax is subtracted.

GVA is also commonly known as income from production and is distributed in three directions – to employees, to shareholders and to government. It is often used as a proxy for estimating the contribution of a firm or industry to GDP.

- **Employment** – Refers to the number of workers employed by CalMac. We typically present results as full-time equivalent (FTE) employees. FTE refers to the hours worked by one employee who is employed on a full-time basis and is used to standardise the hours worked by several part-time employees to one full-time worker. This is important for comparisons across industries or businesses, where the share of employees who work full-time varies.
- **Employee Compensation** – Refers to the total compensation paid to employees in return for work done. This includes wages, benefits and employer pension and tax liabilities.

In the following sub-section, we present results both on a national basis for Scotland as a whole, plus results on a more granular basis for 16 individual islands or island groups that are served directly by CalMac.

Direct economic impacts

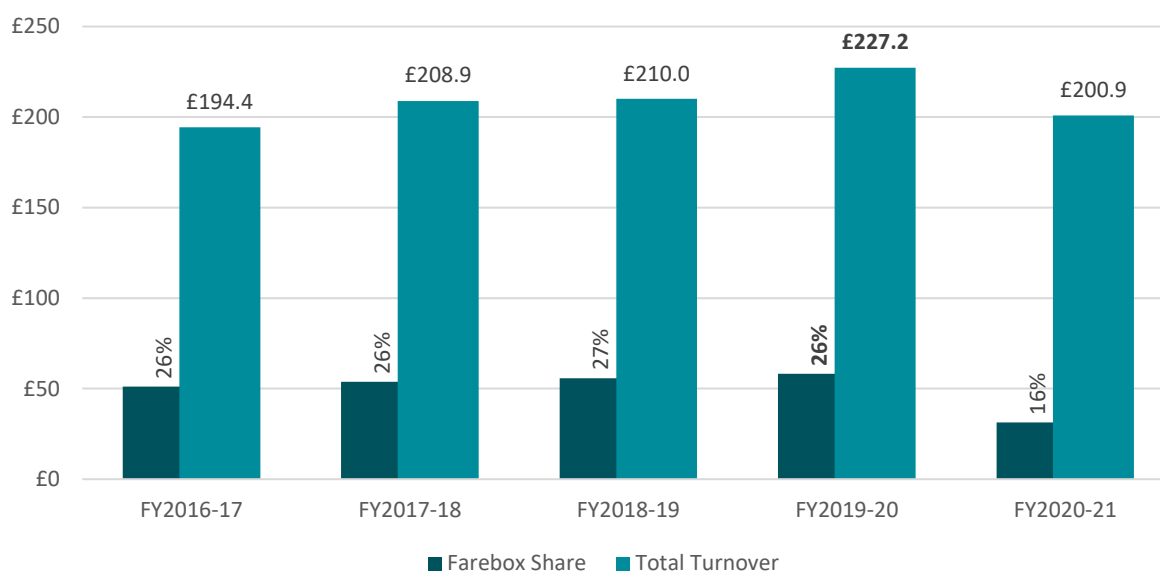
National impacts

While the key analysis year is for FY 2019-20, this sub-section details the direct economic impacts of CalMac across the Scottish economy at a national level between FY 2016-17 and FY 2020-21.

Turnover

Figure 4 illustrates the turnover that was directly generated by CalMac between FY17 and FY21, with the share of total revenue attributable to passenger fares highlighted for each year.

Figure 4. Direct turnover of CalMac, £m, FY17 to FY21



Source: CalMac and Cebr analysis

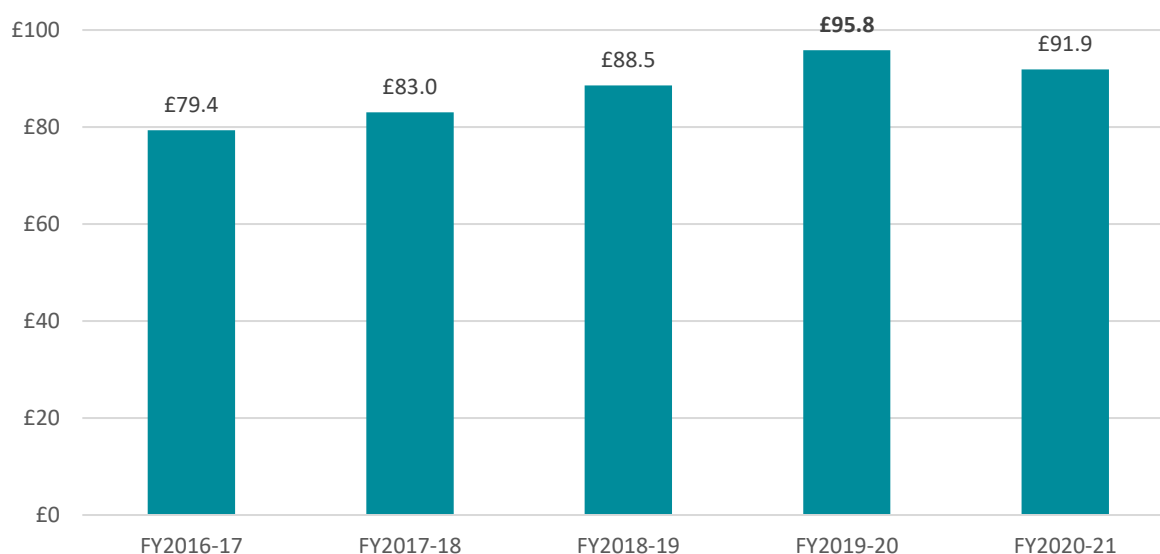
The direct turnover generated by CalMac increased consistently from FY17 to FY20, reaching a peak of £227.2 million in FY20, equivalent to a 16.9% rise from the start of the observation period (or an absolute increase of £32.8 million). However, for the year ending March 2021, direct turnover generated by CalMac fell by £26.3 million (-11.6%) compared to FY20 as travel was restricted due to Covid-19.

As can be seen from Figure 4, prior to the Covid-19 pandemic, the share of total turnover that was generated by farebox revenue was relatively consistent at between 26% and 27%. The impact of the Covid-19 disruption is evident here through a decrease in total farebox revenue to £31.4 million in FY21 from £58.2 million in FY20, a 46.1% fall.

Gross Value Added (GVA)

Figure 5 illustrates the direct GVA contributions made by CalMac to the Scottish economy between FY17 and FY21.

Figure 5. Direct GVA contributions of CalMac, £m, FY17 to FY21



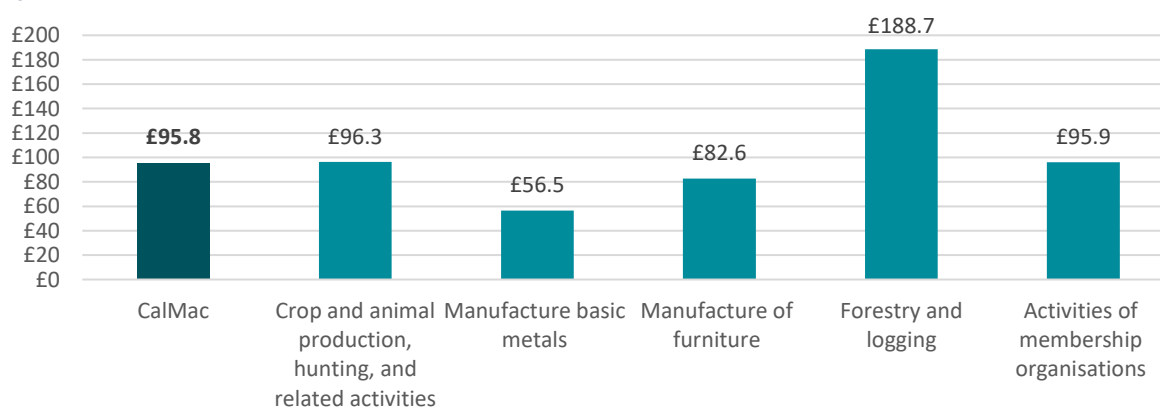
Source: CalMac and Cebr analysis

As was seen for turnover, **GVA increased consistently between FY17 to FY20, reaching a peak of £95.8 million in FY20**, equivalent to a 20.7% rise from the start of the observation period (or an absolute increase of £16.4 million). Again, in the year ending March 2021, direct GVA contributions of CalMac fell. Here, the £3.9 million fall compared to FY20 levels represented a -4.1% contraction in direct value adding contributions to the Scottish economy.

In order to provide some contextualisation for the scale of CalMac's direct GVA contributions to the Scottish economy, we present some analysis comparing the GVA of CalMac to a range of other industries. Regarding sectors that are most closely aligned with CalMac's activities, **38% of the GVA generated by the total water transport sector was attributable to CalMac in FY 2019-20**. Further, in the same year, the entire air transport sector generated £416.1 million of GVA. To put this in perspective, the scale of this activity was approximately 4.3 times the size of CalMac's direct GVA contributions.

Figure 6 visualises some further context by comparing the GVA of CalMac to other sectors in the Scottish economy in FY 2019-20. These sectors are chosen as they reflect similarly sized industries in comparison to the magnitude of CalMac's direct GVA contribution. As illustrated, CalMac contributes more in GVA than the manufacture basic metals and manufacture of furniture sectors, while the company is roughly equal in its GVA contribution to the Scottish economy as the whole of the crop and animal production, hunting and related service activities sector as well as the activities of membership organisations sector.

Figure 6. CalMac GVA compared to selected other industries, £m, FY 2019-20

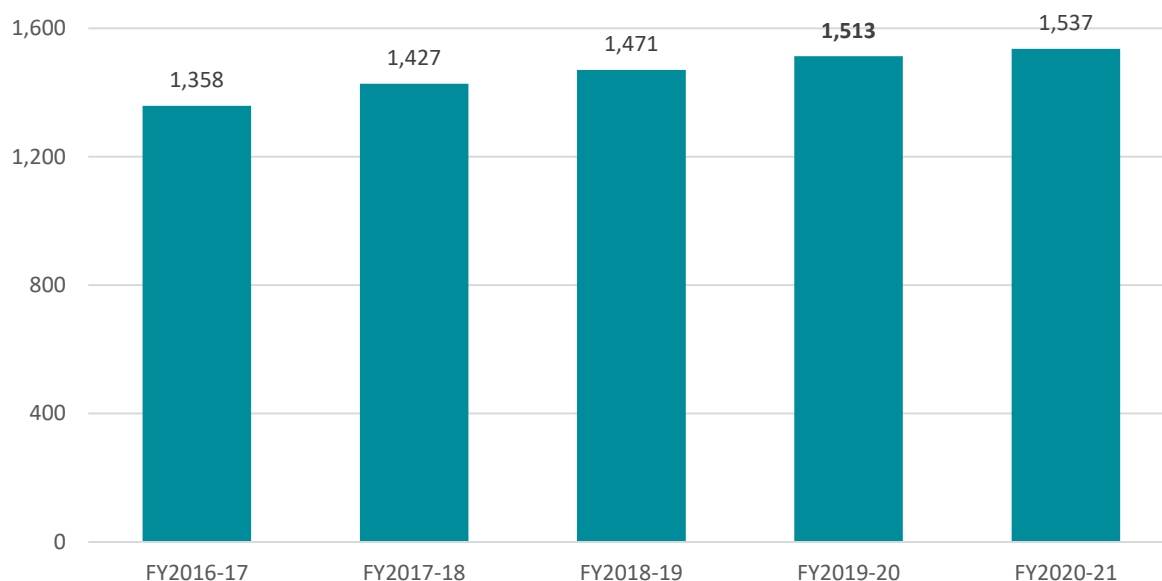


Source: CalMac, ONS, and Cebr analysis

Employment

Figure 7 illustrates the direct employment contributions made by CalMac between FY17 and FY21 to the Scottish economy.

Figure 7. Employment contributions of CalMac, FTE jobs, FY17 to FY21

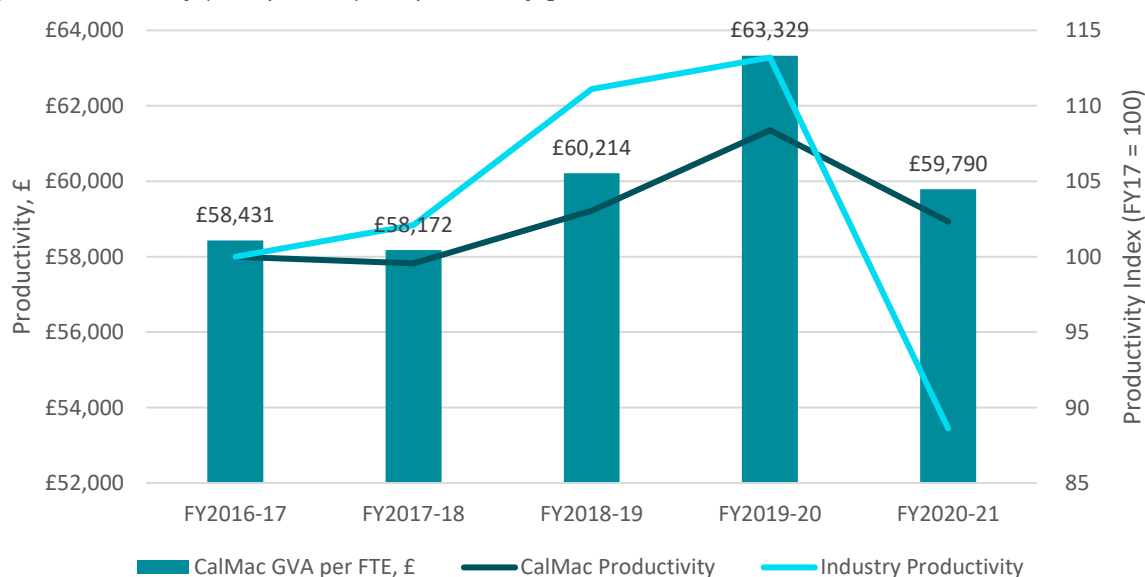


Source: CalMac and Cebr analysis

Unlike the other direct impact metrics, on an FTE basis, the employment contributed by CalMac to the Scottish economy increased monotonically over the observation period, from 1,358 FTE workers to 1,537, an increase of 178 (13.1%). **The average growth rate of FTE jobs between FY17 and FY21 was 3.1% on a year-on-year basis.**

This increase in FTE employment from FY17 and FY21 outstrips wider FTE employment growth in Scotland's labour market, which grew at an average of 0.3% year-on-year over the same period. While year-on-year FTE employment growth in the wider industry for transportation and storage (SIC H), increased by 0.4% in that same period.

Figure 8. Productivity (GVA per FTE) and productivity growth, £, FY17 to FY21



Source: CalMac, ONS, and Cebr analysis

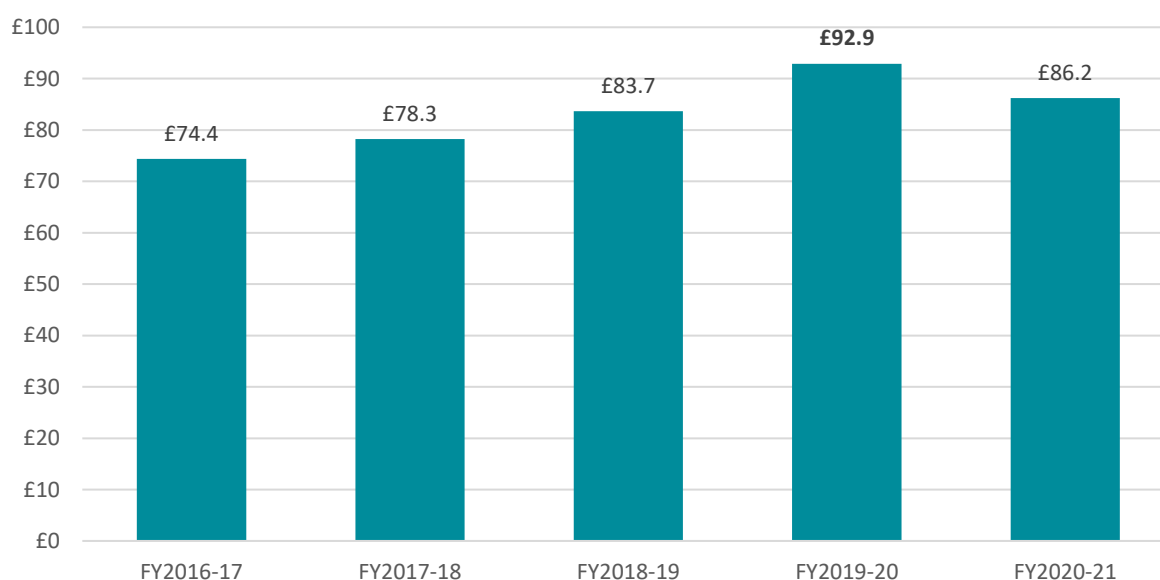
CalMac productivity, in terms of GVA per FTE, fluctuates across the period. Initially, there was a 0.4% decline in productivity in FY 2017-18 from a starting point of £58,431, fuelled by the increase in the number of CalMac employees outstripping the growth in GVA in the same year. **However, the year-on-year productivity growth was 3.5% and 5.2% in the subsequent years, with peak CalMac productivity in FY 2019-20 at £63,329**, followed by a sharp decline in FY 2020-21 following the restrictions imposed as a result of the Covid-19 pandemic.

Compared to the wider productivity of the wider transportation and storage industry, at the start of the period, industry productivity growth outpaced the productivity growth of CalMac. Nevertheless, in the year prior to the pandemic, CalMac productivity grew by 5.2% while the wider transportation and storage industry productivity grew by just 1.9%. The Figure also shows that CalMac was able to better weather the impact of the pandemic compared to the rest of the industry, with CalMac productivity falling by 5.6% compared to a 21.7% fall across the rest of the industry.

Employee Compensation

Figure 9 illustrates the total amount paid in employee compensation by CalMac.

Figure 9. Employee compensation paid to workers in CalMac, £m, FY17 to FY21

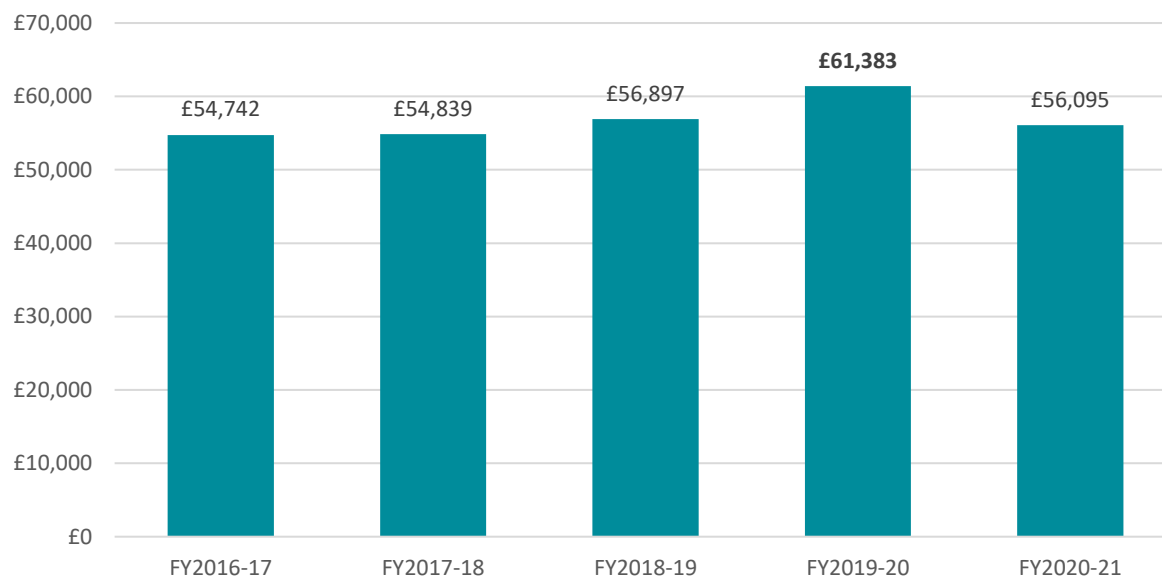


Source: CalMac and Cebr analysis

The total compensation paid rose by £18.5 million from FY17 to FY2019-20, an increase of 24.9%. The total increase occurred gradually over this period, with year-on-year growth averaging £6.2 million per year. In line with turnover and GVA, there was also a drop in employee compensation between FY20 and FY21. The observed fall is a decrease of £6.7 million (-7.2%) for the year. However, with the exception of FY20, the FY21 total remains above all other years in the observation period.

Given that the number of workers in CalMac has also been fluctuating, it is a more meaningful annual comparison to consider the average compensation paid per FTE employee. Figure 10 presents our results.

Figure 10. Average compensation paid per FTE worker in CalMac, £, FY17 to FY21



Source: CalMac and Cebr analysis

In nominal terms, the **average compensation paid per FTE employee in CalMac increased by £1,353 (2.5%) across the whole period, from £54,742 in FY17 to £56,095 in FY21.** However, this increase in compensation did not occur consistently. Overall, employee compensation has increased over the period considered on both a total and per FTE level, however compensation per FTE peaked in FY20 at £61,383, the last full pre-Covid year.

Regional impacts

This sub-section details the aggregate economic footprint of CalMac in FY2019-20 at a regional level, with full results across all 16 islands and island groups analysed as a part of this study.

Table 2 presents full results for the direct economic impact across the 16 island regions assessed in this report. In terms of FTE jobs for FY2019-20, employees living in these 16 regions accounted for approximately 27.8% of CalMac employment in Scotland. While in GVA and employee compensation terms, these 16 regions accounted for an estimated 37.3% and 31.6% of the total direct impact in Scotland, respectively.

Table 2. Direct economic impacts for 16 island regions, £'000 and FTE jobs, FY 2019-20

Direct impact				
Island	Region	GVA (£'000)	Employment (FTE jobs)	Employee Compensation (£'000)
Coll and Tiree	Argyll and Bute	£1,268	14	£1,012
Mull and Iona	Argyll and Bute	£3,249	36	£2,594
Kerrera and Gallanach	Argyll and Bute	£238	3	£190
Jura and Colonsay	Argyll and Bute	£475	5	£380
Islay	Argyll and Bute	£2,219	25	£1,771
Gigha ⁴	Argyll and Bute	£396	4	£316
Bute	Argyll and Bute	£3,249	36	£2,594
Barra	Na h-Eilean Siar	£4,067	42	£3,147
Eriskay and South Uist	Na h-Eilean Siar	£3,050	32	£2,360
Benbecula	Na h-Eilean Siar	£593	6	£459
North Uist	Na h-Eilean Siar	£1,610	17	£1,246
Lewis and Harris	Na h-Eilean Siar	£11,691	122	£9,048
Small Isles	Highlands	£155	3	£157
Skye and Raasay	Highlands	£2,225	38	£2,256
Arran	North Ayrshire	£1,111	34	£1,692
Great Cumbrae	North Ayrshire	£85	3	£130

Source: CalMac, BRES, ONS, and Cebr analysis

The direct impacts across the Outer Hebrides are the largest within the assessed sample. **The single island region with the largest impact was Lewis and Harris.** In terms of FTE employment, the 122 jobs outstripped the next largest island, Barra, almost three-fold. This trend is reflected in both the direct GVA and employee compensation contributions by CalMac, with Lewis and Harris accounting for approximately one third of the total in-scope regional direct impacts.

The remaining islands are part of the broader regions that make up the Inner Hebrides and the Islands of the Firth of Clyde.

Within the narrower Highlands and North Ayrshire regions, Skye and Raasay and the Isle of Arran respectively dominate as the largest centres of CalMac's direct economic activity. In Argyll and Bute, the direct impacts are more widely distributed, with CalMac contributing **over £1 million of direct GVA in Coll and Tiree, Mull and Iona, Islay, and Bute.**

⁴ The Gigha island group is defined by the 2011 Datazone S01007329. In geographic terms, this covers the island of Gigha, plus a portion of the western Kintyre Coast that is directly adjacent to and south of the island.

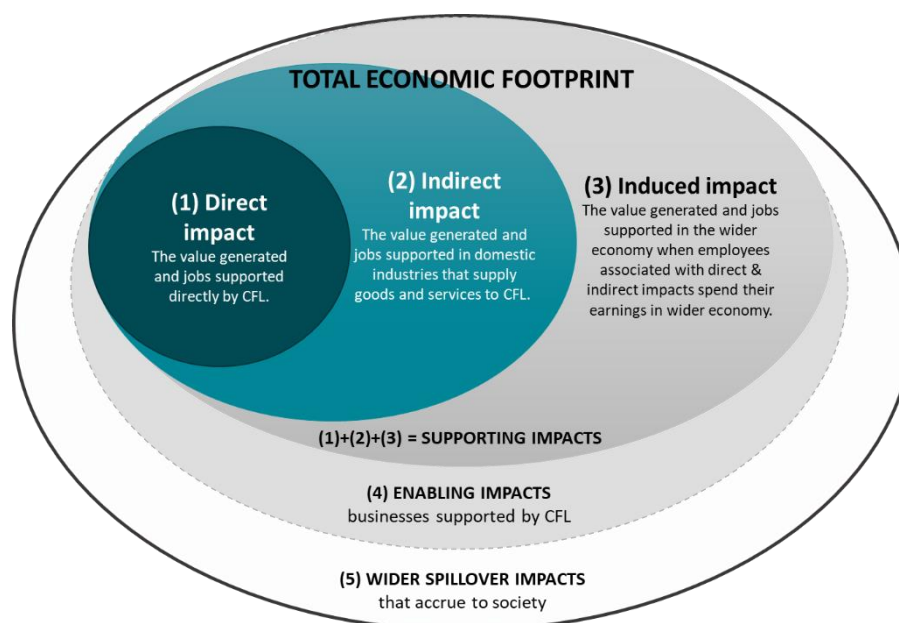
Aggregate economic footprint of CalMac

The wider footprint supported by CalMac is not constrained to the above direct impacts alone. Our approach conceptualises two further impact layers: indirect impacts and induced impacts.

- **Indirect impacts** – CalMac place demands on their upstream supply chains, purchasing goods and services they need for operations. This supports further demand along supply-chains, and output and jobs amongst their suppliers. In turn, these suppliers place demands on their suppliers which supports further output and jobs. The indirect impact captures the revenue, GVA, employment and employee compensation supported along the supply-chains because of these operations.
- **Induced impacts** – The workers who receive income and employment benefits through the direct (CalMac employees) and indirect (the suppliers to the sector and in turn their suppliers) channels spend their increased earnings on goods and services in the wider economy. This helps to further stimulate demand, supporting additional turnover, GVA, employment and employee compensation. The induced impact captures these wider-spending effects.

Summing these direct, indirect, and induced impact layers allows us to estimate the aggregate footprint supported by CalMac in Scotland. Our approach is summarised below in Figure 11.

Figure 11. Summary of economic impact layers



National impacts

In this sub-section, we will present results for the aggregate economic footprint of CalMac across the Scottish economy for the key analysis year, FY 2019-20.

First, Table 3 presents the multipliers used to calculate the indirect and induced (and hence aggregate) effects from the direct CalMac economic impacts. For each of the below metrics, the **multipliers highlight how a unit change in CalMac's direct impacts will affect the economy as a whole.**

Table 3. Bespoke national multipliers for CalMac, Type I and II.

National Multipliers ⁵	Type I Multipliers – Indirect Impacts	Type II Multipliers – Induced Impacts
Turnover	1.26	1.54
GVA	1.30	1.70
FTE employment	1.31	1.67
Employee Compensation	1.20	1.37

Source: CalMac, ONS, and Cebr analysis

Turnover

CalMac directly generated an estimated £227.2 million in turnover in FY 2019-20. Through our input-output modelling, we estimate that this direct turnover supports an additional £60.0 million worth of turnover along the supply-chains (the indirect effect). Furthermore, it is estimated that the increase in wider-spending that occurs when CalMac employees (and the employees supported along the supply-chains) spend their earnings in the wider economy supports £68.5 million (the induced effect).

Combining these direct, indirect, and induced impacts, it is estimated that **CalMac supports an aggregate footprint of £350.6 million in turnover**. The effects of the additional indirect and induced impacts are set out below, in Figure 12.

Figure 12. Turnover multiplier results, £m, FY 2019-20



Source: CalMac, ONS, and Cebr analysis

They should be interpreted as follows. For every £1 in turnover directly generated by CalMac, a further £0.26 of turnover is supported in firms along their supply chains. Furthermore, £0.28 of turnover is supported in Scottish businesses when individuals associated with the direct and indirect impact layers spend their earnings in the wider economy. Summing the indirect

⁵ For comprehensive definitions and practical illustrations of the multipliers for output, GVA, employment, and income, see the following [publication](#) from the Scottish Government.

and induced layers together, we can say that **for every £1 of turnover directly generated by CalMac, a further £0.54 worth of turnover is supported in the wider economy.**

Gross Value Added (GVA)

In FY 2019-20, CalMac directly generated £95.8 million in Gross Value Added (GVA) contributions. It is estimated that a further £28.5 million worth of GVA contributions are supported along the supply-chains (the indirect effect) and £38.6 million is supported when CalMac employees (and employees along their supply chains) spend their earnings in the wider economy.

The effects of these additional indirect and induced impacts are set out below, in Figure 13, leading to an **aggregate impact of £162.9 million.**

Figure 13. Gross Value Added multiplier results, £m, FY 2019-20



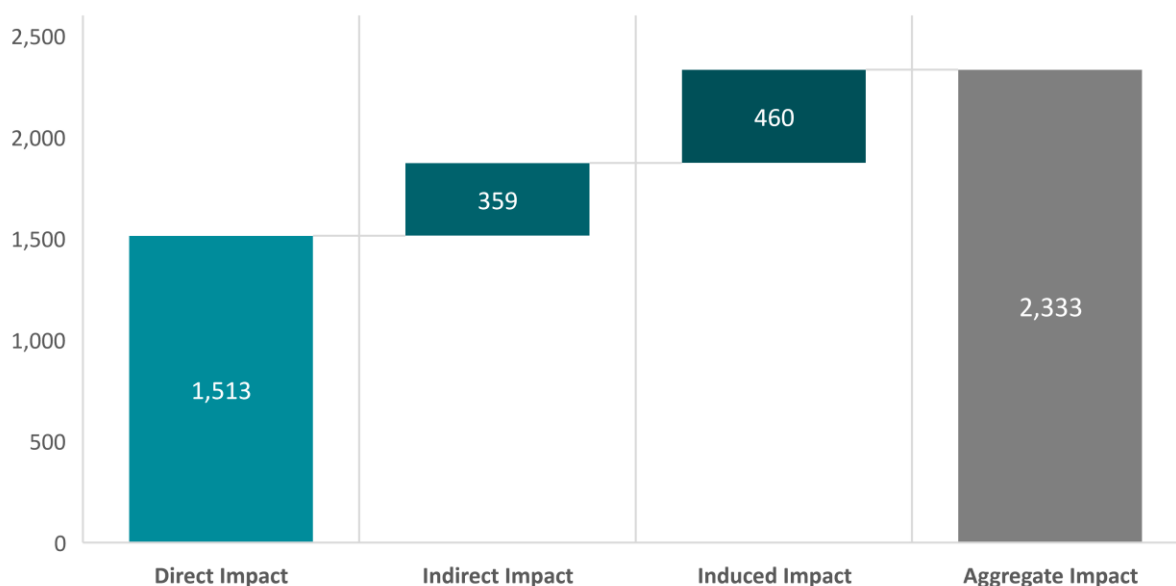
Source: CalMac, ONS, and Cebr analysis

Once again, it is possible to generalise this result by considering the ratios between the direct, indirect and induced impact layers. **For every £1 in GVA directly generated by CalMac in the Scottish economy, a further £0.70 is supported through the indirect and induced impact channels.**

Employment

In FY 2019-20, CalMac directly supported 1,513 jobs. Figure 14 illustrates our calculated employment multipliers for CalMac.

Figure 14. FTE employment multiplier results, FTE jobs, FY 2019-20



Source: CalMac, ONS, and Cebr analysis

The modelling shows that for every FTE job directly generated by CalMac, a further 0.31 jobs are supported along their supply chains. Moreover, a further 0.36 FTE jobs are supported when employees associated with the direct and indirect impact layers spend their earnings in the wider economy. By combining the indirect and induced impact layers, our modelling shows that **for every FTE job directly generated by CalMac, a further 0.67 jobs are supported in the wider Scottish economy.** Overall, on an FTE basis 2,527 jobs are supported across the economy.

Employee Compensation

Finally, we are interested in the aggregate compensation of employees supported by CalMac across Scotland. In FY 2019-20, total direct employee compensation was £92.9 million, while the aggregate impact totalled £127.5 million. The effects of the additional indirect and induced impacts are set out below, in Figure 15.

Figure 15. Employee compensation multiplier results, £m, FY 2019-20



Source: CalMac, ONS, and Cebr analysis

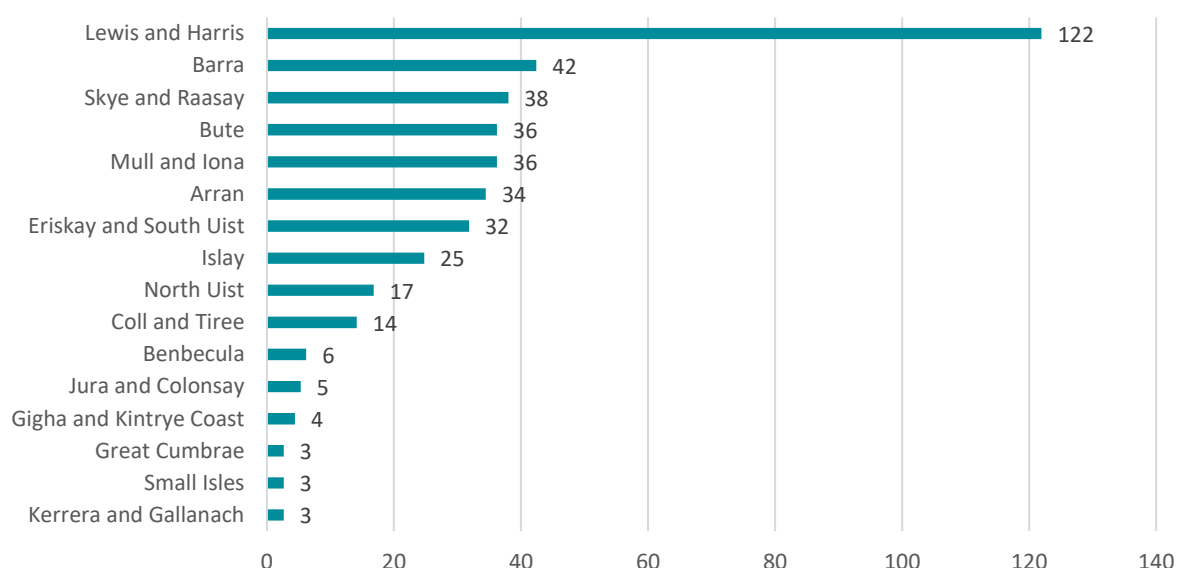
In addition to the direct impact, we estimate that the indirect and induced economic activity that is supported by CalMac, supports an additional £34.7 million of employee compensation in the wider economy. **Hence, for every £1 of employee compensation directly generated by CalMac, a further £0.37 of compensation is supported through the indirect and induced impact channels across the Scottish economy.**

Regional Impacts

This sub-section details the aggregate economic footprint of CalMac in FY2019-20 at a regional level, with selected results presented for six of the larger regions by aggregate impact. For a full breakdown of all multipliers used to calculate the regional aggregate economic impacts, see the appendices to this document.

Also within the appendices, Table 33 details the aggregate economic impact for FTE employment as well as figures for the share of total island employment that is supported by CalMac's economic footprint. This statistic provides useful contextualisation regarding the relative importance of CalMac in supporting economic activity in small, remote areas.

Figure 16. Direct FTE employment contributions by CalMac across 16 island groups, FTE jobs, FY20



Source: CalMac and Cebr analysis

From Table 2 as well as Figure 16 above, it is evident that there is not an equal distribution across the assessed regions in terms of direct FTE employment contributions by CalMac. The economy and population for a number of these regions is very small, hence, so too are the respective aggregate economic impacts of CalMac. For the brevity of the main report, we will highlight six of the largest island regions that span the length of the Clyde and Hebridean network; Lewis and Harris, Skye and Raasay, Bute, Mull and Iona, Arran, and Islay. Full results across all 16 islands and island groups analysed in this study have been tabulated and presented in the appendices.

- Lewis and Harris

In FY 2019-20, **1 in every 52 jobs (1.9%) in Lewis and Harris** was supported by CalMac's aggregate economic footprint in the region.

Table 4. Aggregate economic footprint of CalMac in Lewis and Harris, FY 2019-20

	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
GVA (£'000)	£11,691	£1,574	£1,618	£14,883
FTE employment (jobs)	122	17	27	167
Employee compensation (£'000)	£9,048	£854	£844	£10,746

Source: CalMac, ONS, and Cebr analysis

For every £1 of GVA directly generated by CalMac in Lewis and Harris, a further £0.27 of GVA is supported in the region's wider economy.

For every FTE job directly generated by CalMac in Lewis and Harris, a further 0.4 FTE jobs are supported in the region's wider economy.

For every £1 of employee compensation paid to CalMac employees in Lewis and Harris, a further £0.19 worth of compensation is supported in the region's wider economy.

- Skye and Raasay

In FY 2019-20, **1 in every 109 jobs (0.9%) in Skye and Raasay** was supported by CalMac's aggregate economic footprint in the region.

Table 5. Aggregate economic footprint of CalMac in Skye and Raasay, FY 2019-20

	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
GVA (£'000)	£2,225	£32	£568	£2,824
FTE employment (jobs)	38	1	10	48
Employee compensation (£'000)	£2,256	£21	£321	£2,598

Source: CalMac, ONS, and Cebr analysis

For every £1 of GVA directly generated by CalMac in Skye and Raasay, a further £0.27 of GVA is supported in the region's wider economy.

For every FTE job directly generated by CalMac in Skye and Raasay, a further 0.3 FTE jobs are supported in the region's wider economy.

For every £1 of employee compensation paid to CalMac employees in Skye and Raasay, a further £0.15 worth of compensation is supported in the region's wider economy.

- Bute

In FY 2019-20, **1 in every 46 jobs (2.2%) in Bute** was supported by CalMac's aggregate economic footprint in the region.

Table 6. Aggregate economic footprint of CalMac in Bute, FY 2019-20

	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
GVA (£'000)	£3,249	£266	£411	£3,926
FTE employment (jobs)	36	3	7	46
Employee compensation (£'000)	£2,594	£161	£233	£2,987

Source: CalMac, ONS, and Cebr analysis

For every £1 of GVA directly generated by CalMac in Bute, a further £0.21 of GVA is supported in the region's wider economy.

For every FTE job directly generated by CalMac in Bute, a further 0.3 FTE jobs are supported in the region's wider economy.

For every £1 of employee compensation paid to CalMac employees in Bute, a further £0.15 worth of compensation is supported in the region's wider economy.

- Mull and Iona

In FY 2019-20, **1 in every 33 jobs (3.0%) in Mull and Iona** was supported by CalMac's aggregate economic footprint in the region.

Table 7. Aggregate economic footprint of CalMac in Mull and Iona, FY 2019-20

	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
GVA (£'000)	£3,249	£28	£464	£3,742
FTE employment (jobs)	36	0	8	44
Employee compensation (£'000)	£2,594	£12	£263	£2,868

Source: CalMac, ONS, and Cebr analysis

For every £1 of GVA directly generated by CalMac in Mull and Iona, a further £0.15 of GVA was supported in the region's wider economy.

For every FTE job directly generated by CalMac in Mull and Iona, a further 0.2 FTE jobs were supported in the region's wider economy.

For every £1 of employee compensation paid to CalMac employees in Mull and Iona, a further £0.11 worth of compensation was supported in the region's wider economy.

- Arran

In FY 2019-20, **1 in every 51 jobs (2.0%) in Arran** was supported by CalMac's aggregate economic footprint in the region.

Table 8. Aggregate economic footprint of CalMac in Arran, FY 2019-20

	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
GVA (£'000)	£1,111	£40	£329	£1,480
FTE employment (jobs)	34	1	6	41
Employee compensation (£'000)	£1,692	£37	£186	£1,916

Source: CalMac, ONS, and Cebr analysis

For every £1 of GVA directly generated by CalMac in Arran, a further £0.33 of GVA is supported in the region's wider economy.

For every FTE job directly generated by CalMac in Arran, a further 0.2 FTE jobs are supported in the region's wider economy.

For every £1 of employee compensation paid to CalMac employees in Arran, a further £0.13 worth of compensation is supported in the region's wider economy.

- Islay

In FY 2019-20, **1 in every 61 jobs (1.6%) in Islay** was supported by CalMac's aggregate economic footprint in the region.

Table 9. Aggregate economic footprint of CalMac in Islay, FY 2019-20

	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
GVA (£'000)	£2,219	£41	£299	£2,559
FTE employment (jobs)	25	1	5	30
Employee compensation (£'000)	£1,771	£20	£169	£1,960

Source: CalMac, ONS, and Cebr analysis

For every £1 of GVA directly generated by CalMac in Islay, a further £0.15 of GVA is supported in the region's wider economy.

For every FTE job directly generated by CalMac in Islay, a further 0.2 FTE jobs are supported in the region's wider economy.

For every £1 of employee compensation paid to CalMac employees in Islay, a further £0.11 worth of compensation is supported in the region's wider economy.

Downstream impacts

To this point, the economic analysis has focused on CalMac's upstream supply chain⁶, which allows us to calculate the company's aggregate contribution to the economy. However, **CalMac also feeds into a "downstream" supply chain, whereby CalMac services are used by firms and industries** to transport goods off-island to be sold and distributed from the mainland, for example. Subsequently, other firms use these goods as inputs into their own business activities where additional value is added before being sold to final consumers in either domestic or international markets.

Using supply-use tables, we can trace the transmission of CalMac to other parts of the economy and estimate the value added that CalMac may facilitate through its role in supplying intermediate services to other firms. This only considers the value-added through firms purchasing CalMac services, not of private consumption.⁷

In this subsection, we will break these results down into two broad geographic groups⁸:

- **The Northern Regions** – The Outer Hebrides and the Highlands including the mainland areas of Morvern, Malliag, Ullapool and Oban.
- **The Southern Regions** – Argyll & Bute and North Ayrshire. This also includes the mainland regions of Ardrossan (and Saltcoats), Largs, Cowall and Dunoon, Kintyre, Campbeltown and Oban.

It should also be noted that while the downstream impacts are not necessarily causal, the facilitation layer does provide an important indication of the value contribution of CalMac through its economic associations.

⁶ Defined as purchases of goods and services by CalMac from other firms to supply its own service

⁷ For example, an employee commuting to work who pays for his own trip on a CalMac ferry would not be included within this calculation. However, an employee travelling for work where the firm pays for the ferry ticket would be included.

⁸ Note that we include the mainland area of Oban within both regions. This is because it has ferry routes operating to the Outer Hebrides as well as many of the Southern Islands. As a result, it is not appropriate to sum the results from each geography to produce a single downstream impact for CalMac without appropriately accounting for the double counting of Oban.

The Northern Regions

The headline results of this analysis are as follows:

- In FY 2019-20, CalMac supported £16.9 million of business turnover in the region's wider economy, where firms relied on CalMac services in their production of final goods and services.
- This turnover supported £7.1 million of GVA on a downstream basis, across the Northern Regions' economy.

The Southern Regions

The headline results of this analysis are as follows:

- In FY 2019-20, CalMac supported £10.0 million of business turnover in the region's wider economy, where firms relied on CalMac services in their production of final goods and services.
- This turnover supported £4.4 million of GVA on a downstream basis, across the Southern Regions' economy.

4. Economic footprint under alternative scenarios

To this point, we have produced analysis focussed on FY 2019-20. However, in the following section, we estimate the economic footprint of CalMac in 2032 under two forward-looking investment scenarios.

Methodology

The first of the two alternative scenarios reflects the impact of an optimistic investment programme, while the second reflects a more pessimistic scenario with investment levels meeting existing commitments only, while much of the fleet continues to age.

These scenarios drive different levels of turnover and employment in the economic impact analysis, with the results presented below. To estimate the direct economic impacts at both a national and regional level, 2032 impacts have been estimated relative to a 2022 baseline for the key metrics. All results are in real terms based upon constant 2022 prices.

- **Turnover** has been scaled proportionally to changes in passenger demand in 2032 versus 2022.
- **Full-time equivalent (FTE) employment** is estimated based upon an ordinary least squares regression model that estimates a best-fit relationship between crew requirements and total network capacity (in terms of total passengers and car deck space). We are then able to estimate the required percentage increase in crew required under each investment scenario compared to 2022 levels based upon estimated network capacity in 2032. From this, an uplift to vessel staff is applied to produce a real FTE employment estimate under each scenario, with the staffing requirements for total head office and port staff held constant.
- In real terms, **compensation of employees (COE)** is estimated based upon a nowcast of average COE per FTE for CalMac employees in 2022. Then, to estimate a total company-wide employee compensation figure in 2032, this per-FTE value is applied to the forecasted number of FTE employees in 2032 under each scenario.
- Finally, **gross value added (GVA)** is triangulated by estimating the implied value-added figure through two approaches. Firstly, we use the average GVA-to-turnover ratio over the last five years, but this leads to the implied GVA figure being lower than total COE. The implication of this is that CalMac would be running an operating loss, a prediction that is not consistent with the trends seen in recent management account data. To recalibrate for this, the structure of CalMac over the last 5 years has seen total employee compensation account for an average of 95% of total GVA. Therefore, we have assumed that this relationship will be maintained and combine the turnover-linked estimate of GVA with a GVA estimate based on the average COE as a share of GVA over the last 5 years. These two methodologies are combined to produce a final estimate for gross value-added in 2032.

Finally, to produce the indirect, induced, and aggregate economic impact layers, we have held the previously calculated bespoke multipliers constant, with only the direct economic impacts adjusting under each scenario.

National impacts

Before the results are presented, it should be stressed that the impacts are not limited to these financial and economic impacts. Additional welfare is generated through wider social and economic channels. Further details of these additional socioeconomic impacts are presented in 5. *Connectivity: enabling island activities* and 6. *Supporting prosperity*

In addition, these figures are single-year comparisons. Higher investment is likely to lead to additional benefits every year, hence the total economic impacts that accrue over time because of higher investment are likely to be significantly larger than they appear in the single-year snapshot within Table 10.

The key headline from this analysis is that the Optimistic investment scenario consistently outperforms the Pessimistic investment scenario in all metrics and across all impact layers.

Table 10. Aggregate national economic impacts, £m and FTE jobs, 2032

Metric	2032 Scenario	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact
Turnover (£m)	Optimistic	£246.1	£65.0	£68.8	£379.9
	Pessimistic	£232.0	£61.3	£64.8	£358.0
GVA (£m)	Optimistic	£114.7	£34.2	£46.2	£195.1
	Pessimistic	£107.4	£32.0	£43.2	£182.6
FTE employment (jobs)	Optimistic	1,819	556	664	3,039
	Pessimistic	1,693	518	617	2,828
Employee Compensation (£m)	Optimistic	£112.7	£22.8	£19.2	£154.7
	Pessimistic	£104.8	£21.2	£17.9	£143.9

Source: CalMac, ONS, and Cebr analysis

The aggregate GVA impact of £195.1 million under the Optimistic investment scenario is £12.5 million larger (6.1%) than under the Pessimistic scenario in the 2032 analysis year. While for aggregate FTE employment, the Optimistic investment scenario outpaces the Pessimistic scenario by 212 jobs – equivalent to a **7.5% increase in the aggregate economic footprint of CalMac**.

Regional impacts

This sub-section details the direct and the aggregate economic impacts of CalMac in 2032 at a regional level under both Optimistic and Pessimistic investment scenarios, with full results across all 16 islands and island groups analysed as a part of this study. In the absence of more accurate data, we have assumed proportionality of regional impacts between the current scenario and the two forward looking scenarios.⁹

For both investment scenarios, Table 11 presents full results for the direct economic impacts while Table 12 presents the full results for the aggregate economic impacts. These Tables highlight the importance of CalMac in terms of the organisation's support of economic activity in lifeline areas, even in those regions for which it employs a very small number of people in absolute terms.

For example, we estimate that CalMac supports the employment of 6 workers on an FTE basis in Jura and Colonsay, under both scenarios. In 2022, FTE employment in the region totalled 198. Therefore, approximately 3% of total employment is supported by the aggregate footprint of CalMac. It should also be highlighted that this figure is in the context of 'upstream' impacts and does not factor in the facilitation of economic activity that occurs across the "downstream" supply chain. Again, this is where CalMac services are used by firms and industries to transport goods off-island to be sold and distributed from the mainland. While quantifying the size of this impact under each investment scenario is not within the scope of this study, given that the islands are very remote and served primarily by CalMac ferries, one would anticipate the scale of this support to be large in relative terms, especially for a whisky producing island such as Jura.

However, the island for which this is most apparent is Barra. The population of the island is approximately 1,300 people, with employment estimated to be 455 FTE jobs in 2022. On an aggregate level, 51 FTE jobs are estimated to be supported by CalMac under the Optimistic scenario (versus 47 under the Pessimistic scenario). This suggests that one in 9 jobs in Barra are supported by CalMac (versus one in 10 under the Pessimistic scenario). In relative terms, this highlights how critical the services provided by CalMac are for the viability and survival of the island's economy, as approximately 11% of total employment is supported by the company.

⁹ The reason for this is that even though we know which runs a new ship might be put onto, and hence we know where any additional employees are likely to be needed, we do not necessarily know where these additional employees reside. We would need greater primary data to better map location of employment to home location. For example, in a hypothetical scenario where 25 additional workers are needed for a new Arran vessel, we do not know how many of these workers live on Arran versus how many live in mainland towns like Saltcoats, Ardrossan, or Ayr. In addition, a new Arran vessel does not necessarily employ workers from Arran. Hence, we do not know how the share of these additional impacts would be attributable to the specific island region versus the mainland.

An additional unknown that must be considered is the reliability of older ships in 10 years' time. These reliability concerns have cascading impacts across the network, and hence a new ship that is planned for a certain route may have to be diverted off that route as a result of significant and unforeseen reliability issues affecting other runs across the network. This is especially relevant in the Pessimistic investment scenario where investment levels the meeting of existing commitments only, while much of the fleet continues to age.

Table 11. Direct regional economic impacts, £'000 and FTE jobs, 2032

Regional Direct Impacts - 2032				
Island	2032 Scenario	GVA (£'000)	Employment (FTE jobs)	Employee Compensation (£'000)
Coll and Tiree	Optimistic	£1,579	17	£1,276
	Pessimistic	£1,482	16	£1,191
Mull and Iona	Optimistic	£4,046	43	£3,271
	Pessimistic	£3,798	40	£3,052
Kerrera and Gallanach	Optimistic	£296	3	£239
	Pessimistic	£278	3	£223
Jura and Colonsay	Optimistic	£592	6	£479
	Pessimistic	£556	6	£447
Islay	Optimistic	£2,763	30	£2,234
	Pessimistic	£2,593	28	£2,084
Gigha	Optimistic	£493	5	£399
	Pessimistic	£463	5	£372
Bute	Optimistic	£4,046	43	£3,271
	Pessimistic	£3,798	40	£3,052
Barra	Optimistic	£5,064	51	£3,969
	Pessimistic	£4,753	47	£3,703
Eriskay and South Uist	Optimistic	£3,798	38	£2,977
	Pessimistic	£3,565	35	£2,777
Benbecula	Optimistic	£739	7	£579
	Pessimistic	£693	7	£540
North Uist	Optimistic	£2,005	20	£1,571
	Pessimistic	£1,881	19	£1,466
Lewis and Harris	Optimistic	£14,559	146	£11,411
	Pessimistic	£13,664	136	£10,646
Small Isles	Optimistic	£193	3	£198
	Pessimistic	£181	3	£185
Skye and Raasay	Optimistic	£2,770	46	£2,845
	Pessimistic	£2,600	42	£2,654
Arran	Optimistic	£1,383	41	£2,134
	Pessimistic	£1,298	38	£1,991
Great Cumbrae	Optimistic	£106	3	£164
	Pessimistic	£100	3	£153

Source: CalMac, ONS, and Cebr analysis

Table 12. Aggregate regional economic impacts, £'000 and FTE jobs, 2032

Regional Aggregate Impacts - 2032				
Island	2032 Scenario	GVA (£'000)	Employment (FTE jobs)	Employee Compensation (£'000)
Coll and Tiree	Optimistic	£1,795	20	£1,400
	Pessimistic	£1,685	19	£1,306
Mull and Iona	Optimistic	£4,660	53	£3,618
	Pessimistic	£4,373	49	£3,375
Kerrera and Gallanach	Optimistic	£338	4	£263
	Pessimistic	£317	4	£245
Jura and Colonsay	Optimistic	£692	8	£536
	Pessimistic	£649	7	£500
Islay	Optimistic	£3,186	36	£2,472
	Pessimistic	£2,990	34	£2,306
Gigha	Optimistic	£559	6	£436
	Pessimistic	£525	6	£407
Bute	Optimistic	£4,889	55	£3,767
	Pessimistic	£4,589	52	£3,514
Barra	Optimistic	£5,582	59	£4,266
	Pessimistic	£5,239	55	£3,980
Eriskay and South Uist	Optimistic	£4,318	46	£3,275
	Pessimistic	£4,053	43	£3,055
Benbecula	Optimistic	£846	9	£640
	Pessimistic	£794	8	£597
North Uist	Optimistic	£2,285	25	£1,732
	Pessimistic	£2,145	23	£1,616
Lewis and Harris	Optimistic	£18,500	202	£13,623
	Pessimistic	£17,364	188	£12,710
Small Isles	Optimistic	£229	4	£219
	Pessimistic	£215	3	£204
Skye and Raasay	Optimistic	£3,516	58	£3,277
	Pessimistic	£3,300	54	£3,057
Arran	Optimistic	£1,843	50	£2,416
	Pessimistic	£1,729	46	£2,254
Great Cumbrae	Optimistic	£136	4	£181
	Pessimistic	£127	3	£169

Source: CalMac, ONS, and Cebr analysis

5. Connectivity: enabling island activities

CalMac fundamentally provides connectivity to and from the islands of the Clyde and Hebrides. While the direct, indirect and induced impacts of CalMac's activities are important, it is this connectivity which has the most profound impact on the areas in which CalMac operates. In this section, we analyse the connectivity that CalMac provides and explore how business, residents and visitors could directly benefit from improved services, in terms of economic welfare. In the following chapter we take this analysis further and examine potential wider impacts on productivity, business location, jobs and demography. This quantified analysis is new. Previous work by the Fraser of Allander Institute in 2015 examined CalMac's economic footprint but did not examine the impacts of the connectivity it provides.

To examine CalMac's role in supporting activity on the islands we ask how island activity could be different if the ferry service changed. We use the scenarios outlined earlier in this report to examine how the costs to islanders, businesses and visitors could be different. This brings the analysis closer to that usually undertaken to support the business case for investment and codified in Scottish Transport Appraisal Guidance (STAG). While we draw on similar techniques in our analysis, we have not conducted a STAG appraisal or examined the costs of potential ferry service changes in detail.

The role of Hebridean and Clyde ferry services

Here we briefly review the drivers of demand for CalMac's ferry services. The headline user benefits and demand impacts in the later subsections of this chapter estimate the immediate impacts of improved ferry services; the following chapter considers wider impacts on employment, productivity, and quality of life arising from these.

For residents across the network, ferries are essential for:

- Visiting **family and friends**
- Making **shopping trips** on the mainland, where a wider choice of goods and services is available, and prices are lower
- Undertaking **leisure, sporting, and cultural activities**
- Accessing **health services and education**

Stakeholders indicated that younger islanders have greater expectations than previous generations of being able to regularly access these opportunities on the mainland; meanwhile ageing populations and the centralisation of health care facilities to the mainland have driven growing health travel needs.

There are also **commuting flows, especially in locations around the Clyde** which enjoy reasonable journey times by ferry and rail into Glasgow, and onto islands like Arran with housing affordability issues and difficulties meeting demand for key workers or workers in the tourism sector.

Public and private organisations across the network depend on ferry transport for **goods in and out, business travel, and access to staff and visitors**. Whilst business travel for meetings can increasingly be replaced by video calling, some cases require a person to be on site. For example, the islands are home to significant whisky production and aquaculture activities, highly reliant on sophisticated technology. Repair or maintenance of these systems requires that specialists travel over from the mainland, sometimes at very short notice.

Freight carried on the ferries can be categorised into a few main types, namely:

- Goods for use by island residents – food, fuel, medical supplies, other consumer items for retailers or ordered online for delivery

- Inputs required for production of goods on-island, e.g. grain for whisky, hay for agriculture
- Island 'exports' heading to the mainland for sale or further processing, e.g. whisky (mostly bottled on the mainland), livestock for slaughter

Tourism plays an important role in economies across the CalMac network, with the islands welcoming hundreds of thousands of visitors each year¹⁰.

Unreliability and capacity constraints can result in various costs to users, including:

- Longer journeys because of delays
- Stress associated with late arrival or uncertainty over ability to travel
- Having to make alternative arrangements: using an alternative road or ferry route; flying; or travelling as a foot passenger rather than with a vehicle
- Travelling at a sub-optimal time (whether later or earlier than planned)
- Not being able to make a planned journey at all

For island residents, journey disruption (whether cancellations, delays, or being unable to book due to capacity limits) can result in additional costs through diverted journeys or unexpected overnight stays, additional time spent waiting, or missing out on work, social engagements, or personal appointments. Beyond disruption impacts, timetables constrain the length of time that can be spent on the mainland in a day trip – this is particularly relevant for business and commuting travellers.

For businesses, the costs of disruption include loss of access to visitors, having to pause production, being unable to get goods to market, warehousing to hedge against uncertainty, and extra travel and/or staff time costs – for instance overnight accommodation. Under the future scenarios explored, changes in capacity and reliability will affect these costs. Reliability and capacity enhancements would allow some of these costs to be avoided.

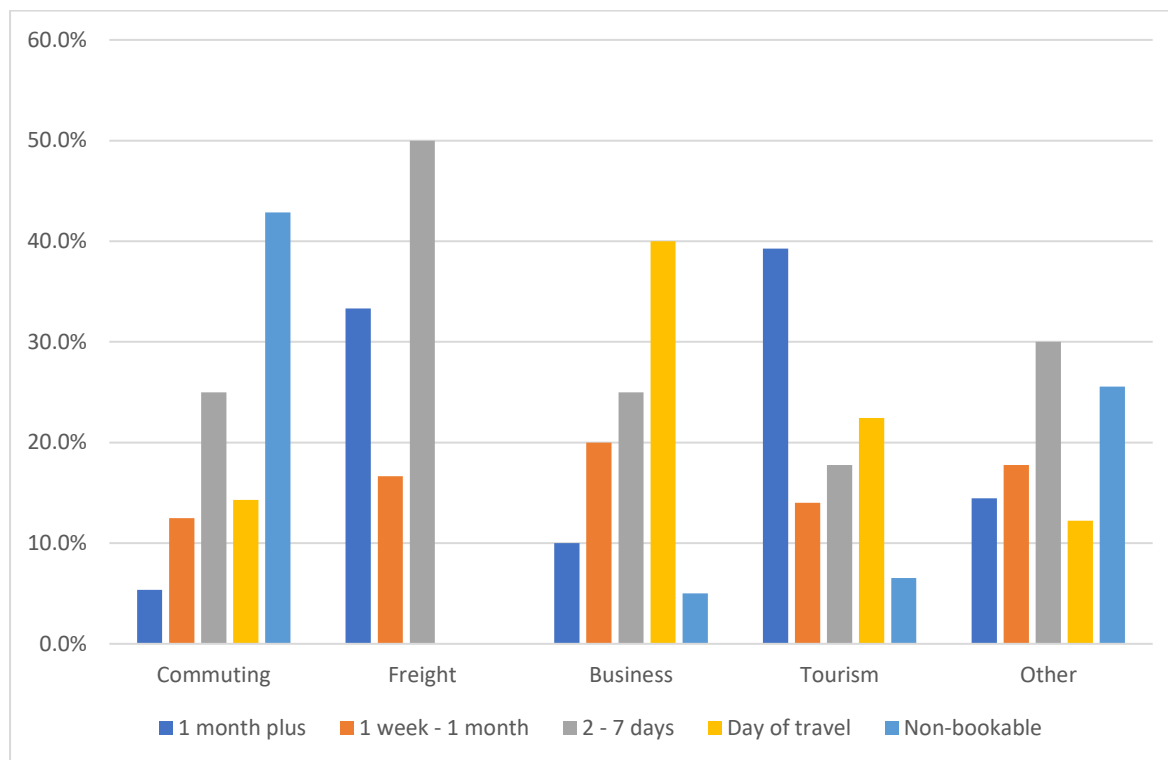
The introduction of RET across the network in 2015 lowered vehicle transit prices for non-commercial vehicles, with major implications for islanders and tourists. Stakeholders generally saw RET as a positive development which supported island tourism and made accessing the mainland for shopping, social, medical, and other purposes easier. Despite these benefits, some problems were identified:

- The increase in demand generated by RET was not matched by a corresponding increase in ferry capacity, **intensifying capacity constraints** across the network; recent delays in procurement and vessel reliability issues have exacerbated this.
- The drastic **reduction in fares for camper vans** has led to many more tourists travelling with them rather than by car, taking up large amounts of space on the vehicle deck and – arguably – spending less on-island than they otherwise would (though recent increases in camper van fares are aimed at addressing this).
- Island residents who need to **travel at short notice**, including for urgent medical or family purposes, feel these constraints most keenly. This is shown in Figure 17, which is based on the results of our passenger survey.
 - **33-40% of freight and tourist journeys were booked a month or more in advance.** This reflects the fact that these journeys are often predictable rather than spontaneous. CalMac encourages freight users to block book well ahead of time, and stakeholders in the hospitality industry reported that they encourage visitors who have booked with them to do the same, in order to avoid capacity issues.

¹⁰ *Tourism in the Outer Hebrides*, Outer Hebrides Tourism. [Link](#). In 2017, the Outer Hebrides alone welcomed 219,000 visitors.

- **Residents' day-to-day journeys cannot always be anticipated** in the same way. For 'Other' journeys (explained more fully in the following section) and business journeys only 10-15% are booked a month or more in advance.
- **Commuting journeys behave rather differently**, with lots booked at short notice or on non-bookable services. Commuting journeys dominate on the Gourock-Dunoon and Gourock-Kilcreggan foot ferries, on which vehicle deck capacity is of course not a constraint in any case.

Figure 17: How far in advance passengers booked, by journey purpose



Future reliability and capacity enhancements could help to **fully unlock the benefits of RET** for island tourism and investment, whilst ensuring that residents can more easily access the mainland when they need to.

In the remainder of this chapter and the following chapter, we draw together information from survey work and from some high-level modelling of transport costs and journey characteristics to examine how ferry connectivity is linked with ferry users' benefits, demand for the services, and some wider economic outcomes.

Model structure

Our analysis is structured around CalMac routes¹¹ and five different journey purposes:

- **Commuting:** travel between home and a place of work done in non-work time.
- **Freight:** transport of goods around the CalMac network – this may include food, medicine, and consumer goods to islands, or island products to mainland markets.
- **Business:** travel in work time, i.e. by private contractors or public sector employees.
- **Tourism:** leisure travel by those who live outside the CalMac network.
- **Other:** a range of purposes, including travel to visit friends and family, shopping, and personal business.

At the core of the analysis are **generalised costs** (GCs) of journeys. These include:

- **Monetary** costs
- **Time** (converted into monetary terms according to the relevant value of time), including boarding/alighting and expected delays
- **Capacity and reliability** costs associated with the probability of being unable to make a journey; these are expressed in minutes and valued according to values of time

Therefore, generalised cost savings do not represent growth in economic output, but an estimated willingness to pay for changes in frequency, capacity, and reliability. These benefits form a key part of the case for investment in ferry service improvements. Changes in fares would also appear in these benefits, but these are not included in our analysis – we assume that fare structure and levels do not change.

GCs are estimated for the entirety of travellers' journeys, including access and egress legs. Therefore, car or public/active transport costs associated with the journey either side of a ferry crossing are included; ultimately it is the total cost of the journey, not just the ferry leg of it, that determines whether or not it will be made. Changes in GCs are driven by ferry services though – we assume that characteristics of access and egress legs do not change. Our passenger survey was instrumental in understanding, among other things, the breakdown of journey purposes, party sizes, and access/egress distances and modes.

Headline results

Overall, as shown in Table 13, the monetised benefits in 2032 of the realisation of the Optimistic rather than the Pessimistic scenario are estimated at **£67.7 million annually**, with passenger journeys for the year expected to be 6.1% higher, at 6.1 million¹².

Table 13: Summary impacts of Optimistic scenario on demand and user benefits

Demand (passenger journeys)	Pessimistic	5,701,522
	Optimistic	6,050,409
	Change	348,887
	Change %	6.1%
Total generalised cost savings (£k)		£67,677

Source: Cebr/Connected Economics modelling and analysis

¹¹ In most cases these are straightforward, between two destinations – e.g. Ullapool-Stornoway or Sconser-Raasay – and a few which cover more than two ports in CalMac data are split out; for instance Uig-Tarbert/Lochmaddy (the Uig Triangle) is shown as Uig-Tarbert and Uig-Lochmaddy in this analysis.

¹² This is 3.8% higher than 2019 demand (5.8 million). In the Pessimistic scenario, demand falls by 2.2% relative to 2019.

The monetised impact here is for one year only and is undiscounted, consistent with the estimation of the economic footprint of CalMac; it is not adjusted to account for the future value of money. Using a 3.5% discount rate for 2022 onwards¹³, the single-year monetised benefit in 2032 is £48.0 million.

Single-year values do not, however, capture the full scope of benefits from investment in ferry services, given that these investments are by definition long term. Table 14 shows 5, 10, and 15-year present values. These assume that full benefits of the Optimistic scenario (and full disbenefits of the Pessimistic scenario) persist from 2032 for the entirety of the period in question.

Table 14: Generalised cost savings - 5, 10, 15-year present values

Time period	PV of generalised cost savings (£k)
2032-2036	£224,203
2032-2041	£412,977
2032-2046	£571,918

Source: Cebr/Connected Economics modelling and analysis

Therefore, the estimated benefit in the 5 years from 2032 would be £224.2 million. Including an additional 5 or 10 years thereafter brings benefits to £413.0 million or £571.9 million respectively. Given the lifetime of ferry and infrastructure investments, a 15-year horizon seems entirely appropriate.

The estimated benefits compare favourably to the £580 million planned investment by the Scottish Government – and there are further benefits not included in generalised cost savings but explored elsewhere in this document. **Including the 15-year PVs of the agglomeration, competition, and earnings impacts discussed in the following chapter brings total benefits to £695.0 million.**

Our model is focused on estimation of 2032 benefits. These present value figures, which assumes those benefits persist until at least 2046, should be treated with caution, and some caveats should be noted:

- At least some of the benefits of the Optimistic scenario will start before 2032 – for instance with the delivery of Hull 801, Hull 802, and the two Islay vessels – but these are not estimated in our model and not included in the PV calculations.
- In the Pessimistic scenario, continued ageing of the fleet after 2032 would likely result in further reliability disbenefits. Other things being equal, this would increase the relative benefits of the Optimistic scenario.
- Benefits of the investments made under the Optimistic scenario would begin to diminish in the absence of further continuing investment – i.e., to support harbour upkeep and further vessel replacement. For example, assuming that the two Islay vessels are delivered as planned in 2024 and 2025 they would each be over 20 years old by 2046, with potential implications for reliability and maintenance costs.
- Any present value calculations, especially those which project decades into the future, are highly sensitive to one's choice of discount rate. Using the 3.5% recommended by DfT results in a total figure of £695.0 million. Using 3.0% instead increases it to £752.5 million and using 4.0% decreases it to £642.4 million.

¹³ This means that for each year after 2022, values would be discounted by 3.5% more, with these discount rates compounding; 2022 values are not discounted, 2023 values are divided by 1.035, 2024 by 1.071 (i.e. 1.035²), and so on – 2032 values are divided by 1.411 (1.035¹⁰). The 3.5% discount rate is recommended by TAG Unit A1.1 – Cost Benefit Analysis ([Link](#), paragraph 2.7.7).

For the rest of this document, socio-economic benefits are generally presented in single-year undiscounted terms, with 15-year present values provided for selected impacts.

Breakdowns of core results

Benefits can also be broken down by journey purpose and by route. Table 15 shows that **nearly half of the increase in demand is driven by growth in tourism**, and the £34.8 million in benefits accruing to these users makes up half of the total. This is unsurprising given the existing importance of tourism demand, and the improvements delivered to tourist-oriented routes under the Optimistic scenario. The highest growth in percentage terms is for business travel, which increases by 7.6% – this reflects business travellers’ high value of time and resulting sensitivity to changes in GCs.

Table 15: Impacts by journey purpose

	Commuting	Freight	Business	Tourism	Other
Change in demand	46,961	4,905	14,581	171,961	110,477
% change in demand	4.7%	5.5%	7.6%	6.7%	6.0%
GC savings (£k)	£6,971	£1,632	£2,379	£34,785	£21,911

Source: Cebr/Connected Economics modelling and analysis

Turning to impacts by route, which are shown in Table 16:

- **The biggest growth in absolute demand is for Ardrossan-Brodick, with almost 100,000 additional passenger journeys made.** This is despite the route benefitting from the introduction of the Glen Sannox in either scenario; however, in the Optimistic scenario the greater improvement in reliability (on a route which presently suffers a lot of cancellations) drives significant increases in demand.
- **There is substantial demand growth, of nearly 20% overall, on the Kennacraig-Islay routes;** this reflects the freight and tourist demands generated by the whisky industry there¹⁴ – in the Pessimistic scenario, there are no new vessels serving these routes so capacity continues to be a major constraint.
- **The Mallaig-Armadale, Mallaig-Small Isles, and Oban/Mallaig-Lochboisdale routes also see very high demand growth.** This is driven more by reliability than capacity – in the Optimistic scenario cancellations decline sharply, and in the case of these routes they start from a high base. The Small Isles experience frequent cancellations due to harbour infrastructure issues, and these are assumed to be ameliorated. Mallaig-Armadale, as a non-lifeline route, is subject to its sailings being diverted to cover lifeline services elsewhere (including in the Small Isles) – greater redundancy in the fleet is assumed to reduce this issue substantially.
- Benefits for Oban-Craignure and the Uig Triangle routes seem relatively modest given their importance. This is because these routes receive new vessels (Loch Frisa and Hull 802 respectively) in either scenario.
- Kerrera-Gallanach already has a reliable service and is not expected to receive a new vessel in the Optimistic scenario, so there is no impact on this route.

¹⁴ Bespoke assumptions are made regarding underlying freight demand growth for Kennacraig-Port Ellen and Kennacraig-Port Askaig in the model, using VRDP forecasts provided to the authors by CalMac. Multiple stakeholders in the whisky industry on Islay expressed concerns around the ability of existing capacity to meet this demand.

Table 16: Impacts by route

	Change in demand		GC savings (£k)
	Passenger journeys	%	
Ardmhor - Eriskay	2,416	3.9%	£493
Ardrossan - Brodick	93,783	11.0%	£17,165
Ardrossan - Campbeltown	959	11.3%	£290
Brodick - Campbeltown	18	0.8%	£5
Berneray - Leverburgh	4,327	5.9%	£925
Claonaig - Lochranza	1,094	1.6%	£178
Tarbert - Lochranza	286	7.1%	£55
Colintraive - Rhubodach	2,566	1.3%	£156
Fionnphort - Iona	4,461	1.9%	£330
Lochaline - Fishnish	243	0.2%	£38
Gourock - Dunoon	15,143	5.3%	£2,338
Gourock - Kilcreggan	4,901	5.8%	£361
Kennacraig - Port Ellen	29,204	22.3%	£6,328
Kennacraig - Port Askaig	17,432	13.7%	£5,022
Oban - Colonsay	798	6.8%	£223
Port Askaig - Colonsay	1,025	10.2%	£235
Port Askaig - Oban	753	7.4%	£258
Kerrera - Gallanach	0	0.0%	£0
Largs - Cumbrae Slip	18,239	2.4%	£1,179
Mallaig - Armadale	47,058	15.9%	£9,566
Mallaig - Lochboisdale	5,066	18.5%	£1,913
Mallaig - Eigg	1,607	20.6%	£444
Mallaig - Muck	1,440	21.1%	£418
Mallaig - Rum	1,373	20.9%	£396
Mallaig - Canna	1,342	17.0%	£468
Oban - Lochboisdale	733	18.7%	£339
Oban - Coll	1,207	6.4%	£379
Coll - Tiree	1,450	7.7%	£328
Oban - Tiree	1,075	5.7%	£385
Oban - Castlebay	2,968	6.1%	£1,225
Oban - Craignure	17,194	2.6%	£2,655
Oban - Lismore	1,213	5.0%	£199
Sconser - Raasay	864	1.0%	£117
Tarbert (Loch Fyne) - Portavadie	3,548	3.9%	£597
Tayinloan - Gigha	1,394	2.0%	£195
Tobermory - Kilchoan	1,026	1.9%	£182
Uig - Lochmaddy	2,932	2.8%	£779
Uig - Tarbert	2,813	2.9%	£742
Ullapool - Stornoway	15,597	5.4%	£4,807
Wemyss Bay - Rothesay	39,339	5.7%	£5,967

Source: Cebr/Connected Economics modelling and analysis

One avenue not explored in our model is *new* connectivity brought about by restoring former routes or creating new ones. Nevertheless, such investments could have interesting impacts. CalMac's operations are focused on the hubs of Oban and Mallaig, with other mainland ports serving individual islands and a few inter-island connections, e.g. within the Outer Hebrides and between large islands and smaller neighbours (like Skye and Raasay).

Some defunct CalMac routes ended because fixed links or alternative routes have replaced them: for example Kyle of Lochalsh – Kyleakin (last sailing 1995), now served by the Skye Bridge, and Kyles Scalpay, Isle of Harris – Scalpay (1997). Other inter-island connections have, however, been lost as resources are focused on connecting islands to the mainland. Potential benefits from restoration of these routes depends on their location and economic context:

- Between 1994 and 1998, a Brodick – Largs – Rothesay service linked the two popular tourist destinations of Arran and Bute. Nowadays, travel between these islands would require two separate ferry crossings with a car journey in between. Given the popularity of 'island-hopping' holidays, for instance within the Outer Hebrides, a new link between Arran and Bute could generate new tourist demand, as well as improving inter-island social and business connections.
- From 1991 to 1994 a Mallaig – Tobermory – Coll – Tiree service was in operation. Ultimately this was discontinued due to a lack of demand and infrastructure constraints. Nevertheless, restoration of inter-island connections between Mull, Coll, and Tiree does present an interesting possibility. The two smaller islands have a population of less than 1,000 between them, so residents depend on journeys to the mainland for large shopping trips and various private and public services. Access to their larger neighbour would allow for some trips to the mainland to be avoided, and Tobermory's 'catchment area' would be increased, allowing for a wider range of goods and services to be offered. Depending on the timetable, commuting into Tobermory may also become feasible. This service might replace the Oban – Coll – Tiree sailings, with travel to the mainland via Mull.

The above impacts are speculative – evidence to robustly estimate them does not exist, and doing so goes beyond the scope of our modelling framework. Moreover, there may be significant infrastructure implications to route restoration/creation, and not just at ports – for instance Mull acting as a land bridge between Coll/Tiree and Oban would probably require significant road upgrades (and perhaps new public transport services) between Tobermory and Craignure.

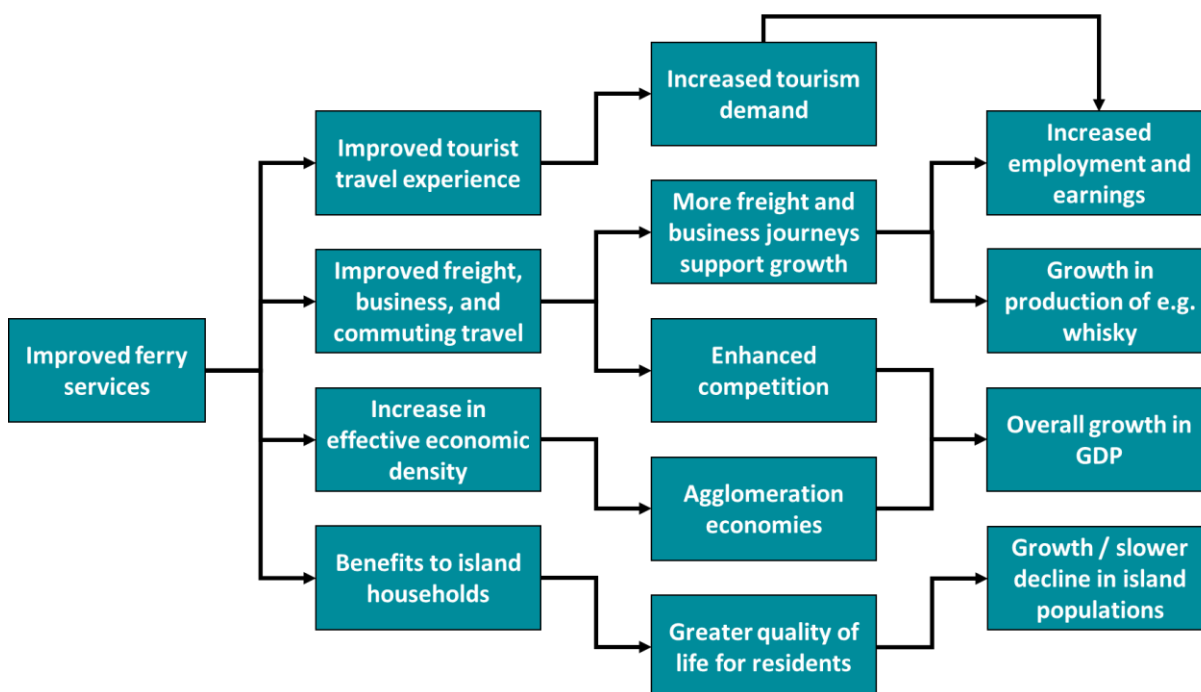
6. Supporting prosperity

Introduction

In this chapter we draw together the findings of the research and examine the impacts that these could have on the long-term prosperity of the islands.

Beyond the direct, indirect, induced impacts of CalMac's activities and supply chains, and its downstream impacts as businesses and organisations use ferry services in their own operations, there is the potential for longer-term impacts on the economies of the communities served. These are the spillover impacts (sometimes referred to as catalytic impacts) introduced in Figure 1 in the Introduction. These impacts are inherently more uncertain than others assessed in this study but are clearly an enormously important component of CalMac's activities given its lifeline role to most of the communities it serves. Figure 18 provides a high-level view of the impacts considered here.

Figure 18: Overview of wider impacts and transmission mechanisms



Impacts on key island industries

The increased ferry demand generated by service improvements is not just a benefit for those making these journeys, but for businesses which rely on the flow of people and goods back and forth. In this section we review in more detail impacts on selected industries of service improvements.

It is important to recognise that **much of this output and employment growth will not be additional at the Scottish or British level**. Growth on the islands and remote mainland locations will displace some growth from elsewhere. To give a practical example, improved ferry services might allow distilleries to continue expanding or opening on islands. In the absence of that improvement, those distilleries could expand or open on the mainland in response to global demand – so growth and jobs would have still been created, but not on the CalMac network. Similarly, tourists visiting the islands may have otherwise gone to the Scottish mainland or elsewhere in the UK rather than going abroad or not holidaying at all.

Moreover, the significant business and freight user benefits estimated partially capture increased output impacts – discussed further in the Competition subsection¹⁵.

Nevertheless, economic growth on the islands – whether it is additional at the national level or not – has strong policy support, as discussed in detail in our Phase 1 report.

Supporting island tourism

The tourist industry, vital to the economies of so many islands on the network, is of course heavily dependent on the connectivity provided by ferry services. Capacity challenges, especially in the peak summer months, and reliability issues do, however, add to the cost of island holidays and create challenges for businesses which rely on tourists. Tourist industry stakeholders reported that:

- **Experience and perception of unreliable services can deter tourists** from making repeat visits or booking island visits at all.
- Restricted capacity and the resulting difficulty in short-notice bookings means that **last-minute vacancies cannot be filled**.
- Periods of disruption do not just result in lost patronage during that period: traffic backlogs take days to clear, and news of disruption leads to upcoming bookings being cancelled and not recovered.
- **Increased unreliability over the last few years has had measurable impacts on businesses**. Auchrannie Resort¹⁶ on Arran provided some figures to the authors:
 - Occupancy in the first quarter of 2018 was 85%; in 2022 this was 74%. 12-month occupancy has fallen from 90% in 2017/18 to 85% in 2021/22.
 - An extended period of disruption in April and early May, during which only one ferry was operating, resulted in approximately £85k of lost revenue.
- Staff have to spend significant time on managing disruption, rather than on their core job roles – this is stressful for them, may contribute to staff retention issues, and is ultimately a drain on productivity.
- On routes where journey times are in principle suitable for commuters (e.g. Mallaig-Armadale, Ardrossan-Brodick), in reality the reliability and timetabling constraints do not allow this. Arran in particular faces housing supply issues on-island, so attracting and retaining staff is very difficult and turnover is high.

Tourism has been a mainstay of the islands' economies for a long time. Two recent phenomena have boosted demand further, however, making the opportunities from future growth greater:

- RET, by lowering prices and making island holidays more affordable.
- Covid-19. Stakeholders reported that the pandemic had resulted in many tourists who would otherwise have gone abroad holidaying in the islands, and in a lengthening of the tourist season beyond the traditional summer peak – and that these trends seemed to be persisting.

¹⁵ TAG unit 2.2. – *appraisal of induced investment impacts*, Department for Transport, September 2016. [Link](#). Paragraph 4.1.2 states that, 'In a perfectly competitive market the value of the output is equal to the cost of production. A reduction in generalised travel costs lowers the costs of production, which as noted in section 2 acts to raise the effective return to capital and induce investment. The value of the resulting increased output will equal the magnitude of the change in generalised travel costs. Therefore the welfare effects, associated with increased output, resulting from a transport investment will be fully captured by business user benefits.' Perfect competition is, however, a strong assumption, and certainly one which does not hold in small island communities.

¹⁶ Auchrannie is a resort in Brodick, Arran which attracts roughly 45,000 overnight visitors per annum. Figures quoted are used with permission.

This section explores the impact of improved services on the islands' tourism economies. We focus on the scale and impact of increased overnight tourism to the islands in terms of number of visits made, total spending and nights stayed, and employment and earnings impacts. These estimates are based on:

- The change in annual tourism ferry journeys by route made in the Optimistic vs. the Pessimistic scenario (172,000).
- Assumptions on how many ferry journeys a tourist makes during one overnight trip; in the absence of hard data, we assume four for most destinations (allowing for some island-hopping or visits spanning multiple islands) and two for Na h-Eileanan Siar.
- Average spending and nights per person-trip by local authority area from the 2019 GB Tourism Survey¹⁷. These are summarised in Table 17.
- The estimated tourist spend required to create one additional job in the UK tourism sector – just over £65,000, based on a Deloitte and Oxford Economics report for Visit Britain¹⁸.
- Average earnings per tourism job, drawing on the same report's definition of the sector and earnings data from the Annual Survey of Hours and Earnings (ASHE)¹⁹.

Impacts are produced by route and presented in Table 18, aggregated to local authority area. In total, these indicate an extra **£13.8 million in annual spending** (15-year PV £116.7 million) by tourists would result, translating into **over 200 jobs with associated earnings of £4.3 million** (15-year PV £36.4 million).

Table 17: Overnight tourism characteristics by local authority

Local authority	Average per person-trip	
	Spend	Nights
Argyll and Bute	£294.84	4.3
Na h-Eileanan Siar	£470.01	8.8
Highland	£302.96	4.2
North Ayrshire	£237.33	3.7

Source: 2019 GB Tourism Survey, Cebr analysis

Table 18: Overnight tourism impacts by local authority

Local authority	Impact on			
	Spending (£k)	Nights	Employment	Earnings (£k)
Argyll and Bute	£4,561	66,061	70	£1,423
Na h-Eileanan Siar	£2,516	47,115	39	£785
Highland	£3,849	53,766	59	£1,201
North Ayrshire	£2,881	45,326	44	£899
Total	£13,807	212,269	212	£4,307

Source: Cebr/Connected Economics modelling and analysis

¹⁷ GB Tourism Survey (domestic overnight tourism): Latest results, Visit Britain. [Link](#).

¹⁸ Economic impact and employment, Visit Britain. [Link](#). £65,000 figure is based on conversion of £54,000 per job from 2013 to 2022 prices.

¹⁹ Earnings and hours worked, all employees: ASHE Table 5, ONS, 2022. [Link](#). Figures from Table 5.7a.

On the one hand, these may be slight overestimates because some tourists will switch to sailing from flying rather than being ‘new’ to the islands, but there are probably more reasons to think that true impacts could be even higher:

- A more reliable ferry service will improve the profile of the islands as a place to visit, and may generate a more significant change in demand.
- We have assumed that the duration and spend of tourist visits in the future stays the same as it does now. Improved perceptions of island holidays may result in longer stays. Moreover, ferry unreliability can shorten visits in more direct ways – either through delaying arrival or causing tourists to hedge against unreliability by leaving a night or two earlier than they otherwise might.
- Earnings impacts only include salary and wages to employees. Given the prevalence of small, locally-owned businesses on islands, further earnings can be expected to accrue to owners as profit.

Growing the island whisky industry

Whisky is an iconic Scottish product – according to the Scotch Whisky Association, in 2021 exports of it were worth £4.5 billion, with the industry employing 11,000 people and providing £5.5 billion in GVA to the UK economy²⁰. In 2016, Islay whisky production alone is estimated to have generated £196 million in excise tax revenue²¹. Most of the 130 malt and grain distilleries, including many of the largest producers by volume, are situated on the mainland, but the islands are home to several, including distinctive and high-end brands²²:

- On Arran, Lochranza Distillery and Lagg Distillery (both owned by Isle of Arran Distillers).
- On Mull, Tobermory Distillery.
- On Lewis and Harris, the Isle of Harris Distillery and Abhainn Dearg Distillery. Elsewhere in the Outer Hebrides, the North Uist Distillery has recently opened.
- On Skye, Torabhaig Distillery and Talisker Distillery, plus Isle of Raasay Distillery on neighbouring Raasay.
- Islay hosts nine active distilleries, plus one on neighbouring Jura, with more set to open in the coming years.

The project team spoke to representatives of several distilleries as part of the stakeholder engagement process and is extremely grateful for their time and input. Ferry reliability and capacity concerns were widely voiced as posing difficulties in reliably bringing in inputs and sending outputs to market. Islay in particular is dominated by the whisky industry, generating significant freight demand and severe capacity challenges on the Kennacraig-Port Ellen and Kennacraig-Port Askaig routes. The success of Islay whisky means that the industry is expanding, but stakeholders felt this growth would be severely constrained without new capacity²³. The two new vessels for Islay which have recently been ordered are expected to increase vehicle deck capacity on the Islay routes by almost 40%²⁴.

We estimate the impacts of improved services on the whisky industry in 2032. These are based on:

²⁰ *Facts & Figures*, Scotch Whisky Association. [Link](#).

²¹ *The flipside of the Islay whisky boom*, Scotch Whisky Association. [Link](#).

²² *Distillery Map*, Scotch Whisky Association. [Link](#).

²³ At time of writing, the two new Islay vessels have been ordered but construction is not underway. Therefore, they have not been included in the Pessimistic scenario, which only includes new vessels acquired (MV Loch Frisa) or under construction (Hull 801/Glen Sannox and Hull 802). This means that the Optimistic scenario vs the Pessimistic scenario reflects the full impact of the new vessels. Sensitivity tests shown in an appendix include one which treats these vessels as part of the Pessimistic scenario.

²⁴ *New vessels for Islay*, CMAL. [Link](#).

- The change in annual freight ferry journeys by route made in the Optimistic vs. the Pessimistic scenario (4,900).
- Estimation of the relationship between HGV movements and whisky production, drawing on desk research and our conversations with distilleries.
- To estimate the proportion of new HGV movements generated by whisky production:
 - For Lewis and Harris, Arran, and Mull, percentage of their GVA which is relevant to whisky manufacture²⁵.
 - For Islay and Jura, we assume a higher share to reflect the growth of the whisky industry there and strong capacity constraints – on this basis it seems entirely plausible that whisky would make up an outsize share of any freight growth.
 - We do not estimate impacts for Skye – the Skye Bridge already provides a freight connection to the mainland, with Mallaig-Armadale primarily used by tourists and carrying very few commercial vehicles.
- Estimation of the relationship between whisky production and employment generated, and an assumed £35,000 average salary for production employees.

Impacts by island are shown in Table 19. Unsurprisingly, these impacts are overwhelmingly concentrated in Islay and Jura; impacts for other islands should be treated as very approximate. The employment impact may seem small, but this includes on-island production jobs only. Most of the distilleries we met with employed more people in their visitor centres – but these are not directly driven by production and in any case have been accounted for above under tourism. Moreover, mainland production jobs (e.g. bottling) may also result from this extra output.

To put the production impacts into context, Caol Ila is by far the largest distillery on Islay, producing 3 million litres of pure alcohol per year²⁶. Assuming 40% ABV this is about 20 million bottles per year. Therefore, for Islay alone, the impact is equivalent to adding a new distillery with half the output of its biggest existing producer.

Table 19: Whisky industry impacts by island

	Production (75cl bottles, thousands)	Employment	Earnings (£k)
Total	9,713	46	£1,596
Islay and Jura	9,222	43.3	£1,515
Lewis and Harris	173	0.8	£28
Mull	135	0.6	£22
Arran	183	0.9	£30

Source: Cebr/Connected Economics modelling and analysis

15-year PV of the £1.6 million annual earnings impact is £13.5 million.

These impacts assume the geographical distribution and structure of island whisky production stays the same in the future. An improved ferry service could, however, lead to the opening of distilleries where there are none at present, or to existing distilleries moving more of their operations on-island; for example, Bruichladdich on Islay is unusual for bottling whisky on-site rather than transporting it to the mainland, but easier freight transport may lead to others following suit.

²⁵ SIC Code 10-15, Manufacture of food, beverages, textiles and clothing. This will include non-whisky manufacturing for some islands. Given, however, the outsize freight demands generated by distilling this is likely to be a reasonable estimate.

²⁶ Caol Ila, Islay.com. [Link](#).

Further economic impacts

Improved connectivity through reduced transport costs can unlock various wider economic impacts. Most relevant in this context are:

- Productivity-enhancing **agglomeration** benefits through improvements in effective economic density (as business-to-business transport costs are reduced)
- Reduction in the 'island premium' through enhanced **competition**
- Business location decisions and consequential **employment** impacts

Agglomeration

There is a wealth of economic evidence to support a link between effective economic density²⁷ and productivity, that is to say output per worker. These agglomeration benefits can broadly be categorised as follows:

- 'Learning' through knowledge spillovers, as the exchange of best practice and skills through business-to-business interaction and movement of employees between companies is facilitated by proximity of firms in the same or similar industries;
- 'Matching' of jobs to workers, suppliers to firms and firms to customers. A high density of related firms means that, for example, employers can more easily hire workers who meet their specific skills requirements;
- 'Sharing' of risk, opportunities for specialization, and access to intermediate inputs. For example as suppliers of intermediate inputs locate close to clusters of firms, they will enjoy lower average transport costs and increasing returns to scale.

Whilst agglomeration benefits are more commonly associated with schemes serving dense urban centres, there is no reason to think that they do not apply in an island context. They were estimated based on the following:

- For each of the 16 island regions assessed in 3. *Current economic footprint of CalMac* and 4. *Economic footprint under alternative scenarios*, the change in the demand-weighted average generalised cost of access²⁸.
 - For Skye and Raasay, estimated impacts are substantially lowered, by 75%, as the Skye Bridge makes ferry connectivity a poor measure of overall connectivity.
- Estimated compositions of GVA by sector (included in an appendix to this document).
- The agglomeration elasticities used by the DfT in their Transport Appraisal Guidance (TAG)²⁹. These elasticities are for Manufacturing, Construction, Consumer services, and Producer services³⁰, with ONS sectors grouped into each of these.

Estimated benefits are shown in Table 20. These relate to *static* agglomeration – that is to say they refer to benefits from **increased productivity for existing economic activity**, rather than assuming changes in land use (the location of employment). Dynamic agglomeration economies may drive further productivity benefits, through businesses physically relocating to better-connected areas, though in the absence of a full LUTI (land use/transport interaction) model these have not been estimated, as to do so at all robustly is not possible.

²⁷ Economic density relates to the physical proximity of business locations. Transport improvements effectively increase it.

²⁸ Only the change in the ferry element of travel is included, i.e. this change is for a port-to-port journey not including access and egress by car or public transport.

²⁹ Based on Graham et al. (2010).

³⁰ Elasticities are 0.021 for Manufacturing, 0.034 for Construction, 0.024 for Consumer services, and 0.083 for Producer services.

Table 20: Agglomeration impacts by island region

Island	Agglomeration impact (£k)
Coll and Tiree	£31
Mull and Iona	£32
Kerrera	£0
Lismore	£2
Jura and Colonsay	£6
Islay	£204
Gigha	£1
Bute	£168
Barra	£21
Eriskay and South Uist	£101
Benbecula	£69
North Uist	£9
Lewis and Harris	£338
Small Isles	£13
Skye and Raasay	£340
Arran	£150
Great Cumbrae	£2
Total	£1,488

Source: Cebr/Connected Economics modelling and analysis

Therefore, **an overall productivity uplift of just under £1.5 million per year for existing island firms is estimated** (15-year PV £12.6 million). This is a modest impact, reflecting the relatively small population of the islands. Nevertheless, it amounts to roughly £26 per person, or £56 per household annually.

Looking at results by island, these are largely a function of current economic size and scale of service improvements. Therefore, large islands like Lewis and Harris, Arran, Islay, and Bute see the biggest benefits – as does Skye, despite the penalty applied to reflect the presence of a bridge, because of the scale of reliability improvements on the Mallaig-Armadale route. Meanwhile Kerrera and Gigha are both small, already enjoy dedicated vessels, and only experience disruption relatively infrequently.

Competition

In TAG, the recommended rule of thumb for estimating the value of output change in imperfectly competitive markets in response to a transport improvement is to take 10% of business and freight user benefits³¹. Other work has suggested an upper limit of 30-40%³²; **we therefore assume 30% given the remote island context and greater potential for market isolation and therefore power to exist**. These benefits, like agglomeration impacts, represent an addition to GDP as a direct result of lower transport costs. Estimates by route are shown in Table 21.

³¹ TAG unit 2.2. – appraisal of induced investment impacts, Department for Transport, September 2016. [Link](#). Paragraph 4.3.1.

³² Wider economic impacts in remote areas, James Laird, 2009. [Link](#). Page 6.

Table 21: Output impacts from enhanced competition

	User benefits (£k)		Value of output change
	Business	Freight	
Ardmhor - Eriskay	£49	£24	£22
Ardrossan - Brodick	£748	£240	£297
Ardrossan - Campbeltown	£2	£1	£1
Brodick - Campbeltown	£0	£0	£0
Berneray - Leverburgh	£94	£21	£34
Claonaig - Lochranza	£0	£1	£0
Tarbert - Lochranza	£0	£1	£0
Colintraive - Rhubodach	£1	£4	£1
Fionnphort - Iona	£11	£3	£4
Lochaline - Fishnish	£0	£1	£0
Gourock - Dunoon	£110	£0	£33
Gourock - Kilcreggan	£17	£0	£5
Kennacraig - Port Ellen	£258	£367	£187
Kennacraig - Port Askaig	£204	£326	£159
Oban - Colonsay	£10	£3	£4
Port Askaig - Colonsay	£26	£9	£10
Port Askaig - Oban	£11	£9	£6
Kerrera - Gallanach	£0	£0	£0
Largs - Cumbrae Slip	£13	£7	£6
Mallaig - Armadale	£12	£6	£6
Mallaig - Lochboisdale	£84	£25	£33
Mallaig - Eigg	£25	£4	£9
Mallaig - Muck	£24	£4	£8
Mallaig - Rum	£22	£3	£8
Mallaig - Canna	£26	£4	£9
Oban - Lochboisdale	£8	£15	£7
Oban - Coll	£17	£18	£10
Coll - Tiree	£36	£17	£16
Oban - Tiree	£17	£19	£11
Oban - Castlebay	£30	£33	£19
Oban - Craginure	£107	£40	£44
Oban - Lismore	£8	£6	£4
Sconser - Raasay	£5	£1	£2
Tarbert (Loch Fyne) - Portavadie	£1	£4	£1
Tayinloan - Gigha	£8	£5	£4
Tobermory - Kilchoan	£1	£0	£0
Uig - Lochmaddy	£19	£23	£12
Uig - Tarbert	£18	£22	£12
Ullapool - Stornoway	£112	£249	£108
Wemyss Bay - Rothesay	£246	£113	£108
Total	£2,379	£1,632	£1,203

Source: Cebr/Connected Economics modelling and analysis

It is not possible to robustly attribute these outcomes to individual islands – some benefits will accrue to mainland areas which now have improved access to island firms, for example. Our conversations with island stakeholders do strongly suggest, however, that there is a great deal of scope for improved services to benefit island or remote mainland households and businesses through this channel:

- **Construction is subject to a significant 'island premium'**, adding to the cost of residential and commercial developments. To some extent this is inherent given the geographical remoteness of communities and thin labour markets, but is also affected by ferry services:
 - Stakeholders in the construction industry estimated this premium at about 15-20% relative to the west coast of Scotland (itself subject to a roughly 10% premium versus the Central Belt).
 - For bigger deliveries such as construction materials, the Small Isles often rely on a charter vessel which is more expensive but flexible and not subject to the same capacity constraints; being able to receive more freight via CalMac would save some of this expense.
 - Where daily commuting is not feasible (or reliability/capacity constraints make it uneconomic), workforces have to be accommodated overnight, contributing to the overall expense of projects.
- Aside from a handful³³, **businesses depend on the ferries for freight in and out**. Reliability or capacity constraints can result in production stoppages and loss of revenue, and ultimately add to the cost of transporting goods.
- Any business which uses specialist machinery – distilleries, cheese producers, fish farms – may need to have this machinery repaired by a specialist at short notice in the event of a breakdown. This can mean the cost of flying a specialist in (not an option if they need to bring heavy equipment) or having such a specialist in-house, or being subject to **operational disruption** whilst waiting for a ferry crossing to be available.
- **Labour supply limitations**, even on larger islands like Islay and Arran, mean that skilled tradespeople e.g. electricians and joiners command a significant wage premium and may not be available at short notice, necessitating bringing in contractors from the mainland – in either case this results in time and money penalties to having work done.
- Where an island's main ferry experiences frequently capacity and reliability issues, **travellers may use more remote but more reliable services instead**. For example, stakeholders on Mull and Arran consistently reported that the ferries out of Fishnish and Lochranza respectively provided more reliable access to the mainland than the Oban-Craignure or Ardrossan-Brodick services. These services do, however, tend to entail longer drives to ultimate destinations on the mainland, which comes with a direct monetary cost in wages and fuel.

All of the phenomena above imply that prices will be above (and therefore quantities demanded and supplied below) those which would occur in a more competitive market. Improved ferry services would ameliorate these issues somewhat, leading to increased output.

Using the 10% rule of thumb as advised by the DfT results in competition benefits in 2032 of £401,000. Using 40% – the absolute upper limit implied by the literature – would make them £1.6 million.

The 15-year PV of the central £1.2 million estimate is £10.2 million.

³³ For example, fish farms with very high feed requirements who use their own vessels.

Employment

Whilst employment generated in specific sectors is estimated in ‘Impacts on key island industries’, improved connectivity stands to generate employment across island economies.

We estimate this overall employment impact in a similar way to agglomeration, based on changes in the demand-weighted average generalised cost of access for the 16 island regions. An elasticity of employment with respect to connectivity is then applied³⁴, producing estimated impacts as shown in Table 22. Results for some of the smallest islands³⁵ are grouped together – due to their small existing employment levels, impacts at the individual island level are not robust. **The overall impact is a little under 2% of current employment level across the islands.**

Table 22: Overall employment impacts

Island	Employment impact
Coll and Tiree	9
Mull and Iona	12
Islay	54
Bute	43
Barra	10
Eriskay and South Uist	25
Benbecula	8
Lewis and Harris	111
Skye and Raasay	80
Arran	62
Others	16
Total	429

Source: Cebr/Connected Economics modelling and analysis

These employment impacts are not additional to those estimated by industry. The whisky and tourism jobs created through improved services – though calculated in more bespoke ways – are ultimately a result of better connectivity, so to include them separately from the above would be double-counting. Therefore, an estimated 429 jobs are created, of which 212 are in tourism and 46 are in whisky production. Total impacts, including earnings, are summarised in Table 23³⁶.

Table 23: Overall employment and earnings impacts

	Employment impact	Earnings impact (£k)
Total	429	£11,873
<i>of which tourism</i>	212	£4,307
<i>of which whisky</i>	46	£1,596

Source: Cebr/Connected Economics modelling and analysis

³⁴ *New Road Infrastructure: the Effects on Firms*, Gibbons et al., September 2012. [Link](#). Elasticity of 0.361 from Table 2, regression 5 used.

³⁵ Kerrera, Lismore, Jura and Colonsay, Gigha, North Uist, Small Isles, Cumbrae.

³⁶ *Earnings and hours worked, place of work by local authority: ASHE Table 7*, ONS, 2022. [Link](#). Figures from Table 7.7a.

As with some of the other impacts explored here, these are not necessarily additional to Scotland or Britain; they may simply be moving employment and earnings to island communities from the mainland³⁷. In 15-year PV terms, the £11.9 million earnings impact is £100.3 million.

Attraction of key workers

An issue of particular concern across the islands is the attraction of key workers, including teachers, medical personnel, and local authority staff. Robustly estimating impacts of improved ferry services on these groups' decisions over whether or not to live on the islands is not possible. Nevertheless, the available evidence suggests that a positive impact would follow. A Scottish Government study³⁸ of public sector employers, ostensibly focused on affordable housing, found that:

- Health Boards and councils operating in **island and rural communities face significant problems with recruitment and retention of staff**.
- Drivers of these difficulties include **geographic remoteness, cost of living** (including public transport), and **access to housing**.
- Lack of suitable accommodation is a particular problem in the attraction of fixed term or temporary staff, teachers and social care staff, and those on lower pay grades.

These findings strongly reflect themes from our discussions with island residents and public sector employers.

Improved ferry services which make coming and going easier, cheaper, and more flexible would effectively make island communities less remote. They can also reduce the cost of living – by allowing easier transport of goods from or shopping trips to the mainland – and make development of new housing easier. They could, therefore, bring more key workers to the islands. Ultimately, impacts would also depend on political decisions – where health services or local authority functions have been centralised to the mainland, attraction of key workers will be of limited benefit unless they are decentralised again.

Addressing population decline

Alongside the policy support for economic growth in the Scottish islands there is strong support – and indeed a strong desire on the islands themselves – for population to grow. Many island communities face declining, ageing populations as young people leave (at least temporarily) for employment and social opportunities elsewhere and incomers are disproportionately retirees.

The factors driving depopulation are partly inherent to any remote, thinly-populated community, but interact with capacity and reliability issues on the ferries, and our engagement strongly suggested that service improvements could have positive impacts:

- **Lack of affordable housing** suitable for young workers and families. This is driven by demand as well as supply, with the islands being popular destinations for those looking to move when they retire and second home buyers. Geographic remoteness and thin labour markets make housing construction on the islands inherently more expensive, but improved ferry services would mitigate this and help bring forward new construction.

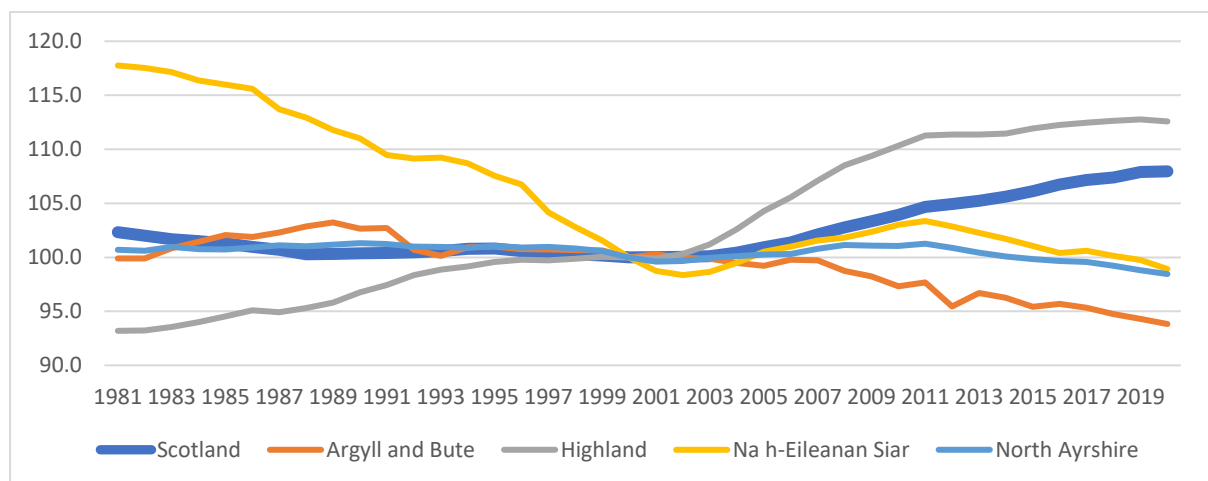
³⁷ TAG unit 2.3. – *employment effects*, Department for Transport, May 2019. [Link](#). Conventional appraisal as covered in this document would value tax revenue impacts of increased productivity or employment – if they can be demonstrated – but, “it should be assumed as a starting point that transport schemes are not able to increase net national employment.” (paragraph 3.2.4)

³⁸ *Affordable housing for key workers*, Scottish Government, August 2015. [Link](#).

- **Limited range of jobs** (particularly graduate and/or well-paid jobs) locally or commutable from home. In the Clyde (including Dunoon and Kilcreggan as well as islands) and other locations close to the mainland like Mull or Sleat, Skye, better services could open up access to mainland jobs.
- **Social and leisure limitations** of island life, and difficulties in getting to the mainland at short notice for sporting, leisure, or family events. Increased capacity makes it less likely that residents would have to book services weeks in advance, allowing a greater degree of spontaneity.
- **Difficulty getting to the mainland** for medical appointments made at short notice (exacerbated by centralisation of NHS services) – this is particularly challenging for ill and elderly residents.

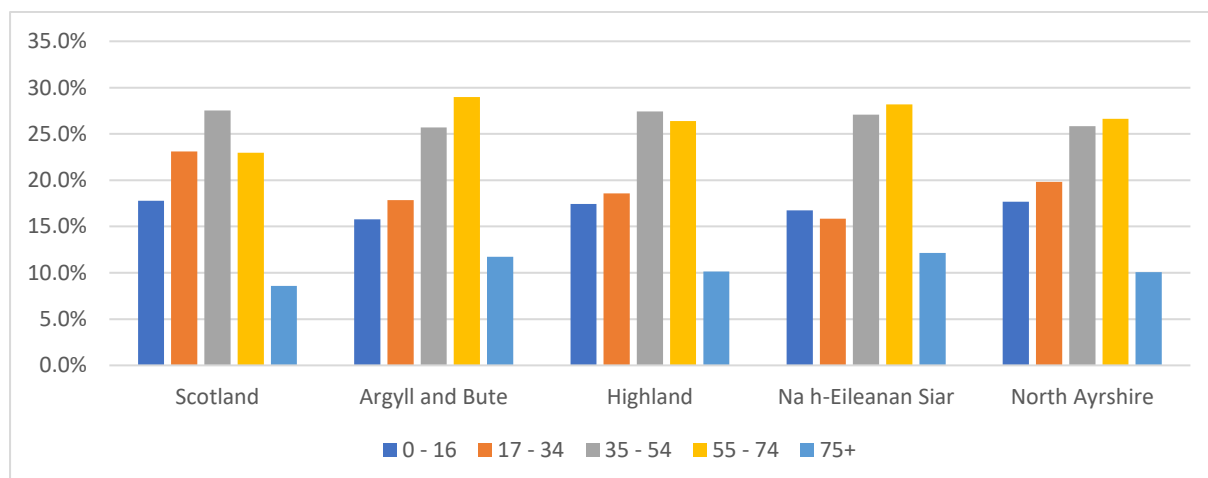
Overall demographic trends are illustrated in Figure 19 and Figure 20³⁹. Since 2000, three of the four council areas in the Hebridean and Clyde network have seen population decline, while the population of Scotland as a whole has grown 8%. Highland has seen faster growth – but this area is dominated by mainland communities including Inverness. When looking at current age distributions, all areas have a lot of 55 and overs and few young adults and young working-age people (17-34) compared to Scotland as a whole.

Figure 19: Population indices for Scotland and selected council areas 1981-2020 (2000 = 100)



Source: Cebr analysis

Figure 20: Population by age, Scotland and selected council areas 2020



Source: Cebr analysis

³⁹ Data from *Population Estimates Time Series Data*, National Records of Scotland, June 2021. [Link](#).

In order to estimate the impact of improved services on island populations, we estimate the generalised cost savings which accrue to households by island⁴⁰ and apply a migration elasticity⁴¹ which relates quality of life to residential choice. Resulting population impacts are shown in Table 24. These are estimated in terms of people then converted into households (according to average Scottish household size).

Table 24: Population impacts

Island	People	Households
Coll and Tiree	18	8
Mull and Iona	49	23
Kerrera	0	0
Lismore	4	2
Jura and Colonsay	7	3
Islay	196	92
Gigha	3	1
Bute	99	46
Barra	35	16
Eriskay and South Uist	26	12
Benbecula	19	9
North Uist	24	11
Lewis and Harris	122	57
Small Isles	23	11
Skye and Raasay	3	1
Arran	375	175
Great Cumbrae	32	15
Total	1,034	483

Source: Cebr/Connected Economics modelling and analysis

These results attempt to predict how improved ferry services will translate into people's decisions to stay in or move to communities, some of which are very small. Therefore, impacts should be treated as very speculative – residential decisions are made over long periods of time and differences of one or two households either way would significantly change results for some islands. Realisation of population growth also depends on housing availability – either through regeneration of vacant, obsolete stock or new construction. Ferry reliability and capacity issues have been identified as a barrier to housing development across the network – though in theory improved services (especially for freight and business) should help to ease these constraints.

Although these population impacts have been estimated independently of the employment impacts elsewhere, they are broadly consistent with them. In Scotland as a whole, the ratio of employment to population is 0.49⁴². The ratio of the estimated employment and population

⁴⁰ By definition, tourist benefits do not accrue to island households, so these are not included. 'Other' journey benefits are weighted at 0.75, as this category includes travel to access shopping or services and visit friends and family, and seem more likely to accrue to islanders than mainlanders. Remaining journey purposes are weighted at 0.5.

⁴¹ *The effect of expected income on individual migration decisions*, National Bureau of Economic Research, March 2003. [Link](#). Page 35: 'Simulations of hypothetical local wage changes show that the elasticity of the relationship between wages and migration is roughly .5.'; therefore we use an elasticity of 0.5, thereby assuming that monetised generalised cost savings are equivalent to changes in income.

⁴² 2,686,000 in employment (*Labour market monthly briefing: June 2022*; [Link](#)); population 5,466,000.

impacts here (429 to 1,034) is 0.41, so slightly lower. Given the economic geography of islands, particularly in the Clyde, this is not surprising; some new residents may commute to the mainland full- or part-time, and some of the new population in places like Arran may be those who already work on the island but are unable or unwilling to live there (so they will be adding to population but not employment).

Overall, given the islands' current total population of a little over 55,000, **this represents a population impact of 2% or so** – given the relatively short timescale this would be a significant uplift.

A confident and secure island future

Improved ferry services therefore stand to support major improvements in island life and economies, by:

- Supporting the growth of the tourism and whisky industries, and employment growth more generally
- Growing the economy further through agglomeration and competition impacts
- Making island life more appealing, combating depopulation trends and directly improving the lives of existing residents

For the islands and islanders, these impacts go beyond what can be expressed in numbers. Island culture and heritage, including the Gaelic language, distinctive island produce like Islay whisky, and events like the HebCelt music festival, will be supported. Communities will be able to attract and retain more young people to work, start businesses, and raise children on the islands. Those from elsewhere will be more likely to visit the islands for pleasure, boosting their profile and reputation at home and abroad.

In the long run, these factors could combine to kick-start a virtuous cycle of growth, investment, and renewal. This will build the case for further investment in ferry services in future.

Appendix: Sensitivity testing

Sensitivity tests adjust assumptions in the socio-economic modelling and present results based on these assumptions. This allows us to better understand the impact of different views of the future and of various factors in driving the core results.

Summary results for the core scenario are presented alongside results for each sensitivity test, and the change that has occurred. Where impacts are focused on particular routes, summary results for those routes are also included.

Increased reliability benefits/disbenefits

Our core assumptions have a 20% generalised increase in unreliability (share of sailings cancelled or late) in the Pessimistic scenario and a 20% generalised decrease in the Optimistic scenario⁴³. Further assumptions reflect the impact of new vessels and infrastructure improvements. This sensitivity test changes the core plus or minus 20% to plus or minus 25%, increasing the reliability impacts in each case.

Table 25: Reliability benefits sensitivity test

		Core results	Sensitivity test	Difference
Demand	Pessimistic	5,701,522	5,670,545	-30,977
	Optimistic	6,050,409	6,080,514	30,106
	Growth	6.1%	7.2%	1.1%
Changes in GCs, £k		£67,677	£79,668	£11,991
Agglomeration, £k		£1,488	£1,761	£273
Competition, £k		£1,203	£1,425	£221
Employment		429	508	78
As % of current		1.7%	2.0%	0.3%
of which tourism		212	247	36
of which whisky production		46	51	6
Earnings, £k		£11,873	£14,036	£2,163
of which tourism		£4,307	£5,034	£727
of which whisky production		£1,596	£1,802	£206
Population		1,034	1,228	194
As % of current		1.8%	2.2%	0.3%

Source: Cebr/Connected Economics modelling and analysis

This increases impacts by about one-sixth across the board, demonstrating the important role of reliability in determining benefits.

⁴³ This does not mean that cancellations or lateness increase or decrease by 20 percentage points, but that existing rates are adjusted by 20% as a percentage of original value. For example a route with 10% of sailings cancelled at present would see this change to 12% in the Pessimistic and 8% in the Optimistic scenario.

No exogenous demand growth

Our core assumptions have demand in both scenarios growing between 2022 and 2032 according to expected total incomes growth. This is based on forecast population growth to 2032 and extrapolation of recent growth rates in gross disposable household income. Due to declining population, this implies a small fall in demand between now and 2032, before other assumptions like new vessels or changes in reliability are accounted for. This sensitivity test simply assumes away any exogenous growth, i.e. baseline demand in the future is the same as it is today.

Table 26: No exogenous demand growth sensitivity test

		Core results	Sensitivity test	Difference
Demand	Pessimistic	5,701,522	5,802,648	101,126
	Optimistic	6,050,409	6,142,570	92,161
	Growth	6.1%	5.9%	-0.3%
Changes in GCs, £k		£67,677	£66,339	-£1,338
Agglomeration, £k		£1,488	£1,491	£3
Competition, £k		£1,203	£1,156	-£48
Employment		429	430	1
As % of current		1.7%	1.7%	0.0%
<i>of which tourism</i>		212	207	-4
<i>of which whisky production</i>		46	31	-15
Earnings, £k		£11,873	£11,898	£24
<i>of which tourism</i>		£4,307	£4,222	-£85
<i>of which whisky production</i>		£1,596	£1,076	-£519
Population		1,034	1,013	-21
As % of current		1.8%	1.8%	0.0%

Source: Cebr/Connected Economics modelling and analysis

The impact of this assumption is minimal. Demand growth is marginally lower, suggesting that higher demand in the sensitivity test interacts with capacity constraints to reduce potential passenger growth. Nevertheless, changes overall are negligible, demonstrating that these tweaks to the exogenous growth assumptions have very little bearing on results.

New Islay vessels in Pessimistic scenario

At time of writing, the two new Islay vessels have been ordered but are not under construction (like the Glen Sannox or Hull 802) or already built (like the Loch Frisa). Therefore, they were not included in the Pessimistic scenario. This sensitivity test assumes that they are delivered and enter service in both scenarios.

Table 27: Islay vessels in Pessimistic scenario sensitivity test

		Core results	Sensitivity test	Difference
Demand	Pessimistic	5,701,522	5,726,529	25,007
	Optimistic	6,050,409	6,041,574	-8,834
	Growth	6.1%	5.5%	-0.6%
Changes in GCs, £k		£67,677	£60,300	-£7,377
Agglomeration, £k		£1,488	£1,366	-£122
Competition, £k		£1,203	£980	-£223
Employment		429	396	-33
As % of current		1.7%	1.6%	-0.1%
of which tourism		212	195	-16
of which whisky production		46	15	-30
Earnings, £k		£11,873	£10,958	-£916
of which tourism		£4,307	£3,978	-£329
of which whisky production		£1,596	£534	-£1,062
Population		1,034	910	-124
As % of current		1.8%	1.6%	-0.2%

Source: Cebr/Connected Economics modelling and analysis

Table 28: Islay vessels in Pessimistic scenario sensitivity test - focus on Kennacraig - Islay routes

Core results	Change in demand		GC savings (£k)
	Passenger journeys	%	
Kennacraig - Port Ellen	29,204	22.3%	£6,328
Kennacraig - Port Askaig	17,432	13.7%	£5,022
Sensitivity test	Change in demand		GC savings (£k)
	Passenger journeys	%	
Kennacraig - Port Ellen	6,888	4.8%	£2,151
Kennacraig - Port Askaig	6,951	5.0%	£2,079

Source: Cebr/Connected Economics modelling and analysis

The effect of this assumption is that, for Islay services, the principal difference between the Pessimistic and Optimistic scenarios is the generalised improvement in reliability resulting from greater redundancy and interoperability in the wider fleet – in either case two new vessels are introduced and the MV Hebridean Isles is retired. This reduces impacts of the scenario

change significantly; demand growth across the network falls from 6.1% to 5.5%, user benefits impact is £7.4 million per year lower, and whisky related impacts are substantially lower.

On the Kennacraig – Islay routes all benefits fall by approximately two thirds. Of course, this does not reflect a worsening of conditions, just a smaller change between the two scenarios as most of the benefits are now realised in the pessimistic scenario.

Appendix: Islanders' feedback

During the meetings held throughout the study, the project team heard a range of feedback, both positive and negative, on CalMac services. Although not all within the direct scope of our research, this feedback is briefly reflected here. The inclusion of feedback below does not indicate the authors' endorsement or otherwise of the comments made.

Overarching issues

The below issues were widely identified by stakeholders across the network.

- Poor interaction with public transport services – either that bus or rail services to and from ports did not coincide well with ferries, or that where they do there is little flexibility when ferries are delayed. This could lead to journeys being made by car instead of public transport or to extended journey times..
- Weather-related cancellations were occurring in conditions under which respondents felt sailings would once have gone ahead.
- Comments about the service provided by port and vessel staff was overwhelmingly positive – for instance with regard to their management of services during periods of disruption and flexibility in getting locals onto services at short notice during periods of disruption.
- Communication between CalMac itself and service users, however, was perceived less well, and was felt to have deteriorated in recent years as the organisation became more centralised in Gourock.
- Some stakeholders favoured a move away from the 'big boat' model to a larger number of smaller boats operating more frequent, flexible services which would be less disrupted by one breakdown.
- Island residents widely felt that the current booking system does not recognise that they sometimes need to travel at short notice, e.g. for medical appointments or family emergencies, and that a system should be put in place to facilitate this – e.g. reserving a proportion of tickets for residents, health/social care needs, or booking at short notice.

Transportation of freight

- Certain dangerous goods (e.g. oxygen, petrol, gas, hay) cannot be transported on closed-deck vessels – therefore when these are substituted for open-deck vessels at short notice the supply of these goods to islands is disrupted.
- Live animals in transport are particularly time-sensitive – both due to animal welfare issues and because of inflexible market times. Some stakeholders reported positively that these vehicles were prioritised during disruption, though others had been unable to make their journeys as planned.
- On the Small Isles, where freight is handled by CalMac directly, a few specific issues were identified:
 - The refusal (by Transport Scotland) of extra fridge storage at Mallaig means storage for food continues to be limited.
 - Visitors are only allowed to bring 14kg of luggage; given the need to be relatively self-sufficient when travelling to the Small Isles this can be challenging, and a solution might be to allow them to pay to bring extra.
 - CalMac increasingly relies on volunteer help to unload freight, rather than for instance keeping a forklift on the ferry. Especially when goods have to be unloaded quickly before the next departure, this can be difficult.
 - Transportation of bikes and kayaks by CalMac is not guaranteed – this poses challenges for the development of sustainable tourism on the Small Isles.

- Difficulties in transport of dangerous goods, for instance multiple types cannot be transported at once, and there are also limitations if a lot of passengers are on board.

Route-specific issues

- The lack of a service between Coll/Tiree and Mull was raised by stakeholders on those islands. Proposed solutions included the use of Mull as a land bridge with through bus services.
- Where vessels include a mezzanine deck, this was not always used due to time/staff constraints, effectively reducing capacity.
- The 'non-landing' tickets formerly offered by CalMac were used by those who, for instance, wanted to go whale-watching around the Small Isles without disembarking. These provided a contribution to CalMac revenues without using capacity on the vehicle deck.

Accessibility

Potential improvements for those with disabilities or special needs were identified, including⁴⁴:

- Allowing a last-minute check-in and rapid access rather than boarding last.
- More accessible disabled lanes in the vehicle queue – at present they are often less accessible – and not boarding disabled passengers on the mezzanine deck, which is narrow and therefore difficult to use with a wheelchair.
- Allowing blue badge holders to book online and obtain the 25% discount on a vehicle ticket which CalMac offers on certain routes, rather than having to book by phone.
- Quiet places on ships, e.g. for the use of those prone to sensory overload.
- Improving harbour infrastructure and current vessel for the Gourock-Kilcreggan service, which are challenging for those in wheelchairs.

⁴⁴ These were mostly with reference to the Ullapool-Stornoway service, but may be applicable elsewhere.

Appendix: List of consultees

The below table lists the consultees who contributed to this study through discussions with the project team, either through phone or video calls, or in-person meetings which took place during the fieldwork trips in Phase 2.

These discussions with representatives of businesses, public services, charitable organisations, and regional development bodies were invaluable in ensuring that this work reflected the specific context, challenges, and opportunities of the islands as closely as possible. The project team is grateful for their time and contributions, as well as those of ferry users who spoke to us and completed surveys.

Name	Organisation(s)/role(s)	Broad geography	Location or remit
Angus Campbell	Ferries Community Board Chair	National/regional	National/regional
Chris Wilcock	Transport Scotland	National/regional	National/regional
Douglas Cowan	Highlands and Islands Enterprise	National/regional	National/regional
Lucinda Gray	Highlands and Islands Enterprise	National/regional	National/regional
Lucy Sumsion	NFU Scotland; Argyll and Bute Economic Resilience Forum	National/regional	National/regional
Morag Goodfellow	Highlands and Islands Enterprise	National/regional	National/regional
Nicky Sobey	Highlands and Islands Enterprise	National/regional	National/regional
Richard Hadfield	Transport Scotland	National/regional	National/regional
Eoin MacNeil	Ferries Community Board Member	Outer Hebrides	Barra
Dave Adey	Benbecula Community Council	Outer Hebrides	Benbecula
Kate MacDonald	North Uist Distillery	Outer Hebrides	Benbecula
Margaret Mackenzie	Harris Transport Forum	Outer Hebrides	Harris
Rhoda Campbell	Ferries Community Board Member	Outer Hebrides	Harris
Ida Holmstrom	Ferries Community Board Member	Outer Hebrides	Lewis
Joe Mahony	An Lanntair	Outer Hebrides	Lewis
Murdo Maclean	Ferries Community Board Member	Outer Hebrides	Lewis
Neil Mackinnon	Galson Estate Trust	Outer Hebrides	Lewis
Anne MacLellan	North Uist Community Council	Outer Hebrides	North Uist
Joan Ferguson	North Uist Community Council	Outer Hebrides	North Uist
Claire Morris	Autism Eilean Siar	Outer Hebrides	Outer Hebrides
Erica Clark & youth representatives	Western Isles Council	Outer Hebrides	Outer Hebrides
Darren Taylor	Stòras Uibhist	Outer Hebrides	South Uist
Gail Robertson	Ferries Community Board Member	Outer Hebrides	Uist
Joanna Peteranna	Ferries Community Board Member	Outer Hebrides	Uist
Robert Currie	Scottish Salmon Company	Outer Hebrides	Uist
Kevin Peach	Ferries Community Board Member	Outer Hebrides	Ullapool
Isebail MacKinnon	Small Isles Community Council	Inner Hebrides	Canna, Small Isles
Alison Jones	Development Coll	Inner Hebrides	Coll
Kirsty MacFarlane	Ferries Community Board Member	Inner Hebrides	Coll
Camille Dressler	Ferries Community Board Member, Small Isles Community Council	Inner Hebrides	Eigg, Small Isles
Antonia Baird	Argyll and Bute Council	Inner Hebrides	Mid Argyll, Kintyre and the Isles
Ruth MacEwen	Small Isles Community Council	Inner Hebrides	Muck, Small Isles

Name	Organisation(s)/role(s)	Broad geography	Location or remit
Andy Knight	TSL Contractors	Inner Hebrides	Mull
Brendan Reade	Isle of Mull Cheese	Inner Hebrides	Mull
Cara Gilbert	Tobermory Distillery	Inner Hebrides	Mull
Naomi Knight	TSL Contractors	Inner Hebrides	Mull
Olivier MacLean	Tobermory Distillery	Inner Hebrides	Mull
Elizabeth Ferguson	Ferries Community Board Member (former)	Inner Hebrides	Mull and Iona
Finlay MacDonald	Mull & Iona Ferry Committee	Inner Hebrides	Mull and Iona
Joe Reade	Mull & Iona Ferry Committee	Inner Hebrides	Mull and Iona
Colin Morrison	Turus Mara - Staffa and Treshnish tours	Inner Hebrides	Mull and Ulva
Duncan MacNeill	Furan Gaelic Centre	Inner Hebrides	Oban
Becky Hothersall	Argyll and Bute Council	Inner Hebrides	Oban, Lorn and the Isles
Fliss Fraser	Small Isles Community Council	Inner Hebrides	Rum, Small Isles
Ian Sargent	NatureScot	Inner Hebrides	Rum, Small Isles
Alex Stoddart	Armadale Castle and Gardens	Inner Hebrides	Skye
Anne Gracie Gunn	Sonas Hospitality	Inner Hebrides	Skye
Donald Angie MacLennan	Sabhal Mòr Ostaig, National Centre for Gaelic Language and Culture	Inner Hebrides	Skye
Rob Ware	Ferries Community Board Member (former)	Inner Hebrides	Skye
Alastair MacInnes	Farm owner (beef, pork and lamb)	Inner Hebrides	Tiree
Donnie MacInnes	Ferries Community Board Member	Inner Hebrides	Tiree
Dr John Holliday	Tiree Community Council	Inner Hebrides	Tiree
Robert Trythall	Commercial marine expert	Inner Hebrides	Tiree
Fergus Murray	Argyll and Bute Council; Argyll and Bute Economic Resilience Forum	Clyde and South	Argyll and Bute
Ishabel Bremner	Argyll and Bute Council; Argyll and Bute Economic Resilience Forum	Clyde and South	Argyll and Bute
Jane MacLeod	MacLeod Construction; Argyll and Bute Economic Resilience Forum	Clyde and South	Argyll and Bute
John Glen	Bute Fabrics; Argyll and Bute Economic Resilience Forum	Clyde and South	Argyll and Bute
Bill Calderwood	Ferries Community Board Member	Clyde and South	Arran
Chris Atkins	Arran Ferry Action Group	Clyde and South	Arran
David Henderson	Kilpatrick Farm	Clyde and South	Arran
Graham Omand	Isle of Arran Distillery	Clyde and South	Arran
Linda Johnston	Auchrannie Resort	Clyde and South	Arran
Peter Dunn	Isle of Arran Distillery	Clyde and South	Arran
Ruth Betley	North Ayrshire Health and Social Care Partnership	Clyde and South	Arran
Sheila Gilmore	Visit Arran	Clyde and South	Arran
Stewart Bowman	Isle of Arran Distillery	Clyde and South	Arran
Tom Tracey	Arran Recovery Group	Clyde and South	Arran
Declan Brennan	North Ayrshire Council	Clyde and South	Arran and Cumbrae
Louise Kirk	North Ayrshire Council	Clyde and South	Arran and Cumbrae
Sarah Baird	North Ayrshire Council	Clyde and South	Arran and Cumbrae
David Herriot	Ferries Community Board Member	Clyde and South	Bute and Cowal
Anne Horn	Argyll and Bute Council	Clyde and South	Campbeltown

Name	Organisation(s)/role(s)	Broad geography	Location or remit
John Armour	Campbeltown Ferry Committee; Argyll and Bute Council	Clyde and South	Campbeltown
Angus Campbell	Ferries Community Board Member	Clyde and South	Cumbræ
Canon Alec Boyd	Cumbræ Community Council; Cumbræ Churches	Clyde and South	Cumbræ
Crawford Gillan	Cumbræ Community Council; Cumbræ Resilience Team	Clyde and South	Cumbræ
Eleanor Brown	Cumbræ Community Council; Cumbræ Forum	Clyde and South	Cumbræ
Graham Wallace	Cumbræ Community Council	Clyde and South	Cumbræ
Jackie Wilson	Cumbræ Community Council; youth representative	Clyde and South	Cumbræ
Leslie Stringer	Cumbræ Community Council; North Coast Locality Partnership	Clyde and South	Cumbræ
Lisa Christie	Cumbræ Community Council	Clyde and South	Cumbræ
Michael Breslin	South Cowal Community Council	Clyde and South	Dunoon
Willie Lynch	Dunoon Community Council (former)	Clyde and South	Dunoon
Allan Logan	Bruichladdich Distillery	Clyde and South	Islay
Ben Mundell	Mundells Haulage; Islay Ferry Committee	Clyde and South	Islay
David Turner	Bowmore Distillery	Clyde and South	Islay
Emma Clark	Explore Islay and Jura; Islay Ferry Committee	Clyde and South	Islay
Garry MacLean	NFU Group Secretary; Islay Ferry Committee	Clyde and South	Islay
Islay McEachern	McEachern Bros Construction; Islay Ferry Committee	Clyde and South	Islay
Jim Porteous	Ferries Community Board Member	Clyde and South	Islay
Paul Graham	Ardnahoe Distillery	Clyde and South	Islay
Ray Lafferty	Museum of Islay Life	Clyde and South	Islay
Christine Murdoch	Cove & Kilcreggan Community Council	Clyde and South	Kilcreggan
Nick Davies	Cove & Kilcreggan Community Council	Clyde and South	Kilcreggan
Ian MacFarlane	Ferries Community Board Member	Clyde and South	Kintyre

Appendix: Island GVA by broad sector

Table 29 shows the GVA estimates by sector used for the estimates of agglomeration, based on the island profiles used for the economic impact modelling.

Table 29: Estimated GVA by broad sector used for agglomeration estimates

	GVA, £m	Manufacturing %	Construction %	Consumer services %	Producer services %
Coll and Tiree	20.6	21.5%	7.2%	21.9%	17.1%
Mull and Iona	67.6	41.0%	3.9%	30.0%	3.9%
Kerrera	0.4	20.7%	24.1%	34.2%	0.0%
Lismore	3.1	33.2%	13.5%	27.6%	0.0%
Jura and Colonsay	8.1	27.9%	6.5%	32.9%	0.0%
Islay	104.3	46.7%	5.2%	18.1%	9.9%
Gigha	2.3	53.3%	7.3%	13.3%	0.0%
Bute	114.7	39.8%	3.3%	13.7%	16.5%
Barra	19.0	24.7%	3.3%	42.8%	3.3%
Eriskay and South Uist	29.7	21.8%	13.1%	23.7%	19.5%
Benbecula	55.8	4.6%	3.4%	11.3%	57.0%
North Uist	16.4	31.9%	3.7%	36.2%	8.3%
Lewis and Harris	388.5	12.9%	5.9%	18.5%	18.9%
Small Isles	3.6	37.4%	0.0%	24.0%	10.0%
Skye and Raasay	255.3	20.6%	5.5%	25.4%	23.6%
Arran	90.7	27.6%	9.1%	34.0%	3.9%
Great Cumbrae	12.4	6.7%	4.0%	18.2%	0.4%

Source: ONS, and Cebr analysis

Total percentages in the table do not sum to 100% because there are sectors not considered subject to agglomeration economies: Public administration and defence; Education; Human health and residential care activities; Social work activities; Arts, entertainment and recreation; Membership organisations; repair of household goods; Other personal service activities; Households as employers and own use production.

The four broad sectors used are defined as the following combinations of sectors by the Department for Transport:

- Manufacturing:
 - Agriculture, mining, electricity, gas, water and waste
 - Manufacture of food, beverages, textiles and clothing
 - Manufacture of wood, petroleum, chemicals and minerals
 - Manufacture of metals, electrical products and machinery
 - Other manufacturing, repair and installation
- Construction:
 - Construction of buildings
 - Civil engineering
 - Specialised construction activities
- Consumer services:
 - Motor trades
 - Wholesale trade
 - Retail trade

- Land, water and air transport
 - Warehousing, transport support, postal and courier activities
 - Accommodation and food service activities
- Producer services:
 - Information and communication
 - Financial and insurance activities
 - Real estate activities, excluding imputed rental

Appendix: Full results tables

Bespoke Regional Multipliers

Type I Multipliers

Table 30. Bespoke regional Type I multipliers for CalMac

Type I Multipliers – Indirect Impacts	Turnover	GVA	FTE Employment	Employee Compensation
Coll and Tiree	1.00	1.00	1.00	1.00
Mull and Iona	1.01	1.01	1.01	1.00
Kerrera and Gallanach	1.00	1.00	1.00	1.00
Jura and Colonsay	1.00	1.00	1.00	1.00
Islay	1.02	1.02	1.02	1.01
Gigha	1.00	1.00	1.00	1.00
Bute	1.08	1.08	1.09	1.06
Barra	1.00	1.00	1.00	1.00
Eriskay and South Uist	1.00	1.00	1.00	1.00
Benbecula	1.00	1.01	1.01	1.00
North Uist	1.00	1.00	1.00	1.00
Lewis and Harris	1.11	1.14	1.18	1.10
Small Isles	1.00	1.00	1.00	1.00
Skye and Raasay	1.01	1.01	1.02	1.01
Arran	1.03	1.04	1.04	1.02
Great Cumbrae	1.00	1.01	1.01	1.00

Source: CalMac, ONS, and Cebr analysis

Type II Multipliers

Table 31. Bespoke regional Type II multipliers for CalMac

Type II Multipliers – Induced Impacts	Turnover	GVA	FTE Employment	Employee Compensation
Coll and Tiree	1.10	1.14	1.21	1.10
Mull and Iona	1.12	1.15	1.22	1.11
Kerrera and Gallanach	1.11	1.14	1.21	1.10
Jura and Colonsay	1.13	1.17	1.25	1.12
Islay	1.12	1.15	1.22	1.11
Gigha	1.10	1.13	1.20	1.09
Bute	1.18	1.21	1.28	1.15
Barra	1.08	1.10	1.16	1.07
Eriskay and South Uist	1.10	1.14	1.22	1.10
Benbecula	1.11	1.15	1.23	1.11
North Uist	1.11	1.14	1.23	1.10
Lewis and Harris	1.21	1.27	1.38	1.19
Small Isles	1.14	1.18	1.18	1.10
Skye and Raasay	1.20	1.27	1.27	1.15
Arran	1.26	1.33	1.20	1.13
Great Cumbrae	1.21	1.27	1.15	1.10

Source: CalMac, ONS, and Cebr analysis

Regional Aggregate Economic Impacts

Gross Value Added (GVA)

Table 32. Aggregate regional economic footprint of CalMac, GVA (£'000), FY 2019-20

GVA (£'000)				
Island	Direct impact	Indirect impact	Induced impact	Aggregate impact
Coll and Tiree	£1,268	£1	£173	£1,442
Mull and Iona	£3,249	£28	£464	£3,742
Kerrera and Gallanach	£238	£0	£33	£271
Jura and Colonsay	£475	£1	£79	£555
Islay	£2,219	£41	£299	£2,559
Gigha	£396	£1	£52	£449
Bute	£3,249	£266	£411	£3,926
Barra	£4,067	£1	£415	£4,482
Eriskay and South Uist	£3,050	£3	£415	£3,468
Benbecula	£593	£4	£82	£679
North Uist	£1,610	£2	£223	£1,835
Lewis and Harris	£11,691	£1,673	£1,492	£14,856
Small Isles	£155	£0	£28	£184
Skye and Raasay	£2,225	£32	£568	£2,824
Arran	£1,111	£40	£329	£1,480
Great Cumbrae	£85	£1	£23	£109

Source: CalMac, ONS, and Cebr analysis

Employment

Table 33. Aggregate regional economic footprint of CalMac, FTE Employment, FY 2019-20

Employment (number of FTE jobs)					
Island	Direct Impact	Indirect Impact	Induced Impact	Aggregate Impact	Share of region employment supported by CalMac (%)
Coll and Tiree	14	0	3	17	3.9%
Mull and Iona	36	0	8	44	3.0%
Kerrera and Gallanach	3	0	1	3	1.5%
Jura and Colonsay	5	0	1	7	3.4%
Islay	25	1	5	30	1.6%
Gigha	4	0	1	5	2.9%
Bute	36	3	7	46	2.2%
Barra	42	0	7	49	10.9%
Eriskay and South Uist	32	0	7	39	6.4%
Benbecula	6	0	1	8	0.8%
North Uist	17	0	4	21	4.5%
Lewis and Harris	122	22	25	169	1.9%
Small Isles	3	0	0.5	3	1.2%
Skye and Raasay	38	1	10	48	0.9%
Arran	34	1	6	41	2.0%
Great Cumbrae	3	0	0.4	3	0.9%

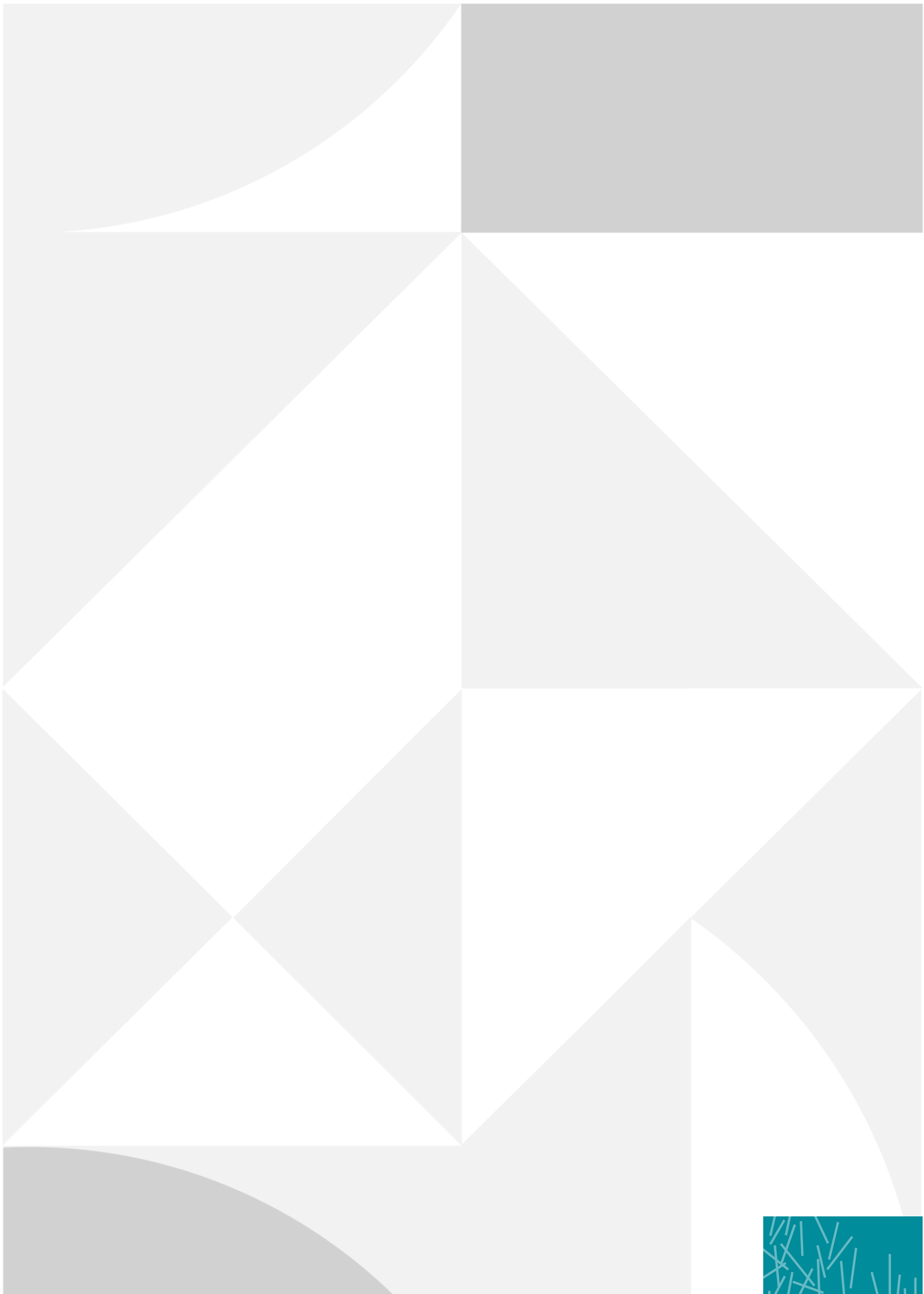
Source: CalMac, ONS, and Cebr analysis

Employee Compensation

Table 34. Aggregate regional economic footprint of CalMac, Employee Compensation (£'000), FY 2019-20

Employee Compensation (£'000)				
Island	Direct impact	Indirect impact	Induced impact	Aggregate impact
Coll and Tiree	£1,012	£0	£98	£1,110
Mull and Iona	£2,594	£12	£263	£2,868
Kerrera and Gallanach	£190	£0	£19	£209
Jura and Colonsay	£380	£1	£44	£425
Islay	£1,771	£20	£169	£1,960
Gigha	£316	£0	£29	£346
Bute	£2,594	£161	£233	£2,987
Barra	£3,147	£1	£235	£3,382
Eriskay and South Uist	£2,360	£1	£235	£2,597
Benbecula	£459	£2	£46	£508
North Uist	£1,246	£1	£126	£1,373
Lewis and Harris	£9,048	£910	£844	£10,802
Small Isles	£157	£0	£16	£174
Skye and Raasay	£2,256	£21	£321	£2,598
Arran	£1,692	£37	£186	£1,916
Great Cumbrae	£130	£1	£13	£144

Source: CalMac, ONS, and Cebr analysis



Connected Economics
competitiveness, spatial economics, development, infrastructure

