Agenda Item	**4**
Report No	**ECI/25/22**

HIGHLAND COUNCIL

Committee: **Economy and Infrastructure**

Date: **10 November 2022**

Report Title: **Corran Ferry Outline Business Case**

Report By: **Executive Chief Officer Infrastructure, Environment & Economy**

1 Purpose/Executive Summary

1.1 This report presents Members with the Outline Business Case (OBC) for replacement vessels and shoreside infrastructure for the Corran Ferry service, which can subsequently be taken through a Final Business Case (FBC).

2 Recommendations

2.1 Members are invited to **Agree** the Outline Business Case (OBC) Final Report for replacement Vessels and shoreside infrastructure for the Corran Ferry service.

3 Implications

3.1 **Resource** - There are potential significant resource implications for the Council depending on the final design, however these will form part of future reports for presentation to the appropriate Council Committee.

The current Council capital programme recognises the important role of the Corran ferry project but does not identify funding within the lifetime of the programme. It was widely recognised at the time of the approval of the Programme that efforts would have to be made to attract external funding to the project wherever possible, and these efforts continue in discussions with both UK and Scottish Governments.

Alongside the review of the capital programme process, efforts to identify and deliver external funding opportunities will continue at pace.

3.2 **Legal** - Relevant legal aspects will be explored appropriately, but construction consents and a compulsory purchase order are anticipated if land agreements cannot be negotiated.

3.3 **Community (Equality, Poverty and Rural)** - The Corran Ferry is a lifeline service with the associated socio-economic implications for the local Community.

3.4 **Climate Change / Carbon Clever** - Clean energy options have been considered in examining future operations and vessels specification.

3.5 **Risk** – Delay to delivery – has continuation of service risks due to the age and condition of the vessels and associated infrastructure. Increased service sustainability and resilience will reduce the risk to future service provision. As with all construction and fabrication projects risks exist – designer risk assessments will be undertaken, and mitigation measures developed and implemented – and residual risks will be managed through the final construction contracts. Costs estimates will be provided to inform and shape the required capital delivery cost and associated approvals.

3.6 Gaelic - No implications.

4 Progress to date

4.1 Located approximately seven miles south of Fort William, the Corran Narrows is the narrowest section of Loch Linnhe. The Narrows is home to the Corran Ferry service, which carries passengers and vehicles between Nether Lochaber (Corran) and Ardgour. Although a short crossing, the service provides an essential connection for the peninsular communities of Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isle of Mull beyond.

4.2 The ferry serves a wide variety of purposes including: providing access to employment, health, education, and retail for peninsular residents; facilitating Council service delivery; acting as a gateway for tourists visiting the peninsula; and meeting the supply-chain needs of communities and businesses, including those of Mull via the Fishnish – Lochaline route. THC owns, funds, and operates the Corran Ferry service, which is the busiest single vessel operated route in Scotland, carrying over 270,000 cars each year, delivering 30,000 sailings from early morning to late in the evening, 363 days of the year.

4.3 The current Corran Ferry Service operates using ferries and shoreside infrastructure that are in urgent need of replacement. This report sets out the Outline Business Case (OBC) for investment in new ferries and shoreside infrastructure for the Corran Ferry service. The OBC has been developed in line with the Guidance on the Development of Business Cases (Transport Scotland 2016), which is based on the H.M. Treasury Green Book ‘Five Case Model’. **Please note** that the detailed Corran Ferry OBC Final Report (**Appendix 2**) and a standalone Corran Ferry OBC Executive Summary (**Appendix 3**) are attached to this report.

4.4 In 2018, Stantec completed the Corran Ferry STAG (Scottish Transport Appraisal Guidance) Appraisal, assessing potential capital and delivery options for the crossing. In Transport Scotland's business case context, a STAG can be considered equivalent to a Strategic Business Case (SBC). Following the completion of the STAG study, the Council further developed the technical options emerging from the business case whilst engaging with both Transport Scotland and the market on future delivery options.

4.5 More recently, the Council commissioned the Socio-Economic Study which highlights that the Corran Ferry is an essential lifeline service on which the region depends. This study included a comprehensive engagement programme designed to complement the existing work and to address the identified gaps in the work undertaken to date to meet the requirements of the business case process. The two studies and considerable in-house development work have now been consolidated into a robust and compliant Outline Business Case.

4.6 As Members will note, the preferred design is for two larger 32-vehicle capacity fully electric vessels and supporting shoreside infrastructure which will can be taken to the market to complete the detailed design and build, subject to the availability of capital. To resolve capacity issues and prevent shuttling 2 vessels are required to operate for 9 months of the year. Refits will be undertaken in the quieter months Nov to Jan, always leaving one vessel on the route. This model will meet Transport Planning Objectives and deliver capacity through frequency which provides reliability, resilience, and sustainability.

4.7 Members will also be aware the £1.6m was set aside by the Council to progress work on the proposed shore-side infrastructure and the vessel design. Both projects are well underway and as set out below, a consultation event is programmed to in November to set out the options for delivery. This is a pre-planning requirement.

4.8 A high-level programme for delivery is detailed in **Appendix 1** although Members should note that this is entirely dependent on the capital being secured for the project, whether as part of the Capital programme Review or by attracting external funding (see Resources Risk section).

5 Corran Ferry Project - Engagement and Consultation

5.1 Regular dialogue is ongoing between Highland Council, Transport Scotland, Caledonian Maritime Assets Limited (CMAL) along with Marine Engineers (Wallace Stone) and Naval Architects (Navalue). Community groups and the Council's Project Design Unit, Finance, Legal, Procurement and Corporate Communications teams are actively involved in the Project.

5.2 The Highland Council will be holding a pre-application public consultation event at the Ardgour Memorial Hall, Clovullin, Corran, Fort William PH33 7AB. The event will be taking place on Thursday 10 November 2022 between 2pm and 8pm.

5.3 The event will be an exhibition format, with opportunity for face-to-face discussions with key project members, to provide an opportunity for stakeholders to consider and comment upon the prospective application. Consultation material will be made available after the event on www.affriclimited.co.uk/news/Consultations.

6 Corran Ferry Project - Governance

6.1 Governance is via the Infrastructure Environment and Economy Committee; the project is overseen by the Harbours Management Board and the Lochaber Area Committee with reports at appropriate intervals. A Technical Project Board provides regular oversight and scrutiny throughout the Project. The Corran Ferry Steering group ensures that links between the community and officers involved are maintained and regular users of the service are given a strong voice to represent their communities.

6.2 Representatives from the following Community Councils - Acharacle, Ardgour, Nether Lochaber, Sunart, West Ardnamurchan and Morvern are invited to attend all Project Steering Group meetings.

6.3 The Executive Chief Officer (Infrastructure, Environment and Economy) is Project Sponsor, and the Project Manager continues to work closely with the area Roads Operations Manager (Project Lead) and the two Ferry Foreman.

Designation: Executive Chief Officer Infrastructure, Environment & Economy

Date: 7 October 2022

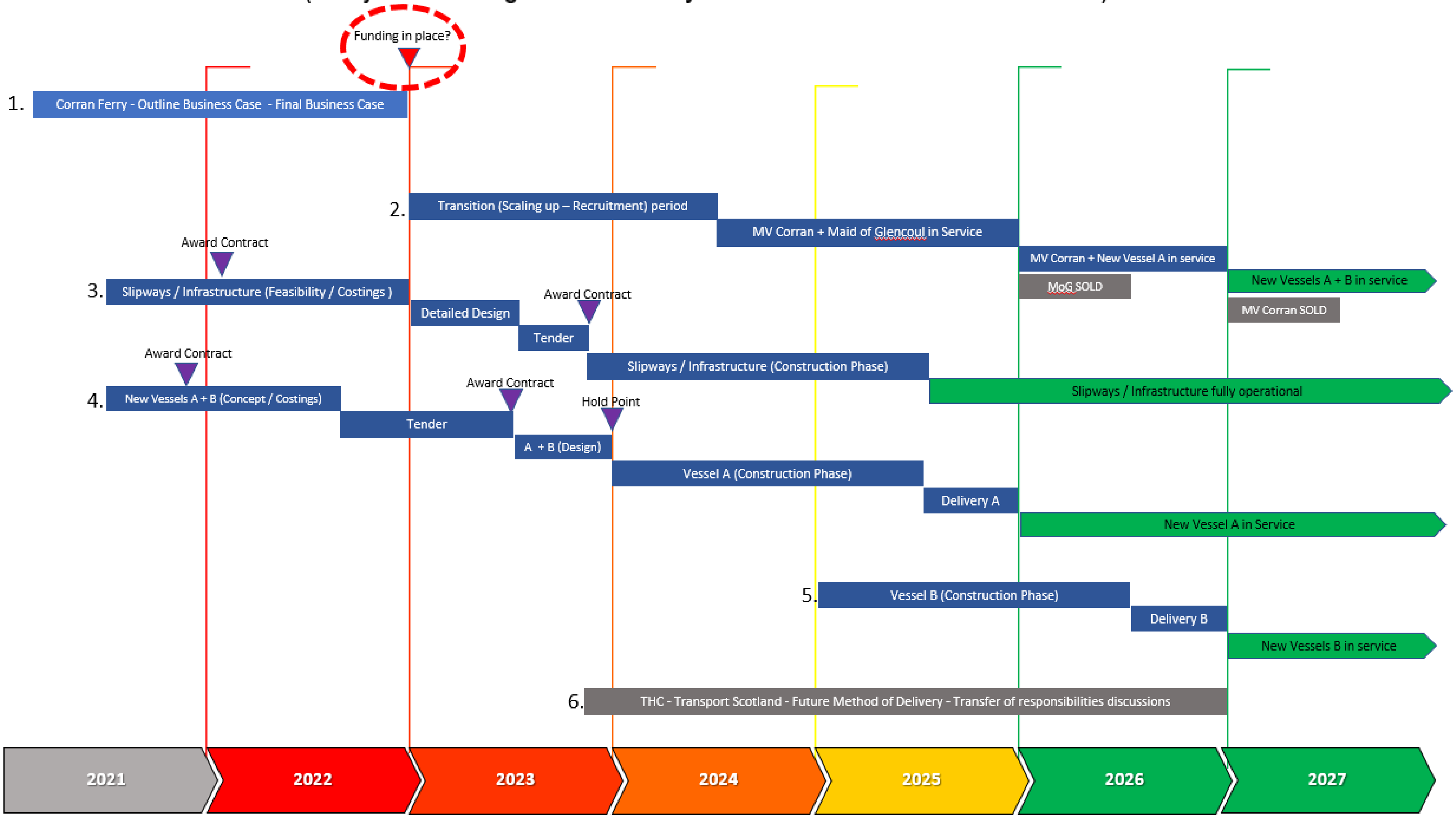
Author: Murray Bain, Corran Ferry Project Manager

Background Papers: Item 13 – ECI/34/20 Report
Item 7 – ECI/9/20 Report
HiTrans Item 6 Report
Item 10 – LA/6/20 Report
Item 7 – LA/31/19 Report
Item 7 – LA/17/19 Report
Item 4 – LA/7/19 Report
Item 20 – EDI/80/18 Report
Item 11 – LA/19/18 Report
Item 8 – LA/23/17 Report
Item 4 – LA/14/17 Report
Item 12 – COM/47/16 Report
Item 11 – COM/8/16 Report
Item 14 – COM/11/15 Report
Item 9 – COM/35/14 Report
Item 8 – LA/5/14 Report
Item 12 – TEC/72/13 Report

Appendix 1

Corran Ferry High Level Programme Timeline (THC)

(Subject to budget for delivery at Final Business Case - FBC)



Appendix 2

Corran Ferry Outline Business Case

Outline Business Case

On behalf of **The Highland Council**

Project Ref: 330610591 | Date: July 2022

Registered Office: Buckingham Court Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire, HP11 1JU
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Document Control Sheet

Project Name: Corran Ferry Outline Business Case

Project Ref: 330610591

Report Title: Outline Business Case

Date: 14th July 2022

	Name	Position	Signature	Date
Prepared by:	Steven Reid	Senior Associate		07/07/2022
Reviewed by:	Stephen Canning	Senior Associate		12/07/2022
Approved by:	Scott Leitham	Director, Transport Planning		14/07/2022
For and on behalf of Stantec UK Limited				

Revision	Date	Description	Prepared	Reviewed	Approved
V2.3	14.09.2022	Update and address of comments in outline first draft.			
V2.4	03.10.2022	Update and address comments for Final Delivery			

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Executive Summary

This report sets out the Outline Business Case (OBC) for investment in new ferries and terminal infrastructure for the Corran Ferry service. It builds on a range of previous studies, including the 2018 Corran Ferry Scottish Transport Appraisal Guidance (STAG) / Strategic Business Case (SBC) study.

Located approximately seven miles south of Fort William, the Corran Narrows is the narrowest section of Loch Linnhe. The Narrows is home to the Corran Ferry service, which carries passengers and vehicles between Nether Lochaber (Corran) and Ardgour. Although a short crossing, the service provides an essential connection for the peninsular communities of Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isle of Mull beyond.

Figure ES1: Location of the Corran Narrows and Community Council Areas

The ferry serves a wide variety of purposes including: providing access to employment, health, education, and retail for peninsular residents; facilitating The Highland Council (THC) service delivery; acting as a gateway for tourists visiting the peninsula; and meeting the supply-chain needs of communities and businesses, including those of Mull via the Fishnish – Lochaline route. THC owns, funds, and operates the Corran Ferry service, which is the busiest single vessel operated route in Scotland, carrying over **270,000** cars each year, delivering **30,000** sailings from early morning to late in the evening, **363** days of the year.

What is the 'Case for Change'?

From an infrastructure perspective, the 'case for change' can be summarised as follows:

- The **current ferries are ageing**. MV *Maid of Glencoul* is 47 years old and is in urgent need of replacement, with the sourcing of spare parts becoming both difficult and expensive. In having deck space for only 14 cars, when she is operating the route on her own (i.e., when the main vessel MV *Corran* is at refit or out of service), she is too small thus requiring frequent shuttling. Even with this shuttling, the vessel frequently cannot keep pace with demand, and this creates problematic delays, particularly for commercial users. MV *Corran* is now also 22-years old and due to the timescales for construction (estimated delivery for replacement vessels is 4 - 5 years) the ordering and commissioning of replacement vessels needs to commence in the immediate-term, otherwise loss of **reliability and more frequent service failure could become a reality**.

- When the service is suspended, the road-based diversion time can be up to two hours, with certain high vehicles excluded entirely from the peninsula due to low bridge heights.
- The two **vessels overnight on 'swing' moorings**, which requires a vessel-to-vessel transfer at the start and end of the operating day – this is a comparatively high-risk arrangement and is a practice which has been gradually phased out in Scotland in recent decades.
- **Vehicle-deck capacity is insufficient at peak times**. When there is short-shipped traffic (i.e., vehicles left behind), the service will routinely depart from timetable and 'shuttle' until the backlog is cleared. Whilst this is effective, it cannot always keep pace with demand, and it increases the pressures of an already intense service on the crew.
- The **marshalling areas on both sides of the crossing are too small to accommodate peak demand queueing**. This increases road safety and network performance risks, particularly where traffic on the Corran side backs out onto the A82 trunk road and on the Ardgour side queues beyond the blind corner south of the lighthouse.
- When MV *Maid of Glencoul* is in operation, her height and weight restrictions **limit access to the peninsula for the largest of commercial vehicles due to bridge height restrictions on the alternative road routes (4.1m A830 and 3.65m A861)**. As well as affecting the peninsula, this also impacts on the Isle of Mull as there is a reliance on the Corran Ferry (and Fishnish – Lochaline) for shipping certain categories of dangerous goods onto the island should the closed-deck MV *Isle of Mull* be operating the route on her own, as she has historically done over the winter timetable period.

The tidal conditions experienced in the Corran Narrows exacerbate the above challenges. In the absence of a berthing / aligning structure on both sides of the crossing, the route is operated by quarter-point vessels rather than more conventional 'straight-through' vessels. This relatively unusual operational arrangement is compounded by the fact that **the Corran Ferry is the only major ferry service operated by THC. It therefore must function as a standalone service with built-in resilience.**

What options were considered?

There were three key considerations in refining the options presented in the STAG / SBC:

- A transfer of responsibilities to Transport Scotland for the Corran Ferry services has been ruled out in the short to medium-term. THC has also explored and rejected the option of private sector involvement in the ferry service. As a result, the **Corran Ferry will remain a standalone Highland Council operated service and thus a two-vessel service remains necessary to ensure reliability and resilience**.
- Caledonian Maritime Assets Ltd (CMAL), the Scottish Government's marine asset owning company, has embarked on a replacement programme for its small ferry fleet, known as the Small Vessels Replacement Programme (SVRP). THC has been invited to join this programme and a specific design for a new Corran Ferry has been prepared. This has strengthened the already convincing argument to **convert the service to straight through operation**. As well as future proofing the service, there will be opportunities to benefit from economies of scale (and thus lower costs) in vessel design and construction.
- Finally, the enacting of the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the declaration of a climate and ecological emergency by THC in 2019

emphasises the necessity to **reduce emissions and pursue low carbon infrastructure solutions**.

Reflecting the above points, the single question facing this OBC is whether both Corran vessels should be replaced in the immediate-term or whether there is a case for retaining MV *Corran* as the secondary / stand-by vessel in the medium to longer-term. This is expressed through the two remaining options from the original STAG / SBC long-list:

- **Option 2c:** One larger 32 PCU[1] straight through fully electric vessel, with MV *Corran (diesel)* retained as the refit / relief / second vessel
- **Option 2f:** Two larger 32 PCU straight through fully electric vessels

What are the benefits and disbenefits of the options?

Transport Planning Objectives

The table below reassesses the performance of both options against the TPOs compared against the present-day situation.

Table ES1: Appraisal of options against the TPOs

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
TPO1: The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland	✓	✓✓✓
TPO2: The Corran Ferry should facilitate year-round access to Ardgour and beyond for all vehicle types	✓✓✓	✓✓✓
TPO3: The available vehicular capacity of the ferry service should as far as possible, facilitate compliance with the published timetable	✓	✓✓✓

Both options perform strongly with respect to the TPOs. However, **Option 2f – Two larger 32 PCU straight through fully electric vessels** performs better as it would ensure the adoption of standard infrastructure and operational practices. In particular, it would negate the need for a quarter point vessel to operate from the new slipways and would address the inherent operational challenges associated with such a solution, such as crew having to be familiar with the operation of two completely different vessels and propulsion systems; maintaining / repairing different vessels; sourcing of spare parts etc Option **2f** would also offer increased capacity.

STAG Criteria

As the primary difference between the options is one of timing rather than substance, their performance against the STAG criteria is broadly similar. However, key points of note from this appraisal are as follows:

- The desire of THC to decarbonise its major ferry route is a principal driver of this project. The early adoption of two all-electric vessels **(Option 2f)** would deliver the early decarbonisation of the route, supporting local and national policy in relation to emissions reduction thus scoring positively in relation to the **Environment** criterion. Option 2c

[1] PCU is a measure primarily used to assess capacity, where different vehicles are assigned a value according to the space they accommodate.

involves retaining a diesel vessel for a longer period of time and will therefore not deliver these benefits in the short-term.

- It should though be noted that the new landside infrastructure issues associated with either option could give rise to landscape and / or visual amenity impacts which would have to be mitigated.
- **Option 2f** would also have the most significant **'Safety'** benefit as it would deliver two identical vessels with standard operating practices.
- Both options would make a strong contribution to the **'Economy'** criterion through increasing capacity and providing improved reliability and resilience. **Option 2f** performs better as it offers additional capacity and two new vessels in the immediate term.
- The landside infrastructure work to enable both options will significantly improve **transport integration** by improving the marshalling areas, which in turn improves safety and reduces queuing back onto the A82 and A861 and improves safety for foot passengers and cyclists accessing the vessels.
- Both options also align well with **policy**, but **Option 2f** performs better because it would accelerate the point at which the service would become 'tailpipe' emission free.

Value for Money

The table below shows the present value of costs (PVC) of the two options presented in 2010 prices[2]. These costs reflect the purchase of the vessels, construction of the associated infrastructure, and the operation of the vessels (fuel / batteries / refit and maintenance).:

Table ES2: Options 2e and 2f – Present Value of Costs in 2010 prices

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f: Two larger** 32 PCU straight through fully electric vessels
Present Value of Costs	£50.1m	£52.8m
Risk Adjusted PVC	£56.9m	£59.5m

The PVC in the above table shows that there is no real significant difference in the costs between the options. The differences that do exist are a result of the horizon period for delivery of the additional new vessel and the OPEX costs accrued over this time when delivering both new vessels at the same time.

As a sensitivity, by extending MV *Corran* to 40-years, the (risk adjusted) PVC of Option 2c would reduce to £51.8m. Such an approach would however clearly come with a range of disadvantages including continued tailpipe emissions, operational inefficiency and the increased costs and challenges associated with maintaining an aging vessel.

What is the preferred option?

Upon careful analysis of the evidence presented, THC has confirmed that the preferred option is **Option 2f: two larger 32 PCU straight through fully electric vessels**. A primary driver of this decision is the Highland Council's desire to decarbonise its main ferry route, where it has defined the **'journey to net zero'** as a priority. Whilst Option 2c would ultimately deliver the net zero outcome, (i.e., when the MV *Corran* is taken out of service) it would occur several years

[2] The H.M. Treasury *Green Book* requires that all prices are presented in a common base year. The Department for Transport (DfT)'s current base year in their Transport Appraisal Guidance (TAG) is 2010 and thus prices are deflated to this year for appraisal purposes.

later and would not contribute to the Council's stated aims in relation to emissions reductions nor wider national targets.

Outwith net zero aspirations, there are several operational benefits from operating two common vessels, including:

- **Common berthing arrangements** at both sides of the crossing, avoiding the challenges associated with using both a quarter point and straight through vessel from the same infrastructure.
- **Crew familiarity** – there would be obvious challenges associated with operating two very different vessels in terms of machinery and propulsion systems, particularly if the secondary vessel is only operated infrequently
- **Reliability and resilience** – having two new vessels will remove the reliability and resilience risks associated with maintaining an older second vessel.

Whilst it is accepted that MV *Corran* will need to be retained as the relief vessel for a short transitional period of time when the second vessel is being built, THC does not consider this to be a suitable medium / long-term arrangement.

Finally, the SVRP provides an opportunity to realise economies of scale in design and procurement. The project has significant momentum behind it at present and represents a major opportunity for THC.

The following sections refer to the preferred option only.

Financial Case

The table below sets out the anticipated capital spend profile as provided by CMAL and marine civil engineers Wallace Stone. It should be noted that the **table is based on Q2 2022 prices**.

Table ES3: Capital spend profile (£thousands) by financial year, rounded to nearest £000

Description	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26	Total
Vessels						
Vessels[3]	£0	£7,000	£15,000	£10,600	£2,600	**£35,200**
Vessel Contingency (3%)	£0	£0	£0	£528	£528	**£1,056**
Naval Architecture Consultancy	£69	£0	£0	£0	£0	**£69**[4]
Tools / spares	£0	£0	£0	£200	£200	**£400**
Site supervision	£0	£45	£160	£65	£30	**£300**
Sub-total by financial year	*£69*	*£7,045*	*£15,160*	*£11,393*	*£3,358*	***£37,025***
Ferry terminal infrastructure						
Slipways and associated infrastructure	£0	£0	£2,000	£12,000	£6,000	**£20,000**
Civil Engineering Consultancy	£10	£760	£225	£60	£40	**£1,095**

[3] Based on construction in a UK yard.

[4] This is the cost to THC. It is assumed that wider naval architecture costs are internalised within CMAL representing a saving to THC of 181k as part of the opportunity presented by the SVRP.

Description	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26	Total
Surveys and Ground Investigation (GI)	£0	£250	£0	£0	£0	**£250**
Infrastructure Contingency (15%)	£2	£152	£334	£1,809	£906	**£3,203**
Sub- total by financial year	*£12*	*£1,162*	*£2,559*	*£13,869*	*£6,946*	***£24,548***
Total	**£81**	**£8,207**	**£17,719**	**£25,262**	**£10,304**	**£61,573**

Factoring in projected inflation, **the total cost of the project could be expected to increase by circa £7.2m to £68.7m**.

A variety of funding sources are being considered to deliver this project.

Commercial Case

Vessel

THC's **preferred option is the development of a concept design to take to the market to complete detailed design and build.** Reflecting this preference, THC has been inputting into the wider CMAL SVRP Design Brief and provided a 'Statement of Requirements (SoR)' for the new Corran vessels. The Design Brief includes the development of 'Design C', the template for new Corran Narrows vessels, the main particulars of which are set out below:

Table ES4: Design C – main particulars

Characteristic	Minimum Specification
Length overall	45m-50m
Maximum draught (moulded)	2.14m
Gross tonnage	~500GT
Design / contract speed	9.0 knots
Passengers	150
Crew	3-4
Cars (PCUs)	32
Propulsion concept	The working proposal is that the vessel will be fully electric with mobile range extender
Class	UK Class V[5]

Landside Infrastructure

The table below summarises the preferred approach to delivering the slipway and enabling infrastructure works for the new Corran vessels:

Table ES5: Summary of the Council's preferred slipway and infrastructure works procurement strategy

	Corran Infrastructure Works
Type of Contract	Traditional

[5] Class V passenger vessels are those vessels licenced to carry more than 12 passengers and are certified by the Maritime & Coastguard Agency to operate on Category C water (tidal rivers, estuaries and large, deep lakes).

	Corran Infrastructure Works
Single or Multiple Contracts	1 No. contract
Open or Restricted	Restricted (shortlist established before tender documents issued)
Lump Sum or Remeasurable	Lump Sum. Building works could be separated out as a remeasurable Scottish Buildings Contracts Committee (SBCC) contract
Fixed Price or Target Price	Fixed Price
Form of Contract	ECC Option A (NEC4)

Management Case

Programme

The table below shows the key milestones for the project:

Table ES6: Key Project Milestones

Milestone	Commencement Date	Notes
Terminal Infrastructure Milestones		
Infrastructure design services award date - *Outline Design and GI Design*	03/05/2021	Given the requirement for new slipways regardless of the vessel design chosen, feasibility and preliminary design was commenced in May 2021 and will be completed in December 2022.
Completion of ground investigations	Q1 2023	
Infrastructure design services award date - detailed design	Q3 2023	
Award construction contract	Q1 2024	6-week tender evaluation period is scheduled to take place in Q4 2023
Completion of construction	Q3 2025	
Vessel Infrastructure Milestones		
Vessel design services – award naval architect	02/08/2021	NaValue appointed by CMAL and work has progressed
Appoint shipyard	Q2 2023	
New vessel 1 enters service	Q4 2025	
New vessel 2 enters service	Q4 2026	

Project Management Framework

The table below summarises the organisations and individuals which will fill each role in the project team:

Table ES7: Roles and Responsibilities

Role	Individual / Organisation
Capital Programme Board	Chaired by the Director of the Development and Infrastructure Service, with representatives from other Services as required

Role	Individual / Organisation
Project Board	Defined in the Project Board Terms of Reference, which is included in **Appendix I**
Council Project Manager	Council Officer(s); and / or fixed-term appointment; and/or consultant
Client's Designers (Vessel and Infrastructure)	Vessel designers: NaValue (contracted to CMAL) Infrastructure designers**:** Wallace Stone
Vessel Project Manager and Contract Supervisor	External appointment through competitive tender
Port Infrastructure Project Manager & Contract Supervisor	External appointment through direct appointment or mini-competition via Scotland Excel Engineering and Technical Consultancy Framework Lot 7 or via competitive tender
Financial advisers	The Highland Council Resources and Finance Service, with external advice procured where required
Legal advisers	The Highland Council Performance and Governance Service, with external advice procured where required
Vessels contractor	To be determined through competitive tender
Landside infrastructure contractor	To be determined through competitive tender

1 Introduction

1.1 Overview

1.1.1 This report sets out the Outline Business Case (OBC) for investment in new ferries and terminal infrastructure for the Corran Ferry service. The OBC has been developed in line with the *Guidance on the Development of Business Cases* (Transport Scotland 2016), which is based on the H.M. Treasury *Green Book* 'Five Case Model'.

1.2 The Corran Ferry

1.2.1 Found approximately seven miles south of Fort William, the Corran Narrows is the narrowest section of Loch Linnhe. The Narrows is home to the Corran Ferry service, which carries passengers and vehicles between Nether Lochaber (Corran) and Ardgour. Although a short crossing, the service provides an essential connection for the peninsular communities of Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isle of Mull beyond.

Figure 1.1: Location of the Corran Narrows and Community Council Areas

1.2.2 The ferry serves a wide variety of purposes including: providing access to employment, health, education, and retail for peninsular residents; facilitating The Highland Council (THC) service delivery; acting as a gateway for tourists visiting the peninsula; and meeting the supply-chain needs of communities and businesses, including those of Mull via the Fishnish – Lochaline route.[6]

[6] When the closed deck MV *Isle of Mull* operates the Oban – Craignure route on her own in winter, dangerous goods are routed via Lochaline – Fishnish.

1.2.3 THC is responsible for funding and operating the Corran Ferry service, which is the busiest single vessel operated route in Scotland, carrying over **270,000** cars each year, delivering **30,000** sailings from early morning to late in the evening, **363** days of the year.

1.2.4 The alternative access route to the peninsula is via road, but journey times can be up to **two-hours longer** via the A830 and A861. This road-based access involves navigating single track roads complete with passing places, in addition to low bridges which limit access for high-sided vehicles to the peninsula. The ferry service is therefore **integral to the economic and social wellbeing** of the peninsula and the wider Mull and Lochaber areas.

1.2.5 Despite its importance however, there are growing pressures on the sustainability of the service. The crossing is currently operated by two vessels, the MV *Corran* (built in 2001) and the 1970s-built MV *Maid of Glencoul*. The requirement to maintain two vessels arises from their 'quarter-point'[7] vehicle ramp design, which is unique to this route and is required to allow safe and efficient operation in the strong tidal conditions in the Narrows.

1.2.6 MV *Corran* is the main vessel, with MV *Maid of Glencoul* stepping in when the primary vessel is out of service for scheduled or unscheduled maintenance. The impending life expiry of MV *Maid of Glencoul* together with recent reliability issues with MV *Corran*; escalating maintenance costs and difficulty in sourcing spare parts; amidst growing vehicle-deck capacity pressures has highlighted the **requirement for capital investment to maintain the integrity and resilience of this essential service**.

1.2.7 The vessel situation is further compounded by a challenging human resource position. As an entirely self-contained THC operated service, the Corran Ferry is dependent on a small number of highly dedicated crew. However, the combination of an aging crew demographic and recruitment difficulties has reduced crew headcount to near the minimum level required to operate the service at its current level.

1.2.8 Whilst the requirement for investment is evident, **the scale of that investment is substantial**, incorporating up to two new vessels in the short to medium-term and upgrades to terminal infrastructure at both Corran and Ardgour to accommodate them.

1.3 The Future of the Ferry Service

1.3.1 Recognising both the importance of the ferry service and the scale of the challenges faced, THC has commissioned a package of research to establish the future of the Corran Ferry service and indeed wider transport connections across the Narrows. These studies are outlined briefly below.

Corran Ferry STAG Appraisal / Strategic Business Case, 2018

1.3.2 In response to the emerging challenges with the ferry service, THC commissioned Stantec (then Peter Brett Associates), Mott MacDonald and WSMD Associates to undertake an appraisal of options for the Corran Ferry using the Scottish Transport Appraisal Guidance (STAG) in 2018. A STAG study is the equivalent of a Strategic Business Case (SBC), as defined in the Transport Scotland *Guidance on the Development of Business Cases*

1.3.3 The STAG study was **focussed on generating, developing, and appraising vessel and infrastructure options** which could address the problems on the route. The STAG / SBC identified **three capital options** to be progressed to OBC. The study also considered how the

[7] A quarter point ferry is where the vehicle ramps are at a 45 rather than 90-degree angle to the car deck. This arrangement allows vessels to berth on the side of a slipway, providing a structure against which it can be held in fast flowing tides.

emerging options could be funded and delivered, which provided the basis for the further exploration of options by THC.

1.3.4 The Corran Ferry STAG Appraisal is provided in **Appendix A**.

High-Level Outline Feasibility Study of a Corran Fixed Link

1.3.5 The specification for the Corran Ferry STAG Appraisal / SBC was focused solely on options related to the capital replacement of vessels and landside infrastructure. However, there has been a long-term aspiration amongst peninsular communities for the replacement of the ferry service by a fixed link (bridge or tunnel). To inform this, THC commissioned Stantec to develop a *High-level Outline Feasibility Study of a Corran Fixed Link* in 2019, with a view to feeding the case for such a link into the Strategic Transport Projects Review 2 (STPR2)[8].

1.3.6 The study considered:

- Whether a fixed link across the Corran Narrows could be **feasibly delivered**
- Potential **alignments** and **structural forms**
- An envelope of **capital and maintenance costs**
- How this cost envelope **compares to a long-term ferry-based solution**
- The scale and **benefits** associated with a fixed link

1.3.7 Three options for a fixed link were identified:

- A **bridge** to be constructed along the existing ferry route
- A **bridge** to be constructed along a central corridor to the south of the ferry route
- A **tunnel** under the Narrows

1.3.8 Taken together, the ferry STAG / SBC and fixed link feasibility study provide a comprehensive statement of all possible future options for crossing the Corran Narrows**.** Whilst there remains a longer-term question over whether a ferry or fixed link is the most appropriate means of crossing the Narrows, a bridge or tunnel remains a longer-term proposition. There is therefore **a requirement to address the issues with the ferry service in the short-term, with the solution delivered in such a way that it is future-proofed against a fixed link**.

1.3.9 The *High-level Outline Feasibility Study of a Corran Fixed Link* study can be found in **Appendix B**. It should be noted that the costings for a fixed link developed in this study were very high-level and would also need to be updated to reflect present day prices.

Corran Ferry Socio-Economic Study

1.3.10 Most recently, THC commissioned Stantec to undertake a *Corran Ferry Socio-Economic Study* to highlight the benefits of the service to the surrounding communities and businesses. More importantly, the study identified the potential implication of a 'no ferry' scenario to highlight the integral role of the Corran Ferry to peninsular life.

1.3.11 The negative impacts of a 'no ferry' service would ultimately coalesce around a threat to the economic viability of the area. The peninsula has a small and sparse population, but one which the Corran Ferry helps to ensure remains viable and vibrant. Increased costs, reduced income, and difficulty accessing employment, personal business and leisure opportunities would act as a significant 'push' factor to out-migration, particularly amongst younger cohorts, and would also

[8] STPR2 is the process through which Transport Scotland's capital investment priorities for the next two decades will be defined

act as a deterrent to families minded to in-migration. In fragile rural communities, it only takes a small number of families to leave for local businesses to become unviable and services reduced, creating a cycle of decline. The benefits of improved connectivity across the Highlands and Islands (e.g., the Skye Bridge, Scalpay fixed link, the Sound ferries in the Outer Hebrides, the Shetland Ro-Ro ferry network etc) have been seen and evidenced in recent years, and the loss of a ferry at Corran could therefore be readily assumed to reverse the types of benefits delivered in these similarly remote areas.

1.3.12 The study concluded that, in short, in the absence of a fixed link across the Narrows, **the provision of a frequent, reliable, and high-capacity ferry service at Corran is fundamental to the economic viability and future sustainability of the peninsula**.

1.3.13 This Socio-Economic Study also included a **comprehensive engagement programme** designed to complement the existing work and to address the identified gaps in the work undertaken to date to meet the requirements of the Transport Scotland business case process (public engagement was excluded from the scope of the original STAG study as that piece of work was intended to be more technical and operational in nature).

1.3.14 The *Corran Ferry Socio-Economic Study* can be found in **Appendix C**.

Corran Ferry Outline Business Case

1.3.15 This OBC will draw together the previous strands of work, arriving at a single preferred **capital option** for the future of the Corran Ferry service and highlighting how that solution will be funded, procured, delivered, and managed.

1.3.16 It is important to note that **THC is separately progressing measures to address the human resource challenges faced by the ferry service**. Indeed, the Council is actively exploring an early transition to a two-vessel operation using the existing tonnage as a means of smoothing periods of peak capacity. Whilst this study is focused on **capital options only**, it will ensure that the preferred option identified is future-proofed against route growth, both in terms of carryings on any single sailing and the ability to operate a more frequent timetable.

1.4 Business Case Context

1.4.1 This section sets out the approach taken to the development of the business case and specific considerations in relation to business case preparation in this context.

Transport Scotland Business Case Guidance

1.4.2 To ensure that the OBC is developed to a nationally recognised standard, it has been developed in accordance with the *Guidance on the Development of Business Cases* (Transport Scotland, 2016). This guidance is based on the H.M. Treasury *Green Book* and is almost identical to the Department for Transport guidance, *The Transport Business Case*. The guidance sets out three main stages which need to be completed in developing a compliant business case:

- **Stage 1 - Scoping: Strategic Business Case (SBC)** - analyses a variety of options which tackle the problems, issues and objectives identified.
  - The SBC was completed and signed off in Autumn 2018 in the format of a STAG Appraisal.
- **Stage 2 - Planning: Outline Business Case (OBC)** - identifies the Preferred Option(s) and establishes how that option(s) should be funded, managed, and delivered.
- **Stage 3 – Procurement: Final Business Case (FBC)** – undertaken during procurement phase.

1.4.3 Within each 'stage' of the business case, there are five 'cases', which provide a structured approach to detailing each component of the overall proposition. These are as follows:

- **Strategic Case:** Defines the case for change / rationale for intervention and identifies a shortlist of options which could deliver the project-specific and wider policy objectives. This case can be thought of as the **'why'**.
- **(Socio)-Economic Case:** Assesses the options to determine their value for money in terms of economic, social and environmental benefits and costs. This case can be thought of as the **'what'**.
- **Financial Case:** The Financial Case involves undertaking a full financial appraisal of the preferred option, based on resource accounting and budgeting principles, including information on funding, budgeting over the life of the project and scheme cash flow.
- **Commercial Case:** The Commercial Case provides evidence on the commercial viability of a proposal and the procurement strategy that will be used to engage the market.
- **Management Case:** Details the project management plans, outlining the framework for managing risk, benefits realisation and post-project evaluation.

1.4.4 The Financial, Commercial and Management Cases can collectively be thought of as the **'how'**.

1.4.5 The focus on each 'case' varies by stage of the business case – this is highlighted in the figure below, with the size of the box showing the emphasis placed on that component of the business case at each stage of the process.

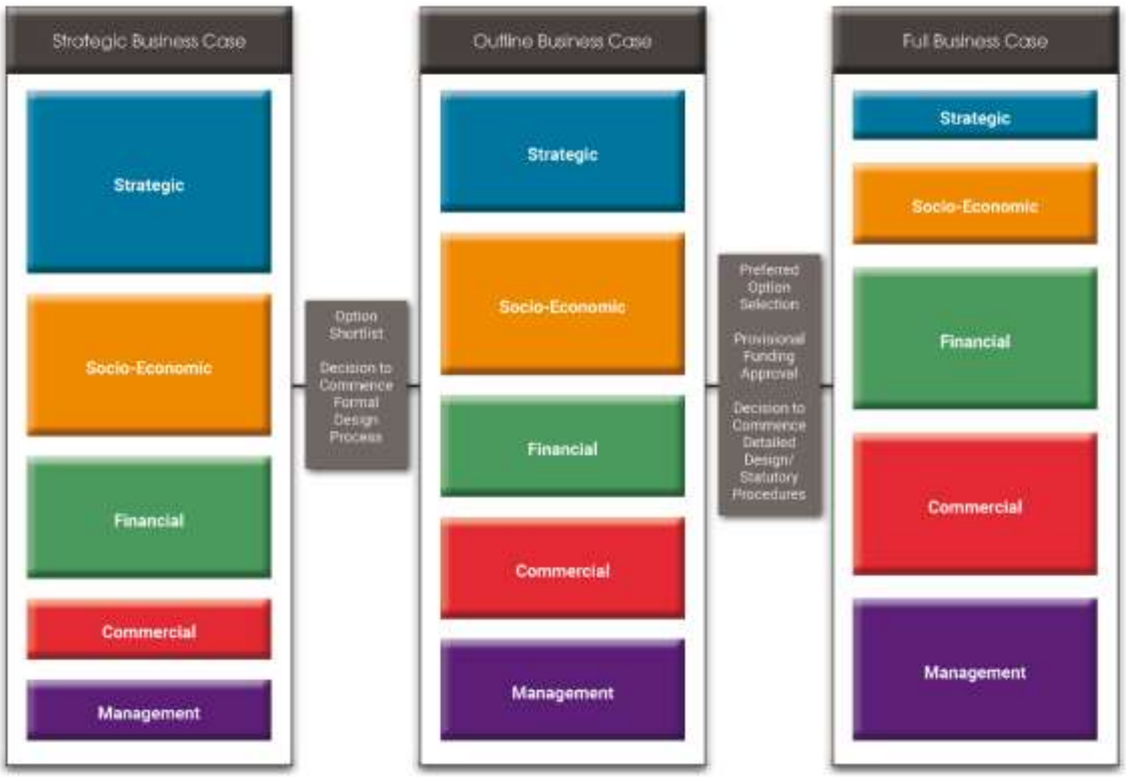

Figure 1.2: Business Case Stages

1.4.6 As can be seen from the above figure, the OBC retains a significant focus on updating and finalising the Strategic and Socio-Economic Cases, in particular arriving at a **preferred option** to progress to delivery. The major difference from the SBC (particularly when the SBC is undertaken in a STAG format) is that the three delivery cases feature much more prominently, identifying how the preferred option will be funded, procured, delivered, and managed.

1.4.7 The remainder of this document is structured around these five cases, as is standard in business case development and presentation.

1.5 Report Structure

1.5.1 The report is structured as follows:

- **Chapter 2** briefly summarises the story so far in terms of the Corran Ferry business case process, including the ‘Case for Change’, Transport Planning Objectives and options considered.
- **Chapter 3** reviews and updates the Strategic Case, accounting for changes in the local and macro environment since the STAG / SBC was completed.
- **Chapter 4** further develops the options which have been shortlisted.
- **Chapter 5** sets out the Socio-Economic Case based on the updated Strategic Case, defining a preferred option.
- **Chapters 6-8** cover the three delivery cases; the Financial, Commercial, and Management Cases.

2 Corran Ferry Business Case – The story so far

2.1 Overview

2.1.1 To provide context for the chapters which follow, this section briefly recaps on the findings of the 2018 STAG Appraisal / Strategic Business Case. The full STAG Appraisal can be found in **Appendix A**.

2.1.2 The brief for the STAG / SBC sought to inform two key questions:

- What level of service should be provided in the future? (the 'what')
- How should the service be funded and delivered? (the 'how')

2.2 What is the 'Case for Change'?

2.2.1 From an infrastructure perspective, the 'case for change' can be summarised as follows:

- The **current ferries are ageing**. MV *Maid of Glencoul* is 47 years old and is in urgent need of replacement, with the sourcing of spare parts becoming both difficult and expensive. In having deck space for only 14 cars, when she is operating the route on her own (i.e., when the main vessel MV *Corran* is at refit or out of service), she is too small thus requiring frequent shuttling. Even with this shuttling, the vessel frequently cannot keep pace with demand, and this creates problematic delays, particularly for commercial users. MV *Corran* is now also 22-years old and due to the timescales for construction (estimated delivery for replacement vessels is 4 - 5 years) the ordering and commissioning of replacement vessels needs to commence in the immediate-term, otherwise loss of **reliability and more frequent service failure could become a reality**.
- When the service is suspended, the road-based diversion time can be up to two hours, with certain high vehicles excluded entirely from the peninsula due to low bridge heights.
- The two **vessels overnight on 'swing' moorings**, which requires a vessel-to-vessel transfer at the start and end of the operating day – this is a comparatively high-risk arrangement and is a practice which has been gradually phased out in Scotland in recent decades.
- **Vehicle-deck capacity is insufficient at peak times**. Indeed, as will be explained in Chapter 3, capacity problems now exist throughout much of the year. When there is short-shipped traffic (i.e., vehicles left behind), the service will depart from timetable and shuttle until the backlog is cleared. Whilst this is effective, it cannot always keep pace with demand, and it increases the pressures of an already intense service on the crew.
- The **marshalling areas on both sides of the crossing are too small to accommodate peak demand**. This increases road safety and network performance risks, particularly where traffic on the Corran side backs out onto the A82 trunk road and on the Ardgour side queues beyond the blind corner south of the lighthouse
- When MV *Maid of Glencoul* is in operation, her height and weight restrictions, **limits access to the peninsula for the largest of commercial vehicles due to bridge height restrictions on the alternative road routes (4.1m on the A830 and 3.65m on the A861)**. As well as affecting the peninsula, this also impacts on the Isle of Mull as there is a reliance on the Corran Ferry (and Fishnish – Lochaline) for shipping certain categories of dangerous goods onto the island should the closed-deck MV *Isle of Mull* be operating on her own.

2.2.2 The tidal conditions experienced in the Corran Narrows exacerbate the above challenges. In the absence of a berthing / aligning structure on both sides of the crossing, the route is operated by quarter-point vessels rather than more conventional 'straight-through' vessels. This relatively unusual operational arrangement is compounded by the fact that **the Corran Ferry is the only major ferry service operated by THC. It therefore must function as a standalone service with built-in resilience.**

2.3 What are the Transport Planning Objectives?

2.3.1 The Transport Planning Objectives (TPOs) established in the SBC / STAG were developed to reflect the transport problems and opportunities associated with the Corran Ferry. The TPOs established in the STAG are out below, together with the transport problems they seek to resolve:

- **Transport Planning Objective 1:** The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland
  - *Addresses the bespoke infrastructure solution and the challenges associated with it*
- **Transport Planning Objective 2:** The Corran Ferry should facilitate year-round access to Ardgour and beyond for all vehicle types
  - *Addresses access issues when MV Maid of Glencoul is in operation*
- **Transport Planning Objective 3:** The available vehicular capacity of the ferry service should as far as possible, facilitate compliance with the published timetable
  - *Addresses evidenced vehicle capacity issues on the ferry and in the marshalling areas*
- **Transport Planning Objective 4:** The delivery and funding model should ensure the long-term sustainability and resilience of the Corran Ferry service
  - *Address the challenges faced with the Corran Ferry being operated in isolation*

2.4 Which options were shortlisted for further consideration?

2.4.1 A set of infrastructure options was generated as part of the SBC, with options which were either undeliverable or did not make a meaningful contribution to the TPOs discounted. The options were then subjected to a more detailed assessment in terms of their performance against the TPOs, STAG criteria and with respect to their affordability and deliverability to identify a shortlist. In developing the shortlist of options, it was considered that:

- Immediately introducing two new vessels to the route would be disproportionate given the remaining lifespan of the MV *Corran* and the relatively infrequent use of the second vessel.
- A new vessel with an equivalent vehicle deck capacity to the MV *Corran* would not address the evidenced capacity options, and thus only options which offered a larger capacity main vessel were progressed.

2.4.2 The following options were, therefore, shortlisted for further consideration:

- **Option 1a: One new larger quarter point vessel**, with **MV *Corran*** retained as the refit / relief / second vessel (replacing the ***MV Maid of Glencoul***). Two overnight berths would also be required. One berthing or aligning structure would also be required.
- **Option 2c: One larger straight through vessel**, with **MV *Corran*** retained as the refit / relief / second vessel (replacing **MV *Maid of Glencoul***). Two overnight berths would be required. One berthing or aligning structure would also be required.
- **Option 2d: One larger straight through vessel** with refit / relief / second vessel secured from elsewhere (Note - this was assumed to be the CMAL fleet in response to a transfer of responsibility for the Corran Ferry to Transport Scotland]. One overnight berth would be required. One berthing or aligning structure is required.

2.5 Methods of Delivery

2.5.1 Given the financial, operation, and human resource challenges facing the Corran Ferry, the STAG appraisal also considered different ways in which both the infrastructure and services could be delivered. This is somewhat unusual in a STAG, which is typically focused on the 'why' and the 'what' rather than on the 'how', but THC was understandably keen to explore options which could place this essential service on a more sustainable footing.

2.5.2 Four methods of delivery options were shortlisted based on their contribution to **TPO4**:

- **MoD, Do Minimum:** THC continue to operate the service on the same basis as at present.
- **MoD1, Public Sector Operation:** Transfer of responsibilities to Transport Scotland, with the Corran Ferry being run on an 'in-house' basis.
- **MoD2, Public Service Obligation:** THC specifies a Public Service Obligation (PSO) on the Corran Narrows and depends on finding an operator(s) to run the service (as specified by THC) without subsidy.
- **MoD3, Public Service Contract:** Specify a Public Service Contract (PSC) and seek an operator to run the route with subsidy - there are two variants to this option:
  - **MoD3a:** THC to establish a PSC and seek an operator to run the route.
  - **MoD3b:** Seek a transfer of responsibilities to Transport Scotland, which would establish a PSC and seek an operator to run the route.

2.5.3 With respect to each delivery method, there were a series of **outstanding questions in relation to vessels and refit / relief / breakdown cover; slipways and infrastructure; crewing; and fares**. It was recommended at that time that THC explore the answers to these questions in more detail and hold discussions with Transport Scotland as to the future delivery of the service.

3 Review of the Strategic Business Case

3.1 Overview

3.1.1 As previously noted, the STAG / SBC was completed in November 2018 and is thus now approaching four years old. In progressing to OBC, it is necessary to review the SBC to ensure that it remains current, updating it where necessary.

3.1.2 The scope of this review is as follows:

- Set out **changes which have occurred since the STAG / SBC** was published in November 2018.
- Set out any **changes in the wider policy environment** since the SBC was published, which may have an impact on the study.
- Review the **Transport Planning Objectives (TPOs)** set in the STAG / SBC to ensure that they continue to align with the 'Case for Change' which has been made.
- **Revisit the options** that emerged from the STAG / SBC to determine whether they continue to remain appropriate.

3.2 What has changed since the STAG / SBC was published?

3.2.1 There have been several material changes since the completion of the STAG / SBC in 2018. These are summarised below and their implications for the OBC established.

Methods of delivery

3.2.2 As explained in Chapter 2, the brief for the STAG required a review of potential methods of delivery for the Corran Ferry, recognising the challenges associated with capital replacement, human resource, and the absence of economies of scale. The STAG shortlisted a range of potential delivery options, and THC has since taken steps to explore each of these in turn – these are explained in more detail below.

Market Testing Exercise (January 2020)

3.2.3 THC conducted a market testing exercise to gauge private sector interest in the Corran Ferry. This aligned with method of delivery options **MoD2 (Public Service Obligation)** and **MoD3a (Public Service Contract)**.

3.2.4 A Prior Information Notice (PIN) was issued with the intention of commencing preliminary market engagement. The purpose of the exercise was to understand if the opportunity to provide the service would be of interest to a commercial service provider. Potential bidders were invited to complete a questionnaire setting out the potential capabilities offered by their company, to allow the Council to evaluate each response against its requirements for the ferry service.

3.2.5 Three responses were received as part of the exercise providing a perspective from a shipbuilder, vessel provider and vessel operator.

3.2.6 Responses were evaluated by THC against six essential ferry service requirements and with consideration of the uncertain financial landscape and ongoing budget constraints. The ferry service currently operates on a break-even basis with running costs of circa £1.5m per annum (this does not include management costs or allocation of funding for future capital reinvestment). THC cannot afford to pay any operator any more than the current running costs and is already finding it difficult to sustainably afford these current costs.

3.2.7 From the evaluation process, it was determined that no private operator would be willing to run the service (as specified by THC) without a subsidy. As there was no firm commitment regarding funding the capital expenditure and revenue requirements of the service, both delivery options **MoD2** and **MoD3a** were rejected from further consideration by THC and this rejection was **approved by the Economy & Infrastructure Committee in July 2020**.

Transfer of Responsibility (2020)

3.2.8 A key theme inherent in the STAG study was consideration of a potential transfer of responsibilities for the Corran Ferry to Transport Scotland in accordance with the *Scottish Ferries Plan 2013-2022*. It was noted within the STAG that Transport Scotland had established broad principles within which a transfer would be considered, but this was ultimately subject to negotiations at both the Officer / Official and Member / Minister levels.

3.2.9 Following the market engagement exercise, THC wrote to the Scottish Government to seek approval to form a working group with officers from Transport Scotland regarding the possibility of transferring responsibility for the Corran Ferry service. In response the Scottish Government raised two principles that must be satisfied before a transfer of responsibility could be considered:

- *"There must be a full transfer of revenue funding to cover the true cost of the service".*
- *"Agreement must be reached on the level of capital funding to transfer based on the current age and condition of vessel and harbour infrastructure".*

3.2.10 As a significant capital investment is required in the service with no THC commitment to fund this investment at present, the Scottish Government highlighted that a key principle for transfer set out in the *Ferries Plan* was not met and thus **a transfer of responsibilities could not be considered at this point in time**.

3.2.11 This outcome has significant repercussions for the viability of **Option 2d** from the STAG / SBC, which assumed as part of this service delivery plan, the refit / relief vessel would be sourced from within the CMAL fleet as the Corran Ferry service would be part of the CalMac Ferries Ltd network.

3.2.12 THC further considered whether it could deliver **Option 2d** independently, procuring a vessel from CMAL or another organisation on a charter basis to cover refit and breakdowns. However, given the extensive commitments and pressures on the CMAL fleet, it was noted that a vessel would not be readily available and realistically would take a minimum of three days to reposition in the event of a breakdown, threatening the resilience of the service under this option. The Economy & Infrastructure Committee again rejected this option from further consideration due to the uncertainty over a relief / refit vessel. In summary, this then confirms that as part of a **THC operated service, <u>there will always be a need to have two vessels in place at Corran to provide resilience in the service</u>**.

3.2.13 The decision not to progress a transfer of responsibilities also influences the financial decisions facing THC, as in the immediate term, the financial responsibility for delivering an option sits with THC. However, it is important that the option development should seek to align with the wider objectives of the Scottish Government for delivering ferry services in order to safeguard the opportunity to revisit the transfer of responsibilities at a later date, which adds some scrutiny to Option 1a. This option looks to introduce new quarter-point vessels which may pose difficulties for interchangeability of vessels depending on the whether the infrastructure present in the network can accommodate this type of vessel.

Implications for the OBC: A key challenge with the STAG appraisal was the uncertainty around how any capital investment solution would be funded, procured, delivered, and managed. The subsequent work undertaken by THC has clearly established that, in the short-term at least, **the Corran Ferry will remain the sole responsibility of the Council**.

As well as placing financial responsibility on the Council, this means that the preferred option emerging from the OBC must sit within the context of an entirely standalone service. An immediate consequence of this is that, as relief and refit cover would not be reliably available from within the CMAL fleet, **the option of purchasing two new vessels to operate the Corran route must come back into play** (having previously been the discounted Option 2f) in the STAG appraisal.

Vehicle-deck capacity

3.2.14 Following the completion of the STAG and the recommendations contained therein, THC undertook a necessarily targeted programme of data collection to understand the vehicle-deck capacity issues more fully and to validate perceived problems with capacity. The data collection programme was required as the number of vehicles onboard each sailing is not recorded due to the very short crossing time and the requirement to take fares whilst sailing. Therefore, estimated carryings were produced based on the number of tickets sold or collected on each crossing.[9]

3.2.15 The analysis of these data and capacity trends more generally is set out in **Appendix D** – the key points of note are as follows

- There has been **steady growth in carryings** year-on-year in this century
- **Commercial vehicle carryings**, whilst fluctuating, have **increased generally**, impacting on available deck space
- There are **capacity issues during peak periods**, which leads to queuing on both sides of the crossing. Whilst these queues are ultimately cleared, this comes at the expense of having to run additional sailings (i.e., on occasions up to as many as 25 additional sailings at peak periods) above the published timetable.
- Added to vehicle deck capacity issues is the **size of the marshalling areas**. Traffic backing out of either marshalling area creates both road safety issues and disruption to non-ferry motorists.

Implications for the OBC: The data collection and capacity analysis undertaken to support this OBC has validated the SBC finding that vehicle deck capacity issues during peak periods is problematic. This has consequential impacts on road safety and journey time reliability when traffic blocks back out of the marshalling areas, particularly onto the A82 trunk road.

Small Vessel Replacement Programme (SVRP)

3.2.16 Whilst a transfer of responsibilities is not a workable proposition in the short-term, there was an agreement between THC and Transport Scotland that there are synergies between the Council's Corran Ferry project and the CMAL **Small Vessels Replacement Programme (SVRP)**, a major programme of capital investment to replace up to seven small *Loch* Class

[9] The Corran Ferry operates a ticket system, whereby the number of tickets required for each crossing depends on the number of axles that a vehicle has. Therefore, on any one sailing, the number of tickets can vary between one for a car to seven for a large HGV. In addition to drive up ticket sales, tickets can also be purchased in books with tickets handed in on each crossing. This adds a further layer of complexity when estimating carryings as tickets may have been sold in the months prior to being used onboard.

vessels serving the Clyde and Hebrides Ferry Services (CHFS) network. The SVRP has a focus on building low or zero emission vessels, by exploring battery and onshore charging technologies.[10] CMAL appointed naval architects NaValue in August 2021 to lead the SVRP concept design.

3.2.17 The vessels which will emerge from the SVRP will be similar in design to those envisaged for the Corran Narrows, i.e., double-ended, through-and-through slipway vessels, the only major difference being the carrying capacity of each 'class' of vessel, and thus **the Corran Ferry has been included within this wider CMAL-led programme**.

3.2.18 CMAL was initially considering two vessel designs with size ranges between 15-20 and 20-25 cars. However, after undertaking a site visit with the Corran Ferry project team, it was recommended by both CMAL and NaValue that THC should consider a larger vessel, to provide the required capacity for the level of carryings across the Narrows, both currently and in the future. The design for the Corran Narrows is therefore based on a **32-car capacity vessel**.

3.2.19 The opportunity for THC to be part of the wider SVRP is a significant one. It provides the Council with access to naval architects and technical design teams, expert experience and advice, and fundamentally, offers the opportunity to leverage economies of scale on vessel costs, beyond which the Council do not currently have access to as a standalone operation.

3.2.20 Additionally, as part of the SVRP, it ensures that the design of the vessels is consistent with those being developed for the CMAL fleet, thus any infrastructure designed to accommodate the Corran vessel(s) will also accommodate the other vessels. This provides a level of futureproofing against an option of potential transfer of responsibility and interchangeability of vessels across the network, affording the much-desired resilience for the service.

Implications for this OBC: The inclusion of the Corran Ferry service within the SVRP provides an opportunity to achieve a level of vessel design and cost certainty not typically available at OBC stage. The emerging outputs from the SVRP work will be fed into the Socio-Economic and Financial Cases. Involvement in the SVRP does also raise questions around how any future tonnage should be procured should THC choose to use the SVRP design.

COVID-19 pandemic

3.2.21 The onset of the COVID-19 pandemic and associated lockdowns from March 2020 onwards led to an immediate change in travel behaviour and could potentially impact on long-term demand for ferry services. There are four potential impacts for the Corran Ferry:

- Pre-pandemic, there were significant levels of daily commuting on the Corran Ferry. Evidence from across the UK suggests that, where a person works in a 'location independent' job, there will be a reduced propensity towards daily commuting – that is, for some people, the link between home and workplace has been weakened or entirely broken. This will put **downward pressure** on commuter demand.
- On the other side of the equation, the reduced need for 'location independent' employees to live physically close to their place of work may lead to a growth in demand for rural and island property. Anecdotal evidence from estate agents[11] suggests that this effect is prevalent across the UK, particularly in rural areas of Scotland. The reduced need for daily commuting may address one of the historic barriers to peninsular life and could grow the population. This would put an **upward pressure** on travel demand.

[10] https://www.cmassets.co.uk/project/svrp/

[11] For example - https://www.heraldscotland.com/news/homenews/19446619.revealed-scots-house-price-boom-hotspots-fuelled-covid-craving-open-spaces/

- The pandemic-led to a reduction in travel for a range of purposes, including for example high street and supermarket shopping and travel for medical appointments. Society adapted to online shopping, video call appointments etc. If this effect is sustained, it will lead to **downward pressure** on travel demand, albeit there would be an increase in supply-chain / courier movements onto the peninsula.
- Restrictions on international travel resulted in a surge in domestic tourism, particularly in rural areas and the islands of Scotland. It is possible that this effect may be short-lived as the restrictions on international travel have eased, and summers 2022 and 2023 could be telling in this respect. However, rural Scotland has benefitted from 'new' domestic visitors who may continue holiday in the UK in the years ahead, particularly if international travel is now perceived to be more of a 'hassle'. In addition, it is possible that people will return to places they 'discovered' during the pandemic. If sustained, this would put an **upward pressure** on travel demand.

Implications for this OBC: The long-term behavioural impact of COVID-19 on travel behaviour will not be fully understood for some time yet. However, it does introduce a degree of uncertainty and the Final Business Case (FBC) should incorporate research and analysis to validate or update the preferred option based on any permanently observed changes in travel behaviour.

3.3 A changing policy environment

3.3.1 The last three years have witnessed a major change in the transport policy environment in Scotland, driven largely by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and its subsequent update in December 2020 combined with the publication of the National Transport Strategy 2 (February 2020).

Climate Change (Emissions Reduction Targets) (Scotland) Act 2019

3.3.2 The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 was an Act of the Scottish Parliament committing the Scottish Government to deliver net-zero emissions[12] by 2050.[13] The Act was amended by the Climate Change Plan Update published in December 2020, which brought forward the date of achieving net zero to 2045. It is important to note that delivering net-zero by 2045 is a **legal commitment** rather than just a statement of aspiration and thus carries a higher weight in future planning.

3.3.3 Two interim targets have been developed to support the delivery of this aspiration:

- A **75%** reduction in greenhouse gas (GHG) emissions by 2030 relative to 1990 levels of carbon dioxide and 1995 levels of hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride.
- A **90%** reduction in GHGs by 2040, again relative to the 1990/95 baseline.[14]

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[12] Net zero means that the amount of greenhouse gas emissions released into the atmosphere and the amount that is extracted through offsetting measures will add up to zero - https://www.netzeronation.scot/the-importance-of-net-zero

[13] https://www.legislation.gov.uk/asp/2019/15/contents/enacted

[14] https://www.gov.scot/policies/climate-change/reducing-emissions/

Implications for this OBC: The legally binding net zero target imposed by the Act highlights the importance of decarbonisation. The Corran vessels both operate on diesel-based fuels and thus there is **an imperative to replace these vessels with new tonnage operating on zero-emission fuels**. The interim target of a 75% reduction in GHGs by 2030 suggests that action in the **short-term is important**, **which has implications for the operational longevity of the MV *Corran* under Options 1a and 2c**.

3.3.4 The Climate Change Plan Update (2020) included a number of commitments of relevance to this OBC, including the aim to **reduce car kilometres travelled by 20%[15] by 2030** and the commitment to **phase out the need for new petrol and diesel cars and vans by 2030**.

3.3.5 It is important to note that the 2019 Act embeds the principles of a 'Just Transition', which means reducing emissions in a way which tackles inequalities, or at least does not widen them. The 'Just Transition' stream of work is in its infancy, but in theory at least recognises that deep rural areas will have unique characteristics which have to be accommodated within the overall transition to net zero.

Implications for this OBC: A strong component of the 'case for change' for the Corran Ferry is reducing the vehicle-deck capacity challenges currently faced. However, the prevailing policy direction is to **reduce** car kilometres overall, and this could therefore put downward pressure on future demand for the Corran Ferry. However, those living on the peninsula often have little choice but to use their cars for what are essential journeys, and this has to be recognised within the context of a 'just transition'.

3.3.6 It should also be noted that THC directly declared a 'climate and ecological emergency' on 9th May 2019 in which it stated: *"Highland Council recognises the serious and accelerating challenges to the world caused by climate change and therefore declares a climate and ecological emergency"*.[16] Transport emissions are a major net contributor of greenhouse gas emissions to the atmosphere – the requirement to replace the tonnage at the Narrows provides an early opportunity for the Council to fully decarbonise a service which it owns and operates. Notwithstanding the requirement for a 'Just Transition', it is important for the Council to work minimise additional vehicle kilometres associated with any new tonnages.

Implications for this OBC: The decision of THC to declare a climate and ecological emergency in May 2019 provides a clear direction of travel for this study, prioritising the need to decarbonise the ferry service and, where practical, minimise additional vehicle kilometres associated with it.

National Transport Strategy 2

3.3.7 In February 2020, Transport Scotland published its *National Transport Strategy 2* (NTS2) which set out a vision for Scotland's transport system over the next 20-years to 2040, including a statement of transport's contribution to achieving net zero by 2045. Its 'Vision' is:

- *"We will have a sustainable, inclusive, safe and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors".[17]*

3.3.8 The Vision is underpinned by **four 'Priorities'** and **twelve 'Outcomes'**, as shown in the figure below:

[15] Note the base year has not yet been confirmed by Transport Scotland.

[16] file:///C:/Users/scanning/Downloads/Item_22_Climate_Change_Update.pdf

[17] National Transport Strategy 2 (Transport Scotland, 2020), p. 5.

Figure 3.1: NTS2 Priorities and Outcomes (Source: NTS2)

3.3.9 The NTS2 also establishes two 'hierarchies' which define the principles upon which future transport investment decision making and services should be planned. The **Sustainable Travel Hierarchy** defines the priority which will be given to each mode of transport in future investment planning and is illustrated in the figure below:

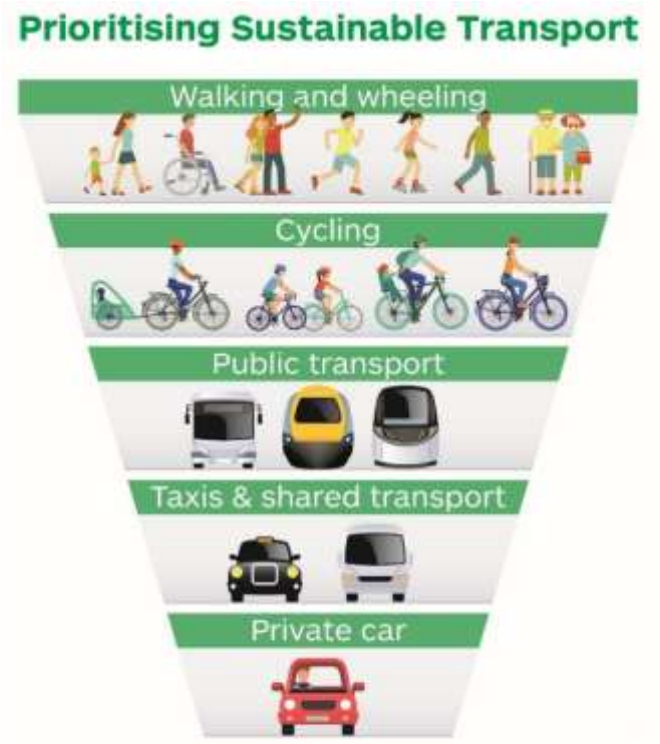

Figure 3.2: Sustainable Travel Hierarchy (Source: NTS2)

3.3.10 The Sustainable Travel Hierarchy prioritises walking and wheeling and cycling, with investment to support the single occupant private car being the lowest priority.

3.3.11 The **Sustainable Investment Hierarchy** establishes a structured set of steps to be followed when planning investment in transport infrastructure, as is illustrated in the figure below:

Figure 3.3: Sustainable Investment Hierarchy (Source: NTS2)

Implications for this OBC: The NTS2 further highlights the aspiration of Transport Scotland to promote sustainable travel and reduce single occupant car use. However, as with the climate change related targets, it is important to note that many journeys to and from the peninsula are non-discretionary and can only realistically be made by private car. Retaining the MV *Corran* as the secondary vessel would however support the aim of the hierarchy in maintaining and making better use of existing assets and capacity (but at the same time would lock-in the emissions from this vessel for the medium-term).

Strategic Transport Projects Review 2 (STPR2)

3.3.12 The STPR2 set out the Scottish Government's transport investment programme over the next 20-years (2022-42), detailing how the government will deliver the vision, priorities, and outcomes of the NTS2. The focus of STPR2 was on the 'strategic transport network', largely that owned and operated by Transport Scotland. It is not therefore directly relevant to this OBC. Moreover, the Islands Connectivity Plan, the branch of the STPR2 which will consider ferry services, will be focused on the CHFS and Northern Isles networks only, and will also not therefore be relevant to this OBC.

What about a fixed link?

3.3.13 As explained in Chapter 2, there are aspirations for a fixed link (a bridge or tunnel) across the Corran Narrows. In recognition of this, THC commissioned the *High-Level Outline Feasibility Study of a Corran Fixed Link* and fed this into the STPR2 process. However, a fixed link at the Corran Narrows was not considered as a project within STPR2 as that study ultimately focused on transport networks and services under Transport Scotland jurisdiction only. The proposal for a fixed link remains an aspiration only at present and there is a need for at least an **interim ferry solution** whilst the case continues to be made.

3.3.14

Implications for this OBC: Whilst a fixed link across the Corran Narrows will not be progressed in the immediate term, it remains a longer-term aspiration of both the community and THC. To this end, the ferry solution developed through this OBC has to be future-proofed against a fixed link as far as reasonably possible, by ensuring that the vessels can be easily cascaded and redeployed elsewhere for example.

3.4 Do the Transport Planning Objectives remain relevant?

3.4.1 The Transport Planning Objectives (TPOs) established in the STAG / SBC were developed to reflect the transport problems and opportunities with the Corran Ferry service. The following TPOs were set as a basis for the appraisal in recognition of the evidenced problems and opportunities. Based on the foregoing review of the STAG / SBC, comment is made on the continued relevance of each objective.

- **Transport Planning Objective 1:** The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland.
  - ***This TPO remains <u>relevant</u>*** *- both the infrastructure and operation of the Corran Ferry service need investment to bring them up to a level commensurate with other lifeline ferry services in Scotland. Slow but consistent growth has compounded the pressures placed on the service, with shuttling now a regular occurrence.*
- **Transport Planning Objective 2:** The Corran Ferry should facilitate, resilient, year-round access to Ardgour and beyond for all vehicle types.
  - ***This TPO remains <u>relevant</u>*** *- service outages and both scheduled and unscheduled maintenance results in vehicles having to reroute via the A82 / A830 / A861 which presents constraints on certain vehicle types accessing locations on the peninsula. Additionally, when in service, MV Maid of Glencoul prevents certain vehicle types from making the crossing due to weight and height constraints.*
- **Transport Planning Objective 3:** The available vehicular capacity of the ferry service should as far as possible, facilitate compliance with the published timetable.
  - ***This TPO remains <u>relevant</u>*** *- The service is departing from timetable more regularly and operating in shuttle to manage current levels of demand. On average, the service is operating 18 additional sailings per day above the published timetable.*
- **Transport Planning Objective 4:** The delivery and funding model should ensure the long-term sustainability and resilience of the Corran Ferry service.
  - ***This TPO is no longer <u>relevant</u>*** *- it was developed as a means of appraising different funding, procurement, and delivery models. However, the work undertaken by THC following the completion of the STAG / SBC has established that the service will continue to be funded by THC in the short-term at least, and thus this TPO is no longer required.*

3.4.2 Our review of the TPOs set at the SBC stage confirms that they continue to reflect the transport problems faced by the communities of the peninsula and the wider area. As alluded to in the TPOs, a key issue for the Corran Ferry service is resilience and capacity to provide year-round connectivity between the peninsula and wider Scotland, and in the elapsed time since the completion of the STAG / SBC, this has issue has become far more acute as the vessels have continued to age and require further maintenance while the service displays continued growth in carryings.

3.4.3 Only **TPO4** has been removed as there is now certainty around the medium-term delivery and funding model for the ferry service, even if the source of that funding is not yet clear.

3.5 Do the options remain current?

3.5.1 As explained earlier, in keeping with the STAG / SBC process a set of capital options was shortlisted for further consideration at OBC. At the time of that study, it was considered that:

- **Immediately introducing two new vessels to the route would be disproportionate** given the remaining lifespan of the MV *Corran* and the relatively infrequent use of the second vessel.
- A **new vessel with an equivalent vehicle deck capacity to the MV *Corran* would not address the evidenced capacity options**, and thus only options which offered a larger capacity primary vessel were progressed.

3.5.2 In undertaking the OBC, it is important to revisit these options and establish whether they remain current.

SBC / STAG Options

3.5.3 We have reviewed the options shortlisted at the conclusion of the STAG / SBC considering developments since the completion of that study and conclude the following:

- **Option 1a: One new larger quarter point vessel, with MV *Corran* retained as the refit / relief / second vessel. Two overnight berths would also be required.**
  - This option is **discounted** from further consideration.
  - Although the option itself is a viable one, the opportunity afforded by the SVRP provides THC with an opportunity to work within a funded and ongoing design programme. THC would otherwise have to specify and procure its own design, which would be both expensive and resource intensive. Moreover, the SVRP is designing a set of largely common vessels and thus there are opportunities for economies of scale in design and construction, which could potentially offer a lower cost solution for THC.
  - This option as it currently stands would prevent THC from revisiting potential alternative methods of delivery for the Corran Ferry service in the future, as the vessels would not be readily compatible with the wider CMAL network and infrastructure. Therefore, this option has no futureproofing against revisiting methods of delivery and very limited future proofing in the context of a fixed link outwith the sale of the vessel.
- **Option 2c: One larger straight through vessel, with MV *Corran* retained as the refit / relief / second vessel. Two overnight berths would be required. A berthing or aligning structure would also be required.**
  - This Option is **retained** for further consideration
  - Firstly, it offers a clear route to market via the SVRP, which is important given the current age and reliability of the existing vessels, especially MV *Maid of Glencoul*. Moreover, by adopting a common design to that of the wider CMAL fleet, it offers the ability to revisit the method of delivery in the long-term and also future proofs against a fixed link.
  - The proposed new straight through vessel would also have larger carrying capacity than MV *Corran* (the vessel it would displace). MV *Corran* in turn has a greater capacity than MV *Maid of Glencoul*. This would therefore provide a significant increase in single vessel and overall vehicle capacity.
  - This option is also financially proportionate in that it addresses the immediate problem (the life expiry of MV *Maid of Glencoul*) without replacing the more modern MV *Corran*. That said, given the time taken to procure even one new vessel, the MV *Corran* will be in her mid-twenties by the time the new vessel enters service.

  - A key question with this option would be the extent to which a straight through and quarter-point vessel could operate off of the same infrastructure,
- **Option 2d: One larger straight through vessel with refit / relief / second vessel secured from elsewhere. One overnight berth would be required. A berthing or aligning structure is required.**
  - This option is discounted from further consideration as it was largely predicated on a transfer of responsibilities being agreed.

3.5.4 Given the now established requirement to maintain two vessels at Corran, the STAG / SBC **Option 2f: Two larger straight through vessels** must now be further considered in the appraisal. Immediately procuring two identical vessels may offer economies of scale in construction, a standardised and optimised landside infrastructure solution and the discontinuation of a hydrocarbon fuelled service across the Narrows in the short-term.

3.6 Summary of the review

3.6.1 The review of the STAG / SBC has confirmed that its findings remain relevant and the TPOs appropriate. There has however been three material changes since the completion of the STAG / SBC in 2018:

- A transfer of responsibilities to Transport Scotland for the Corran Ferry services has been ruled out in the short to medium-term. THC has also explored and rejected the option of private sector involvement in the ferry service. As a result, the **Corran Ferry will remain a standalone Highland Council operated service and thus a two-vessel solution is necessary to ensure reliability and resilience**.
- The emergence of the SVRP workstream has strengthened the already convincing argument to **convert the service to straight through operation**. As well as future proofing the solution, there may be opportunities to benefit from economies of scale (and thus lower costs) in vessel design and construction.
- Finally, the enacting of the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the declaration of a climate and ecological emergency by THC in 2019 emphasises the necessity of **reducing emissions and pursuing low carbon infrastructure solutions**.

3.6.2 Reflecting the above points, the single question now facing the OBC is whether both Corran vessels should be replaced in the immediate-term or whether there is a case for retaining MV *Corran* as the secondary vessel in the longer-term. This is expressed through the two remaining options from the original STAG / SBC long-list:

- **Option 2c:** One larger 32 PCU straight through fully electric vessel, with MV *Corran* retained as the refit / relief / second vessel
- **Option 2f:** Two larger 32 PCU straight through fully electric vessels

3.6.3 It is to this question that the OBC now turns. In advance of this however, there is value in further outlining the emerging vessel specification from the SVRP and the associated infrastructure works.

4 Further Option Development

4.1 Small Vessels Replacement Programme (SVRP)

4.1.1 As previously noted, through discussions with Transport Scotland and CMAL, THC was invited to participate in the Working Group identifying the future delivery of the SVRP. At the core of these discussions were the guiding principles of:

- The need to provide for seven replacement 'small vessels', in addition to two further vessels which could operate across the Corran Narrows.
- In line with Scottish Government policy, these vessels should look to be next generation diesel-electric or fully electric to help contribute towards emissions reduction targets.
- There should be a standardised vessel design to allow for transferability throughout the network when required to provide relief for refit / unplanned maintenance or to allow vessel cascading.
- Consideration of the available energy and grid connection at all potential ports to help determine fuel-based options. This is a major factor and can impact the costs associated with delivering these vessels.

4.1.2 The ‘key objectives’ specified within the design brief are as follows:

- Provision of modern, state-of-the-art shuttle ferries for 150 passengers and 32 cars (‘Design C’ for Corran – see below)
- Common design platform for up to three different vehicle capacity requirements, providing economies of scale in design and build
- Capability to operate from 1:8 gradient slipways without mooring assistance
- Emission free operation on various routes along the west coast of Scotland through maximising use of shore-side electrical energy
- Provision of increased local and network resilience

4.1.3 The SVRP Design Brief is included in **Appendix E** for reference.

Design C – Corran Narrows

Main particulars and general arrangement

4.1.4 At the outset of the SVRP project, CMAL had originally identified two potential designs for replacement small vessels (Designs A and B). Accepting an invitation by THC, members of the CMAL team in addition to members from naval architects NaValue undertook a site visit to Corran and Ardgour to learn more about the operation of the Corran Narrows service.

4.1.5 Following this site visit, a third design specifically for the Corran Narrows was progressed, known as ‘Design C’. Each of the designs centre around the same guiding principles, with the only material difference being the capacity. Design A will provide capacity for 25 PCUs, Design B 16 PCUs and Design C 32 PCUs.

4.1.6 The main vessel particulars for ‘Design C’ are as follows:

Table 4.1: Design C – main particulars

Characteristic	Minimum Specification
Length overall	45m-50m

Characteristic	Minimum Specification
Maximum draught (moulded)	2.14m
Gross tonnage	~500GT
Design / contract speed	9.0 knots
Passengers	150
Crew	3-4
Cars (PCUs)	32
Propulsion concept	The working proposal is that the vessel will be fully electric with mobile range extender
Class	UK Class V[18]

4.1.7 The general arrangement below shows the proposed layout of Design C:

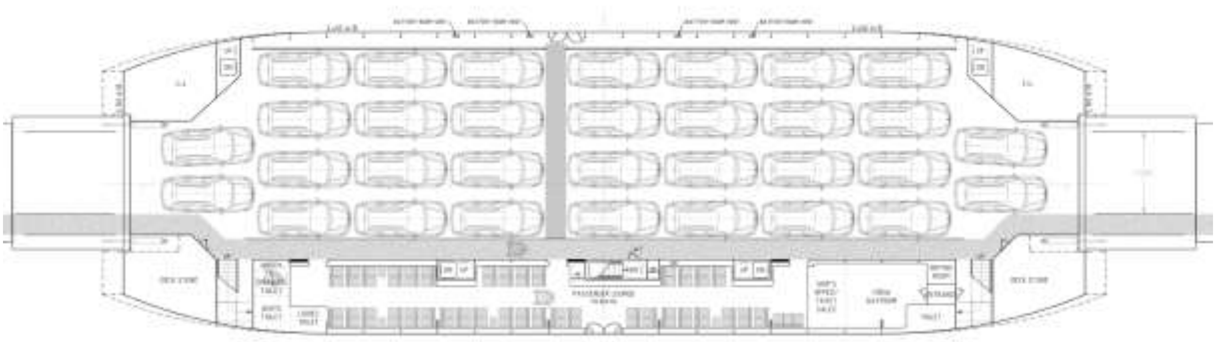

Figure 4.1: Prospective draft design of Design C Small Vessel

Propulsion

4.1.8 To align with emissions reduction targets, the Corran vessels will be designed to be entirely electric, replacing the current two diesel vessels either immediately or over time. This will take the form of an all-electric propulsion system and battery electric energy storage, thus having no internal combustion engines on board. The vessels, therefore, will be entirely tailpipe emission free during service.

4.1.9 The electric power storage and distribution systems as well as the electric propulsion systems will be arranged, duplicated, and separated, in a fully redundant manner to provide resilience of the system. ‘Refuelling’ of the batteries will be carried out by a shore power supply transfer arrangement, which will include the possibility of a direct connection via socket, using a cable and plug. This power transfer arrangement will be designed to meet all requirements for health and safety, in addition to providing adequate protection for the shore power supplies from interaction with pedestrians and vehicles manoeuvring in the vicinity. Battery storage onboard will afford enough charge for a day’s service, with the vessels then charged overnight on low-cost electricity ahead of the next day’s service.

4.1.10 Based on the operational profile of the Corran Ferry, a high level of power delivery is required. An initial review of the power grid and power availability in the study area by SSE has concluded that sufficient power is available to charge the vessels. To provide redundancy during instances

[18] Class V passenger vessels are those vessels licenced to carry more than 12 passengers and are certified by the Maritime & Coastguard Agency to operate on Category C water (tidal rivers, estuaries and large, deep lakes).

where shore side power is out of operation (power failure / cuts) and for travel to drydock for scheduled maintenance, a 'Mobile Range Extender' (MRE) is proposed.[19]

4.1.11 An MRE could be stored shoreside and moved onboard if / when required. When onboard, there would be a requirement for the MRE to be stored on the open vehicle deck and connected in such a way that its power output will feed into the existing shore power connection of the vessel. The MRE is an ideal solution for extending the operational range of the vessel, without the need for fixed equipment, which could decrease the vehicle deck capacity. The flexibility of an MRE also provides the opportunity for the unit to be transferred by road vehicle to another area for recharging if there was a prolonged power cut which prevents localised charging.

4.1.12 NaValue forecast that the annual operational CO_2 emissions of a full electric ferry (112 tonnes per annum) are forecast to be 94% less than a diesel-mechanic equivalent (1,783 tonnes per annum).[20] However, it should be noted that these vessels will have significant embodied carbon and it may therefore be a period of several years before the service is carbon positive.

Cost

4.1.13 Initial indicative vessel costs have been provided by CMAL based on the initial design work undertaken by NaValue. The indicative cost for one all electric 'Design C' vessel is circa £17.6m, excluding contingency, naval architecture consultancy, tools and spares and site supervision.

4.2 Landside Infrastructure

4.2.1 The STAG / SBC developed high-level landside infrastructure designs for each of the options. Such designs are commonly refined at OBC but no detailed option development work takes place until after the OBC is complete. However, recognising that the two shortlisted options would have demonstrably the same infrastructure requirements, THC chose to progress the outline infrastructure design in tandem with the OBC given the urgency of progressing a solution for Corran.

4.2.2 In late 2021, THC procured Wallace Stone Consulting Civil Engineers to undertake an initial review and design of infrastructure options for the emerging Corran Ferry service. This section provides a summary of the high-level work undertaken to-date, although it should be noted that preferred option selection and final design is subject to more detailed assessment informed by the necessary survey work.

Infrastructure Options

4.2.3 Based on site visits and detailed analysis, Wallace Stone has identified five high-level potential infrastructure options on the Corran side of the crossing and two on the Ardgour side. It should be noted that these are early concept solutions and will be subject to significant further development as the project progresses. Paramount in this optioneering exercise is ensuring that the current service can continue to operate unaffected during the construction stage.

Corran / Nether Lochaber

4.2.4 Five options were initially identified for the Corran side of the crossing. All options are designed to provide slipways which facilitate the introduction of straight through vessels in place of the current quarter-point loading vessels. These slipways would need to be designed at a 1-in-8 gradient to allow the vessels to deploy their ramps whilst on the centreline of the slipways. The options are as follows:

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[19] Limited range of 264 nautical miles

[20] CMAL Small Vessel Replacement Programme – Propulsion Machinery Concept Study (NaValue, 2022), p.26.

- **Option A** is located directly next to the existing slipway
- **Option B** is located slightly to the north of the existing slipway
- **Option C** is located slightly south to the existing slipway with a slightly longer approach
- **Option D** is located in a new area altogether approximately 500 metres (as the crow flies) north of the existing infrastructure
- **Option E** is located in a new area approximately 300 metres (as the crow flies) north of the existing infrastructure

4.2.5 The diagram below indicates the approximate locations of these options:

Figure 4.2: Corran / Nether Lochaber infrastructure options

4.2.6 As can be seen from the above figure, all five options could involve providing a new access road and junction with the A82. Preliminary indications have identified the provision of an improved priority junction or the provision of a new roundabout. The identification of a preferred access will be further developed in line with the Design Manual for Roads and Bridges (DMRB) as a preferred infrastructure option is selected.

Ardgour

4.2.7 On the Ardgour side, the current topography limits the potential solutions due to the curvature of the shoreline, tidal conditions, lighthouse and l water depth. As it stands two potential options have been identified:

- **Option A** is to the north of the existing slipway and next to the existing jetty. This option then has various sub options based on the length of delivering either an 'L' shaped pier or 'T' shaped pier
- **Option B** is immediately south to the existing slipway

4.2.8 No new road-based infrastructure would be required to access these structures, although work would need to be undertaken to provide adequate marshalling area capacity.

4.2.9 THC has also decided that both vessels will berth overnight on the Ardgour side of the crossing, with any Lochaber based staff crossing in the morning on a flit boat and transferring to the vessel via the slipway. This eliminates the more dangerous practice of vessel-to-vessel transfer that the crew currently undertake (as the vessels are berthed overnight on swing moorings).

4.2.10 The graphic below places the two options in context.

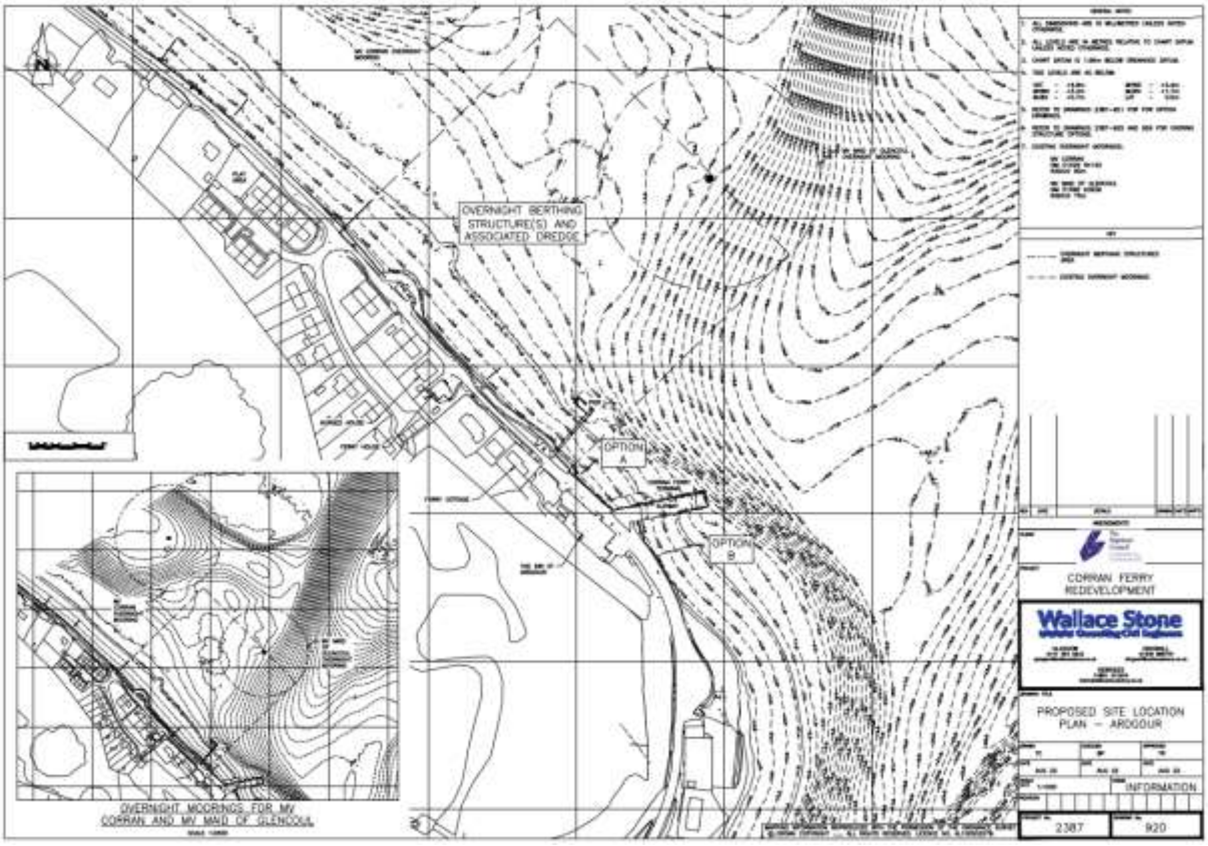

Figure 4.3: Ardgour infrastructure options

4.2.11 Overall, the infrastructure requirements would include the construction of two new slipways and aligning structures, overnight berthing protected by a tidal wall (Ardgour only), electric charging infrastructure and the expansion of the marshalling areas on both sides of the crossing. The emerging analysis suggests that **Options B and D on the Nether Lochaber side** and **Option A** on the Ardgour side are likely to form the preferred infrastructure package.

4.2.12 It should be noted that the MV *Corran* would likely be able to operate off of the new slipways, although this still needs to be confirmed through the detailed design process.

Marshalling Areas

4.2.13 As part of the infrastructure optioneering process, Wallace Stone also undertook an exercise identifying the requirements for improved marshalling areas to support the infrastructure and forecast demand projections.

4.2.14 A report on this matter was submitted by Wallace Stone in May 2022 and made the following recommendations

- Provide at least 250% of new electric vessel NEV capacity – this equates to 400 meters or 80 PCUs within the formal marshalling areas on each side of the crossing. This is 228 meters more than is currently provided.
- Consider options for signage and 'get out' option(s) for vehicles trying to utilise the crossing when the formal marshalling area has reached capacity.
- Consider options for phased extension of the marshalling areas to allow THC to respond to variations in vehicle growth rates.

Infrastructure Costs

4.2.15 Using cost estimates from similar projects, Wallace Stone has developed an indicative cost schedule for the required infrastructure works, which is shown in the table below. It should be noted that these costs exclude land acquisition and Crown Estate fees:

Table 4.2: Indicative Infrastructure Costs (Wallace Stone)

Item	Cost
Supporting Slipways / Berthing / Infrastructure	£20,000,000
Civil Engineering	£1,095,000
Surveys / Ground Investigation Works	£250,000
Infrastructure Contingency (15%)	£3,203,000
Total	**£24,548,000**

5 Socio-Economic Case

5.1 Overview

5.1.1 This chapter updates the Socio-Economic Case as set out in the STAG / SBC, accounting for the updated objectives and options. This assessment is used as the basis for defining a preferred option to be progressed to detailed design and the Final Business Case. To recap, two options remain under consideration at this stage:

- **Option 2c:** One larger 32 PCU straight through fully electric vessel, with MV *Corran* retained as the refit / relief / second vessel
- **Option 2f:** Two larger 32 PCU straight through fully electric vessels

5.1.2 The Socio-Economic Case revisits the appraisal of options against the TPOs, STAG criteria and in terms of their value for money. Given that MV *Corran* will have to be replaced over the period, the solution delivered will ultimately be **Option 2f: two larger 32 PCU straight through fully electric vessels** – the timing of this investment is therefore the substantive difference between the options in the appraisal which follows.

5.2 Transport Planning Objectives

5.2.1 The table below reassesses the performance of both options against the TPOs compared against the present-day situation.

Table 5.1: Appraisal of options against the TPOs

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
TPO1: The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland	✓	✓✓✓
TPO2: The Corran Ferry should facilitate year-round access to Ardgour and beyond for all vehicle types	✓✓✓	✓✓✓
TPO3: The available vehicular capacity of the ferry service should as far as possible, facilitate compliance with the published timetable	✓	✓✓✓

TPO1: Infrastructure

5.2.2 The ultimate preferred infrastructure solution will be common to both options and will deliver a step change in quality, including suitable berthing structures, a secure overnight berth, expanded marshalling and the provision of shore power. As such both options will contribute positively to this infrastructure based TPO.

5.2.3 Option 2c scores less positively against this TPO as it would continue to involve quarter-point vessel operation in addition to the new vessel. This would present several operational challenges, such as crew having to be familiar with the operation of two completely different vessels / propulsion systems; maintaining / repairing different vessels; sourcing of spare parts; and operating a quarter-point vessel from the new slipways. As noted in Chapter 4, this is operationally sub-optimal and the presence of a structure adjacent to the slipway would make manoeuvring more challenging.

TPO2: Year-round access for all vehicles

5.2.4 With MV *Maid of Glencoul* retired under each of the options, the immediate constraint on passage for certain vehicle types would be removed. Both options would therefore perform strongly in the context of this TPO.

TPO3: Capacity

5.2.5 With an overall increase in vehicle deck capacity, both options would contribute strongly to this objective. In straight capacity terms, **Option 2f** (32 PCUs) would provide the most significant benefit as the second vessel would be larger than MV *Corran*. Whilst on paper this is only four PCUs more than MV *Corran*, in practice the differential is likely to be larger. MV *Corran* has a stated car capacity of 28, but she was built in 2001 and the average vehicle has grown in both length and width over the last two decades, with sports utility vehicles and pick-up trucks becoming much more common.

Key Point: Both options perform strongly with respect to the TPOs. However, Option 2f – two larger straight through vessels performs better as it would ensure the adoption of standard infrastructure and operational practices, avoiding the need for a quarter point vessel to operate from the new slipways.

5.3 STAG Criteria

5.3.1 This section briefly revisits the appraisal of the options against the STAG criteria and respective sub-criteria.

5.3.2 It should be noted that, since the completion of the STAG / SBC, the STAG Guidance has been refreshed and updated criteria introduced. However, given that this work builds on the SBC, it uses the original STAG criteria for consistency. However, comment is made in relation to the revised criteria where appropriate.

Environment

5.3.3 A core objective of this proposed investment is to replace the current diesel vessel with modern full electric tonnage which are emission free in operation.

5.3.4 The infrastructure works will include construction of new slipways, berthing structures, and tidal walls to protect the vessels and onshore works including improvements to the marshalling areas on both sides of the crossing. The works will take place above the Mean Low Water Springs (MLWS) but below the Mean High Water Springs (MHWS) and therefore fall under both the Town and Country Planning (Scotland) Act 1997 and the Marine (Scotland) Act 2010.

5.3.5 It is anticipated that the proposed development will affect wider coastal processes, and as such is classed as a Schedule 2 development. It will, therefore, be subject to Environmental Impact Assessment (EIA) Screening to determine whether the project requires a full EIA.

5.3.6 The following table qualitatively summarises the main environmental issues associated with each option.

Table 5.2: Environmental Appraisal

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
Noise & Vibration	×××	××

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
Global Air Quality	✓	✓✓✓
Local Air Quality	O	✓
Water Quality, Drainage & Flood Defence	O	O
Geology	O	O
Biodiversity & Habitats	×	×
Landscape	××	××
Visual Amenity	××	××
Agriculture & Soils	O	O
Cultural Heritage	O	O
Overall Assessment	**××**	**×**

5.3.7 Whilst the above table includes several negative impacts, it should be noted that these are likely to be short-term in nature and associated with construction only. There should be few long-term impacts except changes to landscape and visual amenity depending on the identification of the preferred landside infrastructure option – it should be noted that this will be subject to extensive consultation and will go through the statutory planning process.

5.3.8 The programme of construction works would result in a negative local impact in terms of **noise and vibration**. Both options require new infrastructure offline from the current infrastructure to ensure that the service can continue to operate during the construction period. Option 2f scores better against this criterion as, once in service, the new vessels would address the noise associated the running of diesel engines on MV *Corran*.

5.3.9 The major differentiator between the options is with respect to **global air quality**. Whilst the Corran Ferry service operation will **ultimately** be zero 'tailpipe' emission, **Option 2f** would bring this date forward quite significantly and thus it records a 'major' benefit compared to a minor benefit for **Option 2c**.

5.3.10 **Local air quality** would also be improved with Option 2f as it would immediately address the harmful pollutants associated with hydrocarbon fuels, albeit there are no air quality issues in the area and dispersal would not be problematic. During the construction phase however, there may be a short-term negative impact from construction dust.

5.3.11 The new infrastructure and marshalling would though have negative **landscape** and **visual amenity impacts**, which would need to be considered in the EIA screening. The level of impact is intrinsically linked to the selection of the preferred site on the Nether Lochaber side of the Narrows. Site option B would have a significant impact on the local residences, while site D would have less obvious visual amenity impacts being located further away from local properties.

5.3.12 It should be noted there are a number of protected natural and built environment features located in close proximity to the crossing which would have to be protected during construction and operation. This would again be addressed in the EIA screening.

5.3.13 All other impacts are likely to be short-term, with little differentiation between the options.

Key Point: The desire of THC to decarbonise its major ferry route is a principal driver of this project. The early adoption of two all-electric vessels (Option 2f) would deliver the early decarbonisation of the route. The requirement for infrastructure works would have some short-term negative environmental impacts, but these would be limited in scale and suitable mitigations would be put in place through the EIA process.

Safety

5.3.14 The safety criterion includes two sub-criteria which the appraisal is required to consider:

- Accidents
- Security

Accidents

5.3.15 The accidents sub-criterion was initially developed more in consideration of e.g., urban / inter-urban transport. In the ferries context, the Corran Ferry has an unblemished safety record. The SBC, therefore, focused on the extent to which the options reduce the risks attached to:

- The use of swing moorings for overnight berthing
- Traffic management in and in proximity to the marshalling areas

5.3.16 In terms of road traffic collisions, between 2015 and 2019, four slight incidents and one serious incident occurred at the access junction to the Corran Ferry slipway on the A82. As has been discussed previously, queuing for the service can occur at peak times which on occasion can extend beyond the marshalling areas and onto the public road network. The Corran side in particular is very constrained for space, with vehicles queuing back up the hill and occasionally onto the A82 trunk road. This then causes further issues for local access to the businesses and residences that are located off the Corran Ferry access road, and conflicts can occur.

5.3.17 Although no incidents have been recorded to date on the Ardgour side, the marshalling area is located on a blind corner, and at times traffic has queued back around this corner posing several safety issues including high-speed oncoming traffic meeting unexpected stationary traffic. An example of this can be viewed in the image below from May 2022.

Figure 5.1: Traffic queuing around blind corner

Security

5.3.18 The security sub criterion in this context considers the security impacts of the options on the different categories of service users.

5.3.19 The appraisal of the safety impacts is qualitative.

Table 5.3: Safety & Security Appraisal

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
Accidents	✓✓	✓✓✓
Safety	✓	✓
Overall Assessment	✓✓	✓✓✓

5.3.20 Both options record a positive impact against the accidents sub-criterion, although the benefit is focused on mitigating / reducing the risk of accidents occurring rather than addressing an evidenced accident / safety problem. The delivery of infrastructure will be common for both options and thus both would receive the same benefits from the selected preferred infrastructure options. Both options include the removal of vessel-to-vessel transfer for crew, due to the berthing structures provided at Ardgour. Additionally, the improved marshalling areas, should provide further stacking capacity for vehicles waiting to board, reducing the occurrences of queuing.

5.3.21 **Option 2f** does however perform better against the 'accidents' sub-criterion. The use of two entirely common vessels and the establishment of standard operating practice for these two vessels reduces risk. In particular, it was noted in Chapter 4 that operating a quarter point vessel off the new slipways would be operationally sub-optima.

5.3.22 Both options will deliver minor improvements for **security** by providing more efficient pedestrian and cyclist access to the new vessels as part of the new infrastructure. Additionally, the vessels will be designed to incorporate a separate larger pedestrian lounge providing additional security for foot passengers away from vehicles moving around the vehicle deck.

5.3.23 With respect to the new STAG criteria, it should be noted that both options will improve the reliability and resilience of access to the peninsula, improving access to health and wellbeing infrastructure.

Key Point: Both options will deliver positive safety benefits in terms of risk reduction and mitigation. **Option 2f** would however have the most significant benefit as it would deliver two identical vessels with standard operating practices.

Economy

5.3.24 The STAG Economy criterion considers two discrete sub-criteria:

- **Transport Economic Efficiency (TEE):** the benefits ordinarily captured by standard cost-benefit analysis - the transport impacts of a proposal generally capturing travel time benefits (including reliability) and changes in vehicle operating costs.
- **Wider Economic Impacts (WEIs):** impacts in non-transport markets that are either of importance from policy or distributional perspective or which affect the net value that society attributes to the outcomes of a transport intervention. They are generally treated as a sensitivity to the TEE analysis.

TEE Impacts

5.3.25 The proposed options would do little to improve journey times. TEE impacts would likely therefore stem from increased vehicular capacity, reducing the risk of not getting on the first sailing. The service would also be more resilient, not relying on a 50+ year-old vessel to provide back-up and operate the service when the main vessel is in drydock.

5.3.26 Quantifying such impacts is not possible and in turn this prevents the generation of a Net Present Value or Benefit Cost Ratio associated with the options shortlisted. This could only be done by comparing against a situation where the service ceased to operate, which was the analysis undertaken in the *Corran Ferry Socio-Economic Study* (see **Appendix C**)

Wider Economic Impacts

5.3.27 WEIs only tend to accrue in the case of the largest transport schemes and in the context of the Corran Ferry this is only considered against a 'no ferry' scenario rather than the impact delivered between the options. As such, they are not considered further or quantified in this study in their conventional context, although a qualitative assessment is provided on how each option will impact on the local economy.

5.3.28 The appraisal against the 'Economy' sub-criteria is provided below:

Table 5.4: Economy Appraisal

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
Transport Economic Efficiency (TEE)	✓✓	✓✓✓
Wider-Economic Impacts	✓	✓
Overall Assessment	✓✓	✓✓✓

5.3.29 Both options would evidently make a strong contribution to the STAG Economy criterion, with **Option 2f** performing better because it offers slightly more capacity. Both options would record a minor benefit in terms of wider economic impacts through improving the resilience of the service and giving peninsular residents, businesses and those visiting / doing business in the area increased confidence in the service.

Key Point: Both options would make a strong contribution to the 'Economy' criterion through increasing capacity and providing improved reliability and resilience. **Option 2f** performs better as it offers additional capacity and two new vessels in the immediate term.

Integration

5.3.30 The integration criterion includes three sub-criteria which the appraisal is required to consider:

- **Transport Integration:** which relates to the degree to which a proposal fits with other transport infrastructure and services
- **Transport and Land-Use Integration:** which relates to the fit between the option and established land-use plans and land-use / transport planning guidance
- **Policy Integration:** which relates to the appropriateness of the option in light of wider policies including those of both central and local government

Transport Integration

5.3.31 In this context, transport integration is concerned with the impact of each option on the different types of ferry user, including; foot passenger, car, coach, commercial vehicles and cyclists.

Transport and Land-Use Integration

5.3.32 This sub-criterion considers the extent to which the proposed options impact on land-use and the profile of development in and around the two ferry terminals.

Policy Integration

5.3.33 This final sub-criterion considers the extent to which the proposed options fit with established local, regional, and national policy.

5.3.34 The appraisal against the Integration criterion is exclusively qualitative.

Table 5.5: Integration Appraisal

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
Transport Integration	✓✓✓	✓✓✓
Transport and Land-Use Integration	O	O
Policy Integration	✓	✓✓
Overall Assessment	✓✓	✓✓✓

5.3.35 Both options would deliver a benefit towards the **transport integration** sub-criteria as they reduce the current constraints associated with large commercial vehicles and coaches when MV *Maid of Glencoul* is in operation. It would also improve the marshalling arrangements and facilitate safe foot passenger and cyclist access to the vessel(s). There is little to differentiate between the options in this respect as they will largely deliver the same outcomes.

5.3.36 In terms of **policy integration**, both options would deliver benefits in terms of sustaining and developing peninsular communities, reducing the inequalities which they currently face. An integrated solution at Corran would also support the emerging HITRANS Regional Transport Strategy. In terms of scoring, **Option 2f** again performs better as it would ensure that the service is zero tailpipe emission at an earlier date, supporting emissions reduction targets at the local and national level.

5.3.37 It does have to be recognised that both options are counter to the committed national 20% reduction in car kilometres by 2030. By addressing the capacity issues on the Corran Ferry, there will be increases scope for discretionary travel. That said, for most people living on the peninsula, there are few alternatives but to own and run a car, with most services being located in Fort William or further afield. Limiting or reducing travel would therefore have the effect of widening transport related inequalities.

Key Point: The landside infrastructure work to enable both options would significantly improve transport integration. Both options also align well with policy, although Option 2f performs better because it would accelerate the point at which the service would become emission free.

Accessibility and Social Inclusion

5.3.38 The accessibility and social inclusion criterion includes two sub-criteria which the appraisal is required to consider:

- **Community Accessibility:**
  - Public transport network coverage - changes in accessibility provided by the public transport system
  - Access to local services - changes in accessibility by walking and cycling to local services
- **Comparative Accessibility:**
  - The distribution of impacts by people group
  - The distribution of impacts by location

5.3.39 The appraisal against this criterion is exclusively qualitative.

Table 5.6: Accessibility & Social Inclusion Appraisal

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
Community Accessibility	✓	✓
Comparative Accessibility	O	O
Overall Assessment	O	O

Key Point: As the options shortlisted are focused on maintaining the current level of service, they are broadly neutral from an accessibility perspective. However, both options would record a minor benefit in terms of community accessibility through ensuring year-round access to the peninsula and a reliable and resilient service.

5.4 Cost to Government[21]

5.4.1 Cost to Government refers to all costs incurred by the public sector as a whole, net of any revenues. All investment costs are presented in both absolute terms and with an adjustment for optimism bias.

Optimism Bias

5.4.2 There is a demonstrated, systematic tendency for project appraisers/developers to be overly optimistic (known as Optimism Bias (OB)), where costs and timescales are often under-estimated. In order to account for this in appraisal, the H.M. Treasury *Green Book*, and in this case the STAG Technical Database, provides a set of factors by which costs should be scaled-up at different stages of the business case.

5.4.3 Table 13.4 of the STAG Technical Database sets out the OB adjustments for different types of projects. **Marine infrastructure** is not specifically listed but is assumed to be under the 'Roads' category for the purposes of this appraisal. The guidance also notes that the cost of purchasing **ferries** is not considered an infrastructure investment and therefore is not subject to optimism bias.[22] Whilst this position is potentially open to question, optimism bias is applied in the Socio-Economic Case to test the value for money of different options – as all options are being treated in the same way, it does not therefore make any material difference to their relative performance in the appraisal.

5.4.4 The STAG Technical Database recommends the application of 44% OB at SBC stage, reducing to 15% at OBC stage as costs become clearer. However, in marine civil engineering, a substantive package of work is required to obtain greater cost certainty including surveys and ground investigations. These are significant undertakings and are not typically pursued until detailed design stage, which follows on from the OBC. For this reason, **OB on marine infrastructure is retained at 44% in this OBC**.

Investment Costs – Current Prices

5.4.5 This section sets out the investment costs for each option in current (i.e., 2022) prices. Vessel costs have been provided by NaValue and CMAL as part of the ongoing SVRP work, whilst initial landside infrastructure costs have been provided by Wallace Stone, but these are subject to further refinement.

[21] Note – cost government is a standard term in STAG and refers to cost to the public sector as a whole rather than any individual organisation such as THC or Transport Scotland.

[22] https://www.transport.gov.scot/publication/stag-technical-database/section-13/

5.4.6 Capital expenditure (CAPEX) in 2022 prices has been developed – this would be the current cost in cash terms and is presented in the table below exclusive and inclusive of optimism bias.

- Vessel costs include the cost of two new fully electric vessels; vessel contingency at 3%; naval architecture consultancy; tools and spares and site supervision.
- Ferry terminal infrastructure costs include the slipways and associated infrastructure, civil engineering consultancy; surveys and ground investigations and infrastructure contingency at 15%.

5.4.7 As the differentiator between the options is just when the vessels will be delivered rather than the actual form of the solution, the cost in 2022 prices would be the same.

Table 5.7: Corran Ferry replacement capital costs (undiscounted Q2 2022 prices, £'000)

	Capital cost (Q2 2022 prices)	Capital cost (Q2 2022 prices) inclusive of optimism bias
2 No. new vessels	£37,025	£37,025
2 No. new slipways and supporting infrastructure	£24,548	£35,349
Total	**£61,573**	**£72,374**

Operating Costs – Current Prices

5.4.8 In addition to the capital investment costs, there will be a differential in operating costs between a new vessel and MV *Corran*. Assuming the same timetable and operational practice, this will by and large be accounted for in the difference in fuel prices and battery replacement for the electric vessels

5.4.9 In their *Propulsion Machinery Concept Study*, NaValue estimate that the annual energy costs of one full electric ferry would be **£242,000** per annum. This represents a **48%** reduction on the forecast energy costs of a new diesel-mechanic ferry **(£467,508)**.[23] It should however be noted that this study was published in May 2022 and worked on the basis of an **8.88** pence per kwh electricity price. Energy prices have increased sharply since then – the BEIS[24] note that, by the end of Q1 2022, the per kwh electricity price in the manufacturing sector had increased to **17.15p** per kwh and it has likely risen significantly further since then based on domestic rates.[25] Whilst oil prices have also risen, they have not done so at the same rate as electricity prices. It is therefore likely that the gap between a diesel and electric ferry has narrowed significantly in this period. However, there is significant uncertainty in the short and medium term given the volatility in the markets and the potential for government intervention. For these reasons, we have used the NaValue values for the purposes of comparison here.

5.4.10 With regards to battery replacement, CMAL has advised that there would be a requirement to replace the batteries every 10 years. Due to the uncertainty in future battery costs and advances in battery technology, an average price based on 2022 prices has been used in the appraisal. This has been established as £430 per kWh, with each vessel having two 2,500 kWh batteries fitted.

5.4.11 Outwith fuel costs, other operating costs are likely to be similar. Maintenance costs for the new vessel(s) will likely be less than MV *Corran* in the short-term given that they are new and make

[23] CMAL Small Vessel Replacement Programme – Propulsion Machinery Concept Study (NaValue, 2022), p. 31.

[24] Department for Business, Energy and Industrial Strategy - https://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy

[25] Quarterly Energy Prices UK January – March 2022 (BEIS, June 2022), p. 1.

use of the most recent technology. Electric motors are also less complex than traditional internal combustion engines. We have assumed that they are 39%[26] less in the analysis.

Present Value of Costs

5.4.12 The investment and operating costs have been brought together to provide a Present Value of Costs (PVC). This analysis involves:

- Presenting all costs in their 'present value', where all future year costs are 'discounted'[27] to establish how much the costs are 'worth' today. This reflects the 'rate of time preference', whereby people and organisations attach a lower 'cost' to spending in the future than they do in the present day
- The use of a common price base, stripping out the effects of inflation. The current year used in the Department for Transport's WebTAG Guidance is 2010, and thus all costs in this appraisal are deflated to 2010.

5.4.13 The table below shows the PVC of the two options presented in 2010 prices. It should be noted that:

- For **Option 2c**:
  - The cost of the first new electric ferry and the landside infrastructure costs are spread over the years 2022 to 2025
  - The cost of the second electric vessel accrues in 2031, replacing MV *Corran* at her 30th anniversary
- For **Option 2f**, all costs accrue between 2022 and 2026, when both new vessels would be in service
  - A sensitivity has been undertaken to highlight the impact of retaining MV *Corran* until her 40th anniversary (2041) as a lightly used back-up vessel
- A 60-year appraisal horizon is used – on this basis, a further round of ferry replacement is required with both options. However, only one investment in landside infrastructure is required.

Table 5.8: Options 2e and 2f – Present Value of Costs in 2010 prices

	Option 2c: One larger 32 PCU straight through **fully electric** vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through **fully electric** vessels
Present Value of Costs	£50.1m	£52.8m
Risk Adjusted PVC	£56.9m	£59.5m

5.4.14 The PVC in the above table shows that the difference in the costs between the options is relatively small. The differences that do exist are a result of the horizon period for delivery of the additional new vessel and the OPEX costs accrued over this time when delivering both new vessels at the same time.

5.4.15 As a sensitivity, by extending MV *Corran* to 40-years, the (risk adjusted) PVC of Option 2c would reduce to £51.8m. Such an approach would however clearly come with a range of

[26] Based on THC assumptions

[27] See: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf , Annex A6

disadvantages including continued tailpipe emissions, operational inefficiency and the increased costs and challenges associated with maintaining an aging vessel.

5.5 Feasibility, Affordability and Public Acceptability

5.5.1 In addition to the options appraisal, it is important within a business case to establish the feasibility, affordability and public acceptability of the options.

Feasibility

5.5.2 Both of the proposed options are feasible from both a delivery and operational perspective.

5.5.3 The main point of refinement is related to the location and layout of the landside infrastructure options, which will be undertaken through the outline and detailed design process.

Affordability

5.5.4 As will be detailed in the Financial Case, the capital investment costs associated with the delivery of both options are outwith the means of THC. The purpose of this business case is to make the case for external investment in the Corran Ferry service.

Public Acceptability

5.5.5 The proposals have not been formally tested with the public, albeit there has been considerable consultation on the issue of replacement ferries in recent years, whilst THC Officers regularly brief community representatives on progress.

5.5.6 Both options are likely to have a high degree of public acceptability as they represent a material change on the current day position, including a larger replacement for the main vessel and either a cascading or replacement for the secondary vessel. Two new vessels in the immediate term is of course likely to be preference of the public.

5.6 What is the preferred option?

5.6.1 The analysis contained in the Strategic and Socio-Economic Cases has highlighted the requirement for capital investment at the Corran Narrows. The options have now crystallised around a preferred vessel type and infrastructure solution (albeit the exact design and location remain to be finalised). The remaining question therefore is the timing of delivering this solution.

5.6.2 Upon careful analysis of the evidence presented, THC has confirmed that its preferred option is **Option 2f: two larger 32 PCU straight through electric vessels**. A primary driver of this decision is the Council's desire to decarbonise its main ferry route, where it has defined the **'journey to net zero'** as a priority. Whilst Option 2c would ultimately deliver the net zero outcome, it would occur several years later and would not contribute to the Council's stated aims in relation to emissions reductions nor wider national targets.

5.6.3 Outwith net zero aspirations, there are several operational benefits from operating two common vessels, including:

- **Common berthing arrangements** at both sides of the crossing, avoiding any challenges associated with using both a quarter point and straight through vessel from the same infrastructure
- **Crew familiarity** – there would be obvious challenges associated with operating two very different vessels in terms of machinery and propulsion systems

- **Reliability and resilience** – having two new vessels would reduce the reliability and resilience risks associated with maintaining an older second vessel

5.6.4 Whilst it is accepted that MV *Corran* will need to be retained as the relief vessel for a year or so when the second vessel is being built, THC does not consider this to be a suitable long-term arrangement.

5.6.5 Finally, the SVRP provides an opportunity to realise economies of scale in design and procurement. The project has significant momentum behind it at present and represents a major opportunity for the Council.

5.6.6 The remainder of this OBC is therefore focused on how **Option 2f** can be funded, procured and delivered.

5.7 Risk and Uncertainty

Risk

5.7.1 Within the Socio-Economic Case, there is a requirement to consider how different variables could affect the cost of the preferred option. As explained earlier in this report, a business case of this nature does not lend itself to standard transport appraisal techniques, including the quantification of benefits and the establishment of a benefit-cost ratio. The focus is therefore on variables which could impact on the cost of the preferred option. A full risk register covering all five cases is therefore included in **Appendix F**.

Uncertainty

5.7.2 Uncertainties are issues that can affect the outcomes of the business case but which cannot be controlled or mitigated. The primary uncertainties in this context are the:

- Availability of funding for the preferred option emerging from this study – this is the major uncertainty and will be considered in the Financial Case
- Future energy prices, and therefore the difference between a diesel and electric vessel in this respect
- General inflation, and the implications for vessel and landside infrastructure costs
- Likelihood and timing of a future Corran Narrows fixed link, although the vessel component of the business case is future proofed against this
- The priority which will be afforded to THC in the SVRP and which party will lead on procuring and delivery the vessels (considered in the Commercial Case)

5.8 Next Steps

5.8.1 Having defined the preferred option, the OBC now turns to the development of the Financial, Commercial and Management Cases. These are collectively known as the delivery cases and focus on how the preferred option will be funded, procured, managed and delivered.

6 Financial Case

6.1 Overview

6.1.1 The Financial Case involves undertaking a full financial appraisal of the preferred option, including information on funding and budgeting over the life of the project.

6.1.2 It is important to note that:

- 'Cost' in the Financial Case is focused on monetary expenditure rather than being used as a basis for testing value for money as in the Socio-Economic Case. To this end, the costs presented exclude optimism bias, which is used to test value for money in the Socio-Economic Case in the event of cost increases.
- Procurement models for both the vessels and landside infrastructure are considered in the Commercial Case. For simplicity in the Financial Case at this stage, it is assumed that all funding is met from up-front public sector funding.

6.2 Funding Assumptions

6.2.1 The Corran Ferry STAG Appraisal completed in late 2018 set out the current funding arrangements for the Corran Ferry service and outlined at a high-level the different models that could be adopted. This reflected the Council's awareness that the required level of funding to replace the vessels and infrastructure is beyond what it can reasonably afford. THC is therefore seeking external funding and thus this business case is focused on making the case to the Scottish Government and / or UK Government for capital funding for new infrastructure.

6.2.2 It should be noted that any increase in operational funding is assumed to be the responsibility of THC, although the possibility of exploring a transfer of responsibilities to Transport Scotland remains a potential future option for the Council.

Feasibility and Preliminary Design

6.2.3 At a full meeting of The Highland Council on 24th June 2021, Members approved funding of **£1.6m** to enable the commencement of work on the concept vessel design, infrastructure design and consenting.

Vessel Design

6.2.4 As previously noted, the vessels which will emerge from the SVRP will be similar in design to those envisaged for the Corran Narrows, i.e., double-ended, through-and-through slipway vessels, the only major difference being the respective carrying capacity of each 'class' of vessel. To this end, **Transport Scotland through CMAL has provided circa £181k in-kind funding for the vessel design** for the Corran project, with THC contributing a further **£69k** in three instalments. To recap, this is 'Design C' in the Navalue workstream.

Infrastructure Design

6.2.5 In parallel to the vessel design process, the Council's Project Design Unit progressed a competition through the Scotland Excel Engineering and Technical Consultancy framework to procure a consultant to commence feasibility and preliminary design work for the ferry slipways and infrastructure.

6.2.6 Marine civil engineering consultancy Wallace Stone was appointed on 21st February 2022 to progress the infrastructure design work and consenting. The cost of this work is circa **£1.2 million**.

Construction Costs

6.2.7 The construction costs are currently forecast to be in the region of **£61.6 million in** Q2 2022 prices (a more detailed breakdown of these costs is shown in Table 7.1 below). The key challenge in the context of this project is that the preferred option has a political dynamic and there is thus uncertainty over whether any further Scottish and / or UK Government capital funding inputs (either financial or in-kind) will be committed within the lifetime of this commission, or indeed at all.

6.2.8 The implications of this are as follows:

- The baseline position is a continuation of the current operation, whereby THC is responsible for all aspects of the service. This will be the *de facto* solution if alternative funding sources are not available.
- There is a clear risk that, if the preferred option is predicated on additional Scottish and / or UK Government funding, the business case could ultimately be nugatory if that funding is not forthcoming.

6.2.9 It was therefore agreed at the Inception Meeting to work on the basis of the current delivery model but highlighting where external funding should be sought and what the implications of this would be. Any change to the funding position will be reconciled at FBC as is common on other ferry and marine infrastructure business cases across Scotland.

6.3 Capital Costs

6.3.1 To recap on the Socio-Economic Case, the capital cost of the preferred option package, including consultancy support and contingency, is shown in the table below:

Table 6.1: Corran Ferry replacement capital costs (undiscounted Q2 2022 prices, £'000)

	Capital cost (Q2 2022 prices)
2 No. new vessels	£37,025
2 No. new slipways and supporting infrastructure	£24,548
Total	**£61,573**

Disposal of Assets

6.3.2 The conversion of the Corran Ferry route to one operated by double-ended through-and-through ferries will mean that the current quarter-loading vessels, MV *Corran* and MV *Maid of Glencoul*, will need to be disposed. This therefore provides an opportunity to provide a very modest offset of the capital costs through sale or scrappage fees for this tonnage.

6.3.3 The realisable value of the two vessels will be dependent on their condition and the position of the market at the time of their disposal. However, it should be noted that MV *Maid of Glencoul* is 51 years old and is thus likely to have very little residual value. MV *Corran* is a more modern vessel having entered service in 2001 and thus may achieve a higher sale price, but will still be 25-26 years old when sold.

6.3.4 CMAL has noted that:

- MV *Maid of Glencoul* should be evaluated as a recycling candidate, which implies local recycling due to her size.

- MV *Corran* would likely have to be sold outwith Scotland and the cost of moving a small vessel can be high relative to her value. CMAL estimate that her residual value would be in the region of £400k-£700k.

6.4 Capital Spend Profile

6.4.1 The table below sets out the anticipated capital spend profile as provided by CMAL and Wallace Stone – it is based on the programme set out in the Management Case later in this report and will be subject to review as that programme evolves. It should be noted that the **table is based on Q2 2022 prices**.

Table 6.2: Capital spend profile (£ '000) by financial year

Description	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26	Total
Vessels						
Vessels[28]	£0	£7,000	£15,000	£10,600	£2,600	**£35,200**
Vessel Contingency (3%)	£0	£0	£0	£528	£528	**£1,056**
Naval Architecture Consultancy	£69	£0	£0	£0	£0	**£69**[29]
Tools / spares	£0	£0	£0	£200	£200	**£400**
Site supervision	£0	£45	£160	£65	£30	**£300**
Sub-total by financial year	*£69*	*£7,045*	*£15,160*	*£11,393*	*£3,358*	***£37,025***
Ferry terminal infrastructure						
Slipways and associated infrastructure	£0	£0	£2,000	£12,000	£6,000	**£20,000**
Civil Engineering Consultancy	£10	£760	£225	£60	£40	**£1,095**
Surveys and Ground Investigation (GI)	£0	£250	£0	£0	£0	**£250**
Infrastructure Contingency (15%)	£2	£152	£334	£1,809	£906	**£3,203**
Sub- total by financial year	*£12*	*£1,162*	*£2,559*	*£13,869*	*£6,946*	***£24,548***
Total	**£81**	**£8,207**	**£17,719**	**£25,262**	**£10,304**	**£61,573**

It should be noted that, in our view, the 3% vessel contingency applied by CMAL is very low, particularly given significant uncertainty around future inflation. This will be highlighted in the risk register.

Inflation-adjusted Capital Costs

6.4.2 Given current circumstances, it is particularly important that inflation is appropriately accounted for in the Financial Case, otherwise there is a significant risk of under-budgeting. Inflation forecasts are at present highly volatile *(it should be noted that the FY2021/22 figures have been excluded from the table as it is assumed that they have already been accrued)*.

[28] Based on construction in a UK yard.

[29] This is the cost to THC. It is assumed that wider naval architecture costs are internalised within CMAL.

Table 6.3: Inflation adjusted Capital spend profile (£ '000) by financial year

Description	FY22/23	FY23/24	FY24/25	FY25/26	Total
Vessel (2022 prices)	*£7,045*	*£15,160*	*£11,393*	*£3,358*	***£36,956***
Ferry terminal infrastructure (2022 prices)	*£1,162*	*£2,559*	*£13,869*	*£6,946*	**£24,536**
Total (2022 prices)	*£8,207*	*£17,719*	*£25,262*	*£10,304*	**£61,492**
Inflation adjusted total (RPI)	*£8,207*	*£19,544*	*£28,874*	*£12,056*	***£68,681***

6.4.3 The key point of note from the above table is that if inflation aligns with the forecasts set out above, **the total cost of the project will increase by circa £7.2m[30]**.

6.5 Overall Affordability

6.5.1 Under the current model of delivery for the Corran Ferry, the Council is responsible for the capital funding needs of new vessels and ferry terminal infrastructure. Due to overall affordability issues no funding was identified for investment in the Corran Ferry and associated infrastructure in the Council's 15-year capital programme approved in December 2021. The Council is continuing to engage constructively with the Scottish Government in relation to securing external capital funding however, no funding is as yet secured. If the Council decided to progress with the project by incorporating it into a future iteration of the capital plan without any external funding being secured, it would result in the following implications for the Council:

- In line with the Council's Capital Expenditure Policy, the project costs would require to be funded by borrowing and will add to the Council's external debt
- Under the Local Government in Scotland Act 2003 there is a requirement that local authorities should adhere to the 'CIPFA Prudential Code for Capital Finance in Local Authorities'. The Prudential Code seeks to concentrate primarily on ensuring that local authorities' capital spending plans are affordable.
- The Council's December 2021 capital programme was deemed to be at the limit of affordability in relation to the revenue budget impact of the associated borrowing costs. Without external funding, this proposal would exceed the Council's affordability limit and conflict with the Council's statutory obligations under the Prudential Code.
- Further, the Council's Medium Term Financial Plan, which sets out the Council's forecast income and expenditure over the next five years, demonstrates that the Council faces a **revenue budget gap of over £80m between 2023/24 and 2026/27**. If further borrowing is undertaken, the revenue cost of principal and interest payments will widen this budget gap. As borrowing costs result in fixed annual revenue costs with no scope for reduction, they put additional pressure on other revenue costs to find the reductions required to bring the Council back to a sustainable funding position. Additional borrowing costs would result in further considerable reductions in already constrained revenue service provision to balance the Council's budget, which is a statutory requirement.

6.5.2 **In conclusion, the progression of this project without full external financial funding support is not affordable or sustainable for the Council. The above said, the funding package for publicly supported ferry infrastructure in Scotland is not typically agreed until the FBC stage.**

[30] September 2022 DfT TAG Data Book.

6.6 Financial Risks

6.6.1 A risk-register is included in **Appendix F** and the proposed risk strategy set-out in the Management Case.

6.7 Accounting Implications

6.7.1 If no external funding is secured, the impact on the Council's balance sheet for the preferred option will be an increase in the value of 'Long-Term Assets – Infrastructure Assets' for the new vessels and terminal infrastructure of circa £61m-65m, with a corresponding increase in 'Liabilities' in the form of 'Borrowing' for the capital expenditure. The vessels and terminal infrastructure would then be depreciated over their respective lives.

6.7.2 In line with 'The Local Authority (Capital Financing and Accounting) (Scotland) Regulations 2016', borrowing is undertaken and administered through the Council's Loans Fund. There will be an annual draw on the Council's General Fund revenue budget for the loan interest payments which are charged to revenue and repaid annually. The loan principal payments which are also charged to revenue for the statutory repayment of debt are held in the Capital Adjustment Account[31], which is an Unusable Reserve, until the loan repayments become due.

6.7.3 MV *Corran* and MV *Maid of Glencoul* would be removed from the balance sheet.

6.7.4 If external funding is achieved the balance sheet implications would change accordingly depending on who owned the assets and the nature of any funding provided.

[31] The Council is not required to raise Council Tax to cover depreciation, revaluation or impairment losses. However, it is required to make an annual provision from revenue to contribute towards the reduction in its overall borrowing requirement equal to loans fund principal charges. Depreciation, revaluation and impairment losses are therefore replaced by loans fund principal charges in the General Fund balance by way of an adjusting transaction with the Capital Adjustment Account in the Movement in Reserves Statement – THC Annual Accounts 2020-21 (THC, 2021), p. 60.

7 Commercial Case

7.1 Overview

7.1.1 The Commercial Case provides evidence on the commercial viability of a proposal and the procurement strategy that will be used to engage the market. It presents evidence on risk allocation and transfer, contract and implementation timescale as well as details of the capability and skills of the team delivering the project and any personnel implications arising from the proposal.

7.2 Output Specification

Vessel

7.2.1 When placing an order for a new ferry, there are many potential ways of doing this – these include:

- Procuring a **bespoke vessel** based on a precise specification:
  - With this approach, THC would set out an exacting specification based on vessel general arrangement drawings which could include requirements in terms of engine type, fuel type, passenger and vehicle capacity, fit out requirements etc.
  - The advantage of this approach is that it ensures that the vessel design is precisely aligned with the specified requirements of the client. However, the disadvantage is that it limits scope for innovation and will likely lead to higher capital costs.
- Providing an **output specification** to the market:
  - With this approach, the Council would define a set of broad parameters such as required passenger capacity, speed, physical dimension ranges etc. Shipyards would then be invited to present their own design and costed solutions.
  - The advantage of this approach is that it allows the market to offer different and often innovative solutions and, as a result, may provide a lower capital cost. Conversely, the disadvantage is that elements of the design may not reflect the exact preferences of the client.
- Using an **existing proven design**:
  - With this approach, THC would know that the design provides the level of specification and efficiencies required but can be modified to meet their detailed requirements.
  - The advantage of this approach is that the Council know that the design will provide exactly what they want and will meet their specification and exact preferences. However, the primary disadvantage is that the design may not be readily available from the builders / designer, in which case the Council would have to engage the shipyard / designers to access and develop the modified design.
- Develop a **concept design** to take to market to complete detailed design and build:
  - With this approach, the Council would engage a suitable organisation to develop a concept design based on in-depth design and feasibility studies. This would include developing general arrangement drawings and associated specifications that would allow shipyards to tender for the detailed design and build of the vessel on a fixed price basis whilst reducing design, construction and operating risks for the Council.
  - The advantage of this option is that the Council would have an active input throughout concept design and know that the design will provide what is required. This option may seem to be more costly initially – however, the output concept design will provide a more secure position, reducing the risk of cost escalation through the build.

- This option can be combined with the existing proven design option above.

- Identify suitable **second-hand tonnage**.
  - For routes operating relatively standard vessel designs, it may be possible to procure second-hand tonnage from the market. This would clearly reduce the capital outlay but may bring forward the next cycle of vessel replacement and could also require specific adaptations to the infrastructure.
  - In theory, this is an option for the Corran Ferry as double-ended through-and-through slipway vessels are widely used in Scotland, most notably in the CMAL fleet. However, in practice, these vessels are only typically disposed of by CMAL towards the end of their economic life in Scottish waters and thus would be unsuitable for the Corran route in terms of age, size and fuel type.

7.2.2 The above options represent the most popular ship design solutions, but it is possible to blend elements of each approach.

Preferred Option

7.2.3 The Council's **preferred option is the development of a concept design to take to the market to complete detailed design and build.** Reflecting this preference, THC has been inputting into the wider CMAL SVRP Design Brief and provided a 'Statement of Requirements (SoR)' for the new Corran vessels. The Design Brief includes the development of 'Design C', the template for a new Corran Narrows vessel. As previously noted, naval architects Navalue have been commissioned to progress this design, and indeed the other two standard vessel designs for CMAL. The concept design will then be included with the ITT documents when going out to procurement for a shipyard. The basic and detailed design would then be carried out by the shipyard as part of the design and build contract. The SVRP Design Brief is included in **Appendix E** for reference.

Landside Infrastructure

7.2.4 The landside infrastructure specification is as per Section 4.2 of the Socio-Economic Case of the OBC. No further significant development of the design is undertaken at OBC. The next major stage of development is the outline and then detailed design, which are undertaken to feed into the Final Business Case.

7.2.5 Having defined the preferred vessel option and outlined high-level GA drawings for the landside infrastructure, THC commissioned marine civil engineers Wallace Stone in February 2022 to progress the design of the landside infrastructure to accommodate the 'Design C' class vessels. This design process consists of three stages:

- **Stage 1:** Feasibility and preliminary design, which is intended to find the optimum location and arrangement for the new facilities. This stage includes the specification, tendering and delivery of the necessary ground investigations and environmental studies and surveys to inform the design.
- **Stage 2:** Consenting and detailed design and procurement
- **Stage 3:** Construction, subject to funding

7.2.6 Stage 1 has been completed (February 2022), with Stage 2 forecast to be complete by late 2023. Subject to funding, construction is programmed to commence in February 2024, with completion in August 2025.

7.3 Procurement Strategy

7.3.1 This section identifies the procurement strategy through which the market will be engaged.

Vessel Funding

7.3.2 The procurement strategy for a new vessel or vessels is very much driven by how it is funded. There are various options available for procuring new tonnage, each with its own advantages and disadvantages in terms of cost, affordability, strategic control and both financial and operational risk. This section considers the particulars of these options and the advantages and disadvantages of each before considering a preferred funding option.

Public Sector Capital Funding

7.3.3 This option would involve the public sector (either local authority or central government) providing up-front capital funding for the purchase of the new vessels. This has been the most commonly adopted approach for purchasing vessels for publicly operated ferry services within the UK. Funding could be provided through one or a combination of:

- Direct funding through the local authority or Scottish Government capital budgets
- Grant funding through external schemes such as e.g., the UK Government ‘Levelling-Up’ or ‘Shared Prosperity’ funds
- Local Authority prudential borrowing
- Drawdown on capital reserves

7.3.4 The primary benefit of this approach is that the cost is internalised within the public sector and there is no ongoing cost liability or interest payments except in the case of prudential borrowing. However, the disadvantage of this approach is that the required funding must be found up-front, which could present an affordability challenge as well as questions over opportunity cost.

7.3.5 As a public sector example, the up-front capital funding approach is typically favoured by Transport Scotland in its procurement of new vessels to serve its relatively large ferry network, albeit other financing models have been used when the required funding has not been available or for other technical accounting or government policy reasons. However, up-front funding is much less common for a commercial ferry operator.

Prudential Borrowing

7.3.6 The advantage of using capital budgets or reserves is that all costs are met up-front. Borrowing on the other hand removes the requirement for up-front capital but creates a long-term liability in terms of financing that borrowing.

7.3.7 The decision as to whether to fund tonnage through the capital budget / reserves or prudential borrowing would be driven by: (i) available resources; and (ii) the comparative costs and benefits of each approach. For many local authorities at present, the cost of borrowing is low by historic standards (although it has increased throughout 2022 as interest rates have gone up) and their invested reserves are generating reasonable returns, thus borrowing options can represent better value for money than up-front capital funding.

Finance or Operating Lease

7.3.8 An alternative option for procuring new tonnage would be to arrange a finance or operating lease.

7.3.9 A **finance lease** is where a bank or other finance house meets the up-front costs of an asset (i.e., a vessel) and then provides it to a lessee (e.g., a local authority) for an agreed period and payment schedule. Under this arrangement, the finance company would remain the legal owner of the asset, with the lessee having control over it. The two parties share the economic risks and returns in terms of any changes in the residual value of the asset at the conclusion of the contract. An **operating lease** is a similar arrangement, the main difference being that at the end of the lease, the title to the asset does not pass to the lessee and thus the residual value risk remains with the lessor. This was the model used for the procurement of the three NorthLink Ro-Pax vessels MV *Hamnavoe*, MV *Hjaltland* and MV *Hrossey*. In the past, the benefit of an operating lease from the public sector perspective was that it did not appear on balance sheet and thus did not count against the Public Sector Net Cash Requirement (PSNCR – i.e., borrowing), whilst on the other side, the lessor benefitted from tax concessions. However, changes in accounting standards and definitions make operating leases less attractive than they once were.

7.3.10 The primary benefits of a lease arrangement are:

- There is no up-front capital cost for the buyer – the bank or finance house would pay for the construction and equipping of the vessel. Placing an order following price negotiations with one or more shipyards regularly results in a lower price in comparison to 'one-shot' public sector tendering. There may also be longer-term savings associated with the private sector being in a better position to manage risk, lever economies of scale in the build process and design a vessel to maximise its long-term residual value.
- The design and build risks are taken by the private sector rather than the public sector.
- An operating lease would mean that the asset would be off-balance sheet and would thus not contribute towards the PSNCR (albeit these leases are less attractive than they once were).

7.3.11 The disadvantages of a lease arrangement are:

- There is a commitment of future revenue budgets to fund the lease. As the lease fee will be based on commercial interest rates, this approach could be more expensive in the long-run compared to lower cost prudential borrowing (although this advantage is potentially reduced by the private sector driving efficiencies in risk management - minimising the purchase price whilst maximising the residual value - and levering its economies of scale).
- With an operating lease, the local authority would never own the vessel and the lease period would need to be limited to ensure the company financing the vessel is taking a genuine residual value risk.
- Whilst a more subjective point, lease arrangements of this nature can attract negative publicity as private shareholders are seen to benefit at the expense of the public purse, irrespective of whether this is the case or not. For example, Scottish Ministers have been questioned in Parliament on several occasions about the lease used to fund the Stornoway – Ullapool ferry MV *Loch Seaforth*, despite Audit Scotland not identifying any concerns with the procurement approach used.[32]

Shipbuilder Financing

7.3.12 Shipbuilder financing has been growing in prominence in recent years. Under this option, a shipyard would pay for the cost of a new vessel and then rent it to the operator for an agreed period. The key advantages of this approach are:

- As with a finance or operating lease, the up-front cost of the vessel is covered, in this case by the shipbuilder. In addition, it is in the interest of the shipyard to ensure a high-quality build as they retain liability for any future issues with the vessel.
- At the end of the lease period, there is flexibility as to whether the vessel is purchased, leased for a longer period or permitted to go off-hire and replaced with a new vessel.

7.3.13 The disadvantages are similar to those of a finance or operating lease.

[32] https://www.theyworkforyou.com/sp/?id=2018-09-06.6.0&s=speaker%3A25496

Tendering

7.3.14 The final procurement option is for the ultimate procuring party to wrap-up the procurement of a new vessel within a wider tendering of the service. Under this option, the procuring body would invite bidders to operate a clearly defined service specification and task them with identifying their own vessel(s) to deliver this service, albeit within agreed parameters defined in the tender (e.g., capacity, speed, fuel type etc).

7.3.15 The primary advantages of this approach are:

- There would be no up-front capital cost, rather the cost of a new vessel would be recovered over the contract period. Indeed, it is possible that a bidder could bring existing vessels to operate the service, thus reducing the vessel charge element of the tender.
- The incoming operator would likely have experience in procuring and managing the build of vessels and may thus be better placed to manage the risks associated with this. They may also bring innovative approaches to operating the service.

7.3.16 The primary disadvantages of this option are:

- A contract of at least 10 years, and likely 12-15 years, would likely be required for a bidder to fully recover the cost of the vessel. Whilst there are several ferry service contracts of this duration around Europe at present, the length of the contract could be open to challenge is it is considered to restrict competition.
- At the end of the contract period, there is a risk that if the incumbent operator was to lose the next tender, they would remove the vessel from the route. Whilst in theory an alternative bidder could bring a new vessel, there is a risk of service disruption during any transition period, or more likely no other bids would be received given that the incumbent has an appropriate vessel which would be heavily written down (i.e., a *de facto* monopoly). A transfer of assets clause is a possibility but this may be considered discriminatory if it prevents other operators bringing their own vessel.
- In the event that the incumbent operator went bust, arrangements would be required for an operator of last resort, which would need to have processes in place to take control of the vessel and the financial liabilities associated with it.

Preferred Option

7.3.17 The Council's preferred option is to deliver the new vessels through **public sector capital funding**. Given the essential nature of the Corran Ferry to the communities that depend on it, THC wishes to ensure that the assets are fully publicly owned and that there is certainty of tenure over the lifetime of the asset rather than for a set lease or tender period.

7.3.18 The source of that funding remains an open question at present, although THC is actively exploring funding sources at present. As noted in the Financial Case, independent delivery of the entire project by THC is beyond the financial capabilities of the Council and thus external funding is required. This remains the major risk to the project overall.

7.3.19 It should be reiterated that, in early 2020, THC gauged market interest in the potential operation of the Corran Ferry, including the provision of new vessels. Three responses were received to this Prior Information Notice (PIN). Following a review of these responses, the Council chose not to pursue the tendering option. This was principally due to the requirement for the Council to provide a subsidy to any private sector operator.

Vessels Procurement

7.3.20 An issue of critical importance for THC to consider is the procurement strategy for the two new vessels. As noted, the design work being undertaken by NaValue has been commissioned and funded by CMAL, with THC making a contribution. Following the completion of this design work (at the latest), a decision will have to be made as to which party will procure the vessels. There are three options in this respect:

- The Highland Council
- CMAL
- A partnership / joint venture between THC and CMAL

7.3.21 The high-level advantages, disadvantages and risks of each option are set out below.

The Highland Council

7.3.22 Under this option, THC would tender 'Design C' and enter into a contract with a shipyard for the construction of the vessels.

Advantages

- THC would have full control over the procurement of the vessels and their subsequent build. The tender would therefore be designed to reflect the exact needs of the Council in terms of e.g., price / quality split, allocation of risk, programme etc.
- As the SVRP is tasked with procuring multiple new-build vessels, there is no guarantee that the Corran vessels will be made an early priority, particularly given that the route is not within the Clyde & Hebridean Ferry Services contract, which is CMAL's core area of responsibility. THC leading the procurement would allow for the Corran vessels to be independently prioritised, subject to funding.

Disadvantages

- As the Corran Ferry is the only route of any scale within the THC area, the Council does not have experience in the procurement of vessels and the complexity of managing ship build contracts. External recruitment of staff or the appointment of consultants to oversee the procurement would be essential. This would entail a cost which would need to be factored into the Financial Case in the FBC.
- An important benefit of the SVRP is that CMAL is likely to benefit from economies of scale associated with a bulk order of multiple similar vessels. THC may lose these economies if they procure the Corran vessels separately and potentially at a different shipyard.
- THC has benefitted from in-kind support from CMAL in the development of the vessel design. However, intellectual property rights of the design would remain with CMAL, which would raise a question as to if / how THC could progress with procuring these vessels independently.

Risks

- The key risk with this procurement option is that the Council does not have and / or cannot secure appropriate expertise to deliver the contract. This could lead to delay and / or cost escalation.

CMAL

7.3.23 Under this option, CMAL would tender 'Design C' as part of the wider SVRP and enter into a contract with a shipyard or shipyards for the construction of the vessels. THC would need to agree a contract with CMAL governing the delivery of the project.

Advantages

- The procurement and supervision of ship build contracts is a core part of CMAL's remit. They have the technical expertise, resources and necessary insurances etc to deliver a project of this nature as a matter of course.
- CMAL may benefit from economies of scale, both as a bulk buyer of the SVRP fleet and as a long-term customer of various shipyards.

Disadvantages

- THC would be at arms-length from the construction of their own tonnage. Whilst they would likely have a consultative / stakeholder role, the authority to make decisions would need to rest with CMAL as the procuring body (or a change control process would need to be agreed whereby CMAL could make a claim against the Council for any changes in scope etc).
- Connected to the above, THC would be outsourcing the management of programme and financial risk to CMAL. The liability for this would need to be clearly defined in the contract, but it seems unlikely that CMAL would want to accept risks associated with another organisation's project.
- CMAL's core remit is focused on meeting the needs of the Transport Scotland subsidised ferry networks, i.e., the Clyde & Hebrides Ferry Services and Northern Isles Ferry Services. There is therefore a distinct possibility that the programme requirements of those networks will take precedence over those of THC.

Risks

- The main risk would emerge from the contractual interface between THC and CMAL, particularly in terms of the risk of dispute. As THC would be one-step removed from their own project, they would need to ensure that the contract protects their requirements and interests. Equally however, building ferries for the Corran Narrows is not a core part of CMAL's remit and they would be unlikely to assume responsibility for the risks associated with this.

Partnership between THC and CMAL

7.3.24 This would be a hybrid of the two previous options, where THC and CMAL would agree a partnership arrangement / joint venture to deliver the vessels. A Special Purpose Vehicle (SPV) could potentially be established.

Advantages

- The primary advantage of this option is that it would provide THC with a management role in the delivery of the project, but at the same time would allow them to benefit from CMAL's technical expertise and economies of scale and would address any potential issues associated with intellectual property rights.

Disadvantages

- Whilst not a disadvantage as such, there would again be a requirement for clear role definition. This would particularly be the case in terms of the allocation of risk and also in ensuring that a governance regime is established that allows 'on the ground' decisions to be taken quickly.

Risks

- The primary risk with this option would be the interface between the two procuring parties. There would be a requirement to have a well-defined contract / agreement that specified the respective roles of THC and CMAL, including risk management, governance, and financial liability.
- There would also likely be a requirement for a specific delivery team to be formed, which would have delegated responsibility for day-to-day decision making.

Preferred Option

7.3.25 THC has not yet determined a preferred procurement strategy and is continuing to explore options in this respect.

7.3.26 The remainder of this business case **assumes that THC will be procuring the vessels directly.** The reason for this is that, if CMAL leads the procurement, they will have their own governance and delivery arrangements and would thus develop their own internal business case.

Landside Infrastructure

7.3.27 When procuring marine civil engineering projects, there are a number of considerations in relation to the approach adopted. These are summarised in this section, which concludes with consideration of a preferred option.

Funding

7.3.28 From a funding perspective, marine infrastructure for local authority services is typically funded directly by the Council. However, it should be noted that the Scottish Government runs the Transport Scotland Ports and Harbours Scheme, which allows local authorities, trusts and commercial organisations to make an application for grant funding. Grant funding made by Transport Scotland will be at an ‘intervention rate’, with the applicant contributing the balance. The intervention rate is based on the value of the project involved, typically 80% payable by grant with the applicant contributing 20%.[33]

7.3.29 There are a range of requirements and principles underpinning this scheme, with any application having to be supported by an appropriate business case.[34] Whilst this is an attractive model from a cost perspective, there is significant competition for central government funding and it is unclear as to whether there is precedent for central government supporting infrastructure for local authority controlled ferry services.

7.3.30 The proposed infrastructure works at Ardgour and Nether Lochaber are also likely to be eligible for funding from other sources, including the UK Government ‘Levelling-Up’ and ‘Shared Prosperity’ funding. These are again, however, highly competitive and over-subscribed funds.

Type of Contract

7.3.31 There are two broad contract types which can be adopted, as follows:

- **‘Traditional’:** the customer prepares a fully designed output, with detailed drawings, materials and workmanship specification. This is tendered and the successful contractor delivers the contract to the tendered design and specification.

[33] Infrastructure projects | Transport Scotland

[34] https://www.transport.gov.scot/public-transport/ferries/infrastructure-projects/#60717

- The advantage of this approach is certainty of outcome – i.e., the client gets exactly what they want in terms of an output.
- The disadvantage is that it limits scope for innovation and may lead to higher capital costs.

- **Design & Construct (D&C):** the customer sets out in broad terms what they want delivered and invites the market to bid for designing and ultimately delivering the solution.
  - The advantage of this approach is that it allows the market to offer different and sometimes innovative solutions and, as a result, may provide a lower capital cost.
  - Conversely, the disadvantage is that elements of the design may not reflect the exact preferences of the client (although this could be resolved to some degree through a competitive dialogue). There is also a risk attached to variations in the specification, whereby tenderers offer less durable solutions thus reducing the capital cost, but thereby transferring the costs to future maintenance / refurbishment. In remote locations, this is generally not considered good practice due to the disproportionate cost of mobilising to undertake maintenance works.

7.3.32 The above options do of course represent polar positions and it is possible to blend elements of each approach, particularly if procuring multiple contracts as part of the overall delivery.

Preferred Option

7.3.33 In the context of Scottish ferry infrastructure projects, the requirements for the Corran Ferry are relatively straightforward, consisting of new slipways and associated infrastructure. There have been several recent similar examples, the provision of reconstructed slipways and improved vehicle marshalling at Colintraive and Rhubodach for example.[35] To this end, THC's **preferred option** is to adopt a **'traditional'** approach. Marine civil engineering consultant Wallace Stone has been appointed to progress the slipway infrastructure to detailed design and prepare detailed tender documents (drawings and specifications) for THC to place orders with a marine civil engineering contractor to build the new slipways and infrastructure.

Single Vs Multiple Contract

7.3.34 There is also a question as to whether the works at Ardgour and Nether Lochaber should be procured as a single contract or separately. The key reasons for procuring the works via a single contract are to:

- Simplify the procurement process for the client as all works can be procured via a single procurement exercise rather than multiple procurements
- Reduce the volume of contract administration
- Attract larger contracting companies who can provide a 'one-stop-shop' to provide all elements of the scope of works
- Minimise the number of interfaces between contracts or contractors
- Avoid knock-on impacts across contracts and to avoid blame, thus simplifying matters and minimising the contractor interface risks

7.3.35 The key reasons for splitting the works across multiple contracts are to:

- Reduce the risks associated with working in two distinct locations, albeit they are very close together

[35] https://www.cmassets.co.uk/project/colintraive-and-rhubodach-slipways-reconstruction/

- Manage the varying risk profiles at each location, e.g., technical, ground conditions, logistics etc
- Efficiently manage time sensitive and any seasonal working
- Ensure efficiency regarding the nature of works under the contract and specialist skills involved
- Spread the resource risk across multiple suppliers

Preferred Option

7.3.36 Typically, maritime construction contracts are procured via a single contract unless there are specific resource or technical complexities which make this less efficient. Given the relatively straightforward nature of the proposed Corran works, **THC's preferred option is to procure them as a single contact**.

Open Vs Restricted Tender

7.3.37 There is also a requirement to determine whether the contract will be let using an open or restricted tender procedure.

7.3.38 The open procedure, where the works are advertised and any contractor can submit a tender, may result in numerous tenders being received thus maximising competition and, in theory, increasing the likelihood of a good value for money procedure being realised. However, depending on factors such as the weighting of any quality component of the tender assessment, there is a risk that this approach could also result in the contract being awarded to a tenderer with sub-optimal experience of works of this nature, thus exposing the Council to increased delivery and financial risk. Open procedures work well for small, uncomplicated jobs.

7.3.39 A risk to consider is that an open procedure could prove unattractive to tendering contractors, particularly when the market is busy as it is at present. Contractors may be selective with tendering commitments given the resources required to submit a full tender submission. For this reason, open procedures can result in the receipt of fewer tenders than expected. Given that the maritime market is currently busy and is anticipated to remain busy due to the generational nature of maritime infrastructure works, letting works via open tender procedures may be an unattractive option.

7.3.40 These risks can be addressed by the restricted procedure, which includes a pre-qualification stage to the tender (whereby prospective bidders have to respond to a prequalification questionnaire covering topics such as legal, ethical, health and safety, financial strength and relevant technical experience). Only the top scoring tenderers would be shortlisted and progress to the quality and price tender process. The introduction of the pre-qualification element manages the risk of an inexperienced contractor being awarded the contract.

7.3.41 The key challenge with the restricted procedure is that it can increase the resource input required for both the procuring party and the tenderers (who will weigh the cost of bidding against the risk-adjusted expected profit), when compared to an open, price only bid. However, if prequalification is carried out in advance with only shortlisted contractors invited to tender, many contractors will view this favourably as it minimises their initial input and, assuming they pre-qualify, theirs will be one of a smaller number of tenders under consideration, giving them a statistically increased chance of being successful.

Preferred Option

7.3.42 The preferred option of THC is a **restricted procedure with prequalification carried out in advance of the main tender**.

Lump Sum Vs Re-Measurable

7.3.43 Lump sum versus re-measurable is essentially a decision on who carries the risk over quantities:

- In a re-measurable contract, the employer carries the risk on quantities
- In a lump sum contract, the contractor carries the risk.

7.3.44 The key point of note here is that, in a lump sum contract, the fixed price is likely to be higher as the contractor will have to account for the quantities risk in their price, albeit the presence of competition will exert some pressure in the opposite direction. However, the risk envelope will be much narrower and hence there will be a higher level of price certainty. In a re-measurable contract, the anticipated contract tender price may be lower as the contractor is not including for that risk. However, the risk envelope is much larger and there is thus less certainty over the final price.

Preferred Option

7.3.45 Given the nature of the works and the underpinning detailed design work, the Council's preferred option is the use of a **lump sum contract**. Building works may however be separated out as a remeasurable Scottish Buildings Contracts Committee (SBCC) contract – this will be confirmed when developing the tender specification.

Fixed Price Vs Target Price

7.3.46 The option of a fixed price versus target price contract centres around the degree of flexibility which the Council wishes to permit in the design. A fixed price contract works to an exact specification for a fixed sum – there is limited opportunity for design innovation or methodology-led cost savings.

7.3.47 A target price contract allows the contractor to introduce cost savings by reducing the requirements of the specification, often through a value engineering process. There are potentially programme issues with target price and assessing a reduced specification, but these should be allowed for in the contract period and procedure. However, the required inputs to administer the contract must also be considered and balanced with the potential savings on offer. The required level of administrative input on a target price contract can be significantly more than on a fixed price contract, which is due to the need to consider the merits of alternatives promoted by the contractor and the need to administer the 'pain / gain' share mechanism, requiring an open book approach. In addition, the target price option again introduces the risk of less durable solutions being adopted, thus moving costs from capital to maintenance through the life of the structures. This can be particularly unattractive at remote locations where mobilisation costs are a disproportionately large element of maintenance costs.

Preferred Option

7.3.48 In keeping with the scale and nature of the works, the preferred option is the use of a **fixed price contract**.

Form of Contract ECC vs ICC

7.3.49 The two main suites of contracts currently used for construction contracts in the UK are:

- The Engineering and Construction Contract 4 (ECC4)
- The Infrastructure Conditions of Contract (ICC)

7.3.50 The Infrastructure Conditions of Contract are based on what was previously known as the ICE Conditions of Contract and are generally considered to be more adversarial than the more modern ECC conditions which were also created by the ICE. The ECC is a more collaborative form of contract where risks and change are proactively managed throughout the duration of the contract. ECC is endorsed for public sector use by the UK Government Construction Strategy, the Association for Project Management and others.

Preferred Option

7.3.51 The table below summarises the preferred approach to delivering the slipway and enabling infrastructure works for the new Corran vessels:

Table 7.1: Summary of the Council's preferred slipway and infrastructure works procurement strategy

	Corran Infrastructure Works
Type of Contract	Traditional
Single or Multiple Contracts	1 No. contract
Open or Restricted	Restricted (shortlist established before tender documents issued)
Lump Sum or Remeasurable	Lump Sum. Building works could be separated out as a remeasurable Scottish Buildings Contracts Committee (SBCC) contract
Fixed Price or Target Price	Fixed Price
Form of Contract	ECC Option A (NEC4)

7.4 Sourcing Options

7.4.1 As a public procurement, the new vessels and landside infrastructure will need to be sourced in accordance with the Public Contracts (Scotland) Regulations 2015 (P(C)SR 2015). The proposed scale of works in this context will likely exceed the financial thresholds for works laid down in P(C)SR 2015[36] and thus are subject to the full set of requirements under the legislation.

7.4.2 Under PC(S)R 2015, the procuring body will need to select the appropriate procurement procedure – there are six potential options:

- **Open Procedures – Regulation 28:** Any interested party can submit a tender, there is no separate selection or pre-qualification stage and information to assess supplier suitability is provided with the tender. The tenders are evaluated and an award decision reached. It may be quicker than the other award procedures but may also be more onerous in terms of the number of tenders to be evaluated. Generally, the procedure is suitable only for the most straightforward procurements where the contract specification is clear and can be priced, with no need to negotiate with bidders.
- **Restricted procedure – Regulation 29:** This is a two-stage process, where interested parties submit an expression of interest (EOI) in response to a call for competition via 'Find a Tender'37 or an invitation to confirm interest where a Prior Information Notice (PIN) is used as the call for competition. Only those meeting the pre-qualification or selection criteria will be invited to submit a tender. The initial selection stage must be conducted using the Single Procurement Document (SPD) document. This two-stage procedure allows authorities to limit the number of candidates that will be invited to tender to a minimum of five, assuming that five or more candidates satisfy the minimum pre-qualification requirements. No negotiations with bidders are permitted at ITT stage.
- **Competitive Procedure with Negotiation (CPN) Procedure – Regulation 30:** Reserved for more complex contracts, this procedure involves an initial selection or prequalification

[36] The threshold for 'Works (including subsidised work contracts)' is £5,336,937 exclusive of VAT, as of 1st January 2022 - https://www.gov.scot/publications/procurement-thresholds-and-vat-inclusion-in-estimated-contract-value-sppn-8-2021/

[37] Find a Tender is the successor procurement guidance to the Official Journal of the European Union (OJEU)

stage using the SPD, after which a minimum of three eligible candidates are invited to negotiate the contract. Authorities are required to negotiate the contract on the basis of an initial tender (unless they have reserved the right in the contract notice to award the contract on the basis of the initial tenders). No negotiations are permitted on the minimum requirements or the award criteria. The negotiation phase may be conducted in successive stages to reduce the number of tenders (provided this was provided for in the Find a Tender contract notice). The authority must not conduct any further negotiations with bidders following submission of final tenders.

- **Competitive Dialogue (CD) Procedures – Regulation 31:** This procedure is also reserved for more complex contracts and involves an initial selection or pre-qualification stage using the SPD, after which a minimum of three eligible candidates are invited to participate in dialogue. Dialogue generally takes place over successive stages and involves a reduction in the proposed solutions. Once the authority is satisfied it has at least one solution capable of meeting its needs and requirements, it can close the dialogue phase and invite final tenders from the remaining bidders. Any negotiation and finalisation of the terms of the contract must not involve changes to the essential aspects of the tender or the procurement, including the authority's needs and requirements, where such changes are likely to distort competition or cause discrimination. Under Regulation 27(4) of the PC(S)R 2015, the use of both the CPN and CD procedure is only available to authorities where:
  - The needs of the authority cannot be met without adaptation of readily available solutions.
  - The works, supplies or services required include design or innovative solutions.
  - The contract cannot be awarded without prior negotiations because of specified circumstances related to the nature or complexity of the works, supplies or services or the legal and financial make-up or because of the risks attaching to any of them.
  - The technical specifications of the works, supplies or services cannot be established with sufficient precision by the authority with reference to a standard, European technical assessment, common technical specification or technical reference.
  - In response to an open or restricted procedure only irregular or unacceptable tenders are submitted. The above exceptions are likely to be narrowly construed.
- **Innovation Partnership Procedure – Regulation 32:** This procedure is intended for the situation where there is a need for the development of an innovative product or service or innovative works not already available on the market. It allows authorities to establish a long-term innovation partnership for the development and subsequent purchase of a new, innovative product, service or works without the need for a separate procurement procedure once the product, service or work has been developed.
- **Negotiated procedure without prior publication – Regulation 33:** In limited circumstances, authorities may award contracts without the need to advertise them to the market, where no tenders or suitable tenders have been submitted, where only a particular operator can meet the authority's demands or where there is extreme urgency.38

7.4.3 It is important to note that procurements of this nature are strictly regulated. To this end, no preference can be given towards or against the shipyards and / or marine civil engineering contractors of any country or specific geographic area. It should be noted that companies bidding for capital project contracts are increasingly being encouraged to lodge complaints if they are unsuccessful. Such complaints consume management time and costs as well as slowing down project progress, even if the complaint is ultimately found to be without substance.

[38] *Guide to the public procurement rules in Scotland* (CMS, 2019), pp. 9-10.

Vessels

7.4.4 The Council's procurement team has reviewed the potential routes to market and noted that, given the extent of the requirement and the timescales involved, no procurement strategy should be ruled out at this stage. A decision on the route to market will be confirmed at FBC once the funding model is confirmed.

7.4.5 THC does not have any frameworks available to support this procurement and would thus build a specific tender pack.

Landside Infrastructure

7.4.6 Scotland Excel has a framework in place for Engineering and Technical Consultancy services which expires on 7th March 2025. Lot 7 covers 'Coastal and Maritime' and includes a means to direct award to suppliers. However, there are a number of suppliers on this lot and the Council may choose to run a mini-competition with a specific statement of requirements to ensure best value. However, the route to market will only be confirmed at FBC stage, when there is greater clarity on the scale and duration of works and their funding.

7.5 Payment Mechanisms

Vessel

7.5.1 Assuming the preferred funding model involves up-front payment for the vessels rather than a lease arrangement or tender, a staged capital payment schedule based on agreed milestones would need to be determined with the yard as part of the contract placement process. The Council may wish to include a performance bonus for early completion and / or delay damages for late completion. CMAL noted that the payment schedule would likely consist of six staged payments.

7.5.2 It should be noted that placing an up-front order with a yard does expose the buyer to very significant risk associated with the yard encountering financial difficulties. Through the tendering process, the Council may wish to specify the requirement for any yard to provide a refund guarantee to cover this eventuality (although it should be noted that few if any UK yards currently offer such a guarantee). In a worst-case scenario, the Council could find it has paid some 80% of the contract price, the vessel is incomplete, but the shipyard has suffered cashflow problems and is unable to pay suppliers and their workforce to complete the vessel. If the shipyard has ceased to trade, the part completed vessel would progressively deteriorate and could well be unseaworthy making a move to another yard for completion impossible.

7.5.3 The Council may also wish to discuss with its insurance brokers the potential for buying a Freight, Demurrage and Defence (FD&D) insurance policy, which would cover claims handling and legal costs in the event that disputes arose with the shipyard, as legal disputes are not uncommon in shipbuilding.

Landside Infrastructure

7.5.4 The Invitation to Tender for the landside infrastructure work will establish a proposed payment mechanism and schedule. Prospective tenderers will be invited to bid against this and may be invited to suggest alternative proposed approaches where appropriate.

7.5.5 The preferred form of contract for the works is NEC4 Engineering and Construction Contract Option A (priced contract with activity schedule). Within the contract data, the Council will provide an activity schedule which will be tailored to include the specific activities within each contract. As part of their tender, contractors will allocate a price against each activity, allowing interim payments to be made as each activity or group of activities is completed.

7.6 Risk Allocation and Transfer

As noted in the Financial Case, a combined risk register covering all three cases is included in **Appendix F**.

7.7 Contract Length

7.7.1 The programme established in Section 9.3 of the Management Case sets out the following contract lengths, subject to receipt of funding and programme sign-off:

Vessels

- Vessel design contract (naval architect)
- Vessel design only: Q2 2021 to Q3 2022
- Vessel design and supervision of vessel construction: Q3 2023 to Q4 2023
- Vessel construction (shipyard design, shipyard construction and vessel trials): 18 months per vessel
- Vessel A: Q1 2024 to Q2 2025
- Vessel B: Q1 2025 to Q2 2026

Landside Infrastructure

- Maritime engineering consultancy contract
- Outline design, GI design and GI supervision: Q3 2021 to Q1 2023
- Detailed design and consenting: Q3 2022 to Q3 2023
- Construction work: Q2 2024 to Q3 2025

7.7.2 All construction contract durations shown above are to completion of the works and exclude defects periods.

7.7.3 The Council may wish to consider including delay damages within one or more of the contracts in the event of late delivery. An alternative approach would be to provide a financial bonus for delivering ahead of the contracted date. A combination of the two would also be possible.

7.8 Human Resources

Crewing

7.8.1 The Socio-Economic Case identified a continuously operational two-vessel solution (reducing to one-vessel during refit) as the preferred option for the Corran Narrows. In preparation for the scaling-up of services, which is programmed to happen ahead of the introduction of new vessels, THC is currently undertaking a salary benchmarking exercise and preparing a recruitment and succession plan. The scaling-up of crewing resource is not included within the scope of this business case.

Support Services

7.8.2 The scaling-up to a two-vessel service and recruitment of additional crew will increase the resource management and administrative requirements of THC. The scaling-up of back-office functions will be considered as part of the wider recruitment planning and succession exercise.

7.9 Contract Management

Vessels

7.9.1 The contract placed with a shipyard through the tendering process will be managed by the Council, with staged capital payments linked to milestones in the construction process.

7.9.2 Given that the Council has not procured a new build ferry of any scale since MV *Corran* (over twenty years ago), there are few or no THC staff with direct experience in this field. It is therefore recommended that the Council procures a specialist individual(s) or firm with appropriate professional indemnity insurance to supervise and manage the build process (this will be set out in more detail in the Management Case). However, the Council will also need to have their own suitably experienced team member to liaise with the shipyard and the supervising consultants, overseeing progress and reporting back through the Council governance procedures.

7.9.3 Contract management would be a matter for CMAL if they ultimately procured the vessel.

Landside Infrastructure

7.9.4 With respect to the landside infrastructure, there are two key stages of contract management:

- Detailed Design and Specification - including management of:
  - Designers
  - Principal Designer
  - Ground investigation (GI) contractors
  - Survey contractors
- Construction – at this stage there will be management of:
  - Contractor(s)
  - NEC Project Manager and Supervisor
  - Principal Designer
  - Principal Contractor

7.9.5 Whilst the Council is ultimately the buyer, they have appointed marine civil engineering consultants Wallace Stone to act as Designer and Principal Designer for the **design and specification stage**. These roles will involve taking the lead in planning, managing, undertaking, monitoring and coordinating the design process, and consideration of health and safety therein, including appointment and oversight of GI and survey contractors.

7.9.6 For the **construction stage**, the Council will appoint a consultant or consultants to act as:

- **NEC Project Manager and Supervisor(s)**, to manage all aspects of contract delivery including programme, dependencies, budget and contractor interface.
- **A Client Project Manager(s)**. This individual or firm would represent the client and co-ordinate between the NEC Project Manager and Supervisors and the Project Board. They would effectively be responsible for ensuring the project is managed within the agreed framework and budget.

7.9.7 These roles are set out in more detail in the Management Case.

7.10 Consents

7.10.1 Consenting should be undertaken as part of the detailed design phase. As part of the Council's design contract with Wallace Stone, Affric Ltd has scoped the consenting requirements. This scoping analysis is based on the assumption that the development will include the construction of a new slipway on either side of the crossing; a berthing structure on the Ardgour side; a tidal wall on the Nether Lochaber side and onshore works, including improvements to the marshalling areas at either end of the crossing.

7.10.2 The works will take place above the Mean Low Water Springs (MLWS) and below the Mean High Water Springs (MHWS) and therefore fall under the Town and Country Planning (Scotland) Act 1997 and the Marine (Scotland) Act 2010. The requirements for consents can be broken down into landside, marine and environmental consents, as follows:

- **Landside consents**
  - **Lease Agreements:** Any proposed development by the Council may require amendments / creation of lease agreements which contain provisions for construction on leased land. This will be determined through the design process.
  - **Planning Consents:** Planning consent will be required from THC. If the development is determined to be a major development under the Town and Country Planning (Scotland) Act 1997, a Pre-Application Consultation (PAC) may be required (it is anticipated that this will be the case). Transport Scotland will be specifically engaged with regards to any potential impacts on the A82 Trunk Road.
- **Marine consents**
  - **Crown Estate:** following review of any existing consents, lease agreements may need to be amended or created to extend lease of the seabed to include the footprint of any new developments.
  - **Marine Licence:** A Marine Licence will be required from Marine Scotland for construction activities and an additional licence will be required if dredging works are required. Assuming the works below MHWS exceed 1,000 square metres, the development will have to go through the PAC process to comply with the Marine Licensing (PAC) (Scotland) Regulations 2013. This will not however add significant further work into the programme as it can be progressed in tandem with the planning PAC.
  - As there is no harbour authority in the area, a **Harbour Revision Order** will not be required.
- **Environmental assessments**
  - **Environmental Impact Assessment (EIA)** screening, scoping and assessment phases will need to be undertaken as appropriate to inform the iterative design and consenting processes. Early engagement with statutory environmental stakeholders should be undertaken to confirm the level of environmental assessment and supplementary studies required to support concurrent landside planning and marine licence applications. The required environmental assessments need to be designed in an integrated manner to support both landside and marine elements of the project.
- **Impact assessments**
  - An **Equality Impact Assessment** should also be scoped and carried out to ensure that the project advances equality of opportunity between people who share a protected characteristic.
  - Whilst the Corran Ferry does not serve an island community, the peninsula shares many similar characteristics with Scotland's island communities. There would therefore be benefit in considering whether an **Island Communities Impact Assessment** would

add value to the design process, ensuring that the unique characteristics of the peninsula are protected and enhanced.

State Aid

7.10.3 It is essential to note here that state aid is a matter of law – its definition is very broad, and its application is dependent on its interpretation and legal opinion. **Stantec is neither insured for nor qualified to provide advice in relation to state aid requirements. The narrative in this section highlights state aid considerations in relation to this business case – however, we strongly advise that the Council seeks appropriate independent legal advice on any state aid matters, and indeed procurement more generally.** Furthermore, it is important to emphasise that, if a successful state aid challenge is ever brought in relation to a project, the financial liability lies with the recipient of that aid rather than the funding body – i.e., the Council in this case.

7.10.4 The granting of public funds for capital investment in assets and the provision of operating subsidies has historically been governed by the Treaty on the Functioning of the European Union (TFEU), particularly in relation to state aid. However, the United Kingdom's withdrawal from the European Union on 31st January 2020 and the completion of the subsequent transition period on 31st December 2020 means that the UK is no longer directly bound by these rules.

7.10.5 Under the EU-UK Trade and Cooperation Agreement (TCA), companies in the EU will be able to challenge state aid awarded to UK firms in Britain's national courts if they feel it violates the common principles set out in the agreed TCA, with British firms enjoying reciprocal rights in the European Union. Britain has also agreed to set-up an independent state-aid authority, although the deal does not require the UK to have an *ex ante* regime to approve subsidies / investment before they are granted. Both sides can unilaterally impose tariffs to counter the effect of any subsidies considered to distort free trade, albeit there will be an arbitration system in place to support discussions around this issue.[39]

7.10.6 The implication of the above is that, to minimise any potential state aid challenge, the Council should ensure that the vessels and supporting landside infrastructure are procured in line with the Public Contracts (Scotland) Regulations 2015, as recommended in Section 8.4.

[39] https://www.ft.com/content/bd71fda3-0a34-4b52-ae98-4769848cb628

8 Management Case

8.1 Overview

8.1.1 The Management Case details project management plans, outlining the framework for managing delivery and operational risk, benefits realisation and post-project monitoring and evaluation.

8.2 Evidence of Similar Projects

8.2.1 In developing the business case for new investment, it is beneficial to reflect on the process and outcomes of any similar recent investments to establish whether any lessons can be learned, or good practice replicated. Whilst on paper there is much to be gained from this approach, a key challenge in establishing an objective evidence base is that it is rare – despite guidance to the contrary - for organisations to evaluate and document both the good practices and challenges with a project of this scale. This section therefore largely draws on the project team's own extensive knowledge and experience rather than published documentation. As such, most – although not all - of our experience relates to the Scottish ferry network and it is therefore important to respect confidentiality, thus we have not referenced individual projects.

Lessons Learned

8.2.2 The following sections highlight what we would consider to be the main 'lessons learned' in the context of projects of this nature.

Business Case

- The development of a robust business case – including an objective appraisal of options – is essential in ensuring that the rationale for investment is robust. A business case produced using the 'Five Case Model' covers all of the necessary headings which need to be considered in developing and implementing a project. The project should never be purely operationally led.
- The business case, including financial assumptions within it, should be continually reviewed, with the FBC completed at the point of procurement. The FBC should include tendered costs and a full review of affordability and risk should be undertaken at that point ahead of project commitment.
- The communities and stakeholders which the investment impacts should be engaged throughout the business case process, from SBC through to the point of procurement. Arrangements should be put in place to keep communities and stakeholders informed as the project progresses on-site.
- The vessel and harbour infrastructure should be presented together in the OBC so as to provide a single coherent project approach. There may be a case for splitting the vessel and infrastructure workstreams as the project progresses and particularly at FBC stage as the two procurements can advance at different speeds. That said, there should always remain an overarching coordination piece to ensure the delivery of an integrated solution.

Vessel Procurement

- Vessel procurement is notoriously challenging and can frequently end in litigation or with yards experiencing financial difficulties as a result of cost over-runs. This business case has suggested several approaches to transferring this risk, including the requirement for a refund guarantee, the purchase of FD&D insurance and the appointment of an experienced contractor / consultant to oversee the build on behalf of the client.

- Irrespective of whether a detailed or output specification is used, the design should be fully agreed before the contractors commence work. Moreover, every conceivable effort should be made to ensure that there is a common understanding of the client's requirements and thus minimal reworking of the design once construction has commenced.
- Appropriate documentation of design versions, decisions etc is essential – there should be a clear audit trail which can be followed in the event of staff moving on.
- Appropriate external expertise should be sought where required to oversee a build.
- Where an uncommon or high-risk design is being pursued, that risk should either be transferred through the contract as far as reasonably possible and / or provisioned for in the risk register and financial contingency.
- The crew of existing vessels should also be engaged throughout the design phase. Whilst there is always a risk of change aversion, incumbent crew have an unrivalled understanding of the routes which they operate and can provide 'in the water' feedback which cannot be readily obtained elsewhere.
- The quality component of the procurement should focus on ensuring that bidding yards can demonstrate their experience and suitability to deliver the specification required. The same is true with respect to landside infrastructure.
- The build contract should include provisions around sign-off and acceptance of the vessel, potentially with an after-sales service provided.
- THC should liaise with Transport Scotland / CMAL, other local authorities (e.g., Shetland Islands Council) and sub-regional transport bodies (e.g., Merseytravel) with recent experience in developing and / or delivering new ferry and marine infrastructure projects.

Continuous Review

- Regular and continuous review will provide a good platform for project success. It is important to reflect regularly on what is going well and what is not and adjusting management of the project as it progresses. Challenge to processes, approaches etc. is required and the risk of 'group think' must be avoided. In our experience, it can help to have one or more individuals external to the client body in the team as this can bring a fresh perspective and challenge to established views (as well as a willingness to 'speak-up', which may be less common within an organisational structure).
- Many projects carry out a 'lessons learned' review at the end / completion. Whilst this is essential – and scoped later in this case – it should not detract from reacting actively during the project to anything identified as a problem or a potential problem.

Infrastructure Procurement

- To ensure a smooth procurement journey and contract delivery, it is essential that what is being tendered is very clear, detailed and that the tender returns will provide no ambiguity from any bidder – this is particularly essential where time is of the essence. The outputs required from the bidder must be set out in-depth and the evaluation methodology detailed to allow evaluation on a like-for-like basis. If not, it becomes a lengthy process while clarifications are sought from different bidders to allow evaluation to a standard which will stand-up to any challenge. Spending more time setting out the front end of the tender documents will save time in the long-run.

Governance

- Appoint a suitably qualified Client Project Manager, from internal or external resources and commit fully to the resource being available as needed to protect the interests of the client. For clarity, this is a different role to an NEC Project Manager and Supervisor (or those supervising vessel build), which is a much more contractual role.

- Where external funding parties or stakeholders are involved, there is benefit in forming a Stakeholder Group to keep them abreast of progress and seek inputs or views on funding, regulatory or governance requirements. Such a group may only be advisory, but it is a useful way of ensuring there are no surprises or subsequent issues for the parties involved in a project.
- Build a good team ethos across all of the parties including contractors, stakeholders, funders and the project board. Ensure the communications requirements are clearly established and delivered within and between groups and teams.
- Set out clear roles and responsibilities for all of the parties involved and ensure the correct procedures are in place for any reporting requirements, change to scope / objectives or deliverables.
- Actively manage the risk around the delivery of the project as a whole and through the vessel build supervisor and NEC Project Manager and Supervisor(s). The risk register prepared as part of this business case **(Appendix F)** should be kept live and added to throughout the process.

Delivery

- Manage the programme actively and never assume 'no news is good news'. Be active, be visible and engage with the parties at appropriate times.
- If something is going wrong, ensure this is communicated to all key parties with details of what has gone wrong, why and how to fix it.
- Working actively with the teams will ensure that delivery will go as smoothly as reasonably practicable.

Project Completion

- On completion, a full review of the entire project should be undertaken to identify what went well, what went wrong and what could have been done differently (a process evaluation – this is scoped later in this chapter). This should involve all stakeholders and contractors. Keeping a record of the outputs will provide advice and guidance for any future projects.

8.3 Programme and Project Dependencies

Programme

8.3.1 The table below shows the key milestones for the project. A **high-level programme for the project overall** together with a **detailed programme for the landside infrastructure** works is included in **Appendix G.** It should be noted that:

- These programmes remain subject to funding being achieved
- A detailed vessel-build programme will need to be developed as part of the FBC, if not before

Table 8.1: Key Project Milestones

Milestone	Commencement Date	Notes
Terminal Infrastructure Milestones		
Infrastructure design services award date - *Outline Design and GI Design*	03/05/2021	Given the requirement for new slipways regardless of the vessel design chosen, feasibility and preliminary design was commenced in May 2021 and due for completion in December 2022.

Milestone	Commencement Date	Notes
Completion of ground investigations	Q1 2023	
Infrastructure design services award date - detailed design	Q3 2023	
Award construction contract	Q1 2024	6-week tender evaluation period is scheduled to take place in Q4 2023
Completion of construction	Q3 2025	
Vessel Infrastructure Milestones		
Vessel design services – award naval architect	02/08/2021	NaValue appointed by CMAL and work has progressed
Appoint shipyard	Q2 2023	
New vessel 1 enters service	Q4 2025	
New vessel 2 enters service	Q4 2026	

8.3.2 The durations that have been allowed in the programme are based on experience of marine construction projects of a similar scale, required procurement periods and likely durations for obtaining consents from statutory authorities based upon their advertised response periods for licence applications.

Programme Dependencies

8.3.3 The key dependencies at this stage are as follows:

- **Funding:** At present, there is no committed funding for either the vessels or the infrastructure. The programme is wholly dependent on external funding being achieved.
- **Consents:** Marine, planning and environmental consents are dependencies for awarding the main construction contract. To avoid consents impacting the critical path, engagement with statutory stakeholders (Marine Scotland, Crown Estate, NatureScot, The Highland Council Planning Service etc) should be undertaken as early as possible during design stages. There will also be a requirement to engage with SEPA with regards to a licence for Controlled Activities in the Water Environment.
    - It should be noted that there will be a major pre-application proposal with scheme options, community consultation and committee reporting, all of which are essential steps in evolving the final scheme and achieving local consensus to take the project forward.

8.4 Project Governance

8.4.1 This section considers how the project will be delivered and managed. It considers the:

- Governance framework of the Council
- Project team which will be responsible for the delivery of the vessel and landside infrastructure.

8.4.2 It should be noted that **this outline governance structure would need to be revisited if CMAL procured the vessel or indeed if this was done through a partnership between CMAL and THC**.

Governance Framework

8.4.3 The Council has a *Project Management Governance Policy for Construction Projects* – this is included in **Appendix H**.

Project Team

8.4.4 A specific project team will be developed to deliver this project, consisting of Council Officers and external expertise as required. The governance structure for the project is outlined in the figure below[40], which is assumed to be post-design stage and broadly reflects the governance document included in **Appendix H**. It should be noted that only primary roles are shown, but the project will however have wider administrative support, sub-contractors etc:

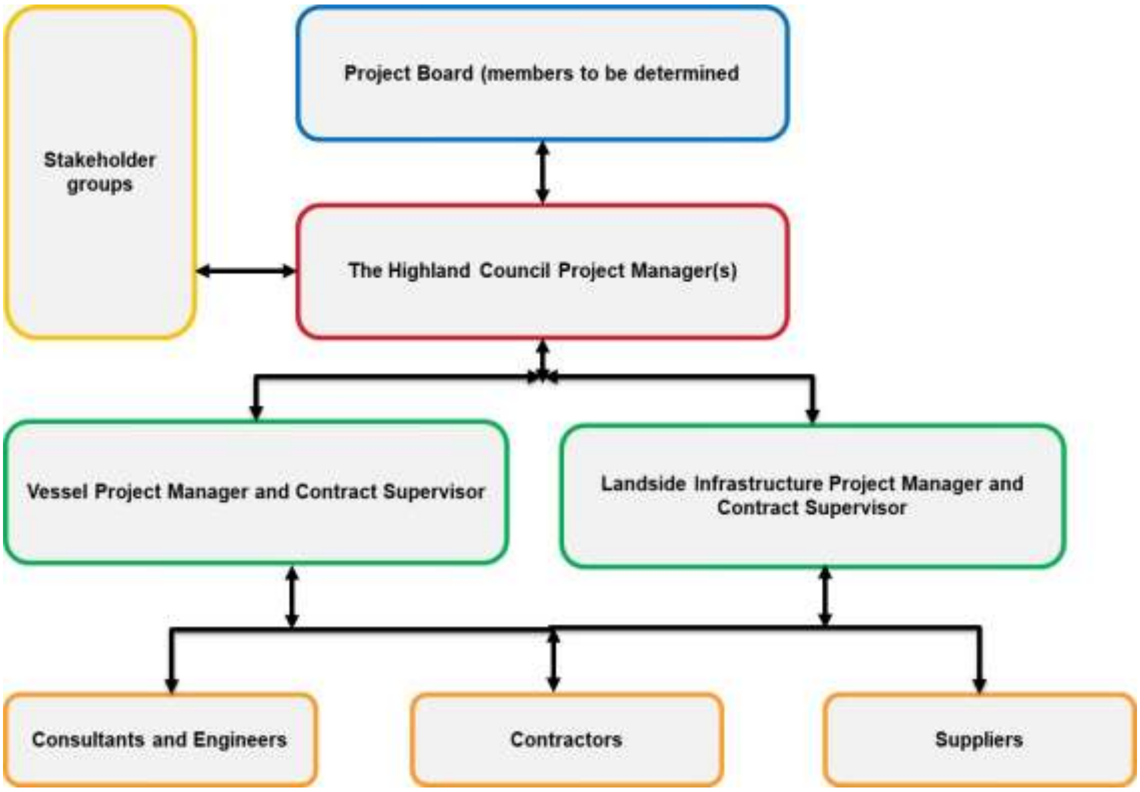

Figure 8.1: Governance Management Structure

8.4.5 To summarise:

- Specific oversight of the project will be the remit of the **Project Board**, the Terms of Reference for which are included **in Appendix I**. The exact composition of the Board may evolve as the project progresses.
- As per the *Project Management Governance Policy for Construction Projects*, the Project Board will report up the chain to the **Capital Programme Board** and ultimately the **Development and Infrastructure Committee**
- The Board will be guided by the advisory **Corran Ferry Steering Group**, which includes representatives of the local community.

[40] This figure should be included in the project governance principles document.

- The project will require a significant day-to-day management input from the Council. A dedicated **Project Manager** or **Project Management Team** for the whole project will need to be appointed. This will either be:
    - (i) from internal Officer resource within the Council;
    - (ii) through a competitive tender or direct appointment of a consultant(s); or
    - (iii) recruitment of a fixed-term employee(s) (or a potential mix of the two depending on available skills).
- Irrespective of how the Project Manager(s) is selected, it is essential that they can dedicate the necessary time to the delivery of the project. The PM will represent the Council and coordinate the flow of information between the Project Board and the workstream Project Managers. Their role will be to deliver project management and governance within the context of the Council's overall project governance procedures set out above. An outline job description is included in **Appendix J**.
- The vessel build and landside infrastructure workstreams will be led by dedicated Project Managers, who will act as the **Contract Project Manager and Supervisor(s)** – these roles are detailed below. The **Vessels Project Manager and Contract Supervisor and Landside Infrastructure Project Manager and Contract Supervisor** will be responsible for managing all aspects of contract delivery including programme, dependencies, budget and contractor interface. It is essential that these roles are filled by an individual / organisation which has an appropriate level of relevant experience and professional indemnity insurance so as to ensure that the Council is protected if they prove to be negligent in their duties.
- The Vessel PM and Landside Infrastructure PM will be required to liaise with each other to ensure appropriate interface, whilst also reporting to the Council Project Manager who will oversee the overall project.

Roles and Responsibilities

8.4.6 Building on the above flowchart, the table below summarises the organisations and individuals which will fill each role in the project team:

Table 8.2: Roles & Responsibilities

Role	Individual / Organisation
Capital Programme Board	Chaired by the Director of the Development and Infrastructure Service, with representatives from other Services as required
Project Board	See **Appendix I**
Council Project Manager	Council Officer(s); and / or fixed-term appointment; and/or consultant
Client's Designers (Vessel and Infrastructure)	- Vessel designers: NaValue (contracted to CMAL) - Infrastructure designers: Wallace Stone
Vessel Project Manager and Contract Supervisor	External appointment through competitive tender
Port Infrastructure Project Manager & Contract Supervisor	External appointment through direct appointment or mini-competition via Scotland Excel Engineering and Technical Consultancy Framework Lot 7 or via competitive tender
Financial advisers	The Highland Council Resources and Finance Service, with external advice procured where required

Role	Individual / Organisation
Legal advisers	The Highland Council Performance and Governance Service, with external advice procured where required
Vessels contractor	To be determined through competitive tender
Landside infrastructure contractor	To be determined through competitive tender

8.5 Assurances and Approvals Plan

8.5.1 The current expectation is that the project will be delivered by the Council irrespective of the funding partners. As a Council funded and procured project, the assurances and approvals plan is determined by the Council's in-house governance arrangements for capital investment. If external funding was secured, compliance with the governance arrangements of the funding parties would also be required.

8.5.2 The overall approvals process is shown in the figure below and described thereafter:

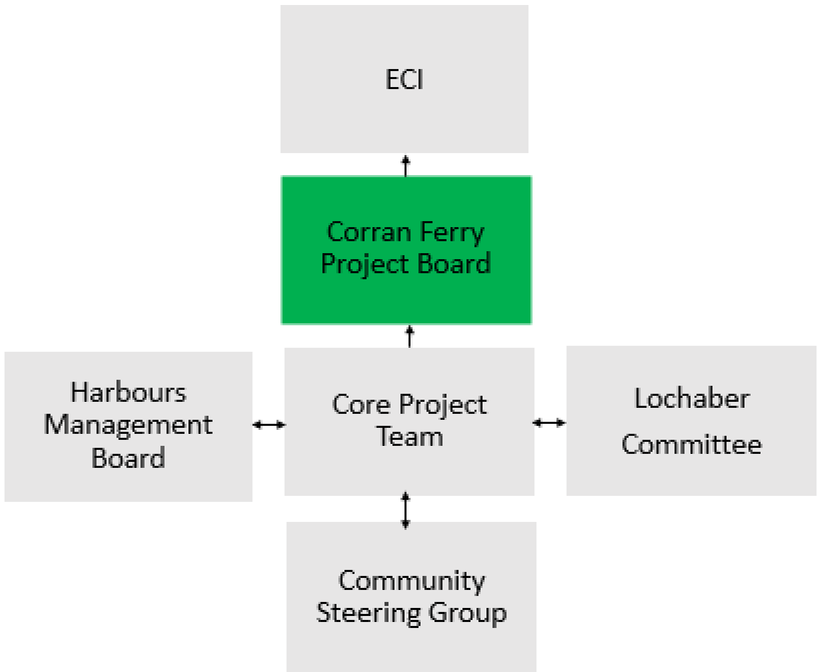

Figure 8.2: Governance Structure

8.5.3 The Corran Ferry Project Board will be part of a wider project approvals process that will involve the Lochaber Committee and the Harbours Management Board. Final decision-making powers will rest with the Economy and Infrastructure Committee. The Corran Ferry Community Steering Group will ensure that links between the community and Council Officers are maintained and that regular users of the service are given a strong voice to represent their local community.

Business Case Development

8.5.4 Underpinning the overall assurance and approvals framework will be this business case process, which has been developed using the Transport Scotland *Guidance on the Development of Business Cases*, which in turn aligns with the H.M Treasury *Green Book*, using the 'Five Case Model'. This represents industry best practice for infrastructure business case development. To recap, the business case approach consists of three stages:

- **Strategic Business Case (SBC)**, consisting of high-level analysis which established the need for the project and identified the options to be shortlisted (completed in November 2018 in the form of a STAG Appraisal).
- **Outline Business Case (OBC)**, containing more detailed analysis of a shortlist of options to identify a preferred option, and setting out the Financial, Commercial and Management strategies (i.e., this report).
- **Detailed design for vessel and landside infrastructure**, which will be used to deliver greater technical and cost certainty.
- **Final Business Case (FBC)**, updating the preferred option analysis and confirming the final financial, commercial, and management approach. The FBC for the vessels and landside infrastructure may be undertaken separately, but there will remain a need for an overarching piece to ensure a fully integrated solution is implemented.

8.5.5 The Final Business Case(s) will need to be prepared following detailed design of the vessel and landside infrastructure, when clearer positions on costs, funding and procurement approaches have been defined. This will be an essential step in the assurance and approvals framework as it will confirm or otherwise the financial and commercial viability of the proposed approach to delivering the project.

8.6 Communications and Stakeholder Management

8.6.1 Significant work has already been undertaken to engage with key stakeholders through the *Corran Ferry STAG Appraisal* (2018) and the *Corran Ferry Socio-Economic Study* (2021). Effective ongoing communication and stakeholder management will be important in ensuring the successful delivery of the project.

8.6.2 To this end, the Council Project Manager(s) will be responsible for developing and implementing a Stakeholder Management Plan (SMP), the purpose of which will be to ensure close liaison with stakeholders and the local community is maintained and that they are kept informed of proposed plans, key dates, service impacts, FAQs etc.

8.6.3 Stakeholders can broadly be split into four categories:

- Statutory
- Strategic
- Operational
- Local

8.6.4 Examples of these stakeholders and the proposed approach to engaging with them is set out below. This initial list and approach will be fully developed in the SMP and may require to be extended / amended depending on any conditions attached through the consenting process (e.g., by Marine Scotland).

8.6.5 A project website will be established and regularly maintained by the Council. This will include progress updates, FAQs, notice of any service outages etc.

Statutory Stakeholders

8.6.6 Statutory stakeholders are those which are not necessarily local to the area, but will have a regulatory interest in the project because it may affect their own policies, strategies or operational plans – these stakeholders could include (but are not limited to), for example:

- Historic Environment Scotland
- Marine Scotland
- NatureScot
- Scottish Environment Protection Agency
- The Highland Council – Planning Service
- Crown Estate
- Transport Scotland (and BEAR Scotland as contracted roads operator), with regards to impacts on the A82 trunk road
- Maritime and Coastguard Agency

8.6.7 Statutory stakeholders will be formally engaged as part of the consenting process. Thereafter, engagement with these stakeholders will be relatively light touch / on an as-required basis and focused on ensuring that they are aware of the work being undertaken. Engagement with each statutory stakeholder will be tailored to suit their individual processes and consenting requirements.

Strategic Stakeholders

8.6.8 Strategic stakeholders may or may not be local to the Corran Narrows but may have a strategic interest in the project. These stakeholders include:

- CMAL
- Highlands and Islands Enterprise
- HITRANS
- Argyll & Bute Council (in terms of connectivity to / from Mull)

8.6.9 These stakeholders will be written to and directed to the project website for information.

Operational Stakeholders

8.6.10 Operational stakeholders are those on which the project will have a direct or indirect operational impact. These include:

- The crew of MV *Corran* / MV *Maid of Glencoul*
- Public service providers to the peninsula, including NHS Highland and THC Education Service.
- Sustrans, in relation to the 'The Caledonia Way' cycling route
- Shiel Buses
- Haulage, logistics and utility providers to the peninsula

8.6.11 The Council Project Manager will be required to engage with some of these stakeholders on a very regular basis (in some cases weekly) to ensure that the project is delivered as required. This will at times involve coordinating discussions between these stakeholders and the Vessel Landside Infrastructure PMs.

Local Stakeholders

8.6.12 The peninsular communities have been engaged throughout the development of the Corran Ferry project, from the STAG appraisal onwards. Building on the Corran Ferry Community

Steering Group, continued and extensive engagement with local stakeholders and communities will be essential as the project progresses. The stakeholder list compiled for the Corran Ferry Socio-Economic Study will provide a good starting point for forming a comprehensive stakeholder list but, as a minimum, engagement should include:

- The Lochaber Committee, which should be regularly briefed on progress
- Community Councils
- Acharacle
- Ardgour
- Morvern
- Nether Lochaber
- Mull
- Sunart
- West Ardnamurchan
- Local estates and landowners
- Local businesses
- Mull and Iona Ferry Committee
- Mull Community Councils

8.6.13 Whilst the website will be the main source of information, broadband connectivity in some areas of the peninsula is limited and regular visits by the Council PM and other relevant individuals should take place. Periodic public meetings or exhibitions to update on progress should also be undertaken. This will again be detailed in the Stakeholder Management Plan.

8.6.14 A key objective of this investment should be to maximise community benefits. Integral to this is developing a pathway for future crew recruitment and development, but other opportunities should also be explored.

8.7 Programme and Project Reporting

8.7.1 Clear reporting arrangements should be established to ensure progress against the programme timescales and budget are communicated effectively. Project reporting will focus on the following aspects of project delivery

- Progress on each workstream – vessels and landside infrastructure
- Key activities to be undertaken before the next report / meeting
- Spend against budget
- Review of strategic risks and issues

8.7.2 Project reporting will be carried out throughout the project, with a weekly reporting cycle for each stream of work – e.g., the contractors will report to the Landside Infrastructure PM, who will in turn report to the Council Project Manager and so forth.

8.8 Risk Management Strategy

As noted in the Financial Case, a combined risk register covering all three cases is included in **Appendix F**. However, it is beneficial to take a step-back from the individual risks, focus on strategic risks and highlight the risk strategy to be adopted on the project – this is summarised in the table below:

Table 8.3: Risk Management Strategy

Risk Item	Strategy	Comment
		Vessels
Design / procurement – i.e., the Council overpays for the vessels	Manage	The Find a Tender procedure is likely to attract only a limited number of bids compared to a commercial approach of working through shipbrokers. There is therefore a risk that the lowest cost is not achieved. However, it is mandatory for the Council to work through this process. This risk can therefore only be **managed**.
Construction cost – i.e., the cost of constructing the vessels exceeds forecast costs	Transfer	It is standard practice for shipyards to take the risk on the cost of newbuild vessels as they are best placed to manage that risk. This risk should therefore be **transferred** through the use of a fixed price contract for an agreed design specification. Care needs to be taken to ensure that the final design is that of the shipyard, as then any design error costs are for their account and not a claim against the Council. An appropriate contingency has been included in the Financial Case to ensure mitigation of any cost increases up to the point of contract signing.
Construction – the construction process does not go to plan	Transfer & manage	As the Council has limited recent experience in managing a ship build, it is strongly recommended that they **transfer** this risk by appointing a specialist firm (with relevant experience and professional indemnity insurance) to supervise and manage the build. If the cost of appointing a specialist firm is excessive, this risk would have to be carefully **managed**, but doing that without recent expertise in shipbuilding would be highly challenging. This risk would be largely mitigated if CMAL was responsible for manging the build, as they have both resource and experience in that area.
Completion – the vessels are not completed on-time or at all because the shipyard encounters financial difficulties	Transfer or manage depending on cost	It is recommended that the Council **transfer** this risk through applying an appropriate financial standing threshold in the PQQ (without it being punitive) and the purchase of FD&D insurance. A refund guarantee should be included in the contract. If the premiums for FD&D insurance are excessive, this risk would have to be **managed** by the Council.
Delay – the vessels' completion is delayed	Transfer or manage depending on cost	Delays to new vessels are highly common. If the Council was to anticipate costs / losses because of any delay, it may wish to **transfer** this risk by including delay damages within the contract, although again not to the extent that they are punitive and deter yards from bidding. However, this may increase the cost of the contract / reduce competition and, if this is considered likely, this risk would have to be **managed** through regular progress meetings with the yard.
Maintenance – breakdowns or other costly maintenance occurs once the vessels are in service	Transfer and then manage over time	The Council should seek an appropriate warranty period for addressing defects with the vessels, and thereafter manage this risk through a scheduled programme of maintenance.
		Landside Infrastructure

Risk Item	Strategy	Comment
Design / procurement – there are interface issues between the new vessels and the landside infrastructure.	Reduce	The detailed design process should be used to reduce this risk. It is also a relatively standard design of a slipway vessel interacting with a 1-in-8 slipway. The Council PM should work in tandem with the Vessel and Landside Infrastructure PMs to further reduce this risk during construction.
Design / procurement – Limited contractor market availability / resource.	Manage	The Scottish marine maintenance and construction market is buoyant due to the generational nature of maintenance and replacement works, so this is a key risk. The contingency included in the Financial Case is intended to account for the risk of inflated costs associated with a buoyant market, and thus will allow THC to **manage** this risk.
Construction cost – the outturn cost identified through tenders is higher than anticipated.	Transfer & manage	Costs should be updated through detailed design and FBC stage and an appropriate contingency retained until final tender prices are in, particularly given current volatility in global material prices – i.e., this risk should be **managed**. Once tenders are received, this risk should be **transferred** as far as reasonably possible to the contractor. The preferred procurement strategy involves the use of a fixed price lump-sum contract.
Construction cost – Inflation over the delivery period exceeds forecasts.	Manage	Annual inflation assumptions have been applied to the costs and will be reviewed regularly throughout the project. Contingency is included to **manage** and mitigate this risk as far as reasonably possible. This risk will however have to be actively managed,
Construction – the construction process does not go to plan	Transfer & manage	The Council has some recent experience in undertaking infrastructure works of this scale, e.g., the new ferry terminal at Uig which is under development. Nonetheless, this risk should be transferred through the construction contract to the contractor, as far as is reasonably possible. The Council PM and Landside Infrastructure Project Manager and Contract Supervisor should though maintain regular dialogue throughout.
Completion / delay – the infrastructure is not ready in time for the new vessels entering service.	Reduce	The project should entail a degree of programme contingency to ensure that the infrastructure is completed well-ahead of the new vessels entering service. In the event that the completion of the new slipways is late, the current / temporary arrangements should be kept in place for as long as possible.

8.8.1 The Council PM will have day-to-day responsibility for managing the risks identified in the risk register and escalating any issues to the Project Board. The risk register will be reviewed regularly throughout the delivery of the programme by the Council PM in liaison with the Vessels and Landside Infrastructure PMs.

8.9 Benefits Realisation

8.9.1 Business case guidance requires the promoter to identify in the Management Case the steps they will take to ensure that the anticipated project benefits are delivered.

8.9.2 This project is somewhat unusual in that its primary benefit is ensuring the continued operation of a resilient ferry service across the Corran Narrows – i.e., it is about ‘protecting’ current day benefits rather than generating new benefits. The *Corran Ferry Socio-Economic Study* (included in **Appendix C**) highlighted the significant economic damage to the peninsular, Lochaber and Mull communities which would result from the ferry service being discontinued. By placing the ferry service on a sustainable long-term footing, this investment would remove the risks identified in the Socio-Economic Study from the ultimate failure of the ferry.

8.9.3 'New' benefits would largely be related to:

- A reduction in short-shipped traffic associated with a significant increase in capacity. This would also address the consequential impact of traffic backing onto the A82(T) and the A861
- Addressing the severance issues for commercial vehicles when MV *Maid of Glencoul* is in operation
- Progression to a safer way of working, in particular discontinuing the practice of ship-to-ship crew transfers

8.10 Monitoring and Evaluation

8.10.1 The final step in the Management Case process is the development of a monitoring and evaluation (M&E) framework, which can be used as the basis of retrospectively assessing the value for money and effectiveness of the investment made.

Monitoring Plan

8.10.2 The monitoring plan should predominantly be focussed on assessing the extent to which the investment contributes towards the Transport Planning Objectives (TPOs) set out in the Strategic Case. In the context of this study, the TPOs are largely operationally focussed and thus the monitoring plan should be built around this.

8.10.3 In order to understand the impact of investment, it is important to have a pre-intervention baseline against which to compare. In the context of this study, this should be fairly simple to develop as, for most of the TPOs, there will be a clear and factual 'before & and after' position. Where this is not the case, data collection should not be particularly intensive.

8.10.4 The table below shows the monitoring requirements for each objective:

Table 8.4: Monitoring Plan

Transport Planning Objective	Required Monitoring Data
Transport Planning Objective 1: The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland.	None – this should be a straightforward before and after comparison.
Transport Planning Objective 2: The Corran Ferry should facilitate year-round access to Ardgour and beyond for all vehicle types.	None – this should be a straightforward before and after comparison.
Transport Planning Objective 3: The available vehicular capacity of the ferry service should as far as possible facilitate compliance with the published timetable	***Before:*** The vessel shuttling data provides an indication of where there are capacity issues at present. However, there would be benefit in collecting 'short-shipped' data (vehicles left behind) at the point when a two-vessel service comes into operation (using the current two vessels). ***After:*** Equivalent short-shipped data should be collected when the new two-vessel solution has bedded-in and a like-for-like comparison made.

Transport Planning Objective	Required Monitoring Data
	This should be adjusted to account for the trend change in carryings over the period.

Evaluation

8.10.5 The term 'Evaluation' in the business case context describes a one-off objective driven review or audit of a project's performance. There are two discrete elements to an evaluation:

- **Process Evaluation:** This is carried out early in the life of a project, before its full effects are known and concentrates on whether input (activity) and expected outcomes for a project are being / have been met.
- **Outcome Evaluation:** This is carried out once sufficient time has elapsed for the project to have delivered its principal outcomes and assesses whether the Transport Planning Objectives have been achieved.

8.10.6 The following sections sets out a recommended approach to the evaluation of the proposed investment.

Process Evaluation

8.10.7 The Process Evaluation would involve an evaluation of how the preferred option was selected and delivered. It would therefore focus on the process of implementation, with the aim of identifying the lessons that could be learned for delivering similar schemes in the future.

8.10.8 The process evaluation would gather a collection of qualitative and quantitative data to understand what worked well and what did not and would involve carrying out a series of mainly one-to-one interviews with staff involved in the delivery phase of the project.

8.10.9 From the interviews and review of documents, information should be gathered on both subjective issues (perceptions of how the implementation and delivery went) and objective issues (factual data on how the implementation and delivery went). More specifically, the evaluation should focus on the process of how the scheme was delivered and identify factors that helped or hindered the effective delivery. The following types of questions should be considered in a process evaluation:

- How was the preferred option delivered?
- In what context was the scheme delivered?
- What worked well in delivering the scheme, why and how?
- What worked less well in delivering the scheme, and why?
- Was the scheme delivered in the way it was anticipated, if not how and why?
- Did the implementation meet budgetary expectations, and were there any unforeseen costs?
- Were there any issues with stakeholders that impacted on the effective delivery?
- Could engagement with stakeholders have been improved?
- What was the experience of staff in delivering the scheme?
- Were delivery team members suitably qualified to implement the scheme?
- Were there process issues that impacted on the outcome of the project?
- How might the delivery process be improved or refined?
- How were community benefits delivered through the project?

8.10.10 Other issues that may be of interest which are also part of the process, but not necessarily part of the implementation / delivery phase, relate to the business case stages. For example:

- Was sufficient resource put into establishing the case for the preferred option (i.e., at STAG / SBC and Outline Business Case stage) – i.e., was the appraisal undertaken sufficient for providing the necessary information for effective decision making?
- Was a clear 'case' made, in terms of quantifying problems which required a transport-based solution? Or was this essentially a solution led process?

8.10.11 The process evaluation would be brought together in a short note with clear and actionable findings for future projects of this nature.

Outcome Evaluation

8.10.12 The outcome evaluation would assess the extent to which the preferred option delivers each of the TPOs. It would use the monitoring framework to identify the extent to which the following outcomes have been delivered:

- Has the solution improved the resilience of the service and addressed threats to long-term threats to service reliability associated with vessel breakdown / failure?
- Has the solution addressed the capacity issues identified in the appraisal and their consequential impacts in terms of traffic blocking back onto the A82(T) and the A861?

8.10.13 The above evaluation would satisfy the requirements of STAG and the Business Case Guidance in terms of measuring the 'transport outcomes' of a 'transport investment'.

Appendix A The Corran Ferry STAG Appraisal

Corran Ferry Services Options Appraisal

Final STAG Report

On behalf of **Highland Council**

Project Ref: 43238 | Rev: SC | Date: August 2018

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Document Control Sheet

Project Name: Corran Ferry Services Options Appraisal

Project Ref: 43238

Report Title: Final STAG Report

Date: 3rd August 2018

	Name	Position	Signature	Date
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Approved by:	Scott Leitham	Director, Transport Planning	SL	03/08/2018
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
V.FINAL	13/11/18	Updated to account for Lochaber Area Committee and E&DI Committee outcomes plus environmental stakeholder feedback	SC	SL	SL

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Executive Summary

The Corran Ferry service operates the short passenger & vehicle crossing of the Corran Narrows between Nether Lochaber and Ardgour. The service provides a lifeline connection linking the communities of Fort William, Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isle of Mull. The ferry serves a wide variety of purposes including providing access to employment and other key services for residents, acting as a gateway for tourists visiting the peninsula and meeting the supply chain needs of the above communities.

In recent years, a number of operational, financial and other challenges have emerged which present both short and long-term threats to the future sustainability and viability of the service. Recognising this, the Highland Council (THC) commissioned Peter Brett Associates LLP (PBA), Mott MacDonald Ltd (MML) and WSMD Associates to undertake a Scottish Transport Appraisal Guidance (STAG) appraisal of future options for the Corran Ferry services.

There are two discrete questions which this appraisal seeks to inform:

- What level of service should be provided in the future? (the 'what'); and
- How should the service be funded and delivered? (the 'how').

The outcome of the study is a set of appraised and costed options in relation to the future service specification, and consideration of the different ways in which this could be delivered.

It should be noted at the outset that there is an aspiration for a fixed link across the Corran Narrows. In the context of how projects of this nature are identified, prioritised and funded in Scotland, this is a longer-term proposition. This study is therefore focussed on the immediate transport problems associated with the ferry service, recognising that actions are required to ensure its sustainability in the short to medium term. Consideration of any future fixed link will be a matter for Transport Scotland's Strategic Transport Projects Review 2 (STPR2) and thus does not form part of this appraisal. It should be noted that, even if a fixed link was prioritised in STPR2, this is a very long-term proposition which does not negate the much more immediate need to put the ferry service on a sustainable footing.

Problems & Opportunities

A robust and evidence-based identification of transport problems & opportunities is the starting point for any STAG appraisal. The main problems identified here are:

- The tidal race through the Corran Narrows and the absence of a berthing or aligning structure at the slipways necessitates the use of quarterpoint vessels. This is a unique infrastructure arrangement for this scale of operation in Scotland. Whilst safe and operationally effective, it requires THC to retain two vessels to ensure the provision of a year-round service. THC estimates that the requirement to maintain a year-round relief vessel adds around £100k to the annual revenue costs of the operation, whilst also presenting challenges in terms of maintaining crew familiarisation with the vessel.
- The relief vessel, the MV *Maid of Glencoul* dates from the 1970s and is in urgent need of replacement, not least because sourcing spare parts for her is becoming increasingly problematic.
- The Corran vessels overnight on swinging moorings on the Ardgour side of the crossing, requiring a vessel-to-vessel transfer at the start and end of the operating day. This is an uncommon practice and presents a health & safety risk, albeit one which is currently well managed.
- Whilst the marshalling area on each side of the crossing is generally sufficient, traffic can block back onto the roads during peak periods and when the lower capacity MV *Maid of Glencoul* is in operation. This creates a safety risk, particularly in relation to the busy A82 trunk road.

- There is an immediate issue in relation to the sustainability of the crewing model:
  - The total number of crew is at or near the minimum complement required to run the current service. Indeed, there is a reliance on overtime to maintain the operation of the service and there is very little spare capacity to accommodate sickness, training etc.
  - Recruitment is proving to be challenging. Agency crew, particularly those with appropriate qualifications, are proving difficult to attract and retain.
  - There is also an emerging demographic challenge as the crew age profile increases.
  - The Corran Ferry is the busiest singe vessel route in Scotland and thus there is pressure on the crew to meet the needs of this frequent and busy service.
- Vehicle deck capacity can be a problem on peak sailings on the Corran Ferry. This problem is addressed through departing from the timetable and operating the service in shuttle mode, but this places added time and workload pressure on the crew.
- Fares are a key issue for the communities served by the ferry, with consultation respondents noting that the current level of fares is inhibiting the economic development of the community.
- Whilst the Corran Ferry service maintains a very high standard of reliability, it is important to bear in mind that, as both vessels get older, the probability of breakdowns increases and the repairs / sourcing of parts may take longer. This is particularly the case with the MV *Maid of Glencoul*, which dates from the 1970s. There is therefore an emerging longer-term reliability problem to be addressed on the crossing.
- During periods when the Corran Ferry is out of service, the road based diversion is lengthy – for example, for residents of Morvern, Sunart and Ardgour, the car-based journey time to Fort William increases by around 30-40 minutes.
- Commercial vehicle access to the eastern part of the study area is hampered by a 12 feet height restriction on the A861, which makes the Corran Ferry the means of accessing Ardgour and beyond (including Lochaline for services to Fishnish on Mull). General service outages are problematic in this respect and give rise to a degree of severance for the peninsula. However, a more specific issue arises when the primary vessel, the MV *Corran*, is out of service. The secondary vessel, the MV *Maid of Glencoul*, is also limited to carrying shorter articulated lorries and a maximum of 38t in weight; 16 feet in height; and 12 metres (rigid) / 15 metres (artic) in length. Consequently, and because there are height and weight restrictions on the alternative road routes, the peninsula is effectively cut off for many large commercial vehicles when she is in service.
- The Oban – Craignure ferry service is currently operated on a year-round basis by the MV *Isle of Mull*. She is a closed deck vessel and therefore cannot carry certain categories of dangerous goods, which instead route via the Corran Ferry and Lochaline – Fishnish. The reliability of the Corran Ferry service is therefore important in meeting this island need during the winter timetable, when the MV *Isle of Mull* is operating on her own. The scheduled deployment of the MV *Maid of Glencoul* for refit cover typically coincides with this period. Dangerous goods access to Mull via Corran and Lochaline therefore becomes challenging for the six or so weeks per year that MV *Corran* is away for refit.
- In terms of methods of delivery, the Corran Ferry is the only route of any significance operated by THC. Responsibility for the ferry service sits within the Council's Roads and Transport Department, rather than a specific marine department or arms-length ferry operating company. This means that Highland Council does not benefit from the economies of scale that accrue to the likes of Orkney and Shetland Islands Councils, both in terms of cost and regulatory compliance. From an operational perspective, the operation of the route in isolation has led to a very specific infrastructure design and has limited the ability to secure refit / breakdown cover from elsewhere, thus necessitating the retention of a second vessel. In addition, the ability to attract and retain both regular and agency crew is becoming a threat to the sustainability of the service. This problem again stems from the route being operated in isolation.

Transport Planning Objectives

The setting of Transport Planning Objectives (TPOs) is a key step in the STAG process as they define what the policymaker should be seeking to achieve through the transport intervention. The TPOs are generally the primary basis by which the impacts of options on the issues specific to a study are assessed. However, in the context of ferry services, the Transport Scotland Routes & Services Methodology provides a 'top-down' guide as to the appropriate level of service for a given community.

Routes & Services Methodology

As part of their comprehensive review of all publicly supported ferry services in Scotland, Transport Scotland developed a 'Routes & Services Methodology' (RSM) designed to ensure a consistent approach to ferry service provision across the country. The RSM is a six-step process which aims to identify whether gaps exist in the current level of service provision[1] for ferry-dependent communities in Scotland. It is intended to be applied consistently across all communities served by the ferries network. Where gaps are identified, options to address the gaps are developed and appraised to set the priorities for future spending.

Our review of the RSM results for the study area establishes that **the current Corran Ferry service is fully aligned to the model service specification**. The options considered in this study are therefore focused on any **infrastructure investment** required to **maintain** the current level of service.

Transport Planning Objectives

The following Transport Planning Objectives were set as a basis for the appraisal in recognition of the evidenced problems & opportunities:

- **Transport Planning Objective 1:** The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland.
- **Transport Planning Objective 2:** The Corran Ferry should facilitate year-round access to Ardgour and beyond for all vehicle types.
- **Transport Planning Objective 3:** The available vehicular capacity of the ferry service should as far as possible facilitate compliance with the published timetable.
- **Transport Planning Objective 4:** The delivery and funding model should ensure the long-term sustainability and resilience of the Corran Ferry service.

Infrastructure Options Development

In keeping with STAG, a set of 'Infrastructure Options' were generated at the 'Initial Appraisal' stage. Options which were either undeliverable or did not make a meaningful contribution to the TPOs were discounted at this stage. The options were then subjected to a more detailed assessment in terms of their performance against the TPOs and with respect to their affordability to identify a shortlist. In developing the shortlist of options, it was considered that:

- Immediately introducing two new vessels to the route would be disproportionate given the remaining lifespan of the MV *Corran* and the relatively infrequent use of the second vessel; and
- A new vessel with an equivalent vehicle deck capacity to the MV *Corran* would not address the evidenced capacity options, and thus only options which offered a larger capacity main vessel were progressed to the Detailed Appraisal stage.

[1] Defined by the number of days which the service operates, the number of crossings per day and the length of the operating day.

The following options were therefore shortlisted for further consideration at the detailed appraisal stage:

- Option 1a: 1 * new larger quarter point vessel, with MV *Corran* retained as the refit / relief / second vessel. Two overnight berths would be required.
- Option 2c: 1 * larger straight through vessel, with MV *Corran* retained as the refit / relief / second vessel. Two overnight berths would be required. A berthing or aligning structure is required.
- Option 2d: 1 * larger straight through vessel, with refit / relief / second vessel secured from elsewhere. One overnight berth would be required. A berthing or aligning structure is required.

Appraisal of Infrastructure Options – Transport Planning Objectives

STAG involves the appraisal of all options on a seven-point scale, as follows:

✓✓✓ - Major Positive

✓✓ - Moderate Positive

✓ - Minor Positive

O – Neutral

× - Minor Negative

×× - Moderate Negative

××× - Major Negative

The table below provides a summary of the appraisal of each option against the Transport Planning Objectives:

Appraisal of Options against TPOs

Infrastructure Option	Description	Relief / 2nd Vessel	TPO 1 – infrastructure	TPO 2 – Year round access for all vehicles	TPO 3 – capacity
1a	1 * L QP	MV *Corran*	✓✓	✓✓	✓
2c	1 * L ST	MV *Corran*	✓✓	✓✓	✓
2d	1 * L ST	From fleet	✓✓	✓	✓

The following points should be noted from the above table:

- All three options involve upgrades to the slipways, which would address the infrastructure issues associated with marshalling, the width of the slipways, commercial vehicle swept paths etc.
- It is proposed under all of the options to retire the MV *Maid of Glencoul*, which would remove the current impediments to year round access by all vehicle types. Options 1a and 2c score more highly with respect to year round access as they offer guaranteed asset availability immediately all year round. In Option 2d, whilst it would be possible to procure a relief vessel to cover scheduled drydocking and breakdowns, there is a risk of service outages whilst a vessel is cascaded to the Corran route

Appraisal of Options – STAG Criteria

The following table summarises the performance of each option against the STAG criteria:

Appraisal of Options against TPOs

Infrastructure Option	Description	Relief / 2nd Vessel	Environment	Safety	Economy	Integration	Accessibility & Social Inclusion
1a	1 * L QP	MV *Corran*	×	✓✓	✓✓	✓	O
2c	1 * L ST	MV *Corran*	××	✓✓	✓✓	✓	O
2d	1 * L ST	From fleet	××	✓	✓	✓	O

The following points should be noted from the above table:

- From an **environment** perspective, all options are likely to have a negative environmental impact to a greater or lesser degree. However, the research undertaken as part of this study suggests that these impacts will generally be minor and short-term (associated with construction) and can be mitigated to a degree. The Construction Works associated with the two options which introduce a *Loch* Class type vessel (Options 2c & 2d) are of a greater scale than Option 1a. Consequently, these options have greater negative impacts in terms of noise & vibration, visual amenity, landscape and local air quality.
- All of the options record a positive impact against the **safety** criterion, although the benefit is more about reducing the risk of accidents (e.g. vessel-to-vessel crew transfer, vehicles blocking back out of the marshalling area etc) rather than addressing an evidenced accident / safety problem. Options 1a and 2c, where the MV *Corran* is retained record a larger benefit in terms of reducing the risk of accidents as they:
    - eliminate the process of vessel-to-vessel transfer;
    - extend / realign the marshalling areas; and
    - ensure that a suitable vessel is available to operate the route on a year-round basis.
- Option 2d delivers the first two bullets above. However, unless a suitable relief cover arrangement is put in place, there is a risk that any relief vessel could be capacity constrained, leading to blocking back out of the marshalling area or incapable of carrying large CVs, leading to additional road miles on poor quality roads.
- Options 1a and 2c would provide moderate **economy** benefits in that the increase in capacity would reduce the volume of 'short-shipped' traffic during peak periods, thus reducing average travel times across the year. This would particularly be the case when events are on in the area, on summer weekends and over the period when the MV *Maid of Glencoul* is currently in operation. Option 2d would provide a similar benefit when the new larger straight through vessel is in operation, but the benefits are less certain around refit time in terms of the availability and capacity of the relieving vessel.
- All of the options offer a minor benefit in terms of **transport integration** in that they reduce the current constraints associated with large commercial vehicles when the MV *Maid of Glencoul* is in operation. They will also ensure plentiful capacity for scheduled bus services using the Corran Ferry, although there is no evidence that this is a problem at present. All three options make a positive contribution to the **policy integration** criterion, in that they would support the long-term sustainability of the service by addressing the current asset related issues.
- As the options presented are focused on maintaining the current level of service, they are broadly neutral from an **accessibility & social inclusion** perspective.

Methods of Delivery

Having shortlisted the infrastructure options which could deliver the TPOs and ensure the sustainability of the service, the key outstanding question is how both the assets and the service should be delivered in the future. This is a complex area and is not easily summarised, although the key points and questions are set out below.

The principal issues to be considered in terms of the methods of delivery are as follows:

- Who is funding the capital and revenue requirements of the service?
- Who owns the landside infrastructure?
- Who provides the vessel(s) and how is relief cover provided?
- Who operates the service?
- How are the fares set and what level should they be at?

The following methods of delivery options have been shortlisted, based on their contribution to TPO4:

- **MoD, Do Minimum:** THC continue to operate the service on the same basis as at present.
- **MoD1, Public Sector Operation:** Transfer of responsibilities to Transport Scotland, with the Corran Ferry being run on an 'in-house' basis.
- **MoD2, Public Service Obligation:** THC specifies a Public Service Obligation (PSO) on the Corran Narrows and depends on finding an operator(s) to run the service (as specified by THC) without subsidy.
- **MoD3, Public Service Contract:** Specify a Public Service Contract (PSC) and seek an operator to run the route with subsidy – there are two variants to this option:
  - **MoD3a:** THC to establish a PSC and seek an operator to run the route.
  - **MoD3b:** Seek a transfer of responsibilities to Transport Scotland, which would establish a PSC and seek an operator to run the route.

The table below summarises the delivery models and potential sub-options under each model in terms of infrastructure owner, vessel provider, operator and operating deficit funding provider:

*Note – in all cases in the table below where **Transport Scotland** is identified as the Operating Deficit Funding Provider, it is assumed that this is on a 'no net detriment' to Transport Scotland basis (i.e. the deficit, whilst paid by Transport Scotland, is funded by a reduction in the THC Grant Aided Expenditure settlement).*

Summary of Potential Delivery Models

Infrastructure Owner	Vessel Provider	Operator	Operating Deficit Funding Provider
Do Min - Public sector operation – continue with current THC delivery model			
Highland Council	Highland Council	Highland Council	Highland Council
MoD1 - Public sector operation – transfer of responsibilities to Transport Scotland			
CMAL	CMAL	CalMac	Transport Scotland
Highland Council	CMAL	CalMac	Transport Scotland
MoD2 – Public Service Obligation			
Highland Council	Private Operator	Private Operator	None
MoD3a: Public Service Contract – The Highland Council			
Highland Council	Private Operator	Private Operator / Public Sector Bidder	Highland Council
Highland Council	Highland Council	Private Operator / Public Sector Bidder	Highland Council
MoD3b: Public Service Contract – Transfer of Responsibilities to Transport Scotland			
Highland Council	Private Operator	Private Operator / Public Sector Bidder	Transport Scotland
Highland Council	CMAL	Private Operator / Public Sector Bidder	Transport Scotland
CMAL	Private Operator	Private Operator / Public Sector Bidder	Transport Scotland
CMAL	CMAL	Private Operator / Public Sector Bidder	Transport Scotland

With respect to each delivery model, there are a series of outstanding questions in relation to vessels & refit / relief / breakdown cover; slipways & infrastructure; crewing; and fares, and little by way of precedent to go on. The outputs from this study should be used as the basis for further exploring these questions within THC, with Transport Scotland and potentially with prospective operators through a market testing exercise.

Cost to Government

In terms of capital cost, the key decision point which emerges from this study is whether there should be a commitment to provide aligning structures at both berths to facilitate the use of straight-through vessels in the tidal narrows. Although this implies a higher capital cost than continuing with the current operational practice, it would remove the constraints on the route once and for all which require the current bespoke solution. This higher up front cost should therefore be seen in the context of the longer-term benefits.

The table below provides a summary of the high-level capital costs of the three options. It is assumed that all costs are paid in a one-off up-front sum and thus we have not provided a 30-year discounted cost stream. Implicit within this approach is that we assume under Options 1a and 2c that the MV *Corran* would remain a viable vessel for the 30-year duration of the appraisal due to the infrequent use of the second vessel. The infrastructure costs are subject to 44%

Optimism Bias at this stage, as per the STAG Technical Database. New vessels are not subject to Optimism Bias.

High Level Capital Cost

	Infrastructure Costs[2]	Vessel Costs (hybrid)[3][4]	Vessel Costs (conventional)
Option 1a *- 1 * Larger QP / MV Corran 2nd Vessel / 2 * Overnight Berth*	£14.8m	£14m - £17m	£8m - £10m
Option 2c *– 1 * Larger ST / MV Corran 2nd Vessel / 2 * Overnight Berth*	£23.0m	£14m - £17m	£8m - £10m
Option 2d *- 1 * Larger ST / 2nd Vessel from fleet / 1 * Overnight Berth*	£23.0m	£14m - £17m	£8m - £10m

It is worth noting that if a fixed link across the Corran Narrows is realised in the long-term, any new quarter point vessels would likely have less resale value / redeployment potential compared to a straight through equivalent.

With respect to operating costs, as the nature of the service does not materially change under the options, the operating cost structure which emerges will reflect the vessel design, the arrangements for relief cover, and the crewing & operational models adopted. The analysis undertaken in this study suggests that, relative to today, some aspects of cost may rise and some may fall leading to a position of broad neutrality or modest increase. A step change in operating costs is not foreseen under any of the options considered here. Overall, there will be a net Cost to Government associated with any of the service and delivery options. However, the cost to different parts of the public sector may vary if THC seek to involve other parties in providing the service. The balance of cost to these different parties would be the subject of negotiation and the issues set out here will help inform this discussion.

Risk & Uncertainty

Taken as a whole, the potential risks and uncertainties associated with the proposed options are relatively minor and, from a financial perspective, captured through the application of Optimism Bias.

The principal uncertainty which needs to be addressed is the method of delivery. At present, there are a significant number of unanswered questions which will need to be resolved between the various parties before a preferred option can be identified and taken forward to procurement.

Public Acceptability

The approach to consulting on options in this study has reflected the scope of work and intended outcomes. This study is not a typical STAG appraisal in that:

- The focus is not on materially improving service levels from the public perspective (outwith an increase in vessel capacity), rather it is on putting the current services on a more sustainable long-term footing – there is therefore little differentiation between the options as perceived by the public providing the objectives are met.
- In considering the methods of delivery, this study also strays into consideration of the ‘Commercial’, ‘Financial’ and ‘Management’ Cases, which would typically only be developed in an Outline Business Case, which would follow on from a STAG appraisal.[5] As previously noted, there is a range of unresolved issues around each method of delivery

[2] Includes optimism bias at 44%

[3] No optimism bias applied to vessel costs as these are based on outturn costs for previous vessels

[4] Note – vessel costs are based largely on recent ferries built at Scottish yards.

[5] Note – a completed STAG Appraisal is considered equivalent to the Strategic Business Case, which precedes the Outline Business Case.

which would need to be resolved before the options could be presented to the public and stakeholders.

Given the above, the approach taken to consulting on the options at this stage has been to present them to, and discuss them with Elected Members. Once a greater degree of clarity is obtained on the questions surrounding each delivery model and a preferred option has been identified, it would potentially be beneficial to consult with the public and local stakeholders at this stage.

Through the Committee process, the Council:

- approved the appointment of a Project Manager to undertake further exploration of options, in more detail in order to develop an Outline Business Case, including essential consultation with Members and appropriate stakeholders; and
- approved discussion with Transport Scotland in order to explore options in more detail.

Next Steps

With respect to Transport Scotland's Business Case Guidance[6], this STAG-based study also provides / is equivalent to the **Strategic Business Case** for the future of Corran Ferry service. As well as considering vessel and related infrastructure requirements, this analysis has set out the parameters to facilitate an informed debate within THC, as well as between THC and Transport Scotland as to the future delivery of the service.

The agreed next step is to proceed towards an **Outline Business Case** (OBC), in line with the Transport Scotland guidance. The key purpose of the OBC is to settle on, and develop a preferred option to facilitate subsequent procurement. This would involve:

- development of the dialogue between THC, Transport Scotland, and potentially CMAL & CalMac Ferries Ltd – informing the Commercial, Financial and Management cases in particular;
- development of the shortlisted infrastructure options with a view to reducing optimism bias, determining the preferred option and establishing greater cost certainty prior to any procurement – this issue essentially boils down to a choice between continuing quarter point operation or a switch to straight through ferries;
- detailed engagement with all relevant parties (including potential vessel providers (main and relief) and operators) to develop the vessel solution and associated operational & crewing models, in order to establish greater cost certainty with respect to the vessel and operating costs;
- analysis of the impact of any changes to fares structures on patronage and revenue; and
- public and stakeholder engagement – particularly with respect to vessel design and fares.

Taken together these components would provide the basis for an OBC from which the preferred option can subsequently be taken through a Final Business Case to procurement.

[6] https://www.transport.gov.scot/publication/guidance-on-the-development-of-business-cases/

1 Overview

1.1 Overview

1.1.1 The Corran Ferry service operates the short passenger & vehicle crossing of the Corran Narrows between Nether Lochaber and Ardgour. The service provides a lifeline connection linking the communities at Fort William, Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern, the Isle of Mull and beyond. The ferry serves a wide variety of purposes including providing access to employment and other key services for residents, acting as a gateway for tourists visiting the peninsula and meeting the supply chain needs of the above communities.

1.1.2 In recent years, a number of operational, financial and other challenges have emerged which present a threat to the future viability of the service. Recognising this, the Highland Council (THC) has commissioned Peter Brett Associates LLP (PBA), Mott MacDonald Ltd (MML) and WSMD Associates to undertake an options appraisal for the future of the Corran Ferry services.

1.2 Scope of the Appraisal

1.2.1 There are two discrete questions which this appraisal seeks to inform:

- What level of service should be provided in the future? (the 'what'); and
- How should the service be funded and delivered? (the 'how').

1.2.2 The outcome of the study is a set of appraised and costed options in relation to the future service specification, and consideration of the different ways in which this could be delivered.

1.2.3 It should be noted at the outset that there is a local aspiration for a fixed link across the Corran Narrows, potentially incorporating tidal energy devices. In the context of how projects of this nature are identified, prioritised and funded in Scotland, this is a relatively long-term proposition. This study is therefore focussed on the immediate transport problems associated with the ferry service, recognising that actions are required to ensure its sustainability in the short to medium term. Consideration of any future fixed link would be a matter for Transport Scotland's forthcoming Strategic Transport Projects Review 2 (STPR2) and thus does not form part of this appraisal. It should be noted that, even if a fixed link was prioritised in STPR2, this is a very long-term proposition which does not negate the much more immediate need to put the ferry service on a sustainable footing.

1.3 Scottish Transport Appraisal Guidance

1.3.1 The Scottish Transport Appraisal Guidance (STAG) is the common means by which all transport projects seeking funding should be identified and assessed. A STAG study should develop and appraise a range of options which can address the transport problems and opportunities identified in a study area. In business case parlance, a STAG is equivalent to a Strategic Business Case (SBC), and provides the gateway to an Outline Business Case (OBC), at which stage a preferred option is identified and worked up in detail.

1.3.2 Transport Scotland is in the process of refreshing the terminology used in the STAG Guidance. This report will make use of the new terminology in anticipation of the refreshed guidance being published by the time this study is signed-off.

1.3.3 There are generally four broad stages in a STAG Appraisal:

- **Initial Appraisal – The Case for Change[7]:** which makes the 'case for change' based on evidenced problems & opportunities and in turn develops a set of objectives for the

[7] Formerly Pre-Appraisal

appraisal and generates a long-list of options which may be capable of addressing the problems and realising the opportunities.

- **Preliminary Appraisal**[8]**:** a high-level appraisal of all options generated during the Initial Appraisal.
- **Detailed Appraisal**[9]**:** detailed appraisal of options against the Transport Planning Objectives using quantitative techniques and analysis. The outcome of the Detailed Appraisal will be a shortlist of options which can be taken forward into the OBC process.
- **Post-Appraisal:** once investment is committed and realised, monitoring and evaluation to assess performance against the original appraisal.

1.3.4 As explained above, in a typical STAG appraisal, the options emerging from the Initial Appraisal stage are taken forward to the Preliminary Appraisal. This allows for a further qualitative sift of options to be undertaken, identifying a much smaller subset of options to be taken forward to Detailed Appraisal, where a more thorough (and where possible quantified) appraisal is undertaken.

[8] Formerly STAG Part 1 Appraisal.

[9] Formerly STAG Part 2 Appraisal.

2 Background & Context

2.1 Overview

2.1.1 This chapter sets out the operational and delivery context for the current Corran Ferry service. Five elements are considered:

- assets & infrastructure;
- operations;
- carryings & capacity utilisation;
- fares; and
- finance & procurement.

2.1.2 The purpose of this chapter is to set out the factual position in relation to each of the above elements of the service. The material presented is subsequently drawn on in Chapter 3, which establishes the problems, issues, opportunities and constraints associated with Corran Ferry service.

2.1.3 It should be noted that a study assessing the socio-economic impact of the Corran Ferry service was published in 2014. The report detailed the critical importance of the ferry to meeting the varied socio-economic needs of the fragile communities served by the Corran Ferry. The conclusions of this report still stand and thus socio-economic issues are not revisited in this study.

2.2 Assets and Infrastructure

2.2.1 This section considers the assets and infrastructure (vessels and slipways) currently used to deliver the Corran Ferry service. This contextual information provides the infrastructure & operational baseline on which the subsequent appraisal is developed.

Nether Lochaber Ferry Terminal

2.2.2 Nether Lochaber Ferry Terminal is approximately 9 miles south of Fort William and is accessed via the A82.

2.2.3 As shown in the Figure below facilities within the ferry terminal comprise a:

- slipway; and
- marshalling area for approximately 15 cars.

2.2.4 Also within the vicinity of the terminal there is:

- A861 road;
- ferry terminal toilets for passengers and crew;
- a bus stop / shelter;
- a bunkhouse;
- a café / restaurant; and
- a number of residential properties.

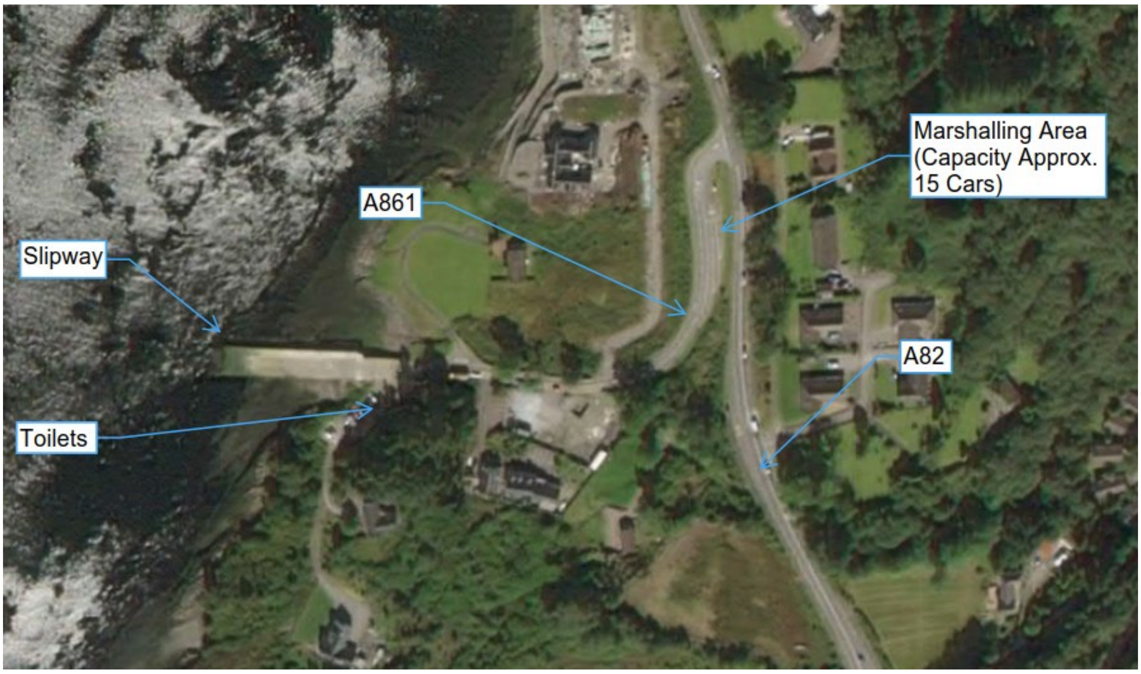

Figure 2.1: Facilities within Nether Lochaber Ferry Terminal

Land Ownership and Licencing

2.2.5 Available information, indicates that the ownership of the slipway at Nether Lochaber was transferred to the Highland Council Under the Highland Roads and Bridges Act 1862. Since then, there have been a number of small land purchases from the Ardgour Estate to extend or modify the slipway.

2.2.6 From reviewed correspondence it appears that the land the slipway was extended into in 2010, as shown below, has still to be formally acquired by Highland Council and this is currently owned by the Ardgour Estate.

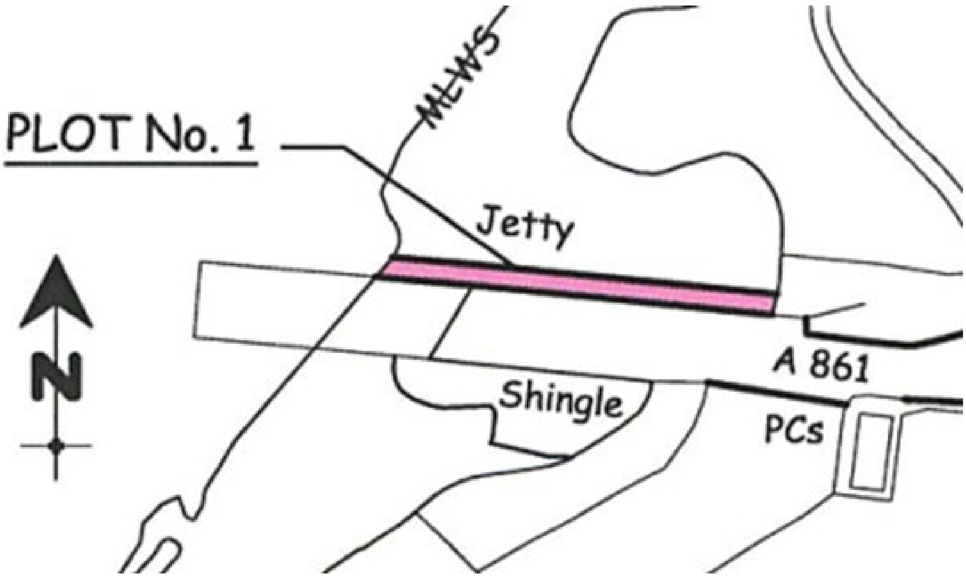

Figure 2.2: Area of Land still to be acquired for works to extend slipway undertaken in 2010

2.2.7 In addition to the slipway, it is understood that the Council own the A861 and the area currently used as marshalling area at Nether Lochaber. All other surrounding land is owned by private land owners, or the Ardgour estate.

Slipway

2.2.8 As-Built records are not available for the construction of the original slipway at Nether Lochaber, our understanding of the slipways form and condition is based upon:

- ‘as-built’ drawings for the widening of the slipway (R. G. Parkins and Partners, 2010); and
- Corran Ferry Slipways Condition Survey, Inspection Report (Arch Henderson, May 2017)

Figure 2.3: Nether Lochaber Slipway

2.2.9 The Slipway at Nether Lochaber is approximately 12m wide, 13m at the toe, this includes extensions that were undertaken to the slipway in 2010 – a 3m wide extension along the entire length of the slipway’s north face and a 1m wide extension was constructed at the toe on the south face.

2.2.10 The ferry vessels can access the slipways on all states of tide. However, on the extremities of Spring Tides it was noted by ferry staff that it is not possible to get the heeling bracket on the slipway to assist with stabilising the vessel when vehicles are offloading from and loading to the ferry. In these tidal conditions, the ferry cannot take heavy commercial vehicles (CVs).

2.2.11 The original slipway was formed of two retaining walls, infilled with granular material, which supports a concrete slab. It is believed that a subsequent north wall was formed of sheet piles, however, these had corroded to such an extent that they required to be replaced with a new fibre reinforced mass concrete wall – understood to be part of the 2010 repair works.

2.2.12 The table below summaries the inspections and repairs that are known to have been undertaken at Nether Lochaber Slipway in recent years.

Table 2.1: Summary of Inspections and Repairs undertaken at Nether Lochaber Slipway

Date	Description	Cost
September 2010	Repairs undertaken to extend the slipway	£1.0 million (Approx.)

Date	Description	Cost
April 2017	Arch Henderson were commissioned to undertake a non-intrusive condition survey of Nether Lochaber Slipway. Note: Scope of their survey was to only look at the condition of the wearing surface.	
May 2017	Arch Henderson Survey Report noted minor defects on the surfacing of the slipway.	

2.2.13 To allow for the service to remain operational throughout the 2010 repair works, it is understood that a barge was used as a temporary slipway for the vessel.

2.2.14 The scope of the Arch Henderson survey in 2017 was to visually inspect the slipway wearing surface and comment on its condition. It was not part of their scope to undertake an inspection of the entire structure. It was noted within their report that the 2010 extension looked to be sound, however there was evidence of the commencement of erosion along the northern edge as a result of abrasion from the ferry. Although undercutting of the structure is not noted within Arch Henderson's report it is considered likely, given their comment, that some will have occurred in the eight years since the repairs were undertaken to the slipway. This will be caused by vortex effects created by the vessel's propulsion system as it berths against the slipway many times daily.

2.2.15 The Arch Henderson report noted that there was general erosion of the top surface resulting in some holes varying in depth from 20-50mm. It was recommended that the concrete around these holes are broken out locally and repairs undertaken.

Marshalling

2.2.16 The marshalling area at the Nether Lochaber slipway is at the eastern extent of the terminal and is situated adjacent to the A861, approximately 150m east of the slipway. This area comprises three lanes for traffic which taper onto the A861. Using GIS software to scale aerial imagery, it is estimated that these lanes have a combined capacity for approximately 15 cars. It is also noted that the marshalling area has no segregation for HGVs. This should be considered in the context of the 28-car capacity of MV *Corran*.

2.2.17 All ferry staff are based on the ferry and therefore the marshalling area is unmanned at all times. This limits the control ferry staff have on the order vehicles are loaded onto the vessel. The Nether Lochaber marshalling is done by the Ferry Foreman where possible. Whilst onsite for a familiarisation visit, it was noted that the designated marshalling area was not being used by vehicles waiting to board the ferry, and instead they were queued from the slipway along one lane of the public road (A861). Vehicles queuing along this stretch of road may restrict access to the residential and commercial properties which are accessed via the A861. This presents a safety issue as it reduces the A861 to one lane, which means that vehicles coming down the hill to access properties must use the wrong side of the road to pass the queueing vehicles. This risk may be increased by two properties which are being constructed at the top of the hill adjacent to the marshalling area, as they will reduce drivers' visibility of cars discharging from the vessel or coming up the hill from the properties lower down.

2.2.18 Ferry staff have reported that despite the ferry operating a shuttle service during peak periods, such as the Scottish Six Day Trials, vehicles have had to queue on the A82 as the marshalling area (and A861) does not have adequate capacity. This issue is amplified further when the smaller ferry, the MV *Maid of Glencoul*, is in service on the route. Though occasional, this is a safety issue as it can cause significant disruption on the A82 trunk road. It was reported by ferry crew that there have been instances when Police Scotland have been involved to clear traffic.

2.2.19 This indicates that the marshalling facilities at Nether Lochaber are under-sized for the volume of traffic that uses the Corran crossing. It is noted that a significant proportion of sailings run at full capacity and the marshalling facilities at Nether Lochaber does not have capacity to hold the number of vehicles which can be carried in one crossing by the MV *Corran*.

Ardgour Ferry Terminal

2.2.20 Ardgour Ferry Terminal is on the western extent of the Corran Narrows as shown below.

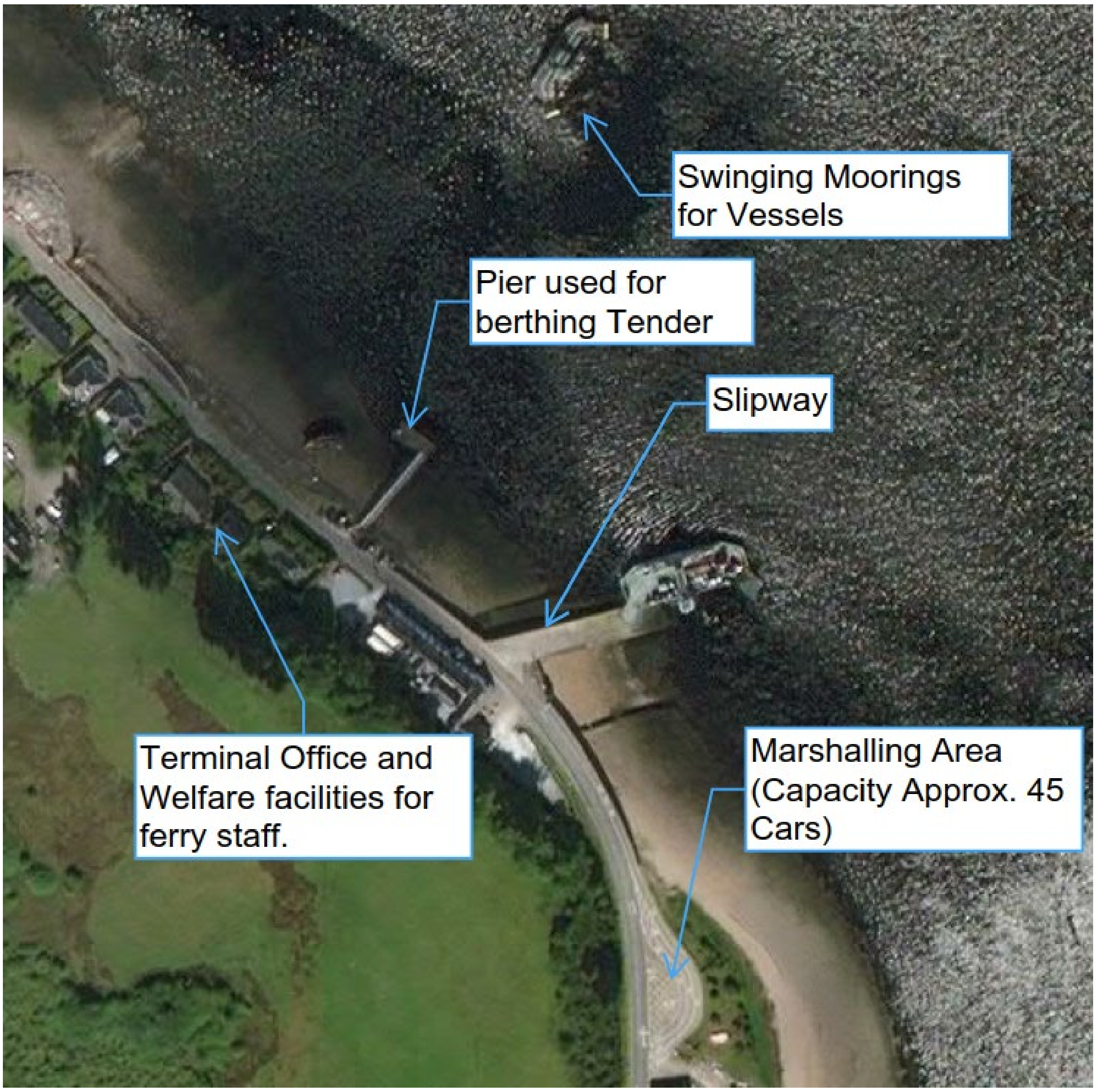

Figure 2.4 Facilities within Ardgour Ferry Terminal

2.2.21 The facilities within the ferry terminal comprise:

- a slipway;
- a marshalling area for approximately 45 cars;
- two swinging moorings;
- a pier which is used to berth the tender vessel used to access the ferries; and
- the terminal office and staff welfare facilities.

2.2.22 Also within the vicinity of the terminal there is:

- a bus stop/shelter;
- a hotel; and
- several residential properties.

2.2.23 It is understood that ownership of the slipway at Ardgour was transferred to the Highland Council Under the Highland Roads and Bridges Act 1862. Since then, there has been a number of small land purchases from the Ardgour Estate to extend or modify the slipway.

Slipway

2.2.24 As built record information is not available for the Ardgour Slipway. However, from reviewing Arch Henderson's 2017 Slipway Inspection Report, it is understood that the slipway comprises of two retaining walls, assumed to be infilled with compacted granular fill. This arrangement supports a concrete slab, nominally 10m wide and 600mm deep. The slab is set at a gradient in the order of 1 in 8 extending from a retaining wall running parallel to the A861 to just below Mean Low Water Springs.

2.2.25 On the foreshore along the length of the northern elevation of the slipway, there is a masonry apron formed from large square masonry units laid perpendicular to the slipway. This apron is thought to provide some scour protection to the foundation of the slipway walls.

2.2.26 Whilst on site, it was noted that the swept path for large vehicles accessing the ferry from the marshalling lane is very tight with vehicles having to manoeuvre over the pavement to make the transition.

2.2.27 Records were provided by the Highland Council for repairs and inspections undertaken to Ardgour Slipway, a summary of these inspections is provided below.

Table 2.2 Summary of Inspections and Repairs undertake at Ardgour Slipway

Date	Description	Repair Costs
2002	Emergency Repairs undertaken to hole in Slipway. Undermining problems noted	£20,000 (Approx.)
2013	Emergency Repairs undertaken to hole in Slipway. Undermining problems noted	£80,000 (Approx.)
February 2017	Ferry Foreman informs Highland Council of cracks and holes appearing in slipway	-
April 2017	Arch Henderson commissioned to undertake non-intrusive condition survey of both slipways.	-
May 2017	Arch Henderson inspection report recommends urgent repairs undertaken to repair a crack and hole in the side of the slipway, and that refurbishment works are required to address undermining of the slipway.	-
July 2017	Arch Henderson was commissioned to design repairs for crack and hole in slipway noted in the above report.	-
February 2018	Emergency repairs undertaken on slipway by North West Marine	£54,379

2.2.28 The most recent Inspection undertaken by Arch Henderson in May 2017 recommended that urgent repairs were undertaken to a hole and crack in the north side wall of the slipway. These urgent repairs were undertaken by North West Marine in February 2018, working around ferry operations.

2.2.29 In addition to these urgent repairs, Arch Henderson's report also highlighted a significant undermining issue of the structure, caused mainly by washout of fines from under the structure as a result of the wash created by the ferry's propellers. Arch Henderson recommended that significant stabilisation and refurbishment works be carried out to address the undermining of the slipway, and general degradation of the ramp and apron.

Waters Categorisation and Vessels Classification

2.2.30 The classification of the waters is an important factor in determining the specification of the vessels that can operate within them. There are four categories of waters designated by the UK Maritime & Coastguard Agency (MCA), which are as follows:

- Category A: Narrow Rivers and canals where the depth of water is generally less than 1.5 metres.
- Category B: Wider rivers and canals where the depth of water is generally 1.5 metres or more and where the significant wave height could not be expected to exceed 0.6 metres at any time.
- Category C: Tidal rivers and estuaries and large, deep lakes and lochs where the significant wave height could not be expected to exceed 1.2 metres at any time.
- Category D: Tidal rivers and estuaries where the significant wave height could not be expected to exceed 2.0 metres at any time.

2.2.31 These categorisations apply specifically to the operation of Class IV, V and VI Passenger Ships and also determine which waters are not regarded as 'open sea' for the purposes of regulations made, or treated as made, under Section 85 of the UK Merchant Shipping Act 1995.

2.2.32 The waters of Loch Linnhe are classified as **Category C** north of the Corran point lighthouse.[10]

2.2.33 The MV *Corran* and MV *Maid of Glencoul* both carry a **Class V** certificate, which permits operation in waters categorised as Classes A-C (which is sufficient for the Corran service).

Tidal Streams

2.2.34 The Corran Narrows experience significant tidal streams, and this impacts on the current infrastructure arrangements on the route. This section briefly sets out the scale of the tidal streams running through the Narrows. The data set out below are based on Admiralty Chart 2380.

2.2.35 The table below sets out the estimated tidal streams through the Corran Narrows based on the time of high water at Oban for spring and neap tides:

Table 2.3: Corran Narrows Tidal Streams[11]

Time Relative to High Water Oban	Direction	Spring Tidal Stream (Knots)	Neap Tidal Stream (Knots)
-6 hours	South	1.3	0.4
-5 hours	North	1.0	0.3
-4 hours	North	2.1	0.7
-3 hours	North	3.8	1.3
-2 hours	North	4.9	1.6
-1 hour	North	4.0	1.3
0 hours	North	1.1	0.4
+1 hour	South	0.7	0.2
+2 hours	South	1.4	0.5

[10] Merchant Shipping Notice MSN 1776 (M), Categorisation of Waters (Maritime & Coastguard Agency), p. 5.

[11] Admiralty Chart 2380

Time Relative to High Water Oban	Direction	Spring Tidal Stream (Knots)	Neap Tidal Stream (Knots)
+3 hours	South	3.6	1.2
+4 hours	South	3.2	1.1
+5 hours	South	2.5	0.8
+6 hours	South	1.0	0.4

2.2.36 The bottleneck caused by the Narrows (with water being pushed through a narrow gap), and a combination of weather and freshwater levels can influence the above tidal streams, which at times exceed the tabulated values and can reach five or six knots. This is a significant and uncertain tidal stream for the ferry service to contend with – indeed, it has influenced the design of the current infrastructure and vessels, as is explained in the next section.

Vessel Design

2.2.37 The MV *Corran* and MV *Maid of Glencoul* are unique in the Scottish context in that they are quarter-loading vessels (as opposed to the more typical bow and stern loading vessels found elsewhere in the country). It is understood that this a direct consequence of the tidal conditions at the Narrows and the current absence of a berthing / aligning structure on either side of the crossing.

2.2.38 The lack of a berthing / aligning structure means that, when loading and discharging traffic, a standard bow & stern loading vessel would be getting pushed across the slipway by the tidal stream, making it difficult for the vessel to hold its position and allow loading and discharge of vehicles. The MV *Corran* and MV *Main of Glencoul* align with the north end of the slipways and lower their ramps. When the tide is running north to south, the vessels are pushed onto the slip, whilst when the tide is running in the opposite direction, the engines can be used to hold her on station, pushing against the side of the slipway.

2.2.39 The Caledonian Maritime Assets Limited (CMAL) ferry MV *Loch Alainn* was briefly trialled on the Corran route but, it is understood, was considered to be unsuitable due to the challenges associated with holding position on the slipway in the strong tidal streams running through the Narrows.

Overnight Berthing

2.2.40 Both the MV *Corran* and MV *Maid of Glencoul* overnight on swinging moorings on the Ardgour side of the crossing (the latter also being on this mooring during the approximate 11 months of the year she is not in service). Figure 2.4 above shows the location of these moorings relative to the Ardgour slipway. The vessel is accessed by tender operating from the small pier adjacent to the slipway.

Relief Vessels

2.2.41 The relatively unusual design of the MV *Corran* vessel means that it is difficult if not impossible to source a relief vessel, from the wider market, to cover scheduled maintenance and breakdowns. The main vessel on the route for 11 months of the year is the MV *Corran*. The much smaller and older MV *Maid of Glencoul* is dedicated to providing scheduled relief cover one month of the year and in the event of a breakdown of MV *Corran*.

2.3 Operations

2.3.1 The specific operating and wider institutional context within which the Corran Ferry operates has influenced the design of the service in numerous respects. The issues surrounding human resources, vessel deployment and maintenance are set out below

Human Resources

2.3.2 This section considers the crewing and back office human resource which delivers the current Corran Ferry operation.

Crew Details

2.3.3 There are currently 14 crew assigned to the operation of the Corran Ferry. The table below provides details of age, rank and qualifications:

Table 2.4: Corran Ferry Crew

Crew	Age Band	Rank	Qualification	Length of Service
Crewman 1	55-60	Foreman	BML Tier 2- Engineer III/2	37 years
Crewman 2	50-55	Foreman	BML Tier 2	34 years
Crewman 3	50-55	Skipper	BML Tier 2- Master III/2	36 years
Crewman 4	60-65	Skipper	BML Tier 2	14 years
Crewman 5	55-60	Engineer	Engineer iii/2- BML Tier 2	36 years
Crewman 6	60-65	Engineer	Mechanic- BML Tier 2	14 years
Crewman 7	50-55	Relief Skipper	BML Tier 2	14 years
Crewman 8	45-50	Relief Skipper	BML Tier 2	14 years
Crewman 9	45-50	Relief Skipper	BML Tier 2	3 years
Crewman 10	45-50	Relief Skipper	BML Tier 2	10 years
Crewman 11	40-45	Relief Skipper	BML Tier 2	5 years
Crewman 12	55-60	Purser/Deck	None	14 years
Crewman 13	50-55	Purser/Deck	None	13 years
Crewman 14	35-40	Purser/Deck	None	2 Years

2.3.4 There are a total 12 on-ferry crew members (two crews of six) and two foremen, although the latter can double-up as crew where required.

2.3.5 The average age of the crew is 52.5, with a number of crew members in their late fifties or early sixties. Whilst this does not necessarily imply that these crew members are close to retirement, there is a clear demographic issue within the crew, with a need for a longer-term succession strategy (particularly given the vested experience in long-serving crew).

Home Postcodes

2.3.6 The map below shows the home postcodes of the Corran Ferry crew:

Figure 2.5: Corran Ferry Crew Home Postcodes

2.3.7 The following points are of note from the above map:

- The majority of the crew are based on the Ardgour side of the crossing, some a reasonable distance away from the ferry. This reflects the overnight position of the vessels.
- The overnighting of the vessels in Ardgour can be considered positive from a socio-economic perspective, as it provides high quality and secure employment in an economically fragile area.
- Whilst the above is true, overnighting on the more sparsely populated side of the crossing likely creates challenges around the recruitment of crew given the more limited potential labour force.

Shift Pattern

2.3.8 This section considers the rostering of crew on the Corran Ferry. The Maritime & Coastguard Agency (MCA) imposes strict limitations on hours of rest. They stipulate that:

- *The hours of rest shall be not less than: a) 10 hours in any 24-hour period; and b) 77 hours in any 7-day period. Note: Hours of rest may be divided into no more than 2 periods, one of which should be at least 6 hours long, and the interval in between should not exceed 14 hours.*[12]

[12] Hours of Work, Safe Manning and Watchkeeping – Revised Provisions from September 2002 (MCA, 2002), p. 3.

2.3.9 On a standard rota period:

- There are two crews of six, working on a five-days on, five-days off basis.
- Each crew has a complement of six, although one crew member is always on holiday.
- The rolling programme of breaks throughout the day means that there is only four crew on duty at any time, a skipper, engineer, purser and deckhand. The certification levels of the crew allows for acting up to cover various positions across the day.

2.3.10 A typical weekly shift pattern is shown below

Table 2.5: Typical 5-Day Crew Rota

Time	Crewman 1	Crewman 2	Crewman 3	Crewman 4	Crewman 5	Crewman 6
0600-0700	BREAK	PURSER	ENGINES	SKIPPER	DECK	*HOLIDAY*
0700-0800	PURSER	BREAK	ENGINES	SKIPPER	DECK	*HOLIDAY*
0800-0900	DECK	PURSER	BREAK	ENGINES	SKIPPER	*HOLIDAY*
0900-1000	DECK	PURSER	ENGINES	BREAK	SKIPPER	*HOLIDAY*
1000-1100	DECK	PURSER	ENGINES	SKIPPER	BREAK	*HOLIDAY*
1100-1200	BREAK	PURSER	ENGINES	SKIPPER	DECK	*HOLIDAY*
1200-1300	PURSER	BREAK	ENGINES	SKIPPER	DECK	*HOLIDAY*
1300-1400	DECK	PURSER	BREAK	ENGINES	SKIPPER	*HOLIDAY*
1400-1500	DECK	PURSER	ENGINES	BREAK	SKIPPER	*HOLIDAY*
1500-1600	DECK	PURSER	ENGINES	SKIPPER	BREAK	*HOLIDAY*
1600-1700	BREAK	PURSER	ENGINES	SKIPPER	DECK	*HOLIDAY*
1700-1800	PURSER	BREAK	ENGINES	SKIPPER	DECK	*HOLIDAY*
1800-1900	DECK	PURSER	BREAK	ENGINES	SKIPPER	*HOLIDAY*
1900-2000	DECK	PURSER	ENGINES	BREAK	SKIPPER	*HOLIDAY*
2000-2100	DECK	PURSER	ENGINES	SKIPPER	BREAK	*HOLIDAY*
2100-2200	BREAK	PURSER	ENGINES	SKIPPER	DECK	*HOLIDAY*

2.3.11 THC negotiated a local workforce agreement in 2006. The above shift pattern, was approved by the Maritime & Coastguard Agency under MSN 1778 for boat masters and others working on commercial inland water transport vessels (now covered by MSN 1876, Working Time: Inland Waterways Regulations 2003 as amended, which came into force on 5th January 2018).

Overtime

2.3.12 It is clear from the above rota that there is very little contingency within the Corran crewing operation in the event of sickness and allowing for routine training. This must be covered by crew overtime and largely depends on the willingness / goodwill of the crew to keep the service operational. The table below shows the overtime hours of the crew between 1st April 2017 and 26th March 2018:

Table 2.6: Crew Overtime 1st April 2017 – 26th March 2018

	Overtime Hours	Days (Based on 16 hour day)
Crewman 1	691.5	43
Crewman 2	535.0	33
Crewman 3	493.0	31
Crewman 4	404.5	25
Crewman 5	349.5	22

	Overtime Hours	Days (Based on 16 hour day)
Crewman 6	261.0	16
Crewman 7	219.0	14
Crewman 8	173.5	11
Crewman 9	113.0	7
Crewman 10	56.0	4
Crewman 11	44.5	3
Crewman 12	43.0	3
Crewman 13	13.0	1
Crewman 14	0.0	0
Total	**3,397**	**212**

2.3.13 The dependence on crew overtime to ensure the continued operation of the Corran Ferry is evident from the above table. The two six-person crews deliver 3,400 hours of overtime a year, which represents 212 days based on a 16-hour day (i.e. assuming breaks are counted as overtime). The overtime is also heavily concentrated within a small group of crew members, with the 'top 6' delivering 170 days, or 80% of the total overtime hours. It is understood that this is achieved within the working hours regulations but that the margin is relatively tight.

Training

2.3.14 There are specific training issues surrounding the MV *Maid of Glencoul*:

- As the vessel sits at her moorings for approximately 11 months of the year, it is difficult to undertake routine 'familiarisation' training without the use of overtime (bearing in mind the hours of overtime already worked and the challenges in relation to crew rest periods). This problem did not occur in the past as the MV *Maid of Glencoul* was previously used at the weekends.
- The lack of use of the MV *Maid of Glencoul* also makes it challenging to train new starts, as most aspects of her operation differ from the MV *Corran*.

Agency Crew

2.3.15 In years gone by, some of the slack in terms of covering sickness could be delivered by agency crew. THC noted that they used to have around 3-3.5 full time equivalent (FTE) agency staff available to cover sickness. However, this has now reduced to around 0.5 FTE, whilst the recent agency staff have had no relevant qualifications to choose from.

Back Office / Support Services

2.3.16 There is clerical staff support located at Ardgour. The relevant staff members work five hours per day, every day except Sunday.

2.3.17 In terms of wider management functions, the service sits within the Community Services Department within THC. Council Officers support the overall operation of the service in terms of supporting regulatory compliance, financial oversight etc. However, the Officers which provide this support are not dedicated to the ferry service and have other responsibilities within the Council.

2.3.18 The above creates a challenge in terms of ensuring continued regulatory compliance, the availability of appropriate back office expertise / experience within the maritime sector and economies of scale in terms of spreading these costs over multiple routes.

Staff Retention

2.3.19 The ‘length of service’ column in Table 2.4 highlights the positive position with regards to staff retention, with the majority of the crew having over 10 years’ service, and several crew having over 30 years’ service. As previously noted, the crew are largely local and invested in the service.

2.3.20 The positive picture above does however mask a wider problem in the recruitment and retention of apprentices and younger crew. As the Corran Ferry is a local authority operation, rates of pay, terms and conditions and promotion opportunities are thought to lag behind a number of other operators. The loss of crew members who have completed apprenticeships on the Corran Ferry as well as agency staff is proving to be an ongoing challenge, compounding the crew demographic issue currently facing the service.

Vessel Deployment

2.3.21 The MV *Corran* is the main vessel for 11 months of the year. She carries 28 cars and does not have any significant restrictions with respect to the height or weight of vehicles carried.

2.3.22 The MV *Maid of Glencoul* is scheduled to operate for around 4-6 weeks a year when the MV *Corran* is in drydock. Originally she could carry 18 cars, which was recently reduced due to the middle lane not having the necessary width to cope with larger modern vehicles whilst still allowing satisfactory passenger access (it is estimated that she now carries 14 cars).

2.3.23 The MV *Maid of Glencoul*, being smaller, is also limited to carrying shorter articulated lorries of 15m long (12m if rigid), a maximum of 38t in weight and with loads no higher than 16ft. Consequently, and because there are height and weight restrictions on the alternative road routes, the peninsula is effectively cut off for many large commercial vehicles when she is in service.

Maintenance

Day-to-Day Maintenance

2.3.24 Day-to-day maintenance is undertaken by the engineers within the wider ferry crew complement. Repairs that cannot be undertaken during operation of the ferry, or which require external expertise necessitate the working of overtime.

Annual Refits

2.3.25 Refits of both vessels are carried out on an annual basis. Each refit is scheduled to take around four weeks and is timed so that:

- there is always one vessel available for the route; and
- the MV *Corran*, as the primary vessel on the route, is taken out of service during off-peak periods only.

2.3.26 The refit of both vessels is put out to tender. THC has explained that, in recent years, it has been difficult to attract bids for the work being let, with only one or two yards submitting a tender. The refits are generally undertaken at Ardmaleish on Bute.

2.3.27 There are a number of challenges in relation to the ongoing maintenance and operation of the MV *Maid of Glencoul.* Much of the mechanical equipment on the vessel (e.g. drivetrain, steering control system etc) is original and dates from the 1970s, and it is no longer possible to obtain engineering support from the agent for many of these components (in particular the steering control system). As such the sourcing of spare parts is becoming increasingly problematic, and in many cases THC is reliant on its own engineers sourcing second hand parts on the internet or on new parts being specifically made. This is also making annual refits longer and more expensive (the 2017 refit being the longest and costliest to date).

2.4 Carryings & Capacity Utilisation

2.4.1 The figure below shows estimated annual car carryings on the Corran Ferry between 2006 and 2016:

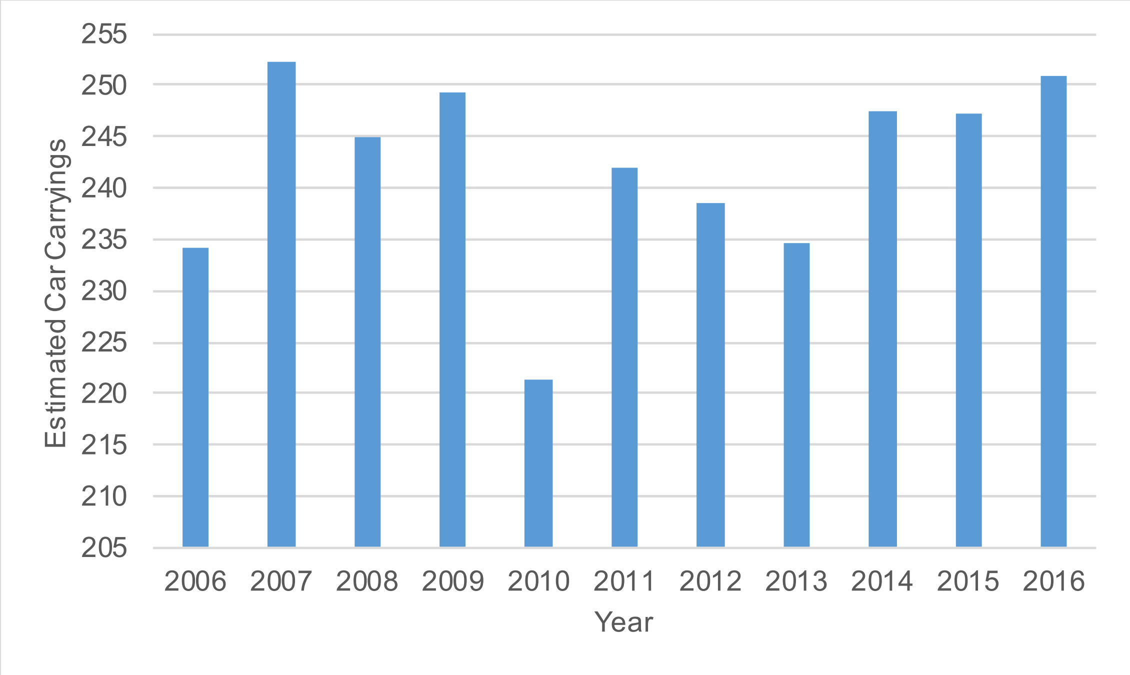

Figure 2.6: Corran Ferry – Estimated[13] Car Carrying 2006-2014 ('000) (Source: Scottish Transport Statistics)

2.4.2 There are a number of points worth noting from the above figure:

- The Corran Ferry service is the busiest single vessel vehicle carrying route in Scotland. It is also second only to the Hunters Quay - McInroy's Point route in terms of overall vehicle carryings.
- Overall carryings have been broadly stable over the past ten years. There was a significant drop-off in 2010, likely due to the economic downturn (this reduction occurred across a wide range of Scottish routes in that same year).
- The peak year for carryings was 2007, although the 2016 figures are once again approaching this level.

2.4.3 The frequent service across the Narrows (every 20 minutes during peak and every 30 minutes thereafter) does provide significant available capacity across the day. However, there are periods where the number of vehicles awaiting carriage exceeds available capacity. When such a situation arises, the service will operate in 'shuttle' mode[14], departing from the timetable to clear a backlog.

2.5 Fares

2.5.1 The Corran Ferry fares structure has been designed predominantly with simplicity in mind. Tickets are sold / collected on the ferry and thus, due to the short sailing time, there is very little time for a complex fares system to be administered.

[13] A formal record of cars carried on each sailing is not maintained, although an estimate is made.

[14] There are no fixed criteria for switching the service into shuttle model – it is entirely at the Master's discretion. Factors which may influence the Master's decision include prevailing weather conditions and tidal streams; the length of the queue, whether there are any service buses waiting to travel; and proximity to next scheduled departure time amongst others.

Passenger Fares

2.5.2 The Corran Ferry operation is unusual in that it is the only Ro-Ro service in Scotland where passengers are not charged. This reflects the requirement / desire for a simple on-vessel administered fares system given the very short crossing time.

Private / Light Goods Vehicles

2.5.3 The fares table for private and light goods vehicles is set out below:

Table 2.7: Private / Light Vehicle Goods Fares (Effective from 1st April 2017)[15]

Vehicle Type	Single Fare
Car, goods vehicle up to 3,500kg GVW, Land Rover	£8.20
Motorhome / caravanette	£8.20
Minibus up to 16 seats	£8.20
Pedal cycle	Free
Motor cycle	£3.00
Motor cycle & sidecar	£8.20
Trailer	£8.20
Caravan	£11.00
Registered disabled driver	Free
Book of 30 tickets (valid for 1 year) – vehicle specific (private owned car or small van & registration)	£72.40 / £2.41 per journey
Lochaber OAP (valid for 2 years) – purchased at service point, book of 20 tickets	£48.30 / £2.41 per journey

2.5.4 There are two points worth noting in relation to the above table:

- The multi-journey books of tickets offer a significant saving of 71% on the 'drive-up' fare.
- There is no differential made between cars, motorhomes, trailers, minibuses etc.

Commercial Vehicles

2.5.5 CVs are defined as being over 3,500kg GVW and are charged as shown in the table below

Table 2.8: Commercial Vehicle Goods Fares (Effective from 1st April 2017)[16]

Vehicle Type	Single Fare (inclusive of VAT)
Van / lorry under 7.5t GVW, tractor / excavator, HGV drawbar trailer	£13.00
HGV 2 -axle / large van (both over 7.5t GVW)	£19.20
HGV 3-axle	£24.80
HGV 4-axle	£30.80
HGV 5/6-axle	£45.50
Bus / coach (17-35 seats) – VAT zero rate	£16.80
Bus / coach (36 seats and over) – VAT zero rate	£25.50

[15] file:///C:/Users/scanning/Downloads/Corran_FerryTimetable.pdf

[16] file:///C:/Users/scanning/Downloads/Corran_FerryTimetable.pdf

Vehicle Type	Single Fare (inclusive of VAT)
Other vehicles / loads ferried by arrangement (fare in application)	£520.00
Book of 30 tickets – issued in name of firm / company **including** VAT – valid 1 year	£168.30
Book of 30 tickets – issued in name of firm / company **excluding** VAT (zero rated), buses / coaches – valid 1 year	£140.25

2.5.6 There are several points worth noting in relation to the above table:

- Heavy goods vehicles are charged on the basis of the number of axles, rather than length which is the more common measure.
- The multi-journey ticket books require a different number of tickets to be surrendered based on the type of vehicle. For example, a lorry / van under 7.5t only 'pays' two tickets for a single journey, whereas a 5/6-axle HGV would have to 'pay' seven tickets.
- The cost of moving 'other loads' (e.g. a wind turbine) is over eleven times that of a 5/6 axle HGV. It is assumed this is for exclusive hire of the vessel.

2.5.7 Benchmarking of the Corran Ferry fares against other equivalent routes in Scotland is provided in Appendix A. Key points to note are:

- The 'drive-up' fare for the Corran Ferry is relatively expensive, particularly on a per mile basis.
- However, the multi-journey fares are significantly less than the equivalent fares on any of the comparator routes. These are the fares most typically paid by local residents.
- The basis on which fares are set is significantly different from the majority of other routes in Scotland. Key differences include:
  - Passengers (whether on foot or in vehicles) are not charged on the Corran Ferry.
  - The basis of the charge for commercial vehicles is on the number of axles rather than length.

2.5.8 The problems caused by the current fares system are explored in more detail in the next chapter.

Fares Increases

2.5.9 The fares on the Corran Ferry service are set by the Highland Council. The chronology of recent fares changes is as follows:

- There were no significant fares changes between 2002 and 2013.
- In March 2013, a paper was presented to the Transport, Environment and Community Services Committee (TECS) proposing increased fares. The Committee requested a period of consultation with the community.
- Following this exercise, a September 2013 TECS Committee Paper recommended a fares increase of 4%, to be implemented from November 2013. A commitment was also made to carrying out a socio-economic study assessing the impact of ferry fares, which was completed in February 2014.
- In November 2014, the TECS Committee requested that further work be undertaken in relation to the steps required for the service to be run as a break-even operation.
- In February 2015, the Committee agreed to put fares up by 2% for 2016/17 (although the agreed increase was lower than an initial recommendation to increase fares by 4% for the next three years).

- Fares have been frozen for the 2017/18 and 2018/19 financial years, pending the outcomes of this appraisal.

Road Equivalent Tariff Fares

2.5.10 It is worth noting for comparison purposes that setting the Corran Ferry fares on an RET basis, as per the Clyde & Hebrides Ferry Services formula, would give estimated single fares of £5.69 for a car and £2.19 for a driver and each passenger (fares are generally increased by CPI each year). There are no equivalent RET fares for commercial vehicles.

2.6 Finance & Method of Delivery

2.6.1 This section considers the current financial position of the Corran Ferry service and the means by which it is currently delivered.

Corran Ferry Finances

2.6.2 THC has provided data for the last 14 financial years (FY), from 2002/03 – 2015/16, so the analysis is informed by a significant time series. It should be noted that all data in this chapter is presented in nominal rather than real terms (i.e. it is not adjusted for inflation).

Main Components of Cost

2.6.3 The figure below shows the breakdown of the main elements of cost associated with operating the Corran Ferry.

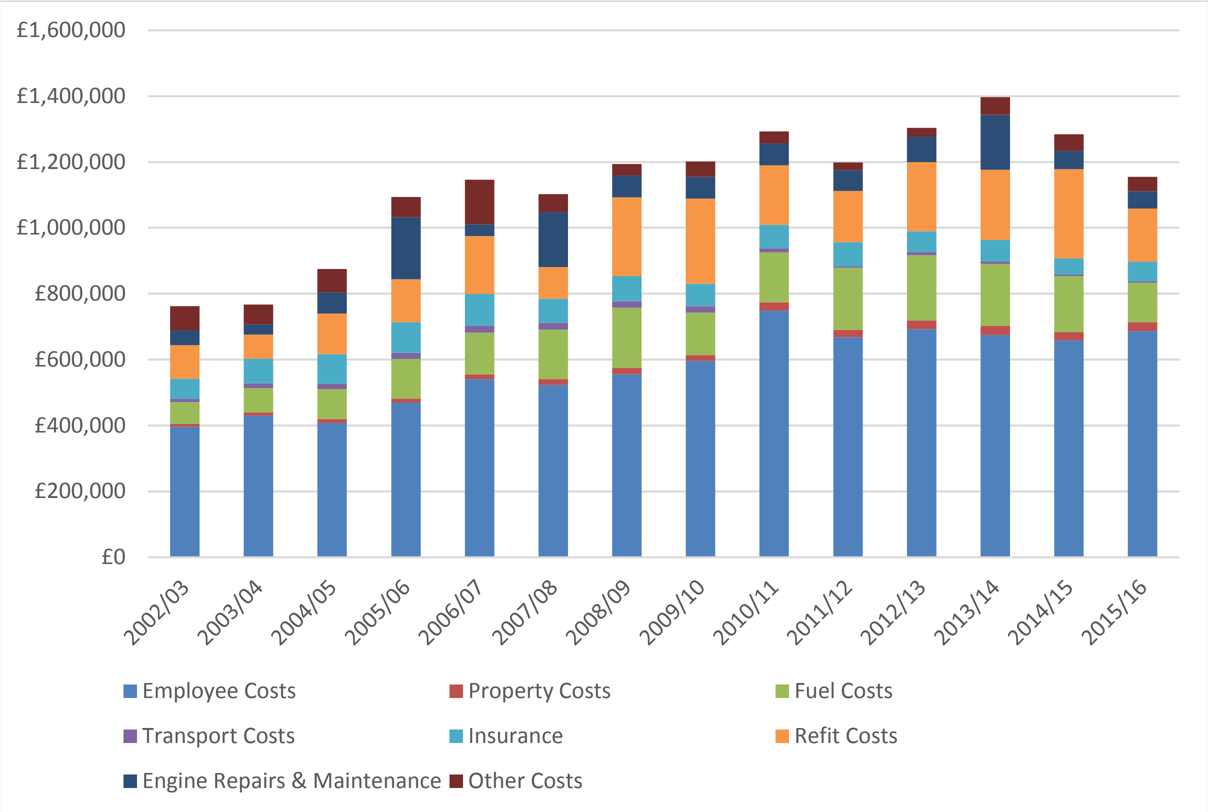

Figure 2.7: Corran Ferry – Main Components of Cost, FY2002-03 – FY2015-16

2.6.4 There are a number of points of note from the above chart:

- Employee costs generally account for over half of the total costs of operating the service (averaging 51% of total costs across the period).

- The second largest element of cost is generally the annual vessel refit, accounting for 12% of costs on average. It is anticipated that refit costs will increase over time as the vessels get older (indeed the 2017 refit period, which is outwith the time series presented in the graph, was the longest and most expensive to date)
- Refit and Engine Repairs & Maintenance costs can vary widely year-on-year.

2.6.5 The figure below shows the change in the main components of cost over the 2002-03 to 2015-16 time series, indexed to the 2002-03 base year:

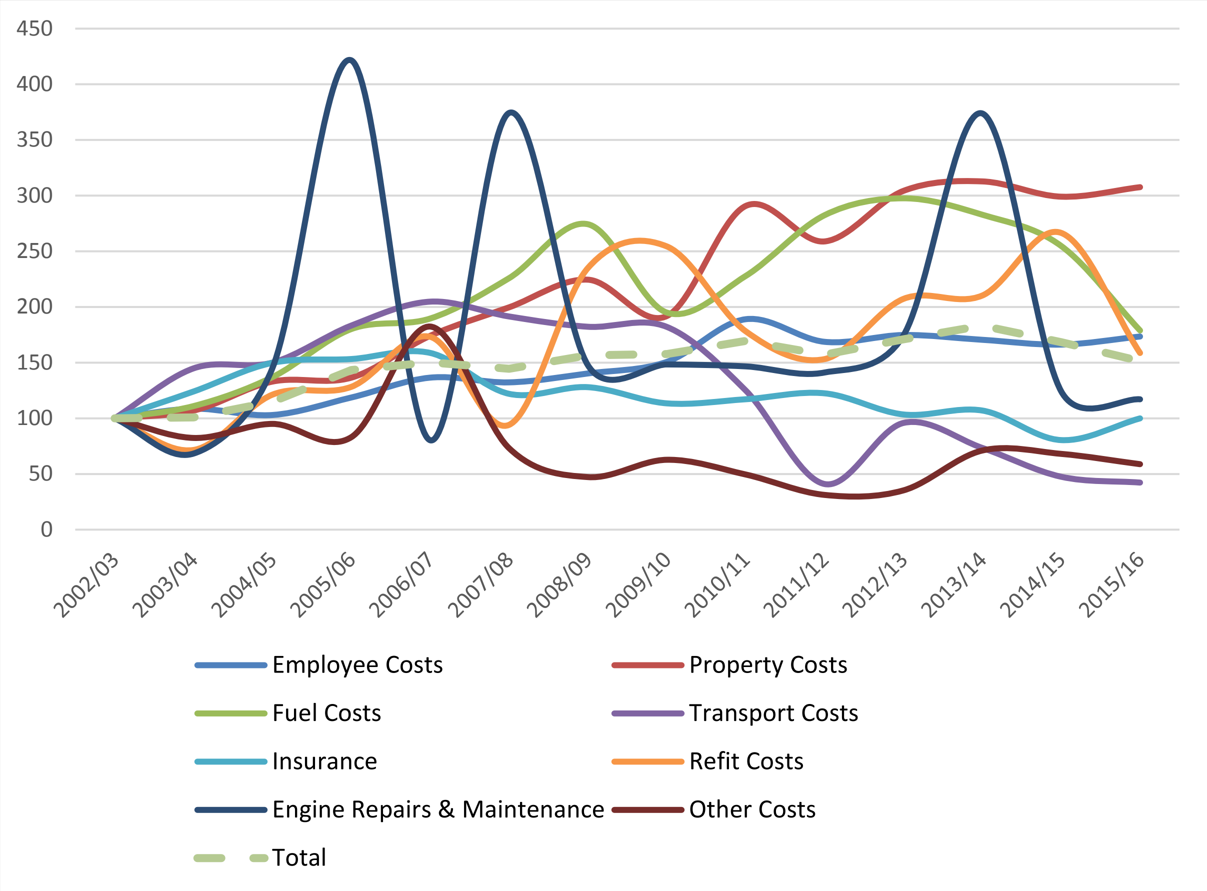

Figure 2.8: Indexed Change in Main Components of Cost – 2002-03 = 100

2.6.6 The following key points emerge from the above figure:

- The total cost of operating the service has increased by 51% over a 13-year period. This is set against a more recent backdrop of local authority funding reductions.
- In absolute terms, this increase has been driven by the three main components of cost:
  - When comparing FY2002-03 with FY2015-16, Employee costs have risen by 73%. Whilst they have continued to represent a relatively fixed proportion of total costs, the absolute costs have increased by almost £300k per annum.
  - There has been a steady increase in refit costs over the same period, which is to be expected as the vessels get older. This is particularly the case with the MV *Maid of Glencoul* which at 42 years old is becoming harder to maintain and source spare parts for. There have also been several years where refit costs have been particularly high, likely reflecting maintenance work required to maintain the vessels' certification and also life extension work. The position is similar with respect to engine repairs and maintenance.
  - Fuel costs have also generally increased over the past 15 or so years, although they have dropped off significantly since the peak year of 2012-13 due to the reduction in

the global oil price. Nonetheless, fuel costs are clearly volatile (even where hedging is used) and the service remains vulnerable to longer term increases in the global oil price.

- Property costs have also increased significantly over the 13-year time series, although this is a relatively small component of total costs (some 2%).

Revenue

Total Revenue

2.6.7 The figure below shows the total revenue associated with the Corran Ferry from FY2002-03 to FY2015-16.

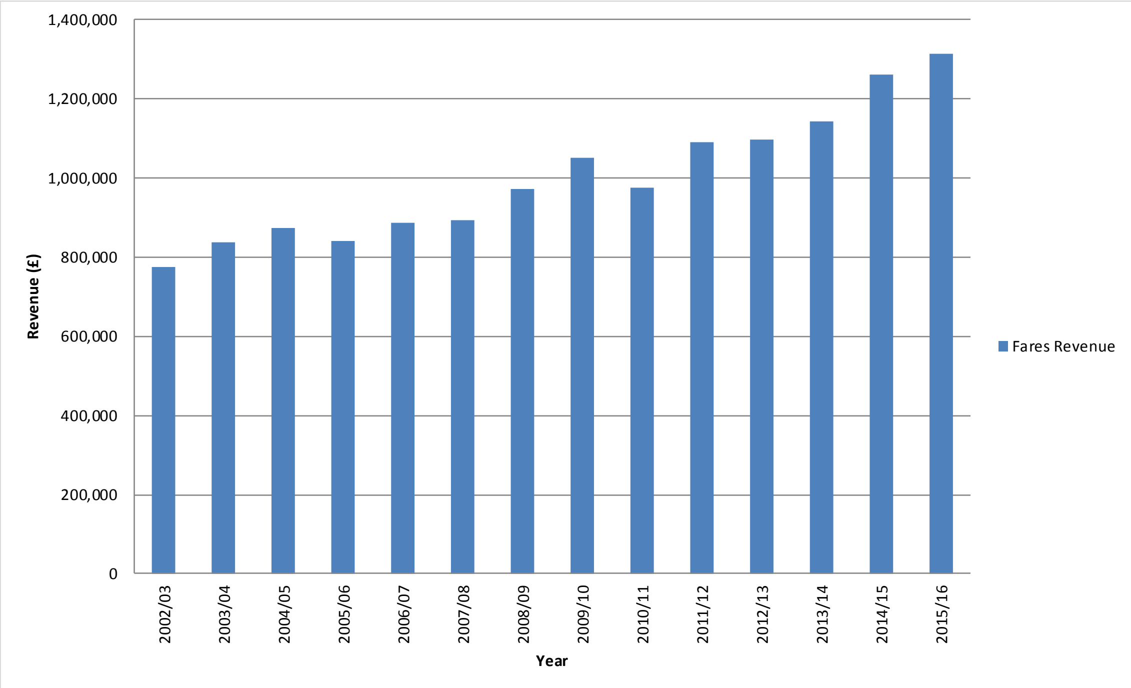

Figure 2.9: Corran Ferry Revenue FY2002-03 – FY2015-16)

2.6.8 The Corran Ferry has been experiencing a steady growth in revenue over the 13-year period covered by the data. This has been driven by a combination of increased carryings and, mainly from FY2013-14 onwards, fares increases.

Revenue by Ticket Type

2.6.9 Underlying the headline revenue figures is the issue of revenue by ticket type. There are 22 individual ticket types available on the Corran ferry, each available as a single ticket or a book of tickets (i.e. 44 ticket types in total). THC has provided monthly ticket sales data by vehicle type, which permits a more detailed profiling of revenue by ticket type.

2.6.10 The figure below shows **ticket sales** for all vehicle categories, split by 'single' and 'discount' for F Y2013-14 to FY 2017-18:

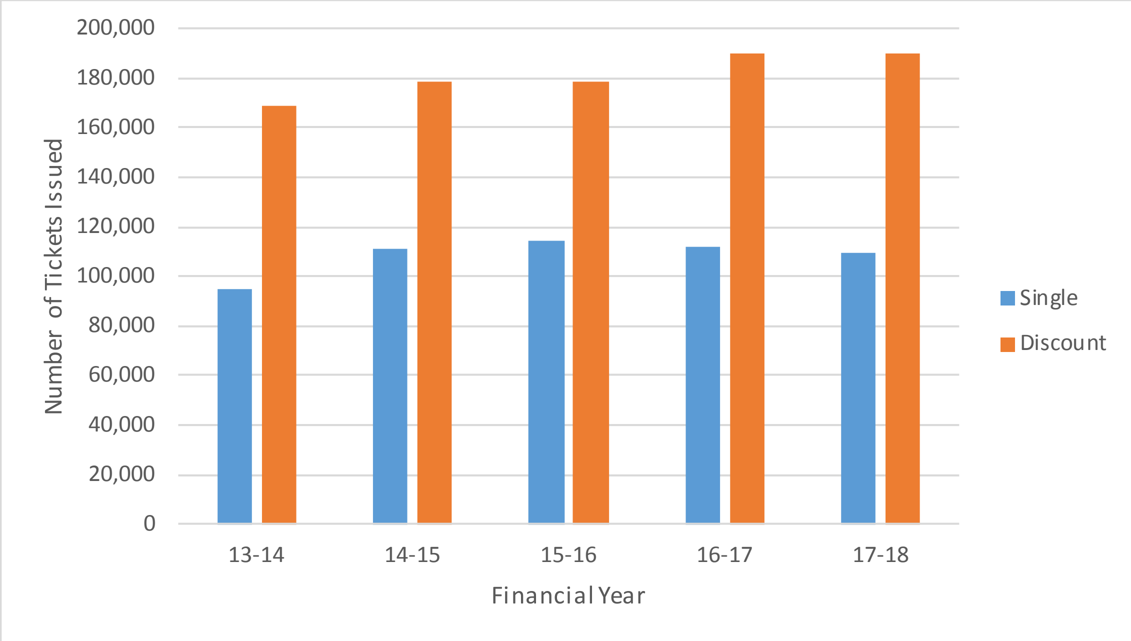

Figure 2.10: Corran Ferry Ticket Sales by Type - FY2013-14 to FY2017-18

2.6.11 The figure above demonstrates the dominance of the discounted book of tickets amongst users of the Corran Ferry. On average, discounted tickets have accounted for 63% of all tickets used across the five financial years.

2.6.12 The figure below shows **ticket sales revenue** for all vehicle categories, split by 'single' and 'discount' for F Y2013-14 to FY 2017-18:

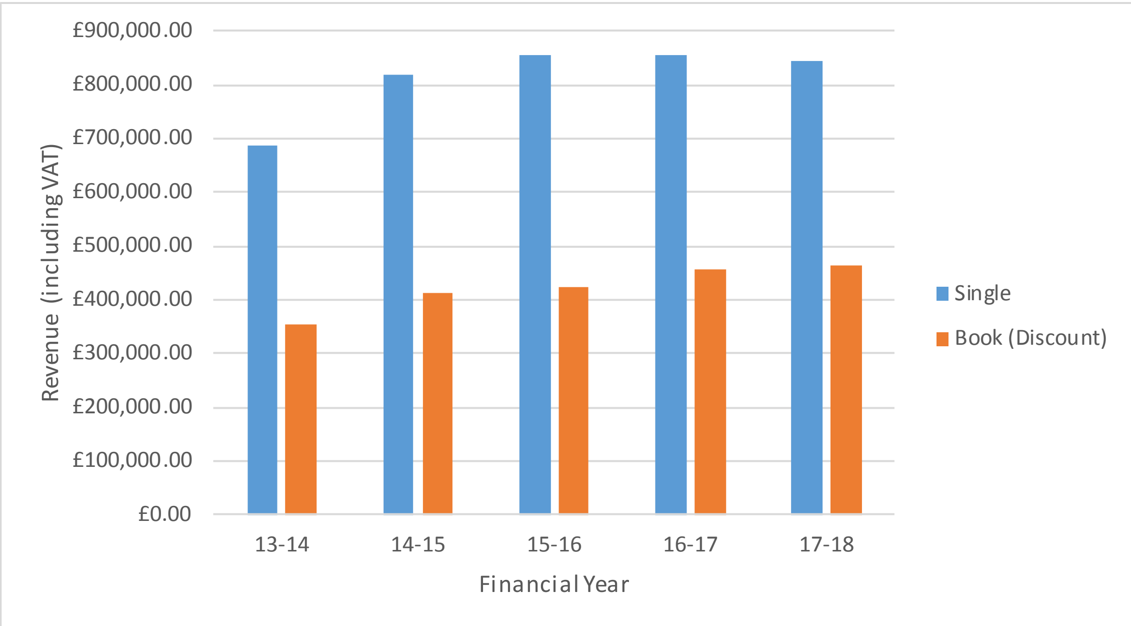

Figure 2.11: Corran Ferry Ticket Revenue by Type - FY2013-14 to FY2017-18

2.6.13 Despite accounting for 63% of all tickets used, the discounted books only provide 34% of annual revenue on average.

2.6.14 The chart below shows the distribution of single and discount ticket sales for cars and light goods[17] across FY2016-17:

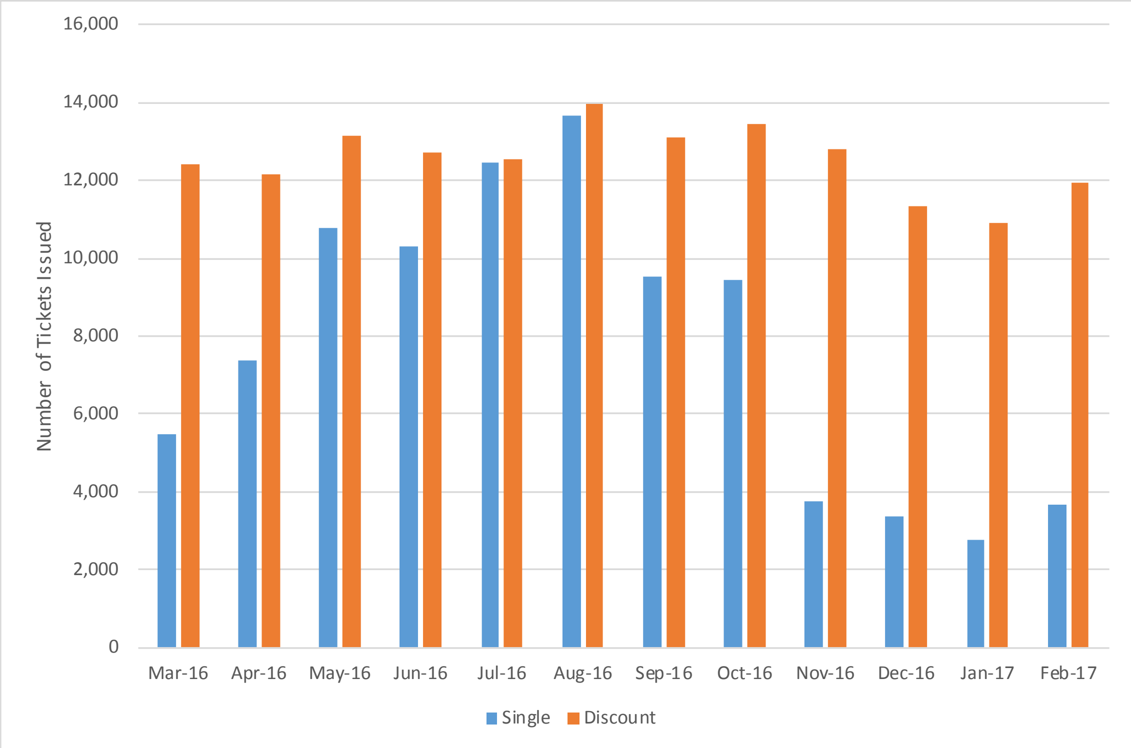

Figure 2.12: Distribution of Ticket Sales – FY2016-17

2.6.15 The key point to note from the above chart is that the use of discount tickets is broadly flat across the year, which implies that they are mainly used by residents. Conversely, there is a clear spike in the number of single tickets sold in the summer months, which implies significant usage by tourists / occasional users. The summer spike in the use of single fares is reflective of trends across the Scottish ferry network.

Surplus / Deficit

2.6.16 The figure below shows the annual surplus / deficit (or profit & loss) of the Corran Ferry operation. Two separate components of data are presented:

- Operating surplus / deficit, which is shown in the blue bars below. This represents total revenue minus the cost of sales (i.e. annual operating costs).
- Surplus / deficit after capital charges, which is shown in red bars below. This represents total revenue minus the cost of sales and a charge levied to recover previous capital outlay on the service. It is our understanding that this capital charge does not provision money for new capital.

[17] Cars & light goods accounted for 80% of all carryings in FY2016-17.

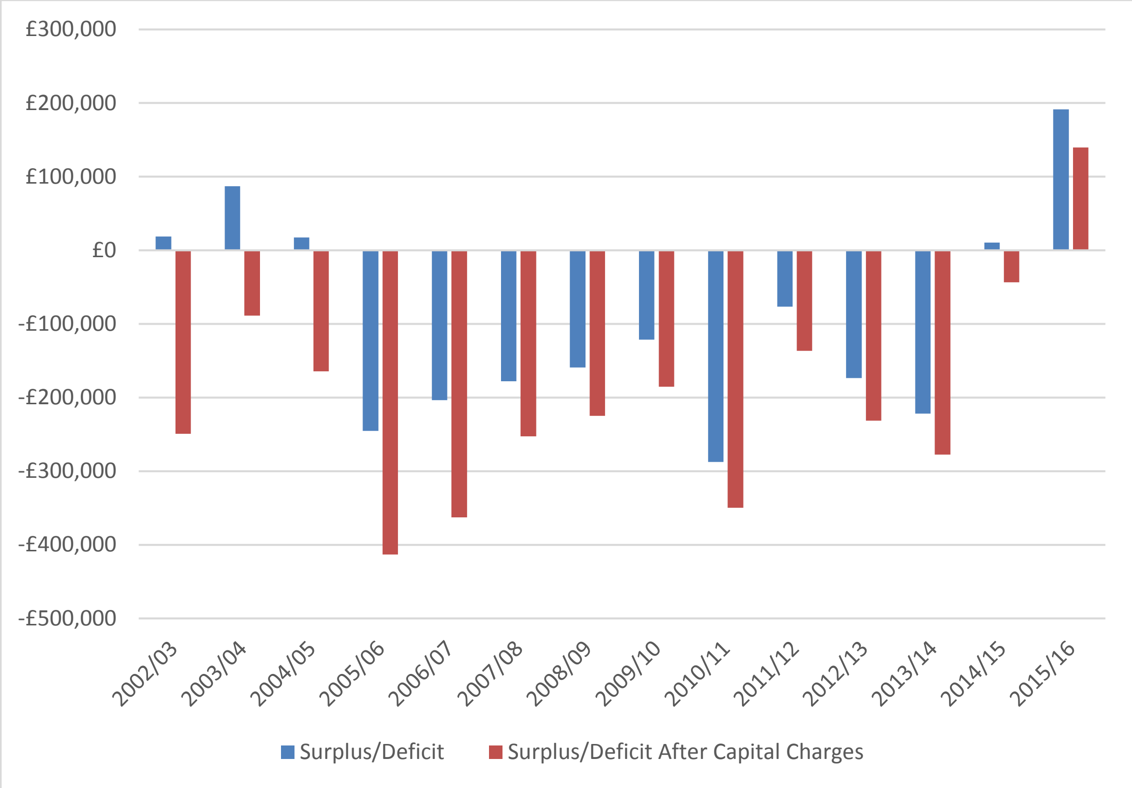

Figure 2.13: Corran Ferry Annual Surplus / Deficit

2.6.17 Key points from the above figure are as follows:

- The service experienced a significant operating deficit between FY2005-06 and FY2013-14, which was exacerbated by the addition of the capital charge.
- A small operating surplus was achieved in FY2014-15, with a much larger surplus achieved in FY2015-16. The improved operating position of the service is partly attributable to the progressive increase in fares, although a much more substantive contributor has been the reduction in fuel prices, which were almost £70k lower in FY2015-16 compared to FY2013-14.
- Despite the ongoing decline in the annual capital charge, it still presents a challenge in terms of the service at least breaking even (it has only done so in FY2015-16, and this is in part due to the lower fuel and refit costs in that year).

2.6.18 In summary, the financial position of the Corran Ferry operation has improved in recent years, with the service currently self-sustaining in terms of its annual operating costs. However, the financial position of the service remains very vulnerable to increases in fuel and refit costs (which will continue to escalate as the vessels get older). The annual capital charges being levied on the service are reducing as the assets are gradually depreciated. However, no provision is being made for capital replacement, which a commercial ferry company would be required to take account of.

2.6.19 There are little or no recharges from THC for back-office and management support costs, which would weaken the overall operating position if accounted for.

Capital Programme

2.6.20 There is currently no committed capital programme to replace any of the major assets associated with the ferry service (i.e. the vessels or slipway infrastructure). Any funding provided would need to come through the annual Highland Council budgeting process or from reserves.

Corran Ferry Delivery Model

2.6.21 The Corran Ferry is operated as a wholly public sector operation. The vessels and infrastructure are owned by THC and the crew are also employed directly by the Council.

2.6.22 THC defines the service specification, operating towards the maximum end of what can be delivered within the current crewing envelope. All capital and revenue costs accrue to THC and all revenue is retained by the Council.

2.6.23 The Council receives an increment on its annual Grant Aided Expenditure (GAE)[18] settlement from the Scottish Government to account for the additional costs it incurs from having to operate ferry services. This sum was £703,000 in 2016-17.

2.6.24 There are a number of different models for the procurement, financing and delivery of ferry services. A key element of this appraisal will involve consideration of potential alternative delivery models for the Corran Ferry. In order to provide a degree of context, a benchmarking paper is included in Appendix B, which establishes the means by which other publicly supported ferry services in Scotland are procured and delivered.

2.6.25 Having set out the factual position around the operation of the Corran Ferry service, the next chapter explores the problems, issues, opportunities and constraints associated with the service which this appraisal should seek to address.

[18] GAE is the means by which the funding allocated from the Scottish Government Spending Review is apportioned fairly amongst local authorities.

3 Problems, Issues, Opportunities & Constraints

3.1 Overview

3.1.1 The purpose of this stage of a STAG study is to identify the problems, issues, opportunities and constraints within the **current and future** transport system. Addressing the identified problems and realising the opportunities (whilst acknowledging issues and constraints) is the ultimate aim of the STAG process, as reflected in the Transport Planning Objectives, STAG criteria and options appraisal. To summarise:

- **Problems** relate to current or future actual or perceived problems in the transport system.
- **Issues** are uncertainties that the study may not be in a position to resolve but must work within the context of.
- **Opportunities** relate to the potential for improvements to the transport system and the way it is used.
- **Constraints** represent the physical, legal and institutional boundaries in which the study is being undertaken. STAG appraisals must take cognisance of all relevant constraints and ensure that the options developed are in keeping with them.

3.1.2 In keeping with the requirements of STAG, evidence of the problems, issues, opportunities and constraints in relation to the Corran Ferry services has been developed through:

- a comprehensive baselining exercise considering all aspects of the service (summarised in Chapter 2); and
- a wide-ranging consultation with users of the service and, with respect to methods of delivery, other providers of publicly funded ferry services in Scotland (a full list of consultees is provided in Appendix C).

3.1.3 The outputs from the above tasks have been used to inform the commentary below.

3.2 Problems & Opportunities

3.2.1 As explained at the outset of this report, this study is appraising options in relation to the:

- future specification of the Corran ferry infrastructure and service; and
- means by which is it is funded and delivered.

3.2.2 The consideration of problems and opportunities is therefore split into three discrete sections:

- assets & operations
- public facing aspects of the service; and
- methods of delivery

Assets & Operations

Vessel Design

3.2.3 As explained in Chapter 2, the tidal race through the Corran Narrows and the absence of a berthing or aligning structure at the slipways necessitates the use of quarterpoint vessels. This is a unique infrastructure arrangement for this scale of operation in Scotland. Whilst safe and operationally effective, it forces the Council to retain two vessels to ensure the provision of a year-round service. This is at odds with other ferry networks in Scotland where relief cover is generally provided from within a larger fleet of vessels or chartered from the spot market. For example:

- Shetland and Orkney Islands Councils both retain one spare vessel within their fleet, which allows for a cascading of vessels to cover scheduled maintenance and breakdowns.[19]
- For the small ferry routes in the Clyde & Hebrides, the operator cascades from within their *Loch* Class fleet to ensure the service is maintained.

3.2.4 In each of the above cases, the commonality of the infrastructure allows one or a small number of spare vessels to cover multiple routes and therefore increases flexibility and reduces costs.

3.2.5 In contrast, THC estimates that the requirement to maintain a year-round relief vessel adds around £100k to the annual revenue costs of the operation, whilst also presenting challenges in terms of maintaining crew familiarisation with the vessel. Moreover, from an asset utilisation point of view, the scheduled use of a vessel for just one month per annum is clearly inefficient.

3.2.6 The requirement to maintain two vessels has historically been manageable, as the MV *Maid of Glencoul* was purchased relatively inexpensively on the second hand market. However, she dates from the 1970s and is in increasingly urgent need of replacement. If a two vessel arrangement is to be maintained in the long-term, a replacement for the MV *Maid of Glencoul* will be required in the short-term, with a replacement for the MV *Corran* required within the next 10-20 years. The capital costs associated with the continuation of this arrangement is a key issue to be explored in the options appraisal.

Overnight Berthing

3.2.7 It was explained in the previous chapter that both Corran vessels overnight on swinging moorings on the Ardgour side of the crossing. This is again a largely uncommon arrangement for a ferry service operating in Scottish waters. Whilst an effective arrangement, consultation with the Council and crew identified a number of challenges:

- The embarkation of the crew onto the ferry via a ship-to-ship transfer is higher risk than an equivalent shore-to-ship transfer, particularly in inclement weather. Whilst this risk is managed, there is a longer-term question as to whether it should be eliminated through overnighting the vessel(s) at a purpose built berth.
- The consultation also found that the water depth at the Ardgour pier can be insufficient for the tender vessel at all states of the tide, which can present a challenge for the crew accessing the ferry.
- Being smaller, the tender also cannot safely operate (including crew transfer) in the same sea state as the two ferries. Whilst risks are again managed, there is potentially a degree of subliminal pressure on the crew to get to the ferry when the conditions are within acceptable bounds for the service to operate.

3.2.8 It is understood that CalMac Ferries Ltd is attempting to move away from swing mooring arrangements where they still exist (e.g. Iona) for the above reasons.

Vehicle Marshalling

3.2.9 There is clear evidence presented in Chapter 2 that the formal marshalling facilities at Nether Lochaber are undersized for the volume of traffic that uses the Corran crossing. It is noted that a significant proportion of sailings run at full capacity and the marshalling area does not have capacity to hold the number of vehicles which can be carried in one crossing by the MV *Corran*.

3.2.10 Adjacent land ownership restricts the opportunities to purchase additional land to widen the road and provide a dedicated marshalling lane of adequate capacity.

[19] Note – there is an issue on the Orkney Outer North Isles services where there is no spare tonnage available, and the number of vessels serving the six islands reduces from three to two for around ten weeks of the year. However, a refit timetable is adopted for this period and a service is maintained, albeit with a lower frequency.

3.2.11 To resolve this issue, there are a number of possible solutions;

- Increase size of marshalling area to a capacity slightly greater than the carrying capacity of the vessel (say 1.2-1.5 times vessel capacity), this would ensure that during peak periods there is capacity within the marshalling to accommodate vehicles for more than one sailing. It is however unlikely that this option would be possible at Nether Lochaber as there is little land available to increase the marshalling area.
- Introduce ferries with larger carrying capacity, the ferry itself could be used to marshal vehicles on while it is at the slipway easing queuing problems. Also due to increased capacity, “shuttling” would be required less frequently.
- Increase the frequency of the service; given that it is currently common practice for the ferry to operate a shuttle service to reduce queues as quickly as possible, the only way to significantly increase the frequency of the service further would be to introduce a second ferry, which would bring its own challenges.

Sustainability of the Crewing Model

3.2.12 It is clear from the analysis contained within Chapter 2 and from the consultation with both the Council and the crew that there are serious short-term challenges in the terms of the sustainability of the crewing model. These include:

- The total number of crew is at or near the minimum complement required to run the current service. Indeed, there is a reliance on overtime to maintain the operation of the service and there is very little spare capacity to accommodate sickness, training etc.
- Recruitment is proving to be challenging. As the service is operated by the Council, crew are paid on Council terms & conditions, which are generally uncompetitive with those of seafarers.[20] In addition, as the Council only operates one major route, there are few progression / promotion opportunities for crew members. This challenge is amplified by the presence of several Clyde & Hebrides routes in close proximity to the Corran Ferry.
- Agency crew, particularly those with appropriate qualifications, are proving difficult to attract and retain.
- There is also an emerging demographic challenge, with a significant proportion of the crew approaching retirement within the next 5-10 years, particularly in terms of the Masters and engineers. This is a critically important issue as the retirement of a small number of crew could lead to a forced reduction in the service. THC has also noted that, as crew become older, they are less inclined to do overtime.
- Feedback from the THC also suggests that more immediate issues of lack of rest days, stress and illness are impacting on service resilience.

3.2.13 The above factors, both on their own and in combination, represent a serious and immediate threat to the sustainability of the service.

Public Facing Aspects of the Service

3.2.14 This section considers the transport problems & opportunities relating to the public facing aspects of the service. A review of the current service levels against the Routes & Services Methodology (see Chapter 4) suggests that the connectivity offered by the ferry service (i.e. number of days of operation, frequency and the length of the operating day) is broadly appropriate, a finding generally supported by the consultation outwith a few specific points.

3.2.15 The problems with respect to the public facing aspects of the service are concentrated more on fares, capacity, reliability and alternatives to the ferry service.

[20] Note – in the height of the oil boom, Shetland Islands Council permitted deviation from public sector pay settlements to ensure retention of key ferry crew.

Fares

3.2.16 The level of fares and how they are set has been a long-running issue in relation to the operation of the Corran Ferry.

Level of Fares

3.2.17 As explained in Chapter 2 and evidenced through the benchmarking in Appendix A, fares on the Corran Ferry service are on the whole lower than elsewhere, particularly in terms of the multi-journey books.

3.2.18 The current arrangements work relatively well for local residents & businesses. The socio-economic study carried out in 2014 evidenced the role that the current fares system plays in supporting the economically fragile communities which the ferry serves, particularly in terms of encouraging population retention. The current fares system is considered to:

- support commuting and business travel to and from the peninsula;
- allow residents on the Ardgour side of the crossing to travel to Fort William and further afield for a wide range of non-work purposes; and
- support affordable freight / supply chain access (it being noted that numerous online retailers add a delivery surcharge or do not deliver at all to areas they consider to be remote).

3.2.19 Despite the above, the multi-journey book fares are low when judged against any comparable benchmark. Whilst this is a perfectly reasonable policy position to adopt, the revenue collected by the ferry service is insufficient to ensure its long-term viability without external sources of funding (particularly for capital). As detailed in Chapter 2, the Council has attempted to increase fares on a number of occasions but has met with local opposition. Indeed, there has been a strong and continuous local campaign for the abolition of fares on the route. The consultation suggested that, given the nature of the crossing, fares are considered the equivalent to a bridge toll. It has also been noted that in countries like Norway and Sweden, short river and fjord crossings are commonly defined as part of the national road network and thus are free at the point of access.

3.2.20 The debate around fares has been insoluble over a number of years and presents a further threat to the long-term sustainability of the service.

Revenue Protection

3.2.21 The collection of fares on the short crossing also means that revenue protection can be a challenge (as well as putting a continuous pressure on the purser across the long operating day). The absence of any smart ticketing system means that ticket sales and collection is an entirely manual process.

3.2.22 The multi-journey books of tickets are specific to a vehicle (personal travel) or company (CV and coach travel). However, the checking of tickets on transit and the short crossing means that it is difficult to check that these tickets are being used by the registered vehicle. Indeed, anecdotal evidence (from e.g. Trip Adviser) suggests that accommodation providers are giving tickets to their guests, whilst there is also a resale value for unused tickets. This is leading to a direct loss of revenue for Council, which is feeding through into the wider challenges surrounding the long-term viability of the service.

Consistency with RET Principles

3.2.23 In the *Scottish Ferries Plan 2013-22*, Transport Scotland stated that they would be willing to negotiate a transfer of responsibilities for local authority operated ferry services. The stated intention within the *Ferries Plan* was that this would be on a ‘no detriment basis’ for central government. This represents a clear opportunity to address some of the underlying issues with the service but at the same would imply a requirement to reform the Corran fares system.

Transport Scotland's ferry fares policy is Road Equivalent Tariff (RET)[21], and it is expected that this would be the starting point in relation to any transfer of responsibilities discussion.

3.2.24 In terms of the straight application of RET on the Corran services, this would have the following implications:

- All passengers would require to be charged at the RET rate.
- Initial calculations (based 2015/16 RET rates uplifted for CPI) suggest that the single fare for a car and driver would be £7.88 (£2.19 for the driver and £5.69 for the car), with each additional passenger in the car being charged £2.19 (children 5-15 would be charged £1.09). This compares favourably to the current £8.20 drive-up fare (assuming car & driver only), but represents a significant increase in price on the £2.41 multi-journey fare.
- Multi-journey books would be discontinued.
- RET fares are generally uprated for CPI inflation on an annual basis and this is applied network wide. In addition, the means of setting fares and their absolute level would be at the sole discretion of Scottish Ministers.
- RET fares would address the revenue protection issues previously noted, although there would remain enforcement challenges without shoreside sales / collection.
- Whilst not RET issues *per se*, it is likely that standardisation of vehicle definitions would be required, with the charges being amended accordingly. This would present a challenge in terms of the currently desired simplicity of the fares system.

3.2.25 Whilst at face value the RET policy position is relatively clear, the situation on the ground is less so. The following issues would need to be considered in any potential application of RET to the Corran Ferry:

- Previous applications of RET have been implemented with a view to leaving no community worse off. Where the RET fare was demonstrated to be higher than a single journey under the previous multi-journey ticket arrangements, the RET fare was capped at that level. There is therefore a question as to whether the Corran Ferry fare would be:
  - Capped at the current multi-journey ticket level (£2.41 for a vehicle and all passengers); or
  - Capped at the current multi-journey ticket level for vehicles (£2.41) plus the application of an RET passenger fare of (£2.19). The total fare for a car & driver would therefore be £4.60; or
  - Introduced as a straight RET fare. In almost all previous applications of RET, the fares replaced were previously set by Transport Scotland through the Clyde & Hebridean Ferry Services (CHFS) contract, and thus there was a degree of ownership / responsibility for those fares. With respect to the Corran Ferry, the view could be taken that the multi-journey books have historically been under-priced, whilst fares have been capped over several years, which has not been the case on CHFS. There may therefore be a desire to implement RET in a more formulaic fashion.
- Any capping at the multi-journey price would imply a very substantial reduction on present-day 'drive up' fares and therefore a reduction in revenue.
- Whilst RET generally superseded the vast majority of the old fares, there were some exceptions to this. There would be an obvious requirement to consider these precedents with respect to the Corran Ferry.
  - On the Bute routes (Wemyss Bay–Rothesay and Colintraive–Rhubodach), a 50 journey ticket book has been retained. It is valid for one year for a registered vehicle and covers the passenger & driver fare.[22]

[21] Road Equivalent Tariff in the Scottish context refers to the equivalence between the ferry fare and the cost of driving the same distance by road, with a fixed sum added to support cost recovery.

[22] https://www.calmac.co.uk/tickets/frequent-traveller

- One, three, six and 12-month season tickets were retained on the Largs-Cumbrae and Wemyss Bay–Rothesay routes. Six and 12-month season tickets were also retained on the Oban – Craignure route.[23]

- When the one year 'fair funding' settlement was announced for the Orkney and Shetland internal ferry services in the Scottish Government 2018 Budget, RET was not imposed as a condition. This funding settlement covers the deficit that both Councils face in operating their internal services for one year only and thus can only be considered a temporary measure at this stage.
- There is also no standardised charging mechanism with regards to freight on other Scottish networks.

3.2.26 It is clear from the above that any future introduction of RET on the Corran Ferry route would therefore pose a number of policy and practical delivery questions.

Vehicle Capacity

3.2.27 Vehicle deck capacity can be a problem on peak sailings on the Corran Ferry, although in a slightly different manner from other longer ferry routes. When the car deck is full to capacity, any traffic which cannot be accommodated on that sailing may be required to wait a maximum of 20 minutes in peak and 30 minutes in off-peak for the next service. This is unlikely to lead to journeys being postponed, although they can be delayed, leading to journey time and reliability disbenefits for users. It is noted though that at the Master's discretion the practice of shuttling is adopted to avoid long queues and passengers being delayed.

3.2.28 Our initial intention in this study was to analyse vehicle deck utilisation on a sailing-by-sailing basis across a long-time period, but vehicle carryings / deck utilisation are not however recorded in this manner for the Corran Ferry. However, when a capacity issue occurs, the service will, at the Masters discretion, operate in 'shuttle' mode to clear any backlogs. The Council has provided a record of all shuttle sailings operated in 2017. Whilst this does not fully establish the capacity issue (as there is no indication of how many shuttle sailings short-shipped traffic has to wait for), it does provide an indication of the days of the week and months of the year when capacity is hardest pressed. The table below sets out the average number of shuttles by day by month across 2017 (note the red italicised numbers denote periods when the MV *Maid of Glencoul* was in operation and shuttling):

Table 3.1: Corran Ferry Shuttles 2017

	Mon	*Tues*	*Wed*	*Thurs*	*Fri*	*Sat*	*Sun*	*Average per Day*
Jan	3	2	4	1	12	0	0	**3**
Feb	6	5	4	6	10	1	0	**5**
Mar	9	8	7	5	8	2	4	**6**
Apr	20	7	12	15	15	11	4	**12**
May	16	14	14	14	24	11	3	**14**
Jun	11	12	12	17	18	18	2	**13**
Jul	16	11	9	12	17	19	2	**12**
Aug	16	14	14	17	24	20	4	**15**
Sept	10	14	8	19	18	11	2	**12**
Oct	16	11	7	8	22	20	8	**13**
Nov	*27*	*27*	*29*	*29*	*36*	*17*	*16*	***26***
Dec	*20*	*17*	*12*	*21*	*18*	*9*	*3*	***14***

[23] https://www.calmac.co.uk/tickets/frequent-traveller

	Mon	*Tues*	*Wed*	*Thurs*	*Fri*	*Sat*	*Sun*	*Average per Day*
Average by Day	**14**	**12**	**11**	**14**	**18**	**11**	**4**	

3.2.29 The following points are worthy of note from the above timetable:

- The number of shuttles increases significantly when the MV *Maid of Glencoul* is in operation as a result of her lower vehicle carrying capacity. The MV *Corran* refit in 2017 commenced in the last week of October and extended through all of November and into early December. During November, when the service was fully operated by MV *Maid of Glencoul*, there were an average of 26 shuttle runs per day, with 36 on a Friday, the peak day of the weak. The timetable offers around 70 scheduled single sailings per day – in November, the number of sailings increased by around a third on average and a half on a Friday. This puts significant pressure on the crew over the course of the operating day.
- In contrast to the above, when MV *Corran* operates the route on her own in the winter months (e.g. January to March), average shuttles per day were in the region of 3-6, with the majority being on a Friday. It is therefore clear that the MV *Maid of Glencoul* struggles to meet the required demand when in service on her own.
- During the 'summer' period (April – September), there is generally a requirement for the service to operate in shuttle mode for a period of time on most days. The peak day on the service is generally a Friday. There is also a significant number of shuttles operated on a peak summer Saturday (i.e. June to August). Monday is also a relatively busy day, with an apparent Easter Monday effect in April.

3.2.30 It should be noted that the transport problem in this respect is not only the capacity of the ferry, but the impact on the constrained marshalling area on the Corran side of the crossing, and the potential overspill onto the A82 trunk road. The additional pressure placed on the crew to operate at a higher intensity should also be acknowledged.

Reliability

3.2.31 The breakdown of the MV *Corran* in July 2017 at a time when the MV *Maid of Glencoul* was out of service (thus leading to the suspension of the service) led to significant negative publicity around the overall reliability of the service. The table below sets out the reliability statistics for the Corran ferry for 2013-2017 inclusive:

Table 3.2: Corran Ferry – Disruption of Service (Hours)

Cause of Disruption	2013	2014	2015	2016	2017
Adverse Weather	32.5	21.5	41.75	15.75	2.5
Breakdown – Restricted Service[24]	56.5	0.0	4.5	9.5	0.0
Break down - No Service	0.5	0.0	1.5	0.0	74.5
Estimated Annual Timetable Hours	*5,311*	*5,311*	*5,311*	*5,311*	*5,311*
% Hours Lost to Adverse Weather	*0.6%*	*0.4%*	*0.8%*	*0.3%*	*0.0%*
% Hours Lost to Breakdowns	*1.1%*	*0.0%*	*0.1%*	*0.2%*	*1.4%*

3.2.32 The following points should be noted from the above table:

[24] Restricted Service – MV *Maid of Glencoul* in operation.

- Despite the high-profile breakdown in summer 2017, the Corran Ferry service is actually one of the most reliable in the country, with very few hours lost relative to the intensity at which the service is operated.
- Given the relatively short and sheltered location of the crossing, very little time is lost to adverse weather (indeed, there were no weather-related stoppages in 2017). It is unlikely that any option emerging from this appraisal would materially reduce weather-related disruption (unless the disruption relates to the use of the crew tender).
- Breakdowns are also infrequent when considered in the context of annual operating hours, although they do by their nature occur in a short and concentrated period of time and can thus create a perception of reliability problems.
- In the four years prior to 2017, there were only two hours where a breakdown of the MV *Corran* was not covered by the MV *Maid of Glencoul*. Whilst the latter vessel has her limitations, she still broadly maintains the service, albeit with a need for almost continuous shuttling. In other areas of Scotland, breakdowns will generally lead to several hours of service outage whilst vessel cascades occur or spare vessels are mobilised (as has recently been seen on the CHFS network). The Corran service therefore maintains an enviable track record in this respect.

3.2.33 Whilst the Corran Ferry service maintains a very high standard of reliability, it is important to bear in mind that, as both vessels get older, the probability of breakdowns increases and the repairs / sourcing of parts may take longer. This is particularly the case with the MV *Maid of Glencoul*, which dates from the 1970s. There is therefore an emerging longer-term reliability problem to be addressed on the crossing.

Alternatives to the Corran Ferry

3.2.34 The Corran Ferry provides a 'shortcut' from the peninsula to Fort William and indeed the rest of Scotland. From the ferry terminal at Ardgour, the alternative road route to Fort William is 35 miles, much of it on single track road. The A861, which connects Ardgour to the A830 at Kinlocheil (and onwards to Fort William) also has a 12 feet height restriction immediately south of the junction (where the West Highland Line crosses the road) restricting access for many CVs. Service outages significantly extend journey times to all destinations, particularly for commercial vehicles, which need to route via Lochailort.

3.2.35 In order to set out the wider role of the service in the context of transport across the area, map based graphics have been produced showing the *difference in travel time from* Census Output Areas within the area bounded by A830 / Loch Linnhe / Sound of Mull to Fort William and the A82 South when travelling *with and without* the ferry service, based on observed traffic speeds ('INRIX' dataset, which provides actual journey times based on data collected from GPS-enabled devices) and using the Network Analyst software.

3.2.36 The figure below shows the change in travel times from all points on the peninsula to **Corran** (taken as a proxy for all points south on the A82) if the ferry service was not in operation.[25]

[25] Note – this run of Network Analyst was undertaken in the AM period but, given the relatively light traffic in the area, there is little to no difference between the time periods.

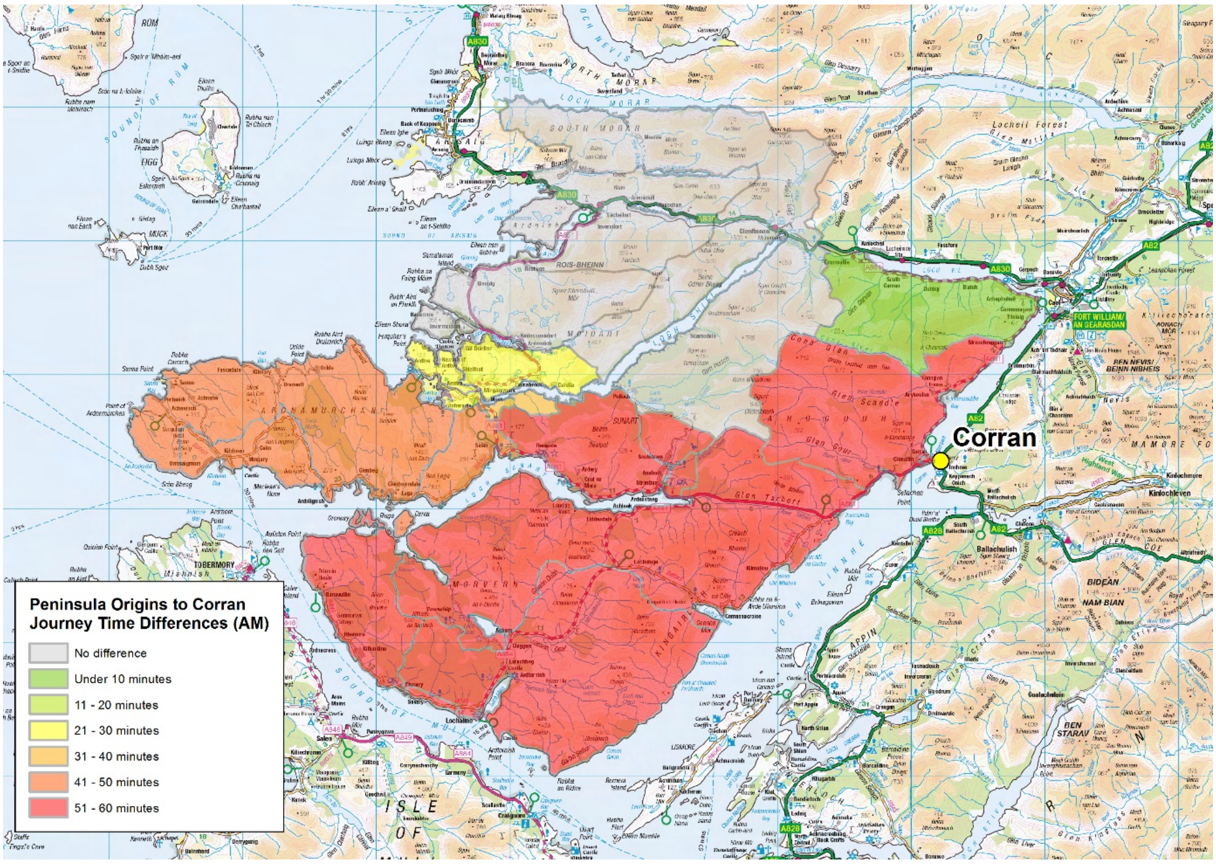

Figure 3.1: Change in Travel Times from Peninsula to A82 Corran in 'No Ferry' Scenario

3.2.37 The above figure demonstrates the role that the Corran Ferry service plays in facilitating travel from the peninsula to the A82 and all destinations to the south, including Oban and Glasgow.

3.2.38 If the ferry services were not in operation, journey times from Morvern, Ardgour and much of Sunart would be increased by up to one hour. This would also have a knock-on effect on the use of the 'back door' to Mull via Lochaline. Given the height restriction on the A861 north of Ardgour, commercial vehicles would need to route to Lochaline via the A861 at Lochailort, a journey length of some 86 miles and almost two and a half hours. This would have implications for driver tachograph hours.

3.2.39 Residents of Ardnamurchan would also experience a significant journey time disbenefit in the region of 40-50 minutes. The journey time disbenefit dissipates the further north and west one travels.

3.2.40 The figure below shows an equivalent graphic for access to Fort William, the key service centre for the peninsula:

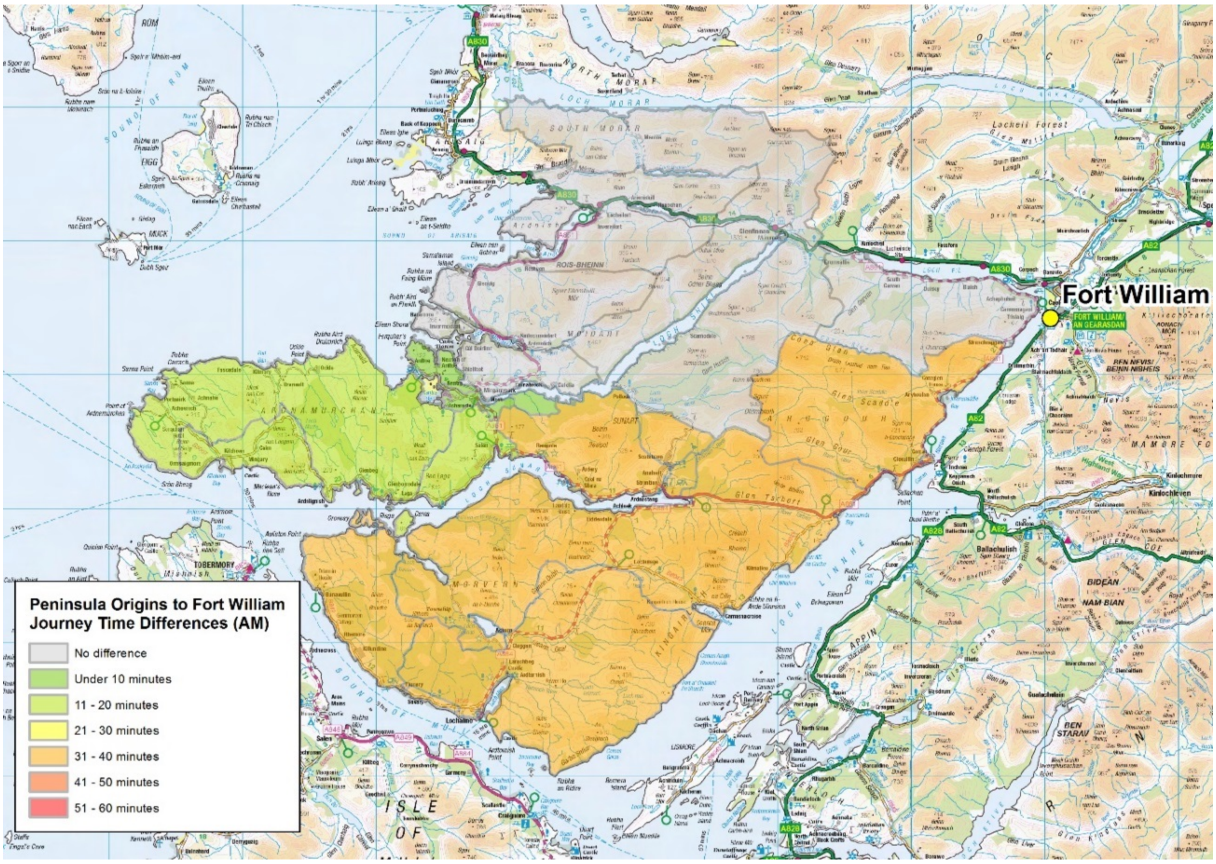

Figure 3.2: Change in Travel Times from Peninsula to Fort William in 'No Ferry' Scenario

3.2.41 The travel time disbenefit to Fort William without the presence of the ferry is less than the equivalent impact on trips to Corran / A82 south (given that all road trips would have to pass through Forth William). The impact is again most significant in Morvern, Sunart and Ardgour, where journey times would increase by around 30-40 minutes. The increase in Ardnamurchan would be around 11-20 minutes, whilst the remainder of the peninsula would be largely unaffected.

Commercial Vehicle Access

3.2.42 As noted above commercial vehicle access to the eastern part of the study area is hampered by a 12 feet height restriction on the A861, which makes the Corran Ferry the preferred means of accessing Ardgour and beyond (including Lochaline for services to Fishnish on Mull).

3.2.43 General service outages are problematic in this respect and give rise to a degree of severance for the peninsula. However, a more general issue arises when the primary vessel, the MV *Corran*, is out of service. The secondary vessel, the MV *Maid of Glencoul*, is also limited to carrying shorter articulated lorries and a maximum of 38t in weight; 16 feet in height; and 12 metres (rigid) / 15 metres (artic) in length.[26] Consequently, and because there are height and weight restrictions on the alternative road routes, the peninsula is effectively cut off for many large commercial vehicles when she is in service.

Mull – Dangerous Goods

3.2.44 The Oban – Craignure ferry service is currently operated on a year-round basis by the MV *Isle of Mull*. She is a closed deck vessel and therefore cannot carry certain categories of dangerous goods, which instead route via the Corran Ferry and Lochaline – Fishnish. The reliability of the Corran Ferry service is therefore important for meeting this island need. The deployment of the MV *Maid of Glencoul* typically coincides with when the MV *Isle of Mull* is operating the Oban –

[26] file:///C:/Users/scanning/Downloads/Corran_FerryTimetable%20(2).pdf

Craignure route on her own. Dangerous goods access to Mull via Corran and Lochaline therefore becomes challenging for the six or so weeks per year that MV *Corran* is away for refit.

3.2.45 This is not an issue in the summer months, when the open-deck MV *Coruisk* is in operation. The problem is also expected to be resolved in late 2019 when the open-deck MV *Hebrides* commences operation on the Oban – Craignure route (although it is understood that this deployment plan is subject to the outcomes of a separate STAG study in the Outer Hebrides).

Methods of Delivery

3.2.46 This final section considers the problems and opportunities with respect to methods of delivery. The current delivery model gives rise to several challenges:

- The Corran Ferry is the only route of any significance operated by the Highland Council. Responsibility for the ferry service sits within the Council's Roads and Transport Department, rather than a specific marine department or arms-length ferry operating company. This means that Highland Council does not benefit from the economies of scale that accrue to the likes of Orkney and Shetland Islands Councils, both in terms of cost and regulatory compliance.
- From an operational perspective, the operation of the route in isolation has led to a very specific infrastructure design and has limited the ability to secure refit / breakdown cover from elsewhere, thus necessitating the retention of a second vessel.
- As explained earlier in this chapter, the ability to attract and retain both regular and agency crew is becoming a serious threat to the sustainability of the service. This problem again stems from the route being operated in isolation.

3.2.47 This appraisal presents an important opportunity to identify and appraise other potential models of delivery, particularly in the context of the much wider ongoing discussion about the funding and delivery of local authority services generally (i.e. the *Fair Funding* discussions in Orkney & Shetland and the discussions surrounding transfer of responsibility for Argyll & Bute and SPT services).

3.3 Issues

3.3.1 This section sets out the uncertainties that the study will not be able to resolve but must work within the context of.

Appropriate Tonnage

3.3.2 As explained earlier in this section, the quarterpoint ramp system is currently used on the Corran Ferry service due to the tidal streams running through the narrows and the absence of an aligning or berthing structure at the slipways. The CMAL *Loch* Class vessel MV *Loch Alainn* was previously trialled on the route but encountered difficulties holding station in the tidal stream.

3.3.3 The MV *Loch Alainn* is however of a 1997-vintage and is thought to be less powerful and manoeuvrable than the modern *Loch* Class vessels, particularly the new hybrid ferries MV *Hallaig*, MV *Lochinvar* and MV *Catriona*. It may therefore be that one of these newer vessels could maintain a reliable service on the Corran route, albeit the reduced capacity relative to MV *Corran* is noted. Whilst there may not be an appetite to operate a 'straight-through' ferry as the main vessel without an aligning or berthing structure, it could potentially provide short-term refit cover, removing the need for a dedicated second vessel.

3.3.4 Trials of one of the more modern vessels would be required to identify whether they are suitable. This is unlikely to happen within the duration of this appraisal, and indeed securing a longer-term commitment to provide cover could be challenging given the pressure on vessels within the CMAL fleet.

Transfer of Responsibility Criteria

3.3.5 Whilst the *Ferries Plan* commits in principle to consider a transfer of responsibilities based on a no net detriment position, the actual process for each local authority which has pursued a transfer has been based on individual negotiations / discussions rather than a fixed set of criteria. Whilst this appraisal will consider a transfer of responsibilities as an option, it will not be able to provide a definitive position on several points including e.g. residual cost delivery, fares, future procurement approach, TUPE arrangements for crew etc. This would all be subject to detailed negotiation with Transport Scotland.

Ferry Services Procurement Policy Review

3.3.6 Transport Scotland is in the process of carrying out a procurement policy review for ferry services. There are several strands to this work but the main point of consideration is whether an exemption under European law (known as the Teckal Exemption) can be adopted. Successful application of the Teckal Exemption would allow Transport Scotland to bring their tendered services in-house (although it has been stressed that the ultimate decision as to whether to tender or otherwise would reflect the wishes of the communities affected).

3.3.7 The outcome of the Procurement Policy Review could therefore impact on how the Corran Ferry service is delivered in the future should a transfer of responsibilities be sought. The outcome of the review is again expected to be after the completion of this study.

Ferry Freight Fares Review

3.3.8 Whilst the starting position for any transfer of responsibilities is the adoption of RET, this fares system does not apply to commercial vehicles, for which there are a wide range of charging methods across Scotland. Transport Scotland is currently undertaking a Ferry Freight Fares Review, with the aim of defining a consistent policy for the charging of freight on its tendered ferry services. The outcomes of this study could influence future freight fares on the Corran ferry. The conclusions of the Ferry Freight Fares Review are not expected to be published within the lifetime of this study.

3.4 Constraints

3.4.1 There are very few constraints when considering future options for the Corran Ferry service. The challenging tidal conditions require that any future infrastructure has to be capable of operating within them, whilst the future delivery model must align with State Aid and other relevant legislation. Land ownership may also be an issue with regards to expanding the marshalling area on the Nether Lochaber side of the crossing. Outwith these points, the options appraisal can be open and wide-ranging.

3.4.2 Having identified the transport problems & opportunities which the appraisal is trying to address, and the issues and constraints within which it must work, the next chapter establishes a set of Transport Planning Objectives for the appraisal.

4 Transport Planning Objectives

4.1 Overview

4.1.1 The setting of Transport Planning Objectives (TPOs) is a key step in the STAG process as they define what the policymaker should be seeking to achieve through the transport intervention. Chapter 3 established the evidence-based transport problems drawing upon the baselining research and consultation. This chapter sets out the TPOs for the Corran Ferry Services Options Appraisal.

4.1.2 In advance of the objective setting process however, the Routes & Services Methodology (RSM) results for the study area are considered.

4.2 Routes & Services Methodology

4.2.1 As part of their comprehensive review of all publicly supported ferry services in Scotland, Transport Scotland developed a 'Routes & Services Methodology' (RSM) designed to ensure a consistent approach to ferry service provision across the country. Completion of the RSM to Transport Scotland's satisfaction is a necessary pre-requisite to any discussions surrounding the potential transfer of responsibility.

4.2.2 The RSM is a six-step process that aims to identify whether gaps exist in the current level of service provision for ferry-dependent communities in Scotland. It is intended to be applied consistently across all communities served by the ferries network. Where gaps are identified, options to address the gaps are developed and appraised to set the priorities for future spending. There are six steps in the methodology.

4.2.3 HITRANS commissioned Eyland Skyn to carry out the Corran Ferry RSM in 2014. This section largely builds on that analysis, although updates it to reflect our recent experience of applying the RSM in Orkney and Shetland, thus working towards a degree of national consistency (the islands served by Clyde & Hebridean Ferry Services having being covered in the *Ferries Plan*).

RSM Process

4.2.4 The RSM process considers four ferry-related dependencies (Commuting & Frequent Business Use, Personal, Freight and Tourism), each of which is informed by a series of indicators. The dependencies give rise to a model service specification in terms of the:

- number of days the service operates;
- length of the operating day; and
- number of connections across the day.

4.2.5 The model service specification is then compared against the current level of service to identify any under or over-provision of service. Any subsequent options appraisal should therefore initially be focussed on options which lead to alignment between the current and model service provision.

Study Area - RSM Results

4.2.6 Our review of the RSM results for the study area establishes that **the current Corran Ferry service is fully aligned to the model service specification**. The options considered in this study will therefore be focused on any investment required to **maintain** the current level of service – i.e. the focus will be on **infrastructure** and the **means by which the service is delivered** rather than service components.

4.2.7 The full RSM analysis can be found in Appendix D.

4.2.8 It should be noted that, whilst the current service aligns with the RSM, a number of consultees did suggest specific areas of the service which they would like to see improved / developed:

- The cost of tickets was widely cited as an issue by local stakeholders.
- There is an aspiration amongst local stakeholders, particularly businesses, for a 24-hour service across the Narrows, given that a relatively short stretch of water creates such a significant severance issue.
- On a more narrow point, stakeholders noted that the timing of the last ferry can be too early when events are taking place in the peninsula.
- There was also a desire amongst a subset of hauliers for an 06:00 rather than an 06:30 start to the operating day (note that any change to the current operating day would require either (i) additional crew; or (ii) the operating day to be adapted by an equivalent amount of time at the other end).
- Haulage firms noted that it would be beneficial if a Variable Messaging Board and notices in the local newspaper / social media were provided when the MV *Maid of Glencoul* is in operation.

4.3 Transport Planning Objectives

4.3.1 The objectives developed below are designed to appraise options in the context of the problems & opportunities developed in the previous chapter. The starting point has been to consider the factors which are influencing ferry service provision / operation and use this as the basis of the objectives (i.e. addressing the transport 'problem(s)').

4.3.2 In keeping with the identified transport problems, the options appraisal will consider two discrete issues – the future infrastructure required (the 'what) and how that infrastructure and the wider service is funded and delivered (the 'how'). The TPOs have been developed to reflect this.

4.3.3 It should be noted that there is no specific objective set in relation the issue of **fares**. The level of fares and the means by which they are set is ultimately a policy decision based on the Council's objectives for the service.

Infrastructure Objectives

- **Transport Planning Objective 1:** The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland.
    - *What problem(s) does this objective seek to address?:* This objective will address the problems / challenges / risks associated with the current infrastructure and operational practices on the Corran ferry service, as identified in Chapter 3 including e.g. inadequate marshalling, narrow slipways, difficult access slipway/vessel for large CVs at Ardgour, crew transfer by tender associated with use of swinging moorings, unique quarter point vessels etc.
    - *How will the objective be made SMART[27]?:* The vessel options and shoreside general arrangement drawings will specify the capability / capacity of the prospective options.
- **Transport Planning Objective 2:** The Corran Ferry should facilitate year round access to Ardgour and beyond for all vehicle types.
    - *What problem(s) does this objective seek to address?:* This objective specifically seeks to address the severance / diversion issue for commercial vehicles when the MV *Maid of Glencoul* is in operation in addition to perceived current and future reliability of service and availability of appropriate relief vessels.
    - *How will the objective be made SMART?:* The vessel options developed will specify the year round capacity of the service.

[27] **S**pecific, **M**easurable, **A**ttainable, **R**elevant and **T**ime-Bound.

- **Transport Planning Objective 3:** The available vehicular capacity of the ferry service should as far as possible facilitate compliance with the published timetable.
  - *What problem(s) does this objective seek to address?:* This objective is intended to address the challenges / pressures placed on the crew and assets by the need to shuttle. It will also seek to ensure that, by providing the right capacity at scheduled times, journeys are not unnecessarily delayed.
  - *How will the objective be made SMART?:* The shuttling data provided by THC will be used as the basis for identifying the periods when the service regularly departs from timetable. This will be used in appraising the capacity offered by each option.

Methods of Delivery

- **Transport Planning Objective 4:** The delivery and funding model should ensure the long-term sustainability and resilience of the Corran Ferry service
  - *What problem(s) does this objective seek to address?:* This objective is intended to address the financial and human resources challenges (crew demographics and retention of trainees / new crew) threatening the continued operation of the ferry service.
  - *How will the objective be made SMART?:* A cost & revenue model will be developed to test the options emerging from the appraisal. The human resource angle will be addressed through a qualitative review of what different delivery methods could imply for this aspect of the service.

5 Option Generation, Development & Initial Appraisal

5.1 Overview

5.1.1 This chapter sets out the long-list of options to be considered through this appraisal. In line with STAG, the potential options were derived through:

- ideas / outputs from the consultation process;
- ideas / proposals that have previously been developed and remain viable options; and
- ideas / outputs from structured decision making processes, followed by our team undertaking the 'optioneering' exercise.

5.1.2 There are two distinct aspects to the option generation process in the context of this appraisal:

- defining options in relation to future infrastructure – the 'what'; and
- identifying how that infrastructure and the wider service could be delivered – the 'how'.

5.1.3 There are therefore two discrete sets of options generated in this chapter.

5.2 Do Nothing

5.2.1 The STAG Guidance does not explicitly recognise a 'Do Nothing' case, as it is assumed that the basis of carrying out an appraisal is to address an identified set of problems and / or opportunities.

5.2.2 However, our review of the assets and the current delivery model suggests that the service is not sustainable in the long-term. Therefore, if there was to be a 'Do Nothing', this would represent a situation, whereby the ferry service is ultimately discontinued at the point where the cost of maintaining the assets exceeds their value and / or insufficient crew can be found to maintain the service.

5.3 Do Minimum and Reference Case

5.3.1 STAG requires the establishment of a 'Do Minimum' and 'Reference Case':

- The 'Do Minimum' is the current position plus any committed investments which have policy and funding approval.
- The 'Reference Case' includes other non-controversial but as yet uncommitted transport schemes and / or development profiles, which can also be used as a baseline for option comparison.

5.3.2 The Do Minimum in this case is the like-for-like replacement of the current assets at life expiry. The delivery and funding model would remain unchanged. This is elaborated on further in the next sections.

5.3.3 Given that there are no committed investments on the route, the Do Minimum and Reference Case are one and the same thing in this instance.

5.4 Infrastructure Options

5.4.1 There are two separate components to the definition of the future infrastructure options, each of which has several sub-options, as follows:

- Vessels – our broad consideration of vessels is based on **vehicle car-carrying capacity**, with options developed from a combination of the following:
    - Like-for-like (LfL) quarter point vessels (this is the Do Minimum);
    - Larger quarter point vessel(s);
    - LfL 'straight through' vessel(s) – i.e. broadly equivalent to a CalMac *Loch* Class; and
    - Larger 'straight through' vessel(s).
- Slipways & shoreside infrastructure:
    - Unchanged (this is the Do Minimum); and
    - Upgraded (widening of the Ardgour slipway and upgrades to vehicle marshalling where practical) - maintenance to repair undercutting and voiding.

5.4.2 The table below sets out the potential combinations of each of the above options and includes consideration of the future deployment of the MV *Corran*. In all cases, the MV *Maid of Glencoul* is retired. A more detailed description and further development of these options is provided after the table:

Table 5.1: Future Vessel and Infrastructure Specification Options (VIS) - Options

VIS Option	New LfL Quarter Point	New Larger Quarter Point	New LfL Straight Through	New Larger Straight Through	*Slipways*	*MV Corran*	*Relief Vessel*
Do Min	**1**				Unchanged	*Second Vessel*	MV *Corran*
Do Min Plus	**1**				Upgraded	*Second Vessel*	MV *Corran*
1a		**1**			Upgraded	*Second Vessel*	MV *Corran*
1b	**2**				Upgraded	*Sold*	*New vessel*
1c		**2**			Upgraded	*Sold*	*New vessel*
2a			**1**		Upgraded	*Second Vessel*	MV *Corran*
2b			**1**		Upgraded	*Sold*	*Sourced externally*
2c				**1**	Upgraded	*Second Vessel*	MV *Corran*
2d				**1**	Upgraded	*Sold*	*Sourced externally*
2e			**2**		Upgraded	*Sold*	*New vessel*
2f				**2**	Upgraded	*Sold*	*New vessel*
3a – 1 * chain ferry					Upgraded	*Sold*	*NA*
3b – 2 * chain ferry					Upgraded	*Sold*	*NA*
4a: Develop a separate overnight berth capable of accommodating **one vessel**							
4b: Develop a separate overnight berth capable of accommodating **two vessels**							
5: Relocate the route to avoid the Corran Narrows, allowing for standardised vessels and infrastructure to be used.							

Do Minimum

5.4.3 The Do Minimum option is essentially a simple replacement of the MV *Corran* with a like for like vessel, with no increased capacity and no significant maintenance or improvements to the slipways. The MV *Maid of Glencoul* is retired and MV *Corran* becomes the relief vessel.

5.4.4 This option would help ease the sourcing of spare parts and thus may reduce the cost of annual maintenance. It would also mitigate the risk of both vessels being out of service simultaneously.

5.4.5 It would also significantly improve the situation when the relief vessel is in service, eliminating the restrictions associated with the MV *Maid of Glencoul*, offering greater capacity and improving access for large CVs. As the relief vessel would offer the same capacity as the main vessel, the dry-docking period could potentially be adjusted and would not have to coincide with low season.

5.4.6 It also mitigates the issues for dangerous cargos when the MV *Isle of Mull* is the sole vessel on the Oban - Craignure route.

5.4.7 This option offers no interchangeability with vessels sourced from other fleets and therefore likely maintains the current lack of flexibility in sourcing relief vessels.

Do Minimum Plus

5.4.8 This option offers an improvement on the Do Minimum option in that the Ardgour slipway is repaired and widened; thus easing the issue associated with large CVs cutting the corner at the head of the slipway and easing access to the vessel.

5.4.9 As with the Do Minimum, this option offers no interchangeability with vessels sourced from other fleets and therefore likely maintains the current lack of flexibility in sourcing relief vessels (unless trials of newer more powerful *Loch* Class vessels from the CMAL fleet prove successful).

Option 1a

5.4.10 In this option, **one new larger quarter point vessel** is provided and MV *Corran* becomes the relief vessel (MV *Maid of Glencoul* is retired) and the Ardgour slipway is repaired and widened. All the benefits associated with the Do Minimum Plus option are achieved and an enhanced service is offered through the greater capacity of the new vessel.

5.4.11 Depending on the design of the new vessel i.e. draft, the slipway may need to be extended.

5.4.12 The greater capacity of the new vessel could be used to mitigate the queuing problem at Nether Lochaber in two ways:

- By removing more vehicles from the queue on each sailing the need for shuttling is likely to be reduced; and
- While operating to timetable and the vessel is on the slipway vehicles could load directly onto the vessel rather sitting in the queue on the A861, thus reducing the queueing traffic on the road. Consideration could be given to adjusting the timetable to allow the vessel to spend more non-sailing time at the Nether Lochaber side.

5.4.13 As for the previous options, this option offers no interchangeability with vessels sourced from other fleets.

Option 1b

5.4.14 In this option, **two new like-for-like quarter point vessels** would be provided. The MV *Corran* would be sold. The slipways would be repaired and upgraded.

5.4.15 This option builds on all the advantages of Option 1a and improves the relief service through the increased size of the relief vessel.

5.4.16 As for the previous options this option offers no interchangeability with vessels sourced from other fleets.

5.4.17 It should be noted that even if not instigated in the short term this option is a likely future scenario if Option 1a were adopted i.e. as MV *Corran* reaches the end of her service life, the new larger quarter point vessel would likely be replaced and be cascaded down to be the relief vessel.

Option 1c

5.4.18 Under this option **two larger quarter point vessels** would be built, with MV *Corran* being sold.

Option 2a

5.4.19 In this option, **one new straight through vessel of the same capacity** as *MV Corran* is provided and the MV *Corran* becomes the relief vessel. Slipways are upgraded.

5.4.20 This scenario offers similar benefits to that of the Do Minimum Plus option but is more complicated in that either the straight through vessel must be powerful enough to hold its position on the slipway, or a solid aligning structure must be built immediately on the south of each slipway.

5.4.21 Where the new straight through vessel is sufficiently powerful to hold its position on the slipway, there may be an associated requirement for improved scour protection around the toe of the slipway.

5.4.22 Where the vessel is not powerful enough to hold its position then a solid aligning structure must be constructed on the south of the slipway. This structure would provide shelter for the vessel when the current flows from south to north, or the vessel could lie against it when the current is from north to south. By building it on the south side, the quarter point relief vessel could continue to operate on the north side.

5.4.23 Shuttling and queuing issues are not addressed.

5.4.24 As a straight through vessel is provided, this option offers interchangeability with vessels sourced from other fleets particularly where a solid aligning structure is constructed on the south side of the slipway.

5.4.25 If an appropriate aligning structure were constructed it may also be suitable to serve as an overnight berth for the ferry, addressing the issues associated with use of swinging moorings.

Option 2b

5.4.26 This option is similar to Option 2a **(one new straight through vessel of the same capacity)** and offers the same benefits with the exception that the MV *Corran* is sold and therefore no dedicated relief vessel is retained.

5.4.27 This option requires that relief vessels are sourced from other fleets, either by arrangement with CMAL (or others) or by chartering from the market. To increase the number of vessels which could operate at Corran, the provision of suitable solid aligning structures assumes greater importance.

5.4.28 As no quarter point vessels would remain in service under this option, the aligning structures could be built on either the north or south side of the slipways.

Option 2c

5.4.29 Under this option, **one larger straight through vessel** is provided and MV *Corran* is retained as the relief vessel.

5.4.30 This is essentially the same as Option 2a but with a larger main vessel. Similar (though possibly larger) infrastructure improvements would be required and the same benefits would be gained. However, these benefits would be enhanced as the larger vessel could address the queuing issues at Nether Lochaber in two ways:

- By removing more vehicles from the queue on each sailing, the need for shuttling would likely be reduced; and
- While operating to timetable and the vessel is on the slipway vehicles can load directly onto the vessel rather sitting in the queue on the A861, thus reducing the queueing traffic on the road. Consideration could be given to adjusting the timetable to allow the vessel to spend more non-sailing time at the Nether Lochaber side.

5.4.31 Depending on the design of the new vessel i.e. draught, the slipway may need to be extended.

Option 2d

5.4.32 Under this option, **one larger straight through vessel** is provided and MV Corran is sold. All the benefits of Option 2c, including queueing and capacity issues are achieved.

5.4.33 This option requires that relief vessels are sourced from other fleets, either by arrangement with CMAL (or others) or by leasing from the market. To increase the number of vessels which could operate at Corran, the provision of suitable solid aligning structures assumes greater importance.

5.4.34 As no quarter point vessels would remain in service, the aligning structures could be built on either the north or south side of the slipways.

5.4.35 Depending on the design of the new vessel i.e. draught, the slipway may need to be extended.

Option 2e

5.4.36 Under this option, **two straight through ferries of the same capacity** as MV *Corran* are provided. MV *Corran* is sold. This option offers the same operational benefits as Option 2a and Option 2b, but is not reliant on access to vessels from other fleets to provide the relief vessel.

Option 2f

5.4.37 Under this option, **two larger straight through vessels** are provided, MV *Corran* is sold and MV *Maid of Glencoul* is retired.

5.4.38 This option offers all the service benefits of Option 2d, but without the reliance on access to vessels from other fleets or the lease market to provide relief vessels.

Option 3a

5.4.39 This option introduces **one new chain ferry** with MV *Corran* sold.

5.4.40 It is considered doubtful that a chain ferry would be a practical option on this route. The reasons for this are:

- the depth of water and length of crossing is such that during the sailing the ferry would have to support the weight of a great length of chain, affecting the draught of the vessel;

- the length of chain to be supported implies that the chain would have to be both sides of the ferry, to avoid issues with the trim of the vessel. This implies greater maintenance and replacement of chains;
- the sourcing of relief vessels would be extremely difficult; and
- due to the strong currents it is likely that solid aligning structures would be required to keep the ferry on the slipway.

Option 3b

5.4.41 By providing **two chain ferries**, this option addresses the perceived difficulty of obtaining a relief vessel for the crossing but does not address the other issues associated with the practicality of operating a chain ferry on this route.

5.4.42 Given the above limitations, chain ferry options will not be considered further.

Option 4a

5.4.43 This option is for the provision of **one separate overnight berth capable of accommodating one vessel**, and would address the safety issues associated with use of a tender and accessing the ferries from the tender.

5.4.44 In reality this option is not a standalone option and should be considered as an additional element to the foregoing options.

5.4.45 Given current crewing postcodes the overnight berth would likely have to be constructed at the Ardgour side, close to the slipway.

5.4.46 Under this option, the relief vessel remains on a swinging mooring, but would only be accessed infrequently - the frequency of vessel-to-vessel crew transfers would therefore be very much reduced.

5.4.47 In the options where a solid aligning structure is required it may serve as a berth for one vessel, therefore the relief vessel may be able to moor at the overnight berth.

Option 4b

5.4.48 Under this option an **overnight berth capable of accommodating two vessels** is constructed. This eliminates the need for use of a tender and improves safety as swinging moorings are no longer required.

5.4.49 As with Option 4a, this option is not a standalone option and should be considered as an additional element to the foregoing options.

5.4.50 At first glance it may appear that this option would not apply to those options where a dedicated relief vessel is not provided. However, this would need careful consideration as the scenario where the service vessel breaks down and occupies the overnight berth would also need to be considered.

5.4.51 Options that require aligning structures may negate this option.

Option 5

5.4.52 The baselining analysis identified the extent to which the tidal race through the Corran Narrows dictates the bespoke infrastructure solution. The initial thinking behind this option was that the **route could be relocated to an area with a lesser tidal flow**, allowing a standardisation of infrastructure. However, there are considerable practical difficulties with this option, including:

- There are no obvious sites to which the two terminals could be relocated. This is particularly true on the Nether Lochaber side of the crossing where the A82 trunk road closely hugs the coast. Even if an alternative route could be identified, land ownership would likely be an issue.
- The key benefit of the current service is that the crossing is very short and thus allows for a very high frequency service to be operated. Any alternative route would have a longer crossing time and thus the service frequency would be lower, amplifying current capacity problems.

5.4.53 In light of the above issues, this option will not be considered further in the appraisal.

Rationale for Selection / Rejection: All of the above options are **retained** for further consideration at this stage with the exception of the chain ferry options and the potential relocation of the route. In order to further develop and sift these options a brief **STAG Preliminary Appraisal (see Chapter 6)** will be undertaken. This will also include the permutations where two vessels are in operation simultaneously during peak periods.

5.5 Methods of Delivery - Options

5.5.1 This section outlines a range of potential delivery models which will be considered for the Corran Ferry service in this appraisal. In keeping with the TPOs established in the previous chapter, the focus will be on identifying the options which best support the long-term sustainability and resilience of the service

5.5.2 The 'Methods of Delivery' (MoD) options which will be considered through this appraisal are as follows:

- **MoD, Do Minimum:** THC continue to operate the service on the same basis as at present.
- **MoD1, Public Sector Operation:** Transfer of responsibilities to Transport Scotland, with the Corran Ferry being run on an 'in-house' basis.
- **MoD2, Public Service Obligation:** THC specifies a Public Service Obligation (PSO) on the Corran Narrows and seeks an operator(s) to run the route.
- **MoD3, Public Service Contract:** Specify a Public Service Contract (PSC) and seek an operator to run the route – there are two variants to this option:
    - **MoD3a:** THC to establish a PSC and seek an operator to run the route.
    - **MoD3b:** Seek a transfer of responsibilities to Transport Scotland, which would establish a PSC and seek an operator to run the route.
- **MoD4, Community Interest Company:** Transfer the Corran Ferry to a trust or community interest company.
- **MoD5, Privatisation / leave it to the market:** Privatise the Corran Ferry or leave it to the market to provide the service.

5.5.3 The following sections develop these options in more detail. It is important to note that the level of the appraisal will be commensurate with that recommended in the STAG Guidance, - i.e. appraising and identifying a range of options which could deliver the TPOs and identifying any uncertainties which exist. The issues surrounding methods of delivery are complex and professional legal, tax and potentially State Aid advice will be required at the Outline Business Case stage, particularly in terms of the further development of the Commercial, Financial and Management Cases.

MoD, Do Minimum: Continue with the current method of delivery

5.5.4 As set out in Chapter 2, the Corran Ferry is operated as an entirely in-house local authority service. The Do Minimum would involve continuation of the current arrangements.

Advantages & Disadvantages

5.5.5 The advantages of this operating model are:

- THC would retain full control over the service, with the ability to specify all key variables such as fares, frequency and the length of the operating day. This ensures that the design of the service profile best meets the needs of local communities.
- There is a degree of democratic accountability, whereby the service specification is signed-off by THC Elected Members.

5.5.6 The disadvantages of this operating model are:

- From a financial perspective, there would need to be significant Council expenditure to fund new or second hand vessels or in maintaining the current ageing fleet (set against a backdrop of public sector spending reductions).
- The Council would be expected to meet all ongoing costs of the operation of the service (e.g. crew, fuel, dues, pension liabilities etc). It would also need to ensure continued compliance with all current and emerging maritime regulations.
- The increasingly pressing need for capital funding could require an increase in the current Corran Ferry fares unless the service was funded from reserves or additional funding provided by central government.
- THC would also need to put in place a strategy to address the human resource sustainability challenges facing the Corran Ferry. There would be no / limited opportunities to benefit from the economies of scale associated with being nested within a larger ferry operation.

Rationale for Selection / Rejection: The Do Minimum is **retained** for further consideration, both as an option in its own right and also as the baseline for comparison for all other options.

Option MoD1: Non-THC Public Sector Operation

5.5.7 This option would involve a formal request from THC to Transport Scotland to enter into negotiations for a 'transfer of responsibilities'. It is assumed in this option that, following the transfer of responsibilities, the Corran Ferry service would continue to operate as an entirely public sector run service, either in its current form or as part of a wider bundle of services (inclusion within the CHFS bundle for example). There are a number of challenges and risks associated with this which are spelled out below.

What are the key considerations in relation to this option?

5.5.8 The *Scottish Ferries Plan 2013-22* noted that the Scottish Government is willing to take responsibility for any 'lifeline' ferry service in circumstances where the current operator is unable to continue or where the operator otherwise considers it best if the Scottish Government assumes responsibility and agreement can be reached.

5.5.9 Any transfer of responsibilities would initially be predicated on a position of **no net detriment** to the Scottish Government. This would require an adjustment to be made to the Scottish Government's local government block grant (potentially over and above the ferries related GAE component) to ensure that the Scottish Government is in receipt of the revenue required to run the ferry services in future and a potential transfer of capital funding to address vessel and infrastructure replacement.[28] The *Ferries Plan* notes that the Scottish Government cannot guarantee to be in a position to provide any additional funding and it may not always be agreed that a transfer goes ahead. The above would represent the starting point for any consideration and subsequent negotiations of a transfer for the Corran Ferry services.

[28] *Scottish Ferry Services Ferries Plan 2013-2022* (Transport Scotland, 2012), pp. 52-54

5.5.10 A number of other local authorities, including Argyll & Bute, Orkney Islands and Shetland Islands Councils, have entered into discussions with Transport Scotland surrounding a transfer of responsibilities or potential top-up funding. The broad principles set out above have applied in these discussions, although a pragmatic approach has been adopted in the consideration of key local issues. This may be the case in any discussion of a transfer for the Corran ferry – key issues which would need to be considered include:

- **Cost of Delivery:** What would be the cost differential between central government and local authority operation of the Corran Ferry service? Would THC be required to provide additional funding on top of their GAE rebate to central government? If so, how much would this be? This issue will be explored as far as practically possible within this appraisal.
- **Fares:** as part of the consultation, Transport Scotland explained that RET is their standard fares policy and would be the starting point for discussions around fares in any potential transfer situation. It was noted that:
    - If THC is seeking to continue with the current fares system, it may be possible (if acceptable to Ministers) for THC to provide top-up revenue funding to cover the shortfall between the RET fare and the current level of fares.
    - It is considered unlikely that any route under Transport Scotland control could operate without a passenger fare.
    - The current RET policy also does not permit a differential between resident and visitor fares.
    - When RET was introduced on the CHFS network, the position was taken by Ministers that no community's fares would increase at the introduction of RET. Therefore, if the single RET fare was higher than the existing fare, the fares were generally capped at the multi-journey single-equivalent level. However, the focus was on the standard 6 or 10 journey multi-ticket books – RET fares were not pegged to the higher discount 50 journey ticket books, or season tickets, where these existed. A small number of communities retained their 50 journey books and season tickets, but this was the exception rather than the rule.
- **Community engagement:** what would be the mechanisms for engaging with the local communities (including Members) and stakeholders on infrastructure and service specification issues once a transfer was completed?
- **Future operations and asset ownership:** How would the service be bundled / operated following the completion of any transfer? Who would own the slipways and vessels?
- **Crewing:** Who would employ the current crew and what would this mean for their terms & conditions? Would they TUPE across to a Transport Scotland operator?

5.5.11 Specifically with respect to this option, it should be reiterated that Transport Scotland is currently undertaking a *Ferry Services Procurement Policy Review*. The key issue being considered is whether government can operate ferry services using an 'in-house operator' through application of the Teckal Exemption rather than a competitive tendering approach as is the case currently. It is likely that this question will be resolved in the relatively near future, but it remains an uncertainty at present as to whether central government could operate the Corran Ferry as an entirely in-house service.

Where is this model currently in operation?

5.5.12 Fully integrated public sector operations can typically be found where:

- marine transport cannot be delivered commercially but is critical to the social and economic vitality of an area; and / or
- where an authority historically views a ferry as part of its road network or public transport network.

5.5.13 Perhaps unsurprisingly, the main areas of public sector ferry operations in the UK outwith the Corran Ferry are internal ferry services within the Orkney Islands and Shetland Islands. Smaller scale examples include those in Argyll & Bute, serving islands such as Lismore and Seil and the River Mersey ferries.

5.5.14 The treatment of ferries as part of the road network is common in Scandinavian countries, with both Sweden and Norway providing public sector run ferry services across major rivers, inlets and fjords.

5.5.15 The commentary above also applies to the Do Minimum.

Advantages & Disadvantages

5.5.16 The advantages of this operating model are:

- The public sector retains full control over the service, with the ability to specify key variables such as fares, frequency and the length of the operating day. This ensures that the design of the service profile best meets the needs of local communities within the available resources of the public sector.
- There is a degree of democratic accountability, whereby the service specification is signed-off by elected politicians.
- The transfer of the Corran Ferry into a larger bundle(s) of services could assist in addressing the crewing and back-office sustainability issues facing the service at present.
- Consultation undertaken with Transport Scotland suggests that there may, depending on the scope of any transfer agreement, be an opportunity for local authority top-up funding to achieve specific outcomes for the service. THC may also wish to explore the feasibility of other options within such discussions, such as ‘Aid of a Social Character’, where the passenger rather than the operator benefits from the subsidy (such as with the Air Discount Scheme).

5.5.17 The disadvantages of this operating model are:

- Whilst the public sector overall would retain control of the service, sign-off of the service specification, revenue and capital budgets would rest with the Scottish Ministers rather than THC Members. Whilst there are established mechanisms for consulting with communities in other centrally run services, there may nonetheless be a diminution of the current level of local control and accountability.
- The case for investment in the Corran Ferry service would have to be made alongside a wide range of other requests for central government funding for ferry services and marine infrastructure. There is understood to be a long list of vessel, harbour and revenue funding requests of government across Scotland, and there is thus an uncertainty as to where new infrastructure for the Corran Ferry service would sit within this list.
- From a financial perspective, there would continue to be a need for significant public sector expenditure to fund new / second hand vessels or in maintaining the current ageing fleet (set against a backdrop of public sector spending reductions).
- The public sector would also be expected to meet the ongoing costs of the operation of the service (e.g. crew, fuel, dues, pension liabilities etc).
- There remains a considerable degree of uncertainty around key issues such as the legal basis for Transport Scotland running ‘in house’ services (i.e. whether the Teckal exemption can be applied), how the current fares system would be reconciled with RET, the level of GAE adjustment etc.

Rationale for Selection / Rejection: Option MoD1 is **retained** for further consideration in the detailed appraisal as it has the potential to address the sustainability issues facing the Corran Ferry service, notwithstanding the current uncertainties surrounding it. It is anticipated that the completion of the *Ferries Procurement Policy Review* (anticipated 2018) may provide a degree of clarity on some of the key issues cited above.

Option MoD2: Public Service Obligation

5.5.18 This option considers the imposition of a Public Service Obligation (PSO) by THC on the Corran Narrows.

5.5.19 A PSO is a situation where the public sector defines what service is required and looks to the private sector to provide it, either commercially or with the assistance of a subsidy. The European Maritime Cabotage Regulations are defined in Council Regulation (EEC) No 3577/92. This directive regulates the transportation of passengers by sea between two points within Member States of the European Union. The Cabotage Regulations apply the principle of free movement of services to maritime transport and oblige member states to allow community ship owners to operate freely in the European market.

5.5.20 The Cabotage Regulations recognise that marine transport can often be vital to the economic prosperity of an area. As such, exceptions to the principle of free movement of services are allowed where, owing to special circumstances, market forces would not provide a satisfactory level of service. In certain circumstances, the Cabotage Regulations allow Member States to intervene in particular markets by imposing PSOs

5.5.21 Where the public sector does not wish to operate ferry services directly but, at the same time, has a desire to influence certain service characteristics, they can impose a Public Service Obligation (PSO) on a route. A PSO will help to ensure an adequate regular ferry service to and from given location(s) where community ship owners, in considering their own commercial interests, would not provide an adequate level of service. It is the decision of individual member states to determine which routes the market would fail to deliver in its own right. The imposition of a PSO will only typically be challenged by the European Commission in the case of "manifest error".

5.5.22 PSO requirements that can be mandated by Member States are limited to the following service characteristics:

- the ports to be served;
- requirements in relation to the length of operating day, timetable, frequency of services and vessel capacity; and
- fare levels.

5.5.23 A crucial issue is that when imposing a PSO, Member States must ensure that there is no discrimination against community ship owners interested in serving a route. So, for example, if THC imposed a PSO for services across the Corran Narrows, they would have to ensure that it did not discriminate against non-local or indeed non-UK operators. The non-discrimination point must be observed throughout the process, from specifying the content of the PSO through to service commencement.

5.5.24 PSOs can be implemented in two ways:

- applying PSOs to all operators on a route by way of a fixed set of commitments for an operator or a licencing system; or
- entering into a public service contract (PSC) with individual operators for one or more routes

5.5.25 *Note - this section considers the first bullet above, with the imposition of a PSC considered in the next option (Option MoD3).*

What are the key considerations in relation to this option?

5.5.26 The key issues in relation to a THC specified PSO are as follows:

- Analysis of the Corran Ferry financial data (see Chapter 2) would suggest that it is highly unlikely that a commercial operator would sign up to a PSO on the basis of the current fares.
- There would be no guarantee of tenure. THC would therefore need to have a contingency plan in place should any operator which they did secure withdraw (i.e. an 'operator of last resort').
- The Council has limited / no in-house experience of operating a marine PSO.

5.5.27 If THC chose to pursue the PSO option, robust market testing and engagement with operators (to a level permitted within the regulations) would be required to ensure the risk of service disruption / loss is minimised.

Where is this model currently in operation?

5.5.28 There are, as we understand it, no examples of marine transport PSOs in the UK, generally because non-commercial services require subsidies. However, PSO arrangements exist in various countries in Europe, such as Denmark, Spain and for freight services in Portugal.

Advantages & Disadvantages

5.5.29 The advantages of this operating model are that:

- The public sector can influence a range of socially desirable service characteristics, including fare levels.
- The cost of all assets and operation (with the exception of shoreside infrastructure rests with the private sector).

5.5.30 The disadvantages of this operating model are that:

- Securing an operator on a PSO could be challenging, particularly on the basis of the current fares.
- There is no guarantee of tenure and any PSO operator could choose to walk away from the service if it did not prove to be commercially viable. An operator of last resort would be required.

Rationale for Selection / Rejection: Option MoD2 is **retained** for further consideration. Whilst we consider it unlikely that a PSO operator could be secured at present, there may be some scope for this if the service specification was revised. In addition, it is our understanding that the PSO mechanism should be declared and tested before a Public Service Contract can be introduced.

Option MoD3: Public Service Contract

5.5.31 This option theme would involve the imposition of a PSC on the Corran Narrows. There are two discrete options in this respect

- **MoD3a:** THC to establish a PSC and seek an operator to run the route.
- **MoD3b:** Seek a transfer of responsibilities to Transport Scotland, which would establish a PSC and seek an operator to run the route.

5.5.32 The following sections set out the specifics of a PSC before considering each of the above options.

The Basis for Establishing a PSC

5.5.33 If, upon imposition of a PSO, it becomes clear that no operators are willing to offer the required level of service without a subsidy, the organisation promoting the PSO can then seek to implement a Public Service Contract (PSC). Any PSC offered would have to be procured in accordance with the Cabotage Regulations, EU and national procurement rules.

5.5.34 PSCs are the instrument typically used to impose PSOs where a subsidy is required for providing the PSO requirements. A PSC can cover a wider range of requirements than a PSO, including continuity of service over a contract period. With a PSO only, there are no barriers to operators entering or leaving the market, providing a lack of guarantees over the long-term viability of the service. A PSC negates this problem by contractually mandating the tendered operator to see out a tender period.

5.5.35 As previously mentioned, where a PSO is imposed, it must be on a non-discriminatory basis and the same applies for a PSC. In addition, where a subsidy is provided in return for delivering the contractual requirements, this subsidy must be available to all community ship owners (i.e. not just British owned or flagged vessels).

5.5.36 When procuring a PSC for ferry services, the Commission would advise launching an open, community-wide tendering process, which they see as the best way to avoid discrimination. However, the decision as to whether to pursue this option rests with the authority undertaking the procurement. It should be noted that undertaking such a procurement minimises the risk of later legal challenge.

5.5.37 There are two distinct types of subsidy available to procurement bodies:

- **a gross-cost contract** pays the operator a specified sum to provide a specified service for a specified period. All revenue collected is returned to the funding authority, and thus that authority assumes the revenue risk; and
- **a net-cost contract** is where an operator provides a specified service for a specified period and retains all of the revenue. The authority pays a subsidy to the operator if the services are forecast to be unprofitable. If the services are profitable, the operator will pay the authority a royalty. Under a net-cost contract, the operator has to forecast both the costs and revenues and the risk on this typically lies with the operator.

5.5.38 An important issue with a PSC is to identify the appropriate balance between risk and reward for operators that will bid for the contract. By definition, a PSC is put in place to ensure a service is delivered that the market would not otherwise offer. There will therefore be an element of prescription in the contract in terms of timetable, fares etc. In order to attract bidders and increase competition, a PSC should ensure that it offers bidders a fair return on investment, typically reflecting market rates of return.

State Aid

5.5.39 As well as the Cabotage Regulations, any public support for the Corran Ferry must be compliant with European State Aid legislation. State Aid is defined as an advantage in any form whatsoever conferred on a selective basis to undertakings by national public authorities. So, for example, the provision of a subsidy or public sector funded vessel to an operator would be considered a State Aid if not procured in the manner described above.

5.5.40 To avoid a State Aid case being referred to the Commission, the following four criteria must be met:

- the receiving undertaking (i.e. the winning tenderer) must have public service obligations to discharge and these must be clearly defined in the contract;
- the subsidy must be calculated in an objective and transparent manner;
- the subsidy cannot exceed what is necessary to cover the costs in discharging the public service obligations plus a “reasonable” profit; and

- if the undertaking concerned is not chosen under a compliant public procurement procedure, then the level of subsidy must be determined on the basis of an analysis of costs of what an efficient undertaking would have incurred.

5.5.41 State Aid is an issue of European law – outwith the precedent related criteria set out above, there is not a firm definition of what does or does not constitute a State Aid. This is decided on a case-by-case basis, although the risk of a State Aid challenge is real and potentially expensive. State Aid advice should always be sought from the Scottish Government and / or legal professionals so as to ensure any risk of non-compliance is minimised.

Contract Length and Vessels

5.5.42 A further important consideration when procuring a PSC is the duration of the contract and how this relates to the vessel offered. The Cabotage Regulations do not set a maximum duration for a PSC, although the maximum length of contract appears to have increased in recent years with contracts now extending for 12 years.

5.5.43 One of the criticisms of this approach across all transport tendering and franchising is that the cost of investment in capital assets such as ferries, aircraft or rail rolling stock are recovered over the life of that asset, typically 20-30 years. However, with comparatively short contract periods (i.e. relative to the life of the asset), there is obviously little incentive to purchase new tonnage because losing the next contract could lead to the operator being left with a vessel that they cannot use, particularly if it is built for very specific sea or river conditions (as the current Corran vessels are). It also means that if an incumbent operator owns a bespoke vessel for the route, they are likely to be the only bidder for any contract.

5.5.44 One potential solution to this is that a vessel purpose built to serve a route undergoes what is known as a transfer of assets at the end of the contract. Under this arrangement, assuming ownership of the said vessel and the attached liabilities would form part of the next contract. As a result, an operator coming to the end of its contract would not face the problem of being left with an expensive capital asset and nowhere to use it. All bidders for the contract would also have access to a route-specific vessel on an equal basis.

5.5.45 It is our understanding that the operational crew would also move into the employment of the new operator under what is known as a “Transfer of Undertakings (Protection of Employment)” (TUPE for short), irrespective of whether the vessel was transferred or not. This again would need to be confirmed through bespoke legal advice.

5.5.46 However, the European Commission does not typically favour this approach as it views a tender requirement whereby a successful bidder for a PSC has to assume control of existing vessels and crew as discriminatory. This is because it does not allow Community ship owners to come forward with their own vessels. This has been a long-term point of debate in Scotland in the Clyde & Hebrides network, where all operators must use the vessels provided by the government asset company (Caledonian Maritime Assets Limited (CMAL)). Special permissions were recently granted to Transport Scotland to continue with this arrangement because the current CMAL fleet has been proven to be unique in its scope, size and composition. It is possible that this would also be the case on the Corran Ferry route but this would be dependent demonstrating the ‘uniqueness’ of the vessels and their bespoke application to that route.

5.5.47 There is therefore a clear trade-off between tender length and securing the most appropriate tonnage. This is an issue that would have to be discussed with procurement experts should this option be pursued.

Testing the Market

5.5.48 In advance of announcing a competition for a PSC, it is possible to undertake a market testing exercise to assist in defining the scope of the procurement. The market testing process can help the contracting authority obtain clarity on what the market thinks is appropriate in terms of vessels, timetables, the length of the operating day etc. However, it is important to note that any market testing process must be carried out in a way which does not prejudice the process or preclude competition.

5.5.49 One way of carrying out market testing would be to issue a Prior Information Notice (PIN). A PIN would give the market notice that a procurement for ferry services in the area may be coming forward. Those who respond to the PIN notice could be consulted in developing the tender notice.

5.5.50 In order for the market testing to be successful, consultees would have to be provided with a certain level of detail about the proposed procurement. However, the level of detail should not exceed what would be included in the Official Journal of the European Union (OJEU) notice. Any information provided to consultees should be made available in the 'Information Room' to any bidders who come forward under the OJEU process. The consultation should also be transparent, with a list of consultees and their responses being documented.

5.5.51 Crucially, the information provided as part of the PIN process should not give consultees at this stage an advantage over other bidders further down the line. The consultation should also be carried out in a way that does not preclude future competition.

What are the key considerations in relation to these options?

5.5.52 As noted at the outset of this section, there are two potential options by which a PSC could be introduced:

- **MoD3a:** THC to establish a PSC and seek an operator to run the route.
- **MoD3b:** Seek a transfer of responsibilities to Transport Scotland, which would establish a PSC and seek an operator to run the route.

5.5.53 The key considerations in relation to each of these options are considered in turn:

Option MoD3a

5.5.54 The implementation of a PSC on the Corran Narrows could potentially provide THC with a means of securing the long-term future of the service. There are however a number of key considerations in relation to the form of any PSC on the Narrows:

- The implementation of a PSC by the Council would allow it to retain long-term strategic control of all aspects of the service, whilst at the same time providing a means of securing external resource and expertise. A decision would be required as to whether the PSC would be intended as a basic ship management contract or a more flexible arrangement allowing operators to develop their own solutions.
- A key issue in defining the PSC would be the level at which the fares are set. The current model could be retained or amended as Members see fit, but this would be reflected in the level of subsidy which would need to be paid (bearing in mind that capital would also need to be funded).
- Consideration would need to be given as to whether the Council wanted to introduce a gross or net cost contract. Other innovative models such as profit sharing (as happens on the Ballycastle – Rathlin Island service in Northern Ireland) could also be considered.
- THC would also need to consider whether they would be looking for operators to bring their own vessels or whether there is a case to be made for the Corran tonnage being unique and thus provided by the public sector to potential bidders.
- The Council would need to ensure that it had the appropriate in-house expertise to specify, procure and manage any PSC developed.

Option MoD3b

5.5.55 It is likely that the considerations around the method of delivery in a 'transfer of responsibilities' scenario would be dependent on negotiations surrounding the specifics of that transfer itself, including whether there was a requirement and / or desire to tender. Nonetheless, if a transfer was to be sought and subsequently agreed, it should be noted that Transport Scotland has considerable in-house experience of specifying and managing PSC contracts in the maritime industry. These range from single route PSCs like Gourock – Dunoon through to CHFS bundle, which has over 25 routes in it.

Where is this model currently in operation?

5.5.56 The PSC model is used across many European countries to support air and ferry services in particular. Indeed, PSC's are used extensively in Scotland to support the operation of ferry services to the Clyde & Hebridean islands and the Northern Isles. The most relevant local authority comparator is the Argyll & Bute Council PSC for services between Port Askaig (Islay) and Feolin (Jura), although it should be noted that the Council is in the process of bringing this service back in-house.

5.5.57 Scotland's tendered services currently operate on a broadly net-cost contract system, where the operators are paid a monthly subsidy to top-up the forecast revenue shortfall from farebox and other sales. The Port Askaig – Feolin route operates on a gross cost basis and is effectively a ship management contract.

Advantages & Disadvantages

5.5.58 The advantages of this operating model are that:

- The public sector can directly specify a range of socially desirable service characteristics, including fare levels.
- A PSC provides a degree of certainty of tenure based on an agreed contract period.
- The tendering process could allow bidders to offer innovative solutions in terms of vessels, service levels, value for money initiatives etc. In a situation where an operator brings their own vessels, lumpy capital payments are spread more evenly across the revenue budget.
- In the case of a local authority service, a PSC can provide a back-office for a single route which would be more expensive and challenging to run in-house.

5.5.59 The disadvantages of this operating model are that:

- Tendering and contract management can be labour intensive and will place an additional burden on procurement, finance and legal departments in terms of designing and running the tender and managing the contract.
- The service becomes very contractually based, with variations in contract required where the procuring party wishes to change the service. This loss of flexibility may be seen as detrimental in the communities served.
- As any tenderer would be seeking to make a profit from a PSC, they would have to reduce costs and / or increase revenue if a profit was to be realised without any additional cost to the public purse.

Rationale for Selection / Rejection: Options MoD3a and MoD3b are **retained** for further consideration. The PSC option combines the desired outcomes of controlling the service specification and developing a model which ensures the long-term viability of the Corran Ferry service.

Option MoD4: Community Interest Company / Conversion to Trust Status

5.5.60 This option involves the establishment of a Community Interest Company (CIC) or Trust to operate the Coran Ferry service (there are differences between the two models but they are grouped together here given their similarity). Under such an arrangement, the ferry operation would be reconstituted and would be run by a Board of Trustees, with any profits made reinvested back into the company.

What are the key considerations in relation to this option?

5.5.61 There are several attractions to trust status. These include:

- potential tax concessions (including gift aid) and access to new funding streams, including for vessel procurement;
- the ownership and direction of the company for the local good; and
- increased civic involvement, including the use of volunteers.

5.5.62 However, a key issue which would remain to be overcome is how the service would be funded, as the operation is currently dependent on direct public sector funding. The burden of complying with maritime, human resource and other legislation could also be challenging for a small scale organisation of this nature, whilst there is no immediate suggestion that it would resolve the sustainability challenges facing the service.

Where is this model currently in operation?

5.5.63 The use of the trust model is widespread across the UK. From a ferries perspective, many small Scottish and Dutch routes are operated by the local community trusts, the Glenelg ferry for example. The PS *Waverley* is also a highly successful trust. A community interest company has also recently been established in the Isles of Scilly with a view to operating lifeline transport services.

5.5.64 At a more macro level, British Waterways (in England & Wales) was recently reclassified as the Canal & River Trust, a move which appears to have been a success to date. A number of ports also operate on a trust basis.

Advantages & Disadvantages

5.5.65 The advantages of this operating model are that:

- The ferry service is run for the benefit of the local community – any profits raised are reinvested back in the company.
- Trust status provides a range of benefits in terms of tax concessions and access to funding streams

5.5.66 The disadvantages of this operating model are that:

- Any trust operation would need to be financially sustainable, which would require farebox and other revenue to cover the cost of operation and any capital investment.
- It would also be challenging for a trust focussed on a single route to meet the wide range of safety and regulatory requirements that a commercial operator is mandated to meet.

Rationale for Selection / Rejection: Option MoD4 is **rejected** from further consideration. Whilst there are benefits to this model, it is not considered to address the key issue of service sustainability.

Option MoD5: Privatisation / Leave it to the market

5.5.67 At its simplest level, THC could withdraw from operating the Corran Ferry entirely. The existing infrastructure at Nether Lochaber and Ardgour could be made available on an open access basis or sold to any operator wishing to run services across the Corran Narrows in whichever form. The vessels could be sold to any incoming operator or, if they were bringing their own vessels, sold on the open market.

What are the key considerations in relation to this option?

5.5.68 Should THC choose to pursue this option, the following issues would need to be considered:

- A decision would need to be taken as to whether to engage with the market, secure an operator and then withdraw the service or sell the vessels directly to a private company.
- If the decision was taken to withdraw the service, the future role of the current crew (and any financial liabilities associated with their employment) would also need to be considered.
- The Council would also need to consider whether it wished to retain control over the landside assets. This could prevent an outright monopoly emerging but would mean that THC retained the ongoing liability for this infrastructure.
- A contingency plan would need to be developed in the event that the private operator ceased trading or withdrew the service (i.e. an 'operator of last resort' would be required).

Where is this model currently in operation?

5.5.69 The most high profile UK example of free market operations using public sector infrastructure are the riverboat services on the River Thames (for example, those operated by Thames Clippers). The majority of the landing points, such as Embankment and Greenwich Piers, are provided by Transport for London (TfL), with riverboat operators paying harbour dues to TfL, which they recover through the farebox. This model is highly successful in London because the visitor market provides both volume and a relatively high willingness-to-pay on a year-round basis.

5.5.70 The most prominent private sector Scottish ferry operator providing a service of this nature is Western Ferries. The major difference with this operation compared to its River Thames counterpart is that they own the landside infrastructure in its entirety. Almost all costs are thus internalised within the business and paid for through farebox revenue.

Advantages & Disadvantages

5.5.71 The advantage of a commercially provided ferry service is that it removes all operating and capital costs from the public sector (except for maintaining / replacing shoreside infrastructure if this remained in public ownership – although presumably berthing / pier dues could be charged) so long as a commercially satisfactory service can be established.

5.5.72 The clear disadvantage of a commercial operation in this context are:

- It is possible that no private operator would be willing to run services across the Corran Narrows, although this seems unlikely given that it is the busiest single vessel route in Scotland. It does however seem highly likely that at least some fares would increase.
- THC (and the public sector generally) would lose all control over the service. Key issues such as fares, frequency and the length of the operating day would be determined entirely by the operator's interpretation of the market, as would staffing and terms & conditions.
- Given the physical scale of the service and the volumes, it is unlikely that there would be more than one operator, thus the incumbent would have a *de facto* monopoly.
- There would be potential for a commercial operator to withdraw at any time, thus terminating the service until another operator could be found or an 'operator of last resort' stepped in.

Rationale for Selection / Rejection: Option MoD5 is **rejected** from further consideration. This option is likely to lack public support and removes the ability of the public sector to maintain a degree of control over aspects of the operation which are key to the communities it serves.

5.6 Summary & Next Steps

5.6.1 The table below identifies the options which will be taken forward into the Preliminary Appraisal:

Option	Option Description	Progress from Initial Appraisal
	Infrastructure Options	
Do Min	1 * new LfL quarter point vessel / Slipways – unchanged / MV *Corran* – second vessel / Relief vessel – MV *Corran*	✓
Do Min Plus	1 * new LfL quarter point vessel / Slipways – upgraded / MV *Corran* – second vessel / Relief vessel – MV *Corran*	✓
1a	1 * new larger quarter point vessel / Slipways – upgraded / MV *Corran* – second vessel / Relief vessel – MV *Corran*	✓
1b	2 * new larger quarter point vessels / Slipways – upgraded / MV *Corran* – sold / Relief vessel – new vessel	✓
1c	2 * new LfL quarter point vessels / Slipways – upgraded / MV *Corran* – sold / Relief vessel – new vessel	✓
2a	1 * new LfL straight through / Slipways – upgraded / MV *Corran* – second vessel / Relief vessel – MV *Corran*	✓
2b	1 * new LfL straight through / Slipways – upgraded / MV *Corran* – sold / Relief vessel – new vessel	✓
2c	1 * new larger straight through / Slipways – upgraded / MV *Corran* – second vessel / Relief vessel – MV *Corran*	✓
2d	1 * new larger straight through / Slipways – upgraded / MV *Corran* – sold / Relief vessel – new vessel	✓
2e	2 * new LfL straight through vessels / Slipways – upgraded / MV *Corran* – sold / Relief vessel – new vessel	✓
2f	2 * new larger straight through vessels / Slipways – upgraded / MV *Corran* – sold / Relief vessel – new vessel	✓
3a	1 * chain ferry	✗
3b	2 * chain ferry	✗
4a	Develop a separate overnight berth capable of accommodating **one vessel**	✓
4b	Develop a separate overnight berth capable of accommodating **two vessels**	✓
5	Relocate the route to avoid the Corran Narrows, allowing for standardised vessels and infrastructure to be used.	✗
	Methods of Delivery	
MoD Do Min	Public sector operation – continue with current THC delivery model	✓
MoD1	Public sector operation – transfer of responsibilities	✓
MoD2	Public Service Obligation	✓
MoD3a	Public Service Contract – Highland Council	✓
MoD3b	Public Service Contract – transfer of responsibilities	✓
MoD4	Community interest company	✗
MoD5	Privatisation / withdrawal of service	✗

6 Preliminary Appraisal

6.1 Overview

6.1.1 The Preliminary Appraisal (formerly STAG Part 1 Appraisal) provides a bridge from the 'Initial Appraisal – The Case for Change' to the Detailed Appraisal by undertaking an initial check on the suitability of options to proceed to detailed development. It ensures that resources are targeted on the development and appraisal of those options which are most likely to contribute towards the TPOs and STAG criteria.

6.1.2 Whilst there is a broad process to be followed, it is advised by Transport Scotland that the guidance is applied proportionately rather than followed to the letter. In the context of the Corran Ferry, it is likely that the key differentiators between the **infrastructure** options at this stage will be the extent to which they **contribute towards the TPOs and their affordability**. The STAG criteria are unlikely to differentiate significantly between the options at this stage and are thus not considered until the Detailed Appraisal stage.

6.1.3 With respect to the options surrounding **methods of delivery**, these are focussed on how the proposed service specification is delivered. The appraisal, both at the Preliminary and Detailed Appraisal stages, will not therefore assess these options in the conventional manner, rather it will consider the potential pros and cons of each delivery model in the context of TPO4 and any outstanding questions / issues to be considered.

6.2 Infrastructure Options – Appraisal Against TPOs

6.2.1 This section involves an initial appraisal of the service specification options against the TPOs. Implicit within this, the underlying assumption is that the public sector will have a role in specifying the future infrastructure and service. However, it should be noted that the methods of delivery options do allow for a number of 'leave it to the market' options.

6.2.2 The table below provides an initial assessment of each infrastructure option against the relevant TPOs:

Table 6.1: Preliminary Appraisal of Infrastructure Options against TPOs

Infrastructure Option	Description	Relief / 2nd Vessel	TPO 1 – infrastructure	TPO 2 – Year round access for all vehicles	TPO 3 – capacity
Do Min	1 * LFL QP	MV *Corran*	✘	✔✔	✘
	+ overnight berth(s)		✔	✔✔	✘
Do Min Plus	1 * LFL QP	MV *Corran*	✔	✔✔	✘
	+ overnight berth(s)		✔✔	✔✔	✘
1a	1 * L QP	MV *Corran*	✔	✔✔	✔
	+ overnight berth(s)		✔✔	✔✔	✔
1b	2 * LFL QP	New vessel	✔✔	✔✔	✔✔
	+ overnight berth(s)		✔✔✔	✔✔	✔✔
1c	*2 * L QP*	New vessel	✔✔	✔✔	✔✔✔
	+ overnight berth(s)		✔✔✔	✔✔	✔✔✔
2a	1 * LFL ST	MV *Corran*	✔	✔✔	✘
	+ overnight berth(s)		✔✔	✔✔	✘
2b	1 * LFL ST	From fleet	✔	✔	✘
	+ overnight berth(s)		✔✔	✔	✘

Infrastructure Option	Description	Relief / 2nd Vessel	TPO 1 – infrastructure	TPO 2 – Year round access for all vehicles	TPO 3 – capacity
2c	1 * L ST	MV *Corran*	✓	✓✓	✓
	+ overnight berth(s)		✓✓	✓✓	✓
2d	1 * L ST	From fleet	✓	✓	✓
	+ overnight berth(s)		✓✓	✓	✓
2e	2 * LFL ST	New vessel	✓✓	✓✓	✓✓
	+ overnight berth(s)		✓✓✓	✓✓	✓✓
2f	2 * L ST	New vessel	✓✓	✓✓	✓✓✓
	+ overnight berth(s)		✓✓✓	✓✓	✓✓✓

6.2.3 The following points should be noted from the above table:

- **TPO1 - Infrastructure**
  - The Do Minimum option performs negatively as it would not address any of the infrastructure challenges faced on the route.
  - All of the other vessel options involve upgrades to the slipways, which would address the infrastructure issues associated with marshalling, the width of the slipways, commercial vehicle swept paths etc. The options which involve either a larger vessel or two vessels would also reduce the requirement to shuttle, reducing the wear and tear on the current assets.
  - Combining any of the options with one or more overnight berths would record a benefit in terms of this TPO, as it would remove the requirement for overnighting the vessel(s) on a swing mooring.
- **TPO2 – Year round access for all vehicles**
  - It is proposed under all of the options to retire the MV *Maid of Glencoul*, which would remove the current impediments to year round access by all vehicle types.
  - Options which offer a dedicated second vessel on the route – i.e. the MV *Corran* or a new vessel in the 'two new vessels' options – would score more highly as they offer guaranteed asset availability immediately year round.
  - Options 2b and 2d, where refit and breakdown cover is sourced from a wider fleet of vessels, score less well than the two dedicated vessel options. Whilst it is likely that refits can be planned around, arranging cover in the event of a breakdown would lead to a period of service outage awaiting the arrival of the relieving vessel (bearing in mind that there has only been 76.5 hours of 'no service' due to a breakdown in the last five years, and most of this concentrated in one week when both vessels were out of service).
- **TPO3 – Capacity**
  - As would be expected, the contribution of each option to this TPO increases incrementally with (i) vessel size; and (ii) the number of vessels deployed. Any single vessel like-for-like option would not address the current capacity challenges on the route.
  - All options would increase capacity during refit and / or breakdowns as the MV *Maid of Glencoul* would be replaced by a larger relieving vessel.

6.3 Infrastructure Options – Affordability

6.3.1 As would be expected, the appraisal against the TPOs demonstrates that the options which will generate the largest benefits are also those which involve the most significant infrastructure investment. The second element of this preliminary appraisal is therefore to consider each of the options in terms of their affordability. This is summarised in the table below:

Table 6.2: Preliminary Appraisal of Options - Affordability

Infrastructure Option	Description	Relief / 2nd Vessel	Affordability – Potential Cost Items
Do Min	1 * LFL QP	MV *Corran*	• 1 * new LfL vessel, plus a long-term replacement for MV *Corran* • 2 * overnight berths • Opportunity to run two vessel service retained, but a second crew would be required to do this.
Do Min Plus	1 * LFL QP	MV *Corran*	• 1 * new LfL vessel, plus a long-term replacement for MV *Corran* • Slipways repaired and widened • 2 * overnight berths • Opportunity to run two vessel service retained, but a second crew would be required to do this.
1a	1 * L QP	MV *Corran*	• 1 * new larger vessel, plus a long-term replacement for MV *Corran* • Upgrades to current slipways • 2 * overnight berths • Opportunity to run two vessel service retained, but a second crew would be required to do this.
1b	2 * LFL QP	New vessel	• 2 * new LfL vessels • Upgrades to current slipways • 2 * overnight berths • Two vessel operation would require recruitment of a second crew • Potential resale value of MV *Corran*
1c	*2 * L QP*	New vessel	• 2 * new larger vessels • Upgrades to current slipways • 2 * overnight berths • Two vessel operation would require recruitment of a second crew • Potential resale value of MV *Corran*
2a	1 * LFL ST	MV *Corran*	• 1 * new LfL straight through vessel, plus a long-term replacement for MV *Corran* (likely straight through) • Upgrades to current slipways • A berthing and / or aligning structure may be required. • 2 * overnight berths • Opportunity to run two vessel service retained, but a second crew would be required to do this.
2b	1 * LFL ST	From fleet	• 1 * new LfL straight through vessel • Upgrades to current slipways • A berthing and / or aligning structure may be required. • 1 * overnight berth • Annual cost associated with securing refit cover • Potential resale value of MV *Corran*
2c	1 * L ST	MV *Corran*	• 1 * new larger vessel • Upgrades to current slipways • A berthing and / or aligning structure may be required. • 1 * overnight berth • Opportunity to run two vessel service retained, but a second crew would be required to do this.
2d	1 * L ST	From fleet	• 1 * new larger straight through vessel • Upgrades to current slipways • A berthing and / or aligning structure may be required. • 1 * overnight berth

Infrastructure Option	Description	Relief / 2nd Vessel	Affordability – Potential Cost Items
			• Annual cost associated with securing refit cover • Potential resale value of MV *Corran*
2e	2 * LFL ST	New vessel	• 2 * new LfL straight through vessels • Upgrades to current slipways • A berthing and / or aligning structure may be required. • 2 * overnight berths • Two vessel operation would require recruitment of a second crew • Potential resale value of MV *Corran*
2f	2 * L ST	New vessel	• 2 * new larger straight through vessels • Upgrades to current slipways • A berthing and / or aligning structure may be required. • 2 * overnight berths • Two vessel operation would require recruitment of a second crew • Potential resale value of MV *Corran*

6.3.2 The key points to note from the above table are as follows:

- Any option which sees two vessels permanently based on the Corran Narrows provides the necessary assets to scale up to a two-vessel operation. However, a full second crew roster would be required for this, which would give rise to a considerable additional cost (circa £700k per annum based on 2015/16 crew costs) as well as deliverability issues given current issues around crewing sustainability.
- Whilst a two-vessel solution at Corran would provide both relief cover and operational flexibility, there is a question over allocative efficiency in terms of one vessel only being used for a small part of the year (or both vessels operating on a largely part-time basis).
- In line with the TPOs, it is assumed that where two vessels are dedicated to the route, an overnight berth will be provided for each vessel. This cost item is reduced to a single overnight berth where there is only one vessel dedicated to the route, with relief and breakdown cover sourced from elsewhere.
- The retention of the MV *Corran* in the medium-term would provide high quality relief cover and the potential to operate a two-vessel service where desirable, without the need for purchasing two new vessels. However, when considered over a 30 or 60-year appraisal horizon, a replacement for this vessel has to be factored in, albeit these costs will be discounted 10-20 years into the future.

6.3.3 A costing exercise will be undertaken for shortlisted options as part of the Detailed Appraisal.

6.4 Rationale for Selection / Rejection

6.4.1 The following table summarises the options to be taken forward to the Detailed Appraisal and the rationale for selection / rejection:

Table 6.3: Preliminary Appraisal – Rationale for Selection / Rejection

Infrastructure Option	Description	Relief / 2nd Vessel	Take Forward to Detailed Appraisal	Rationale for Selection / Rejection
Do Min	1 * LFL QP	MV *Corran*	✘	This option does not meet the infrastructure and capacity needs of the route. The Do Min will be retained for comparison purposes only.

Infrastructure Option	Description	Relief / 2nd Vessel	Take Forward to Detailed Appraisal	Rationale for Selection / Rejection
Do Min Plus	1 * LFL QP	MV *Corran*	✘	This option does not meet the capacity needs of the route.
1a	1 * L QP	MV *Corran*	✓	When combined with suitable overnight berthing facilities, this option would meet the infrastructure and capacity needs of the route. It would also provide resilience by retaining MV *Corran* as a second vessel without the requirement to purchase another new vessel for that role (in the short-term at least).
1b	2 * LFL QP	New vessel	✘	The operation of a year-round two vessel service is considered to be disproportionate and unaffordable.
1c	*2 * L QP*	New vessel	✘	The operation of a year-round two vessel service is considered to be disproportionate and unaffordable.
2a	1 * LFL ST	MV *Corran*	✘	This option does not meet the capacity needs of the route.
2b	1 * LFL ST	From fleet	✘	This option does not meet the capacity needs of the route.
2c	1 * L ST	MV *Corran*	✓	When combined with suitable overnight berthing facilities, this option would meet the infrastructure and capacity needs of the route. It would also provide resilience by retaining MV *Corran* as a second vessel without the requirement to purchase another new vessel for that role (in the short-term at least).
2d	1 * L ST	From fleet	✓	When combined with suitable overnight berthing facilities, this option would meet the infrastructure and capacity needs of the route. It would also negate the need to retain a second vessel as the standardised infrastructure would allow such a vessel to be procured from elsewhere, although there is a risk of at least a short-term service outage in the event of a breakdown.
2e	2 * LFL ST	New vessel	✘	The operation of a year-round two vessel service is considered to be disproportionate and unaffordable.
2f	2 * L ST	New vessel	✘	The operation of a year-round two vessel service is considered to be disproportionate and unaffordable.

6.4.2 In undertaking the above appraisal, it was considered that:

- Immediately introducing two new vessels to the route would be disproportionate given the remaining lifespan of the MV *Corran* and the relatively infrequent use of the second vessel; and
- A new vessel with an equivalent vehicle deck capacity to the MV *Corran* would not address the evidenced capacity options, and thus only options which offered a larger capacity main vessel were progressed to the Detailed Appraisal stage.

6.4.3 In summary, the following options will be considered in the Detailed Appraisal:

- Option 1a: 1 * new larger capacity quarter point vessel, with MV *Corran* retained as the refit / relief / second vessel. Two overnight berths would be required.
- Option 2c: 1 * larger capacity straight through vessel, with MV *Corran* retained as the refit / relief / second vessel. Two overnight berths would be required. Berthing or aligning structures may be required.
- Option 2d: 1 * larger capacity straight through vessel, with refit / relief / second vessel secured from elsewhere. One overnight berth would be required. Berthing or aligning structures may be required.

7 Detailed Option Development

7.1 Overview

7.1.1 Having defined three prospective options which could deliver the future needs of the Corran route, each of the options was developed to a level commensurate with a STAG Detailed Appraisal. This chapter summarises the detailed option development process.

7.1.2 Associated General Arrangement and Section Drawings are provided within Appendix E. As no existing topographic or bathymetric information was available for this study, these options have been developed based upon available slipway record drawings, aerial photography and Admiralty charts. Should any of the infrastructure recommendations of this appraisal be taken forward it is recommended that detailed bathymetric and topographic surveys of the infrastructure and surrounding areas at both sides of the crossing be undertaken.

7.2 Option 1a: 1 * new larger capacity quarter point vessel with MV *Corran* retained as relief

Infrastructure Requirements

Marshalling

7.2.1 As established during the Initial Appraisal, marshalling areas at both sides of the crossing overspill onto the adjacent roads during busy periods (e.g. during the Mull Rally). This is particularly significant at Nether Lochaber where vehicles are known to back out onto the A82 and cause queuing on the A82 trunk road. Due to land ownership and the tight boundaries of the site, there is little scope to increase the capacity of the marshalling area at Nether Lochaber. Therefore, provision of a larger vessel would increase vehicle carrying capacity on the route, mitigating the issue of overflow from the marshalling areas in the ways previously explained.

7.2.2 At Ardgour, there is scope to reconfigure the marshalling lanes to provide an additional 54.0m lane length, which would increase the capacity of the marshalling from approximately 45 cars to 53 cars. It is also recommended that a barrier be installed between the road and the marshalling area to segregate it from the road and protect those using it.

7.2.3 As there is currently no larger vessel ordered or in scope for the Corran route, for the purposes of this study the larger *Loch* Class vessels within the CMAL fleet have been considered to provide a reasonable indication of the scale of the infrastructure required for any new larger vessel.

7.2.4 The larger *Loch* Class vessels in the CMAL fleet are the MV *Loch Fyne*, MV *Loch Dunvegan* and MV *Loch Shira* all of which have a vehicle carrying capacity of 36 cars, which would provide around a 30% increase on the current capacity of the MV *Corran*. The general characteristics of these vessels are tabulated below.

Table 7.1 Design Vessels

Design Vessel	MV *Corran*	MV *Loch Fyne* / MV *Loch Dunvegan*	MV *Loch Shira*
Vehicle Carrying Capacity (Cars)	28	36	36
Length B. P.[29] (m)	42.00	54.20	53.90
Beam (m)	13.40	13.20	13.90
Draught (M)	1.80	1.60	1.80

[29] Length B.P. – Length Between Perpendiculars

7.2.5 Reviewing the above vessels, the design characteristics adopted in this study for a larger quarter point loading vessel are as follows:

- Longest vessel: 55.0 metres
- Beam: 14.0 metres
- Draught: 1.8 metres

Slipways

7.2.6 The initial appraisal identified that the slipway at Nether Lochaber is in reasonable condition, having been recently extended and repaired, and that there are no known issues with accessing the quarter point vessel from this slipway. However, to improve manoeuvrability of the vehicles onto the vessel, especially larger commercial vehicles, it would be recommended that the slipway is widened to the south. The extent to which this should be widened should be confirmed by swept path analysis, but it would be reasonable to assume that this should be in the order of approximately 2.0-2.5m, taking the overall width of the slipway to approximately 15.0m.

7.2.7 During the Initial Appraisal, it was noted that the slipway at Ardgour is narrower than that at Nether Lochaber and larger vehicles struggle to make the swept path from the road onto the vessel and often have to cut the corner of the pavement. Therefore, the corner of the slipway and the slipway itself should be widened; easing this issue.

7.2.8 Asset inspection reports indicate that there is holing and subsidence in the north wall of the Ardgour slipway, and the masonry apron on the foreshore is also showing signs of subsidence. Prior to introduction of any new vessel these defects should be repaired.

Berthing of Vessels

7.2.9 At present, both the main and relief vessels are moored overnight on swinging moorings to the north of the Ardgour slipway. On a daily basis, this requires the crew to undertake a vessel-to-vessel transfer from a small tender boat to access and egress the ferry. Vessel-to-vessel transfer is an operation that is still undertaken by other ferry operators within Scotland on a small number of routes. From consultation with CFL, it is understood that this practice currently takes place on the Fionnphort to Iona crossing and the Gallanach to Kerrera crossing. However, CFL regard this as a high-risk activity which is only permitted to be undertaken on these routes under strict control measures including; weather limitations for transfer, communication plans with the Coastguard, and specialised Personal Protective Equipment for crew. Due to the high-risk nature of this activity, it is one that CFL is trying to move away from where possible. At present Argyll & Bute Council is procuring works to provide an overnight berth at Fionnphort for the CalMac ferry, thus eliminating the need for vessel-to-vessel transfer.

7.2.10 It is therefore considered prudent for this study to reflect the hazardous nature of vessel-to-vessel transfers and consider options for an overnight berth for at least the main vessel. At present the majority of the crew are based on the Ardgour side, therefore, at least in the short term, it would be sensible to maintain the overnight berthing of the vessel at this location. It is however noted that there may be a greater pool of resource for crewing on the Nether Lochaber side of the route, due to its relative proximity to the population centre of Fort William, and in the future the balance of the crew's home location may change. Therefore, a secondary facility at Nether Lochaber to accommodate a smaller vessel to provide crew transfer from Nether Lochaber will be considered as a potential addition to this option. This would likely be positioned south of the existing Slipway to allow the Quarter Point Vessel to continue to operate from the north of the slipway.

7.2.11 An option for the main vessel overnight berth would be to position a new pier in a similar location to the existing pierhead used for the crew's tender. This is located out of the narrow channel with the result that the currents are less strong. The pier would need to be in deeper waters than the existing as it is understood that the inner berth on the existing lacks sufficient water depth for all tides access. Ideally the new pier would be positioned to allow adequate depth on the inner berth to accommodate the MV *Corran*. The MV *Corran* has a design draught of 1.8m, therefore to allow for adequate under keel clearance at LAT[30] (minimum of 0.5m -1.0m) the pier should be positioned to provide an inner berth with minimum depth of -2.8m Chart Datum (CD).

7.2.12 To provide the required water depth at this location, the pier would need to be in waters of -5.0 to -7.0m CD. The deck on the berthing structure would be set to say 0.5m above HAT[31] (approximately +5.5m CD), resulting in pile lengths of around 10.5m-12.5m. At this depth, the construction of the pier could be of open piled bents or a solid structure (sheet piled and infilled with crushed rock). For flexibility, it is likely that both berths would be fendered similarly. Based on design codes, the spacing of fenders should be no greater than 0.15 of the length of the shortest vessel. For the MV *Corran* this would mean fenders would be at a maximum of 6m centres.

7.2.13 The table below summarises the recommended shore-side infrastructure improvements for Option 1a:

Table 7.2: Option 1a – Shoreside Infrastructure Improvements

Nether Lochaber	Ardgour
Widen existing slipway to the south	Realignment of marshalling area to increase capacity
Consider secondary berthing facility for crew transfer vessel	Widen existing slipway to the south
	Repair holing and subsidence to existing slipway
	Consider overnight ferry berth

7.3 Option 2c: 1 * new larger straight through vessel with MV *Corran* retained as relief

Infrastructure Requirements

Marshalling

7.4.1 The introduction of a larger straight through vessel is likely to provide the same benefits in reduced vehicle queuing as described in Option 1a above. This option would also include reconfiguring the marshalling lanes at Ardgour to provide additional capacity.

Slipways

7.4.2 Both of the existing slipways are set at gradients between 1:7 and 1:8, which is typical of slipways used by *Loch* Class vessels. It is, however, understood from anecdotal evidence that there was considered to be issues with adequate draught at the slipways in all states of tide when trials of the MV *Loch Alainn* were undertaken. This should be investigated further, but, likely means that the slipways will need to be lengthened to accommodate a larger *Loch* Class type of vessel operating over the full tidal range. Full topographic and bathymetric survey information is not available around the slipways and therefore it is not possible to estimate to what length this extension would need to be. An allowance has been made in the cost estimates for a 5m extension.

7.4.3 As well as extending the length of the slipways, based on the existing evidence of scour and undercut, coupled with the high-power propulsion systems that would be needed for a *Loch* Class type vessel to hold position, it would also be advisable to install scour mattresses around

[30] LAT - Lowest Astronomical Tide

[31] HAT – Highest Astronomical Tide

the toe of both slipways. This is likely to comprise of a concrete mattress and/or rock armour protection system.

7.4.4 As described in Option 1a above, to ease the issues of tight swept paths for large commercial vehicles accessing and egressing the quarter-point ferry, for this option the slipways should be widened to be approximately 15.0m wide. This increased width of slipway would also be of benefit when aligning the straight through vessel on the slipway at times of strong current.

7.4.5 During trials of the MV *Loch Alainn*, it was noted that the vessel was unable to hold position on the slipway because of the strong currents through the narrows. To assist a straight through vessel holding position on the slipway, a **solid aligning structure** should be constructed on both slipways. To allow the MV *Corran* to maintain service from the north side of the slipways when the new larger vessel is out of service, these aligning structures should be constructed to the south. Depending on the direction of the current, these would allow the ferry to either operate in the lee of the aligning structure or 'lean' against it as she took the slipway.

7.4.6 The aligning structures would be of solid construction and extend beyond the end of the slipways to protect the vessel from the currents in the channel. The vessel procured should also have strong enough propulsion systems that it can propel itself away from the structure when the current is pushing it onto it. Review of available Admiralty Charts, indicates that at Ardgour, the aligning structure will need to extend out to bed levels of -15.0m to -17.0m CD.

Berthing of Vessels

7.4.7 As discussed in Option 1a, it would be prudent to provide an overnight berth within these options to negate the need for vessel-to-vessel crew transfer. As the aligning structure has to extend a reasonable distance out beyond the slipway to provide protection to the vessel when on the slipway, it would appear sensible to extend the aligning structure to provide an overnight berth. It would also be possible to design the aligning structure to have a berth on both sides, and the MV *Corran* can be berthed on the opposite side from the slipway.

7.4.8 As discussed above, the home location of the crew might not always remain on the Ardgour side of the crossing. In this option the aligning structures could be designed to berth the main vessel on either side of the crossing overnight, and a tender could be berthed on the opposite side to transfer crew.

7.4.9 A summary of the infrastructure works required for Option 2c is provided in the table below:

Table 7.3: Option 2c – Shoreside Infrastructure Improvements

Nether Lochaber	Ardgour
Widen existing slipway to the south	Realignment of marshalling area to increase capacity
Extend length of slipway to accommodate the draught of new larger vessel on all tides	Repair holing and subsidence to existing slipway
Install scour protection around toe to slipway	Widen existing slipway to south
Construct aligning structure to south of slipway which could also be used as overnight berthing for crew transfer tender	Extend length of slipway to accommodate the draught of new larger vessel on all tides
	Install scour protection around toe of slipway.
	Construct aligning structure to south of slipway, which could also be used as an overnight berth for main vessel and MV *Corran*

7.5 Option 2d: New Larger Straight Through Vessel with MV *Corran* Sold

7.6.1 Under this option, a larger straight through vessel is provided and MV *Corran* is sold. Relief is provided from within the CMAL fleet or with vessels chartered from the open market.

7.6.2 This option would provide all the benefits and would require the same infrastructure arrangement as Option 2c. As before, the aligning structures would be built on the south side of the slipways to allow construction in advance of mobilisation of the new vessel and disposal of the existing quarter-point vessels.

7.6.3 The table below summarises the works that are required to be undertaken to the infrastructure for option 2d:

Table 7.4: Option 2d – Shoreside Infrastructure Improvements

Nether Lochaber	Ardgour
Widen existing slipway to the south	Realignment of marshalling area to increase capacity
Extend length of slipway to accommodate the draught of new larger vessel on all tides	Repair holing and subsidence to existing slipway
Install scour protection around toe to slipway	Widen existing slipway to south
Construct aligning structure to south of slipway which could also be used as overnight berthing for crew transfer tender	Extend length of slipway to accommodate the draught of new larger vessel on all tides
	Install scour protection around toe of slipway.
	Construct aligning structure to south of slipway, which could also be used as an overnight berth for main vessel and MV *Corran*

7.7 Next Steps

7.7.1 Having defined the technical particulars of each option, the next chapter appraises them against the TPOs and STAG criteria.

8 Detailed Appraisal – Infrastructure Options

8.1 Overview

8.1.1 Having developed the options to an appropriate level of detail for this study, this chapter sets out the detailed appraisal of options against the TPOs and STAG criteria.

8.1.2 A conventional STAG Appraisal would generally consider cost to government at this stage of the appraisal. However, the cost of delivering each of the options will depend on how it is delivered and thus cost to government is considered separately in Chapter 10.

8.2 Transport Planning Objectives

8.2.1 In advance of a STAG Detailed Appraisal, the study team reviewed the TPOs set at the Initial Appraisal stage to determine whether they could be further developed. Having reviewed the objectives, we have concluded that the wording of the TPOs does not have to change at this stage as they were made broadly SMART at the Initial Appraisal stage.

8.2.2 The appraisal of the options against the TPOs in the Preliminary Appraisal therefore remains current.

8.3 Appraisal Against STAG Criteria

8.3.1 This section appraises each of the options against the five STAG criteria, namely Environment, Safety, Economy, Integration and Accessibility & Social Inclusion. STAG involves the appraisal of all options on a seven-point scale, as follows:

✓✓✓ - Major Positive

✓✓ - Moderate Positive

✓ - Minor Positive

O – Neutral

× - Minor Negative

×× - Moderate Negative

××× - Major Negative

8.3.2 For each option under each STAG criterion (and respective sub-criteria), an evidence-based judgement is made on the extent of the impact using the scale set out above.

8.3.3 Within the detailed appraisal, the performance of all the options is measured against a range of sub-criteria. The underlying fundamental principle is that appraisals should be proportionate – i.e. they should concentrate on significant impacts that allow for the differentiation between options. Qualitative and quantitative measures should be used to determine significance, provided that these measures are understandable and robust.

Environment

Approach to Environmental Appraisal in this Study

8.3.4 In keeping with STAG, our approach to the environmental appraisal in this study is proportionate with the anticipated type and scale of impacts. The appraisal of the environmental impacts is therefore relatively light touch and largely **qualitative**.

8.3.5 Strategic Environmental Assessment may be required at a later stage when the preferred infrastructure option emerges.

Written Consultation

8.3.6 In order to collect any evidence on the specific impacts of the options, a written consultation was undertaken with statutory consultees, namely:

- The Highland Council
- Historic Scotland
- Scottish Environmental Protection Agency
- Scottish Natural Heritage

8.3.7 The response from each of the above consultees is included in Appendix F.

Appraisal

8.3.8 The following table sets out the assessment of environmental impacts under each sub-criterion followed by some commentary on these ratings.

Table 8.1 :Environmental Appraisal

	***Option 1a** - 1 * Larger QP / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2c** – 1 * Larger ST / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2d** - 1 * Larger ST / 2nd Vessel from fleet / 1 * Overnight Berth*
Noise & Vibration	××	×××	×××
Global Air Quality	✓	✓	✓
Local Air Quality	×	××	××
Water Quality, Drainage & Flood Defence	O	O	O
Geology	O	O	O
Biodiversity & Habitats	×	×	×
Landscape	×	××	××
Visual Amenity	×	××	××
Agriculture & Soils	O	O	O
Cultural Heritage	O	O	O
Overall Assessment	×	××	××

8.3.9 It should be noted that a number of the above environmental impacts are associated with the construction phase of the project and thus will be relatively short-term in nature.

8.3.10 In terms of **noise & vibration**, Option 1a will record a moderate negative as construction works, including piling, will be undertaken in close proximity to residential properties in Ardgour and Nether Lochaber. Options 2c and 2d will record a major negative as the scale of the construction work associated with these options will be greater at both extents of the crossing. Long-term noise impacts associated with all options are likely to be neutral.

8.3.11 All options may lead to a minor positive impact in terms of **global air quality** as new vessels will be more efficient than the MV *Corran* and MV *Maid of Glencoul* and are likely to lead to a reduction in emissions. If the new vessel(s) was to be a hybrid, this could be increased to a moderate positive. **Local air quality** may also marginally benefit from this improvement in the long-term (albeit there is no evidence of an existing air quality problem). However, dust etc generated during construction will result in a negative impact to local air quality in the short-term. Again, because the scale of the construction works associated with Options 2c and 2d is greater than Option 1a, they will have a greater negative impact (moderate negative) than Option 1a (minor negative).

8.3.12 For all options there will be a minor negative impact in relation to **biodiversity and habitats** as there is likely to be a minor loss of habitats due to the relatively small-scale construction works.

8.3.13 All options will have a negative impact in terms of **landscape and visual amenity** as they will involve the creation of entirely new structures adjacent to Ardgour. The impact will be greater for Options 2c and 2d as the scale of the infrastructure required at both extents of the crossing is of greater magnitude than Option 1a.

8.3.14 Across all of the options, there may also be some short-term impacts on marine **water quality** during construction, but this is unlikely to be significant in the longer-term.

8.3.15 In summary, all of the options that have been taken forward are likely to have a negative environmental impact to a greater or lesser degree. However, the research undertaken as part of this study suggests that these impacts will generally be minor and short-term (associated with construction) and can be mitigated to a degree.

8.3.16 The Construction Works associated with the two options which introduce a *Loch* Class type vessel (Options 2c-2d) are of a greater scale than Option 1a. Consequently, these options have greater negative impacts in terms of noise & vibration, visual amenity, landscape and local air quality.

8.4 Safety

8.4.1 The Safety criterion includes two sub-criteria which the appraisal is required to consider:

- Accidents; and
- Security.

Accidents

8.4.2 The 'Accidents' sub-criterion was initially developed more in consideration of e.g. urban / inter-urban transport. In the ferries context, the Corran Ferry has an unblemished safety record. The focus in this section is therefore on the extent to which the options reduce the risks attached to:

- the use of swing moorings; and
- traffic management in and in proximity to the marshalling areas.

Security

8.4.3 The 'Security' sub-criterion in this context will consider the security impacts of the options on the different categories of service users (e.g. foot passengers, car drivers etc).

8.4.4 The appraisal of the safety impacts is largely **qualitative**.

Appraisal

8.4.5 The following table sets out the assessment of safety impacts under each sub-criterion followed by some commentary on these ratings.

Table 8.2: Safety Appraisal

	Option 1a *- 1 * Larger QP / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2c*** *– 1 * Larger ST / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2d*** *- 1 * Larger ST / 2nd Vessel from fleet / 1 * Overnight Berth*
Accidents	✓✓	✓✓	✓
Security	O	O	O

	***Option 1a** - 1 * Larger QP / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2c** – 1 * Larger ST / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2d** - 1 * Larger ST / 2nd Vessel from fleet / 1 * Overnight Berth*
Overall Assessment	✓✓	✓✓	✓

8.4.6 All of the options record a positive impact against the **accidents** sub-criterion, although the benefit is more about reducing the risk of accidents (e.g. vessel-to-vessel crew transfer, vehicles blocking back out of the marshalling area etc) rather than an evidenced accident / safety problem.

8.4.7 Options 1a and 2c, where the MV *Corran* is retained records a larger benefit in terms of reducing the risk of accidents as they:

- eliminate the process of vessel-to-vessel transfer;
- extend / realign the marshalling areas; and
- ensure that a suitable vessel is available to operate the route on a year-round basis.

8.4.8 Option 2d delivers the first two bullets above. However, unless a suitable relief cover arrangement is put in place, there is a risk that any relief vessel could be capacity constrained, leading to blocking back out of the marshalling area or an inability to carry large CVs, leading to additional road miles on poor quality roads.

8.4.9 None of the options have any material impact on **security**.

8.5 Economy

8.5.1 The STAG Economy criterion considers three discrete sub-criteria:

- Transport Economic Efficiency (TEE): the benefits ordinarily captured by standard cost-benefit analysis – the transport impacts of a proposal generally capturing travel time benefits (including reliability) and changes in vehicle operating costs;
- Economic Activity and Location Impacts (EALIs): allow the impacts of a proposal to be expressed in terms of its net effects on the local and/or national economy. The EALI does not identify additional benefits, rather it considers the distribution of the identified benefits.
- Wider Economic Impacts (WEIs): relate to the notion of wider economic benefits (i.e. they are additional to the TEE benefits) derived from the impact of transport upon agglomeration (i.e. the benefits that firms obtain by locating near to each other), the underlying relationship of impacts of agglomeration upon productivity, and labour market efficiencies.

Note – it is our understanding that, in the soon to be refreshed STAG Guidance, WEBs and EALIs will be combined under a new Wider Economic Impacts heading.

TEE Impacts

8.5.2 TEE benefits are likely to be limited to improvements in reliability and capacity, although quantifying such impacts is not possible (and in turn this prevents the generation of a Net Present Benefit or Benefit Cost Ratio associated with the options presented).

EALIs

8.5.3 Given that the options presented will not fundamentally change the service offered, it is unlikely that any significant EALI benefits will emerge from the preferred option.

Wider Economic Impacts

8.5.4 WEIs only tend to accrue in the case of the largest schemes (i.e. nationally significant transport investments such as the M8 Completion or Borders Rail) and thus are not likely to be relevant in this context. They are not considered further in this study.

Appraisal

8.5.5 The following table sets out the assessment of economy impacts under each sub-criterion followed by some commentary on these ratings.

Table 8.3: Economy Appraisal

	Option 1a *- 1 * Larger QP / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2c*** *– 1 * Larger ST / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2d*** *- 1 * Larger ST / 2nd Vessel from fleet / 1 * Overnight Berth*
Transport Economic Efficiency (TEE)	✓✓	✓✓	✓
Economic Activity & Location Impacts (EALI)	✓	✓	✓
Wider Economic Benefits (WEBs)	**O**	**O**	**O**
Overall Assessment	✓✓	✓✓	✓

8.5.6 Options 1a and 2c would provide moderate **TEE** benefits in that the increase in capacity would reduce the volume of ‘short-shipped’ traffic during peak periods, thus reducing average travel times across the year. This would particularly be the case when events are on in the area, on summer weekends and over the period when the MV *Maid of Glencoul* is currently in operation. Option 2d would provide a similar benefit when the new larger straight through vessel is in operation, but the benefits are less certain around refit time in terms the availability and capacity of the relieving vessel.

8.5.7 All of the options would generate a minor **EALI** benefit (when compared to the Do Minimum) in that they would ensure the long-term sustainability of the route in terms of assets and relieve some of the current pressures in terms of capacity (thus removing the constraints which impact on peninsular communities). However, such impacts would be highly marginal.

8.5.8 As previously noted, **WEIs** only accrue in relation to the largest schemes and are not relevant in this context.

8.6 Integration

8.6.1 The Integration criterion includes three sub-criteria which the appraisal is required to consider:

- Transport Integration: which relates to the degree to which a proposal fits with other transport infrastructure and services;
- Transport and Land-Use Integration: which relates to the fit between the option and established land-use plans and land-use / transport planning guidance; and
- Policy Integration: which relates to the appropriateness of the option in light of wider policies including those of both central and local government.

Transport Integration

8.6.2 In this context, transport integration is concerned with the impact of each option on the different types of ferry user, e.g. passenger, car, coach and commercial vehicle.

Transport and Land-Use Integration

8.6.3 This sub-criterion considers the extent to which the proposed options impact on land-use and the profile of development in and around the two ferry terminals.

Policy Integration

8.6.4 This final sub-criterion considers the extent to which the proposed options fit with established local, regional and national policy.

8.6.5 The appraisal against the Integration criterion is exclusively **qualitative**.

Appraisal

8.6.6 The following table sets out the assessment of integration impacts under each sub-criterion, followed by some commentary on these ratings.

Table 8.4: Integration Appraisal

	Option 1a *- 1 * Larger QP / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2c*** *– 1 * Larger ST / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2d*** *- 1 * Larger ST / 2nd Vessel from fleet / 1 * Overnight Berth*
Transport Integration	✓	✓	✓
Transport & Land-Use Integration	**O**	**O**	**O**
Policy Integration	✓✓	✓✓	✓✓
Overall Assessment	✓	✓	✓

8.6.7 All of the options offer a minor benefit in terms of **transport integration** in that they reduce the current constraints associated with large commercial vehicles when the MV *Maid of Glencoul* is in operation. They will also ensure plentiful capacity for scheduled bus services using the Corran Ferry, although there is no evidence that this is a problem at present.

8.6.8 All three options make a positive contribution to the **policy integration** criterion, in that they would support the long-term sustainability of the service by addressing the current asset related issues. This would be line with the Highland Council Local Transport Strategy, the Action Plan for Economic Development in Highland and the HITRANS Regional Transport Strategy. It would also ensure that the assets allow for a service to be delivered which is in keeping with that identified through the Transport Scotland Routes & Services Methodology.

8.6.9 The three shortlisted options would also allow for the discontinuation of the practice of vessel-to-vessel transfer. This would bring the Corran Ferry into line with operational policies elsewhere in Scotland, including on the CHFS network.

8.7 Accessibility & Social Inclusion

8.7.1 The Accessibility & Social Inclusion criterion includes two sub-criteria which the appraisal is required to consider:

- Community Accessibility
  - Public transport network coverage – changes in accessibility provided by the public transport system; and
  - Access to local services – changes in accessibility by walking and cycling to local services.
- Comparative Accessibility
  - The distribution of impacts by people group.
  - The distribution of impacts by location.

8.7.2 The appraisal against the Accessibility & Social Inclusion criterion is exclusively **qualitative**.

8.7.3 It should also be noted that, in the context of this appraisal, there is a significant overlap between the Accessibility & Social Inclusion criterion and the transport integration criterion (see above). The appraisal will therefore be relatively light touch in relation to this criterion.

Appraisal

8.7.4 The following table sets out the assessment of accessibility & social inclusion impacts under each sub-criterion followed by some commentary on these rating.

Table 8.5: Accessibility & Social Inclusion Appraisal

	Option 1a *- 1 * Larger QP / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2c*** *– 1 * Larger ST / MV Corran 2nd Vessel / 2 * Overnight Berth*	***Option 2d*** *- 1 * Larger ST / 2nd Vessel from fleet / 1 * Overnight Berth*
Community Accessibility	**O**	**O**	**O**
Comparative Accessibility	**O**	**O**	**O**
Overall Assessment	**O**	**O**	**O**

8.7.5 As the options presented are focused on maintaining the current level of service, they are broadly neutral from an accessibility perspective.

8.8 Summary

8.8.1 The appraisal of options against the STAG criteria has demonstrated that, across the piece, all three options are likely to make a positive contribution to the STAG criteria. However, given that each of the options is largely focused on ensuring a sustainable asset position and addressing a number of operational issues rather than fundamentally upgrading the service, the appraisal against the TPOs and STAG criteria does little to differentiate between the options.

8.8.2 The key differentiating factors are therefore:

- how the new assets and the service are funded, procured and delivered; and
- cost to government; and
- risk & uncertainty.

8.8.3 These issues are explored in more detail in the proceeding chapters.

9 Detailed Appraisal – Methods of Delivery

9.1 Overview

9.1.1 The previous chapter appraised options for the future Corran Ferry service specification in terms of assets and infrastructure. It assumed a degree of public sector control / specification of the service, either in terms of directly operating it or establishing the parameters within which a third party could operate it. Having defined the infrastructure options and service profile (i.e. what needs to be delivered?), this chapter appraises options with respect to methods of delivery (i.e. how should it be delivered?).

9.1.2 The Initial Appraisal – The Case for Change identified as the final TPO that the delivery and funding model should ensure the long-term sustainability and resilience of the Corran Ferry service, this being the immediate short-term issue outwith the need for asset replacement. Five prospective delivery models were shortlisted for further consideration:

- **MoD, Do Minimum:** THC continue to operate the service on the same basis as at present.
- **MoD1, Public Sector Operation:** Transfer of responsibilities to Transport Scotland, with the Corran Ferry being run on 'in-house' basis, i.e. taken into the CHFS bundle.
- **MoD2, Public Service Obligation:** THC specifies a Public Service Obligation (PSO) on the Corran Narrows and seeks an operator(s) to run the route.
- **MoD3, Public Service Contract:** Specify a Public Service Contract (PSC) and seek an operator to run the route – there are two variants to this option:
  - **MoD3a:** THC to establish a PSC and seek an operator to run the route.
  - **MoD3b:** Seek a transfer of responsibilities to Transport Scotland, which would establish a PSC and seek an operator to run the route.

9.1.3 It is important to note at the outset of this chapter that there is no 'right answer' in terms of how the service should be delivered. The preferred option in this respect is ultimately a political choice for Members and will reflect a combination of factors including cost, attitude to risk, desired level of control over the service (including fares) and public acceptability. For each delivery model, there are a range of questions which would need to be considered by Members and, if the Council elects to pursue a transfer of responsibilities, by Transport Scotland.

9.1.4 This chapter cannot therefore take the form of a conventional STAG Appraisal, whereby options are scored against the TPOs and STAG criteria. Instead the approach here is to set out:

- key issues / questions surrounding each delivery model in terms of:
  - vessels and refit / relief / breakdown cover;
  - slipways and infrastructure;
  - crew; and
  - fares.
- implications for The Highland Council in terms of:
  - day-to-day operations;
  - supply of vessels;
  - slipways and infrastructure; and
  - local accountability.

9.1.5 The outputs of this section could form the basis of internal discussions on a preferred option and, should Members wish to explore a transfer of responsibilities, the areas which would need to be explored with Transport Scotland.

9.2 MoD, Do Minimum

9.2.1 To recap, the Corran Ferry is operated as an entirely in-house local authority service, sitting within the THC Roads and Transport Department. The Do Minimum would involve continuation of the current arrangements.

Key Questions / Issues

Vessels and refit / relief / breakdown cover

9.2.2 Under the Do Min, asset maintenance, planning and renewal would remain the sole responsibility of THC. In effect, the Council would be responsible for selecting and funding the preferred service specification option emerging from this appraisal.

9.2.3 Given that the current vessels are bespoke to the route, it is unlikely that a replacement for the MV *Maid of Glencoul* could be sourced from the charter or second hand market and thus there would be a short-term (almost immediate) requirement to secure new tonnage or adapt a second hand vessel, whilst also developing a long-term strategy for the replacement of the MV *Corran* (depending on the service specification option progressed).[32] All capital funding requirements would have to be met by THC, either from their capital budget, reserves or through converting the spending into an ongoing revenue cost through for example a finance lease.

9.2.4 Should THC wish to pursue Option 2d (1 * larger straight through vessel, with refit / relief / second vessel secured from elsewhere), a clear plan and indeed contract would have to be developed for ensuring cover during refit and breakdowns (unless a certain level of service outage was considered politically acceptable). For refits, this would likely require negotiation with CMAL / CFL to charter one of their vessels for a defined period each year, although this would clearly come at a cost. In addition, given current vessel availability within the CMAL and other Scottish fleets, securing a relief vessel could prove challenging, particularly during unscheduled breakdowns. Added to the above, it is possible that resistance could be encountered from other islands if 'their vessel' or 'their relief vessel' was redeployed to Corran.

Slipways and infrastructure

9.2.5 The slipways and other infrastructure would remain in the control of THC, which would be responsible for maintaining them and undertaking any upgrades.

Crew

9.2.6 The key question surrounding this option is how the Council would address the immediate and increasingly critical issues surrounding the sustainability of the crewing. The evidence presented in the Initial Appraisal clearly demonstrates that the crewing position is becoming unsustainable, with an ageing crew, declining crew & agency staff numbers and a heavy reliance on overtime.

9.2.7 Should THC retain control of the service, there would be an immediate requirement to develop a crew retention and recruitment plan. This would in all likelihood require a benchmarking of crew terms & conditions against other operators, and in particular CFL, which is the local 'competitor' for crew. Given the current difficulties in recruiting, choices would be faced, including whether there is a need to depart from public sector terms & conditions for the crew (although this may well not be possible, no matter how desirable) and whether there should be a long-term aim of overnighting the vessel(s) on the Nether Lochaber side of the crossing[33], increasing the potential labour catchment. Consideration would also have to be given as to how

[32] Note – a potential contingency plan would be to source a conventional straight through vessel which could be deployed outwith periods of peak tidal flow, which are largely predictable. Whilst a limited service is better than no service, it is highly unlikely that this option would be publicly acceptable.

[33] An alternative to basing the vessel on the Nether Lochaber side of the crossing would be to pay local boatmen to take crew over to the Ardgour side of the crossing.

crew can be offered a career path, given that the Corran Ferry is the only significant route operated by THC.[34]

9.2.8 In any case, it is apparent from the evidence that the current crewing model cannot be sustained indefinitely and there is a high likelihood that crew numbers and costs will increase. Quick decisions on crewing supported by the necessary revenue funding will be required from THC should they choose to retain the service in-house

Fares

9.2.9 THC would continue to determine the means by which the Corran Ferry fares are set and their absolute level. With a requirement for capital investment and a reform of the crewing model, it is likely that the costs of operating the ferry service will increase (providing these costs are recharged internally). If the Council was to maintain the current level of fares, it is likely that additional revenue funding would be required to bridge the increasing gap between farebox revenue and costs.

Implications for THC

9.2.10 The implications of this option for THC are largely reflective of the above commentary. This option effectively maintains the current day arrangements, which means responsibility for funding new investment and resolving the crewing sustainability issues would rest wholly with the Council. THC would however maintain control over all aspects of the service.

9.3 MoD1, Public Sector Operation, Transport Scotland

9.3.1 This option would involve a formal request from THC to Transport Scotland to enter into negotiations for a ‘transfer of responsibilities’. It is assumed in this option that the service would then be operated ‘in-house’ by Transport Scotland (options around tendering the service are considered later in this chapter).

9.3.2 It should be reiterated that Transport Scotland explained through the consultation that the specifics of any transfer of responsibilities would be subject to negotiation with Scottish Ministers and would commence from a position of ‘no net detriment’ to the Scottish Government.

Key Questions / Issues

9.3.3 There is an overarching question in relation to this option as to whether the Corran Ferry operation, if transferred, would:

- sit within the CHFS bundle (operated in-house under the Teckal Exemption if this is proven to be possible);
- sit within another bundle of services; or
- be operated / run independently of all other Transport Scotland funded services.

9.3.4 Given the recent precedent with Kerrera, the economies of scope & scale etc from being part of the CHFS bundle, this would seem the most likely outcome. However, it would again be a matter for discussion / negotiation with Scottish Ministers.

Vessels and refit / relief / breakdown cover

[34] One potential, albeit radical, solution would to have crew form their own co-op crewing company which is contracted to man the vessel. This would be straying into outsourcing but would give THC scope to move away from local authority T&Cs. It is possible that, if the crew owned the manning agency and shared the profits, then creative solutions may emerge as to how differently they could ensure the minimum safe manning was achieved. This idea would allow crew to create their own local pool of relief workers to cover absences without resorting to overtime.

9.3.5 Directly related to the above point is the means by which the vessel(s) would be provided. In the event that the route folded in CHFS, the key questions which would need to be considered include:

- Would the vessel(s) be built and owned by CMAL, and operated by CFL?
- Would the MV *Corran* transfer into CMAL ownership or would she be sold by THC? If the former, what would her residual value be and how would this be factored into any transfer agreement?
- Would relief cover be provided from within the CFL fleet? If so, which vessels could provide that cover and would they be available to do so? *Note – this would clearly depend on the infrastructure solution adopted*.
- How would refit and breakdown cover be arranged and prioritised?

Slipways and infrastructure

9.3.6 A similar set of questions would also surround the ownership and operation of the slipways. There would be two broad options:

- THC could retain ownership of the slipways and would continue to have responsibility for their operation and maintenance. Under such an arrangement, they would charge Transport Scotland or its operator dues, providing a revenue stream to cover maintenance costs; or
- THC could transfer ownership of the slipways to CMAL, which would then have the responsibility for maintaining them and collecting the necessary dues to facilitate this. There would again be a negotiation to be had as to whether any remedial work would be required on the slipways prior to a transfer and whether the slipways had a residual value that CMAL would have to pay the Council.

9.3.7 This study is not in a position to make a judgement on which of the above options would be preferable. However, irrespective of the approach adopted, the funding burden would lie with central government, either directly or via the payment of dues. This burden would need to be quantified and discussed as part of any negotiations surrounding a potential transfer of responsibilities.

9.3.8 Outwith day-to-day maintenance, the current slipways will also have to be upgraded to accommodate the preferred service specification option emerging from this appraisal and subsequent business case. As with the vessel(s), the capital cost of slipway upgrades and their subsequent ownership would have to be discussed as part of any transfer negotiations.

Crew

9.3.9 One of the primary reasons THC is considering making a request for a transfer of responsibilities is to address the crewing sustainability issues surrounding the current operation. There are a range of questions which would need to be considered in any transfer negotiations, including:

- Would the current crew transfer from the employment of THC to Transport Scotland or their operator under the Transfer of Undertakings (Protection of Employment), TUPE for short? It is our understanding that this would be the case but appropriate human resource advice would be required on this matter.
- Assuming the crew did TUPE over, presumably into the employment of CalMac Ferries Ltd, would their T&Cs (e.g. salary, pension, leave entitlement, overtime, working hours etc) be made equivalent to all other staff within that organisation. Also would the crew remain dedicated to the Corran Ferry or would they become part of a wider pool of ‘small vessel’ crew which could be deployed around the network as required?
- Could the current crewing shortfall on the Corran Ferry be made up from within the wider CFL small ferry crewing pool or would additional crew need to be recruited? It is in our

view likely that any shortfall could be covered but it may be by non-local crew, thus increasing the cost.

9.3.10 The crewing question at this stage is a challenging one – it can be reasonably assumed that if the crew did TUPE over to CFL, the cost of running the Corran Ferry would increase, as crew would be transferring from a local authority contract onto a CFL contract (assuming that a two-tier workforce would not be acceptable). In addition, the working pattern on the Corran Ferry is different from the CFL 'small ferry' fleet and it would need to be determined whether the same length of operating day could be delivered with the same number of crew (this is considered further in Chapter 10).

9.3.11 Any increase in crewing costs would need to be considered as part of transfer negotiations should they take place.

Fares

9.3.12 Transport Scotland noted during the consultation that RET is their standard fares policy and would be the starting point for discussions around any potential transfer. They noted the following points in relation to fares:

- If THC sought to continue the current fares system, it is likely that, if acceptable to Ministers, THC would be required to make up the revenue funding shortfall between the RET fare and the current level of fares.
- Transport Scotland considers it unlikely that any route under their control could operate without a passenger fare (as per current practice at Corran). Consideration would need to be given as to how passenger fares would be collected on such a short crossing, perhaps using shore-based self-service ticket machines.

9.3.13 When RET was introduced on the CHFS network, the position was taken by Ministers that no community's fares would increase due to the introduction of RET. Therefore, if the single RET fare was higher than the existing fare, the fares were generally capped at the multi-journey single-equivalent level. TS did however note that their focus was on the standard 6 or 10 journey multi-ticket books – RET fares were not pegged to the lesser used and higher discount 50 journey ticket books, or season tickets, where these existed. A small number of communities retained their 50 journey books and season tickets, but this was the exception rather than the rule.

9.3.14 The exact position in relation to fares and the ability of THC to provide top-up funding would again need to be negotiated in any discussions surrounding a potential transfer of responsibilities.

Implications for THC

9.3.15 The option of seeking a transfer of responsibilities to Transport Scotland is likely to be attractive to THC for a number of reasons, which are set out below. The 'benefit' to the Council may however be offset to some extent by a reduction in the GAE contribution to THC and a requirement to commit at least partial capital funding towards asset replacement. This would again be subject to negotiation with Scottish Ministers.

Day-to-day operations

9.3.16 From a THC perspective, the key benefit of this option is that all financial and operational risks (including those surrounding the sustainability of the crewing model) would be passed to another operator. The only residual responsibility would be for maintenance of the slipways and marshalling areas should these be retained by the Council.

Supply of vessels

9.3.17 In the event of a transfer, it is probable that responsibility for the supply of vessels would pass to CMAL (in terms of providing new tonnage) and CFL (in terms of the deployment of the fleet, arranging refit cover etc). THC would no longer have responsibility for specifying, designing and procuring vessels, or arranging refit or breakdown cover.

9.3.18 It is however important to note that a number of island and peninsular communities across Scotland are making the case for new tonnage. A commitment has been made to build a new vessel for Islay, but there is no further committed investment beyond that. Depending on how the Corran route is prioritised and the availability of funding, there could be a wait for a new vessel for the route, which could require ongoing maintenance of the MV *Maid of Glencoul* in the medium-term.

Slipways and infrastructure

9.3.19 The implications for the slipways and other marine infrastructure would be dependent on whether these were transferred as part of any agreement or retained by THC.

Local accountability

9.3.20 This option would diminish local accountability as service design and operations would be managed centrally. Whilst there are established means of feeding into ferry related decisions in islands and peninsular communities across Scotland, Ferry Stakeholder Groups for example, THC Elected Members would lose the ability to directly influence the design of the service.

9.4 MoD2, Public Service Obligation

9.4.1 To recap, this option would involve the Council specifying, within the limitations of a PSO, the level of service it requires an operator to provide if they are to be permitted to operate on the Corran Narrows. The Council would seek a private operator(s) to run the route without a subsidy.

Key Questions / Issues

Vessels and refit / relief / breakdown cover

9.4.2 Under a PSO, any incoming operator would be required to bring their own compliant vessel if they wished to operate on the route. They would be responsible for providing crew and a year-round service, inclusive of refit and breakdown cover. Whilst there would be a benefit if this model could be realised, the obvious challenge is securing an operator to run the route on a no-subsidy basis at the current fare levels. In addition, the more requirements that are added into the PSO specification, the less likely it is that an operator will be attracted to the route. Market testing would be required.

9.4.3 It should also be noted that, due to current slipway grading issues, the incoming vessel would need to be of a quarter point design capable of fitting the existing infrastructure (although this could change depending on the infrastructure solution adopted). There are likely to be few operators with such a vessel readily available which further limits the likelihood of securing an operator. Whilst an operator could build or adapt a vessel bespoke to the route, they may be reluctant to do so without a guarantee of exclusivity, which is not possible under a PSO. That said, it would not be practical for the route to host two or more competing operators on the crossing, so exclusivity is less of an issue than on other routes in Scotland.

9.4.4 One of the key issues with a PSO is that it does not provide certainty of tenure, with operators free to enter or leave the market as their commercial imperatives dictate. Given that this is a lifeline service, there would therefore need to be an ‘operator of last resort’, which would likely be THC. For this to be practical, the MV *Corran* would need to be retained, together with a crew to operate her. This raises obvious questions around allocative efficiency and the cost savings which would be realised from a PSO.

Slipways and infrastructure

9.4.5 The Council would be responsible for all ongoing maintenance and capital expenditure on the slipways and shoreside infrastructure. These costs would be recouped through berthing dues. It should however be noted that the level at which the dues are set would have to be recoverable for the operator through the farebox and thus would need to be fully reflected in the fares charged. If this was not the case, it may be difficult to attract an operator.

9.4.6 In order to address the potential need for an operator to bring a bespoke vessel, THC could consider upgrading the slipways / infrastructure to take a wider range of vessels before declaring the PSO. This could increase the likelihood of securing an operator but, at the same time, would involve up-front expenditure for which there is no guarantee of recouping.

Crew

9.4.7 The PSO operator would in all likelihood bring their own crew, which presents an obvious question over the future of the current crew. Given their experience and knowledge of the route, it is however probable that at least some of the current crew would join the PSO operator. Nonetheless, it is possible that there would be some redundancies. As well as being negative for the economy of the local area given that the current crew are all locally based, it also compromises the ability of THC to act as an operator of last resort.

Fares

9.4.8 The fares could be set by whichever means and at whatever level the Council chose. However, in order to attract one or more operators, the fares would need to cover all operating costs (including berthing dues which are not currently paid) and the cost of capital employed. It therefore appears highly unlikely that the current fares regime would be attractive to any operator, and thus fares would in all likelihood have to increase.

9.4.9 A commercial operator would also impose much stricter revenue enforcement.

Implications for THC

Day-to-day operations

9.4.10 All day-to-day financial and operational risks would be passed to the PSO operator(s). The operator would ensure compliance with all maritime legislation and the PSO requirements.

Supply of vessels

9.4.11 The PSO operator(s) would bring their own vessel and recoup the cost of capital employed through the farebox. However, as noted above, THC would need to develop a contingency plan for vessels and crew whereby they could step in as operator of last resort in the event that the PSO operator(s) chose to leave the route.

Slipways and infrastructure

9.4.12 The Council would continue to bear the full operating and capital costs of the slipways and other shoreside infrastructure, although there would be a revenue stream in the form of dues coming from the PSO operator.

Local accountability

9.4.13 The Council would have full control over the PSO specification and could set:

- the ports to be served;
- requirements in relation to the length of operating day, timetable, frequency of services and vessel capacity; and

- fare levels.

9.4.14 The Council would not control any other aspect of the service.

9.5 MoD3a, Public Service Contract (The Highland Council)

9.5.1 If THC declared a PSO and failed to attract any bidders, they could then move towards procuring a PSC for the Corran Narrows. A PSC allows the contracting authority to define a required contract length and pay a subsidy to the operator.

Key Questions / Issues

Vessels and refit / relief / breakdown cover

9.5.2 There are two potential vessel strategies under this approach:

- THC could supply and specify the vessel(s) within the contract – this is the model used by Transport Scotland in contracting the CHFS and Northern Isles Ferry Services (NIFS); or
- The Council could mandate that the operator brings their own vessel and provides relief cover through the tender specification.

9.5.3 Under the first option, THC would lease the vessel to the successful operator for the duration of the contract period. The operator would be responsible for maintaining and operating the vessel over the lifetime of the contract.

9.5.4 Should THC wish to specify the vessel in the contract, advice would be required from State Aid Scotland to ascertain whether this would be acceptable to the European Commission. The requirement to use the CMAL fleet within the CHFS contract arises from the 'uniqueness' of the vessel, a point which had to be notified to and agreed by the Commission. It is possible that a similar agreement could be reached for Corran, particularly if any new tonnage is of a quarter point design, but specialist advice would be required to minimise the risks of a State Aid complaint.

9.5.5 The second approach, whereby the incoming operator brings their own vessel, is the more common across Europe. However, given the largely bespoke design of the current Corran tonnage, there are unlikely to be many operators with an appropriate and readily available vessel to operate the route, although the chances of this may increase if the route is upgraded to accommodate straight through vessels. Where an incoming operator proposes to build a new vessel, the contract duration would have to be sufficiently long to allow them to fully depreciate that asset (or alternatively a transfer of assets clause could be put in place, but it is understood that this is not the favoured approach of the Commission as it could lead to discrimination against other Community ship owners).

9.5.6 A key challenge with an operator bringing their own vessel is refit and breakdown cover. It is highly unlikely that a commercial operator would retain a spare vessel for the route (unless funded through the contract) and thus they would have to seek a vessel from the market. This would likely lead to a period of service outage during breakdowns and potentially refits if a suitable replacement vessel cannot be found. Again, converting the route to accommodate straight through vessels would lessen this risk, at the very least allowing a selection of CMAL *Loch* Class vessels to provide cover (assuming CMAL would be prepared to / allowed to charter to the operator of the day, which is not a given).

Slipways and infrastructure

9.5.7 The slipways and landside infrastructure would remain in the ownership of THC, although the successful tenderer could be contracted to operate them for the duration of the contract (the model used on CHFS). The Council would retain responsibility for funding and carrying out maintenance and for all capital investment.

9.5.8 In order to address the potential need for an operator to bring a bespoke vessel, THC could consider upgrading the slipways / infrastructure to take a wider range of vessels before tendering the PSC. This could increase the likelihood of securing an operator but, at the same time, would involve up-front expenditure which there is no guarantee of recouping.

Crew

9.5.9 The current THC employed crew would TUPE across to the incoming operator, a process that would be repeated at the start of each new contract period. However, TUPE only applies on Day 1 on the transfer and it is highly probable that the incoming operator would wish to move the crew to their own T&Cs, which will be different to those of THC.

Fares

9.5.10 The fares could be set by whichever means and at whatever level the Council chose. However, depending on the price elasticity of demand, it is likely that, the lower the fares, the higher subsidy that would need to be paid to the operator. Any change in fares during the contract would require a variation in the operator’s contract managed through agreed change control procedures – i.e. THC would be retaining a significant proportion of the revenue risk

Implications for THC

Day-to-day operations

9.5.11 All day-to-day financial and operational risks would be passed to the operator assuming a net cost contract is specified. The operator would ensure compliance with all maritime legislation and the PSC requirements. It should be noted that, in order to attract bidders, THC would potentially have to take the risk on key uncertainties, such as market entry and fuel prices.

Supply of vessels

9.5.12 See sections 9.5.2 – 9.5.6 above.

Slipways and infrastructure

9.5.13 See section 9.5.7 – 9.5.8 above.

Local accountability

9.5.14 The terms of the contract would determine the degree of control that THC would have over the service. Precedent from other Scottish tendered services suggests that local accountability is a key requirement. For example, in the CHFS and NIFS contracts, proportion of profit retained, the vessels, fares, length of the operating day, service frequency etc are all defined within the contract.

9.5.15 It should however be noted that, the more tightly defined the contract, the more challenging it can be to attract a bidder, whilst the cost of the contract can also be higher – i.e. there is a risk of seeking a private sector solution and then so heavily constraining the private provider that you end up with a public service provided by a private sector operator for their profit.

9.6 MoD3b, Public Service Contract (Transport Scotland)

9.6.1 The option of operating a PSC under the banner of Transport Scotland would give rise to the same set of questions & issues as a transfer to an in-house operator. The key point here again is that the *Ferries Plan* states that any transfer has to be on the basis of no net detriment to central government. Therefore, the issues around GAE clawback, capital expenditure contributions, crew terms & conditions etc would all have to be explored through detailed discussions with Transport Scotland.

Key Questions / Issues

Vessels and refit / relief / breakdown cover

9.6.2 As with a THC operated PSC, the primary question in relation to vessels is whether the contracting authority would supply the vessel or whether operators would be invited to bring their own tonnage.

9.6.3 The issues are largely the same as the THC operated PSC, but the key difference is that Scottish Government, through CMAL, already operates the model of publicly provided vessels on the CHFS and NIFS contract. If a transfer was negotiated and agreed, it appears likely that the Corran route would sit within the CHFS bundle (as was the case with Kerrera) and it would therefore seem unlikely that there would be a departure from the currently established model of operation.

Slipways and infrastructure

9.6.4 As noted under MoD1, THC could continue to own, maintain and upgrade the slipways or, as part of any transfer negotiations, pass control over to CMAL. This study is not in a position to make a judgement on which of the above options would be preferable. However, irrespective of the approach adopted, the funding burden would lie with central government, either directly or via the payment of dues. This burden would need to be quantified and discussed as part of any negotiations surrounding a potential transfer of responsibilities.

Crew

9.6.5 The current THC employed crew would TUPE across to the incoming operator (potentially via Transport Scotland / Scottish Government), a process that would be repeated at the start of each new contract period.

9.6.6 The questions and issues around the crew in a transfer scenario are explore in sections 9.3.9 - 9.3.11 above.

Fares

9.6.7 As previously noted under MoD1, the starting point in relation to fares in any transfer discussions would be the application of RET fares and the charging of passenger fares. It is possible that THC could provide a top-up to maintain fares at their current level, but this would put the route at odds with other routes within the CHFS PSC, for which there is no precedent.

Implications for THC

9.6.8 The implications of this model for THC would be largely the same as in Option MoD1.

9.7 Summary

9.7.1 This section has considered the pros, cons and key questions / issues / implications surrounding different delivery models for the Corran Ferry. The table below summarises the potential delivery models (and sub-options in terms of the infrastructure owner, vessel provider, operator and operating deficit funding provider) which could be considered:

Note – in all cases in the table below where Transport Scotland is identified as the Operating Deficit Funding Provider, it is assumed that this is on a 'no net detriment basis' (i.e. the deficit, whilst paid by Transport Scotland, is funded by a reduction in THC GAE).

Table 9.1: Summary of Potential Delivery Models

Infrastructure Owner	Vessel Provider	Operator	Operating Deficit Funding Provider
Do Min - Public sector operation – continue with current THC delivery model			
Highland Council	Highland Council	Highland Council	Highland Council
MoD1 - Public sector operation – transfer of responsibilities to Transport Scotland			
CMAL	CMAL	CalMac	Transport Scotland
Highland Council	CMAL	CalMac	Transport Scotland
MoD2 – Public Service Obligation			
Highland Council	Private Operator	Private Operator	None
MoD3a: Public Service Contract – The Highland Council			
Highland Council	Private Operator	Private Operator / Public Sector Bidder	Highland Council
Highland Council	Highland Council	Private Operator / Public Sector Bidder	Highland Council
MoD3b: Public Service Contract – Transfer of Responsibilities to Transport Scotland			
Highland Council	Private Operator	Private Operator / Public Sector Bidder	Transport Scotland
Highland Council	CMAL	Private Operator / Public Sector Bidder	Transport Scotland
CMAL	Private Operator	Private Operator / Public Sector Bidder	Transport Scotland
CMAL	CMAL	Private Operator / Public Sector Bidder	Transport Scotland

9.7.2 It is evident from the commentary above that there are a significant number of questions which need to be resolved with each delivery model, and little by way of precedent to go on. This chapter and the wider outputs from this study should be used as the basis of further exploring these questions with Members, Transport Scotland and potentially with prospective operators through a market testing exercise.

9.7.3 Regardless of the delivery model pursued, there is no 'right' answer and ultimately the preferred model will be a political choice trading-off the different elements of the service set out above.

10 Cost to Government

10.1 Overview

10.1.1 The cost to government in both capital revenue terms will differ over time depending on the method of delivery adopted. In addition, the costs to different parties within the public sector (or publicly owned companies) will also differ between the different approaches.

10.1.2 To recap on Chapter 9, the cost Implications to different parties under the different methods are as follows:

- **Do Min: In house at THC**
  - All costs remain with THC
  - Represents a continuation of the status quo
- **Option MoD1: TS / CalMac / CMAL bundle**
  - All costs transfer to Scottish Government / CalMac / CMAL
  - THC would likely see a reduction in GAE
  - THC may provide additional subsidy for lower than RET fares
  - All subject to negotiation between TS and THC
    - A variant of this would see THC fund any new ferry terminal infrastructure with costs recovered through harbour dues
- **Option MoD2: Council PSO**
  - THC would be responsible for infrastructure, recovered through harbour dues
  - Dependent on private operator providing own vessel, employing crew etc and operating without subsidy
- **Option MoD3a: Council PSC**
  - THC would be responsible for infrastructure, financed through harbour dues
  - Subsidy required
  - THC could provide vessel or invite bidders to provide vessel
- **Option MoD3b: TS PSC**
  - THC or CMAL would be responsible for infrastructure, financed through harbour dues
  - Subsidy required
  - CMAL could provide vessel or invite bidders to provide vessel

10.1.3 In reality, it is highly likely that without an increase in fares, the cost of providing and maintaining the infrastructure (vessel and terminal) and operating the service (fuel, crew, maintenance etc) will exceed fares revenue and thus there will be a cost to government. Under any scenario where the service remains in the public sector, there will therefore be a cost to the public sector. As noted above, there may however be different costs to different parts of the public sector. However as this would be a matter for negotiation between the parties, this section focusses on **overall cost to the public sector only**.

10.2 Investment Costs

10.2.1 Investment Costs in this case relate to the acquisition of new vessels and the provision of new marine infrastructure. As noted above these costs will fall to either THC or CMAL.

Vessels

10.2.2 The vessel options have been sifted to two variants:

- One new larger capacity quarter loading vessel; and
- One new larger capacity straight through vessel

10.2.3 There are a range of factors which will influence the cost of any future ferry for Corran including but not limited to:

- Vessel design: e.g. fuel type - Marine Gas Oil / hybrid / LNG etc; level of innovation; level of 'bespokeness' of design versus 'off the shelf' design etc; and
- Method of delivery: e.g. who is providing the vessel; allocation of risk within the procurement process; the choice of shipyard etc.

10.2.4 As such there is a high degree of uncertainty based on the vessel design and method of delivery which would be progressed further during any subsequent Outline Business Case. We have therefore used publicly available build cost figures to provide an approximate cost range based on recent vessels in the Scottish fleet.

10.2.5 The MV *Corran* has a stated capacity of 28 cars. Any new, larger Quarter Loading vessel would therefore essentially be a larger version of the current vessel. The MV *Corran* cost £2.8m when built in 2000 / 2001. No comparable vessel has been built since then for ferry services in Scotland.

10.2.6 For Options where a straight through vessel is required, the most obvious benchmark is the CMAL ***Loch* Class** vessels which operate off of similar slipways to those at the Corran Narrows. Variants of these vessels have been being built and in service for over 30 years.

10.2.7 However, the most recent Loch Class hybrid-vessels (the 43m MV *Catriona* (2016), MV *Lochinvar* (2013) and MV *Hallaig* (2012)) have a stated capacity of only 23 cars, significantly less than the current vessel, MV *Corran*. The larger *Loch* Class vessels currently in operation are the MV *Loch Shira* at 54m / 36 cars (Cumbrae vessel), and the former Skye vessels of MV *Loch Dunvegan* (Colintraive-Rhubodach) & MV *Loch Fyne* (currently operating Mallaig-Armadale) also at 54m / 36 cars.

10.2.8 The recent hybrid Loch Class vessels were built in Scotland between 2012 and 2016 at a cost of £10.0m-£12.3m each. Assuming that, in line with current Scottish Government policy, any new vessel would also be of hybrid design, it could therefore be assumed that a larger version of these vessels suitable for Corran (e.g. perhaps a version the 54m MV *Loch Shira* size (36 car)) may cost in the region of **£15m-£17m** for a build in say 2020. These costs may be reduced if the build process has been honed through the three previous vessels with respect to the innovative technologies.

10.2.9 However, if a conventional design was adopted, the evidence suggests that the cost would be substantially lower – for example the MV *Loch Shira* reportedly cost £5.8m in 2007. A similar (or slightly larger vessel) built in 2020 may therefore cost in the region of **£8m-£10m.**

10.2.10 The specification of a Quarter Loading vessel of similar size is assumed not to have a significant impact on these costs.

Alternative Vessel Types

10.2.11 The only other services operating in Scotland off ramps similar to those at Corran are in Orkney. However, the Orkney vessels are aging and do not provide a meaningful comparison. The vessels operating in Shetland are also not of directly comparable design. Alternative vessel types such as a simplified and larger version of Shetland's 65m 31 car MV *Daggri* / MV *Dagalien* could be considered (although these are full Euro B specification so these would be over-specified for this route). These vessels were built in Poland in 2003. For comparative purposes, updated costs were obtained during the Shetland Inter-Island Transport Study of £10.7m per vessel in 2016.

10.2.12 A further alternative model vessel would be the recent Western Ferries 2013 build conventionally powered ferries, which were built at Cammell Laird in Birkenhead. These are 50m length overall and carry 40 cars (although noting that these vessels run off of linkspans rather than slipways). The cost of these ferries is not in the public domain but some sources suggest the costs were substantially less than the CMAL Hybrid vessels noted above.

10.2.13 Under Option 2d, it is assumed that a **relief vessel** could be sourced from the CMAL fleet (whether as part of the CalMac bundle or otherwise). CMAL does operate at least one 'spare' *Loch* Class vessel which permits a cascade of other vessels during refit periods (or breakdown) and it is assumed that refit / breakdown of the new Corran Narrows vessel could be included within this schedule. There would also be a benefit to the public sector if MV *Corran* is sold on the open market.

10.2.14 If relief events cannot be programmed into the CMAL programme, this option could not be delivered and the MV *Corran* would be retained as (immediate) relief. This would involve a significant additional cost for retaining the MV *Corran* in serviceable condition, bringing requirements for annual refit, crew training etc. THC estimate that costs £100k per annum at present to 'retain' the MV *Maid of Glencoul* at present.

Infrastructure

10.2.15 A detailed breakdown of the construction costs as estimated at this stage in the process can be found in Appendix G. The main differentiator in the costs is the requirement for aligning structures in the straight through vessel options (Options 2c & 2d).

10.2.16 The main components of cost are estimated as follows (excluding Optimism Bias):

- **Option 1a:**
  - Ardgour:
    - Marshalling area: £24,000
    - Slipway repairs & widening: £1,188,000
    - Berthing structure: £7,052,940
  - Nether Lochaber:
    - Widen slipway: £1,125,096
    - Small berth for crew vessel transfer: £875,500
  - **Total (including fees & contingency): £10,265,536**
- **Option 2c and 2d:**
  - Ardgour:
    - Marshalling area: £24,000
    - Slipway Repairs, widening & scour protection: £1,379,500
    - Aligning structure: £8,026,528
  - Nether Lochaber:
    - Slipway widening & scour protection: £1,144,314
    - Aligning structure: £5,417,063
  - **Total (including fees & contingency): £15,991,404**

Capital Cost Summary

10.2.17 The table below provides a summary of the high-level capital costs of the three options. It is assumed that all costs are paid in a one-off up-front sum and thus we have not provided a 30-year discounted cost stream. Implicit within this approach is that we assume under Options 1a and 2c that the MV *Corran* would remain a viable vessel for the 30-year duration of the appraisal due to the infrequent use of the second vessel.

10.2.18 The infrastructure costs are subject to 44% Optimism Bias at this stage, as per the STAG Technical Database.

Table 10.1: High Level Capital Cost

	Infrastructure Costs[35]	Vessel Costs (hybrid)[36][37]	Vessel Costs (conventional)
Option 1a *- 1 * Larger QP / MV Corran 2nd Vessel / 2 * Overnight Berth*	£14.8m	£14m - £17m	£8m - £10m
Option 2c *– 1 * Larger ST / MV Corran 2nd Vessel / 2 * Overnight Berth*	£23.0m	£14m - £17m	£8m - £10m
Option 2d *- 1 * Larger ST / 2nd Vessel from fleet / 1 * Overnight Berth*	£23.0m	£14m - £17m	£8m - £10m

10.2.19 It is worth noting that in the event that a fixed link across the Corran Narrows is realised, any new quarter point vessels would likely have less resale value / redeployment potential compared to a straight through equivalent.

10.3 Operating and Maintenance Costs

10.3.1 Operating and Maintenance Costs in this case relate to the annual spend on providing the service including crew costs, fuel and annual vessel refit costs. THC provided a full breakdown of costs and these can be found in Chapter 2. To provide a high-level comparison, CFL has kindly provided details of the operating costs of a large *Loch* Class vessel (the MV *Loch Shira*) and a new Hybrid vessel such as the MV *Hallaig*.

Employee Costs

10.3.2 Over the last three years, employee costs have comprised more than 50% of the cost of operating the Corran Ferry so this is the most substantive element of overall cost. There are a total of 14 staff allocated to the Corran Ferry – 12 crew and two foremen, working on a five-day on / five-day off rota. At any one time, the service operates with a crew of 5 (plus 1 land based foreman) with one crew member on leave.

10.3.3 Any new vessel (impacting on the number of crew required) and the different methods of delivery (be it THC, Transport Scotland or a private operator) both have the potential to impact on crewing costs, as operational practices and crew Terms & Conditions may differ.

10.3.4 Under a continuation of the **current arrangements** where THC operate the service with a new vessel, costs would be broadly pro-rated if the larger vessel implied more or fewer crew, assuming local issues surrounding staff retention and succession planning are resolved. As discussed previously, this may necessitate a review of terms and conditions.

10.3.5 Any transfer into the **CHFS bundle** would potentially see a change in Terms & Conditions in terms of pay, pension etc as well as revised shift patterns / leave arrangements etc. At this stage, it is not possible to be precise about these changes as they would presumably be the

[35] Includes optimism bias at 44%

[36] No optimism bias applied to vessel costs as these are based on outturn costs for previous vessels

[37] Note – vessel costs are based largely on recent ferries built at Scottish yards.

subject of negotiation during any transfer. Operational practice may also change for example in terms of fares collection.

10.3.6 In terms of a comparator, the closest CHFS routes to Corran in terms of length of operating day are Colintraive - Rhubodach and Largs - Cumbrae (although this operates 2 vessels). Focussing on the former, Colintraive-Rhubodach operates an approximate 16-hour day with one of the larger *Loch* Class vessels, the MV *Loch Dunvegan*. To cover this operating day, we understand that on any given month four crews of three operate the service (as opposed to give at Corran). In addition, there is also a manned ticket office at Colintraive where tickets are sold and collected (as most trips from Bute will be locals with multi-journey tickets or returning visitors to the island).

10.3.7 Overall therefore the manning level at Colintraive Rhubodach is not dissimilar to that of the Corran service, and a similar approach to ticket sales could be adopted if onboard collection was deemed inappropriate in future to improve revenue protection. It is therefore assumed that adopting the 'Colintraive-Rhubodach' model at Corran would not necessarily result in a substantive increase in crewing resource in terms of man-days, assuming the service could be operated with a crew of three. However, our understanding is that CalMac employee costs per FTE are higher than the equivalent figure for THC so the overall employee cost would likely rise.

10.3.8 Any move to a **private operator** under a PSO or PSC would see responsibility for crewing pass to the operator (again with TUPE potentially applying to current staff). In the latter case, the crew cost model adopted would be reflected in the tender price and implied subsidy.

Refit Costs

10.3.9 Second to employee costs at Corran is refit costs at 16% of the total. Any new vessel would be expected to see reduced refit costs at least in the short to medium term compared to an aging vessel.

10.3.10 The refit costs provided by CalMac for the newer vessels are lower than those of THC, so there is some evidence that refit costs may be reduced, perhaps benefitting from the scale economies of the bundle.

Fuel Consumption

10.3.11 Fuel is the other major operating cost and this cost varies widely depending on fuel prices. Given that none of the options involve a change to the service timetable, this cost would be entirely dependent on the vessel specification and its associated fuel consumption.

10.3.12 The exception to this is that a larger vessel would be expected to make fewer 'shuttle' runs, given its greater carrying capacity. This may reduce running hours over a week, and increase idling hours resulting in a fuel saving, particularly if shore power could be used.

10.3.13 The CMAL Hybrid ferries reportedly reduce fuel consumption by 38% compared to a conventionally powered ferry of the same size[38], although there is an additional cost for the shore side electricity of approximately £10k per annum. It could therefore be assumed that any new hybrid ferry for Corran may see a modest reduction in fuel costs compared to the present day, with the hybrid-related fuel saving outweighing the greater fuel demands of a larger vessel.

10.3.14 A new conventionally powered vessel would be expected to be more efficient than one built in 2000. However, this greater efficiency may be counteracted by the greater tonnage, therefore there may be a broadly neutral impact of a slight increase in fuel consumption. In any case, fuel costs would certainly be higher than for the hybrid option.

[38] http://www.cmassets.co.uk/project/hybrid-ferries-project/

Other Costs

10.3.15 The other costs noted by THC include: property costs, transport costs, insurance, engine repairs & maintenance, and ‘other costs’. Any new vessel should see a short-medium term reduction in ‘engine repairs & maintenance’ (the CalMac figure for this are lower for the hybrids) whilst data from CalMac suggests insurance costs may also fall, again potentially reflecting scale of operation in the bundle.

Harbour Dues

10.3.16 As THC currently owns and operates the vessels and ferry terminals, there is no harbour charging regime in place. If THC was to retain responsibility for the terminals, they would levy pier and harbour dues on CalMac in the same way as other local authorities do across Scotland, with a view to funding new infrastructure and maintaining the assets, subject to negotiation of an appropriate rate.

10.3.17 If the terminal facilities were handed over to CMAL, then CalMac would pay dues to CMAL on the same basis as across the network. In both of these cases, the cash flow is essentially between different arms of the public sector and is therefore cost neutral at the Scotland level.

10.3.18 If a private operator was running the service, either commercially through a PSO or through a PSC, these funds would be a net gain to the public sector, although these costs would be accounted for in the contract in the latter case.

Operating Cost Summary

10.3.19 It is not possible at this stage to be specific on the cost to government of the different options as there is inevitable uncertainty regarding the vessel specification which would drive much of the cost. However, it is possible to provide an indication of how the current cost structure might change and what the overall balance might be. Our analysis suggests the net impact of these changes would be:

- Increased employee costs in the event of a transfer into the CHFS bundle, assuming similar manning levels and the adoption of CalMac Terms and Conditions.
- Reduced fuel costs – assuming a new vessel is a larger hybrid *Loch* Class, or a broadly neutral impact under conventional power.
- Within the CHFS bundle, reduction in insurance costs, annual refit costs and engine repairs & maintenance costs based on CalMac figures – assuming benefiting from scale / bundle / back office.
- Outwith the CHFS bundle, smaller reductions in insurance costs, annual refit costs and engine repairs & maintenance costs, based on the requirements of a new vessel.
- No change in minor costs: property costs, transport costs, other costs – some of these may be absorbed into exiting back office operations.
- Option 1a and 2c would incur an additional cost associated with the retention of the MV *Corran* as an (immediate) relief vessel.

10.3.20 Overall, subject to the above assumptions, annual operating costs would not be expected to vary widely between options. The main driver of this is the fact that the nature of the service is not changing, only the vessel. Indeed, the savings from operating a newer, more efficient vessel within the ‘scale’ context of the CHFS bundle could outweigh the higher crew costs and lead to an overall saving in operating costs. The main uncertainty would surround the impact of any transfer of THC employees into the CHFS bundle, and any operational changes CalMac may seek to make. These issues would form part of any negotiation.

10.3.21 In the event of a PSO operation, all of these costs would pass to the private operator. Under a PSC, the costs would be wrapped up in the subsidy payment.

10.4 Grant and Subsidy Payments

10.4.1 At present THC covers any annual operating deficit although in some years the service has returned a net surplus. Formal subsidy payments would be required if a PSC was taken forward, having exhausted the PSO route.

10.5 Revenues

10.5.1 It has been shown that fares at Corran are low compared to other routes across Scotland, at least for those purchasing multi-journey books, and certainly for foot passengers who travel free. Any change to this fares structure would impact on fares revenue subject to the price elasticity of demand where an increase in fares would be expected to reduce demand. Non-discretionary ferry use is likely to be inelastic although higher fares may encourage car-sharing or indeed the practice of leaving a car on one side and travelling as a foot passenger (although this would be problematic given the parking supply situation). At the margin, for some origin – destination combinations, an increase in price may encourage some to drive rather than take the ferry but the scope for this would appear to be limited given the local geography. Impact of any fares increase on routing could only be established by an origin-destination survey.

10.5.2 Fares revenue has gradually increased in recent years in line with carryings and modest fares increases. Typical ferry fares elasticities (derived e.g. from the impact of RET) would suggest that any increase in fares would see revenue increase, i.e. the reduction in demand would not outweigh the increase in fares revenue.

10.5.3 Fares are currently under sole control of THC. The fares regime under any transfer to Transport Scotland would be a matter for negotiation but RET fares would likely form the starting point of this discussion.

10.6 Indirect Tax Revenue

10.6.1 The options would have no measurable impact on indirect tax revenue.

10.7 Summary

10.7.1 At present, the Corran Ferry operates on a broadly break-even basis. As the options do not materially affect the level of service, the impact on operating costs is primarily driven by the vessel specification and also any future changes to the fares regime.

10.7.2 In terms of capital costs, there is an additional cost of aligning structures associated with any move to a straight through vessel. However, this would be necessary to avoid Corran continuing as a bespoke service with all the issues associated with this that have been set out in this report.

11 Risk & Uncertainty

11.1 Overview

11.1.1 In appraisals, there is always some difference between what is expected and what eventually happens, because of biases unwittingly inherent in the appraisal and risks and uncertainties which materialise. This chapter considers the risks and uncertainties associated with the options presented for the Corran Ferry.

11.2 Technical Feasibility

11.2.1 A combination of the Initial Appraisal and Detailed Option Development, allowed for the generation, development and assessment of the technical feasibility of a wide range of options. The options which remain in the process are all technically feasible, although the required capital investment costs clearly vary by option.

11.2.2 As no existing Topographic or Bathymetric information was available for this study, the options have been developed based upon available slipway record drawings, aerial photography and Admiralty charts. Should any of the infrastructure recommendations of this appraisal be taken forward it is recommended that detailed bathymetric and topographic surveys of the infrastructure and surrounding areas at both sides of the crossing be undertaken.

11.3 Operational Feasibility

11.3.1 As with technical feasibility, all the options developed are operationally feasible. The study is not proposing any major changes in terms of how the service is delivered, and indeed aims to reduce or eliminate some of the operational quirks with the current service (e.g. vessel-to-vessel transfers).

11.4 Quantified Risk Assessment

11.4.1 The STAG Guidance requires the development of a Quantified Risk Assessment (QRA), which allows for the quantification and, where practical, valuation of risk factors. As the options emerging from this appraisal are tightly defined, the cost risks are captured through the application of Optimism Bias (see Chapter 10).

11.4.2 Risks and opportunities are appraised using two criteria:

- **Significance:** What would be the impact and severity if the risk materialised?
- **Likelihood:** How likely is the opportunity to occur within the period stated?

11.4.3 To produce a risk appraisal score, a risk is first judged for its significance (extreme, high, medium, low or negligible) and for its likelihood (almost certain, likely, possible, unlikely or rare) and scored from 1 to 5, where 1 is negligible / rare and 5 is extreme / almost certain.

11.4.4 The maximum score for a risk is 25 – i.e. an extreme significance and almost certain likelihood. The table below, developed by Liverpool John Moores University, indicates the status of risks coded in terms of a “traffic lights system”. A score of above 12 is regarded as needing full risk management.

11.4.5 It should be noted that all scoring is, by its nature subjective. Risk appraisal is not an exact science and best estimates and frequent reviews are required to make such appraisals robust.

Table 11.1: Risk Mitigation Table

Significance	Extreme	5	M	M	H	H	H
	High	4	L	M	M	H	H
	Medium	3	L	L	M	M	H
	Low	2	L	L	L	M	M
	Negligible	1	L	L	L	L	M
			1	2	3	4	5
			Rare	Unlikely	Possible	Likely	Almost Certain
	Likelihood						

11.4.6 The table below provides an assessment of the wider project risks in terms of their significance, likelihood, potential mitigation measures and residual risk:

Table 11.2: Quantified Risk Assessment

Risk	Likelihood	Significance	Risk Score	Mitigation	Residual Likelihood	Residual Significance	Residual Risk Score
Operational risk – Planning for infrastructure has a long lead time, particularly where there are considerations around the method of delivery. There are however a number short-term asset and human resource factors which could lead to a requirement to reduce the level of service.	5	5	**25**	THC has identified the progression of this appraisal as a priority and has held exploratory discussions with key stakeholders on progressing the outputs. Ongoing operational planning will be undertaken to maintain the service in the interim.	4	5	**20**
Delivery risk – This appraisal has explored different potential methods of delivery. Each of these methods comes with a number of significant risks and, at present, unanswered questions. Answers to these questions will be required and a full risk mitigation strategy put in place before the future operational model is implemented.	5	5	**25**	The results of this report (and the questions it raises) will be presented to the Lochaber Area Committee and Environment, Development & Infrastructure Committee in 2018. THC is also engaging with key stakeholders on the principal questions surrounding future delivery models. These measures will be combined to work towards a preferred option in early 2019	4	5	**20**
Delivery risk – should THC decide to seek a transfer of responsibilities, there is likely to be a lengthy period of negotiation to be undertaken before a decision is made.	5	5	**25**	THC has held exploratory discussions with Transport Scotland and will seek further immediate dialogue with TS post study should they wish to consider options for a transfer of responsibilities further.	3	5	**15**
Political risk – whichever method of delivery is chosen by THC, there will be political challenges to be managed around e.g. fares, local accountability etc.	5	5	**25**	The study outcomes and pros & cons of each option will be presented to the Lochaber Area Committee and the Environment, Development & Infrastructure Committee in 2018, allowing an informed decision to be made.	3	4	**12**
Delivery risk – Funding / affordability risk – given current funding pressures on THC (and the public sector generally), there is a risk that funding is not allocated to the project.	5	4	**20**	This report provides a degree of mitigation as it identifies, appraises and costs options. Increased certainty on the funding requirement will emerge as the Outline Business Case is developed.	5	2	**10**
Delivery risk – there is no suitable bathymetric or topographical information available at this stage.	5	4	**20**	Should any of the infrastructure recommendations of this appraisal be taken forward it is recommended that detailed bathymetric and topographic	1	2	**2**

Risk	Likelihood	Significance	Risk Score	Mitigation	Residual Likelihood	Residual Significance	Residual Risk Score
				surveys of the infrastructure and surrounding areas at both sides of the crossing be undertaken.			
Political risk – given the timescales and complexity of the issues, public and stakeholder consultation on the options has not yet been undertaken. Whilst the results have been presented to the Lochaber Area Committee and Environment, Development & Infrastructure Committee, a round of public and stakeholder consultation may be required when there is greater clarity around the options.	5	4	**20**	A round of public and stakeholder consultation may be required when there is greater clarity around the options.	2	3	**6**
Delivery risk – a change in the current delivery model may require notification to the European Commission, which would introduce a delay to the process whilst the EC makes its deliberations.	4	4	**16**	Should potential notification of the delivery model to the EC be required, this will be done as soon as practically possible.	4	2	**8**
Delivery risk – The construction of the assets is not completed on time, to budget or to specification.	3	5	**15**	The inclusion of standard Optimism Bias (44%) mitigates against cost increases. This should be reduced throughout the Outline Business Case and Final Business Case as greater certainty emerges.	1	5	**5**
Delivery risk – Inflation above market averages would increase the cost of any option above expectations.	4	3	**12**	This risk cannot be mitigated but costs should be kept up-to-date throughout the process. As the preferred option should be progressed in the short-term, this risk is not considered to be overly-problematic.	3	3	**9**
Delivery risk – the preferred option does not obtain the necessary planning or environmental consents.	2	5	**10**	The marine civil engineering works proposed in this appraisal are relatively limited in scale and thus this is unlikely to be a major issue. This risk will nonetheless be gradually mitigated as the OBC and FBC are developed, and through a Strategic Environmental Assessment if required.	2	3	**6**

11.5 Uncertainty

11.5.1 The STAG Guidance notes that, no matter how well risks are defined, the future remains uncertain and thus a narrative on key future uncertainties which could impact on the study outcomes is required.

Method of Delivery

11.5.2 The primary uncertainty surrounding this study is the means by which the future service will be delivered. This report has set out a range of delivery options which could be considered but there are a range of uncertainties with each option surrounding asset ownership, operator, vessel provision, crewing and cost to government. In progressing the outcomes of this study, it will be necessary to work towards addressing uncertainties in the short-term.

Strategic Transport Projects Review

11.5.3 The consultation undertaken during the Initial Appraisal stage of this study highlighted the desire amongst local communities on the west side of the crossing (and indeed Mull) for a fixed link across the Corran Narrows. This study specifically excluded consideration of a fixed link as:

- it was focussed on addressing the short-term challenges faced on the Corran Ferry service, ensuring both its short and long-term sustainability; and
- the capital cost of a fixed link would be beyond the resources of THC.

11.5.4 Whilst the study did not consider a fixed link directly, Transport Scotland is currently procuring the Strategic Transport Projects Review (STPR), which will consider the long-term capital investment priorities of central government. As part of this piece of work, there is an islands / peninsular communities connectivity review, which is likely to consider the case for fixed links in more detail. The STPR is likely to completed within the duration of this Parliament (i.e. by 2021).

11.5.5 Whilst the commissioning of the STPR presents an opportunity, it also creates a degree of uncertainty whereby a new ferry and landside infrastructure could be supplanted by a fixed link in the medium to long-term. This would be a particular issue if a new quarter point vessel is procured as it would have less redeployment potential within Scotland (albeit it would still have resale value).

11.5.6 It is advisable given the timescales for the STPR that consideration and specification of the future ferry solution takes cognisance of the emerging STPR outcomes.

12 Public Acceptability

12.1 Overview

12.1.1 The STAG Guidance recommends consultation on the options emerging from an appraisal to inform the public acceptability criterion.

12.2 Approach to Consultation

12.2.1 The approach to consulting on options in this study has reflected the scope of work and intended outcomes. This study is not a typical STAG appraisal in that:

- The focus is not on materially improving service levels from the public perspective (outwith an increase in vessel capacity), rather it is on putting the current services on a more sustainable long-term footing – there is therefore little differentiation between the options as perceived by the public providing the objectives are met.
- In considering the methods of delivery, this study also strays into consideration of the 'Commercial', 'Financial' and 'Management' Cases, which would typically only be developed in an Outline Business Case, which would follow on from a STAG appraisal.[39] As previously noted, there is a range of unresolved issues around each method of delivery which would need to be resolved before the options could be presented to the public and stakeholders.

12.2.2 Given the above, the approach taken to consulting on the options at this stage has been to present them to, and discuss them with, Elected Members. Once a greater degree of clarity is obtained on the questions surrounding each delivery model and a preferred option has been identified, it would be beneficial to consult with the public and local stakeholders at this stage.

12.3 Lochaber Area Committee

12.3.1 The findings of the study were presented to the Lochaber Area Committee on Thursday 30th August 2018. The Committee:

- noted the strategic business case options presented in the Corran Ferry Service Options Appraisal;
- noted the intention to present the report to the Environment, Development and Infrastructure Committee in November 2018 in reference to the financial aspect;
- approved the exploration of options in more detail in order to develop a preferred outline business case, including essential consultation with Members and appropriate stakeholders;
- approved discussion with Transport Scotland in order to explore options in more detail; and
- noted the intention to bring a further report back to Committee with proposals to address the sustainability of the current Corran Ferry Crewing Model.[40]

12.4 Environment, Development and Infrastructure Committee

12.4.1 The findings of the study were presented to the Environment, Development and Infrastructure Committee on Thursday 8th November 2018. The Committee:

[39] Note – a completed STAG Appraisal is considered equivalent to the Strategic Business Case, which precedes the Outline Business Case.

[40] Lochaber Area Committee Meeting Minutes, 30th August 2018 - https://www.highland.gov.uk/meetings/meeting/4014/lochaber_committee/attachment/74208

- noted the Strategic Business Case options presented in the Corran Ferry Service Options Appraisal;
- approved the appointment of a Project Manager to undertake further exploration of options, in more detail in order to develop a preferred Outline Business Case, including essential consultation with Members and appropriate stakeholders;
- approved discussion with Transport Scotland in order to explore options in more detail; and
- approved that the Governance arrangements for the project will be through the Harbours Board.

13 Monitoring & Evaluation

13.1 Overview

13.1.1 The final step in the development of the STAG report is the development of a monitoring & evaluation (M&E) framework, which can be used as the basis for retrospectively assessing the value for money and effectiveness of the investment made.

13.1.2 The framework and subsequent monitoring & evaluation can often be an extensive exercise, because the focus is on understanding the outcomes (generally behavioural change) and subsequent impacts of a transport investment.

13.1.3 However, the STAG guidance explicitly recognises the need for the framework and subsequent M&E to be proportionate to the type and scale of investment being made. In the context of this study, monitoring and evaluation, whilst still necessary, should be relatively light touch. This is because:

- The proposed transport investment is focussed on the replacement of life-expired infrastructure. It is not intended to stimulate behavioural change *per se*.
- The out-turn impacts of the investment are likely to be relatively small scale and local in nature.

13.1.4 The following sections set out a proposed M&E framework, which can be revised / developed as the preferred option begins to crystallise.

13.2 Monitoring Plan

13.2.1 The monitoring plan should predominantly be focussed on assessing the extent to which the investment contributes towards the TPOs. In the context of this study, the TPOs are largely operationally focussed and thus the monitoring plan should be built around this.

13.2.2 In order to understand the impact of investment, it is important to have a pre-intervention baseline against which to compare. In the context of this study, this should be fairly simple to develop as for most of the TPOs there will be a clear and factual 'before & after' position. Where this is not the case, data collection should not be particularly intensive.

13.2.3 The table below shows the monitoring requirements for each objective:

Table 13.1: Monitoring Plan

Transport Planning Objective	Required Monitoring Data
Transport Planning Objective 1: The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland.	None – this should be a straightforward before and after comparison.
Transport Planning Objective 2: The Corran Ferry should facilitate year round access to Ardgour and beyond for all vehicle types.	None – this should be a straightforward before and after comparison.
Transport Planning Objective 3: The available vehicular capacity of the ferry service should as far as possible facilitate compliance with the published timetable	***Before:*** The vessel shuttling data provides an indication of where there are capacity issues at present. ***After:*** These data should be reviewed after any new vessel(s) come into service and a like-for-like comparison made.
Transport Planning Objective 4: The delivery and funding model should ensure the long-term	None – the outcomes in terms of financial, crewing etc position of the Corran Ferry would be monitored

Transport Planning Objective	Required Monitoring Data
sustainability and resilience of the Corran Ferry service.	and managed by the procuring party as a matter of course.

13.3 Evaluation

13.3.1 The term 'Evaluation' in the STAG context describes a one-off objective driven review or audit of a project's performance. There are two discrete elements to an evaluation:

- **Process Evaluation:** This is carried out early in the life of a project, before its full effects are known and concentrates on whether input (activity) and expected outcomes for a project are being / have been met;
- **Outcome Evaluation:** This is carried out once sufficient time has elapsed for the project to have delivered its principal outcomes, and assesses whether the Transport Planning Objectives have been achieved.

13.3.2 The following sections sets out a recommended approach to the evaluation for the Corran Ferry STAG.

Process Evaluation

13.3.3 The Process Evaluation would involve an evaluation of how the preferred option was selected and delivered. It would therefore focus on the process of implementation, with the aim of identifying the lessons that could be learned for delivering projects in the future.

13.3.4 The process evaluation would gather a collection of qualitative and quantitative data to understand what worked well and what did not, and would involve carrying out a series of mainly one-to-one interviews with staff involved in the delivery phase of the project. Consideration of how the preferred delivery model was chosen and implemented would also be essential.

13.3.5 From the interviews and review of documents, information should be gathered on both subjective issues (perceptions of how the implementation and delivery went) and objective issues (factual data on how the implementation and delivery went). More specifically, the evaluation should focus on the process of how the scheme was delivered, and identify factors that helped or hindered the effective delivery. The following types of questions should be considered in a process evaluation:

- How was the preferred option delivered?
- In what context was the scheme delivered? This would pick up the key questions around methods of delivery.
- What worked well in delivering the scheme, why and how?
- What worked less well in delivering the scheme, and why?
- Was the scheme delivered in the way it was anticipated, if not how and why?
- Did the implementation meet budgetary expectations, and were there any unforeseen costs?
- Were there any issues with stakeholders that impacted on the effective delivery?
- Could engagement with stakeholders have been improved?
- What was the experience of staff in delivering the scheme?
- Were delivery team members suitably qualified to implement the scheme?
- Were there process issues that impacted on the outcome of the project?
- How might the delivery process be improved or refined?

13.3.6 Other issues that may be of interest which are also part of the process, but not necessarily part of the implementation / delivery phase, relate to the appraisal stage. For example:

- Was sufficient resource put into establishing the case for the preferred option (i.e. at STAG / SBC and Outline Business Case stage) – i.e. was the appraisal undertaken sufficient for providing the necessary information for effective decision making?
- Was a clear 'case' made, in terms of quantifying problems which required a transport based solution? Or was this essentially a solution led process?

13.3.7 The process evaluation would be brought together in a short note with clear and actionable findings for future projects of this nature.

Outcome Evaluation

13.3.8 As previously noted, given the context of this study, the outcome evaluation should be relatively light touch. It could essentially be limited to a comparison of the 'before & after' data for each objective identified in the monitoring plan. Ultimately, the key outcome is ensuring that the Corran Ferry is placed on a sustainable long-term footing with respect to both the assets used to deliver the service and the means by which it is delivered.

14 Conclusions & Next Steps

14.1 Conclusions

14.1.1 This study has investigated the current operation and delivery of the Corran Ferry service and has identified a range of emerging problems which could potentially compromise the long-term sustainability of the service. Key issues include the life expiry of the relief vessel, the MV *Maid of Glencoul*, non-standard operational practices, the sustainability of the crewing model and the limited back-office support for the service. This appraisal has therefore systematically appraised options in relation to the future service specification and the means by which that specification would be delivered.

14.1.2 In keeping with the requirements of STAG and Transport Scotland's *Guidance on the Development of Business Cases*, the appraisal does **not** identify a preferred option, rather it establishes the pros and cons of each option. This study also forms the **Strategic Business Case** for the proposed investment.

Infrastructure Options

14.1.3 The Initial Appraisal and stakeholder consultation found that the current service provided across the Corran Narrows is of a high quality and is valued by local communities. Whilst there are desires amongst the local community to see improvements to the service in terms of e.g. the length of the operating day, the service provided is in line with that specified by Transport Scotland's Routes & Services Methodology (RSM). The focus of the appraisal was therefore on identifying the most appropriate capital options for the service.

14.1.4 Three options have been shortlisted for further consideration:

- Option 1a: 1 * new larger quarter point vessel, with MV *Corran* retained as the refit / relief / second vessel. Two overnight berths would be required.
- Option 2c: 1 * larger straight through vessel, with MV *Corran* retained as the refit / relief / second vessel. Two overnight berths would be required. A berthing or aligning structure may be required.
- Option 2d: 1 * larger straight through vessel, with refit / relief / second vessel secured from elsewhere. One overnight berth would be required. A berthing or aligning structure may be required.

14.1.5 Each of these options would:

- end the practice of vessel-to-vessel transfers by providing overnight berthing facilities;
- facilitate year-round access to Ardgour and beyond for all types of vehicles, removing the constraints imposed on commercial vehicle traffic by the MV *Maid of Glencoul*; and
- provided a year-round increase in capacity, thus reducing the need to shuttle and reducing wait times at both ends of the crossing.

14.1.6 A key factor in selecting a preferred option will be establishing the means by which that option and the subsequent service is delivered.

Methods of Delivery

14.1.7 Recognising the issues around the short and indeed longer-term sustainability of the ferry service, the study explored a number of delivery models, ranging from continuing with the current delivery model through to a transfer of responsibilities to Transport Scotland and tendering.

14.1.8 With respect to each delivery model, there are a series of outstanding questions in relation to vessels & refit / relief / breakdown cover; slipways & infrastructure; crewing; and fares, and little by way of precedent to go on. The outputs from this study should be used as the basis for further exploring these questions in-house, with Transport Scotland and potentially with prospective operators through a market testing exercise.

14.2 Next Steps

14.2.1 With respect to Transport Scotland's Business Case Guidance[41], this STAG-based study also provides the Strategic Business Case for the future of Corran Ferry service. As well as considering vessel and related infrastructure requirements, this analysis has set out the parameters to facilitate an informed debate within THC, as well as between THC and Transport Scotland as to the future delivery of the service.

14.2.2 The agreed next step is to proceed towards an **Outline Business Case** (OBC), in line with the Transport Scotland guidance. The key purpose of the OBC is to settle on, and develop a preferred option to facilitate subsequent procurement. This would involve:

- Development of the dialogue between THC, Transport Scotland, and potentially CMAL & CFL – informing the Commercial, Financial and Management cases in particular.
- Development of the shortlisted infrastructure options with a view to reducing optimism bias, determining the preferred option and establishing greater cost certainty prior to any procurement.
- Detailed engagement with all relevant parties (including potential ferry providers and operators) to develop the vessel solution and associated operation & crewing models in order to establish greater cost certainty with respect to the vessel and operating costs.
- Analysis of the impact of any changes to fares structures on patronage and revenue.
- Public and stakeholder engagement – particularly with respect to vessel design and fares.

14.2.3 Taken together these components would provide the basis for an OBC from which the preferred option can subsequently be taken through a Final Business Case to procurement.

[41] https://www.transport.gov.scot/publication/guidance-on-the-development-of-business-cases/

Appendix A Fares Benchmarking

This section benchmarks the Corran Ferry fares from two perspectives:

- how the fares compare to other similar routes across Scotland; and
- the approach to setting fares compared to other networks across Scotland.

The intention is not to provide an exhaustive record of all fares and fares setting mechanisms across Scotland, rather a broad comparator benchmark which will assist the subsequent appraisal.

Route Comparisons

A review of all Scottish ferry services has been undertaken to identify routes which can be considered broadly comparable to that at Corran. The shortest Ro-Ro route from each network has been chosen as the basis of the comparison, although it should be noted that Serco NorthLink Ferries has been excluded given that their route network is of an entirely different scale. The chosen routes are:

- Colintraive – Rhubodach (Clyde & Hebridean Ferry Services).
- Tarbert – Portavadie (Clyde & Hebridean Ferry Services). This route has been chosen because, like the Corran Ferry, it provides an alternative to a lengthy road journey between Kintyre and Cowal.
- Port Askaig – Feolin (Argyll & Bute Council tendered service).
- Kirkwall – Shapinsay (Orkney Ferries / Orkney Islands Council).
- Lerwick – Bressay (Shetland Islands Council).

Passenger & Car Fares

The table below sets out the passenger and car fares for the above routes:

Benchmarking of Corran Ferry Passenger & Car Fares

Route	Basis of Fare	Route Distance (Stat. Miles)[42]	Passenger Fare	Car Fare	Multi-Journey Fare
Corran Ferry	***Local authority***	***0.4***[43]	***£0.00***	***£8.20***	***£2.41***[44]
Colintraive – Rhubodach	RET	0.6	£1.15	£5.95	£6.00[45]
Tarbert – Portavadie	RET	3.4	£2.70	£8.40	N/A
Port Askaig - Feolin	Local authority	0.8	£1.80	£9.45	£7.31[46]
Kirkwall - Shapinsay	Local authority	4.4	£4.25	£13.60	£8.93[47]
Lerwick - Bressay	Local authority	0.7	£2.70	£6.45[48]	£4.35[49]

[42] Official route distance unless otherwise stated.

[43] Source: Google Maps

[44] Note – this is car plus an unlimited number of passengers

[45] This is for a 50 journey book covering the car & driver. This fare has not been published since 2015 – it can only be obtained through calling the booking office – and it is likely to have gone up by inflation in that period.

[46] This fare is for a 10 journey ticket for car & driver.

[47] Based on a 50 journey ticket for car & driver, which is only available to island residents - http://www.orkneyferries.co.uk/pdfs/inner_isles_rates.pdf

[48] Price is combined car + driver.

[49] Based on a 10 journey ticket for car & driver.

It can be seen from the above table that the 'drive-up' fare for the Corran Ferry is relatively expensive (depending on how many passengers are carried), particularly on a per mile basis. For example, despite being 0.2 of a mile shorter than Colintraive – Rhubodach, the drive-up fare for a passenger & car is £1.10 more expensive. In addition, the Tarbert – Portavadie route, which is 8.5 times the length of the Corran Ferry, is only £2.90 more expensive.

However, the multi-journey fares are significantly less than the equivalent fares on any of the comparator routes. The three sub-one mile routes which are benchmarked against have significantly more expensive multi-journey tickets. The data show that the majority of frequent resident users have a multi-journey book, which suggests that the Corran Ferry is a clear outlier in terms of the cost of regular travel.

Commercial Vehicles

The table below sets out the CV fares for the comparator routes. The comparison is based on a 7 metre and 17 metre CV:

Table 14.1: Benchmarking of Corran Ferry CV Fares

Route	Basis of Fare	Route Distance (Stat. Miles)	7m CV	17m CV
Corran Ferry	***Local authority***	***0.4***	***£19.20***[50]	***£45.50***[51]
Colintraive – Rhubodach	Transport Scotland	0.6	£19.18 + VAT	£46.58 + VAT
Tarbert – Portavadie	Transport Scotland	3.4	£52.08 + VAT	£126.48 + VAT
Port Askaig - Feolin	Local authority	0.8	£20.35 + VAT	£25.75 + VAT
Kirkwall - Shapinsay	Local authority	4.4	£38.20 + VAT	£161.20 + VAT
Lerwick - Bressay	Local authority	0.7	£14.25	£38.15

The following points should be noted from the above table:

- Comparing CV fares is more challenging than comparing passenger & vehicle fares. The basis of the charge and available discounts vary widely across Scotland. Transport Scotland is currently undertaking a Ferry Freight Fares Review but this is not expected to report in the timescale of this study.
- In general, fares on the Corran Ferry are broadly comparable to those on the CHFS network. They are however notably higher than in Shetland, particularly given that a flat fare structure is applied across all the major Shetland routes, the majority of which are much longer than Lerwick – Bressay.
- The Corran Ferry fares are comparatively expensive compared to that which Argyll & Bute charge on the Port Askaig – Feolin ferry, which is double the distance but with a broadly comparable fare for 7m CVs and a much lower fare for larger CVs.

Whilst clear comparisons can be drawn in relation to passenger and car fares, and a standard broadly adhered to in terms of RET, there is a less obvious benchmark with respect to CV fares.

Approach to Fares Setting

This section considers how fares are set (as opposed to their absolute level) across all Scottish networks. As with the previous section, this is intended to be a summary to support the appraisal rather than an exhaustive review of all ferry fares.

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[50] Assumed to be an HGV 2 axle / large van.

[51] Assumed to be an HGV 5/6 axle.

The earlier sections of this chapter identified the importance of simplicity in the Corran Ferry fares structure. A few points are worth reiterating before comparing the basis of fare setting with other Scottish networks:

- Passengers are not charged.
- Multi-journey books (30 tickets) offer a significant discount on the drive-up price.
- Cars, caravans, motorcycles, minibuses etc are all charged at a single standard price.
- CVs fares are determined by the number of axles on the vehicle. Multi-journey tickets are available for CVs, with a defined number of tickets requiring to be surrendered depending on the size of the vehicle.

Clyde & Hebridean Ferry Services

- CalMac Ferries Limited operates ferry services on around 30 routes across the Clyde & Hebrides, under a Public Service Contract with the Scottish Government. The nature of the contract requires any change to fares to be agreed by Scottish Ministers.
- All fares are generally increased by CPI each year.
- Passenger & car fares:
    - Passenger and car fares are set on the basis of the RET formula. There are a handful of exceptions to this, including RET fares capped at previous multi-journey ticket prices, multi-journey books (Bute only) and season tickets (Bute, Cumbrae and Mull only).
    - Infants (up to 5 years of age) travel free and 5-15 year olds travel for half the adult fare.
    - All vehicles less than 6 metres in length are classified as cars, with length based banded fares for motorhomes, caravans and baggage trailers. Motorcycles are roughly half the price of car.
- CV fares:
    - CV fares on CalMac services have been set using a number of different regimes in recent years due to the introduction and subsequent removal of RET for CVs on one section of the network (i.e. the Western Isles, Coll and Tiree).
    - Currently, on all CalMac routes, vehicle length is the key variable in determining fares for CVs that are plated to operate in excess of 3.5 tonnes.
    - On all routes (except those to the Western Isles, Coll and Tiree where RET was previously in place for CVs and subsequently withdrawn), the CV fare is the product of the vehicle length and the rate charged per half CV metre. The rate per half metre varies by route and is broadly based on the length of the crossing, with longer crossings generally having a higher rate per half metre. The rate per half metre is a flat rate which means a 14 metre CV travelling on a particular route would pay a fare exactly double that of a 7 metre CV.
    - On the Western Isles, Coll and Tiree routes where RET was previously in place for CVs, the fare comprises a fixed element and rate per half CV metre. The rate per half metre is a flat rate, although the fixed element of the formula means that a 14 metre CV travelling on a particular route would face a fare less than double that of a 7 metre CV.
    - CalMac offer a number of concessions to CVs. The availability of some discounts is dependent on whether RET was previously in place on the route.

Northern Isles Ferry Services

- Serco operates ferry services on four routes to the Northern Isles under Public Service Contracts with the Scottish Government. The nature of the contract requires any change to fares to be agreed by Scottish Ministers.
- Serco is contractually required not to increase overall fares receipts, other than by Minister-approved annual increases based on CPI inflation.

- Passenger & car fares:
  - The Northern Isles routes are expected to move to an RET-based fares system in Summer 2018. This will be similar to the CHFS system. There however remains some uncertainty at present as to whether the length at which a vehicle is classified as a commercial will remain at over 5 metres or migrate to 6 metres as per CHFS.
- CV fares
  - Serco NorthLink does not distinguish between large and small CVs; irrespective of size, all CVs are charged at CV rates. Any vehicle used for commercial purposes is defined as a CV – this includes a distinction between domestic and commercial vans.
  - CV fares are set in a consistent way across all Serco NorthLink routes. Vehicle length is the key variable in determining CV fares. The CV fare on a particular route is the product of the vehicle length and the rate charged per CV metre.
  - The rate per metre is based on the length of the crossing, with longer crossings having a higher rate per metre. The rate charged per metre on a particular crossing is a flat rate so that a 10 metre CV travelling on a particular route faces a fare exactly double that of a 5 metre CV.
  - Separate rates per metre are in place for vehicles booking in advance and for vehicles booking three days or less prior to departure. However, in practice, the three day premium rate is rarely applied as most CVs book well in advance.
  - 'Wide load' CVs greater than 2.6 metres in width are subject to a 50% surcharge on the standard fare.

Argyll & Bute Council

- Argyll & Bute Council runs four ferry services within the local authority area. Three services are operated directly by the Council and one is contracted out. These services are funded by the Council and are indirectly subsidised by the Scottish Government through the block grant they receive. The Council has sole responsibility for setting and approving fares.
- Each year, with a few exceptional circumstances, Argyll & Bute Council ferry fares are subjected to an inflationary increase.
- Passenger & car fares
  - The four routes which Argyll & Bute Council own and operate were all transferred to the respective Council authority many years ago. In the case of the three in the Lorn district of Argyll, the Cuan ferry was acquired by Argyll County Council (ACC) in 1951, the Easdale ferry was transferred from the Fell Trustees to ACC in 1947 and the Port Appin to Lismore Point ferry was transferred to ACC in 1949. The link between Port Askaig and Feolin came much later and whilst the MV *Eilean Dhiura* was built for Argyll & Bute Council in 1997, she has always been operated under contract, currently undertaken by ASP Ship Management Ltd.
  - In respect of the fares strategy, the Council explained in a previous study that there is no detail available to confirm the position but it is highly likely that the fares were adopted by ACC and then subject to annual increases in line with the prevailing budgetary policy.
  - The present Authority undertakes an annual budget review and has always subjected the fares to an inflationary increase, typically based on RPI, with a few other amendments in exceptional circumstances.
- CV Fares:
  - Two of the Council's ferry services are available for the use of large CVs. The other two routes are foot passenger-only.
  - CV fares on Argyll & Bute Council routes are applicable only to CVs exceeding 5 metres in length. CVs under these measurements are charged as cars.

- For the most part, CVs are charged on the basis of length, with different fares charged for different bandings of vehicle length. These fare bandings differ by route. Fares per mile on the shorter Cuan-Luing route are higher than on the longer Port Askaig-Feolin route.
- Whilst CV fares for the Port Askaig-Feolin route are published for single journeys, fares for the Cuan-Luing route are published for return journeys and five journey returns. Fares for both services exclude the driver and exclude VAT.
- Marginally lower fares per journey are available to hauliers using the Cuan-Luing route through purchasing a five journey return ticket rather than the standard return ticket. The discount is however small, averaging at around a 2% reduction on the standard return fare. Discounts of this kind are not available on the Port Askaig-Feolin route.

Orkney Islands Council

- Orkney Ferries Limited, a company wholly owned by Orkney Islands Council, operates the Orkney inter-island ferry services, connecting the Orkney mainland to 13 islands. These services are funded by the Council and are indirectly subsidised by the Scottish Government through the block grant they receive (and for the 2018/19 financial year, directly by Scottish Government as part of the one year ‘Fair Funding’ settlement).
- Fares structures and levels are set by the Council and it is understood the fares reflect historic levels uprated for inflation. Orkney Islands Council undertakes annual reviews to inform the setting of the following year’s tariff. Ordinarily, fares are subject to an inflation-based uplift however the Council takes local economic conditions into consideration when deciding whether or not to impose an increase each year.
- Passenger & car fares:
  - There are differential rates for the Outer North Isles and the Inner & South Isles, the latter being cheaper (likely reflecting the much shorter route distances and lower classification / less costly vessels).
  - 10, 20 and 50 journey ticket books are available. The 10 journey books offer a 25% reduction on the standard fare, whilst the 20 journey books offer a 30% reduction. The 50 journey books offer a 50% reduction but are only available to residents of the Outer North Isles and the Inner & South Isles. In proportionate terms, this is still 20% less than the equivalent discount on the Corran Ferry.
- CV Fares
  - The general rationale for the setting of CV fares is largely historical but has an over-arching basis of:
    - Location/journey time: there are four CV fares ‘blocks’ based on location / journey time.
    - Vehicle length: All CVs are assumed to be 5m or over (if a CV is under 5m, it is charged the 5m fare) and the charging regime is based upon increased charges for every 0.5m increment over 5m.
  - The standard single CV fare for a route in any of the four blocks is calculated using the same method. The fare is calculated as a fixed charge plus the product of the rate charged per half CV metre and the number of half metres the CV’s length is in excess of 5m. In this way, a 5m CV will only be charged the fixed charge.
  - Both the fixed charge and the rate per half CV metre vary by route, with the longer routes having a higher fixed charge and a higher rate per half metre. Published CV fares are generally for single journeys and exclude VAT. Fares exclude the driver.
  - Two forms of concessions are available to CVs which significantly reduce the fare paid per single journey - multi-journey tickets and automatic discounts. These discounts are available for CVs travelling on all four CV fare blocks.
  - Multi-journey tickets, which are available to all hauliers paying up-front, can reduce the fare paid for a single journey by 25%-50%.

- Automatic discounts are available to Orkney-based Account Customers only and allow hauliers to benefit from a discount without having to pay the high cost of a multi-journey ticket upfront. The discount received differs depending on whether the Account Customer is Orkney mainland-based or Orkney-isles based.

Shetland Islands Council

- Shetland Islands Council is responsible for the network of inter-island ferry services, connecting the Shetland mainland with nine islands. These services are funded by the Council and are indirectly subsidised by the Scottish Government through the block grant they receive (and for the 2018/19 financial year, directly by Scottish Government as part of the one year 'Fair Funding' settlement).
- All services, except one, are operated directly by the Council. The Council has sole responsibility for setting and approving fares. There is no set fares increase mechanism for fares on Shetland Islands Council services. There is no restriction on increases / decreases in fares however any significant changes require strong political consensus to implement.
- Passenger & car fares
  - The Shetland network is unlike the majority of other Scottish ferry routes in that it broadly operates on a system of flat fares. For passengers on the shorter routes (Unst / Fetlar, Yell, Whalsay and Bressay) a flat **return** fare of £5.40 is applied (£2.70 each way), with a multi-journey book reducing this to £2.10 each way. On the longer routes to Fair Isle, Foula, Papa Stour and Skerries, the passenger fare is double that on the shorter routes.
  - A broadly similar approach is adopted for cars.
- CV Fares
  - The Council classifies commercial vehicles into three categories: commercial vehicles; tankers; and plant.
  - CV fares on Shetland Islands Council services are determined by two factors:
    - Vehicle type: separate fares structures are in place for traditional CVs and tankers.
    - Vehicle length: different fares (rather than rates per metre) are in place for different ranges of vehicle length, with the length bandings depending on the vehicle type (5.51m-8.00m, 8.01m-12.00m and 12.01m-18.00m for commercial vehicles and up to and including 7.5m, 7.51m-10.00m and 10.01-16.00m for tankers).
  - There is some inconsistency in how CVs are treated for charging purposes in terms of vehicle length. Fares for CVs (as defined by the Council) are in place for CVs of length 5.51m or over. CVs under this length are charged as cars. Tankers are however all charged commercial rates, with the lowest fare band taking in all tanker lengths up to and including 7.5m.
  - There is some inconsistency in how fares are presented. Whilst fares (for both CVs and tankers) for services to Bressay, Whalsay, Yell, Unst and Fetlar are published for return journeys, fares for services to Skerries and Papa Stour are published for single journeys. However, when the return fares are converted to a single journey equivalent, we see that fares are equal on all routes so that a CV of a particular length travelling on any inter-island route will face the same fare and a tanker of a particular length travelling on any inter-island route will face the same fare (albeit at a different rate to that faced by a commercial vehicle). This flat fares structure is not seen in any other part of the Scottish ferries network.
  - As a flat fare is charged regardless of the route, the fare per (route length) mile decreases as route length increases. This results in a significant spread in the fare per mile charged across the network with CVs on the longest route facing a fare per mile of £1.14 and CVs on the shortest route facing a fare per mile of £52.20.

- Fares for both CVs and tankers include VAT and include the driver.
- Shetland Islands Council does not offer concessions for CVs on any of its routes.

Appendix B Methods of Delivery – Other Publicly Funded Scottish Ferry Services

Clyde & Hebridean Ferry Services

The Clyde & Hebridean Ferry Services (CHFS) operate as a single network covering 27 routes (with variant routes within these). The CHFS services are procured by Transport Scotland under a PSC arrangement, with CalMac Ferries Ltd (part of the David MacBrayne Group) holding the contract to operate the services through until 2024. Specific provisions of this PSC include:

- The service is operated by CalMac Ferries Ltd, with the current contract running from 2016-2024 (although note Scottish Ministers are seeking to apply the Teckal Exemption and have the CHFS network run by an in-house operator in future years).
- The tender tightly specifies the requirement in terms of routes, timetables, crewing requirements etc, although there was some scope for innovation in the tendering process.
- The service is operated on a net-cost basis, with the operator taking the revenue risk (the exceptions to this being the fuel price risk and market entry).
- A ‘clawback’ mechanism is in place which allows Transport Scotland to claim back profit above certain defined thresholds.
- The operator must make use of the Caledonian Maritime Assets Limited (CMAL) vessels.

The first tendering of the CHFS network was in 2005, and it is thus fairly recent. There is therefore some value in reflecting on the specific challenges that were faced in moving from an entirely public sector run operation (as per the current Corran Ferry arrangements) to a PSC solution. Issues of lesser relevance to Corran, such as bundling, are not considered here.

Split of Operations and Ownership

One of the key changes required in the first CHFS tender was the split of the operations and ownership of the network. Like the Corran Ferry, the assets and operation of the CHFS network were previously consolidated under the Caledonian MacBrayne banner, a nationalised transport company.

The Scottish Office and latterly the Scottish Executive / Government provided the majority of capital funding for new vessels and new infrastructure at government owned ports. Investment capital was provided through the government’s budget settlement with Caledonian MacBrayne, which in turn was responsible for specifying and delivering capital investment, ongoing maintenance and, ultimately, the operation of the network.

In the interests of fair competition, it became necessary, following the decision to tender, to divorce the ownership of the assets from the operation of the service. On 1 October 2006, Caledonian MacBrayne was split into two separate companies:

- Caledonian Maritime Assets Limited (CMAL), an asset owning company; and
- CalMac Ferries Limited, an operating company.

CMAL is a company wholly owned by the Scottish Ministers – from 1 October 2006, the company assumed ownership of all vessels and ports previously owned by Caledonian MacBrayne. CMAL is responsible for:

- maintaining, improving and enhancing assets such as vessels, CMAL owned ports, and the land and property around ports and harbours; and
- seeking extra investment in ferries and harbour facilities.

The European Commission has accepted the case made by the Scottish Government that the vessels used to operate the CHFS network when considered as a single network bundle are 'unique', in that no bidder could credibly offer a fleet of vessels which could meet the needs of the network. Successive rounds of CHFS tendering have mandated the use of the CMAL fleet in the fulfilment of the contract requirement.

Vessel Lease

Had the European Commission not agreed to the 'uniqueness of the fleet' argument, it is possible that CMAL's vessels' role would have been temporary, easing the transition from state owned vessels to a situation where private tonnage assumed control of most if not all of the CHFS routes. However, with the guarantee that the use of the CMAL fleet will be mandated in tender processes, the company has assumed a position akin to that of Network Rail or a (albeit government owned) rolling stock company, providing the assets for the tendered operators to use.

The operational element of Caledonian MacBrayne was renamed CalMac Ferries Ltd, a ferry operating company wholly owned by the Scottish Ministers. Under the new arrangements, CalMac lease the vessels through a Fleet Charter Agreement. The individual lease cost for each vessel is calculated on the basis of its Gross Register Tonnage (GRT), although the operator pays CMAL a single combined fee for the lease of the entire fleet.

Ports & Harbours

CMAL owns and is Statutory Harbour Authority (SHA) for numerous ports around the CHFS network. Other ports are run by a combination of commercial companies, trusts and local authorities. As SHA, it is CMAL's responsibility to ensure that the ports are operating safely and are also financially self-sustaining. It is therefore the organisation's responsibility to collect berthing and pier dues from the ferry operator and any other users, and ensure that the harbours are safely maintained and invested in.

Berthing and pier dues at CMAL ports were historically low, resulting in under-investment and a maintenance backlog which was giving rise to potential safety issues. A key commitment in the *Ferries Plan* was to increase dues at all harbours where CMAL is the SHA, a change which was implemented in 2013. Whilst the increased dues result in a higher subsidy payment for Transport Scotland for the operation of the CHFS contract, this action will ensure a long-term safer operating environment, reducing potential legal liabilities.

Allocation of Risk

The CHFS contract is net-cost, and thus the operator carries the revenue risk. In any given year, there can be marked variations caused by the summer weather, but over time, the carryings are fairly predictable.

Transport Scotland has also internalised the risk of market entry including a clause within the contract whereby the subsidy is recalculated if carryings are abstracted by a commercial operator. In addition, the fuel price risk lies with the public sector. There are otherwise relatively few risks in the contract, something which is reflected by the limited rate of return on offer.

Overall, whilst the CHFS network is on an altogether different scale to the operation on the Corran Narrows, there are a number of parallels and recent lessons which could assist in shaping the future specification at Corran.

Northern Isles Ferry Services

The Northern Isles Ferry Services (NIFS) tender is currently operated by Serco NorthLink Ferries on a Transport Scotland let PSC. The basis of the contract is equivalent to that of the CHFS network in that:

- it is a net-cost contract in which the government assumes the fuel price and market entry risks; and
- the routes, vessels and service requirement are all largely specified within the contract.

Historically, the one fundamental difference between the NIFS and CHFS contract was the situation in relation to the vessels. The three NorthLink Ro-Pax vessels, the MV *Hamnavoe*, MV *Hjaltland* and MV *Hrossey* were the product of a joint venture between the Scottish Ministers, CalMac and RBS, with the RBS subsidiary Lombard financing the vessels through an operating lease to meet the then needs of government financing requirements. Lombard leased the vessels back to NorthLink for use on the Northern Isles routes. The key issue with this contract was that the agreement had to be seen as an operating lease, rather than a finance lease, otherwise it would appear on the Scottish Government's balance sheet.

The other key challenge was that after the initial 20-year lease period, the vessels would effectively have to go off-hire (for tax reasons associated with which party carried the risk). However, a solution to this issue has been found, with CMAL recently purchasing the vessels from RBS.

The two NorthLink freight vessels were historically chartered directly by the operator. However, it is our understanding that Transport Scotland is now the charter party as there was a desire within government to end the normal merchant navy practice of paying the crew on 'home' terms and conditions. Ownership of the vessels has also changed with the UK firm having recently sold the vessels to a subsidiary of a Japanese bank.

The one other major difference with NIFS is that all of the ports into which services are operated are local authority or trust owned, and thus there is no equivalent to CMAL.

The specifics of the vessels aside, the NIFS contract is operated on a near identical basis to the CHFS tender.

Argyll & Bute Council

Argyll & Bute Council (A&BC) is currently responsible for the delivery of four ferry services within its administrative area:

- Cuan - Luing
- Ellenabeich - Easdale
- Port Appin – Point (Lismore)
- Port Askaig – Feolin (Islay – Jura)

The routes are all relatively small scale in nature, although the Port Askaig – Feolin route is akin to some of the smaller & shorter CHFS routes, such as Sconser – Raasay. As is the case with THC, there is not believed to be a clear rationale as to why A&BC operate these services, rather it appears to be a historic arrangement.

The Port Askaig – Feolin route is operated on a tendered basis by ASP Ship Management (although the crew are Council employees), although this service is being brought back in-house by the Council. The remaining routes are operated on an equivalent basis to the Corran Ferry. Argyll & Bute Council owns the vessels and marine infrastructure and employ the crew. These services are operated on a gross cost basis, with the Council paying all costs of operation and retaining all the revenue. In all cases, cost exceeds revenue and the Council covers this shortfall through its revenue budget.

The Council is working towards a capital replacement plan for its ferry fleet, which is expected to be published towards the end of 2018 / early 2019.

A&BC is exploring a potential transfer of responsibilities of their services to Transport Scotland. The Council has completed the RSM process and awaits a statement from Transport Scotland on the financial and other considerations surrounding any transfer. There is no fixed position within the Council as to whether they wish to seek a transfer or otherwise.

In the event that a transfer did take place, it is anticipated that the routes would transfer into the CHFS bundle and the vessels into CMAL, but this is not certain. The Council is not keen to hand over their slipways as they have other commercial activities taking place at them outwith ferry services.

Orkney Islands Council

Orkney Islands Council (OIC) is responsible for operating ferry services to 13 islands within the archipelago. These services are delivered by Orkney Ferries, which is at arms-length but wholly owned by the Council. The vessels are owned, maintained and operated by Orkney Ferries, with the marine infrastructure (e.g. piers, linkspans etc) owned, maintained and operated by OIC Marine Services. Whilst there is, strictly speaking, a division of ownership and operation, the service is delivered in a seamless manner.

The Council is responsible for all capital and revenue funding, although the Grant Aided Expenditure (GAE) settlement from central government takes account of the requirement for the local authority to operate ferry services. However, the service operates at a deficit of around £2.6 million per annum. There is also no committed capital programme of any substance to replace the ageing fleet and infrastructure. The capital requirements on the Orkney Ferries' network are becoming particularly pressing.

In 2015, Orkney Islands Council commissioned the Orkney Inter-Island Transport Study (OIITS), a piece of work similar in nature to this study. As part of that piece of work, a 'Fair Funding' group was established considering the funding settlement and means of delivery for the Orkney services. As part of the 2018/19 Budget settlement, the Scottish Government committed to funding the operating deficit for the following financial year, although there is at present no agreed approach beyond the next financial year. There is also no capital replacement plan in place.

Shetland Islands Council

Shetland Islands Council operates routes to eight islands within the archipelago, with the service to the small island of Foula having been tendered and subsequently contracted to the private sector following an extended period of difficulty in running the service as part of the SIC operation.

The operation in Shetland is run on a broadly equivalent basis to Orkney, with the local authority owning all of the assets, operating the network and covering all capital and revenue costs. The only difference between the two local authorities is that the ferry services are operated directly rather than via an arms-length company.

The SIC services operate at a deficit of around £5.5m per annum and there is a limited capital expenditure plan in place.

Shetland Islands Council commissioned the Shetland Inter-Island Transport Study (SIITS) in 2015 and participated in the same 'Fair Funding' group as the Orcadians. As with Orkney, the Scottish Government has committed to funding the revenue deficit for the financial year 2018/19, although there is no commitment beyond this. There is also no capital replacement plan in place.

The Foula service is operated on a gross-cost tendered basis. The tendering of this service is understood to be for operational reasons, with the vessel (supplied by the private sector operator) and crew both based on the island.

Appendix C List of Consultees

Methods of Delivery

- Argyll & Bute Council
- HITRANS
- Orkney Islands Council
- Shetland Islands Council
- Transport Scotland

Public Service Provision

- Corran Ferry Foreman
- The Highland Council – Community Services
- The Highland Council – Rubbish & Recycling
- The Highland Council – Social Care & Health
- Police Scotland

No response was received from the National Health Service or Scottish Ambulance Service.

Stakeholders

Responded

- Acharacle Community Council
- Ardnamurchan Estates
- CC Plant
- Ferguson Transport
- Marine Harvest
- Mull, Iona, Lochaline and Ardnamurchan Ferry Committee
- Scottish Fuels
- Strontian Hotel
- Sunart Community Council
- Travis Perkins
- West Ardnamurchan Community Council

No Response

- Ardgour Community Council
- Boyd Brothers
- Breedon
- Certas Energy
- Habro
- Letterfinlay Foods Ltd
- Leven Homes

- MacDiarmids
- Menzies Distribution
- Morvern Community Council
- Oilfast
- Shiel Buses
- TSL (although note a face-to-face discussion was held with TSL representative at a meeting related to another study)

Appendix D Routes & Services Methodology

As part of their comprehensive review of all publicly supported ferry services in Scotland, Transport Scotland developed a 'Routes & Services Methodology' (RSM) designed to ensure a consistent approach to ferry service provision across the country. Completion of the RSM to Transport Scotland's satisfaction is a necessary pre-requisite to any discussions surrounding the potential transfer of responsibility.

The RSM is a six-step process that aims to identify whether gaps exist in the current level of service provision for ferry-dependent communities in Scotland. It is intended to be applied consistently across all communities served by the ferries network. Where gaps are identified, options to address the gaps are developed and appraised to set the priorities for future spending. There are six steps in the methodology. This chapter sets out the RSM process for steps 1-4 for the Corran ferry route, which involves defining the dependencies and any gaps between the current and model level of service. Steps 5 and 6 will be covered by the options appraisal which will be undertaken as this study progresses.

HITRANS commissioned Eyland Skyn to carry out the Corran Ferry RSM in 2014. This section largely builds on that analysis, although updated to reflect our recent experience of applying the RSM in Orkney and Shetland, thus working towards a degree of national consistency (the islands served by Clyde & Hebridean Ferry Services having being covered in the Ferries Review).

Defining Community Dependencies

The RSM process considers four ferry-related dependencies, each of which is informed by a series of indicators – this is set out in the table below:

Community Dependencies and Indicators

Dependency	Indicator
Commuting and Frequent Business Use	1. Island to mainland crossing time (in minutes) 2. Percentage of households who use the ferry service for commuting purposes and are also high frequency users 3. Percentage of households who use the ferry service for business purposes and are also high frequency users
Personal	4. Population 5. Percentage of households who use the ferry services for health-related purposes 6. Frequency profile for all travel using the ferry service
Freight	7. Population 8. Percentage employed in freight-intensive industry 9. Commercial Vehicle Lane metres per capita
Tourism	10. Percentage employed in Tourism 11. Share of summer patronage versus share of population

The first step of the RSM is to identify the community dependencies in relation to each of the above categories. Rather than a strict ranking, communities are categorised into a set of pre-defined 'pots', A to D, which are defined as follows:

- 'Pot A': the community has a strong set of indicators which all point to a specific need for that particular dependency.
- 'Pot D': the community has a weak set of indicators which all point to no specific need to that particular dependency.

- ‘Pot B’: the community has a mixed set of indicators but has more in common with communities in ‘pot A’ than ‘pot D’.
- ‘Pot C’: the community has a mixed set of indicators but has more in common with communities in ‘pot D’ than ‘pot A’.

Only those communities categorised into ‘pots’ A or B for a particular dependency are regarded as having a priority need in that specific aspect.

Approach to RSM in this Study

The data required to inform the RSM are a combination of ferry operator data and primary data collection (a household survey) undertaken with residents of island & peninsular communities. In all previous applications of the RSM, the focus was generally on a network of services and, in most cases, a discrete geographic entity.

The Corran ferry service is somewhat different in this respect in that it is not part of a wider network and serves a large geographic catchment including Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isle of Mull, as well as communities on the east side of the crossing in Nether Lochaber and beyond. Developing and running an appropriate household survey for such a diverse and geographically disparate area would be an expensive process. In line with the guidance in the Scottish Transport Appraisal Guidance (STAG), we propose to adopt a proportionate approach to the application of the RSM to the Corran route. This consists of:

- Review of the Ferries Review RSM scoring for Ardnamurchan, which partially but does not fully capture the role of the Corran ferry.
- Qualitative review of the Corran operation in the context of each dependency; and
- Benchmarking against the most obvious comparator routes in Scotland:
  - Our review suggests that the most appropriate comparators in this respect are Bute, Cumbrae and Yell, which are all short high volume crossings.

Step 1 - Corran Ferry Community Dependencies

The RSM *Guidance for Local Authorities* published by Transport Scotland suggests that only those communities categorised into ‘pots’ A or B for a particular dependency are regarded as having a priority need in that specific aspect.

The following table summarises the RSM dependency pots for the communities served by the Corran ferry, as well as Ardnamurchan and the comparator islands:

Summary of RSM Dependencies

	Commuting & Business	Personal	Freight	Tourism
Communities served by Corran Ferry	***A***	***A***	***A***	***B***
Ardnamurchan	A	B	-	-
Bute	B	B	B	A
Cumbrae	A	A	B	A
Yell	B	A	B	A

The key point of note from the above table is that the communities served by the Corran ferry are considered to have a dependency in each of the four categories, which are considered in turn below.

Commuting

The rationale behind allocating the communities served by the Corran Ferry an 'A' dependency for commuting is as follows:

- Ardnamurchan was previously allocated an 'A' dependency for commuting in the Ferries Review RSM.
- A review of the 2011 Census travel-to-work data highlights a relatively significant commuting flow (relative to the population of the area) between Lochaber West and Fort William (263 respondents). There are also around 1,000 inbound movements from the Fort William area. The travel-to-work data are not broken down to a more disaggregate level so it is not possible to determine which of these trips use the Corran Ferry or travel entirely by road.[52]
- The anticipated development of the aluminium smelter at Fort William is likely to generate a significant number of employment opportunities for Lochaber as a whole. A number of these jobs are likely to be relatively high value and could be of benefit for the study area. In addition, the plant is likely to operate on a shift system, so early morning and late evening access will be important in facilitating employment opportunities.
- Whilst not defined as commuting in the typical sense, there will be a range of services delivered in the study area from Fort William which will necessitate frequent if not daily movements to the study area. These could include e.g. social care, itinerant / specialist teachers, utility providers etc.

Personal

The study area has been allocated an 'A' dependency for personal for the following reasons:

- The Corran Narrows route is the second busiest in Scotland and the busiest single vessel route. It is an essential connection for residents in the study area, allowing them to access Fort William as the regional service centre and a wide range of facilities including health (a key issue in an area with an ageing demographic), shopping, leisure opportunities, visiting friends and family etc.
- Like Cumbrae and Yell, there are limited services within the study area, and thus external connectivity is essential to facilitate many elements of daily life. This contrasts with e.g. Bute, where Rothesay offers a reasonably sized settlement on-island.
- We would consider the 'B' rating from the Ferries Review as being relatively conservative – the study area has several characteristics which put it on a par with the most remote and isolated areas of Scotland.

Freight

The study area has been allocated an 'A' dependency for freight for the following reasons:

- The road connections into the study area are less than ideal for freight, with single track sections, height restricted bridges, challenging alignments etc. The ferry effectively acts as a bypass of a number of these restrictions.
- According to Scottish Transport Statistics Table 9.16, the Corran Ferry carried 11,400 commercial vehicles. This is a higher number than the majority of routes in Scotland, including highly freight intensive routes like Kennacraig – Port Askaig / Port Ellen and Ullapool Stornoway.[53]
- The deployment of a single closed deck vessel on the Oban – Craignure route (MV *Isle of Mull*) for the winter timetable period means that use of the Lochaline – Fishnish route (accessed via the Corran Ferry) can be necessary for the conveyance of dangerous goods to Mull.

[52] Source: Scotland Datashine

[53] https://www.transport.gov.scot/publication/scottish-transport-statistics-no-35-2016-edition/SCT01171871341-12

Tourism

There are less readily available data to inform considerations of tourism, although a ‘B’ dependency has been allocated to the study area for the following reasons:

- 2017-18 Ticket sales data suggest that 56% of users are non-resident (i.e. those not using multi-journey books were counted as non-residents).
- For the period October 2016 – March 2017, 37% car-based ticket sales were to non-residents (based on the same definition as above).
- The Lochaber area is generally understood to be popular amongst tourists and indeed web-based research highlights that there are a number of holiday properties in the study area. It also allows tourists to take the popular ‘back door to Mull’ and indeed provides an alternative route onto the island when required.

Having defined the RSM dependencies, the next step in the process is to use them to develop the model service and compare it to the current level of provision

Step 2 - Defining the Model Service

Step 2 in the RSM process is to define the service profile that fits the community’s dependencies based on the dependencies identified as having a ‘priority need’, and the crossing time (in minutes).

The table below outlines the required service profiles for each dependency identified as having a ‘priority’ need, based on the crossing time. On crossing times greater than 60 minutes, no service profile for commuting and frequent business use is included.

RSM Service Profiles for each Dependency

		Crossing Time (minutes)					
		(0-30)	(31-60)	(61-90)	(91-180)	(181-360)	(360+)
Commuting & frequent business use	Sailing days	7 days	7 days	-	-	-	-
	Sailings per day	Freq. Peak	Freq. Peak	-	-	-	-
	Operating day	Specific	Specific	-	-	-	-
Personal	Sailing days	7 days	7 days	7 days	7 days	7 days	7 days
	Sailings per day	Standard	Standard	Std-Ltd	Limited	Limited	Limited*
	Operating day	Extended +	Extended +	Extended	Partial	Partial	Partial
Freight	Sailing days	7 days	7 days	7 days	7 days	7 days	7 days
	Sailings per day	Frequent	Frequent	Limited	Limited	Limited	Limited*
	Operating day	Standard	Standard	Specific	Specific	Specific	Specific
Tourism	Sailing Days	7 days	7 days	7 days	7 days	7 days	7 days
	Sailings per day	Standard	Standard	Std-Ltd	Limited	Limited	Limited*
	Operating day	Extended +	Extended +	Extended	Partial	Partial	Partial

The definitions for the profiles of sailings per day and operating day are provided in the table below.

RSM Service Profile Definitions

Sailings Per Day	Frequent	Constant service throughout the day (20+)
	Freq. Peak	Frequent core hours and then regular (>8)
	Standard	Regular service throughout the day (6-8)
	Std-Ltd	Limited service throughout the day (3-5)
	Limited	1-2 sailings per day (*denotes 1)
Operating Day	Extended +	More than 14 hours
	Extended	Up to 14 hours, 6 am to 8 pm
	Standard	11 hours, 7 am to 6 pm
	Specific	At peak times, not prescribed
	Partial	No normal operating day

The overall service profile is determined by examining the individual service profiles for the identified dependencies (i.e. those scoring 'A' or 'B') and using the service profile from whichever one has the greatest requirements.

Model Service – Corran Ferry

The **model service** for the communities served by the **Corran Ferry** should therefore be:

- Sailing Days: *'7 Days'*
- Sailings per Day: *'Frequent'* that is '*Constant service throughout the day (20+)*'
- Operating Day: *'Extended+'* that is '*More than 14 hours*'

Step 3 – Current Service

Step 3 in the RSM process requires the current service to be defined in terms of sailing days, sailings per day and length of operating day.

The RSM guidance suggests that the definition of the current ferry service should take account of both summer and winter timetables, although there is in fact no seasonal differential on the Corran Ferry route.

Using the RSM definitions, the current service on the Corran Ferry is as follows:

- Sailing Days: *'7 Days'*
- Sailings per Day: *'Frequent'* that is '*Constant service throughout the day (20+)'*
- Operating Day: *'Extended+'* that is '*More than 14 hours*', although it is marginally less than this on a Sunday (13 hours).

Step 4 – Gap Analysis

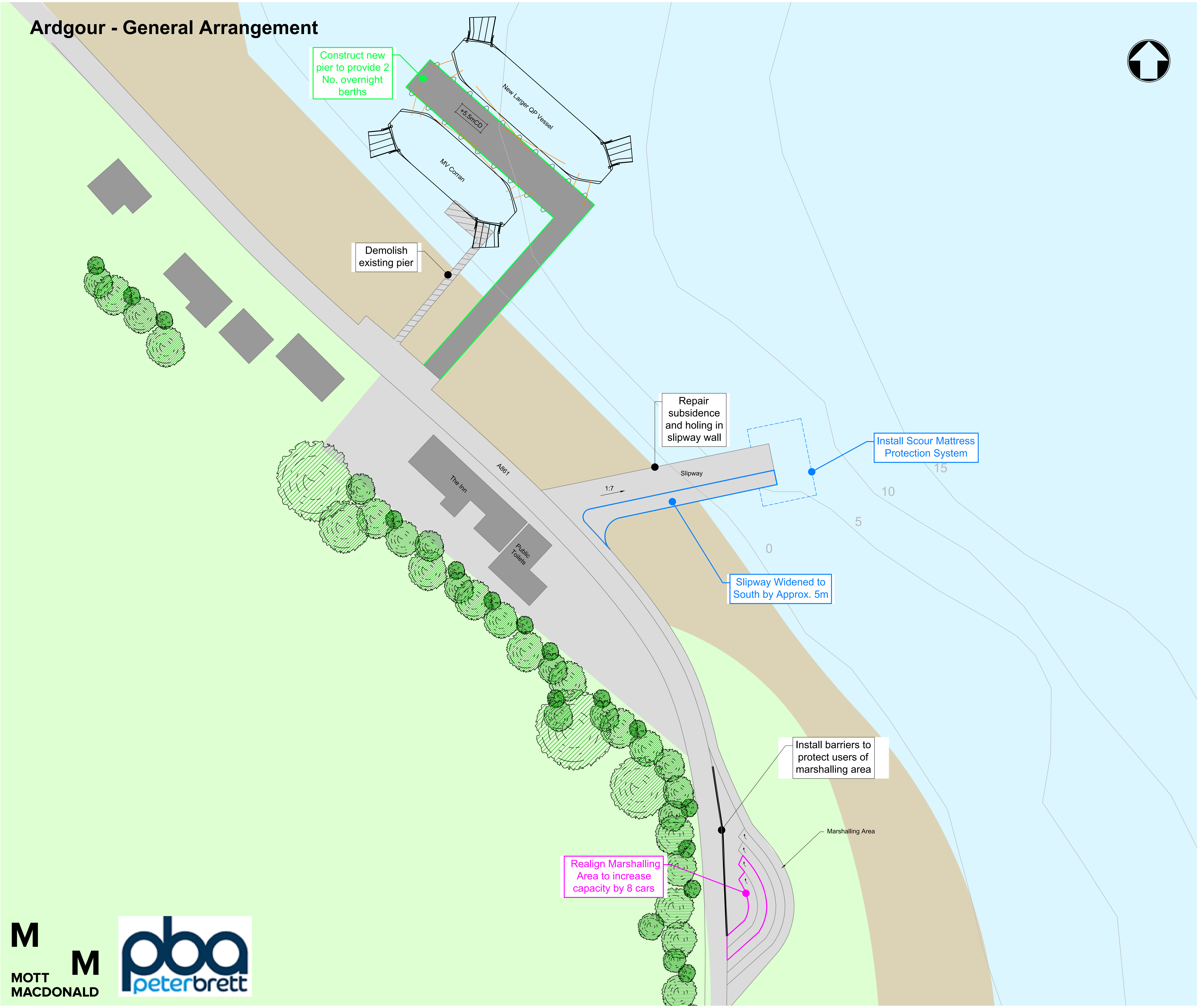
This step requires a comparison between the proposed and current service profiles to identify whether gaps exist in service provision. The RSM methodology advises the use of a five point scale to identify gaps, as follows:

- ***Substantial under provision*** – where current provision is at least two ‘service definitions’ short of model provision – e.g. current sailings per day is “Standard” and model sailings per day is “Frequent”.
- ***Marginal under provision*** - where current provision is one ‘service definition’ short of model provision – e.g. current sailings per day is “Freq. Peak” and model sailings per day is “Frequent”.
- ***Sufficient provision*** – where current provision equates with model provision.
- ***Marginal over provision*** - where current provision is one ‘service definition’ greater than model provision – e.g. current sailings per day is “Freq. Peak” and model sailings per day is “Standard”.
- ***Substantial over provision*** - where current provision is at least two ‘service definitions’ greater than model provision – e.g. current sailings per day is “Frequent” and model sailings per day is “Standard”.

The commentary set out in Steps 3 and 4 clearly demonstrate that the Corran Ferry route is well aligned with the ‘model service’ requirement. With the exception of a one hour shortfall in the length of the operating day on a Sunday (a common issue across Scotland), the current service exactly delivers the model service.

Steps 5 and 6 of the RSM involve appraising and prioritising options for addressing any RSM shortfalls or over-provisions. In the case for the Corran Ferry, the focus will predominantly be on the capital and revenue measures required to **maintain** the current level of service.

Appendix E General Arrangement Drawings



Corran Ferry Service Options Appraisal Detailed Appraisal Report

Option 1A - New Larger QP Vessel. Retain MV Corran as Relief

Note: OS and Bathymetry is shown indicative only with levels below C.D.

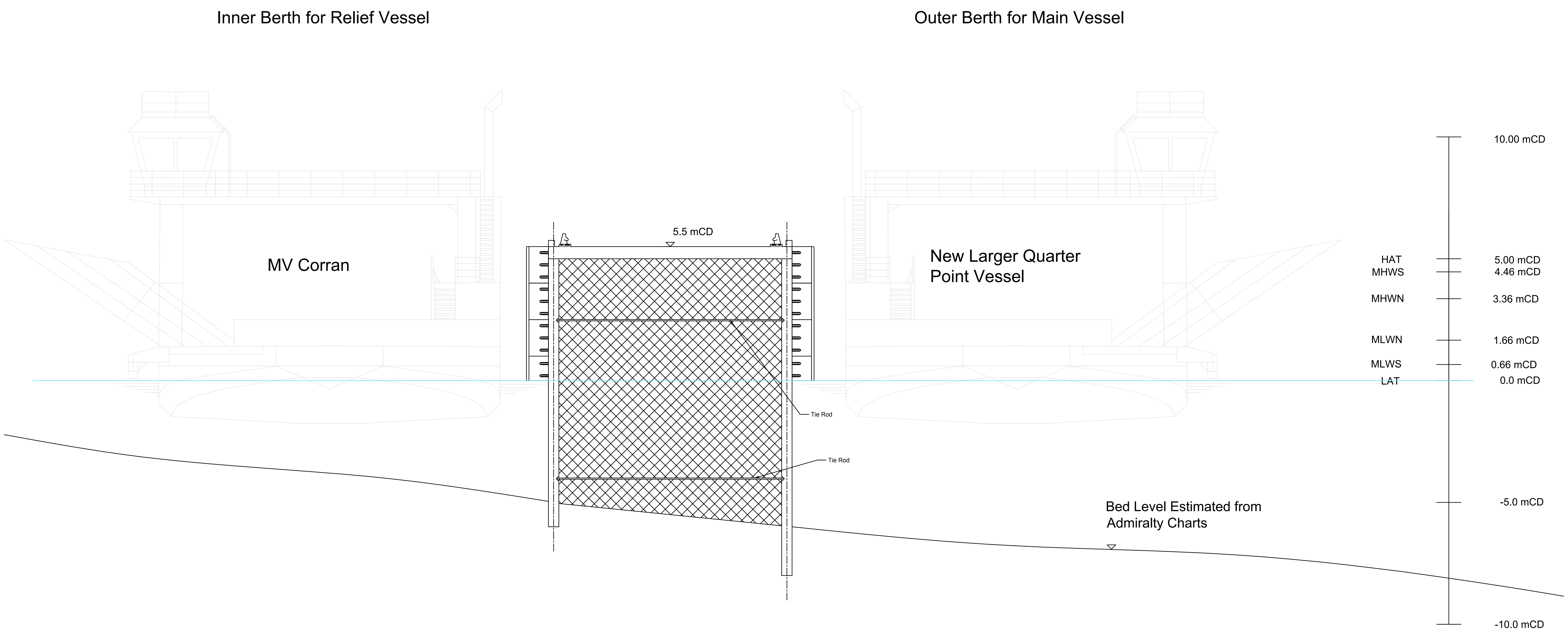
The Highland Council
Comhairle na Gàidhealtachd

1:1000 0 25m 50m
1:1000 at A3

Ardgour - Section Through Overnight Berth

Corran Ferry Service
Options Appraisal
Detailed Appraisal Report

Option 1A - New Larger QP Vessel. Retain MV Corran as Relief



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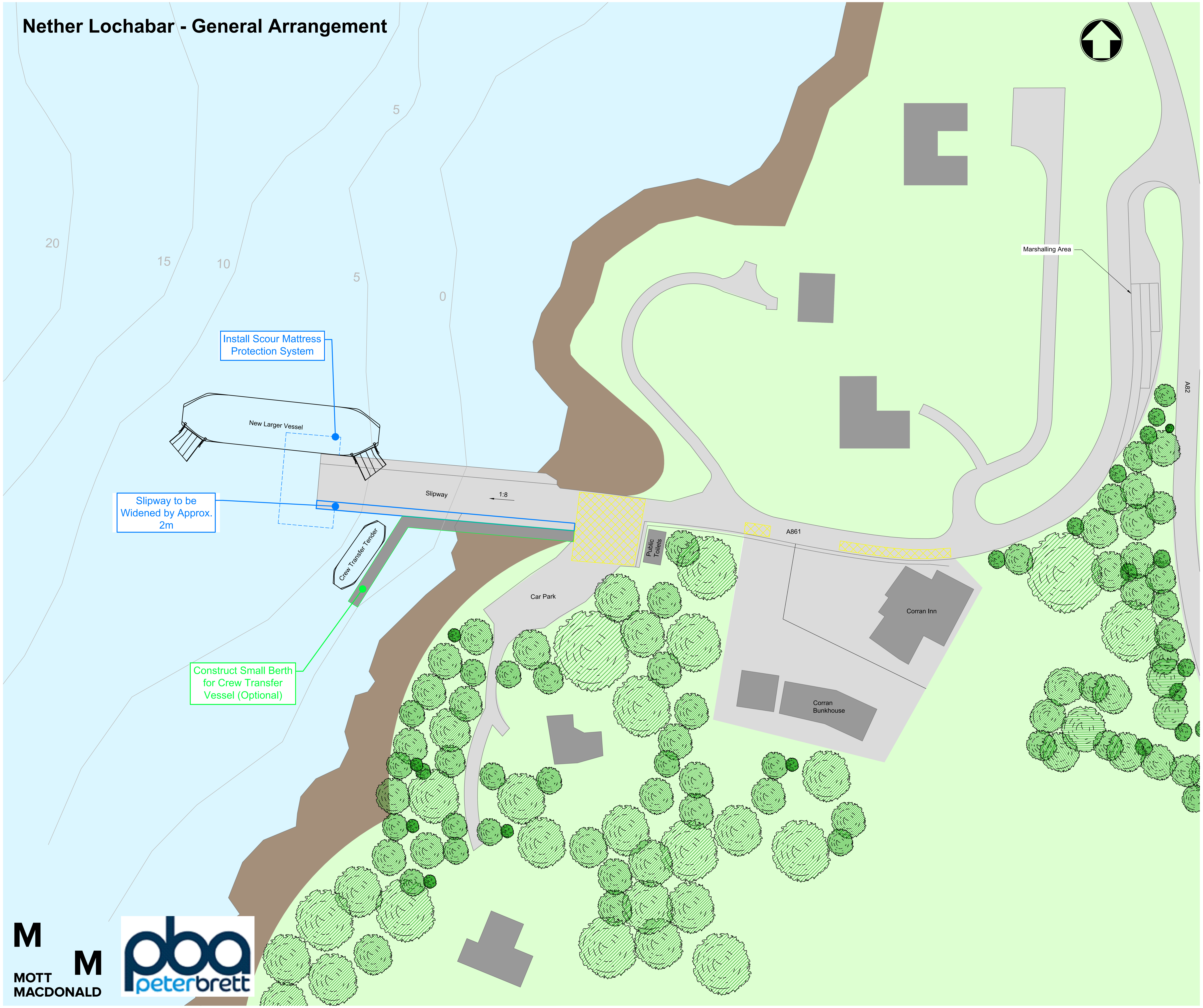
Nether Lochabar - General Arrangement



MOTT MACDONALD

pba peterbrett

Corran Ferry Service Options Appraisal Detailed Appraisal Report

Option 1A - New Larger QP Vessel. Retain MV Corran as Relief

Note: OS and Bathymetry is shown indicative only with levels below C.D.

The Highland Council
Comhairle na Gàidhealtachd

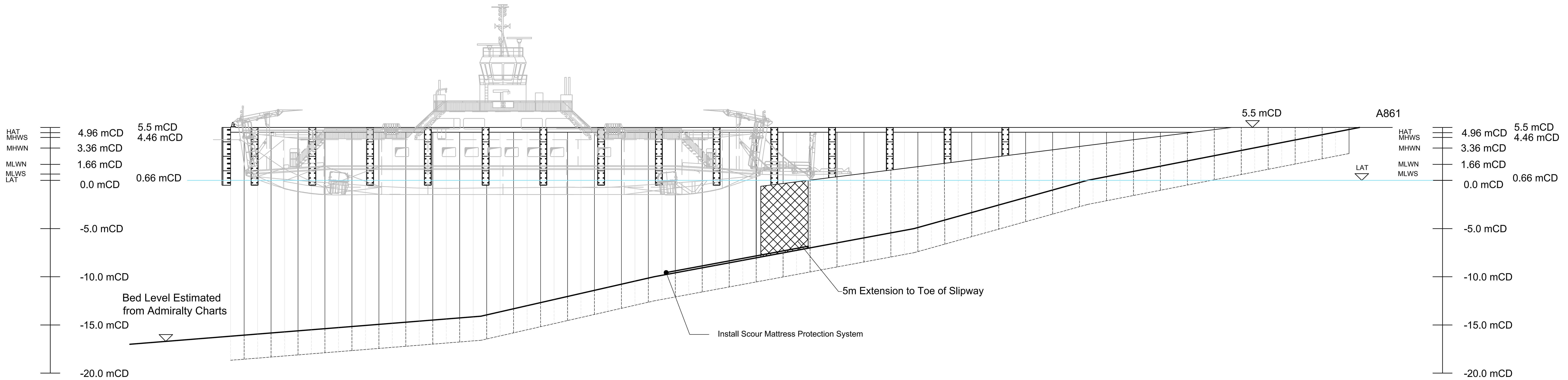
1:1000 0 25m 50m
1:1000 at A3

Ardgour - Aligning Structure/ Elevation of Overnight Berth

Corran Ferry Service
Options Appraisal
Detailed Appraisal Report

Option 2C - New Larger Straight Through Vessel. Retain MV Corran as Relief

Option 2D - New Larger Straight Through Vessel. Sell MV Corran.



MOTT MACDONALD

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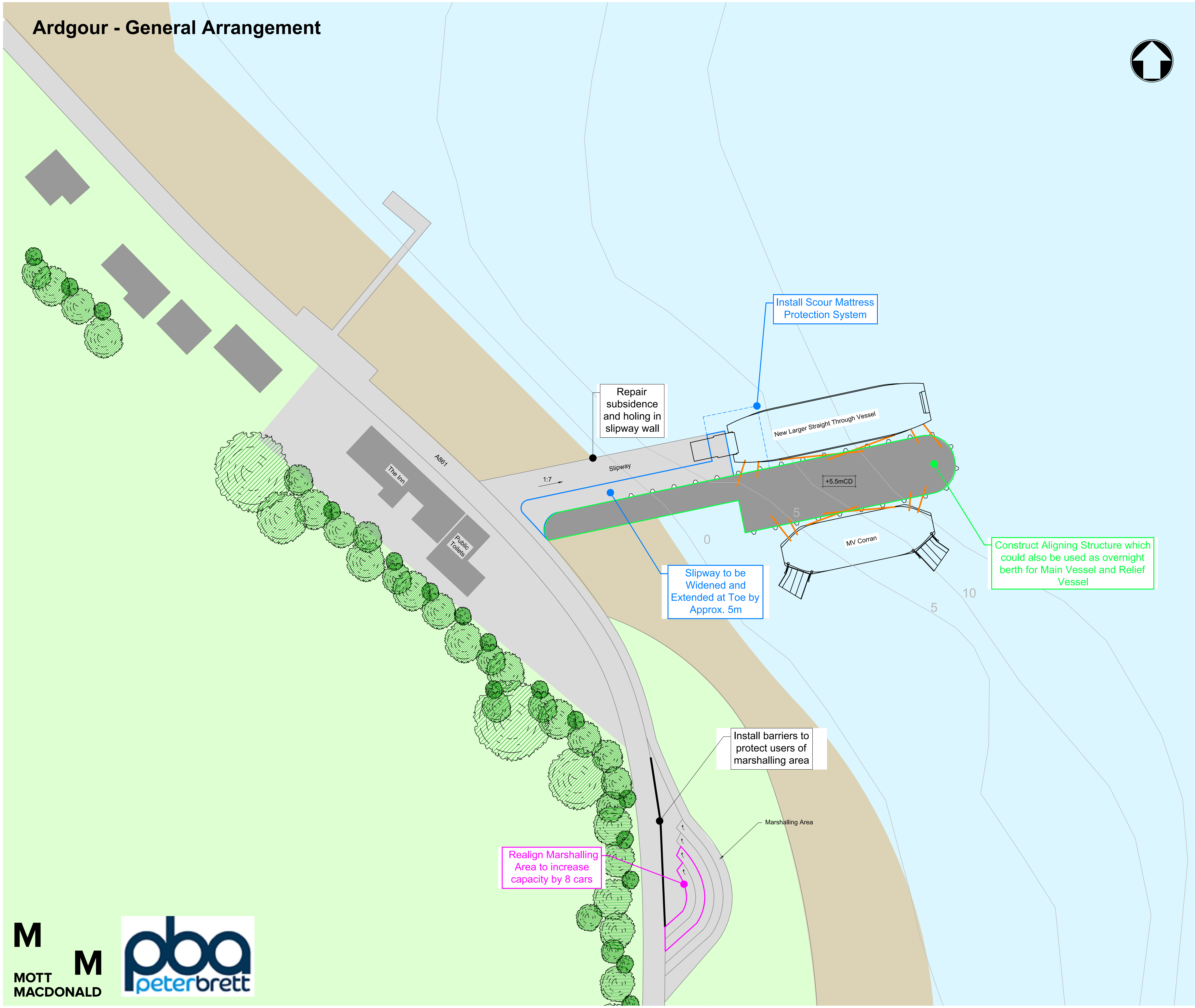
The Highland Council
Comhairle na Gàidhealtachd

1:500 0 12.5m 25m



Corran Ferry Options Appraisal
Detailed Appraisal Report

Option 2C - New Larger Straight Through Vessel. Retain MV Corran as Relief.

Option 2D - New Larger Straight Through Vessel. Sell MV Corran.

Note: OS and Bathymetry is shown indicative only with levels below C.D.

The Highland Council
Comhairle na Gàidhealtachd

1:1000 0 25m 50m

1:1000 at A3

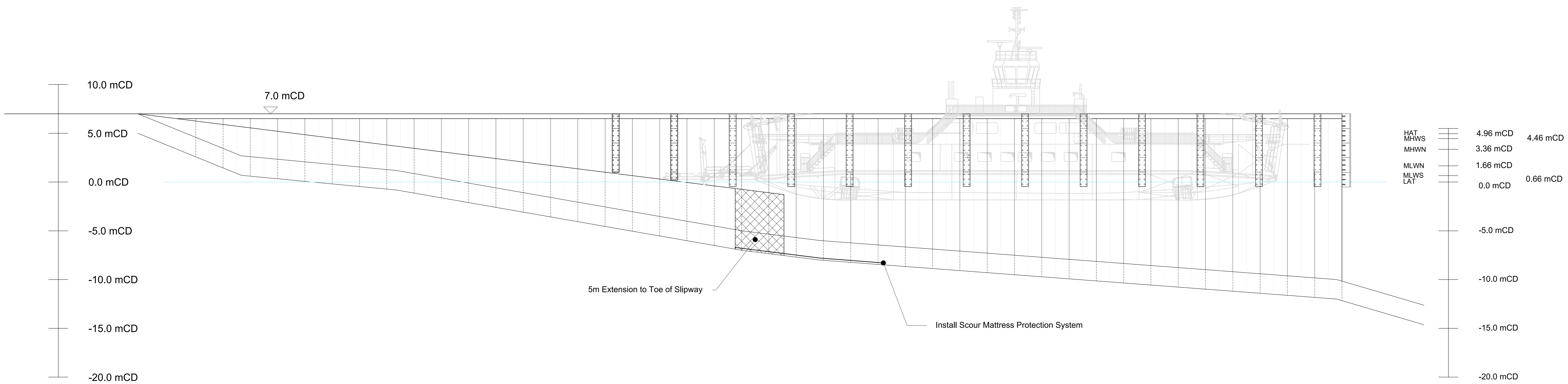
Nether Lochabar - Aligning Structure/ Elevation of Overnight Berth

Corran Ferry Options Appraisal
Detailed Appraisal Report

Option 2C - New Larger Straight Through Vessel. Retain MV Corran as Relief

Option 2D - New Larger Straight Through Vessel. Sell MV Corran.

Note: OS and Bathymetry is shown indicative only with levels below C.D.



MOTT MACDONALD

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The Highland Council
Comhairle na Gàidhealtachd

1:500 0 12.5m 25m

Nether Lochabar - General Arrangement

MOTT MACDONALD

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Corran Ferry Options Appraisal
Detailed Appraisal Report

Option 2C - New Larger Straight Through Vessel. Retain MV Corran as Relief.

Option 2D - New Larger Straight Through Vessel. Sell MV Corran.

Note: OS and Bathymetry is shown indicative only with levels below C.D.

The Highland Council
Comhairle na Gàidhealtachd

1:1000 0 25m 50m

1:1000 at A3

Appendix F Environmental Consultation

Feedback from statutory environmental consultees is provided below

The Highland Council – Development Planning

The THC Development Planning response noted that:

- The immediate environs of the two ferry terminals have few environmental constraints in terms of formal heritage designations or other features.
- The Ardgour terminal has several listed buildings adjacent but the works will have no direct impact on the structures and therefore they will only act as a design constraint on the project – (i.e. the works should be designed in such a way as to not have a significant adverse on the setting of the listed buildings). Full details of the listed buildings and other archaeological sites are available via https://her.highland.gov.uk/
- Existing coastal flood risk is a constraint and SEPA may ask for modelling (or other comfort) that the terminal works will not magnify existing issues.
- Otherwise, noise, air and light pollution will be the principal environmental concern. The options that overnight berth the ferry vessels furthest from existing residential properties will cause least impact (but may be less desirable from a flooding and/or visual/landscape impact). It should be noted that local residents are pressing for the ferry crossing timetable to be extended at either end of the day and therefore early and late engine noise may become more of an issue. The options that berth the vessels closest to where they already berth would be preferable in terms of not affecting new, additional "sensitive receptors" (more residential properties).

A consultation request was sent to the THC Flood Risk Management Team, but no response was received.

Scottish Natural Heritage

There are no protected areas that will be affected by any of the options for the future of the service. We would however make you aware that whichever option you proceed with, a protected species survey should be carried out on all areas where construction works may occur. In particular, otters may use the area and a survey would determine if they are present and if so, what mitigation would be required.

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

By email to: **scanning@peterbrett.com**

Peter Brett Associates LLP - Edinburgh
3rd Floor
Exchange Place 3
3 Semple Street
Edinburgh
EH3 8BL

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Alison.Baisden@hes.scot
T: 0131 668 8575

Our ref: AMN/16/H
Our case ID: 300030904

04 September 2018

Dear Mr Canning

Corran Ferry Service
STAG Appraisal

Thank you for consulting Historic Environment Scotland on the STAG Appraisal (August 2018) for the Corran Ferry Services. We have reviewed this document for our historic environment interests. These include Historic Marine Protected Areas (HMPAs), world heritage sites, scheduled monuments and their settings, category A-listed buildings and their settings, and gardens and designed landscapes (GDLs) and battlefields in their respective inventories.

You should also seek advice from the Highland Council's conservation and archaeology advisors for matters including unscheduled marine and terrestrial archaeology and category B and C-listed buildings.

We have reviewed the summary of options included within the STAG Appraisal and can confirm that the options under consideration are unlikely to affect marine or terrestrial heritage assets within our statutory remit. We therefore do not have any comments to make regarding the selection of options in this instance.

Please contact us if you have any questions about this response. The officer managing this case is Alison Baisden who can be contacted by phone on 0131 668 8575 or by email on Alison.Baisden@hes.scot.

Yours sincerely

Historic Environment Scotland

SEPA
Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba

Our ref: PCS/160777
Your ref: Corran Ferry STAG

Stephen Canning
Peter Brett Associates
Edinburgh

If telephoning ask for:
Susan Haslam

3 September 2018

By email only to: scanning@peterbrett.com

Dear Mr Canning

Pre-planning enquiry
Corran Ferry Services STAG Appraisal
Corran Narrows between Nether Lochaber and Ardgour

Thank you for your consultation email which SEPA received on 16 August 2018. We welcome consultation on the Note for Environmental Stakeholders at this early stage. We provide the following advice but please note that this advice is based on emerging proposals as outlined in the document you provided and we cannot rule out potential further information requests as the project develops.

Our understanding is that the options still being considered will all result in works within or adjacent to the marine environment and apart from this the only on shore proposals are slight modifications to the marshalling area at Ardgour. On this basis then nearly all the issues in which we have an interest will be adequately covered by our SEPA standing advice for The Department of Energy and Climate Change and Marine Scotland on marine consultations and we therefore refer you to that document.

The only issue we consider it may be helpful for us to provide site specific advice to you on at this stage is flood risk; the design of the new pier and berth should consider this issue, including in relation to effects of climate change.

An approximate 1 in 200 year coastal water level for the area is 4.5mAOD based on extreme still water level calculations using the CFB Method (this does not take into account the potential effects of wave action, funnelling or local bathymetry at this location). We have a surveyed flood level of 3.87mAOD for the 11 January 2005 flood event at Clovullin, to the south west of Corran (national grid reference 200840,763130). In addition we can advise you that as part of the Caol and Lochyside Flood Protection Scheme, there has been considerable analysis of the levels recorded at the Corpach tide gauge on Loch Linnhe. This work may be useful to this development proposal and we recommend you contact The Highland Council Flood Risk Management Team (FRM@highland.gov.uk) for further information on this.

With regard to consideration of future climate change we refer you to the SEPA report “Flood Modelling Guidance for Responsible Authorities. Version 1.1”. We recommend that you consider the new UK Climate Projections 2018 (UKCP18) which will be available in November 2018. UKCP18 will provide the latest information on our future climate.

If there are any aspects of the development which are not covered by the above standing advice, or if proposals change and there are more on shore works (for example additional parking or welfare facilities) then please feel free to re-consult us on the development.

Should you wish to discuss this letter please do not hesitate to contact me on 01349 860359 or planning.dingwall@sepa.org.uk.

Yours sincerely

Susan Haslam
Senior Planning Officer
Planning Service

Disclaimer
This advice is given without prejudice to any decision made on elements of the proposal regulated by us, as such a decision may take into account factors not considered at this time. We prefer all the technical information required for any SEPA consents to be submitted at the same time as the planning or similar application. However, we consider it to be at the applicant's commercial risk if any significant changes required during the regulatory stage necessitate a further planning application or similar application and/or neighbour notification or advertising. We have relied on the accuracy and completeness of the information supplied to us in providing the above advice and can take no responsibility for incorrect data or interpretation, or omissions, in such information. If we have not referred to a particular issue in our response, it should not be assumed that there is no impact associated with that issue. Further information on our consultation arrangements generally can be found on our website planning pages.

Appendix G Capital Costs

Corran Ferry Service Option Appraisal - Option 1A

New Larger Quarter Point Vessel with MV Corran Retained as relief

Item		Quantity	Unit	£/unit	Item Cost
Ardgour					
Marshalling Area					
Reconfiguring Marshalling Area		1	No	£10,000	£10,000
Installation of Barriers	35m @ £400	1	No.	£14,000	£14,000
	Sub Total of Construction Works to Marshalling Area				**£24,000**
Slipway					
Repairs to Slipway					
Repairs to Slipway for Holing and Subsidence	£20k Materials, Allowance for 3wks Dive Team 15@£3k	1	No	£65,000	£65,000
	Sub Total of Construction Works to Repair Ardgour Slipway				**£65,000**
Widen Slipway to South and Install Scour Protection at Toe					
Infill Material	5m widening over length	1300	m^3	£55	£71,500
Prepare surface to receive rails		260	sq m	£25	£6,500
Levelling Rails	5 rows of 203 x 133 x 25 UB	8	tonne	£1,500	£12,000
RC Concrete Deck	0.4m deep	104	m^3	£750	£78,000
Sheet Piles		72	tonne	£2,500	£180,000
Tie Rods	at 1.4m centres	40	No.	£2,000	£80,000
Procure and Install Scour Mattress at Toe of Slipway		1	No.	£250,000	£250,000
				Sub Total	£678,000
Mobilisation and Demobilisation of Floating Plant, etc.		1	No.	£100,000	£100,000
Maintain Plant throughout Construction					£70,000
Preliminaries					£100,000
Contingency					£100,000
Engineering Fees					£75,000
	Sub Total of Construction Works to Widen Argour Slipway				**£1,123,000**
Overnight Berthing Structure					
Concrete Deck including Surfacing		260	m^3	£450	£117,000
Deck Furniture		260	sq m	£100	£26,000
Sheet Piles	height upto 12.5m to rock	355	tonne	£5,000	£1,775,000
Tie Rods	two layers at 1.4m centres, plus additional on corners	100	No.	£2,000	£200,000
Rock Infill	average height 10m	6500	m^3	£55	£357,500
Fendering	MV Fenders at 6.0m spacing	21	no.	£20,000	£420,000
Approach Trestle	55m long, 6m wide, Open Piled	330	sq m	£4,000	£1,320,000
Demolish Exisiting Pier		1	No.	£100,000	£100,000
				Sub Total	£4,315,500
Mobilisation and Demobilisation of Floating Plant, etc.		1	No.	£100,000	£100,000
Maintain Plant throughout Construction		1	No.	£350,000	£350,000
Preliminaries					£953,100
Contingency					£857,790
Engineering Fees					£476,550
	Sub Total of Construction Works Overnight Berthing Structure				**£7,052,940**
	SubTotal of Construction Works Ardgour				**£8,264,940**
Nether Lochaber					
Widen Slipway to South and Install Scour Protection at Toe					
Infill Material	2m widening over 46m and 1.5m over 17m	790	m^3	£55	£43,450
Prepare surface to receive rails		135	sq m	£25	£3,375
Levelling Rails	2 rows of 203 x 133 x 25 UB	4	tonne	£1,500	£5,271
RC Concrete Deck	0.4m deep	54	m^3	£750	£40,500
Sheet Piles		95	tonne	£2,500	£237,500
Tie Rods	at 1.4m centres	50	No.	£2,000	£100,000
Procure and Install Scour Mattress at Toe of Slipway		1	No.	£250,000	£250,000
				Sub Total	£680,096
Mobilisation and Demobilisation of Floating Plant, etc.		1	No.	£100,000	£100,000
Maintain Plant throughout Construction					£70,000
Preliminaries					£100,000
Contingency					£100,000
Engineering Fees					£75,000
	Sub Total of Construction Works to Widen Argour Slipway				**£1,125,096**
Small Berth for Crew Transfer Vessel (Optional)					
Sheet Piles		250	tonne	£2,500	£625,000
Infill Materail		500	m^3	£55	£27,500
Tie Rods		50	No.	£2,000	£100,000
Fendering		12	No.	1500	£18,000
RC Concrete Deck		220	m^3	£450	£99,000
Deck Furniture		60	sq m	100	£6,000
	Sub Total of Construction Works for Small Berth				**£875,500**
	SubTotal of Construction Works Nether Lochaber				**£2,000,596**
	Total of Construction Works Option 1A				**£10,265,536**

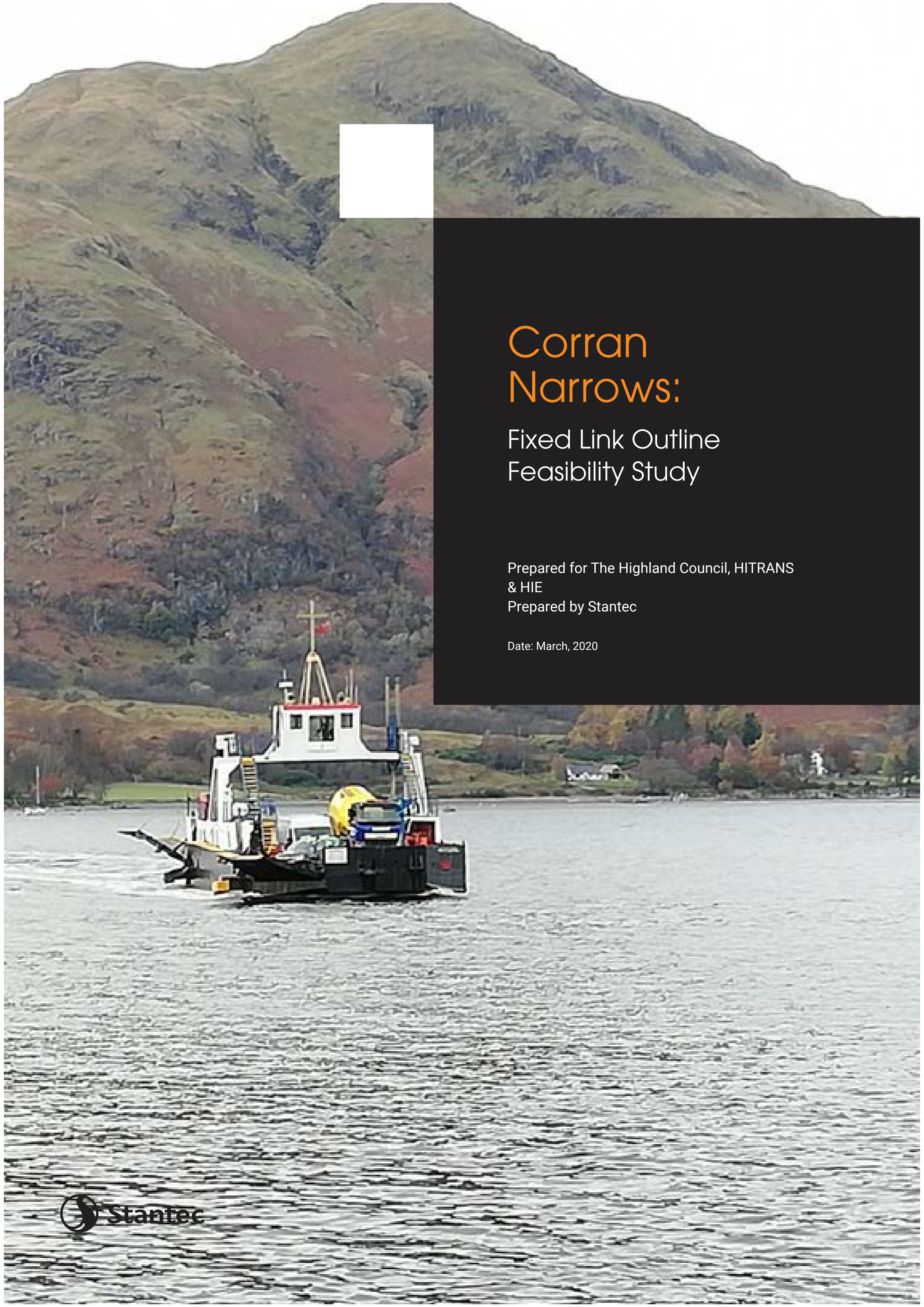
Excludes any land/seabed purchase or lease arrangements

Topographic and Bathymetric suveys are required to confirm levels, and site investigation required to establish ground condtions

Corran Ferry Service Option Appraisal - Option 2C or 2D					
Option 2C - Larger Straight through vessel with MV Corran as relief, MV Maid of Glencoul Sold					
Option 2D - Larger Straight through vessel with MV Corran and MV Maid of Glencoul Sold					
Item		**Quantity**	**Unit**	**£/unit**	**Item Cost**
Ardgour					
Marshalling Area					
Reconfiguring Marshalling Area		1	No	£10,000	£10,000
Installation of Barriers	35m @ £400	1	No.	£14,000	£14,000
	Sub Total of Construction Works to Marshalling Area				**£24,000**
Slipway					
Repairs to Slipway					
Repairs to Slipway for Holing and Subsidence	£20k Materials, Allowance for 3wks Dive Team 15@£3k	1	No	£65,000	£65,000
	Sub Total of Construction Works to Repair Ardgour Slipway				**£65,000**
Widen Slipway to South, Lengthen at Toe and Install Scour Protection at Toe					
Infill Material	5m widening over length and 5m at toe	1675	m^3	£55	£92,125
Prepare surface to receive rails		335	sq m	£25	£8,375
Levelling Rails	5 rows of 203 x 133 x 25 UB	9	tonne	£1,500	£13,500
RC Concrete Deck	0.4m deep	134	m^3	£750	£100,500
Sheet Piles		80	tonne	£2,500	£200,000
Tie Rods	at 1.4m centres	55	No.	£2,000	£110,000
Procure and Install Scour Mattress at Toe of Slipway		1	No.	£250,000	£250,000
				Sub Total	£774,500
Mobilisation and Demobilisation of Floating Plant, etc.					£100,000
Maintain Plant throughout Construction					£95,000
Preliminaries					£150,000
Contingency					£120,000
Engineering Fees					£75,000
	Sub Total of Construction Works Widen Slipway to South and Lengthen at Toe				**£1,314,500**
Aligning Structure and Overnight Berth					
Concrete Deck including Surfacing		1326	sq m	£450	£596,700
Deck Furniture		1326	sq m	£100	£132,600
Sheet Piles	height upto 22m, average 15m	573	tonne	£4,000	£2,293,200
Tie Rods	three layers at 1.4m centres, plus additional on corners	206	No.	£2,000	£411,429
Rock Infill	average height 13m	17238	m^3	£55	£948,090
Fendering	MV Fenders at 6.0m spacing	27	no.	£20,000	£540,000
				Sub Total	£4,922,019
Mobilisation and Demobilisation of Floating Plant, etc.		1	No.	£100,000	£100,000
Maintain Plant throughout Construction		1	No.	£350,000	£350,000
Preliminaries					£984,404
Contingency					£1,034,463
Engineering Fees					£635,642
	Sub Total of Construction Works Aligning Structure Ardgour				**£8,026,528**
	SubTotal of Construction Works Ardgour				**£9,430,028**

Corran Ferry Service Option Appraisal - Option 2C or 2D					
Option 2C - Larger Straight through vessel with MV Corran as relief, MV Maid of Glencoul Sold					
Option 2D - Larger Straight through vessel with MV Corran and MV Maid of Glencoul Sold					
Nether Lochaber					
Widen Slipway to South, Lengthen at Toe and Scour Protection					
Infill Material	2m widening over 46m and 1.5m over 17m	1165	m^3	£55	£64,075
Prepare surface to receive rails		206.5	sq m	£25	£5,163
Levelling Rails	2 rows of 203 x 133 x 25 UB	5	tonne	£1,500	£8,095
RC Concrete Deck	0.4m deep	83	m^3	£750	£61,950
Sheet Piles		105	tonne	£3,500	£368,358
Tie Rods	at 1.4m centres	70	No.	£2,000	£140,000
Procure and Install Scour Matress at Toe of Slipway		1	No.	£250,000	£250,000
				Sub Total	£647,640
Mobilisation and Demobilisation of Floating Plant, etc.					£100,000
Maintain Plant throughout Construction					£95,000
Preliminaries					£129,528
Contingency					£97,146
Engineering Fees					£75,000
	Sub Total of Construction Works Slipway				**£1,144,314**
Aligning Structure and Overnight Berth					
Concrete Deck including Surfacing		392	sq m	£450	£176,400
Deck Furniture		980	sq m	£100	£98,000
Sheet Piles	height upto 20m, average 15m	551	tonne	£3,500	£1,929,375
Tie Rods	two layers at 1.4m centres, plus additional on corners	180	No.	£2,000	£360,000
Rock Infill	average height 12m	4704	m^3	£25	£117,600
Fendering	MV Fenders at 6.0m spacing	24	no.	£20,000	£480,000
				Sub Total	£3,161,375
Mobilisation and Demobilisation of Floating Plant, etc.		1	No.	£100,000	£100,000
Maintain Plant throughout Construction		1	No.	£350,000	£350,000
Preliminaries					£722,275
Contingency					£650,048
Engineering Fees					£433,365
	Sub Total of Construction Works Aligning Structure Nether Lochaber				**£5,417,063**
	Sub Total of Construction Works Nether Lochaber				**£6,561,376**
	Total of Construction Works Option 2C or 2D				**£15,991,404**
Excludes any land/seabed purchase or lease arrangements					
Topographic and Bathymetric suveys are required to confirm levels, and site investigation required to establish ground condtions					

Appendix B Fixed Link Outline Feasibility Study



Corran Narrows:

Fixed Link Outline Feasibility Study

Prepared for The Highland Council, HITRANS & HIE
Prepared by Stantec

Date: March, 2020

Stantec

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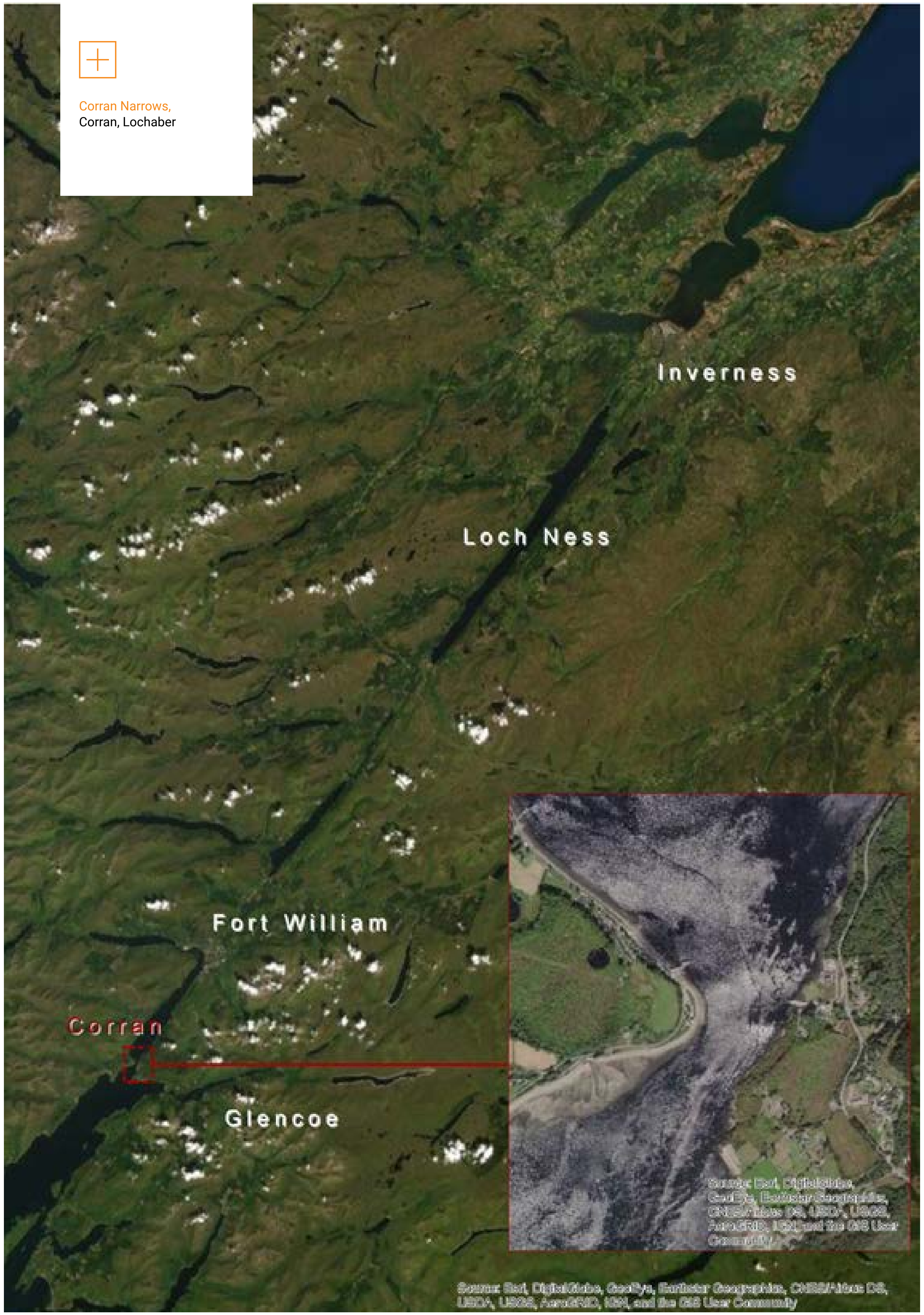
Corran Narrows,
Corran, Lochaber



1.0 Executive Summary

Overview

The Corran Narrows marks the dividing line between the upper and lower section of Loch Linnhe, a circa 30-mile long sea loch which runs along the Great Glen Fault. The loch separates Nether Lochaber from Ardgour and the areas beyond, albeit it is possible to drive around the loch (with some restrictions for larger vehicles). As the name suggests, Loch Linnhe is at its narrowest at Corran, circa 300 metres wide at its narrowest point.

The Corran Ferry service operates the short passenger and vehicle crossing of the Corran Narrows between Nether Lochaber and Ardgour. The service provides a **lifeline connection** linking the communities of Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and, to a lesser degree, the Isle of Mull to Lochaber. The ferry serves a wide variety of purposes including: providing access to employment and other key services for residents; acting as a gateway for tourists visiting the peninsula; and meeting the supply-chain needs of the above communities. **It is understood to be the busiest single-vessel ferry crossing in Europe**.

Whilst the ferry has served communities on both sides of the crossing for many years, there is a longstanding aspiration amongst peninsular communities for a fixed link across the Corran Narrows. Recognising the aspirations of these communities, a partnership of The Highland Council (THC), Highlands and Islands Transport Partnership (HITRANS) and Highlands and Islands Enterprise (HIE) commissioned Stantec to develop a high-level feasibility study for a fixed link across the Corran Narrows.

Why commission this study now?

Whilst the desire for a fixed link at Corran has been a long-held aspiration, two factors have combined to create increased urgency and need for this study:

- The future of the ferry service: Significant investment in new vessels, infrastructure and human resource is required in the near future, prompting the question as to whether a ferry or a fixed link represents the best long-term value for money when considered in the widest sense (i.e. social and economic in addition to financial outcomes).

- Strategic Transport Projects Review 2 (STPR2): STPR2 is a Transport Scotland-led study which will inform transport investment in Scotland for the next 20 years, ensuring that such investment is in line with the vision, priorities and outcomes of the National Transport Strategy 2 (NTS2). Whilst this study may identify a fixed link as a feasible option, there is an affordability question, particularly within the context of limited local authority budgets. Recognising this, the funding partners are seeking to potentially submit the case for a fixed link into the ongoing STPR2, thus progressing it into the national context.

What is the scope of this study?

As alluded to above, this piece of work is a high-level feasibility study. The outcomes emerging from it will require further development, either within the context of STPR2 or as part of a standalone business case comparing ferry and fixed link options. In terms of outcomes, this study:

- reviews case-study evidence on the cost, procurement and socio-economic impact of equivalent fixed links;
- identifies potential route corridors for a fixed link, within which alignments are developed;
- considers the options in relation to the structural form of any fixed link;
- provides a commentary on the required supporting road infrastructure and tie-ins to the existing network on both sides of the crossing;
- provides high-level capital and maintenance cost-banded estimates for each fixed link option;
- identifies the scale of potential Transport Economic Efficiency (TEE) benefits of a generic fixed link, providing a quantified estimate of benefit ranges;
- compares the whole life costs of a fixed link with a continuing ferry service; and
- qualitatively explores the potential societal and economic impacts of a fixed on both sides of the crossing.

At this stage, the study does not:

- firmly define a preferred option in terms of alignment or fixed link structural form;
- recommend whether a ferry or fixed link is the most appropriate long-term option for the Corran crossing; or
- engage with communities and stakeholders.

The study findings help to determine whether there is merit in considering fixed link options for the Corran Narrows further, either within the context of STPR2 or more generally.

What can be learned from previous Scottish fixed links?

Case study evidence from fixed links constructed in the Highlands & Islands between the late 1970s and early 2000s has been considered and the following broad conclusions can be drawn:

- It is reasonable to conclude that a Corran Narrows fixed link will lead to significant traffic generation. This is likely to be due to a combination of: (i) latent demand for journeys which are currently suppressed by the limitations associated with the ferry service - this would include peninsular residents making more frequent trips to Fort William and elsewhere to access services; (ii) increased visitor numbers, particularly in terms of 'unplanned' or spontaneous trips; and (iii) additional journeys generated by 24-hour connectivity.

- The evidence suggests that the provision of a fixed link across the Corran Narrows would make a positive contribution to population retention and growth, although any effects would be long-term in nature and difficult to attribute directly to the crossing given that many factors impact on population numbers and structure.

- A fixed link across the Corran Narrows would provide residents of the peninsula with improved access to employment (and vice versa, although the effect in the other direction is likely to be weaker). There is a risk that it creates a 'dormitory' effect with an increase in commuting to Fort William or elsewhere, but this would nonetheless bring a range of benefits to the peninsula in terms of increased local spending power and the potential in-migration of working-age families.

- Anecdotal evidence suggests that the construction of a fixed link improves the business confidence of an area, but the issues of time-lag and causality make it challenging to isolate specific new business investments emerging directly as a result of a fixed link. The one exception is in the tourism sector where it is the growth in visitor numbers which acts as a direct stimulus to investment.

- Fixed links can fundamentally alter the economic and social fabric of an area. The extent to which this is the case depends on the specific local circumstances. On balance, the evaluation evidence suggests that fixed links have improved the quality of life where they have been built, but they do bring challenges, particularly in terms of any reduction in local services brought about by centralisation and pressure on local infrastructure associated with increased visitor numbers. These issues are likely to be less significant in the context of a peninsula compared to an island.

What are the key environmental, planning and construction considerations at Corran?

Environmental considerations

- The following environmental issues would need to be considered further at detailed design stage:

- the high likelihood of coastal flooding, especially on the eastern bank of Loch Linnhe between Nether Lochaber and Inchree, which can influence design and construction of any fixed link.

- statutory ecological designations, particularly, the Onich to Ballachulish Woods and Shore Special Area of Conservation and the Site of Special Scientific Interest south-west of Inchree; and

- landscape designations and heritage assets, particularly, the Ardgour Special Landscape Area along the west side of Loch Linnhe.

- The above considerations will contribute towards informing the potential alignments for a fixed link.

- It is though important to note that no '**showstopper**' issues have been identified here from an environmental perspective which would preclude the construction of a fixed link across the Corran Narrows.

- Potential environmental impacts will however have to be fully scoped and appropriate mitigation identified through the appropriate assessments if the fixed link proposition is to proceed to detailed design in the future.

Planning considerations

- The proposal for a fixed link across the Corran Narrows is supported within the local planning context. Inclusion of the scheme as an STPR2 priority may also secure its recognition within the emerging National Planning Framework 4 (NPF4).

- However, any planning application will likely need to be accompanied by an Environmental Impact Assessment Report given the scale of the project and potential environmental impacts.

Construction considerations

- The depth of the Corran Narrows together with the main shipping channel being on the eastern side will have implications for the alignment, size and gradients of any fixed link option.

- The Corran Narrows has tidal characteristics which impact on the air draught requirement of vessels. There are also aspirations to develop tidal energy schemes at Corran and thus any fixed link should not prevent the future realisation of these projects.

- The requirement to maintain an appropriate air draught for the transit of vessels along Loch Linnhe, accounting for the tidal range at the Corran Narrows, will be an important consideration.

- The ferry currently provides the main dangerous goods route onto the peninsula (and currently Mull), including for the transport of e.g. fuel and heating oil, agricultural products etc. which is an important aspect in the context of Corran and the subsequent identification of potential fixed link options (i.e. transport of dangerous / hazardous goods through a tunnel)

What route corridors and alignments have been considered?

Five route corridors within which a fixed link could be located have been identified, comprising of **four** bridge corridor options and **one** tunnel corridor option. These are shown in the figure below:

These route corridors can be broadly categorised as follows:

- RC1 would be broadly on the alignment of the current ferry service

- RC2-RC4 would be to the north or south of the existing ferry service

- RC5 would be potentially suitable for a tunnel option..

The table below summarises the performance of each of these identified route corridors against a variety of criteria. The level of impact is registered using a 7-point scale similar to that defined in the Scottish Transport Appraisal Guidance (STAG) as indicated below:

✔ ✔ ✔ - Highly Positive Impact

✔ ✔ - Moderate Positive Impact

✔ - Slightly Positive Impact

O - No Impact

✕ - Slightly Negative Impact

✕ ✕ - Moderate Negative Impact

✕ ✕ ✕ - Highly Negative Impact

Criterion	RC1: Existing Corridor	RC2: Northern Corridor	RC3: Central Corridor	RC4: Southern Corridor	RC5: Tunnel Corridor
Ability to retain ferry service during construction	✕ ✕ ✕	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Long-list of structural options available	✕ ✕ ✕	✕ ✕ ✕	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Ability to retain Narrows as a shipping lane	✔	✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Ability to provide satisfactory air draught	✔	✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Ability to retain future potential for tidal energy generation	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Visual impact of a fixed link	✕	✕ ✕	✕	✕ ✕ ✕	✔ ✔ ✔
Environmental impact of a fixed link	✕	✕ ✕	✕	✕	✕ ✕
Conflict with land ownership	O	✕	O	✕	O
Routing of traffic away from settlements	✕ ✕	✕ ✕ ✕	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Reduction in quantity of required works (earthworks)	✕	✕ ✕	✕	✕ ✕	✕ ✕ ✕
Impact of construction	✕ ✕ ✕	✕	✕	✕ ✕	✕ ✕
Impact on costs of project	✕	✕ ✕	✕	✕ ✕	✕ ✕ ✕

Table 1 1: Route Corridor Impact Summary

Based on the scoring in the table above, the five Route Corridors have been narrowed down to **three** at this feasibility stage. These corridors are as follows:

- Route Corridor 3: Central Corridor, provides the greatest positive impact and the fewest negative impacts across all potential bridge corridors.
- Due to the benefits of the Tunnel Corridor: Route Corridor 5, this option has been retained. It should though be noted that the capital and ongoing costs of a tunnel are likely to be comparatively high and there are significant risks relating to the technical complexity of the work and the procurement of competent UK contractors to deliver it.
- It is also recommended that Route Corridor 1: Existing Corridor is considered further due its location in the current crossing corridor and therefore the more limited roadside works required, and its minimal disruption to surrounding property owners. However, it should be acknowledged that any future consideration of this corridor would be predicated on developing a solution to maintain the ferry service and the identification a deliverable and reliable bridge option which maintains the shipping corridor. Route Corridors 2 and 4, have been sifted at this stage as they offer no further benefits above Route Corridor 3.

Broad fixed link alignments have therefore been worked-up for each route corridor, although these would be subject to significant refinement if the project is taken forward.

Fixed Link Structure Options

A range of fixed link structure options has been developed, building on the STAG principle that all options should be considered and progressively sifted to a working shortlist. These options include both high and low-level bridge options for consideration for Route Corridors 1 and 3, and a tunnel option for route corridor 5.

Each option has been considered on its own merits as a structure and its suitability for this location. The shortlist of fixed link structure options to be considered in any subsequent study are as follows:

- Cable-stayed bridge
- Suspension bridge
- Tied-arch bridge
- Vertical lift-bridge
- Cantilever bridge
- Truss bridge
- Tunnel

A causeway, bascule bridge and swing bridge have been ruled out for a range of reasons, including cost, deliverability and the impact on the shipping channel.

The table below shows estimated undiscounted low and high capital cost ranges for the different options, with risk-adjusted costs also presented (i.e. the inclusion of 66% optimism bias). 60-year operating and maintenance costs are also included, based on a varying percentage of the overall capital cost.

Option	Indicative Capital Cost		Capital Cost + OB		Operational and Maintenance	
	Low	**High**	**Low**	**High**	**Low**	**High**
A – Cable Stayed Bridge	£35m	£45m	*£58m*	*£75m*	*£9m*	*£11m*
B – Suspension Bridge	£37m	£47m	*£61m*	*£78m*	*£10m*	*£12m*
C – Tied-arch Bridge	£30m	£40m	*£50m*	*£66m*	*£5m*	*£7m*
D – Vertical Lift Bridge	£25m	£30m	*£42m*	*£50m*	*£15m*	*£20m*
E – Cantilever Bridge	£40m	£45m	*£66m*	*£75m*	*£5m*	*£8m*
F – Truss Bridge	£35m	£45m	*£58m*	*£75m*	*£10m*	*£12m*
G - Tunnel	£40m	£65m	*£66m*	*£108m*	*£20m*	*£33m*

Table 1 2: Risk Adjusted Capital Cost Ranges of Fixed Link Structures

The cost of the connecting road infrastructure varies depending on the route corridor and alignment chosen, but generally it represents only a small proportion of the total cost of the crossing. It should however be noted that any requirement for rock blasting would significantly increase the cost of the road connections.

An illustrative example of a cable-stayed bridge in Route Corridor 3 (Alignment 1) is shown below:

Figure E1: RC3, Alignment A, Cable Stayed Bridge

Figure E2: RC3, Alignment A, Cable Stayed Bridge, Road Connectivity

What are the potential scale of benefits of a fixed link?

Wider Economic and Social Benefits

It is difficult to quantify the wider economic benefits of these types of schemes in such a sparse rural context. While the economic appraisal in the main focuses on a Benefit Cost Ratio (BCR) figure, it is important to consider the importance of **connectivity and resilience** in the region and the benefits it brings to society.

The recently published National Transport Strategy 2 (NTS2) outlines the importance of taking cognisance of social inclusion and reducing the levels of inequality and deprivation.

As such it is important to consider the following challenges and policies within NTS2, and their application within the context of the communities that depend on the Corran Narrows crossing, as for some it is a lifeline service.

NTS2 The Challenges facing society		
Poverty and child poverty	Social isolation	Gender inequalities
Disabled people	Scotland's regional differences	Global climate emergency
Decline in bus use	Productivity	Fair work and skilled workforce
Tourism	Digital and energy	Spatial planning
Health and active travel	Information & integration	Resilience
Ageing population	The changing transport needs of young people	Reliability and demand management
Technological advances	Air quality	Safety and security
Trade and connectivity	Freight	

Table 1 3: NTS2 Challenges, Transport Scotland 2020

NTS2 Vision

We will have a sustainable, inclusive and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors.

PRIORITIES	OUTCOMES
Promotes equality	Will provide fair access to services we need
	Will be easy to use for all
	Will be affordable for all
Takes climate action	Will adapt to the effects of climate change
	Will help deliver our net-zero target
	Will promote greener, cleaner choices
Helps our economy prosper	Will get us where we need to get to
	Will be reliable, efficient and high quality
	Will use beneficial innovation
Improves our health and wellbeing	Will be safe and secure for all
	Will enable us to make healthy travel choices
	Will help make our communities great places to live

Table 1 4: NTS2 Vision, Transport Scotland 2020

NTS2 Policy	
Policy	**Enabler**
A. Continue to improve the reliability, safety and resilience of our transport system	Increase safety of the transport system and meet casualty reduction targets
	Increase resilience of Scotland's transport system from disruption and promote a culture of shared responsibility
	Implement measures that will improve perceived and actual security of Scotland's transport system
	Increase the use of asset management across the transport system
B. Embed the implications for transport in spatial planning and land use decision making	Ensure greater integration between transport, spatial planning, and how land is used
	Ensure that transport assets and services adopt the Place Principle
	Ensure the transport system is embedded in regional decision making
C. Integrate policies and infrastructure investment across the transport, energy and digital system	Ensure that local, national and regional policies offer an integrated approach across all aspects of infrastructure investment including the transport, digital, and energy system
D. Provide a transport system which enables businesses to be competitive domestically, within the UK and internationally	Optimise accessibility and connectivity within business and business-consumer markets by all modes of transport
	Ensure gateways to and from domestic and international markets are resilient and integrated into the wider transport networks to encourage people to live, study, visit and invest in Scotland
	Support measures to improve sustainable surface access to Scotland's airports and sea ports
E. Provide a high-quality transport system that integrates Scotland and recognises our different geographic needs	Ensure that infrastructure hubs and links form an accessible integrated system that improves the end-to-end journey for people and freight
	Minimise the connectivity and cost disadvantages faced by island communities and those in remote and rural areas
	Safeguard the provision of lifeline transport services and connections
F. Improve the quality and availability of information to enable better transport choices	Support improvements and innovations that enable all to make informed travel choices
	Support seamless journeys providing the necessary infrastructure, information and interchange facilities to connect all modes of transport
	Ensure that appropriate real-time information is provided to allow all transport users to respond to extreme weather and incidents
G. Embrace transport innovation that positively impacts on our society, environment and economy	Support Scotland to become a market leader in the development and early adoption of beneficial transport innovations
H. Improve and enable the efficient movement of people and goods on our transport system	**Ensure the Scottish transport system efficiently manages needs of people and freight**
	Promote the use of space-efficient transport
I. Provide a transport system that is equally accessible for all	Ensure transport in Scotland is accessible for all
	Identify and remove barriers to public transport connectivity and accessibility within Scotland
	Reduce the negative impacts which transport has on the safety, health and wellbeing of people
	Continue to support the implementation of the recommendations from, and the development of, Scotland's Accessible Travel Framework
J. Improve access to healthcare, employment, education and training opportunities to generate inclusive sustainable economic growth	**Ensure sustainable labour market accessibility to employment locations**
	Ensure sustainable access to education and training facilities
	Improve sustainable access to healthcare facilities for staff, patients and visitors
K. Support the transport industry in meeting current and future employment and skills needs	To meet the changing employment and skills demands of the transport industry and upskill workers
	Support initiatives that promote the attraction and retention of an appropriately skilled workforce across the transport sector
L. Provide a transport system which promotes and facilitates travel choices which help to improve people's health and wellbeing	**Promote and facilitate active travel choices across mainland Scotland and islands**
	Integrate active travel options with public transport services
	Support transport's role in improving people's health and wellbeing
M. Reduce the transport sector's emissions to support our national objectives on air quality and climate change	Facilitate a shift to more sustainable modes of transport for people and commercial transport
	Reduce emissions generated by the transport system to improve air quality
	Reduce emissions generated by the transport system to mitigate climate change
	Support management of demand to encourage more sustainable transport choices
N. Plan our transport system to cope with the effects of climate change	Increase resilience of Scotland's transport system to climate change related disruption
	Ensure the transport system adapts to the projected climate change impacts

Table 6 3: NTS2 Policy, Transport Scotland 2020

Items in Orange are especially applicable to the Corran Narrows.

Economic Benefits

A fixed link would provide benefits to the user through reductions in journey times and no longer having to pay a toll. These would be offset slightly by the increased vehicle operating costs resulting from taking a longer driving route compared to being on a ferry.

Note that a 'Do Nothing' scenario is not considered here. The Corran transport connection is lifeline in nature and as such investment in either ferry services or a fixed link in essential in the short / medium term.

Two main scenarios have been considered here:

- Reference Case: In the Reference case, it is assumed that:
  - No fixed link is constructed, with the ferry service providing the long-term solution for the crossing of the Narrows.
  - New ferries and associated infrastructure are provided on life expiry of the current assets. There are a number of variants of the Reference Case, reflecting the range of costs of the different ferry options, and these are set out in more detail below
- Do-Something: In the Do-Something, it is assumed that:
  - A new fixed link will be provided, opening in 2027. This is a conceptual fixed link between Nether Lochaber and Ardgour as the structural form and alignment would not significantly impact on the scale of the benefits.

Within the modelling, as a core assumption, it is assumed that there would be a 50% uplift in trips associated with the introduction of a fixed link, accounting for people in the area making more trips and an increase in tourist-based trips.

Given the uncertainties surrounding the main appraisal parameters at this early feasibility stage, we developed **72 different scenarios (4*6*3)** to represent the potential costs and benefits of a fixed link compared to an ongoing ferry operation, comprising:

- **4 Ferry Cost Scenarios:**
  - Quarter Point Ferry Low Cost
  - Quarter Point Ferry High Cost
  - Straight Through Ferry Low Cost
  - Straight Through Ferry High Cost
- **6 Fixed Link Cost Scenarios:**
  - Cable Bridge Low Cost
  - Cable Bridge High Cost
  - Vertical Lift Bridge Low Cost
  - Vertical Bridge High Cost
  - Tunnel Low Cost
  - Tunnel High Cost
- **3 Benefits Scenarios:**
  - 5 Minute Wait for Ferry
  - 10 Minute Wait for Ferry
  - 15 Minute Wait Ferry

The four ferry options were derived from the preferred options identified through the Corran Ferry STAG Part 2 Appraisal and encompass the variety of costs represented by these options.

The six fixed link scenarios were derived from the range of costs associated with the options A-G described above. These three core fixed link options provide an envelope of costs comprising the seven options (A-G) providing a representative cost range.

We have estimated a range of PVBs (Present Value of Benefits) based on 5, 10 and 15-minute average ferry wait times (indicated by the 3 benefits scenarios), ranging from **£25.8m to £60.0m.**

Of all the scenarios considered, over **80% generated an implied Benefit Cost Ratio of greater than 1.**

Other notable results from the analysis include:

- 5 Min Wait Scenario: With the exception of the high cost tunnel options, the majority of the scenarios provide a BCR greater than 1. Only seven scenarios fail to deliver a BCR greater than 1.
- 10 Min Wait Scenario: Only 4 scenarios fail to deliver a BCR greater than 1, with these comprising the high cost tunnel scenarios.
- 15 Min Wait Scenario: All scenarios provide a BCR greater than 1.

This implies that, based on this initial analysis and the core assumptions made here, the fixed link could be a 'feasible' proposition from this perspective.

How might a fixed link impact on the economy and society of the area?

Outwith the estimated quantified economic benefits, a key question is how the construction of a fixed link would impact on the social and economic structure of both the peninsula and Lochaber communities. It should be noted that, as this is a high-level feasibility study only, no primary research or stakeholder & public engagement has been undertaken, with the type and potential scale of benefits drawn from the case study evidence and some initial consultation undertaken during the Corran Ferry STAG Appraisal work. Should the proposal be progressed further, supporting research (potentially including an Economic Impact Assessment) and a full programme of engagement would be required to more fully establish existence and scale of the anticipated benefits.

When considering the potential impacts, it is important to bear in mind that the peninsula is an expansive land mass, connected throughout much of that area by single track roads. Impacts are therefore likely to be most strongly felt in Ardgour, Morvern and Sunart, but perhaps less so in Ardnamurchan and Moidart.

The 'logic map' shown in Figure E3 below provides a systematic means of considering and presenting the potential benefits of a fixed link. The **Strategic Need** sets out the rationale for intervention, with the evidence showing the current issues and problems. If there is investment of X (**Inputs**) this will then generate **Outputs** which result in certain **Outcomes** and then, ultimately, **Impacts**.

When considering how a fixed link may affect the economy and society of the study area, the key column in the logic map is the anticipated '**impacts**':

Figure E3: Corran Narrows Fixed Link – Logic Map

Strategic Need

- Nether Lochaber – Ardgour busiest single vessel route in Europe
- Capacity constraints on the ferry service at peak times or when MV *Maid of Glencoul* is operating on its own
- Requirement for major capital investment in ferry service
- Human resource challenges associated with the ferry service – front line and back office
- Limitations on the size of commercial vehicles which can access the peninsula when ferry is off or MV *Maid of Glencoul* is operating on its own
- Social & economic development – supporting development of a fragile community

Inputs

- Corran Narrows Fixed Link Feasibility Study
- Development of Outline and Final Business Cases – these would include detailed option development and established funding, procurement and management arrangements
- Placing of contract following procurement process

Outputs

- Bridge or tunnel across / under the Corran Narrows
- Connecting road infrastructure to the A82 and A861
- Management, operation and maintenance contract in place
- Sale or disposal of the MV *Corran* and MV *Maid of Glencoul*

Outcomes

- Additional trips across the Corran Narrows
- 24-hour access between the peninsula and Lochaber (and vice versa)
- Creation of unrestricted large HGV route onto peninsula
- Reduced journey times
- Overall improved journey time reliability
- Improved resilience for the peninsula and, to a lesser extent, the A82
- Supports active travel corridor along west side of Loch Linnhe (although reliance on Camusnagaul Ferry for 'short' connection to Fort William)
- Increased emissions from more trips
- Reduced emissions from not operating ferries

Impacts

- Population retention / growth
- Expanded labour market catchment & job opportunities
- Increased local / regional productivity
- New business formation
- Increased tourism in peninsula
- Improved access to services – health, education, social & leisure opportunities
- Improved supply-chain efficiency
- Efficiencies in service delivery from the perspective of the public sector
- Quality of life benefits

What are the key conclusions?

This high-level feasibility study has demonstrated that, subject to more detailed option development and costing, a fixed link across the Corran Narrows appears a potentially viable proposition from an engineering, planning and financial perspective. In particular, it should be noted that:

- There are no 'showstopper' issues preventing the construction of a fixed link, albeit there are environmental, planning and construction issues which would need to be taken into consideration. The fixed link is therefore technically feasible.
- The costs of a fixed link are not significantly out of step with a continued ferry service, particularly when set against the range of benefits of a fixed link.
- Under the majority of the scenarios developed here, the fixed link proposal generates a benefit-cost ratio of greater than 1.

The analysis and evidence presented in this report therefore suggests that **there is a case for further exploring the comparative merits of a fixed link, either within the context of STPR2 or as a standalone business case**.

What are the next steps?

Whilst this study has demonstrated that a fixed link is a potentially viable option for the Corran Narrows, it is essential to bear in mind that it is an early feasibility study, drawing together high-level option development, costing and economic narrative. It is clear that further development work will be needed to take the project to the next stage.

The project partners should consider **submitting this report to Transport Scotland for consideration within the STPR2 options appraisal process**. Whilst STPR2 represents an important opportunity to realise a fixed link at Corran, it should not be considered the only avenue for realising this aspiration as there are a number of uncertainties attached to it, not least whether a fixed link across the Narrows would be prioritised.

Corran Transport Link – Outline Business Case

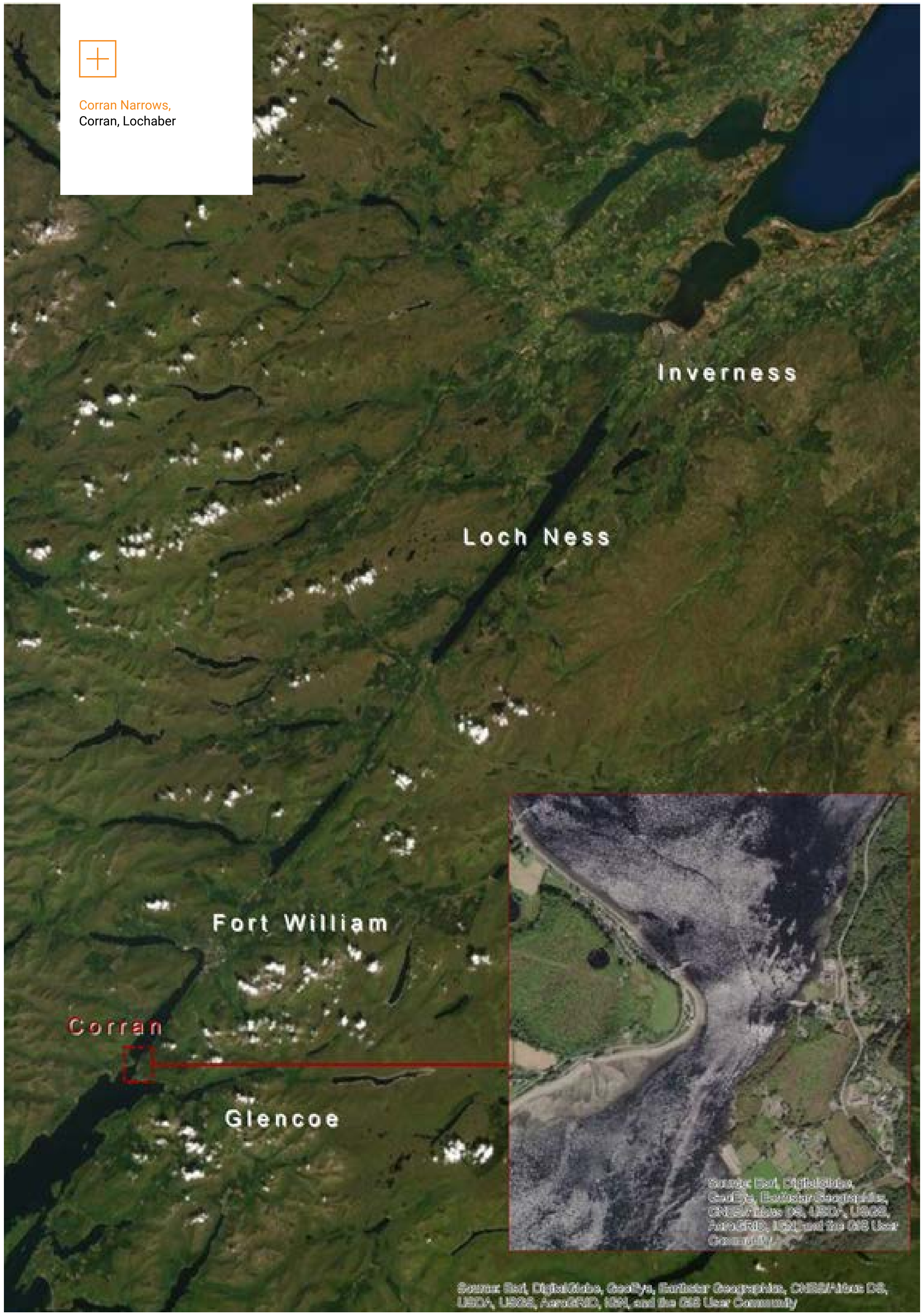
There are now two recent studies exploring future transport provision across the Corran Narrows:

- Corran Ferry STAG Appraisal: This report was published in 2018 and considered the different options for the future of ferry services at Corran, mainly form a technical and financial perspective. This study did not cover fixed links and thus was focussed on ferry-based options only.
- Corran Narrows Fixed Link Feasibility Study (i.e. this report): This report develops the fixed link options to a level equivalent with ferry options in the Corran Ferry STAG Appraisal.

To comply with best practice, in devising a long-term solution for the Corran Narrows, there would be significant benefit in developing single, umbrella Strategic and Outline Business Cases considering the comparative merits of ferry and fixed link-based solution in the round. This would involve:

- Combining the Corran Ferry STAG Appraisal and the Fixed Link Feasibility Study into a single Strategic Business Case within the STAG format.
- Infilling material to comply with STAG including public and stakeholder engagement
- Undertaking bespoke analysis of the economic and social impacts of a fixed link on the peninsula
- The SBC should then be progressed to an Outline Business Case (OBC) which would select a preferred option for the long-term future of transport across the Narrows.

Corran Narrows,
Corran, Lochaber



2.0 Introduction

2.1 Overview

The Corran Narrows marks the dividing line between the upper and lower section of Loch Linnhe, a circa 30-mile long sea loch which runs along the Great Glen Fault. The section of the loch upstream of Corran separates Lochaber from Ardgour and the areas beyond, albeit it is possible to drive around the loch, although with some restrictions for larger vehicles. As the name suggests, Loch Linnhe is at its narrowest at Corran, circa 300 metres wide at its narrowest point. The map left shows the location of the Corran Narrows.

The Corran Ferry service operates the short passenger and vehicle crossing of the Corran Narrows between Nether Lochaber and Ardgour. The service provides a lifeline connection linking the communities of Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and, to a lesser degree, the Isle of Mull to Lochaber. The ferry serves a wide variety of purposes including: providing access to employment and other key services for residents; acting as a gateway for tourists visiting the peninsula; and meeting the supply-chain needs of the above communities. **It is understood to be the busiest single-vessel ferry crossing in Europe.**

Whilst the ferry service has met the needs of communities on both sides of the crossing for many years, it is at present facing significant challenges associated with:

- the requirement for capital investment to replace life-expired assets, particularly the back-up ferry, MV *Maid of Glencoul*, which entered service in 1971; and
- the development of a sustainable human resources solution, both in terms of front-line and back office staff, to operate the service.

In parallel to this, there is a long-held aspiration amongst the peninsular communities, and those living in Mull, for a fixed link to replace the ferry service, as reflected in the adopted 2019 WestPlan, safeguarding the crossing for future option appraisal. Recognising the aspirations of both these communities, a partnership of The Highland Council (THC), Highlands and Islands Transport Partnership (HITRANS) and Highlands and Islands Enterprise (HIE) has commissioned Stantec to develop a high-level feasibility study for a fixed link across the Corran Narrows.

2.2 Why Commission This Study Now?

Whilst the desire for a fixed link at Corran has been prominent for many years, two factors have combined to prompt the requirement for this study.

2.2.1 The future of the ferry service

Whilst THC is addressing some of the immediate issues with the ferry service through a business case process, there is a much longer-term consideration as to whether a ferry or fixed link would provide the best value for money when considered in the widest sense (i.e. social and economic as well as financial outcomes). With capital expenditure in the region of £23m-£40m required on the ferry service in the medium term, it is essential to contrast the comparative merits of an ongoing ferry service against a fixed link before committing to any new investment. This high-level feasibility study will identify and compare the costs and benefits of a fixed link relative to a ferry, providing an initial steer with respect to future investment priorities.

2.2.2 Strategic Transport Projects Review 2 (STPR2)

Whilst the study may identify a fixed link as providing value for money over the long-term, the up-front investment cost is likely to significantly exceed that of a ferry replacement programme. There is therefore an affordability question, particularly within the context of reductions in local authority budgets.

Recognising the affordability challenge, THC is seeking to submit the case for a fixed link into the ongoing Strategic Transport Projects Review 2 (STPR2), thus progressing it for consideration in the national context. STPR2 is an ongoing Transport Scotland study which will inform transport investment in Scotland for the next 20 years, ensuring that investment is in line with the vision, priorities and outcomes set out in the National Transport Strategy 2 (NTS2). This study will, at a high-level, frame the costs and benefits of a fixed link, providing a basis for further development and appraisal within the context of STPR2.

2.3 Study Scope

As alluded to above, this piece of work is a high-level feasibility study. The outcomes emerging from it will require further development, either within the context of STPR2 and / or as part of a standalone business case comparing ferry and fixed link options. In terms of outcomes, the study will:

- review case study evidence on the cost, procurement and impacts of equivalent fixed links;
- identify potential alignments for a fixed link, defined on a corridor basis;
- consider the types of fixed link which could be progressed in each corridor;
- set out the most appropriate fixed link options within each corridor;
- provide a commentary on supporting road infrastructure and tie-ins to the existing network on both sides of the crossing;
- provide high level capital and maintenance cost bands for each fixed link option;
- identify the Transport Economic Efficiency (TEE) benefits of a generic fixed link;
- qualitatively explore the potential societal outcomes and impacts of a fixed link on both sides of the crossing; and
- compare the whole life costs of a fixed link to continuing with a ferry service.

The output of this process **will** determine:

- whether a fixed link can feasibly be delivered at the Corran Narrows;
- if so, identify options in relation to the alignment and structural form;
- lifetime costs of the fixed link;
- the benefits of a fixed link; and
- the comparative costs of a fixed link and continued ferry service over a 60-year appraisal horizon.

At this stage, the study **will not**:

- firmly define a preferred option in terms of alignment or structural form;
- recommend whether a ferry or fixed link is the most appropriate long-term option for the Corran crossing; or
- engage with communities, which is outwith the scope of work at this stage.

2.4 Corran Ferry Stag Appraisal

It should be noted that THC commissioned Stantec (formerly Peter Brett Associates LLP), Mott MacDonald and WSMD Associates to prepare a Scottish Transport Appraisal Guidance (STAG) study of future options for the Corran Ferry in February 2018. The findings of this study were published in November 2018. To avoid confusion, it is worthwhile explaining the purpose and broad outcomes of this piece of work, and how they relate to this feasibility study.

The Corran Ferry STAG Appraisal was prompted by a desire to secure the short to medium-term future of the ferry service (circa 5-10 years), addressing the issues associated with ageing capital assets and human resource pressures. The study sought to answer two discrete questions within the overall context of the STAG framework:

- What level of service should be provided in the future? (the 'what'); and
- How should the service be funded and delivered? (the 'how').

The study did not compare a ferry service and fixed link given the shorter-term focus of the work, but it highlighted that there was a longer-term question surrounding the most appropriate solution for the Corran Narrows.

The key point in relation to this feasibility study is that the STAG study identified and costed three vessel and marine infrastructure solutions, thus allowing for a comparison with the cost of a fixed link.

2.5 Report Structure

This report consists of five further chapters, as follows:

- Chapter 3 provides case study evidence considering the form, cost and outcomes & impacts of other fixed links from within the United Kingdom (UK).
- Chapter 4 sets out the land-use, planning and environmental constraints in the vicinity of the Corran Narrows, which must be considered when developing fixed link proposals.
- Chapter 5 sets out the detailed option development, with respect to the alignment, structural form, connecting road infrastructure and indicative cost of different fixed link options.
- Chapter 6 establishes the TEE and wider economic impacts of a fixed link and compares the whole life costs and benefits of such a structure to the equivalent for a continued ferry service.
- Chapter 7 provides conclusions, recommendations and next steps.

MV Corran,
Corran Narrows.

3.0 Case Studies

3.1 Overview

In order to place the proposed fixed link at Corran in context, it is beneficial to review case study evidence and experience related to other fixed link schemes, which have been delivered in the UK. This chapter consists of three sections, as follows:

- The **appraisal context** (Section 3.2): this section considers how the case for a fixed link at Corran would be made.
- The **deliverability context** (Section 3.3): This section sets out other fixed link schemes which have been delivered in the UK in recent decades and explores the cost, design and procurement challenges associated with different types of fixed link.
- The **socio-economic context** (Section 3.4): Using case study evidence, this final section explores the societal outcomes and impacts which have emerged from recent fixed link projects.

3.2 The Case For Fixed Links

3.2.1 Appraisal and the Business Case Process

The case for any major new piece of transport infrastructure in Scotland is initially made in the context of a STAG study and a subsequent business case. The appraisal process allows for an objective-led and multi-modal approach to identifying a preferred option which addresses an evidenced set of transport problems and opportunities.

Whilst the STAG process involves a multi-criteria appraisal, the key output in most studies is the benefit-cost ratio (BCR), which compares the social welfare benefits of a scheme against its financial cost.

3.2.1.1 Transport Economic Efficiency

The 'benefit' side of the cost-benefit ledger is principally determined by the TEE benefits of a scheme – this typically involves:

- calculation and monetisation of the travel time savings associated with a scheme for existing users;
- where a fixed link is new / replacing a ferry service (rather than replacing a life-expired fixed link), monetisation of the frequency benefits; and
- benefits for 'new' demand, where these new users are assigned half of the benefits of existing users (the 'rule of a half').

On large scale fixed link projects, such as the Queensferry Crossing and Mersey Gateway, the TEE benefit accounts for the bulk of the benefits generated, reflecting the high volumes making movements between e.g. Edinburgh & Fife and Cheshire & Merseyside.

The Corran Ferry is understood to be the busiest single vessel ferry route in Europe and thus a fixed link across the Narrows would similarly generate TEE benefits associated with:

- the ability to travel without waiting on a timetabled ferry and travelling at times when the ferry does not operate (or when it is suspended due to weather or a breakdown);
- reduced crossing times between Nether Lochaber and Ardgour from not having to queue for, board, travel on and disembark the ferry; and
- year-round 24-hour access to the peninsula.

Whilst a Narrows fixed link would generate TEE benefits (which will be estimated as part of this study), it is possible that the costs of such a connection would exceed the TEE benefits. Despite being the busiest single vessel route in Europe, absolute traffic numbers remain relatively low, circa 700-750 Annual Average Daily Traffic (AADT) currently. The long-term case for a fixed link across the Narrows therefore has to be much wider than would perhaps be required for a link connecting two major centres of population or adjoining banks of a river in a major urban area.

3.2.1.2 Wider Economic Impacts

In recent years, transport appraisal guidance has evolved to account for 'wider economic impacts' (WEI), which are non-transport benefits which emerge in addition to the TEE. WEI take the form of:

- increases in **productivity**, associated with improved transport connections effectively bringing places, businesses and employment & labour markets closer together (known as **agglomeration**); and
- enhancements to the functionality of **labour markets**, in terms of:
    - those currently out of work moving into employment;
    - people in work moving to more productive employment; and
    - people working more hours.

The guidance suggests that WEI, and in particular agglomeration benefits, only typically occur in the largest schemes, and in any case are treated as a sensitivity on the BCR rather than a core component. They have nonetheless been integral in several business cases making the case for investment where the conventional BCR does not suggest that the project is economically beneficial. For example, WEIs have been an important part of the business case for the dualling of the A9 and A96. Whilst not expressed as WEI specifically, the productivity, land-use and labour market benefits were also integral to making the case for the committed new River Clyde crossing between Renfrew and Yoker as part of the Glasgow and Clyde Valley City Deal.

As alluded to above, the guidance would suggest that WEIs are unlikely to be material with respect to a fixed link at Corran given relatively low traffic flows, low population and limited economic activity on either side of the crossing – it will therefore not be possible to monetise the WEIs. There is nonetheless a strong qualitative case that a fixed link in this context would support the delivery of a range of socio-economic benefits beyond the pure TEE – this report will therefore include an 'economic narrative' explaining the potential of a Corran Narrows fixed link to generate wider economic and distributional benefits, including:

- Facilitating improved **access to employment** in Fort William and beyond – the Corran Ferry operating day currently permits a standard working day in Lochaber, but shift work is more difficult.
- Improving access to all other **services** in Lochaber, including Belford Hospital (particularly in emergencies) and higher education.
- Improving the **resilience** of the peninsula and, to a lesser degree, the Isle of Mull (providing an alternative route to the mainland in the event that the Oban – Craignure route is out of service).
- Promoting scope for **business investment** through improving access to Lochaber and beyond (although note that given the size of the labour market, on-peninsula infrastructure etc, the scale of new business investment is likely to be limited).
- Promoting increased **tourism**, in effect addressing the 'psychological barrier' associated with having to take a ferry. Those unfamiliar with the arrangements at Corran may be interested in visiting the peninsula but could drive past due to lack of awareness of the fares, length of operating day, timetable etc. It should though be noted that increased tourism can be a double-edged sword in areas with limited road and public infrastructure provision.
- Assuming any fixed link is not tolled, increasing the **disposable income** of residents in the peninsula, which generally lags regional and Scottish averages due to limited employment opportunities.
- Improved **supply-chain efficiency** and public transport reliability.

The extent to which such benefits have emerged in other recent fixed link schemes in the Highlands & Islands (e.g. Skye Bridge, Scalpay Bridge etc) will be explored in Section 2.4.

3.2.2 What are the implications for the Corran Narrows?

The purpose of this feasibility study is to calculate the TEE benefits associated with a fixed link across the Corran Narrows and compare them to:

- the costs associated with a shortlist of bridge and tunnel options, deriving a benefit-cost ratio; and
- the costs and benefits of continued operation of a ferry between Nether Lochaber and Ardgour.

This technical exercise will act as a 'gateway' process to enable the joint agencies to submit the study information for consideration in Transport Scotland's STPR2 or if required to be considered more widely beyond STPR2. If the decision is made to promote the scheme, a much more detailed piece of research will be required to expand on the social and economic 'outcomes' and 'impacts' of a fixed link.

3.3 Recent Experience, Standards And Procurement

3.3.1 Overview

The 'optioneering' task of this appraisal will explore the different types of fixed link which could be constructed across the Narrows. Whilst the full range of fixed link options will be considered, it is highly likely that the solution would either be a bridge or a tunnel (the requirement to maintain a shipping lane and the depth of water would likely prevent a causeway).

To provide context, this section firstly reviews recent new build bridges and tunnels in the UK, before exploring technical design standards and the procurement environment within which any fixed link would be constructed.

3.3.2 Recent New Build Bridges & Tunnels in the UK

3.3.2.1 Bridges

In setting the context for a potential bridge across the Corran Narrows, it is worth reflecting on other bridges recently built in the UK. A selection of such bridges is shown in the table below, setting out their length, the number of lanes, opening year and cost, both at the time of construction and in 2018 prices. It should be noted that:

- Only road bridges crossing river estuaries / firths / sea lochs have been included, with a focus on crossings in Scotland and in particular the Highlands & Islands.
- With the exception of the recently constructed Queensferry Crossing and Mersey Gateway bridges, the focus is predominantly on smaller and lower cost bridges akin to what would be anticipated at Corran.
- The table is only intended to provide an indication of recent history in terms of cross-water bridge construction in the UK. Every project has its own unique characteristics and cannot readily be compared to what is proposed at Corran.
- The uprating of build costs to 2018 prices is based on the Bank of England inflation calculator, which uses the Retail Price Index. These costs therefore do not specifically reflect construction indices and any location related cost inflations.
- In many cases, it is unclear whether the bridge costs we have found through our research are for the structure only or include the connecting road infrastructure.

Bridge	Length (m)	Total Lanes	Year Opened	Cost (£m)	Cost (£m, 2018 prices)[1]
Clyde Arc	96	2	2006	£20.30	£28.90
Jubilee Bridge, Stockton-on-Tees	150	4	2002	£14.30	£22.90
Surtees Bridge, Teesside	150	6	2008	£14.30	£18.70
Creagan Bridge	150	2	1999	£4.00	£6.80
Scalpay	170	1	1997	£6.40	£11.40
Kylesku	276	2	1984	£4.00	£12.60
Flintshire	294	4	1998	£55.00	£95.10
Skye	500	2	1995	£27.00	£51.00
Cleddau, Pembrokeshire	820	2	1975	£11.80	£97.20
Dornoch	892	2	1991	£13.50	£28.50
Kessock	1,056	4	1982	£17.50	£60.70
Clackmannanshire	1,200	3	2008	£120.00	£157.30
Sheppey Crossing, Kent	1,250	4	2006	£30.00	£42.60
Cromarty	1,464	2	1979	£5.0[2]	£17.30
Mersey Gateway	2,200	6	2017	£600	£620.00
Queensferry	2,700	4	2017	£1,350	£1,395.00

Table 3 1: Recent Cross-Water Bridges Constructed in the UK

The key points of note from the above table are as follows:

- There is a strong and recent UK track record in building new bridges spanning rivers, estuaries / firths and major sea lochs, with the above providing only some examples from a much longer list. This is an important point as it demonstrates that there is current procurement and contractor experience in the UK.
- There was a concerted programme of bridge building in the Highlands over the period 1982 to 1995. It is notable that there was an established road route available prior to the construction of the Kessock, Cromarty and Dornoch Bridges. The focus of these connections was therefore on reducing journey times and promoting improved accessibility along what is now the A9 corridor (and in particular from Caithness and Sutherland to Inverness).

3.3.2.2 Tunnels

An equivalent table showing recent UK experience in tunnelling is provided below. Given the context at Corran, the focus is again on road crossings under major bodies of water.

1 | 2018 costs calculated on basis of Bank of England inflation calculator.
2 | This was the only published figure which could be found for the Cromarty Bridge, but it appears very low and out of keeping with other bridges of a similar length, so it is possible that there is an error in the figure.

Bridge	Length (m)	Total Lanes	Year Opened	Cost (£m)	Cost (£m, 2018 prices)[3]
Medway Tunnel	240	4	1996	£80.00	£147.50
Queensgate Tunnel, Cardiff	715	4	1995	£60.0[4]	£113.30
Conwy Tunnel, North Wales	1,080	4	1991	£146.00	£307.90
Tyne Tunnel 2	1,500	4	2011	£139.00	£166.40
Limehouse Link, London	1,800	6	1993	£293.00	£586.30

Table 3 2: Recent Underwater Tunnels Constructed in the UK

The key points of note from the above table are as follows:

- There have been comparatively few major underwater road tunnels built in the UK in recent years, although there have been several tunnels built under hills and for railways, canals and utilities. The most recent underwater road tunnel built in Scotland was the Clyde Tunnel, which opened in 1963. This suggests that procurement and contractor expertise is much more limited than is the case with bridges.
- It is also notable from the above list that, with the exception of the Conwy Tunnel, the others are in major city centres where presumably land availability / value and, to a lesser degree, visual amenity are the key driving factors in choosing a tunnel over a bridge.
- In the context of Conwy, a tunnel was chosen over a bridge for environmental reasons and to preserve views of Conwy Castle[5]. This tunnel is an immersed tube rather than a bored tunnel, as would be required at Corran to avoid compromising the navigation channel and future potential for developing tidal energy in the Narrows.

3.3.3 Design Standards

3.3.3.1 Bridges

Roads in Scotland are designed to the requirements set out in the Design Manual for Roads and Bridges (DMRB). These requirements include desirable minimum requirements and absolute requirements. In certain circumstances, at the discretion of the designer, designs can incorporate elements which do not meet the desirable minimum requirements, road gradients for example. These are known as **'Relaxations'**.

If a design does not meet the absolute requirements, a **'Departure from Standard'** is required and this must be approved by the Overseeing Organisation, which in this case is likely to be one of the road authorities, The Highland Council or Transport Scotland[6].

3.3.3.2 Tunnel

THC has recently published a range of STAG and DMRB reports in relation to options for addressing rock falls on the A890 at Stromeferry in Wester Ross. The options considered in that report included a range of fixed link types for crossing Loch Carron. Of particular relevance with respect to this piece of work is the review of tunnel options, which sets out the design considerations for a tunnel in an area broadly similar to Corran. There is benefit in replicating this section of the Stromeferry report almost in its entirety, as it provides useful design considerations and a benchmark for Corran.

Design Standards

Tunnel options were considered as part of the Stromeferry STAG Appraisal, which identified that Transport Scotland would be the Technical Approval Authority (TAA) for the options presented in that appraisal. Given that any fixed link at Corran would be on the THC road network and also tie into the A82(T), it is highly likely that Transport Scotland would be the TAA in this instance also. As such, the applicable design standard for road tunnels constructed as part of the scheme would be DMRB BD 78/99 'Design of Road Tunnels'.

Other Design References

Road tunnels which form part of the Trans-European Transport Network (TEN) and exceed 500m in length must be designed in accordance with the Road Tunnel Safety Regulations 2007, which is transposed into UK law Directive 2004/54/EC of the European Parliament and of the Council (although this is now, of course, potentially subject to change). Whilst neither the A82 or A861 are part of the TEN, the regulations do, however, exist as an example of best practice and provide relevant guidance intended to minimise risk in road tunnels. It is, therefore, considered that the design of any new tunnel under the Corran Narrows should be in accordance with relevant requirements of the regulations as referenced below:

- Directive 2004/54/EC of the European Parliament and of the Council of 29 April 2004 on minimum safety requirements for tunnels in the Trans-European Road Network.
- Statutory Instruments, 2007 No. 1520, Highways, Tunnels, The Road Tunnel Safety Regulations 2007.

Risk Evaluation & Management

Risk evaluation and management are key components in road tunnel design and several sources provide guidance. The British Tunnelling Society has published a code of practice that sets out guidance on the identification, minimisation and management of risks associated with tunnelling works[7]. The World Road Association (PIARC) also provides guidance on the management of operational risks for road tunnels. This guidance is published online as the PIARC Road Tunnels Manual.

Interpreted Design Requirements and Guidance

The references cited above provide important requirements and guidance for the design of new road tunnels and these should be considered at the option selection and design stages – i.e. the stages subsequent to this study if a tunnel is selected as the most appropriate form of fixed link. Relevant guidance and requirements are summarised below:

- The Road Tunnel Safety Regulations suggest the following should be considered for any tunnel across the Narrows:
  - Duties of the Tunnel Manager.
  - Appointment of a Safety Officer.
  - Appointment of an Inspection Entity.
  - Appointment of a Technical Approval Authority (anticipated to be Transport Scotland).
  - Use of Risk Analysis to assess operating risks prior to design.
- Suitable signage should be provided as indicated within the 2007 Regulations, Annex I.
- Emergency equipment and exits and the provision of information to tunnel users in an emergency should be in accordance with the 2007 Regulations, Annex I.
- Planning and design of the tunnel and ground investigation for tunnelling should be in accordance with the 'Codes of Practice' referenced above.
- Pedestrians and animals are generally not permitted to use road tunnels under the requirements of BD 78/99. The majority usage at Corran would be vehicles (as per the ferry) but the requirement for pedestrian and animal usage would need to be consulted on in any future business case. Specific design requirements must be considered if pedestrians and animals are to be permitted to use the tunnel. This may require the use of a dividing wall within the tunnel to provide a separate structural cell for these user classes.
- BD 78/99 requires classification of the tunnel by length and traffic volume to determine safety measures and requirements. Based on an annual average traffic flow (AADT) of 700-1,000[8] vehicles per day and tunnel lengths of between 1km and 3km, the tunnel would be classified as Tunnel Category B[9]. This classification would lead to the following principal safety and fire protection requirements:
  - emergency telephones;
  - fire extinguishers;
  - pressurised fire hydrants;
  - emergency exit signs;
  - lane control and tunnel closure signs / signals;
  - emergency stopping lane;
  - emergency walkway; and
  - ventilation for smoke control.
- In addition, the following equipment or measures may be required:
  - radio rebroadcasting system;
  - traffic Loops;
  - CCTV;
  - fire hose reels; and
  - escape doors.

Transport of Dangerous Goods

BD 78/99 requires assessment of the risks associated with the carriage of dangerous goods through road tunnels and the adoption of suitable safeguards. Dangerous Goods are defined as explosives, flammables, radioactives and toxins. Assessment of the risks involved would include consideration of the types of materials that are likely to be carried, patterns of traffic flow and the risks associated with passage through the tunnel compared to alternative routes.

Research has been carried out by the World Road Association (PIARC) regarding the assessment of risks associated with the passage of dangerous goods through tunnels. This research has resulted in the development of a Quantitative Risk Assessment Model (QRAM) for Dangerous Goods Transport through Road Tunnels. The software model allows parameters for the tunnel and alternative routes to be entered and permits evaluation of tunnel facilities and safety measures.

Where there is no suitable alternative route for hazardous goods or the alternative routes give rise to significant risks, it is usual to provide specific safety measures, such as isolation of vehicles carrying hazardous goods from other tunnel users. This is an important issue in the context of Corran, as the ferry currently provides the main dangerous goods route onto the peninsula, including for the transport of e.g. fuel and heating oil, agricultural products etc. Whilst there are alternative routes, they are predominantly single track and also have height restrictions which limit the types of vehicle which can use them. Moreover, the Corran Ferry also currently provides the dangerous goods access for Mull and Iona via the Lochaline – Fishnish ferry. This is because the current vessel on the primary Oban – Craignure route is closed deck and cannot accommodate certain categories of dangerous goods

3 | 2018 costs calculated on basis of Bank of England inflation calculator.
4 | Note – this project was developed as part of the wider Butetown Link Road and there is no readily available data on the outturn cost of the project overall or the tunnel component of it.
5 | http://www.engineering-timelines.com/scripts/engineeringItem.asp?id=381
6 | Stromeferry Options Appraisal STAG Part 1 / DMRB Stage 1 Report (URS, 2013), pp. 89-92.
7 | The Joint Code of Practice for Risk Management of Tunnel Works in the UK, prepared jointly by The Association of British Insurers and The British Tunnelling Society, published by The British Tunnelling Society, 2003

8 | Scottish Transport Statistics notes that, in 2018, the Corran Ferry carried 257,500 cars, meaning Average Annual Daily Traffic (AADT) is 705 cars (and 35 commercial vehicles and coaches). It is though assumed that any fixed link would generate traffic, so for the purposes of this comparison, it can be assumed that AADT would be in the region of 700-1,000 vehicles per day.
9 | See BD 78/79, Figure 3.1.
10 | Stromeferry: Review of Tunnel Options (URS, 2014), pp. 6-8.

(although it should be noted that proposed vessel deployment on the Oban – Craignure route from 2022/2023 would eliminate this issue and would actually provide an alternative dangerous goods route onto the peninsula).

Nonetheless, given the relatively low traffic flows expected to use a Corran Narrows tunnel, it is likely that controlled entry of vehicles carrying dangerous goods could be implemented with adequate mitigation methods in place to reduce any significant delays to other road users, with specific cognisance of the risks of traffic backing up onto the A82(T). Consideration could therefore be given to limiting access to other traffic during passage of vehicles carrying hazardous goods by use of stop lights or barriers[10].

3.3.4 Procurement

As previously noted, work on a business case subsequent to this study would progressively take-forward and define a 'preferred option'. As part of the business case process, the preferred approach to the procurement and management of the delivery of the selected option would be identified in the 'Commercial' and 'Management' Cases. It is however worthwhile to initially consider procurement in the context of a bridge or tunnel in terms of how this may influence the appraisal of options.

The purpose of this study is to explore whether a Corran Narrows fixed link has any merit and, if so, to initially make a case for its inclusion in the STPR2. If the scheme was to be included in STPR2, its delivery would likely fall upon Transport Scotland (although this would remain to be confirmed in the business case).

In the context of a bridge, it is important to note that:

- Both Transport Scotland and various local authorities have experience of designing, procuring and managing a bridge construction project. The most obvious example is of course the highly successful build and delivery of the Queensferry Crossing, but other recent examples include the Clackmannanshire and Skye Bridges.
- There is also an established pool of consultants, contractors and project managers with recent experience of delivering bridge construction projects in the Scottish market, and thus they are familiar with the institutional, legal and procurement frameworks used.

The same cannot however be said of an underwater road tunnel. As can be seen from Table 3.2, there have been very few underwater road tunnels built in the UK in the last 30 years, and none in Scotland. In the event that a tunnel was identified as the preferred option for Corran, this would present a challenge to overcome, in terms of:

- The procurement authority putting in place a sufficiently large and experienced team to procure and deliver the structure.
- The absence of local consultants and contractors with experience of delivering underwater road tunnels in Scotland or indeed the UK. It is likely that the risks associated with this inexperience would be priced into the bid (or may later materialise as a cost over-run if not priced appropriately).

3.3.4.1 Could best-practice approach from elsewhere be adopted?

Whilst tunnelling is not particularly common in the UK, it is a widely adopted approach amongst our European neighbours, particularly the Norwegians, who have decades of experience in delivering estuarial and cross-fjord tunnels at comparatively low costs. The question is whether procurement and construction approaches from Norway could be readily adopted to deliver a low-cost tunnel solution for the Corran Narrows.

The potential adoption of Norwegian tunnelling expertise in the Scottish context has been explored across several studies, most notably in Shetland where there are long-standing aspirations for tunnels to Bressay, Unst, Whalsay and Yell. Indeed, in 2010, Shetland Islands Council facilitated a workshop with Norwegian and UK tunnelling experts to compare approaches and determine whether Norwegian tunnel costs could be achieved in the Shetland / Scottish context. The key findings of this workshop in relation to Norwegian tunneling were as follows:

- Contractors
  - There tend to be fewer but highly skilled and experienced personnel on Norwegian tunnelling projects who work very efficiently.
  - 'Active design' at the face during construction means decisions are taken in 'real time' enabling quick and efficient progress.
  - Competition is high.
  - Low profit margin of circa 2%-3% acceptable.
  - Dedicated and modern equipment.
- Technical standards
  - Norwegian tunnels are generally based on quite a minimal design.
  - Tunnel Linings: The Norwegian highway tunnels are typically constructed in relatively high-quality rock masses and utilise structural linings only where necessary to provide additional support. Tunnels generally include local shotcrete support and rock-bolting, but do not include a continuous concrete lining as would likely be required by UK standards.
  - Water Ingress: Norwegian tunnels, including sub-sea tunnels, do not typically provide a water-tight lining, but instead allow some degree of water ingress which is dealt with by tunnel drainage. There is potential for increased operational cost associated with pumping water ingress to the surface. Water ingress is typically limited by providing relatively large depths of cover and by grouting the rock mass during construction.
  - Cross-section: Norwegian tunnel cross-sections reflect reduced lining requirements, as described above, and relatively low traffic volumes. Tunnel cross-sections are typically in the region of 50 to 60m2, which allows for two lanes of traffic, but does not provide provision for a segregated escape route or dedicated stopping lane. Locally widened sections of tunnel are typically provided to allow emergency lay-bys containing safety stations (fire extinguishers and emergency telephones).
  - Tunnel Lengths: Norway has the longest road tunnel in the world with a length in excess of 24km (Laerdal Tunnel). Typical road tunnel length is in the order of 1km. Norwegian standards place more emphasis on traffic volume and less emphasis on length when determining safety requirements, compared to the BD78/99 regulations.
  - Escape Routes / Refuges: Segregated escape routes or refuges are not generally provided in single bore tunnels[11].
- Procurement
  - There is significant tunnel procurement and contract management expertise within the Norwegian public sector.
  - The contractual system in Norway helps, with the public sector sharing the risks attached to tunnel projects to keep costs down.
  - The Government 'self-insures' and has a dedicated budget for this.
  - Insurers also share the risk in Norway (up to 30%). In contrast, the cost of tunnelling insurance tends to be much higher in the UK.
  - The Contractor provides insurance for machinery, labour, and tunnel collapse (under certain circumstances only).
  - Taxes are applied to waste (excavated rock) in the UK if taken 'off-site', sold as aggregate or put in landfill whereas waste can be disposed of in land around the tunnel in Norway with no disposal cost, without planning permission or Environmental Impact Assessment (EIA), if placed to a thickness of less than 0.5m[12].

In their considerations surrounding the proposed Stromeferry tunnel options, URS noted that, whilst Norwegian tunnelling approaches provide potential cost savings and are suitable for lightly trafficked areas with good quality rock, there are several disadvantages when compared to typical UK road tunnel specifications:

- Reduced cross-sectional area precludes some safety measures, such as a segregated emergency exit or service corridor. Therefore, it is only suitable where risks are low, such as tunnels with very low traffic intensity.
- Reduced cross-sectional area also means that there is no provision for pedestrian access or other non-motorised users.
- Absence of full lining increases tunnel lighting requirements and may reduce aesthetic appeal. It also makes cleaning more difficult. Exposed rock areas may require increased inspection and maintenance compared to lined tunnels.
- The absence of a water-tight lining requires that all infiltration is pumped to the surface unless the geometry of the tunnel allows gravity drainage. Infiltration is likely to be more widespread and measures such as internal water management may be necessary to control seepage water. Grouting requirements may be increased to avoid excessive infiltration.
- Depending on the chosen contract, an increased allocation of risk to the client would add to the uncertainty of overall capital cost[13].

Whilst the evidence suggests that there is much to learn from the Norwegian approach, it is important to note that it is not easily transferable to Scotland in the short-term. Indeed, in the Shetland workshop, it was recorded that:

- Norwegian contractor costs would most likely rise if they were working outside the Norwegian market.
- Norwegian contractors are giving up on working outside of Norway, e.g. when working in Sweden, the Norwegian contractors find that they face much slower progress because of issues with contracts, regulations, culture, etc and the costs become higher with reduced profits as a result[14].

3.4 Case Studies – Outcomes & Impacts Of Fixed Links

3.4.1 Overview

This final section explores the potential impacts of a fixed link across the Corran Narrows through the application of case study evidence. The evidence presented in this section will form the basis of the 'economic narrative' of benefits set out in Chapter 5.

3.4.2 Selection of Case Studies

The first step in this task was selecting the case studies to be used in supporting the analysis for Corran. Following a review of available case study material, the decision was taken to focus predominantly on Scottish examples (although wider examples will be drawn in where appropriate), particularly in the

11 | Stromeferry: Review of Tunnel Options (URS, 2014), p. 9.

12 | Shetland Inter-Island Transport Study: Fixed Links Review Supplement (Donaldson Associates, 2016), pp. 10-11.
13 | Stromeferry: Review of Tunnel Options (URS, 2014), pp. 9-10.
14 | Shetland Inter-Island Transport Study: Fixed Links Review Supplement (Donaldson Associates, 2016), pp. 10-11.

Highlands & Islands because:

- There are several recent comparable examples, most notably the Skye Bridge.

- Whilst there are many rural areas across the UK, the Highlands & Islands is unique in its scale, economic structure and population density. Almost all major transport schemes in the area – going back as far as the Caledonian Canal – have been justified on the dual basis of improving transport connectivity and overtly promoting socio-economic development. This compares to most other schemes where the focus is predominantly on improving transport connectivity between conurbations (e.g. the Severn Bridges) or major areas of economic activity (e.g. the Dartford Bridge between Essex and Kent, or the Cleddau Bridge which links settlements on either side of the strategically important Haven Waterway in Wales).

- International experience is useful (and incorporated where appropriate) but differences in spatial development, economies, history and culture makes these limited comparisons at best.

The relevant case studies which will be drawn on in this analysis are therefore (in chronological order of construction):

- Burra and Trondra, Shetland, 1970
- Cromarty Bridge, 1979
- Kessock Bridge, 1982
- Kylesku Bridge, 1984
- Dornoch Bridge, 1991
- Skye Bridge, 1995
- Scalpay Bridge, 1997
- Berneray Causeway, 1999
- Eriskay Causeway, 2001

Having reviewed a range of recent studies in relation to the above and other fixed links, case study evidence is generally presented on a scheme-by-scheme basis. However, our approach in this review is to focus on themes in terms of what a fixed link has meant for different components of societies or economies, drawing on all of the case study material as appropriate. This narrative is set out in Section 2.4.4, but firstly the challenges associated with using case study evidence are explored.

3.4.3 Challenges with Case Study Evidence

Case study evidence and benchmarking is a valuable means of understanding the type and scale of impacts which may emerge from a transport investment. However, it is important to note that there are several challenges and limitations associated with such evidence, each of which are set out below.

3.4.3.1 Monitoring and Evaluation Data

Whilst several fixed links have been constructed in the last three decades, there is a paucity of robust ex post evaluations. This is a UK-wide issue applying as much to major schemes as to smaller local fixed links – whilst the uplift in traffic as a result of fixed link is widely reported (or can be calculated), holistic evaluations considering how the 'output' of a fixed link translates into transport 'outcomes' and societal 'impacts' are comparatively rare.

The Highlands & Islands is somewhat better off than most areas in this respect, as evaluations have been undertaken in relation to the Skye Bridge, the Scalpay Bridge and the causeways to Eriskay and Berneray. However, even in these cases, the analysis is limited and has generally been undertaken relatively quickly after the completion of the fixed link.

3.4.3.2 Impacts Time-Lag

Where evaluations of fixed links have been carried out, this has typically been a short-time after the new connection was opened. For example, there were several studies assessing the impact of the Skye Bridge on different aspects of the island in the late-1990s, whilst the evaluation of the Berneray and Eriskay causeways was published in 2004. Early evaluations of this nature are essential as they pick-up immediate travel and other changes (e.g. increased tourism) following the opening of the fixed link.

However, impacts in terms of business investment, changes in the level and structure of population, migration rates etc will generally emerge over a much longer period – i.e. the supply-side takes longer to respond to new investment than the demand-side. Therefore, whilst the traffic generation and some of the shorter-term tourism impacts of the various fixed links in the Highlands & Islands are understood, the long-term implications are less well understood.

3.4.3.3 Causality

A further challenge with available case study evidence is demonstrating causality between a fixed link and the outcomes and impacts which emerge as a result. This is particularly the case with longer-term impacts (e.g. business investment) and intangible outcomes (e.g. community confidence).

In particular, a number of case studies reviewed as part of this research suggest that population has grown as a result of a fixed link being introduced. Whilst fixed links will have been a contributor in most cases, a range of other factors will also have been at play, not all of which are easily identifiable or measurable.

3.4.3.4 Local Applicability

Finally, it is important to bear in mind that every area has its own local circumstances, and the impact of a fixed link will differ to reflect these circumstances. Indeed, the evidence on the impact of fixed links is mixed – the background economic conditions appear to have a strong bearing on the success of fixed links in stimulating economic growth – a point also referred to later in this summary.

3.4.4 What have been the main impacts of fixed links?

Using the case studies previously cited, the following sections set out a thematic commentary on the evidence of the impact of fixed links.

3.4.4.1 Rationale for Intervention

The rationale for progressing a fixed link has generally either been:

- reducing the long journey times associated with looping around estuaries / firths or major sea lochs; or

- replacing ferry services which are either:

    - life-expired and where there is thus a case for capital investment in new tonnage and supporting marine infrastructure (which is set against the cost of a fixed link); or

    - incapable of providing the required capacity to meet the needs of the island or peninsular community.

The progressive bridging of the major Firths (**Moray, Cromarty and Dornoch**) between Inverness and Thurso is the most obvious example of the first bullet above. The opening of the Kessock Bridge in 1982 dispensed with the need for either travelling on a capacity constrained ferry or making a long inland loop to Beauly. The Cromarty Bridge did likewise, removing the need to route via Dingwall. The Dornoch Bridge was opened in 1991 providing a direct route across the Dornoch Firth linking south-east Sutherland and Easter Ross. Previously these trips had to be made by travelling inland to cross the Firth at Bonar Bridge, and thus the new crossing provided a 20-mile reduction in the journey between Golspie and the area immediately south of the Dornoch Firth[15].

When completed, the combination of the Kessock, Cromarty and Dornoch bridges provided a direct route from Inverness to Sutherland and ultimately Caithness, linking Wick, Thurso and other settlements to the Highland capital. Moreover, these three fixed links provided a much higher quality route for residents of the Orkney Islands travelling to e.g. Raigmore Hospital for appointments or Inverness for shopping.

The effect of these improvements can be seen in the comparative road and rail journey times between Inverness and Thurso. The road journey time is around 2h:30m, whilst the equivalent journey time by rail is 3h:45m as the train continues to loop around the major water bodies (albeit line speeds are also low).

The concept of bridging major firths / estuaries, sea lochs and rivers is common across Europe. As previously alluded to, the practice of tunnelling under fjords is very common in Norway, whilst in the Faroe Islands, tolled tunnels have been constructed as alternatives to long land journeys on poor quality roads.

The situation in **Skye** was broadly similar to that at Corran. Despite a frequent and high capacity two vessel service running 24-hours per day in its latter years, ferry capacity was simply incapable of keeping pace with peak demand, with queues often extending to several hours in peak season[16]. As well as this observed excess demand, there was significant latent demand, particularly in the peak summer daytripper / short-break market, as the ferry acted as a barrier to accessing the island.

Whilst a more extreme situation than that currently experienced at Corran, the 'case for change' was broadly one of demand exceeding supply. The Skye Bridge opened in 1995, with tolls set at a level slightly cheaper than previous ferry fares, although high by comparison to other fixed links. It nonetheless alleviated the capacity constraints associated with crossing Loch Alsh, with the removal of tolls in 2004 accelerating the increase in demand for trips to Skye.

In the Outer Hebrides, the case for fixed links to **Scalpay, Berneray and Eriskay** were made in part due to the inadequacy of the previous ferry services. In each case, the islands were served by very small car ferries, with comparatively short operating days (it is understood the vessels were single crewed and thus the operating day restricted to what one crew could deliver). The situation at Eriskay was even more challenging, where tidal (and likely daylight) restrictions meant that the ferry could only be operated during limited tidal windows, a more extreme version of what is currently experienced on the Sound of Harris in the present day[17].

The rationale for constructing the bridge to Scalpay and the causeways to Berneray and Eriskay was essentially social and economic . It was identified that the restrictions associated with the then transport connections were of such a level that they were negatively impacting various elements of island life (e.g. personal travel, supply-chain, employer's business etc) and thus contributing to population decline.

In the case of the Berneray and Eriskay causeways, there was a wider objective than just linking these two islands to Uist. Both islands became the Uist terminals for the inter-island ferry services to Harris and Barra, thus becoming part of the Outer Hebrides Spinal Route, and significantly strengthening links along the island chain. For the first time, it became possible to travel from the Butt of Lewis to Vatersay over land and sea in a single day.

It is our understanding that the replacement of a ferry with the **Kylesku Bridge** in 1984 was related to reducing journey times for fish lorries travelling from Kinlochbervie.

15 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.85.

16 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.72.
17 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.85.
18 | Shetland Fixed Links Strategy: Socio-Economic Study (Reference Economic Consultants, 2007), p.43.

What are the implications for Corran?:

The rationale for intervention in the context of Corran is a combination of addressing the capacity constraints and improving connectivity and resilience between Lochaber and the peninsula, partly with a view to supporting the social and economic development of the area.

3.4.4.2 Traffic Generation

When a fixed link is introduced, the demand-side response is generally very swift, with an immediate increase in traffic. This is generally caused by a combination of (i) people already travelling making more journeys (e.g. island / peninsular residents); (ii) induced journeys (e.g. additional tourist visits); and (iii) substitution effects (e.g. on Skye, travellers switching from the Armadale – Mallaig ferry to the new bridge).

In a 2007 study for Shetland Islands Council, Reference Economic Consultants tabulated traffic generation factors for a range of fixed links – the Scottish examples are reproduced in the table below:

Fixed Link	Before Date	After Date	Years of Growth	Factor from before to after traffic
Skye Bridge (Tolled)	1995	1996	1	1.20
Skye Bridge (Toll Free)	2004	2005	1	1.46
Scalpay Bridge	1996	2006	10	12.86
Berneray Causeway	1999	2006	7	5.70
Eriskay Causeway	1998	2003/04	5/6	22.40

Table 3 3: Fixed Link Traffic Generation Factors[18]

Before considering the specifics of some of the above fixed links, it is worth noting some general trends identified in relation to their traffic generation impacts. It was noted in the Reference study that improvements in quality are the main driver behind the increase in traffic growth, and it is the variations in quality (and where appropriate, the tolling regime) that contribute to the variations in demand uplift. Reference note that the quality improvements depend on the following factors.

- The quality of the previous ferry service in terms of journey time, frequency and hours of operation. The poorer the quality of the previous ferry service the larger the uplift in demand.
- The proximity of the crossing to centres of population. Crossings that mainly serve short distance trips usually provide a larger percentage step-change improvement and therefore generate the largest uplifts in demand.
- The availability of services and employment on the island or peninsular community connected by the fixed link. A lack of on-island services and employment opportunities will increase the propensity to travel off the island once the fixed link has been constructed (although, paradoxically, islands which are less well connected generally have more on-island services)[19].

The **Skye Bridge** provided a transformational change in accessibility from the island to the Scottish mainland. Research by Reference found that the large uplift in demand from the removal of the Skye Bridge tolls was primarily driven by local trips between two settlements quite close to the bridge (Kyle of Lochalsh and Broadford)[20]. However, the bridge fundamentally altered perceptions of the accessibility of Skye, providing a stimulus to the tourism industry which has continued largely unabated ever since. It also provided improved connectivity to Harris and North Uist via Uig, growing the tourist and resident travel market for those two islands.

The significant increase in traffic generated as a result of the **Berneray and Eriskay** causeways reflected both the replacement of the limited ferry services and, perhaps more significantly, the growth in travel along the Outer Hebrides chain. As with the Skye Bridge, the growth generated by the causeways has been sustained, and indeed has been further stimulated by successive improvements in the connecting Sounds of Barra and Harris ferry services (e.g. the introduction of the larger capacity vessels MV Loch Portain (Sound of Harris) and MV Loch Alainn (Sound of Barra); timetable improvements; and the introduction of Road Equivalent Tariff)[21]. The continued growth in traffic with each incremental improvement on and adjacent to the Sounds highlights the potential traffic generation impacts of fixed links (and improved ferry connections).

Whilst built in part to support the logistics needs of the fishing industry, the **Kylesku Bridge** has become an integral part of the highly popular North Coast 500 route. It can be argued that the construction of this bridge has, in the long-term, enhanced the attractiveness / viability of that route and has thus assisted in growing overall traffic levels.

What are the implications for Corran?:

It is reasonable to conclude that a Corran Narrows fixed link will lead to significant traffic generation. This is likely to be due to a combination of: (i) peninsular residents making more frequent trips to Fort William and elsewhere to access services; (ii) increased visitor numbers, particularly in terms of 'unplanned' trips; and (iii) additional journeys generated by 24-hour accessibility.

3.4.5 Population

Whilst the demand-side impacts of a fixed link become apparent relatively quickly, the supply-side changes only become manifest over a much longer period and are often very subtle in nature. One of the principal reasons cited for pursuing a fixed link in a number of the case studies presented is to reverse population decline. In advance of considering the case study evidence, it is worth laying out the 'transmission mechanisms' by which this may happen:

- Improved accessibility to employment and services may encourage **existing residents** of an island or peninsular community to remain when they would otherwise leave.
- The removal of a barrier to travel may encourage **new residents to move into an island or peninsular community from a neighbouring area** to take advantage of e.g. lower land-values or lifestyle benefits.
- Improved accessibility may also attract **lifestyle in-migrants** to an area, who are seeking a rural / island way of life, but with the ability to travel with minimum hindrance when they so wish to do so. The growth of remote working is making this an increasingly strong effect across north-west Scotland.

22 | Shetland Fixed Links Strategy: Socio-Economic Study (Reference Economic Consultants, 2007), p.54.
23 | The Value of Transport (Peak Economics, 2017), p.34.

In general, there is deemed to be a positive relationship between the construction of a fixed link and population. The previously cited Reference study found that fixed links have helped to contribute towards increasing, or in some cases slowing the decline in, the number of residents[22]. Similarly, international research by Peak Economics reviewed recent ex post Norwegian work, which found that, on average, populations increase after the introduction of a fixed link. The study found that over 11 fixed links, average population growth was 2% after 5 years and 6 % after 15 years (when compared against the 'counterfactual' – i.e. what would have happened without a fixed link having been built). It is however noted that this disguises substantial variation with some islands experiencing large population growth and others experiencing a static or declining population. In general, islands close to urban areas experience large growth but elsewhere results are more mixed. Importantly, it was noted that traffic flows on the fixed links are not good indicators of population change (possibly due to the 'two way road' effect) and land-use change in the main exhibits a lot of inertia with few impacts in the first few years after opening but with effects still being experienced some 15 years after construction, highlighting the lag effect described previously[23].

In terms of specific case studies, research undertaken by Derek Halden Consultancy (DHC) on the impacts of the **Skye Bridge** noted that, whilst the population of Skye increased following the opening of the bridge, the extent to which this can be directly attributed to the new link is "not clear" (highlighting the issue of causality previously raised). Nonetheless, a 1999 evaluation of the Skye Bridge found that 6% of the island residents surveyed indicated that they had moved to Skye from elsewhere because of the bridge, which enhanced the attractiveness of the island as a place to live. Similarly, it was noted that follow-up surveys undertaken once the tolls were removed found that 8% of respondents had moved, or would consider moving, to Skye as a result of the toll-free crossing[24]. Whilst the above evidence cannot directly link the construction of the bridge to an increase in population, there is at least some evidence that it has contributed to the overall growth in those living in Skye.

In the context of the Outer Hebrides, evaluations of the fixed links connecting **Scalpay, Berneray and Eriskay** found that construction of fixed links has helped to stabilise and / or reduce the rate of long-term population decline. The research indicated that the fixed links had attracted people to the isles who would not have moved there otherwise. They also encouraged existing residents to remain - some 28 residents of Scalpay and five on Berneray reported that they or a member of their household would have left if the fixed link had not been built[25]. Whilst the absolute numbers are relatively small, it is important to note that in fragile communities like those listed above, the retention or otherwise of even a single family can impact on the sustainability of an island through its implications for e.g. the school role or voluntary work on the island etc.

What are the implications for Corran?:

The evidence suggests that the provision of a fixed link across the Corran Narrows would make a positive contribution to population retention and growth, although any effects would be long-term in nature and difficult to attribute directly to the crossing given the plethora of other factors which impact on population numbers and structure.

3.4.6 Employment

There are two considerations from an employment perspective:

- Access to the **employment / jobs market** – i.e. connecting people with areas of employment; and
- Access to the **labour market** – i.e. providing employers with a larger labour market catchment from which to recruit.

3.4.6.1 Employment Market

An integral component of any case for a fixed link across the Corran Narrows would be improving access to employment. The current ferry is heavily used by commuters travelling to Fort William and other surrounding settlements. Whilst the ferry operating day comfortably permits a standard day's work in Lochaber (and limited shift work), a fixed link would fundamentally transform labour market access, which could provide new opportunities if the proposed developments at the Fort William smelter are realised to the scale originally envisaged. Access to employment is a strong determinant of population retention in island and peninsular communities, and thus this would be a key benefit of a fixed link at Corran given the proximity of Fort William[26].

The **Skye Bridge** improved labour market catchment areas in South Skye and Lochalsh. It was noted that this facilitated greater access to employment, allowing individuals to access a range of new jobs as well as lower paid and / or part-time jobs which may not otherwise have been possible. This was particularly significant in Skye given the importance of seasonal and part-time work in the area, reflecting the significance of the tourism sector[27]. It could likewise be important in the Lochaber and peninsula study areas given the strong but generally seasonal tourism demand, particularly in and around Fort William.

In common with much of the preceding analysis, the long-term labour market and employment impacts are not fully understood, as much of the evaluation work was undertaken soon after the bridge opened or the tolls were removed. Nonetheless, it is evident from the evidence that has been

24 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.72-74.
25 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.85.
26 | The Value of Transport (Peak Economics, 2017), p.15.
27 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.72-74.

collected, and wider anecdotal evidence, that the Skye Bridge has more tightly bound together the Skye and Lochalsh economies from an employment and labour market perspective.

Whilst there are no formal evaluations for the **Kessock, Cromarty and Dornoch** bridges, it is evident from peak traffic flows alone that these fixed links (and in particular the Kessock Bridge) have significantly expanded opportunities to enjoy the rural lifestyle of Ross and Sutherland whilst being able to readily access Inverness and surrounding areas for employment. This effect can be seen in the below travel-to-work graphic, which shows the origin points of all travel-to-work journeys to Inverness.

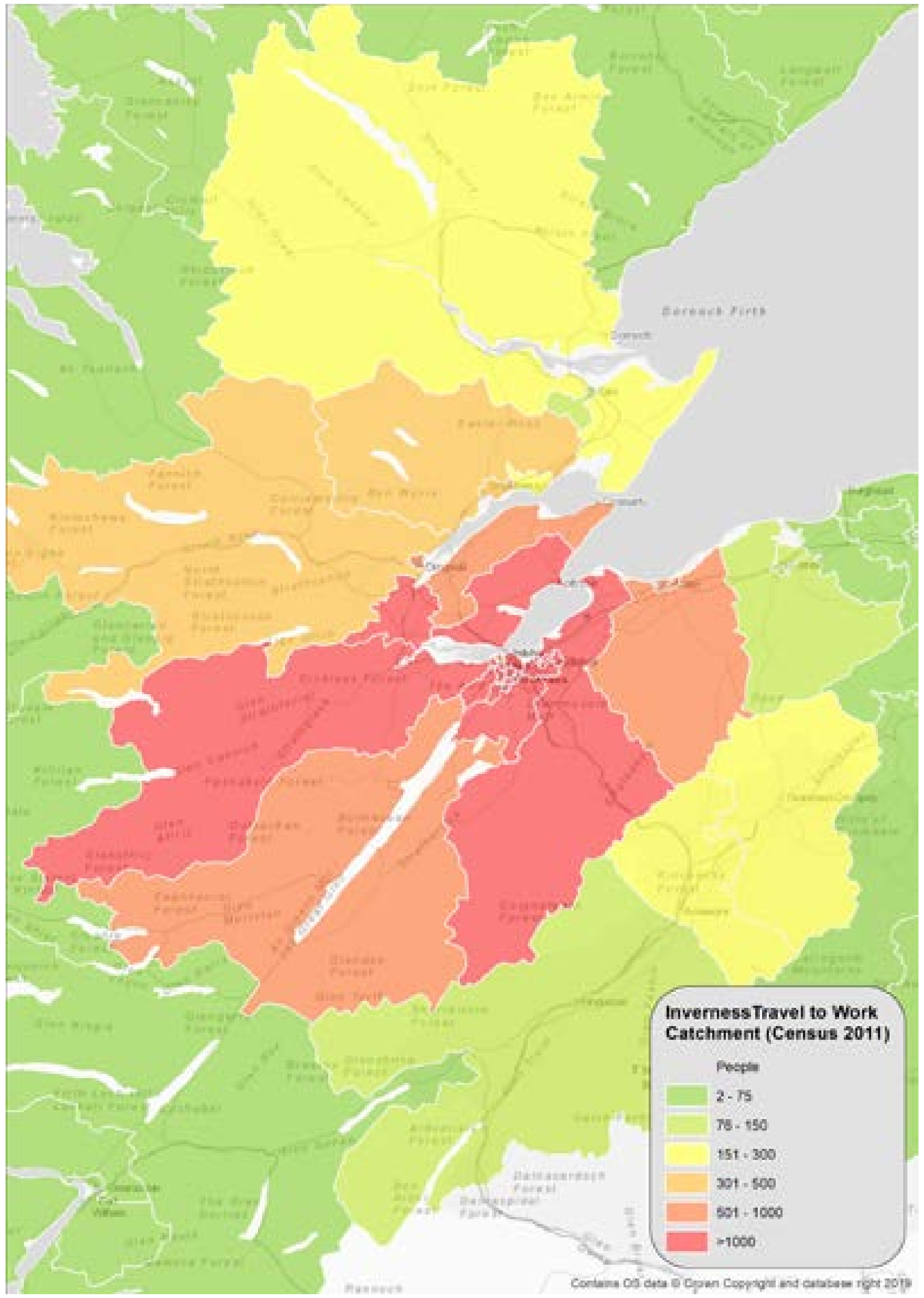


Figure 5: Inverness Travel-to-Work Catchment

Evidence from the fixed links in the Outer Hebrides also highlights their role in improving access to employment, both in Uist and, as a result of the improved Sound ferries, along the entire Outer Hebrides chain (although typically non-daily commuting in the context of the wider island chain). One specific finding from the evaluation is that the **Berneray** causeway has led to a significant increase in employment among women due to improved access to jobs off of the island[28].

Whilst the evidence does suggest that fixed links generate new employment opportunities, it is essential to bear in mind the 'two-way street' effect of transport improvements. There is an extensive body of evidence from across the UK and elsewhere which suggests that where transport connections between a rural area and a larger settlement(s) are improved, the dominant flow will be to the larger settlement(s). Specific fixed link examples of this effect include:

- In the islands of **Burra and Trondra** in Shetland, the construction of fixed links provided a quick and high-quality connection to Scalloway, Lerwick and Sullom Voe, fundamentally altering the travel-to-work market in the two communities. Whilst several benefits have been realised as a result of these new connections, consultees in a previous evaluation noted that the fixed links led to a leakage of economic activity from these islands. It was noted that there are now fewer shops, less fishing vessels based in the area and a general loss of amenities, with Burra in particular described as a "dormitory" community[29].

- In a number of the smaller islands which have been connected by fixed links (e.g. **Scalpay**), there has been a growth in off-island commuting, although this mirrors wider developments in mainland rural areas, where centralisation of employment and services is common[30].

- The case of **Bressay** in Shetland is also illustrative. Whilst the island does not have a fixed link, the frequency of the ferry service and the length of operating day has been improved over several years, whilst the fares are low by most comparable benchmarks. These improvements have stimulated significant daily commuting to Lerwick. As more people commute to Lerwick, they now take their children to school there and go to the shops in the town. In many respects, Bressay has now become part of 'Greater Lerwick' – there are very few on-island services or amenities left, with the island now highly integrated into the Lerwick economy. Bressay contrasts to other islands close to major settlements (e.g. Shapinsay, Hoy, Cumbrae etc) where the more limited ferry service has acted as a barrier to such a strong dormitory effect emerging.

The benefits or otherwise of the dormitory effect are debatable – indeed, there is a whole body of research dedicated to this topic. Whilst a fixed link at Corran may make commuting to Fort William and elsewhere more common, it is important to note that:

- The communities which would be served by the fixed link are amongst the most fragile in Scotland. Improving access to employment would be positive, bringing additional income to the area, and potentially attracting families to move there.

- Whilst a dormitory effect is possible, and indeed even likely in areas closest to the proposed crossing, it is possible that those whose journey to work is prevented or made more difficult may leave anyway, increasing the fragility of the area.

- The growth in remote working may to some extent limit the 'dormitory effect'. Whilst a majority of people still physically travel to a workplace, remote working has been growing very strongly in the last two decades and is likely to continue doing so.

What are the implications for Corran?:

A fixed link across the Corran Narrows would provide residents of the peninsula with improved access to employment (and vice versa, although the effect in the other direction is likely to be weaker). There is a risk that it creates a 'dormitory' effect with an increase in commuting to Fort William or elsewhere, but this would nonetheless bring a range of benefits to the peninsula in terms of increased gross value added (GVA) and potential in-migration of working-age families.

3.4.6.2 Labour Market

A fixed link across the Corran Narrows would also improve labour availability for businesses in Lochaber and further afield by expanding the employment catchment. This outcome was particularly prominent in Skye when the bridge was completed. However, given the large land mass of the peninsula, the low population and long journey times between settlements, it is likely that this effect would be less significant in the context of the peninsula.

The more prominent issue for businesses is likely to be the **labour productivity improvements** associated with improvements in supply-chain efficiency, reduced dead time etc associated with not having to wait for a ferry, or being unable to travel when the ferry is out of hours / service.

3.4.7 Business Formation

A further question in relation to the impact of fixed links is the extent to which they support new business formation. As previously noted, the evidence on this issue is limited due to a combination of investment lagging new infrastructure by several years and the ability to demonstrate causality between a fixed link and specific business investments.

There is broad consensus across a range of evaluation studies that a fixed link (and indeed transport improvements generally) improves business confidence in an area through providing increased certainty.

The one potential exception to the above point is tourism,

28 | Shetland Fixed Links Strategy: Socio-Economic Study (Reference Economic Consultants, 2007), p.50.
29 | Shetland Fixed Links Strategy: Socio-Economic Study (Reference Economic Consultants, 2007), p.45.
30 | Shetland Fixed Links Strategy: Socio-Economic Study (Reference Economic Consultants, 2007), p.45.

where there is a strong linkage between increased visitor numbers and business investment. For example:

- It was found that the **Skye Bridge** has made a major contribution to the tourism product on the island, particularly once tolls were removed. Day and short-stay visitor numbers grew considerably and prompted investment in accommodation, campsite provision and retail / food businesses serving the tourism market[31].

- A substantial increase in tourist bus and coach travel was also recorded after the bridge opened. There were some early indications in the evaluation work undertaken that an increased proportion of trips appeared to be travelling through Skye to the Outer Hebrides, and there were also more circular trips to Skye making use of the bridge and the Armadale–Mallaig ferry – each of these trips generates spend and bed nights[32].

- The **Kylesku Bridge** is now an integral part of the North Coast 500, and indeed has become a tourist attraction in its own right. It is one of the most photographed bridges in the country and has featured in films, adverts and TV programmes.

- Primary research showed that 62% of visitors to **Berneray** would not have made the trip without the causeway and the ferry service that it enabled. In the case of **Scalpay**, almost half (49%) of the surveyed visitors would not have visited the island if the bridge had not been built[33]. Total visitor expenditure on Berneray was estimated to be just under £110,000 and £150,000 on Scalpay[34]. The additional spend on both islands will have stimulated new tourism businesses and a growth in employment in that sector – for example, six new B&Bs opened on Scalpay and two on Berneray shortly after the fixed links were completed[35].

What are the implications for Corran?:

The evidence suggests that the construction of a fixed link improves the business confidence of an area, but the issues of time-lag and causality make it challenging to isolate specific new business investments emerging directly as a result of a fixed link. The one exception is in the tourism sector where it is the growth in visitor numbers which acts as a direct stimulus to investment.

3.4.8 Quality of Life / Community

The final and much less tangible impact of a fixed link is how it impacts on the newly connected communities and the quality of life of their residents. This is a challenging area to evidence as it very much depends on local circumstances and is also often about how an area is perceived rather than actual outcomes.

The following bullets set out some of the potential impacts of a fixed link, drawing on evidence from case studies where available:

- Overall, the evidence suggests that fixed links will not in themselves reverse major social and economic changes on islands – e.g. declining populations. However, they are considered to improve general confidence in an area as a place to live, work and invest.

- The construction of a fixed link to a rural community has in many cases led to a centralisation of key services such as health, high school education and social care. Whilst this is often viewed as a negative as it reduces local facilities and requires travel for essential appointments (albeit this is not anticipated to be a major issue in this context (i.e. Corran)), it can also create benefits in terms of access to a wider range of services or better facilities than would be available locally (e.g. evening classes). This effect can also provide cost savings for local authorities which can be reinvested elsewhere.

- Evidence from Scalpay in particular suggests that a fixed link can significantly improve health, home care, day care and residential care services. However, this effect is likely to be less noticeable on the peninsula due to the high quality, reliability and frequency of the Corran Ferry service.

- Linked to the above is the loss of local retail, which can gradually become centralised when a new fixed link is realised. Whilst this loss of local services is again generally viewed negatively, the fact that residents do choose to shop, eat out etc in larger settlements suggests that they derive a benefit from doing so.

- Fixed links provide improved access to evening leisure (e.g. the cinema, events etc) and community / voluntary opportunities. This can be important in retaining young people, and thus families, in an island or rural community.

- Opportunities to visit friends and relatives can also improve – this is essential in rural communities where adult children will often live elsewhere and travel home or e.g. in-migrants may have elderly relatives elsewhere in the country that they wish to visit.

- Fixed links have almost universally been evidenced to grow visitor numbers in the Highlands and Islands. For example, the Skye Bridge has been an integral component in developing the Skye tourism market, and supporting secondary tourism growth in e.g. Harris, North Uist and Raasay. Tourists generate additional employment and income for local residents but can also prompt investment in e.g. cafes' restaurants and infrastructure from which tourists and residents alike benefit.

- Whilst increased visitor numbers are on the whole beneficial, they can generate their own issues in terms of overwhelming the local infrastructure, which could be a particular issue on the peninsula given the limited road network and facilities (e.g. public toilets, campsites, waste disposal etc).

- Other issues raised through the case study material include reduced need for two cars (i.e. an island and mainland car) and perceptions of reduced security through being unable to 'pull up the drawbridge'. These effects are though less relevant in the context of Corran.

What are the implications for Corran?:

Fixed links can fundamentally alter the economic and social fabric of an area. The extent to which this is the case depends on the specific local circumstances. On balance, the evaluation evidence suggests that fixed links have improved the quality of life where they have been built, but they do bring challenges, particularly in terms of the centralisation of services and pressure on limited local infrastructure associated with increased visitor numbers.

31 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.72-74.
32 | McQuaid, R.W. and Greig, M., Socio-Economic Impact of Skye Bridge (HITRANS & HIE, 2007), p.7
33 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.85.
34 | An evaluation of the social and economic impacts of fixed links to the islands of Scalpay and Berneray, (Western Isles Enterprise (Unpublished), 2004), p. 25
35 | Argyll & Bute Transport Connectivity and Research Report (HIE, 2016), p.85.

Figure 6: Study Area for Planning and Environmental Scoping

4.0 Planning & Environmental Context

4.1 Overview

This chapter provides sets out the environmental and planning position in the vicinity of the Corran Narrows, providing the context against which fixed link options can be developed. The analysis undertaken at this stage is proportionate and reflective of an initial feasibility study and, as such, any identified and highlighted constraints will be noted for further consideration and mitigation if the study progresses to the next stage in the process.

This chapter is divided into three distinct sections:

- Study Area: The definition of the geographic area for which planning and environmental data have been collated and assessed.
- Environmental Context: An outline of the pertinent environmental characteristics and features within the study area, including identification of issues for future consideration if the scheme progresses.
- Planning Context: An outline of the applicable planning policy framework and key planning issues likely to influence the consentability of any future fixed link.

4.2 Study Area

The study area considered in the context of the environmental and planning analysis comprises land on both the western and eastern banks of Loch Linnhe at the Corran Narrows, together with the stretch of water itself. This encompasses the villages of Ardgour, Corran, Nether Lochaber and Inchree, and their hinterlands (including Clouvillin and Keppach). The Corran Narrows lies below Mean High Water Springs (MHWS) and therefore falls within the Scottish Marine Area.

Looking southwards along Loch Linnhe from the Corran Ferry

4.3 Environmental Considerations

4.3.1 The Water Environment and Flood Risk

The SEPA Flood Map (http://map.sepa.org.uk/floodmap/map.htm) indicates that, in relation to Loch Linnhe:

- Western bank, all land east of the A861 carriageway has a high likelihood of coastal flooding. This includes Corran Point and the foreshore of Loch Linnhe. Additionally, land surrounding the confluence of Allt Cladh a'Mhuillin and Loch Linnhe (approximately 500m south-west of Corran) has a high likelihood of fluvial flooding. The area is generally free form identified surface water flood risks, with the exception of isolated parcels of land surrounding Lochan nan Luireach (immediately west of Corran) and in the south eastern extent of the Blar a Corran marshland (west of the Bruac nan Corran dwelling house);

- Eastern bank, all land south and west of Nether Lochaber has a high likelihood of coastal flooding. This includes an extensive area of the Blar Moine marshland but excludes Inchree and land immediately west of the A82. The area is generally free from identified surface and fluvial flood risks, with the exception of land either side of Abhainn Righ watercourse and at its confluence with Loch Linnhe south of Inchree (and the south eastern extent of the study area) which has a high likelihood of fluvial flooding.

Notwithstanding the presence of substantial areas with a high likelihood of coastal flooding, the study area is not located within any 'Potentially Vulnerable Areas' i.e. areas identified as being at significant flood risk as designated within the Highland and Argyll Local Flood Risk Management Strategy (2015).

The extent of high coastal flood risk on the banks of Loch Linnhe at the Corran Narrows means that, irrespective of the specific alignment and type of fixed link considered, the design process should be underpinned by detailed flood modelling. Any alignments, fixed link type options and indicative designs identified through this feasibility study **therefore need to be subject to further flood risk analysis**, taking account of SEPA's Climate change allowances for flood risk assessment in land use planning guidance (2019).

Key Point:

Further flood risk analysis, including detailed modelling, will be required if the fixed link concept progresses to detailed design.

4.3.2 Ecology

Figure 6: Study Area for Planning and Environmental Scoping

Figure 8: Areas of Ancient Woodland

As shown in the Figures 4 & 5, the key ecological constraints within the study area are:

- International Designations

- The Moidart and Ardgour Special Protection Area (SPA) is located approximately 2km to the north-west and west of Ardgour slipway.

- The Onich to North Ballachulish Woods and Shore Special Area of Conservation (SAC), is situated approximately 1km to the south east of the Nether Lochaber slipway.

- National (Statutory) Designations:

- The Onich to North Ballachulish Woods and Shore Site of Special Scientific Interest (SSSI) is the constituent statutory designation of and co-located with the aforementioned SAC.

- Several areas of ancient woodland are present within the study area, the largest of which is located just over 250 metres to the north-east of the Nether Lochaber slipway, while two other parcels are located approximately 200 metres to the west of the Ardgour slipway.

- Local (Non-Statutory) Designations:

- At present no local nature conservation or wildlife sites are designated within THC's administrative area.

- The adopted West Highland and Islands Local Development Plan (2019) also did not designate any green network corridors within the study area.

Key Point:

Although the SAC, SSSI and SPA are not within the immediate proximity of the Corran Narrows, there is **potential for indirect disturbance** related to the effects from construction activities and increased vehicle movements associated with any potential fixed link project. The level of this disturbance would need to be **considered at the design stage**.

4.3.3 Landscape

The entirety of the study area falls within Landscape Character Type (LCT) 234 – Lochs with Settled Edges as identified on the SNH Landscape Character Assessment (2019). The following landscape designations and recreational routes are also present within the study area:

- National Designations:
- On the eastern side of Loch Linnhe, the Ben Nevis and Glen Coe National Scenic Area (NSA) encroaches on the south extent of the study area surrounding Onich, 1.5km south of the Lochaber slipway.
- On the western side, the Ardgour House Inventory Garden & Designated Landscape is situated inland west of Clouvillin and 1km from the Ardgour slipway.
- Further to the west, 2km, lies the Ardgour & Moidart Wild Land Area.
- Local Designations:
- With the exception of Corran Point itself, the western side of Loch Linnhe lies within the Ardgour Special Landscape Area (SLA).

It should also be noted that a network of Core Paths provides access to Ardgour House from the village on the western side, and on the eastern side to upland wooded areas north of Inchree. The Corran Ferry also acts as part of the National Cycle Network Route 78, which links Campbeltown to Inverness. Heading northbound towards Fort William, the route travels along the A82, before crossing Loch Linnhe via the Corran Ferry and then continuing northbound along the A861 on the western shore of Loch Linnhe, before once again crossing Loch Linnhe using the Camusnagual Ferry.

Irrespective of any specific alignment identified, the design of a fixed link will need to consider likely impacts on the setting of the LCT, each landscape designation and associated landscape features and sensitivities. Of particular relevance is the Ardgour SLA, as any potential alignment is likely to result in a western landfall and associated road infrastructure within or adjacent to this designation. Designated by THC, the SLA covers the Ardgour peninsula west of Loch Linnhe and is designated for contrasting rugged interior mountains and wooded and sheltered shorelines. Views across the open water of Loch Linnhe, swathes of woodland and a sense of remoteness are identified as key characteristics of the SLA. THC's SLA Citation (2011) also advises that sensitivities associated with development in or affecting the SLA specifically include:

- *"New structures or buildings on land or sea (or the enlargement of existing ones) which would obstruct or significantly detract from the quality of coastal vistas; and.*
- *Structures which would visually connect the peninsula to the mainland and diminish the formers sense of detachment and remoteness".*

Figure 9: NCN78, Core Paths & Listed Buildings in Study Area

Key Point:

The design of a fixed link should include consideration of likely impacts on the setting of the Landscape Character Type, each landscape designation and associated landscape features and sensitivities. A key consideration here is how any fixed link would interact with the Ardgour Special Landscape Area.

4.3.4 Cultural Heritage

There are eight listed structures or buildings and no other designated heritage assets present within the study area. Seven of these assets are situated on the west side of Loch Linnhe. This includes the Category C listed Corran Narrows lighthouse and adjacent former lighthouse keeper's dwelling, as well as the Ardgour Hotel to the north-west. As with the identified landscape constraints, impacts on the setting of these listed buildings would need to be considered in the selection of alignment options and in the design process.

4.3.5 Summary

To summarise, the key environmental considerations within the study area pertaining to any future fixed link are as follows:

- There is a high likelihood of coastal flooding, especially on the eastern bank of Loch Linnhe between Nether Lochaber and Inchree.
- Statutory ecological designations, particularly, the Onich to Ballachulish Woods and Shore SAC and SSSI south west of Inchree.
- Landscape designations and heritage assets, particularly, the Ardgour SLA along the west side of Loch Linnhe.

Key Point:

The above identified considerations will contribute towards informing the identification of potential alignments for a fixed link. It is though important to note that no 'showstopper' issues have been identified from and environmental perspective which would directly preclude the construction of a fixed link across the Corran Narrows. Potential environmental impacts will however have to be fully scoped and appropriate mitigation identified if the fixed link proposition is to proceed to detailed design in the future.

4.4 Planning Considerations

A Corran Narrows fixed link would require planning permission from:

- THC (or related consent) for terrestrial elements above Mean Low Water Springs (MLWS).
- The granting of a marine licence from Scottish Ministers for marine elements below Mean High Water Springs (MHWS).

4.4.1 Planning Policy Framework

Any planning or other consenting applications for a fixed link would be determined in accordance with the statutory Development Plan and other material considerations of relevance at the time of the application. The current statutory Development Plan applicable to the Study Area comprises the adopted Highland-wide Local Development Plan (HwLDP) (2012) and the West Highland and Islands Local Development Plan (WestPlan) (2019). In terms of how these two documents relate to each other, it should be noted that:

- The HwLDP provides the strategic planning context and a comprehensive suite of development management policies (including policies addressing the key environmental considerations identified above).
- WestPlan identifies local spatial priorities and development constraints for specific settlements. Key constraints noted for Ardgour and Clovullin include landscape designations, coastal flooding, cultural heritage assets, ancient woodland, carbon rich soils, core paths and green network requirements. Nether Lochaber and Inchreee are not identified as specific settlements but rather fall within the wider Fort William hinterland.

In relation to marine spatial planning, relevant general and subject policies from Scotland's National Marine Plan (and any future marine plan developed for the West Highlands marine region) would be applicable to the determination of any marine licence application for the project.

Figure 10: Past and Present Planning Applications

4.4.2 Key Planning Issues

Reflecting the nature of this feasibility study and the environmental characteristics of the study area, the two main determining issues for any future consenting application for a fixed link are likely to comprise the principle and need for the development and the acceptability and likely environmental & amenity impacts of the scheme. These are discussed in more detail below.

4.4.2.1 The Principle and need for the development

The project already benefits from strong policy support at the local level, as the recently adopted WestPlan (2019) and associated Action Programme prioritises 'the A82 to A861 Corran Narrows Crossing' as one of the key transport improvements needed in the plan area. **Of direct relevance to this feasibility study, the WestPlan Action Programme commits to the potential safeguarding of land either side of the Corran Narrows to facilitate any future fixed link**. However, it is noted that further transport appraisal work is required to demonstrate the benefits and inform the alignment and design of a fixed link between the A82 (T) and A861 (it should be noted that this report is the first step in undertaking that appraisal work).

A possible outcome of this study is consideration by the client group to submit the fixed link project for inclusion within the STPR2. In addition to securing funding support, inclusion within STPR2 would likely secure recognition of the project within the emerging National Planning Framework 4 (NPF4). This will:

- Form part of the statutory Development Plan and include a suite of high-level thematic policies to replace the current Scottish Planning Policy (2014).
- Define a suite of 'National Developments' for which the overarching principle of development is deemed to be established at the national level.
- Support the preparation of Regional Spatial Strategies (RSS), which under Section 6 of the Planning (Scotland) Act 2019 must identify priorities for and the proposed location of "strategic developments"[36]. Whist the main benefit (connecting the A82 and A861 across Loch Linnhe) would be contained within THC's administrative area, wider socio-economic impacts around Loch Linnhe may allow the project to be considered as a candidate strategic development in any RSS.

Key Point:

The proposal for a fixed link across the Corran Narrows is supported within the local planning context. Local promoters are keen to see this infrastructure as part of a long term national programme, ideally included as an STPR2 priority scheme, which may also secure its recognition within the emerging NPF4.

36 | Defined as developments "likely to have a significant impact on future development within the area of more than one planning authority".

4.4.2.2 The acceptability of likely environmental and amenity impacts

The key environmental considerations identified earlier in this chapter should inform the final design of any fixed link (including alignment selection) and will need to be subject to detailed assessment to inform any consenting application.

The determination of any such application is likely to be influenced significantly by these issues through the application of related subject policies within the statutory Development Plan (in particular relevant policies within the HwLDP (2012)) and in guidance set out in other relevant material considerations. In general terms, the key tests which any consenting application (and thus finalised design) for the project should satisfy are:

- the avoidance of any likely significant effects during construction or operation on the qualifying and special features of the Onich to North Ballachulish Woods and Shore SAC and SSSI;
- the avoidance of any likely significant adverse effects during construction or operation on flood risk, ecological, heritage and other environmental interests; and,
- the avoidance of any unacceptable likely significant adverse effects during operation on landscape character, landscape designations and visual amenity. This acknowledges the likely occurrence of localised significant landscape and visual effects, taking account of the nature of the project and the characteristics of the Study Area.

Owing to the area required to develop the project it would constitute a Schedule 2 Development under the Environmental Impact Assessment (EIA) Regulations[37] and therefore require EIA screening. Subject to confirmation through formal EIA screening, the project is likely to constitute an EIA Development and any consenting application is therefore likely to require to be accompanied by a statutory EIA Report in order to assess all likely significant effects on the environment.

Key Point:

Any consenting application will likely need to be accompanied by an Environmental Impact Assessment Report.

4.4.3 Summary

As with the investigation of the environmental considerations, there are no planning related 'showstoppers' for a fixed link at Corran, indeed the scheme is recognised within the local development planning context. Of particular notes is the WestPlan Action Programme, which commits to safeguarding land on either side of the Narrows for a future fixed link. The policy framework, therefore, has been established to support and influence the identification of any alignment and design for a fixed link, around which a robust case must be made outlining the need for the fixed link from an economic societal perspective.

4.5 Conclusion

From this initial examination of the environmental and planning context in the proximity of the Corran Narrows, there exists no 'showstoppers' which would preclude the future determination of a fixed link across the Narrows. Constraints have been identified and would have to be more fully evidenced and, potentially, mitigation measures developed at detailed design stage where the scale of impacts is deemed to be unacceptable

Although these constraints would not preclude a fixed link, they can and would influence the identification of any particular alignment and the design of the structure itself. Additional mitigation would also need to be considered to address any other constraints identified through a more detailed review of planning policy in the context of a more developed design for a fixed link.

37 | As the project would involve development above and below MHWS, both the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 and the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 are likely to be engaged.

Corran Lighthouse,
Corran Narrows

5.0 Option Generation And Development

5.1 Overview

Having defined the environmental context within with which a fixed link would be constructed, this chapter sets out the process of option generation and development. There are six sections in this chapter covering:

- the key characteristics of the Narrows which will influence the type, design and scale of any fixed link;
- the identification of route corridors which any potential crossing could be developed within;
- definition of broad alignments within the identified route corridors;
- consideration of structural options for a fixed link within the identified route corridors;
- indicative costings for each fixed link solution; and
- consideration of route and junction options for connecting into the existing road network on both sides of the Narrows.

Whilst this is a feasibility study, the STAG principle that optioneering should be unconstrained is adopted, and thus a wide range of route corridors, alignments and structural forms have been considered in the analysis. The options developed reference DMRB requirements.

This chapter will conclude by:

- identifying whether a fixed link across the Corran Narrows is technically feasible;
- if so, the definition of a shortlist of options in relation to the most appropriate route corridor(s), alignment(s) and structural form(s); and
- the broad cost of each shortlisted option, feeding into the cost-benefit comparison in Chapter 5.

5.2 Key Characteristics Of The Corran Narrows

The Corran Narrows has a number of characteristics which will need to be accounted for if a fixed link is to be constructed across or indeed beneath it. These are set out in more detail below.

5.2.1 Bathymetry

Despite the short distance between Nether Lochaber and Ardgour, the Corran Narrows is a deceptively deep stretch of water. The bed drops off dramatically close to the shore on both sides to a maximum depth of circa -24m Chart Datum (CD). This is important in the context of a fixed link, and in particular tunnel options where the entrance and exit portals would need to be well inland to provide acceptable gradients for getting under this depth of water. Any bridge support tower located away from the shoreline would also need to extend a significant distance to reach the seabed.

It should also be noted that the channel is deepest on its eastern side and thus the shipping lane (see below) is to that side of the channel. From a bridge perspective, the maximum air draught (see below) will need to be provided over this part of the channel, rather than in the centre point, which has implications for the structural design of the bridge.

Key Point:

The depth of the Corran Narrows together with the main shipping channel being on the eastern side will have implications for the alignment, size and gradients of any fixed link option.

5.2.2 Tidal Conditions

The Narrows act as the confluence between the upper and lower sections of Loch Linnhe and are effectively a choke point in the Loch. This gives rise to very specific tidal conditions, namely:

- A 'tidal race' through the Narrows, which, according to Admiralty Chart 2380, can give rise to tidal streams as high as 5 knots, with local anecdotal evidence suggesting that a combination of weather and freshwater levels can lead to tidal streams of 6-7 knots at times[38].

- From historic levels recorded and data available from www.tidetimes.org.uk it is estimated that water levels in the Corran Narrows can vary by up 4-5 metres on spring tides. This is a significant tidal range and has implications for required air draught (see next section).

5.2.2.1 Tidal Energy Opportunities

The tidal race through the Corran Narrows means that it has long been identified as a potential source of tidal energy. This has been promoted through several studies and there has been commercial development interest in the site. At this stage incorporation of tidal energy generation options have not been included as part of any fixed link solution due to current research identifying that current designs are not cost effective.[39] As such this will require further exploration at a later detailed appraisal stage to understand changes in the market as renewable energy continues to play a key role in ongoing policy development and the possible introduction of hybrid ferries.

As such, any consideration of a fixed link should, as a minimum, not prevent the future realisation of these aspirations.

Key Point:

The Corran Narrows has very specific tidal characteristics. This impacts on the air draught requirement of vessels. There are also aspirations to develop tidal energy schemes at Corran and thus any fixed link should not prevent the future realisation of these aspirations.

5.2.3 Air Draught

As alluded to above, Loch Linnhe is a shipping channel connecting Fort William and the port facilities at Corpach with the Sound of Mull, Firth of Lorn and beyond to the open sea. Traffic through the Narrows is a combination of leisure craft, coasters & cargo vessels and small cruise ships. At present, there are no significant restrictions for vessels transiting the Narrows.

Clearly, the construction of a bridge could, depending on design, place a restriction on the movement of vessels through the Narrows. This could have negative impacts on the Lochaber economy and would give rise to public and stakeholder acceptability issues. The key design parameter from this perspective is air draught, which is the distance from the surface of the water to the highest point of the vessel, itself influenced by the tidal range at Corran.

A particular issue in this respect is cruise liners, which tend to have a larger air draught requirement than small coaster and cargo vessels (high masted yachts are also an issue but can be more readily de-masted) and relatively inflexible schedules. Cruise vessels therefore require a degree of certainty when planning schedules and the requirement to work around tidal windows is likely to be unattractive to them, such as only being able to transit under a fixed link during low tides.

Due to the success of marketing in recent years, Fort William has witnessed a steady increase in the number of cruise ships calls, with 19 vessels scheduled to arrive during 2020. There are aspirations from Fort William Marina & Shoreline Company Limited, local residents and Elected Members to increase this market to further support the economic development of the Lochaber region. It is therefore important that any potential route corridors or structural options do not within reason constrain these growth opportunities, and the option development therefore accounts for this. From data highlighting vessels that have previously called at Fort William, the maximum air draught indicated is 40 metres.

It is though important to bear in mind that there will be trade-off to some extent with the height of any bridge (and its associated air draught), its design and its cost. A fixed structure would also put a hard and permanent constraint on the height of vessels which could transit the Narrows to Fort William and Corpach. These issues will be explored in more detail in this chapter and, if a fixed link scheme progresses, in the business case and detailed design stage.

Key Point:

The requirement to maintain an appropriate air draught, accounting for the tidal range at the Corran Narrows, will be an important consideration in the option development process which follows.

5.3 Route Corridor Identification

Having determined the key planning & environmental considerations and the specific characteristics of the Corran Narrows, the next step in the option development process is to identify the corridors in which a fixed link could be built.

In line with DMRB guidance, and recognising the feasibility nature of this study, a variety of route corridor options have been identified. It was quickly identified that there are a limited number of corridors within which a fixed link could feasibly be constructed. Consequently, the number of locations was established as four potential route corridors for bridge crossings and one route corridor for a tunnel option.

5.3.1 Potential Route Corridors

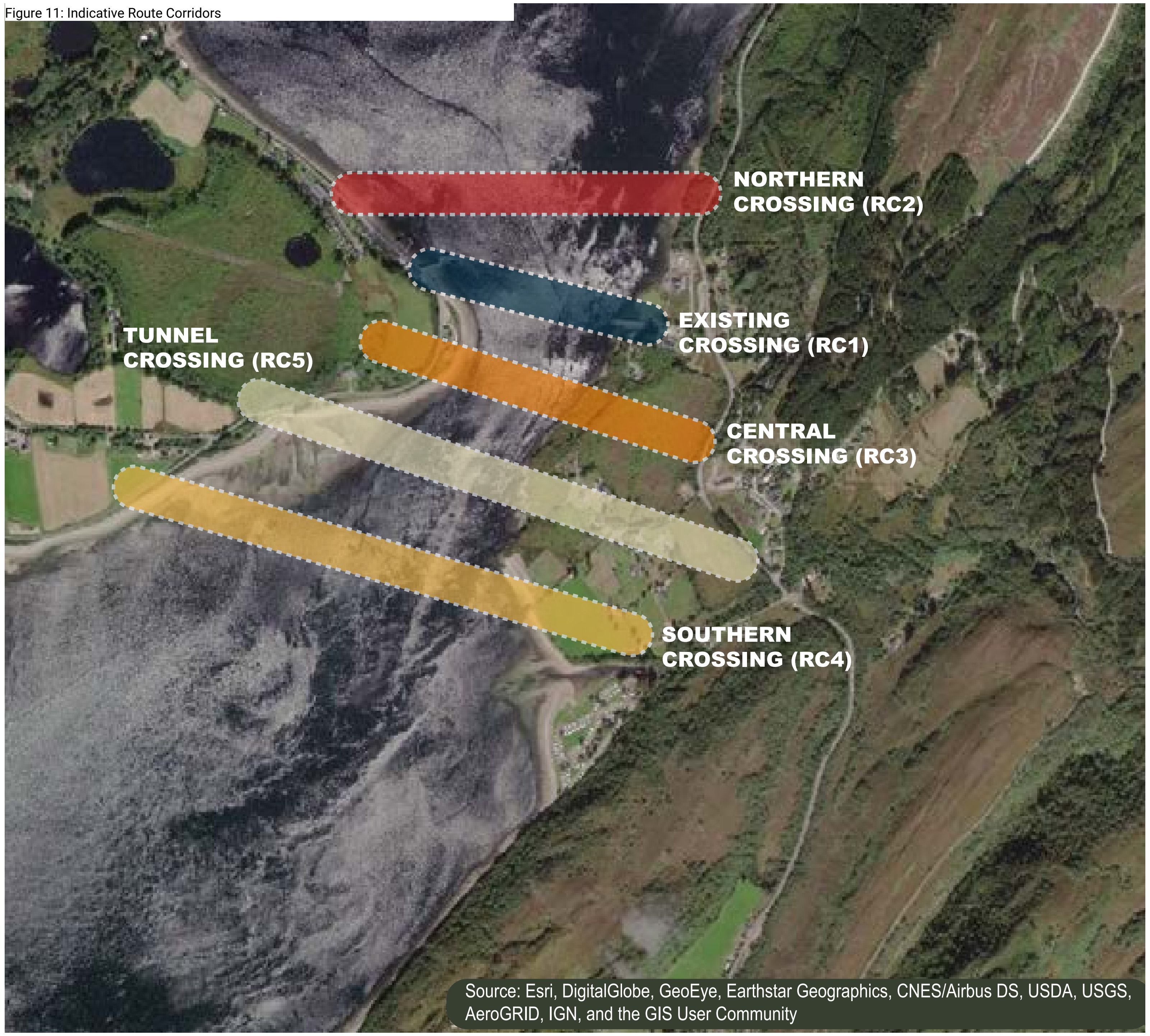
The route corridors considered as part of this high-level feasibility study are illustrated in figure 11 below and can be broadly categorised as follows:

- RC1 would be broadly on the alignment of the current ferry service

- RC2-RC4 would be to the north or south of the existing ferry service

- RC5 would be the required road corridor for a tunnel option.

Figure 11: Indicative Route Corridors



38 | Corran Ferry STAG Appraisal (Peter Brett Associates LLP, 2018), p. 26
39 | The Highlands Council — Stromeferry Bypass Tidal Generation, Feasibility Report Stage 2 Assessment, 2014

In more detail, the corridors, therefore, are:

- Route Corridor 1 - Existing Ferry Service Corridor: On the line of the existing ferry crossing, linking Nether Lochaber and Ardgour in the vicinity of the current slipways.
- Route Corridor 2 - Northern Corridor: This corridor would link into the A82 north of the existing access junction to the Corran Ferry on the eastern shore. On the west bank, the corridor would link into the existing junction of the A861 and James Carmichael Way, which is approximately 270 metres north of the Ardgour slipway.
- Route Corridor 3 - Central Corridor: This corridor would link into the A82, south of the existing access junction to the Corran Ferry on the eastern shore. On the western shore, the corridor would land on the hill above the Corran Lighthouse and link down onto the A861.
- Route Corridor 4 - Southern Corridor: This corridor would link into the A82, further south of the existing access junction to the Corran Ferry and just north of the Abhainn Righ watercourse. On the western shore, the landing point would be south of the junction of the A861 and the access road to Clovullin.
- Route Corridor 5 - Tunnel Corridor: Due to the physical constraints within the study area, the potential corridor options for a tunnel are limited. As such, the identified route for a tunnel is a hybrid of Route Corridors 3 and 4 above. On the eastern shore, the entry portal would be located slightly north of the location identified in RC4 above. The tunnel route would then need to curve along a similar alignment to RC3 due to the length required to minimise gradients, keeping them within the thresholds recommended by DMRB. On the western shore, the portal would then be located north of the access road to Clovullin.

Having defined broad route corridors, the pros and cons of each are explored in more detail below. These route corridors are indicative and by no means firmly define a preferred crossing point, rather they provide an envelope within which any crossing would be located. If this study was to progress beyond the feasibility stage, these route corridors would be fully assessed as part of a more detailed route option assessment stage to assist in identifying a preferred route alignment to take forward for detailed design and development. Public and stakeholder engagement would be a key element of this process, particularly for those directly affected by the route corridors.

5.3.2 Potential Route Corridors – Pros and Cons

5.3.2.1 Route Corridor 1: Existing Ferry Service Corridor

Pros

RC1 would follow the same broad alignment as the current ferry service. This would make best use of the current road access points from both the A82 and A861, reducing the amount of construction related works.

At 550 metres in length, this route corridor is also the shortest of those identified, which would reduce the overall cost of the fixed link.

RC1 would minimise impacts on the local environment - it would require minimal vegetation clearance, especially with respect to the plots of ancient woodland within the study area and thus may be more readily consentable.

This route corridor would also require minimal land-take and is unlikely to impact significantly on any property boundaries on both shores.

RC1 would not inhibit future tidal energy schemes in the Corran Narrows.

Cons

The primary disbenefit of this route corridor is the impact it would have on the ferry service during the construction period. The ferry could not operate its current route for a period of circa 24 months and thus a temporary ferry service and marshalling would need to be established at an alternative crossing point (which would be very challenging and be an additional cost to this option) or the service would need to be suspended. It is possible that a temporary ferry service could not be established given limited options to operate from elsewhere and this would thus give rise to major severance issues for the peninsular communities, severely restricting access to employment, services and onward travel opportunities. If a suspension of the ferry necessary, there would likely be major public acceptability issues with this route corridor.

Due to the levels of the road connector points on both the A82 and A861, any fixed crossing along this corridor could not achieve the required air draught and thus the shipping lane would be closed off to all but the smallest of vessels. It would therefore be necessary to construct a low-level bridge with an opening or lifting mechanism to maintain the shipping channel. This in itself would be challenging as:

- The location of the main channel means that the opening bridge would have to be asymmetric, with the difficulty of providing a support for the opening sections to rest on when the bridge is opened.
- A vertical lifting bridge would need to be of a considerable scale to provide the necessary clearance. As well as being expensive, the structure would have a significant visual impact and may have difficulties in securing the required planning and environmental consents.

A swing or lift bridge would also introduce a delay for users of the fixed link, particularly with the latter. These delays would erode the journey time savings benefits associated with the fixed link. In addition, there would be little predictability in terms of when the bridge would be opening, which would be a major issue for public transport operators given their requirement to maintain a timetable and for those trying to make an onward connection, the ferry at Lochaline for example.

A bridge with an opening or lifting mechanism would also have a higher level and cost of ongoing maintenance. Additionally, there may be a more frequent need to replace parts due to the saltwater environment, which hastens corrosion and rust to moving parts. This would diminish the reliability of the fixed link. Additionally, there would be an ongoing cost associated with running a control centre and operative to manage the structure.

The construction phase in itself would also give rise to several obstacles that would need to be mitigated, such as establishing a safe construction working zone due to the number of properties that would share the access with construction vehicles and staff (e.g. the Corran Inn and Corran Bunkhouse and several residential properties). The access road is narrow and could give rise to potential conflicts between pedestrians / general traffic and construction traffic. In addition to disruption to existing properties and businesses taking access from this route.

Summary of RC1:

There are many benefits to this route corridor, such as reduced requirements for roadside construction and the minimisation of impacts on both neighbouring properties and the environment as it uses an established corridor. However, this route corridor may require the suspension of the ferry service for the duration of the construction period (this remains to be determined), which would have major socio-economic impacts on the peninsula communities. Moreover, the requirement for a low-level structure with an opening / lifting mechanism would add to the capital and ongoing costs and would give rise to delays and, potentially, reliability issues.

5.3.2.2 Route Corridor 2: Northern Corridor

Pros

RC2 would permit the continued operation of the ferry service during construction.

This route would not inhibit future tidal energy schemes in the Corran Narrows.

Due to the location of this corridor, there is sufficient length to construct a new access road to the bridge structure running perpendicular to the current A82 to establish the height necessary to provide the required air draught. The structure would then need to reduce in height quickly to link into the existing A861 and John Carmichael Way junction. This is however possible as the navigation channel for the Narrows is in close proximity to the eastern shoreline and thus there is scope for the bridge to gently decrease in height as it approaches the western landing point.

RC2 would also have a limited impact on surrounding residential properties in terms of both the requirement for compulsory purchase and construction related disturbance.

Cons

RC2 is the second longest of the route corridors currently identified at approximately 1km in length. This length would increase the cost and ongoing maintenance of any fixed link compared to the other corridors. Additionally, there would be higher road based construction costs incurred at the eastern side to develop the connecting road from the A82 and to form an embankment of sufficient height to meet the bridge at a level which allows it to achieve the required headroom clearance over the shipping lane.

The structural options for a bridge would be limited given the required length of the span.

There would be a requirement for the felling of some parcels of ancient woodland to facilitate this corridor on the eastern shore, whilst there would also be potential conflicts with the Scottish Water Pumping Station and fish farms closer to the shoreline on the Ardgour side of the Narrows. Ongoing construction work at sub-sea level and on the banks of the loch could give rise to sedimentary disturbance and discharge which could impact the water quality and subsequently the aquatic ecology. Additionally, as the structure is likely to be situated in an undeveloped corridor, it will have a significant visual impact on residents on the Ardgour side who currently have an undisturbed view across Loch Linnhe.

Currently the main traffic movement of users of the Corran Ferry on the Ardgour side is to turn left towards Clovullin, bypassing the village at Ardgour. As this corridor would make landfall to the north of the village, the majority of traffic movements would be routed through the village which would impact on the local environment, in terms of both noise and air quality and could give rise to safety concerns, due to the increased likelihood of conflicts between vehicles, pedestrians and cyclists. There may be a minor benefit associated with an increase in passing trade.

Summary of RC2:

Whilst this route corridor would provide benefits in terms of the continuation of the existing ferry service during the construction period, the scale of the disbenefits is significant. These include higher capital costs than the other options, challenges in terms of obtaining environmental consents and limitations in terms of the number of bridge options available due to the length of span required.

5.3.2.3 Route Corridor 3: Central Corridor

Pros

The ability to continue to operate the existing ferry service during the construction period, limiting the impact on the residents and visitors.

RC3 is also one of the shortest crossings, which will minimises the cost and ongoing maintenance of any potential fixed link structure.

This route corridor also provides advantages over the other corridors with respect to its topographical characteristics. The natural height afforded by the bluff on the eastern side of the Narrows and the hill above Corran Lighthouse on the western side provide natural height and reduce the amount of land and earthworks required to provide this when compared to some of the other options.

The potential locations of the bridge piers would be close to the shoreline. This would ensure that future proposals to harvest tidal energy are not compromised, whilst construction would not impact upon the fish farm on the Ardgour side.

This route corridor would have minimal environmental impact on designated features.

There is potential to improve overall local access to the A82 from the local settlement of Inchree by rationalising the A82 junction connections in the area and providing an improved single junction connection onto the trunk road network.

Cons

A number of properties have recently been constructed on the bluff above the Narrows in the vicinity of the route corridor. To develop a sufficiently wide corridor, a 30 metre buffer was established around the route corridor to ensure that it does not infringe upon any land boundaries. Nonetheless, there are still likely to be significant visual impacts for these properties, particularly for those facing onto the Narrows.

The residents of neighbouring properties would potentially be subject to noise and air quality impacts during construction and there would be a need to consider mitigation measures to reduce these impacts.

The corridor is also in close proximity to Corran Lighthouse, which is a Category C-Listed Building, and there would also be an additional requirement to relocate the war memorial from the top of the hill behind the lighthouse. The final environmental consideration would be the requirement to fell a small parcel of ancient woodland that surrounds the hill where the western extent of a fixed link would land.

To provide the required air draught, the structure would be high and visible from a significant distance away. It would also have significant visual impact on residents of Inchree and Bunree on the Lochaber side who currently have an undisturbed view across the Narrows. The impacts on views from local properties and villages on the Ardgour side is anticipated to be less significant due to the presence of woodland planting. This route corridor will have very limited interaction with any residential property boundaries.

Summary of RC3:

This route corridor has more benefits than disbenefits, with many of the disbenefits similar to all other corridors under consideration, while the benefits for this corridor are more specific to it. Of particular importance is the natural height afforded on both sides, which would provide the required air draught to maintain the shipping lane.

5.3.2.4 Route Corridor 4: Southern Corridor

Pros

This route corridor would allow the ferry service to be maintained during construction and would not preclude tidal energy development in the Narrows.

There is land available on both sides of the Narrows to facilitate construction of embankments of sufficient height to tie into a structure with the clearance required to permit free transit of vessels along Loch Linnhe. However, it should be noted that the earthworks of an option along this route may encroach on residential properties.

The landing point on the western shore also provides a direct route for traffic to continue southbound without residual impact on the neighbouring village.

Environmental impacts are likely to be minimal, with only a small number of trees requiring to be felled and with limited impact to no impact on the fish farm further up the loch.

RC4 would not inhibit future tidal energy schemes in the Corran Narrows.

Cons

This corridor is the longest of those identified at approximately 1.5km. This length would increase the cost and ongoing maintenance of any fixed link compared to the other options. There also would likely be increased road construction costs on the eastern end due to the need to have a lengthened connecting road between the bridge and the A82. The bridge would also have a larger gradient (although still with standards) to ensure sufficient air draught – this will incur additional costs associated with earthworks to provide this height.

This corridor would also have conflicts with surrounding residential properties on both the eastern and western sides of the Narrows and may even require the compulsory purchase of land on the eastern side depending on the final alignment. It is also likely to have a significant visual impact on both residents and visitors due to the length and height required and its proximity to the Bunree Caravan and Motorhome site.

Summary of RC4:

This route corridor is likely to have significant costs associated with it, due to the span of the structure required and the associated subsequent road-based works to provide access to the structure. There are few obvious advantages over RC3.

5.3.2.5 Route Corridor 5: Tunnel Corridor

Pros

As well as providing continuity for the ferry service during construction, the main benefit of the tunnel corridor is that there would be little in the way of visual impact in comparison with an above ground fixed link.

A tunnel would also allow any future aspirations for harvesting tidal energy, and it will not impact on the shipping lane through the Narrows. Indeed, it future proofs the shipping the lane against growth in vessel size / height, removing any 'hard' constraints in this respect.

Environmental impacts would be minimal with both entry and exit portals located away from any designations and there would be no need for the felling of any trees. Sub-seabed activity is also unlikely to impact on aquatic ecology and seabed biodiversity.

Cons

The main disbenefits associated with this route corridor, as highlighted within the case studies section, is cost and the lack of tunnel procurement and construction experience in the UK.

There are several risks associated with this route, including unknows with regards to the geology below the seabed and ability to source the required experience and machinery to make this route viable.

Construction impact is also likely to be high with increased HGV trips in the area to remove excavated material during the boring process.

A tunnel option would also make it difficult to create an active travel travel route as part of a fixed link option.

Summary of RC5:

This route corridor is likely to be the most expensive option for a fixed link structure across the Narrows. The level of construction and removal of excavated materials is likely to increase the environmental impact associated with noise and emissions from significant numbers of HGV trips. Also, there is a significant degree of risk associated with tunneling due to the limited experience of procuring and delivering such projects in the UK.

5.3.2.6 Route Corridor Summary

The table below summarises the performance of each of these identified route corridors against a variety of criteria, effectively collating the above narrative into a single table. Level of impact is registered using a 7-point scale similar to that defined in the STAG guidance and indicated below:

✔ ✔ ✔ - Highly Positive Impact

✔ ✔ - Moderate Positive Impact

✔ - Slightly Positive Impact

O - No Impact

✕ - Slightly Negative Impact

✕ ✕ - Moderate Negative Impact

✕ ✕ ✕ - Highly Negative Impact

Criterion	RC1: Existing Corridor	RC2: Northern Corridor	RC3: Central Corridor	RC4: Southern Corridor	RC5: Tunnel Corridor
Ability to retain ferry service during construction	✕ ✕ ✕	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Long-list of structural options available	✕ ✕ ✕	✕ ✕ ✕	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Ability to retain Narrows as a shipping lane	✔	✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Ability to provide satisfactory air draught	✔	✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Ability to retain future potential for tidal energy generation	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Visual impact of a fixed link	✕	✕ ✕	✕	✕ ✕ ✕	✔ ✔ ✔
Environmental impact of a fixed link	✕	✕ ✕	✕	✕	✕ ✕
Conflict with land ownership	O	✕	O	✕	O
Routing of traffic away from settlements	✕ ✕	✕ ✕ ✕	✔ ✔ ✔	✔ ✔ ✔	✔ ✔ ✔
Reduction in quantity of required works (earthworks)	✕	✕ ✕	✕	✕ ✕	✕ ✕ ✕
Impact of construction	✕ ✕ ✕	✕	✕	✕ ✕	✕ ✕
Impact on costs of project	✕	✕ ✕	✕	✕ ✕	✕ ✕ ✕

Table 5 1: Route Corridor Impact Summary

From the variety of benefits and disbenefits associated with each of the potential route corridors, the five corridors have been narrowed down to **three** at this stage, and these should form the basis of any subsequent engagement if the project were to proceed. These corridors are as follows:

- Of the high-level bridge options, **Route Corridor 3: Central Corridor**, provides a greater positive impact and the fewest negative impacts across all potential bridge corridors.
- Due to the benefits of the **Tunnel Corridor: Route Corridor 5**, this option has been retained. It should though be noted that the capital and ongoing costs of a tunnel are likely to be comparatively high and there are significant risks relating to the technical complexity of the work and the procurement of competent contractors to deliver it.
- It is also recommended that **Route Corridor 1: Existing Corridor** is considered further due to the more limited roadside works required at this site and its minimal disruption to surrounding property owners. However, it should be acknowledged that any future consideration of this corridor would be predicated on developing a solution to maintain the ferry service and the identification a deliverable and reliable structural option.

5.4 Route Corridors - Broad Alignments

Having identified three route corridors for further consideration, broad alignments were investigated identifying a possible location for a fixed link within each corridor. As stated previously, these alignments are wholly indicative at this stage and are intended to provide a broad basis for comparative purposes.

5.4.1 Route Corridor 1 - Alignment

As route corridor 1 is situated within the existing crossing corridor, the alignment of any structure would remain within this corridor to take the full advantage of the existing infrastructure and therefore, no other possible alignments have been considered further at this stage – i.e. it can effectively be thought of as approximately slipway to slipway or approximately 520m.

Figure 12: Route Corridor 1, Alignment A (Indicative)

Figure 13: Route Corridor 3, Alignment A (Indicative)

5.4.2 Route Corridor 3 – Alignment A

SPAN: 485M

EASTERN APPROACH: 265M
WESTERN APPROACH: 605M

VOLUMETRIC CUT: 114,170M³
VOLUMETRIC FILL: 114,920M³

Working from east to west, the alignment leaves the existing A82, using the natural height afforded by the bluff on this side of the Narrows, landing on the hill directly west of the Corran Lighthouse, before sweeping round to the south on a tight radius curve before tying into the A861 at a new priority junction. This alignment would require significant earthworks on the western side to tie into the elevated bridge and then would transition down through a large cutting to tie into the existing road network. This alignment minimises environmental impacts, with limited vegetation required to be removed, while at the same time providing a safe link into the existing road network.

5.4.3 Route Corridor 3 – Alignment B

SPAN: 485M

EASTERN APPROACH: 265M
WESTERN APPROACH: 257M

VOLUMETRIC CUT: 14,707M³
VOLUMETRIC FILL: 10,760M³

This alignment follows the previous alignment in much the same vein, with the only difference involving the link into the existing A861 on the western side of the Narrows. This alignment would also involve a deep cutting into the hillside to provide a transition into the existing road network. The height of the bridge crossing causes some issues for this option as the road would require a steep alignment to facilitate a connection into the existing road network, due to restricted available space.

This alignment is likely to require a 'Departure from Standards' to facilitate its development. Another limitation of this particular alignment is the link into the road network which would be, situated on the inside of a bend. This is not a recommended arrangement and would, therefore, increase the need for the removal of vegetation and potential earthworks adjustments to increase sightlines and visibility. This process may also identify a need to consider alternative junction types to mitigate against potential hazards at this intersection.

Figure 14: Route Corridor 3, Alignment B (Indicative)

Figure 15: Tunnel Alignment (Indicative)

5.4.4 Route Corridor 5 – Tunnel Alignment

SPAN: 1,555M

EASTERN APPROACH: 192M
WESTERN APPROACH: 84M

VOLUMETRIC CUT: 35,959M³
(APPROACHES ONLY)

The alignment currently considered falls outwith the desirable maximum gradient for all-purpose single carriageways in DMRB guidance, with gradients of 8% required to ensure the structure could be accommodated within the route corridor and the subsequent tunnelling length minimised. This incline is not a 'showstopper' in its own right but would require a relaxation from the desirable minimum standard by the approving authority.

Additionally, the alignment has assumed relatively easy tunnelling and thus has a depth of 5 metres below seabed. This is a significant uncertainty and the position could change significantly based on any future geological reports that are sought if this option was to be pursued. The alignment design has currently followed the bare minimum required from a road geometry perspective. The curvature of the alignment may also raise issues with regards to drilling and the ability for heavy duty machinery to manoeuvre within these tight confines.

5.5 Fixed Link Structural Options

5.5.1 Foundations

The setting of the Corran Narrows provides a range of challenges for constructing a fixed link. The steep bluffs on the eastern shore and the subsea bathymetry and topography pose several engineering challenges.

Based on initial scoping of available data providing information on ground conditions, subsea terrain and water depths, our emerging thoughts are to locate the foundations for any fixed link as close to the shoreline as possible. Due to the profile of the loch bed and the fast-flowing tidal waters, it would be best to construct these foundations in waters no deeper than 5 metres. This depth and associated proximity to the shoreline ensures that construction is feasible, cost effective and limits the impact on the potential for harvesting tidal energy in the future. It is envisaged that the foundations would be constructed using cofferdams. As the structure moves further into the Narrows, where waters get deeper and faster flowing, there would be significant cost escalations if foundations were to be located here due to the engineering difficulties associated with working in such conditions. Once the locations for the foundations have been identified, the length of clear span (the distance between the foundational supports) would dictate the various structural forms suitable for spanning the Narrows.

A fixed link across the Narrows would require a span of circa 485m for a high bridge and circa 520m for a low bridge, with the main span between two supporting pylons varying between circa 200m and 300m. The chart below provides a high-level indication of optimum spans of fixed links by structure type which has, in combination with other factors, provided the required information for determining the long list of potential fixed link structures for spanning the Corran Narrows.

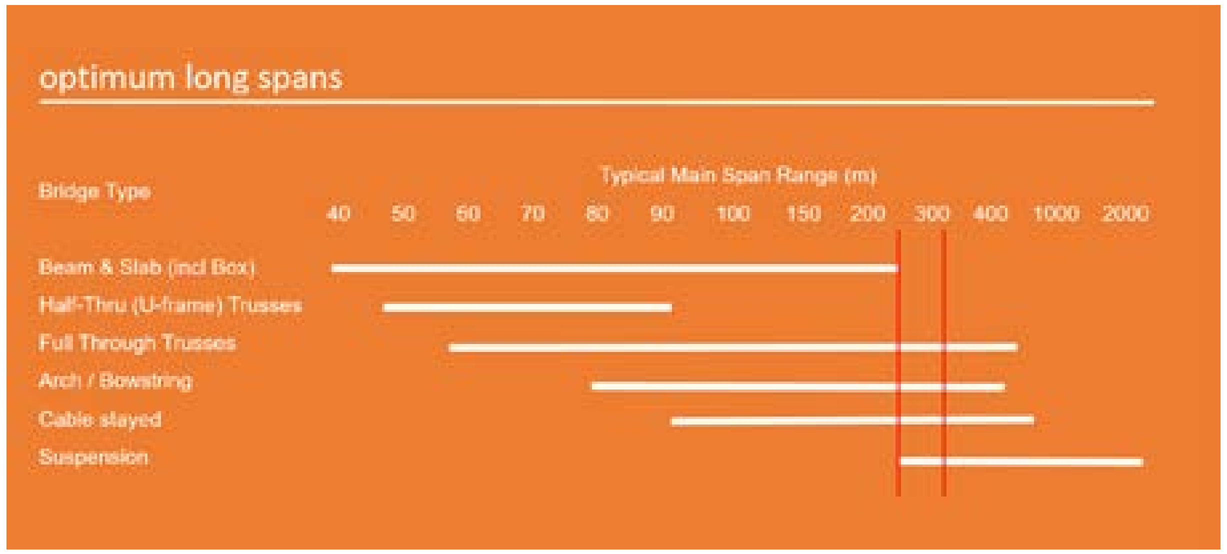


Figure 16: Bridge Spans and Structural Options

Key Point:
It is anticipated that the foundations for any bridge would be located close to the shoreline. The overall span of the bridge would be circa 485m for a high bridge and circa 520m for a low bridge, with the clear span (the distance between the foundational supports) varying between 200m-300m.

5.5.2 Structural Options

A long list of structural options has been developed, building on the STAG principle that all options should be considered and progressively sifted to a working shortlist. These options include both high and low-level bridge options for consideration for route corridors 1 and 3, and a tunnel option for route corridor 5.

Each option has been considered on its own merits as a structure and its suitability for this location. At this stage of the study, the options are discussed in terms of the pros and cons associated with each and have not been considered to the level of detail required to inform overall design. This process would be undertaken if the project were to proceed further, where more detailed analysis of each structure would be undertaken, progressively working towards a preferred option. This would include the actual design of the bridge deck, air draught, cycle and walking infrastructure provision and detailed drawings of the linkages into the existing road network and junction design.

5.5.2.1 Options Long List

Option A: Cable Stayed Bridge
Structure Type: High Level Bridge
Route Corridor: 3

A cable stayed bridge consists of one or more towers, from which cables are suspended supporting the main bridge deck. The most distinctive feature of these bridges is the suspension of the cables directly from the tower(s) to the bridge deck, which normally form one of four designs; Mono, Harp, Fan and Star. This type of bridge has similarities to a suspension bridge as both have bridge decks that hang from cables and both have towers. However, their main difference is related to the way in which they perform their function, supporting the load of the bridge deck. In cable stayed bridges, the cables are attached from the tower(s) to the bridge deck directly, alone bearing the weight of the load. Suspension bridges on the other hand, have cables which ride freely across the towers (as a catenary), transmitting the load to the anchorages at either end.

Cable stayed bridges are preferred for medium length spans, normally between 150 and 900 metres in length. This is due to advances in the materials used in the construction of these types of bridges becoming cheaper, whereby balanced cantilever bridges become heavier and more costly in this distance range. There is also a requirement for less cable with these bridges and combined with the fact these bridges can be constructed out of identical pre-cast concrete, fabricated steel or steel concrete composite sections, put them ahead of suspension bridges also.

There are several well-known examples of these types of bridges including;

- The Queensferry Crossing, which became the world's longest triple-tower cable stayed bridge in 2017
- Oresund Bridge which links Sweden and Denmark between Malmo and Copenhagen
- Ada Bridge, Belgrade, Serbia
- Most SNP Bridge, Bratislava, Slovakia
- Vasco da Gama Bridge, Lisbon, Portugal
- Franjo Tudman Bridge, Dubrovnik, Croatia

FiFigure 17: Queensferry Crossing (Cable Stayed Bridge)

Pros

- **Quick to construct:** The design of these bridges lends itself to a relatively rapid construction timeframe, due to the reduced requirement for anchorage and cabling when compared to the suspension bridge for the span range considered at Corran. There are fewer temporary works as the cable stays are incrementally installed with the prefabricated deck sections in a sequential and relatively balanced manner.
- **Strength of the structure:** The cable stayed bridge is an efficient structural form with the deck loads transmitted upwards to the towers and thence downwards to the foundations in a direct load-path.
- **Cost Advantages:** Its efficient structural form results in less construction complexities, less temporary works, resulting in a reduction in the overall construction time and use of materials. This can reduce installation costs significantly and is one of the main reasons why it is one of the most common bridge types in the world for the span range under consideration at Corran.
- **Design Options:** Although the optimum span length of a cable-stayed bridge is less than that of the suspension bridge type, subject to reasonable substrata being able to support additional towers, one can attach different spans together to create a viaduct bridge of considerable length. An example of this is the infamous Millau Viaduct in France with a total length of 2,460 meters and seven towers.
- **Adaptability:** Cable stayed bridges provide the possibility for a variety of designs enhancing the aesthetics of the structure in its environment. The bridges afford the opportunity for a symmetrical design, four different classes of cabling designs as mentioned above (Mono, Parallel, Fan and Star), and the ability to use any of four arrangements for their support columns. As such, this structural form can be adapted to be sympathetic to the environment in which it is situated.

Cons

- **Unsuited in specific environments:** Although cable stayed bridges can help provide a consistently supportive bridge deck when there are crosswinds present over a span, this option does not work well in locations where the wind speed remains consistently high over significant periods of time. This is due to the rigidity of the cables, which under the pressure of the high-speed crosswinds, may cause the bridge deck to start rocking. Over time this effect starts to loosen the support cables, which will need replacing and constant reviewing, adding to the life-cost of the structure.
- **Challenges for inspection, maintenance and repairs:** Due to the reduced need for anchorage and that the cables are connected into high towers, physical inspection becomes very challenging and maintenance can become intensive. Combined, this can increase maintenance costs significantly compared to other bridge types, often reducing the cost saving benefits during the construction phase. These costs increase depending on the number of towers involved and the length of span.
- **Susceptibility to rust or corrosion:** The majority of cable stayed bridges use a combination of concrete and steel to create a rigid and supportive structure. Unless there are protections in place to maintain the quality of the metals used for the cabling, they can become highly susceptible to corrosion and rust, especially in saltwater conditions. Due to the technique of the cabling for supporting the weight of the bridge deck, even the smallest appearance of corrosion can have a significant impact on the structure. As such, it is necessary to use a water-resistant paint to protect the cabling and structure which can significantly increase ongoing maintenance costs depending on the span and amount of cabling present.
- **Maximum benefits typically apply to medium spans and its connectivity:** The optimum effectiveness of this form of bridge is over medium spans and its agility and flexibility to be linked end-to-end creating a much longer structure / viaduct. For this high-level study, it appears that its linkage benefits are not fully exploited at Corran due to the constraints presented by the Narrows.

Option B: Suspension Bridge
Structure Type: High Level Bridge
Route Corridor: 3

A suspension bridge is a type of bridge in which the bridge deck is hung below suspension (catenary) cables on vertical (or incline) hangers. The suspension cables form a catenary between towers and are anchored at each end of the bridge.

The suspension cables must be anchored at each end of the bridge, since the load on the bridge deck is transferred into tension in these cables. These cables continue beyond the pillars to the deck level supports and then further continue to connections with ground anchors. The bridge deck is then supported by vertical suspender cables called hangers.

There are several well-known examples of these types of bridges including;

- Forth Road Bridge, Queensferry, UK
- Humber Bridge, Hull, UK
- Golden Gate Bridge, San Francisco, California
- Brooklyn Bridge, New York
- Akashi Kaikyō Bridge, Kobe, Japan

Figure 18: Golden Gate Bridge (Suspension Bridge)

Pros

- **Span:** Suspension bridges have the ability to span further than most, if not all, of the other bridge types. The longest bridge in the world from a suspension standpoint is the Akashi-Kaikyo Bridge in Japan at 2,000 metres.
- **Maintenance:** Great strides have been made in recent years in the advent of advances in corrosion protection for suspension cables. Maintenance of suspension bridges has therefore improved but at the expense of a higher initial capital cost.
- **Landmarks:** Suspension bridges have undoubtedly become a feature and an attraction which define many locations, such as the Golden Gate Bridge which immediately strikes an association with a place. They can become a landmark in their own right, drawing visitors to the area.
- **Flexibility:** This type of bridge provides the flexibility of being able to construct the bridge deck in sections, so that they can easily be replaced, without having to have grand overhaul or maintenance project. Additionally, adjustments can be made to the cabling to adjust the amount of weight the bridge can support over time, which infers that the bridge can become flexible and can be adapted to reflect changes in traffic flows and movements across the bridge.
- **Less time to construct:** There is a general reduction in the required amount of materials to construct a suspension bridge than other bridge types. These bridges can be constructed with a reduced need for anchors and as such a reduction in the amount of required cabling to support the bridge deck. This enables the bridge to be constructed in a reduced timeframe from concept design to onsite.

Cons

- **Strength:** Although suspension bridges have the ability to bear the load of traffic through the transfer of tension and weight across the whole structure, there is an upper weight tolerance associated with some designs. If there is a constant focused weight on the bridge that is greater than the weight limit of a single cable, then the whole structure is at risk.
- **Aerodynamics:** High winds are known to cause vibration of the bridge deck due to the interaction with the rigid cabling of a suspension bridge. Newer bridge designs have mitigation methods integrated to reduce the occurrence of this such as aerodynamic profiling, however, this can often result in the support columns not being designed for this extra weight.
- **Lower Deck stiffness:** Typical suspension bridge designs offer a relatively low deck stiffness compared to other bridge designs. This reduces the ability of the bridge to carry intense and focused weight that occurs frequently, such as railway traffic.
- **Extensive foundations work at end anchorages and towers:** If the suspension bridge is built in an area that has soft ground, then there will need to be considerable engineering works to secure the foundations. This is necessary as the weight of the bridge forces downward pressure onto the tower anchors which over time will start to sink into the ground.
- **Redundancy:** It only takes the failure of one of the suspension cables to cause catastrophic results for the bridge, as they need to work in conjunction to provide the necessary support to transfer the tension caused by the weight of the bridge deck. It should be noted, however, after some recent disasters, there have been advances in the safety design of these types of bridges to prevent this from happening.
- **Cost:** Although suspension bridges are one of the most affordable of all bridge types, for certain spans, there are more cost-effective types available, due to the costs of installation of the bridge.

Option C: Tied-Arch Bridge
Structure Type: High Level Bridge
Route Corridor: 3

A tied arch bridge is an arch shaped structure in which the outward horizontal forces of the arch are resisted in tension by the bridge deck itself, rather like a bow (the arch) being restrained by the string (the deck). Vertical hangers or chords connect the bridge deck to the arch at regular spacings to support the deck and the traffic load.

This bridge works by transferring the weight on the bridge deck into tension on the vertical ties, which try to flatten the arch and to push its end tips outward onto the abutments. The horizontal chord provides the stability and constraint on the tension, therefore, allows the bridge to be constructed on less robust foundations because the force on the abutments is low. This design affords great flexibility in locating a structure of this type as they can be built on elevated pylons or in areas of unstable soils as there is less downward vertical pressure onto the foundations and instead the force is pushed horizontally. A further added advantage of this design is that they can be built off-site and transported into place.

There are many variants to a tied-arch that can be considered for most spans including;

Shouldered tied-arch: Half arches at either end of the span support the bridge deck from below and join to the feet of the main arch to prolong the strengthened chord across the span. This makes the whole structure self-anchored and places all vertical loads on all ground bound supports created from the half arches;

There are several well-known examples of these types of bridges including;

- Windsor Railway Bridge, Windsor, UK
- Infinity Bridge, Stockton-on-Tees, UK
- Sydney Harbour bridge, Sydney, Australia
- Birmingham Bridge, Pittsburgh, Pennsylvania
- Fremont Bridge, Portland, Oregon
- Bayonne Bridge, Staten Island, New York

Multi-span discrete tied-arch: Consist of successively lined up tied arches in places where a single span is not sufficient;

Multi-span continuous tied-arch: The tying chord continually spans over all bridge piers, tying the multiple arches feet at the bridge piers. This then enables the distribution of dynamic loads between the spans.

Single tied-arch per span: Two tied-arches are placed in parallel alongside the bridge deck, so that the bridge deck lies in between the respective arches;

Tilted tied-arch: The arches are tilted outward or inward in respect to the central axis running along the bridge deck;

Tied-arch Twin: Two tied-arch bridges constructed side by side to increase carrying capacity, whilst remaining structurally independent.

Figure 19: Bayonne Bridge (Tied Arch Bridge)

Pros

- **Offsite Construction:** As the loads for this structural form is predominantly internal (except for the vertical loads at its supports) this form of bridges lend itself to be fully pre-fabricated offsite, transported to site and either lifted or jacked and lowered onto its prepared foundations. Savings to programme, less site based activities (sustainability and impact on the environment) and reduced temporary works.
- **Length of Span:** The arch design of these bridges affords greater flexibility for spanning greater distances due to the advantages of strength afforded by the design. The arch can travel further between two bridge piers than a straight beam because of how the downward tension is managed, which affords the opportunity to construct a longer bridge deck, whilst providing more horizontal strength to support heavier loads.
- **Resilience:** The curvature of the arch provides the bridge deck and overall structure more strength than other alternatives. A reasoning why, many railway bridges take on this design, as the movement of a heavy load across the bridge, is modified with a downward sagging force, which is then transferred consistently along the full length of the structure by the support columns, reducing the stress over the structure, thus providing resilience longevity.
- **Flexibility of construction materials:** The design affords the possibility of constructing the bridge out of a variety of materials including concrete, steel, aluminum or a combination, due to the way in which the stress of the load is transferred along the structure evenly.
- **Adaptation to local environment:** The arch design and subsequent strength to the structure it affords, provides the structure with the ability to withstand the natural environment better than traditional pillar or abutment style supports. This has been attested to by the number of these bridges and other structures still standing that were constructed over a 1,000 years ago that have an arched design in their construction.
- **Structural Integrity:** Although the arch design is already naturally strong, as the structure continues to age, it is possible for the structure to continually become stronger. This is due to the compression applied over the years, beginning to flatten out the arch slightly, creating a U-shape with less rounding. This process assists in more efficiently distributing the weight of the bridge deck better to the abutments while providing more stability.
- **Design Options:** As the arch shape is so effective at displacing weight across the full length of the structure, it provides the opportunity to design the structure based on many different forms as listed above. This provides a greater degree of flexibility in identifying a structure to best fit the span being considered, whilst combinations of arch designs can improve and provide greater stability.

Cons

- **Finite span with each set of abutments:** Although there is an indefinite span associated with tied-arch bridges, to cover longer spans, you need multiple arches, thus supporting abutments. The longer the span, the more arches required and the more abutments. Without this, the greater the distance between arches reduces the benefits of the design to transfer weight across the structure.
- **Experience and Cost:** These types of bridges are one of the most difficult to design and requires an experienced structural engineer to plan. There is a need to understand the complexities of interior and exterior pressures that the abutments must handle. There is then a need to ensure there is adequate strength in the materials and support processes for enough transference of weight to occur and thus enable the structure to perform its function. This thus increases the cost associated with the design process of the bridge, which increases significantly depending on the complexity of the design.
- **Perfection:** There is a need for absolute perfect alignment of the support abutments with the arch design to ensure that the distribution of weight to the abutments is equally balanced. Any discrepancies in this part of the process are significantly challenging to overcome.
- **Higher levels of ongoing maintenance:** Arch bridges require ongoing maintenance to ensure the supports are distributing the weight to the abutments correctly. Subsequently, there is a need for frequent inspections of the span of the structure as it ages to ensure that the structure is not weakening over time.
- **Construction time:** Due to the level of detail and specifics in the design of an arch bridge, construction time of the bridge can be significantly greater than other types of bridge structures. Again, this can impact overall budget of the structure due to the increased manhours and experience required to build these types of structure.
- **Cost:** Complexity of design, construction and ongoing maintenance can all add up significantly depending on the design of the structure. This can increase the overall cost of this style of bridge significantly above other designs. However, the resilience afforded by this design can improve the lifespan and longevity of the bridge.

Option D: Vertical Lift Bridge
Structure Type: Low Level Bridge
Route Corridor: 1

A vertical lift bridge is a bridge which contains a section of bridge deck that is lifted vertically, while remaining parallel to the remaining bridge deck. Lift bridges generally cost less compared to other types of opening bridges such as bascule and swing bridges.

Lift bridges use a system of counterweights and cables to move the allocated section up and down to allow marine traffic to pass beneath the structure. The average time for the bridge to complete the full operation varies depending on the size of span and required height necessary to facilitate the movement of traffic below it. For example, the Hawthorne Bridge in Portland, Oregon, takes around eight minutes to complete the full cycle – depending on the length of time required by the vessel to pass beneath.

These types of bridges require manual intervention to open and close the bridge and as such require an operator based in a control room on site of the bridge. This is a necessary requirement so the operator can view the bridge to ensure there is no traffic on the bridge deck before beginning the process. The operator can control the movement of the lift span by selecting pre-determined heights or personally manipulating the speed of the motors until the desired height is reached.

The weight of the lifting span is counterbalanced, generally, by two concrete counterbalance weights and are connected to the lift span by numerous heavy tension cables. Turnbuckles on the cables allow maintenance personnel to adjust the tension in the cables and the alignment of the counterweights over time to compensate for any wear and tear.

There are several well-known examples of these types of bridges including;

- Kingsferry Bridge, Kent, UK
- Tees Newport Bridge, Middlesbrough, UK
- The Pont Jacques Chaban-Delmas, Bordeaux, France
- Kattwyk Bridge, Hamburg, Germany
- Aerial Lift Bridge, Duluth, Minnesota
- Tower Bridge, Sacramento, California

Figure 20: Aerial Lift Bridge, Duluth (Vertical Lift Bridge)

Pros

- **Design and construction:** Of all types of opening bridges available, the vertical lifting bridge is the easiest to both design and construct reducing costs of both elements as a consequence.
- **Lifting angle:** The vertical lifting angle can be built with any length required, with the only limitation being the span itself.
- **Strength:** Lifting bridges have the capability to support heavy load structures since the vertical lifting bridge spans are approximately fixed.
- **Versatility:** As the structure only requires both upward and downward movement, it is not as restricted as other opening bridges and, therefore, affords the opportunity to double deck the bridge, which can be moved up and down disregard of each other. Therefore, depending on the clearance required, only one deck may need to be lifted, while the other can continue to function.

Cons

- **Halt to traffic:** The main disadvantage of a lifting bridge is that in the main it restricts the free movement of traffic at all times. In effect it still maintains the characteristics of a ferry to a large extent.
- **Vertical space:** A lifting bridge would still have a restriction to the air draft afforded to vessels to pass through. To overcome this would require higher support towers which would then have a more significant visual impact.
- **Restricted navigation width:** The entire width of the navigation channel cannot be used and navigation is restricted to the relatively narrow corridor afforded by chosen span of the vertical lifting bridge even when the bridge is completely 'opened'.
- **Construction costs:** Although potentially cheaper than other types of opening bridges, vertical lifting bridges are still expensive, due to the requirement of the lifting towers to be some 18 metres higher than the required air draft due to the mechanical components, structural span depths and cable connections in the common traditional form. As the height of these towers increase, so does its impact and influence on the natural environment, in particular wind effects and visual impact.
- **Resilience:** These types of bridges require frequent maintenance to ensure the counterbalances are correct and that all the mechanisms are working accurately. The water environment they are based within, in particular saltwater can increase corrosion and rust, and impact the operation of the mechanisms controlling the lifting section. As such they need to be continually monitored and inspected.
- **Cost:** In addition to the above construction and ongoing maintenance costs, there are also the additional costs associated with running a control center and operator to manually operate the bridge, although the use of technology could to some extent mitigate but not replace human intervention entirely. This will pose an ongoing cost associated with the lifespan of the bridge.

Option E: Balanced Cantilever Bridge
Structure Type: High Level Bridge
Route Corridor: 3

Cantilever Bridges are built using cantilevers, structures that project horizontally, supported on only one end. Large cantilever bridges designed to carry traffic use structural supports called trusses built from either structural steel or box girders built from prestressed concrete.

In its simplest form, a cantilever span is formed by two cantilever arms extending from opposite sides of the feature that is to be crossed, meeting in the middle. The most common variation of this style of bridge is the balanced cantilever bridge, which involves counterbalancing each cantilever arm with another cantilever arm projecting from the opposite direction, forming a balanced cantilever, which are then attached to a solid foundation. The two counterbalancing arms are called anchor arms and extend away from the feature to be crossed.

For example, a bridge built on two foundation piers, there is a requirement for four cantilever arms, two which span the feature to be crossed and then two anchor arms which extend away from the feature. This design requires additional strength to be provided at the balanced cantilevers support piers, which often takes the structural form of towers above the foundation piers. Balanced Cantilever Bridges can be constructed from prestressed concrete, steel or steel-concrete composites. Variants have included the use of steel trusses.

There are several well-known examples of these types of bridges including;

- Forth Bridge (Railway), Queensferry, UK
- Skye Bridge, Skye, UK (to an extent)
- Vejle Ford Bridge, Vejle, Denmark
- Quebec Bridge, Quebec, Canada
- Minato Bridge, Osaka, Japan
- Crescent City Connection, New Orleans, Louisiana

Figure 21: Vejle Bridge (Cantilever Bridge)

Pros

- **Suitability:** This style of bridge is well suited to spanning features in difficult terrains such as deep and rocky gorges and rivers that are prone to flooding. This is advantageous as they don't need temporary supporting structures during construction which would be difficult in these types of terrain.
- **Support structures:** These bridges permit the use of simple column style supports reducing the complexity of the structures. Additionally, with exception of the piers, these bridges do not require further supports during construction.
- **Length of span:** The span of this style of bridge can be longer than other conventional types of bridges as the beams can be attached at the ends of the cantilevers.
- **Business as usual:** Navigation below the bridge is not obstructed during its construction as the spans are constructed incrementally in a balanced fashion outwards from the support pier.
- **Construction efficiencies:** The bridge deck can be easily constructed in segments, which maintains uniformity and consistency while at the same time ensures quality especially when the segments have been cast or fabricated off-site. Additionally, this segmental construction, also makes the installation repetitive, which ensures efficiency during construction. There is also a reduction in the time required as most of these types of bridges are constructed to contain multiple cantilever spans, which means construction can begin simultaneously from all piers.
- **Strength:** Cantilever decks are generally stiffer than other medium and long-span bridges because they have structural continuity and they do not employ tension only members (e.g. cables) and therefore have better resilience to dynamic responses.
- **Design:** The lack of multiple supporting piers provides the opportunity to expand on the depth, style and geometry of the bridge deck supported by the bridge.

Cons

- **Cost: Cantilever** bridges maintain their stability by a balance between compressive and tensile forces within its relatively 'thin' structural depth in resulting a relatively heavy structure in comparison to other bridge forms. As such, this can increase costs significantly due to the amount of material required for its construction.
- **Large supports:** Due to the weight of these types of bridges, the cantilever deck spans require larger and stronger support piers and their associated foundations. This can potentially be costly where subsurface geotechnical conditions may not be suitable to sustain their heavy loads.
- **Construction Complications:** Although these bridges have benefits associated with being constructed in segments, in addition to providing efficiencies, it can also lead to discrepancies during the installation, increasing the chances of visual differences cropping up between adjacent segments.
- **Span configuration:** At Corran, the optimum position to locate the pier supports conflict with the navigation channel and has the challenge of locating the other pier at the deeper part of the narrows.
- **Extreme conditions:** These bridges are not suitable for environments with prolonged exposure to extreme conditions due to the lack of supporting columns.

Option F: Truss Bridge
Structure Type: High Level Bridge
Route Corridor: 3

A truss bridge is a popular bridge form that has the advantages of the inherent stability and efficiency of member triangulation resulting in a relatively stiff and lightweight structure. Examples of trusses include the Warren and the Pratt and their modified variants. Trusses have also been used as a sub-form in other bridge structural forms, for example a Tied-Arch Bridge may have the primary arch member being form of a curved truss comprising triangulated members.

The two most common truss designs are the king posts which utilise two diagonal posts supported by a single vertical post in the centre and queen posts which use two diagonal posts, two vertical posts and a horizontal post that connects the two vertical posts at the top. There are a further 24 design types of truss in use across the world today.

Truss bridges became very popular due to their resilience and economic builds that require minimal amounts of material for construction. Additionally, truss bridges can also be of fixed form or moveable providing greater flexibility.

There are several well-known examples of these types of bridges including;

- Ballachulish Bridge, Ballachulish, UK
- Connel Bridge, Connel, UK
- Royal Albert Bridge, Plymouth, UK
- Francis Scott Key Bridge, Baltimore, Maryland
- Braga Bridge, Fall River, Massachusetts
- Ikitsuki Bridge, Nagasaki, Japan
- Jiujiang Yangtze River Bridge, Jiujiang, China

Figure 22: Jiujiang Yangtze River Bridge (Truss Bridge)

Pros

- **Structure weight:** This type of structure is one of the lightest available, which allows for greater spans to be crossed without penalising the structure through additional weight.
- **Efficiency of design:** This type of bridge can be installed almost anywhere due to the benefits of its design. Although mostly used for the short and medium spans, the overall design of a truss bridge can be scaled up to bridge into the long-span category.
- **Minimal impact during maintenance:** As truss bridges have their bridge deck on top of the structure and not within it, traffic can continue to use the bridge whilst it is undergoing routine maintenance and repairs without causing delay or closures.
- **Flexibility:** This type of bridge can be constructed from a variety of materials, meaning it is possible to construct a bridge based on specific needs to keep cost down. Additionally, due to the many varied design types of truss, it is possible to construct a bridge that reduces negative visual impact.
- **Affordability:** Due to the reduced need for materials and ability to construct these bridges from a variety of materials, it is possible to construct a truss bridge for a lower fee than other types. Furthermore, most of the pieces that engineers develop with this option can fit together quickly as the bridge builds outward. This makes it possible to save on design and implementation costs, while also reducing the labour needs of the structure.
- **Strength:** The truss design provides additional strength due to the nature of how it distributes weight throughout the entire structure, whilst having minimal impact on the environment upon which it is constructed.

Cons

- **Higher degree of wear and tear:** The interaction between the trusses and the way in which weight and pressure is distributed can cause premature wear and tear to occur. Thus, these bridges are favoured more for shorter spans, as the pressure increases significantly as span lengthens.
- **Perfection:** Both the design and construction of the trusses need to be perfect for this style of bridge to be fully functional and distribute the weight efficiently. If there are errors during this process, such as uneven balancing of weight coming from the deck to any of the frames, then this can further premature wear and tear.
- **Maintenance:** Further to the above, the need to ensure that the bridge is constructed perfectly also has inherent issues for ongoing maintenance. There are higher levels required from maintenance personnel to check the framework to maximise its function. There are several additional connections and components to these bridge designs than others which significantly increase the potential for weaknesses and deterioration over time. Every part of the structure fulfills a role and as such it is important to continually maintain the bridge to reduce any wear and tear which may significantly increase if there are shifts in the load distribution across the entire structure.
- **Width:** Although there is a degree of flexibility in the design of truss bridges, there are width requirements that are necessary for this style of bridge to be successful. As such it is important that the unique spatial needs that the truss bridge will require are considered when investigating potential crossing points.
- **Perceived aesthetics:** A product of the Industrial Revolution of the last century trusses have an "industrial" heritage and have often being perceived to have a negative visual impact on the environment.

Option G: Tunnel
Structure Type: Tunnel
Route Corridor: 5

As alluded to in the case study chapter, tunnels are not frequently constructed in the UK, due to a lack of necessary experience due to the difficulties and risks associated with tunneling.

A major tunnel project must start with a comprehensive investigation of ground conditions by collecting samples from boreholes and other geotechnical techniques to make informed choices over the alignment of any tunnel structure. Additionally, these initial investigations can then inform engineers of what machinery and methods of excavation and ground support are required, which will reduce the overall risks. In planning the route of a tunnel, the horizontal and vertical alignments need to be carefully selected to make best use of best ground and water conditions and is common practice to tunnel deeper than is required in order to excavate through solid rock or other material that is easier to support during construction.

Often smaller pilot tunnels are constructed before the main tunnel to identify any unexpected conditions not identified during the initial investigations. These smaller tunnels are then often incorporated into the main tunnel or else safeguarded to be used as a backup or emergency escape tunnel.

There are several well-known examples of these types of bridges including;

- Clyde Tunnel, Glasgow, UK
- Lincoln Tunnel, Manhattan, New York
- Dartford Tunnel, London, UK
- Detroit-Windsor Tunnel, Michigan
- North Shore Connector Tunnel, Pittsburgh, Pennsylvania

Figure 23: Lincoln Tunnel

Pros

- **Visual impact:** Tunnels have no visual impact on the environment.
- **Shipping lane and tidal energy:** Tunnels have no impact on the operation of the shipping lane or preclude the future potential to harvest tidal energy from the Narrows.
- **Reduced footprint:** Tunnels require less land and footprint than a bridge, with land only needed for the entry and exit portals.
- **Weight capacity:** Tunnels afford a greater weight capacity than bridges in general and negate the need to invest in heavier materials to reinforce a bridge.
- **Resilience:** Tunnels have been found to be more resilient than bridges to the impact of natural disasters such as earthquakes and ground movements. This is important in this context as the Narrows sits on the Great Glen Fault. Additionally, tunnels are not affected by adverse weather conditions such as high winds which can impact on the use of bridges by different vehicles.

Cons

- **Cost:** Tunnels are far more expensive than bridges and costs can significantly increase during construction time due to unforeseen circumstances not identified during initial investigations. This has the ability to increase costs exponentially.
- **Experience:** There is a lack of suitable experience and knowledge in the UK on tunnelling. This would then require the need to bring in external professionals to assist in the design and construction phases increasing timescales and costs.
- **Construction time:** Tunnel construction times can be far more significant than bridge construction times and can vary dramatically depending on the variety of risks associated with tunnelling, such as the collapse of the structure or water leakage into the tunnel.
- **Dangerous goods:** Tunnels can preclude the transit of vehicles based on the goods that are carried in case of risk of fires on the tunnel or mean that other vehicles are not allowed in the tunnel at the same time.
- **Lack of adequate active travel links:** Most tunnels do not include an active travel link, and those that do are often uninviting for active travel users. They can often be dangerous for these types of users, due to risks of vehicle accidents and fire outbreaks.
- **Staff costs:** Tunnels require the installation of control centres to continually monitor the tunnel in case of emergencies such as fires and accidents as mentioned above.
- **Availability of heavy machinery:** The boring of a new tunnel requires the acquirement of heavy-duty machinery to bore through the soil and rock and to construct the tunnel. These machines can often be difficult to source and are costly, which increases overall construction times and costs. Additionally, both gradient and curvature of the alignment of the tunnel can have implications on the manoeuverability of these machines.

5.5.3 Initial Options Sift

The structural options listed above were considered for further discussion within this feasibility report, while some further options were investigated but then sifted out due to the inherent difficulties associated with each and unsuitability for the unique characteristics of the Narrows. These included:

- **Causeway:** This option has been sifted as it would effectively close the shipping lane, which would be an unacceptable outcome.

Figure 24: Causeway

- **Bascule Bridge:** Often referred to as a drawbridge, this option was considered as a low-level bridge for RC1. It was discounted on the basis of:

- being more expensive than a lifting bridge;
- restrictions in the possible span afforded, due to the maneuverability of the mechanisms;
- the wait required for the full cycle, which would not be dissimilar to a ferry;
- costs associated with ongoing maintenance, control centre and operator;
- resilience of the moveable structures which could potentially breakdown and require vehicles to reroute around the loch, which has the same result as the ferry currently during breakdowns and bad weather.

Figure 25: Bascule Bridge

- **Swing Bridge:** This option was considered as a low-level bridge for RC1. It was discounted on the basis of:

- being more expensive than a lifting bridge;
- requires considerable maintenance because of the large number of moving elements;
- a requirement for supporting piers at the centre of the channel makes the bridge vulnerable to collisions and can impact the beam of vessel that can travel through the bridge;
- the extended wait times required for the full cycle over a lifting bridge, which would not be dissimilar to a ferry;
- costs associated with ongoing maintenance, control centre and operator;
- high instances of breakdown due to the fragility of parts and mechanisms used to perform the swing function, which increases the occurrences of malfunction. Again, this replicates the same issues with the resilience of the ferry during breakdowns or bad weather and the requirement for traffic to reroute around the loch.

Figure 26: Tyne Swing Bridge

Other types of opening styles of bridges including tilt, folding and retractable have also been sifted. This is due to the cost of these options and limited benefits on offer, even when compared to the sifted options above.

5.5.4 Estimated Capital Costs

This section sets out the indicative costs associated with each of the structural options described above, broken down by capital and maintenance & operational costs. It is important to reiterate again here that the costing undertaken in this feasibility study is high-level and solely intended to identify whether there is merit in considering one or more fixed link options in detail.

Costs have been derived through a review of completed structures across the world to provide a structure cost by span matrix. Whilst this does not take account of the local procurement, regulatory regimes, cost and contractor experience, it provides a reasonable and consistent basis for comparison at this stage. The charts below provide an illustrative example of the varying degrees of cost associated with building different bridge types.

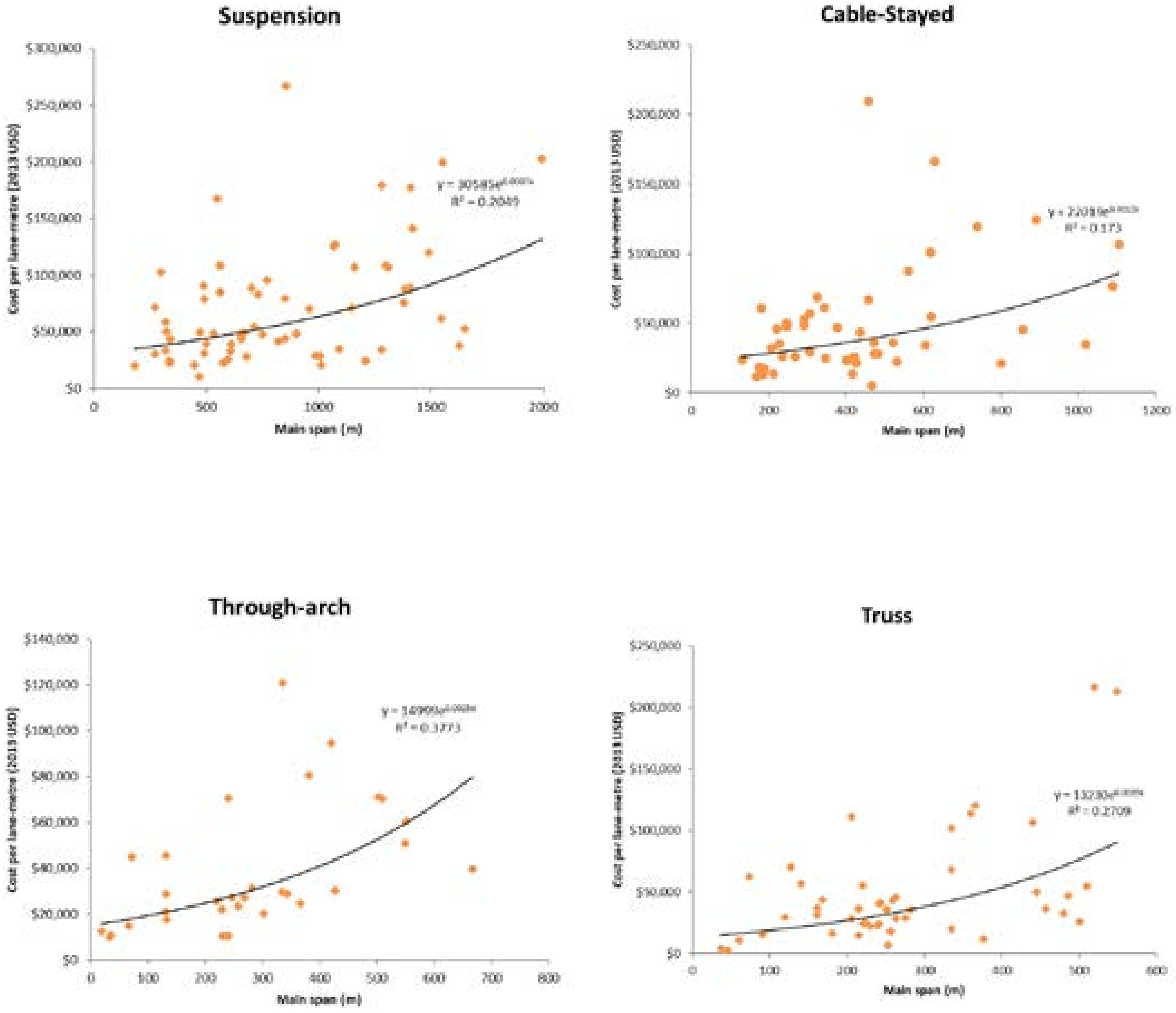


Figure 27: Illustrative Costs of Bridge Structures per lane metre (US Dollars ($))

5.5.4.1 Capital Costs

The table right sets out the estimated capital costs of each of the identified structural options based on the analysis above. These are presented as a 'low to high' range. These costs are for the structure only, including the bridge deck and do not include the costs associated with roadside construction, which is discussed at a later stage. These costs do not include optimism bias at this stage.

All costs for bridge structures have been costed to include an **air draught of 32m**. An increase in height would increase subsequent costs associated with the structure and the road based connections.

Option	Indicative Capital Cost	
	Low	High
A – Cable Stayed Bridge	£35m	£45m
B – Suspension Bridge	£37m	£47m
C – Tied-arch Bridge	£30m	£40m
D – Vertical Lift Bridge	£25m	£30m
E – Cantilever Bridge	£40m	£45m
F – Truss Bridge	£35m	£45m
G - Tunnel	£40m	£65m

Table 5 2: Indicative Capital Cost for Corran Narrows Fixed Link by Structure Type

Key Point:

It can be seen from the above table that the cost envelope for a **bridge** at Corran would be in the region of £30m-£47m. The 'high' **tunnel** cost is by some margin the highest overall cost.

5.5.4.2 Operational and Maintenance Costs

As covered in the supporting text for each of the structural options, different structure types require different levels of ongoing maintenance (low & high bridges) and operational involvement (low bridge), including repairs, replacement parts and human resource. As these will vary on an annual basis, the estimation of operational and maintenance (O&M) costs has been framed in the context of a percentage of the capital cost over the appraisal lifespan of 60 years.

Option	Indicative Capital Cost		Maintenance & Operational	Maintenance & Operational	
	Low	High	%	Low	High
A – Cable Stayed Bridge	£35m	£45m	*25%*	*£9m*	*£11m*
B – Suspension Bridge	£37m	£47m	*27%*	*£10m*	*£12m*
C – Tied-arch Bridge	£30m	£40m	*17%*	*£5m*	*£7m*
D – Vertical Lift Bridge	£25m	£30m	*60%*	*£15m*	*£20m*
E – Cantilever Bridge	£40m	£45m	*13%*	*£5m*	*£8m*
F – Truss Bridge	£35m	£45m	*29%*	*£10m*	*£12m*
G - Tunnel	£40m	£65m	*50%*	*£20m*	*£33m*

Table 5 3: Indicative 60-Year O&M Cost for Corran Narrows Fixed Link by Structure Type

Key Point:

Whilst some bridge structures have a lower overall capital cost, this benefit can be eroded due to higher maintenance costs, an obvious example being a vertical lift bridge. Overall, it is anticipated that a tied-arch bridge would have the lowest O&M cost, but there is little difference from a whole-life cost perspective when compared to a cable-stayed, cantilever or suspension bridge.

5.5.4.3 Optimism Bias

There is a demonstrated, systematic tendency for project appraisers to be overly optimistic – this is known as Optimism Bias (OB), where costs are often under-estimated and benefits over-estimated. In order to account for this in appraisal, the H.M. Treasury Green Book, and in this case the STAG Technical Database, provide a set of factors by which costs should be scaled-up at different stages of the business case.

Table 13.4 of the STAG Technical Database recommends the application of 66% OB at Strategic Business Case (SBC) stage, which is actually one step on from where this study is at present. In all projects, and in line with the guidance, the initial optimism bias should not be 'locked in' and, as the design and cost estimates mature, optimism bias is likely to reduce, reflecting a better understanding of these parameters – this incremental reductions in OB approach is highlighted in the Technical Database.

The table below highlights the low and high ranges for the options based on the 66% optimism bias.

Option	Indicative Capital Cost		Capital Cost + OB	
	Low	High	Low	High
A – Cable Stayed Bridge	£35m	£45m	*£58m*	*£75m*
B – Suspension Bridge	£37m	£47m	*£61m*	*£78m*
C – Tied-arch Bridge	£30m	£40m	*£50m*	*£66m*
D – Vertical Lift Bridge	£25m	£30m	*£42m*	*£50m*
E – Cantilever Bridge	£40m	£45m	*£66m*	*£75m*
F – Truss Bridge	£35m	£45m	*£58m*	*£75m*
G - Tunnel	£40m	£65m	*£66m*	*£108m*

Table 5 4: Risk Adjusted Capital Cost

Key Point:

Given the broad costs presented here, the cost differentials between the bridge options are not overly significant within each low and high band. The tunnel is notably more costly in terms of cost.

5.6 Road Connections

5.6.1 Connecting Road

The final component of the option development process is establishing the requirement in terms of connecting road infrastructure associated with each route corridor and alignment.

Again these costs have been calculated based on providing an air draught of 32m. If an increased air draught was required then these costs would also increase to mitigate against significant increases in inclines of the bridge deck in the case of bridge options.

5.6.1.1 Route Corridor 3: Alignment A

As previously established in the route corridor section, this alignment involves a south-west sweeping curvature of the road from the structure onto the A861. On this western landing, the western approach road would measure approximately 605 metres in length, with the eastern approach measuring approximately 265 metres. To facilitate this alignment of the road network, there would need to a volumetric cut of approximately 114,000m^3 and a volumetric fill of 115,000m^3.

The costs associated with these works can vary widely under two scenarios, with and without the need for rock excavation. The presence of rock will significantly increase the costs associated with earthworks. From geological data available, it is currently assumed that in both locations, rock is not at shallow depth and that the landscape mainly consists of glacial deposits. To complete initial due diligence, however, the table below provides estimates for the road works involved as part of this alignment for any structure.

Option	Indicative Capital Cost	
	No Rock	Rock
Eastern Approach	£851,000	£851,000
Western Approach	£2,758,000	£12,124,000
Total	**£3,610,000**	**£12,975,000**

Table 5 5: RC3: Alignment A – Indicative Capital Cost of Connecting Roads

As can seen from the table above, there are significant costs differences between a 'with' and 'without' rock scenario. If the project proceeds further, this issue will need to be explored further to establish the actual geology of the area. Site investigation works will be required to determine ground conditions and inform design development.

5.6.1.2 Route Corridor 3: Alignment B

As previously established in the route corridor section, this alignment involves a north-east sweeping curvature of the road from the structure onto the A861. On the western landing the western approach road would measure approximately 257 metres in length, with the eastern approach measuring approximately 265 metres. To facilitate this alignment of the road network, there would need to a volumetric cut of 14,700m³ and a volumetric fill of 10,700m³. As with the above alignment, the costs are provided under a without and with rock scenario.

Option	Indicative Capital Cost	
	No Rock	Rock
Eastern Approach	£852,000	£852,000
Western Approach	£974,000	£2,784,000
Total	**£1,826,000**	**£3,636,000**

Table 5 6: RC3: Alignment B – Indicative Capital Cost of Connecting Roads

As can seen from the above table, the differential between the 'with' and 'without' rock costs is much less in this case, with the overall cost being lower than Alignment 1. This is due to the significantly reduced earthworks required to facilitate this alignment into the road network. However, the alignment is of a lesser standard than Alignment 1 and careful consideration of the implications of the required 'Departures from Standards' would be necessary before progressing with this alignment.

Key Point:

The cost of the connecting road infrastructure represents only a small proportion of the total cost of the bridge structure. Alignment B is considerably less expensive than Alignment A, although it would require approval for 'Departure from Standards' to 8%.

The cost of connecting road infrastructure varies depending on whether there is a requirement to remove rock or otherwise. This is particularly significant with Alignment A, where the presence of rock would increase the cost of providing connecting roads more than threefold.

5.6.1.3 Route Corridor 5: Tunnel Alignment

The costs for the tunnel alignment only consider the approach roads to each portal, with the road surface within the tunnel contained within the overall indicative cost of the structure.

In terms of the tunnel approach roads, the eastern approach would measure approximately 192 metres, whilst the western approach would measure 84 metres. To facilitate the approach roads, there would need to be a volumetric cut of approximately 36,000m³. The table below sets out the costs associated with the approach roads only under both a without and with rock scenario.

Option	Indicative Capital Cost	
	No Rock	Rock
Eastern Approach	£2,735,000	£7,160,000
Western Approach	£533,000	£1,174,000
Total	**£3,268,000**	**£8,334,000**

Table 5 7: RC5: Tunnel Alignment – Indicative Capital Cost of Connecting Roads

Key Point:

Whilst the cost of the tunnel approach roads are broadly similar to RC3: Alignment A, the cost per metre is significantly higher as this option only requires cut and the removal of soils, whereas the bridge options involves cut and fill and this implies cost savings.

5.6.1.4 Roadside Works Summary

The costs outlined above provide an indicative summary cost for each of the alignments for RC3 and for the single alignment within RC5. As stated, these costs are indicative and would need to be refined at a later stage of the project once more detailed design information is available, and in particular the presence to rock or otherwise.

These costs would need to be included in addition to the previously established structural costs to provide an overall scheme cost of a fixed link across the Narrows, as illustrated in the table below using Alignment A and no rock as an example.

Option	Indicative Capital Cost		Ind Cap Cost (Road, No Rock)	Capital Cost + OB	
	Low	High	Alignment A	Low	High
A – Cable Stayed Bridge	£35m	£45m	**£3.6m**	*£64m*	*£81m*
B – Suspension Bridge	£37m	£47m	**£3.6m**	*£67m*	*£84m*
C – Tied-arch Bridge	£30m	£40m	**£3.6m**	*£56m*	*£72m*
D – Vertical Lift Bridge	£25m	£30m	**£3.6m**	*£47m*	*£56m*
E – Cantilever Bridge	£40m	£45m	**£3.6m**	*£72m*	*£81m*
F – Truss Bridge	£35m	£45m	**£3.6m**	*£64m*	*£81m*
G - Tunnel	£40m	£65m	**£3.2m**	*£72m*	*£113m*

Table 5 8: Indicative Capital Cost of Fixed links plus Connecting Roads

5.6.2 Road Junctions

Based on initial analysis of the ferry carryings and traffic flows on both the A82 and A861, a variety of junctions were considered for connecting any fixed link into the existing road network. At this stage, the recently measured A82 two-way AADT flow of 11,000 (September, 2017, Transport Scotland), remains well within the thresholds of a priority junction, based on the values in Figure 2.3.1 of DMRB CD 123 Geometric 'Design of at-grade priority and signal controlled junctions', and as such negates the need to consider a roundabout or signalised junction. Based on current statistics for the ferry, AADT for traffic crossing the Narrows is 750. However, it can reasonably be anticipated that a new fixed link will generate additional traffic, as has been demonstrated by the case study analysis in Chapter 2. However, these are not, at this stage, expected to deliver an overall step change in road based demand to such a level that it warrants the current investigation of a junction more complex than a priority arrangement.

The known traffic flows based on A82 traffic counts and ferry vehicle counts indicate that a 'ghost island' arrangement would be required at the connection point onto the A82. From site observations. there appears insufficient space within the existing highway boundary to implement a ghost island arrangement. Third party land would therefore be required to facilitate the construction of such a junction. This would provide right turners from the A82 onto the bridge adequate space to complete the manoeuvre without causing delay for straight on traffic.

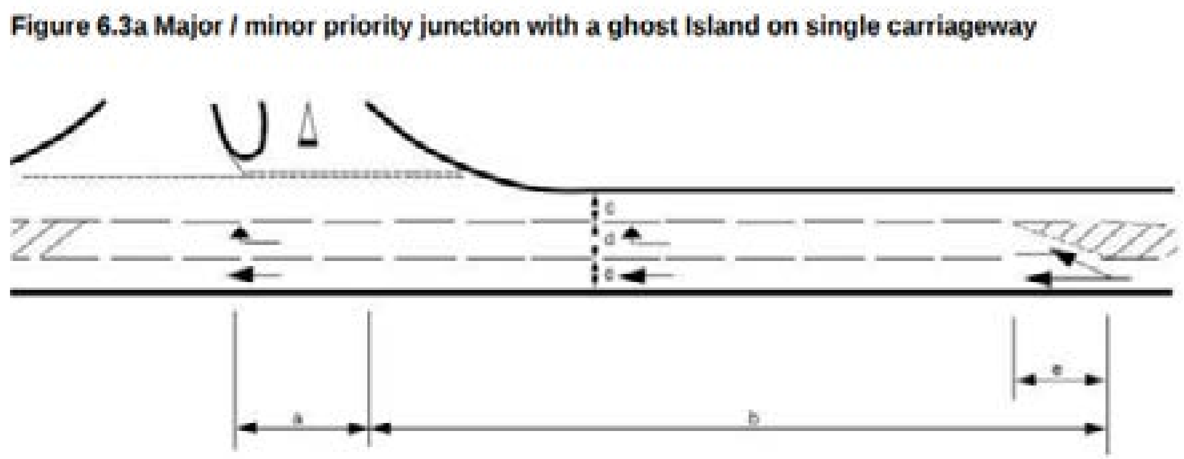


Figure 28: Ghost Island, Source; DMRB CD123 Geometric Design of at-grade priority & signal controlled junctions Rev1

As the flows on the Ardgour side will be far lower, it is anticipated that a simple priority junction would be sufficient at the connection point with the existing road network. However, further investigation and design development would be required to consider whether there was merit in switching the priority to the new road at the connection points and placing the give-way on the existing road. Detailed traffic modelling would be required to determine if the dominant flow will be on the new section of road towards the fixed link in future and, if so, it may be beneficial to switch the priorities to improve traffic flow. A junction assessment can be carried out at the design stage to determine an adequate solution.

5.6.3 Indicative Option Feasibility – RC3 Cable Stayed Bridge, RC5 Tunnel

Based on the analysis above and taking into account all of the individual factors influencing the potential construction of a fixed link spanning the Corran Narrows, computerised modelling was undertaken. The rationale behind this exercise was to determine the actual feasibility of one of these fixed link structures and provide a visualisation of how this structure would look in the Corran Narrows environment. As such, an exercise was undertaken to model RC3, Alignment A, Cable Stayed Bridge as an illustrative example, in addition to entry/exit portals of a potential tunnel for RC5.

Detailed drawings were created in CAD, before the measurements and geometries were inserted into 'InfraWorks software' to create 3D modelling of the structure to determine whether these measurements are feasible. The images below provide an overview of this exercise and provide the context of a fixed link in the Corran Narrows environment.

Fly through videos of both options have also been created and have been made available to all the funding partners.


Figure 29: RC3, Alignment A, Cable Stayed Bridge


Figure 30: RC3, Alignment A, Cable Stayed Bridge, Road Connectivity


Figure 31: RC5, Tunnel, Clovullin Portal


Figure 32: RC5, Tunnel, Inchree Portal

MV Corran,
Corran Narrows

6.0 High Level Economic Appraisal of a Fixed Link

This chapter firstly sets out an initial economic appraisal of a Corran Narrows fixed link, considering the potential scale of the quantified TEE (Transport Economic Efficiency) benefits in the context of the costs of fixed link and ferry options across the Corran Narrows.

The second part of this chapter sets out the potential type and scale of wider societal benefits and impacts which may emerge as a result of a fixed link being constructed across the Corran Narrows, illustrated in a logic map approach.

6.1 Transport Economic Efficiency

6.1.1 Appraisal Conventions

This section of the report establishes the TEE benefits of a fixed link spanning the Corran Narrows. TEE analysis captures the benefit or otherwise of a transport scheme by comparing its costs & benefits and deriving a Benefit Cost Ration (BCR). Costs include all capital, operating and maintenance costs of the project. Benefits on the other hand are generally determined through an analysis of the impact of a scheme on transport users, and are thus predominantly, although not exclusively, social welfare, rather than financial benefits. Benefits include:

- changes in the monetary costs of travel, in this case the replacement of a charged ferry with a toll-free bridge;
- journey time savings;
- improvements in journey time reliability; and
- improvements in journey quality.

A key issue with transport schemes is that the costs tend to be accrued up-front, with the benefits emerging over a much longer time period. To account for this, an appraisal typically works over a 60-year time horizon to provide an equitable comparison of costs and benefits. This recognises that a cost or benefit accrued a long-way in the future is 'worth' less than a cost or benefit in the present day (this is known as 'rate of time preference'). To account for this, appraisal uses the convention of discounting, which equates future benefits and costs to a single point in time (known as present value), thus providing a consistent and equitable comparison.

This chapter:

- Sets out the scenarios under consideration;
- Estimates the appraisal period costs for all options, and the range of cost increments in moving from a ferry operation to a fixed line;
- Estimates the benefits of a fixed link relative to a ferry, based on a range of implied travel time savings; and
- Compares the Present Value of Benefits (PVB) and the Present Value of Costs (PVC) of the range of fixed link options relative to the range of ferry options to determine whether a fixed link would be likely to generate a benefit cost ratio (BCR, i.e. PVB/PVC) of greater than 1.

6.1.1.1 Wider Economic and Social Benefits

As mentioned previously, it is difficult to determine the wider economic benefits of these types of schemes in such a sparse rural context. While the economic appraisal in the majority focuses on a 'BCR' figure, it is important to consider the importance of connectivity in the region and the benefits it brings to society. The recently published National Transport Strategy 2 (NTS2) outlines the importance of taking cognisance of social inclusion and reducing the levels of inequality and deprivation. The current STAG methodology does not provide a mechanism for capturing these aspects within the economic appraisal, however, this may change in the future with a potential 'refresh' of the STAG methodology currently being considered.

As such it is important to consider the following challenges and policies within NTS2, and their application within the context of the communities that depend on the Corran Narrows crossing, as for some it is a lifeline service.

NTS2 The Challenges facing society		
Poverty and child poverty	Social isolation	Gender inequalities
Disabled people	Scotland's regional differences	Global climate emergency
Decline in bus use	Productivity	Fair work and skilled workforce
Tourism	Digital and energy	Spatial planning
Health and active travel	Information & integration	Resilience
Ageing population	The changing transport needs of young people	Reliability and demand management
Technological advances	Air quality	Safety and security
Trade and connectivity	Freight	

Table 6 1: NTS2 Challenges, Transport Scotland 2020

NTS2 Vision	
We will have a sustainable, inclusive and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors.	
PRIORITIES	**OUTCOMES**
Promotes equality	Will provide fair access to services we need Will be easy to use for all Will be affordable for all
Takes climate action	Will adapt to the effects of climate change Will help deliver our net-zero target Will promote greener, cleaner choices
Helps our economy prosper	Will get us where we need to get to Will be reliable, efficient and high quality Will use beneficial innovation
Improves our health and wellbeing	Will be safe and secure for all Will enable us to make healthy travel choices Will help make our communities great places to live

Table 6 2: NTS2 Vision, Transport Scotland 2020

NTS2 Policy	
Policy	**Enabler**
A. Continue to improve the reliability, safety and resilience of our transport system	Increase safety of the transport system and meet casualty reduction targets **Increase resilience of Scotland's transport system from disruption and promote a culture of shared responsibility** Implement measures that will improve perceived and actual security of Scotland's transport system Increase the use of asset management across the transport system
B. Embed the implications for transport in spatial planning and land use decision making	Ensure greater integration between transport, spatial planning, and how land is used Ensure that transport assets and services adopt the Place Principle Ensure the transport system is embedded in regional decision making
C. Integrate policies and infrastructure investment across the transport, energy and digital system	Ensure that local, national and regional policies offer an integrated approach across all aspects of infrastructure investment including the transport, digital, and energy system
D. Provide a transport system which enables businesses to be competitive domestically, within the UK and internationally	Optimise accessibility and connectivity within business and business-consumer markets by all modes of transport Ensure gateways to and from domestic and international markets are resilient and integrated into the wider transport networks to encourage people to live, study, visit and invest in Scotland Support measures to improve sustainable surface access to Scotland's airports and sea ports
E. Provide a high-quality transport system that integrates Scotland and recognises our different geographic needs	Ensure that infrastructure hubs and links form an accessible integrated system that improves the end-to-end journey for people and freight **Minimise the connectivity and cost disadvantages faced by island communities and those in remote and rural areas** **Safeguard the provision of lifeline transport services and connections**
F. Improve the quality and availability of information to enable better transport choices	Support improvements and innovations that enable all to make informed travel choices Support seamless journeys providing the necessary infrastructure, information and interchange facilities to connect all modes of transport Ensure that appropriate real-time information is provided to allow all transport users to respond to extreme weather and incidents
G. Embrace transport innovation that positively impacts on our society, environment and economy	Support Scotland to become a market leader in the development and early adoption of beneficial transport innovations
H. Improve and enable the efficient movement of people and goods on our transport system	**Ensure the Scottish transport system efficiently manages needs of people and freight** Promote the use of space-efficient transport
I. Provide a transport system that is equally accessible for all	Ensure transport in Scotland is accessible for all Identify and remove barriers to public transport connectivity and accessibility within Scotland Reduce the negative impacts which transport has on the safety, health and wellbeing of people Continue to support the implementation of the recommendations from, and the development of, Scotland's Accessible Travel Framework
J. Improve access to healthcare, employment, education and training opportunities to generate inclusive sustainable economic growth	**Ensure sustainable labour market accessibility to employment locations** **Ensure sustainable access to education and training facilities** **Improve sustainable access to healthcare facilities for staff, patients and visitors**
K. Support the transport industry in meeting current and future employment and skills needs	To meet the changing employment and skills demands of the transport industry and upskill workers Support initiatives that promote the attraction and retention of an appropriately skilled workforce across the transport sector
L. Provide a transport system which promotes and facilitates travel choices which help to improve people's health and wellbeing	**Promote and facilitate active travel choices across mainland Scotland and islands** Integrate active travel options with public transport services Support transport's role in improving people's health and wellbeing
M. Reduce the transport sector's emissions to support our national objectives on air quality and climate change	Facilitate a shift to more sustainable modes of transport for people and commercial transport Reduce emissions generated by the transport system to improve air quality Reduce emissions generated by the transport system to mitigate climate change Support management of demand to encourage more sustainable transport choices
N. Plan our transport system to cope with the effects of climate change	Increase resilience of Scotland's transport system to climate change related disruption Ensure the transport system adapts to the projected climate change impacts

Table 6 3: NTS2 Policy, Transport Scotland 2020

Items in Orange are especially applicable to the Corran Narrows.

6.1.1.2 Assumptions

Recognising the high degree of uncertainty around many of the key parameters at this stage, the analysis set out in this chapter is underpinned by a range of assumptions. In the interests of brevity, only the key assumptions are set out in the text which follows, whilst all the model assumptions and parameters are included in Appendix A. The analysis is based on current WebTAG parameters and best practice.

6.1.2 Scenarios

Two main scenarios will be tested in the proceeding analysis:

- Reference Case: In the Reference case, it is assumed that:
- No fixed link is constructed, with the ferry service providing the long-term solution for the crossing of the Narrows.
- New ferries and associated infrastructure are provided on life expiry of current assets. There are a number of variants of the Reference Case and these are set out in more detail below .
- Do-Something: In the Do-Something, it is assumed that:
- A new fixed link will be provided, opening in 2027. This is a generic fixed link between Nether Lochaber and Ardgour as the structural form and alignment would not significantly impact on the scale of the benefits.
- Within the modelling, as a core assumption, it is assumed that there would be a 50% uplift in trips associated with the introduction of a fixed link, which will account for people in the area making more trips and an increase in tourist-based trips. Sensitivity tests around this figure are also considered below.
- A Do-Nothing scenario was originally considered. This scenario assumed that the current ferry service will continue until the existing vessel(s) fail and the service is discontinued. Whereby there would be no crossing provided across the Corran Narrows. This scenario was then discounted on the basis of:
- The provision of no crossing is not a realistic option as it goes against all national policy, especially those particular points highlighted in above in section 6.1.1.1.
- Both the Reference Case and Do-Something will display significant benefits against a no option scenario, due to the importance of a link for the peninsular communities.

A bespoke, WebTAG-based economic benefits spreadsheet model was developed to determine the comparative benefits associated with a fixed link (Do-Something) in the context of the Do-Nothing and Reference Case.

6.1.3 Scheme Costs

6.1.3.2 Reference Case Costs

Ferry based option costs have been considered in line with the work undertaken as part of the Corran Ferry STAG Appraisal, which identified two core vessel options and variations of these, which have been integrated into this study to help inform the TEE analysis. There were four future vessel scenarios emerging from the STAG – these are summarised in the table below:

Ferry STAG Ref	Ferry Scenario	Main Vessel	Relief Vessel	Infrastructure
1a	Quarter Point Ferry Low	Diesel Quarter-point vessel	Diesel Quarter -point vessel	New overnight berth
1a	Quarter Point Ferry High	Hybrid Quarter -point vessel	Diesel Quarter -point vessel	New overnight berth
2d	Straight Through Ferry Low	Diesel straight through vessel	Chartered	New overnight berth and vessel aligning structures
2d	Straight Through Ferry High	Hybrid straight through vessel	Chartered	New overnight berth and vessel aligning structures

Table 6 4: Reference Case Scenarios

In summary:

- Scenario 1a.L involves retaining the current quarter point berthing arrangement using a conventional diesel vessel. It would involve the construction of a new overnight berth to improve the ship-shore interface for the crew.
- Scenario 1a.H is broadly the same as Scenario 1a.L except that the primary vessel would be a hybrid-electric similar to the CMAL vessel MV Lochinvar. This would provide a long-term reduction in emissions but would increase up-front capital costs.
- Scenario 2a.L would involve converting the route to operate with conventional 'straight through' diesel vessels. An additional £9m of infrastructure spending would be required to provide aligning structures at both terminals for these vessels, but it is assumed that this would negate the need to maintain a relief vessel, which could be more readily chartered from elsewhere.
- Scenario 2a.H would be as per Scenario 2a.L except that that the primary vessel would be a hybrid-electric.

The specifics of each scenario are now set out below in terms of the extent and timing of investment.

It should be noted that the analysis assumes that ferry operating costs are broadly covered by fares revenue.

Scenario 1a.L: Quarter Point Ferry Low

Option	Main Vessel	Relief Vessel
2027 – 2030	MV Corran	MV Maid of Glencoul
2031 – 2040	New Vessel 1 (Diesel £8m)	MV Corran
2041 – 2060	New Vessel 1 continues	New Vessel 2 (Diesel £8m)
2061 - 2083	New Vessel 2 continues	New Vessel 3 (Diesel £8m)
	Costs in 2019 prices are: £14m for Infrastructure works (overnight berth) £24m for three vessels at £8m (note ferries are not subject to optimism bias)	

Table 6 5: Scenario 1a.L – Quarter Point Ferry Low

Scenario 1a.H: Quarter Point Ferry High

Option	Main Vessel	Relief Vessel
2027 – 2030	MV Corran	MV Maid of Glencoul
2031 – 2040	New Vessel 1 (Hybrid £17m)	MV Corran
2041 – 2060	New Vessel 1 continues	New Vessel 2 (Conventional £8m)
2061 - 2083	New Vessel 3 (Hybrid £17m)	New Vessel 2 continues
	Costs in 2019 prices are: £14m for Infrastructure works (overnight berth) £34m for two hybrid vessels at £17m (ferries are not subject to optimism bias) £8m for one conventional relief vessel	

Table 6 6: Scenario 1a.H – Quarter Point Ferry High

Scenario 2d.L: Straight Through Ferry Low

Option	Main Vessel	Relief Vessel
2027 - 2053	New Vessel 1 (Conventional £8m)	From CMAL Fleet (assumed @ £100k p.a.)
2054 - 2083	New Vessel 2 (Conventional £8m)	From CMAL Fleet (assumed @ £100k p.a.)
	Costs in 2019 prices are: £23m for Infrastructure works (overnight berth and aligning structures at slipways) £16m for two conventional vessels at £8m £100k p.a. for 60 years for lease of support vessel	

Table 6 7: Scenario 2a.L – Straight Through Ferry Low

Scenario 2d.H: Straight Through Ferry High

Option	Main Vessel	Relief Vessel
2027 - 2053	New Vessel 1 (Hybrid £17m)	From CMAL Fleet (assumed @ £100k p.a.)
2054 - 2083	New Vessel 2 (Hybrid £17m)	From CMAL Fleet (assumed @ £100k p.a.)
	Costs in 2019 prices are: £23m for Infrastructure works (overnight berth and aligning structures at slipways) £34m for two Hybrid vessels at £17m £100k p.a. for 60 years for lease of support vessel	

Table 6 8: Scenario 2a.H – Straight Through Ferry High

In each case, the above timeline of costs has been input to the Economics Benefits model, which calculates the 60-year discounted appraisal PVC associated with these four ferry options within the Reference Case scenario as:

Option	Specification	60 Year PVC
1a.L	Quarter Point Ferry Low	£15.0m
1a.H	Quarter Point Ferry High	£20.1m
2d.L	Straight Through Ferry Low	£19.7m
2d.H	Straight Through Ferry High	£26.1m

Table 6 9: 60-Year PVC of Future Ferry Scenarios

6.1.3.3 Do-Something Costs

Due to the number of options and ranges of costs associated with each of the fixed link options, a proportionate approach to cost estimation was undertaken. This has taken the form of considering one option type for each of the three identified route corridors, RC1, RC3 and RC5. A low and high cost for an option within each route corridor is assumed, providing an overall total of six Do-Something (fixed link).

As there is only one feasible option for RC1, a low and high cost for a vertical lifting bridge was created, as with RC5, the tunnel option. For RC3, there are several feasible options available. As such, the low and high costs of each of the options was plotted and then simplified to provide a proxy low and high cost representation of an option for this route corridor. Based on the range of costs quoted for a cable-stayed bridge and that the range between the lowest and highest costs provides an envelope encapsulating the costs for each of the other structures, the costs associated with this option were used to represent the third set of options for the Do-Something.

The result of this process was the identification of six fixed link options to represent the Do-Something based on the costs outlined in Chapter 4. The Do-Something options all account for maintenance and any operating costs in addition to capital costs. The 60-year discounted PVCs for each of the six Do-Something scenario is shown in the table below:

Option	Specification	60 Year PVC
1	Cable-Stayed Bridge Low	£36.3m
2	Cable-Stayed Bridge High	£51.4m
3	Vertical Lift Bridge Low	£26.3m
4	Vertical Lift Bridge High	£31.2m
5	Tunnel Low	£43.1m
6	Tunnel High	£72.2m

Table 6 10: Fixed Link Scenarios – 60-Year PVC

As expected, the tunnel options provide the highest long-term costs due to the complexities associated with this type of structure.

6.1.3.4 Do-Something vs Reference Case

Here, the key issue is the relative cost of the Do Something compared to the Reference Case. Given the uncertainties surrounding the main appraisal parameters at this early feasibility stage, we developed **72 different scenarios (4*6*3)** to represent the potential costs and benefits of a fixed link compared to an ongoing ferry operation, comprising:

- **4 Ferry Cost Scenarios:**
  - Quarter Point Ferry Low Cost
  - Quarter Point Ferry High Cost
  - Straight Through Ferry Low Cost
  - Straight Through Ferry High Cost
- **6 Fixed Link Cost Scenarios:**
  - Cable Bridge Low Cost
  - Cable Bridge High Cost
  - Vertical Lift Bridge Low Cost
  - Vertical Bridge High Cost
  - Tunnel Low Cost
  - Tunnel High Cost
- **3 Benefits Scenarios:**
  - 5 Minute Wait for Ferry
  - 10 Minute Wait for Ferry
  - 15 Minute Wait Ferry

As mentioned previously, the four ferry options were derived from the preferred options identified through the Corran Ferry STAG Part 2 Appraisal and encompass the variety of costs represented by these options.

The six fixed link scenarios were dervived from the range of costs associated with the options A-G described above. These three core fixed link options provide an enevlope of costs comprising the seven options (A-G) to provided a representative cost range.

For appraisals purposes, we have established 24 PVCs reflecting the cost uncertainty at this stage, i.e. there is a PVC for each combination of costs as shown in the table opposite (in £m).

		PVCs (60 Year Appraisal Period) (£, Millions)			
		1a.L	1a.H	2d.L	2d.H
ID	Link Option	Quarter Point Ferry Low	Quarter Point Ferry High	Straight Through Ferry Low	Straight Through Ferry High
1	Cable Stayed Bridge Low	£18.5m	£13.5m	£18.6m	£16.9m
2	Cable Stayed Bridge High	£32.2m	£27.1m	£32.3m	£30.6m
3	Vertical Lift Bridge Low	£9.5m	£4.5m	£9.6m	£7.9m
4	Vertical Lift Bridge High	£13.9m	£8.9m	£14.0m	£12.4m
5	Tunnel Low	£24.6m	£19.5m	£24.8m	£23.0m
6	Tunnel High	£50.9m	£45.9m	£51.0m	£49.4m

Table 6 11: Do Something v Reference Case PVC

The key points of note from the above table are as follows:

- In all cases, the fixed link options are more expensive than the ferry options.
- Under the lower-cost Reference Case Scenarios, all Do-Something Scenarios prove to be more expensive, ranging between £11m to £57m above the Reference Case;
- When compared against the higher cost Reference Case Scenarios, the Do-Something Scenarios (with exception of the 'Tunnel High') become more competitive.
- Comparing the Do-Something Scenarios against the mid-range Reference Case Scenarios, there are less significant cost differences, with the cost envelope provided using the low cable stayed bridge option as a proxy showing differences of approximately 45% above Reference Case Scenarios 1b and 2a.
- Do-Something Scenario 6, 'Tunnel High' cost, is significantly costlier against all Reference Case Scenarios.

Key Point:

In all cases, the construction of a fixed link is more expensive than the costs associated with a continuing with a ferry service, particularly with respect to a tunnel. However, a fixed link will provide a range of benefits over and above a continued ferry operation. These are explored in the next section.

6.1.4 Benefits of a Fixed Link

6.1.4.1 Benefits Model

Within this TEE[40] analysis, the transport benefits that comprise the PVB have been defined as consisting of:

- Vehicle Operating Costs (VoC): which include changes in operating costs incurred by a user, such as fuel, repairs, maintenance etc.
- Travel Time Benefits: including any journey time benefits associated with a scheme and the removal of ferry wait times; and
- User Charges: Any changes in charges incurred by users, such as ferry based vehicle fares.

VoC in the context of this study includes any changes to operating a vehicle under any of the Do-Nothing, Reference Case and Do-Something Scenarios. This includes increased distances travelled in the absence of a crossing with the Do-Nothing option, including both private vehicles and buses.

Travel time benefits within this analysis include changes in travel times associated with making a longer trip in the Do-Nothing option, the removal of ferry waiting times in the Do-Something options (with exception of the Vertical Lifting Bridge option) and the reduction in crossing times. Travel times have been calculated using Transport Scotland's licence to use INRIX data and the extraction of journey time information along the A861 from the current Ardgour ferry slipway in relation to the Do-Nothing and travel times along the A82 within both the Reference Case and Do-Something options.

Journey purpose is important when calculating travel time benefits, as there are different perceived costs associated with journey types – for example, a commute journey has a high value of time than a leisure journey, and therefore a minute saved for a commuter is 'worth' more than for a leisure traveller. As such variables from WebTAG for travel during work time, commute, other and by public transport have been included in the analysis and are summarised Appendix A.

User Charges have been qualified as changes associated with:

- the removal of ferry fares in both the Do-Nothing and Do-Something options;
- changes to bus fares associated with longer distance journeys in the Do-Nothing option; and
- changes associated with the removal of the ferry crossing element of the bus ticket fare in the Do-Something options.

The calculation of PVB within this study is categorised by three ferry-based wait time scenarios, defined as a 5-minute wait, 10-minute wait and 15-minute wait.

40 | https://www.transport.gov.scot/publication/stag-technical-database/section-9/

6.1.4.2 Do-Something vs Reference Case

The benefits of a Do-Something fixed link option compared to a Reference Case involving the continuation of the ferry service, are again significant although to a lesser extent than in the Do-nothing scenario. The table below provides a summary of the expected benefits under this scenario.

Ferry Wait Scenario	Travel Time	User Charges	VoC	PVB
5 Minute Wait	£26.7m	£3.4m	-£4.3m	£25.8m
10 Minute Wait	£43.8m	£3.4m	-£4.3m	£42.9m
15 Minute Wait	£60.9m	£3.4m	-£4.3m	£60.0m

Table 6 12: Do-Something vs Reference Case PVB

6.1.5 Comparison of PVCs and PVBs

6.1.5.1 Do-Something vs Reference Case

Section 6.1.3.5 set out that there were 24 different Do Something versus Reference Case PVCs reflecting the range options range of costs considered here. Combining these with the three benefits scenarios developed in Section 6.1.4.1 means there are 72 PVC/PVB combinations and hence BCRs under consideration here. The values associated with each of the 72 modelled scenarios is listed in the table below.

The figure below however, summarises these results by plotting the PVB on the vertical axis and the PVC on the horizontal axis for each of the 72 combinations. Any point above the diagonal implies a BCR of greater than 1.

Figure 33: Do-Something Scenarios – PVB v PVC

Description	5 Min Wait - Scenarios	10 Min Wait - Scenarios	15 Min Wait - Scenarios
Ferry Type: Quarter point & Low **Fixed link type:** Cable tied bridge with 2 towers & Low	1	25	49
Ferry Type: Quarter point & Low **Fixed link type:** Cable tied bridge with 2 towers & High	2	26	50
Ferry Type: Quarter point & Low **Fixed link type:** Opening bridge & Low	3	27	51
Ferry Type: Quarter point & Low **Fixed link type:** Opening bridge & High	4	28	52
Ferry Type: Quarter point & Low **Fixed link type:** Tunnel & Low	5	29	53
Ferry Type: Quarter point & Low **Fixed link type:** Tunnel & High	6	30	54
Ferry Type: Quarter point & High **Fixed link type:** Cable tied bridge with 2 towers & Low	7	31	55
Ferry Type: Quarter point & High **Fixed link type:** Cable tied bridge with 2 towers & High	8	32	56
Ferry Type: Quarter point & High **Fixed link type:** Opening bridge & Low	9	33	57
Ferry Type: Quarter point & High **Fixed link type:** Opening bridge & High	10	34	58
Ferry Type: Quarter point & High **Fixed link type:** Tunnel & Low	11	35	59
Ferry Type: Quarter point & High **Fixed link type:** Tunnel & High	12	36	60
Ferry Type: Straight through & Low **Fixed link type:** Cable tied bridge with 2 towers & Low	13	37	61
Ferry Type: Straight through & Low **Fixed link type:** Cable tied bridge with 2 towers & High	14	38	62
Ferry Type: Straight through & Low **Fixed link type:** Opening bridge & Low	15	39	63
Ferry Type: Straight through & Low **Fixed link type:** Opening bridge & High	16	40	64
Ferry Type: Straight through & Low **Fixed link type:** Tunnel & Low	17	41	65
Ferry Type: Straight through & Low **Fixed link type:** Tunnel & High	18	42	66
Ferry Type: Straight through & High **Fixed link type:** Cable tied bridge with 2 towers & Low	19	43	67
Ferry Type: Straight through & High **Fixed link type:** Cable tied bridge with 2 towers & High	20	44	68
Ferry Type: Straight through & High **Fixed link type:** Opening bridge & Low	21	45	69
Ferry Type: Straight through & High **Fixed link type:** Opening bridge & High	22	46	70
Ferry Type: Straight through & High **Fixed link type:** Tunnel & Low	23	47	71
Ferry Type: Straight through & High **Fixed link type:** Tunnel & High	24	48	72

Table 6 13: Do-Something vs Reference Case PVB Scenario Descriptions

As can be seen in the chart above, the PVB exceeds the PVC in most cases, i.e. **the benefits of the fixed link outweigh the additional costs of a fixed link over a replacement ferry**. Overall 83% (60 scenarios) provide a BCR greater than 1.

There is a very clear correlation of the benefits and costs under each of the three ferry wait time overarching scenarios. Of those scenarios that fall below the line, where the costs are greater than the benefits, **seven** do so under the 5-minute wait scenario and **four** do so under the 10-minute wait scenario. These individual scenarios, in the main, involve the **tunnel high cost option** and it is these high costs associated with this fixed link type that increase the costs and outweigh the long-term benefits.

6.1.6 Sensitivities

As noted above, we have assumed that traffic volumes over the Narrows would increase by 50% as a result of a fixed link. These trips derive benefits using the 'rule of a half' convention. To understand the importance of this assumption, two sensitivity tests were also modelled, varying the levels of induced traffic as a result of any Do-Something option.

6.1.6.1 10% Induced Traffic

Reducing the induced traffic to 10% within the Do-Something reduces the PVB associated with any of these options to the following:

- Do-Something vs Reference Case: Under the 5-minute wait scenario the PVB of the Do-Something options is £24.0m (compared to £26.1m with 50% induced traffic). These benefits consist of travel time benefits of £23.1m, user charge benefits of £1.9m (associated with the removal of ferry fares), while there would be VoC disbenefits of -£1.0m.

6.1.6.2 200% Induced Traffic

Increasing the induced traffic to 200% within the Do-Something increases the PVB associated with any of these options to the following:

- Do-Something vs Reference Case: Under the 5-minute wait scenario the PVB of the Do-Something options is £34.0m (compared to £26.1m with 50% induced traffic). These benefits consist of travel time benefits of £44.0m, user charge benefits of £8.5m (associated with the removal of ferry fares), while there would be VoC disbenefits of -£18.5m.

These figures suggest that while important the level of induced traffic is of less significance in the appraisal than the actual quantum of time saving.

6.1.7 TEE Summary

The analysis undertaken here sought to explore the quantum of costs and benefits of providing a fixed link at Corran, primarily compared the on cost of continuing to operate a ferry service. Given the level of uncertainty surrounding many of the key appraisal parameters, we have developed 72 scenarios to reflect this range of potential outcomes. In 83% of cases, a BCR of greater than 1 is derived, with this value being up to 6 under some scenarios. This suggests that the scheme may be feasible from an economic perspective.

If taking this appraisal forward, we would seek to reduce some of these uncertainties by more detailed cost analysis and deriving greater certainty with respect to time savings. This latter point could perhaps be achieved through a programme of Journey Time surveys and/or ANPR surveys to establish true 'road to road' travel times.

6.2 Potential Wider Benefits of a Fixed Link

Having established the TEE benefits of a fixed link across the Corran Narrows, this section considers the wider economic and societal impacts of the proposed scheme.

In conventional transport appraisal, the TEE benefits are supplemented by 'wider economic impacts' (WEI), which quantify how the transport improvement impacts on e.g., productivity and the functioning of the labour market. However, as explained in Chapter 2, WEI only tend to emerge in the context of the largest schemes and are likely to be insignificant in the context of the Corran Narrows.

Of greater relevance here is how the construction of a fixed link would impact on the social and economic structure of both the peninsula, Lochaber and Mull. This is best established through the development of an economic narrative, which explores how the proposed scheme could impact on different aspects of the society and economy of the study area. These are as follows:

- Resilience of the wider transport network, especially for events that require this enhanced connection as a diversion rathe than the primary route
- population;
- labour market;
- productivity and business formation;
- personal travel and access to services;
- tourism;
- supply-chain;
- public service provision; and
- quality of life / sense of community.

It should be noted that, as this is a fixed link feasibility study only, the scope did not include primary research or public and stakeholder consultation. The narrative which follows is therefore based on the case study evidence presented in Chapter 2 and some initial consultation undertaken during the Corran Ferry STAG Appraisal work. It is only intended to provide a framework to establish the type of impacts which may emerge from a fixed link. Should the proposal be progressed further, supporting research (potentially including an Economic Impact Assessment) and a full programme of engagement would be required to more fully establish existence and scale of the anticipated benefits.

When considering the potential benefits, it is important to bear in mind that the peninsula is an expansive land mass, connected throughout much of that area by single track roads. Impacts are therefore likely to be across a very large area most strongly felt in Ardgour, Morvern and Sunart, but less so in Ardnamurchan and Moidart.

6.2.1 Logic Map

In order to present the potential benefits of a fixed link in a systematic manner, there is benefit in developing a 'WEI logic map' – this is an effective way of presenting the linkages between the case for the fixed link, its delivery and the potential transport outcomes and societal impacts which it could generate.

The Logic Map tells the story along the lines of that set out diagrammatically in Figure 34 below. The **Strategic Need** sets out the rationale for intervention, with the evidence showing the current issues and problems. If there is investment of X (**Inputs**) this will then generate **Outputs** which result in certain **Outcomes** and then, ultimately, **Impacts**. If the linkages are correct, these impacts should resolve the problems and issues identified under the Strategic Need / current situation.

The key stages of the Logic Map have been defined as follows:

- Strategic Need: The transport problems and opportunities that the proposed fixed link would address and the rationale for proceeding with the intervention.
- Inputs: The proposal being taken forward, which in this case would need to be further developed through an appropriate business case.
- Outputs: The outputs from the process – e.g. a bridge or tunnel, approach roads, maintenance plan etc.
- Outcomes: The change in travel opportunities and behaviours as a result of the fixed link being introduced.
- Impacts: The long-term effects of the intervention in terms of the economy and society of the study area.

Figure 34: Corran Narrows Fixed Link – Logic Map

Strategic Need

- Nether Lochaber – Ardgour busiest single vessel route in Europe
- Capacity constraints on the ferry service at peak times or when MV *Maid of Glencoul* is operating on its own
- Requirement for major capital investment in ferry service
- Human resource challenges associated with the ferry service – front line and back office
- Limitations on the size of commercial vehicles which can access the peninsula when ferry is off or MV *Maid of Glencoul* is operating on its own
- Social & economic development – supporting development of a fragile community

Inputs

- Corran Narrows Fixed Link Feasibility Study
- Development of Outline and Final Business Cases – these would include detailed option development and established funding, procurement and management arrangements
- Placing of contract following procurement process

Outputs

- Bridge or tunnel across / under the Corran Narrows
- Connecting road infrastructure to the A82 and A861
- Management, operation and maintenance contract in place
- Sale or disposal of the MV *Corran* and MV *Maid of Glencoul*

Outcomes

- Additional trips across the Corran Narrows
- 24-hour access between the peninsula and Lochaber (and vice versa)
- Creation of unrestricted large HGV route onto peninsula
- Reduced journey times
- Overall improved journey time reliability
- Improved resilience for the peninsula and, to a lesser extent, the A82
- Supports active travel corridor along west side of Loch Linnhe (although reliance on Camusnagaul Ferry for 'short' connection to Fort William)
- Increased emissions from more trips
- Reduced emissions from not operating ferries

Impacts

- Population retention / growth
- Expanded labour market catchment & job opportunities
- Increased local / regional productivity
- New business formation
- Increased tourism in peninsula
- Improved access to services – health, education, social & leisure opportunities
- Improved supply-chain efficiency
- Efficiencies in service delivery from the perspective of the public sector
- Quality of life benefits

This section is focused on the Impacts section of the logic map, each of which is explored in more detail below.

6.2.2 Population

6.2.2.1 Population Size

The combined population of the peninsular communities is 4,763 (2018, Mid-Year Estimates, NRS), with a further 2,990 residing on Mull. As well as population being low in absolute terms, the area also has one of the lowest population densities in Scotland. It is thus an economically fragile area, where maintaining and sustainably growing the population is an important consideration.

The evidence from the case studies suggests that a fixed link would contribute towards promoting population retention and growth, creating new opportunities to access employment and services in Fort William and beyond and thus making the peninsula a more attractive place to live. Population levels are of course influenced by a myriad of factors but the improvements in connectivity would create new opportunities for those living in or looking to move to the peninsula.

There may be a particular attraction for Lochaber residents seeking to move to a more remote area or take advantage of lower land costs (albeit development on the peninsula will be limited by the structure of land ownership and planning restrictions).

In absolute terms, any increase would be small given that much of the area would be remote from the crossing and the housing stock is in any case limited. However, in deep rural areas, even small increases in population can be essential in ensuring the area has the right mix of skills to meet community needs and to provide the critical mass to maintain e.g. schools, village shops etc.

It should however be noted that a fixed link may encourage increased out-commuting for employment, creating something of a dormitory effect. This in itself is not necessarily a bad thing as it may increase average incomes in an area, but there is also a risk of a centralisation of economic activity, particularly retail, to larger service centres such as Fort William.

6.2.2.2 Population Profile

As is common across rural areas, the population demographic of the peninsula is also relatively unfavourable (40% of the population combined is, under 16 and over 65), weighted as it is towards older demographics. The limited employment opportunities on the peninsula and the requirement for most to move away for further and higher education means that there is often a 'brain drain' of younger people[41]. Whilst some young people may return after they complete further / higher education or when wider personal circumstances permit, it is more common for them not to return, or not to do so until they are reaching retirement age themselves.

A high 'dependency ratio' (the ratio of the economically active resident population to the economically inactive) is generally considered negative for an area. It can lead to a shallow labour market, with paid and voluntary posts unfilled and challenges in terms of both commercial and public service delivery. Again, this is a deep-rooted challenge across rural areas and a fixed link in itself will not act as a panacea. However, by improving connectivity to employment opportunities in Fort William and beyond and the West Highland College (also in Fort William), a fixed link may encourage young people to remain in the area longer (i.e. for education) or indefinitely (i.e. for employment).

In absolute terms, any such impact would likely be relatively small. However, it is again important to bear in mind that in deep rural areas, such marginal changes can actually be critically important as they may be the difference between a business or a bus service, for example, being viable or otherwise.

The flip side of a fixed link is that it may encourage lifestyle in-migration, which is typically dominated by older demographics seeking a rural lifestyle. This is not in itself a problem, and indeed in-migrants are often highly skilled and have an appetite for engaging in community activities / volunteering. However, it can contribute to worsening the demographic imbalance of an area and in some cases (e.g. Arran, Mull and Sleat) lead to a rise in house prices which makes it less affordable for local people to rent or buy.

6.2.3 Labour Market

A fixed connection between Ardgour and Nether Lochaber could fundamentally change the labour market in the peninsula. The potential impacts are explored in more detail below.

6.2.3.1 Corran Ferry Employment

It is important to note that an immediate implication of a fixed link is that the roles of the current ferry crew would be made redundant. The Corran Ferry STAG Appraisal noted that, in 2018, there were 14 crew assigned to the operation of the ferry, of which 12 live on the peninsula.

As well as the direct financial implications for these individuals, the overall loss of this level of income from the peninsular communities would have a knock-on effect on local aggregate demand, and could encourage out migration by redundant crew members and their families (although it should be noted that several crew members are approaching retirement age). This is an issue which THC Highland Council and HIE along with others should seek to mitigate as far as reasonably possible if a fixed link is progressed. It is noted that the Council already has a positive policy for dealing with redeployment opportunities for at risk staff.

There would be a labour cost saving for THC associated with:

- No longer having to pay the costs of ferry staff, although up-front redundancy costs would have to be paid and long-term pension liabilities would remain.
- THC staff associated with management of the ferry service being redeployed to other duties.

6.2.3.2 Commuting

From the perspective of commuting, the Corran Ferry provides one of the best services in Scotland. It offers a long operating day (06:30-21:30), high frequency and low fares when benchmarked against other routes in Scotland. However, there remain two key challenges for current and prospective commuters:

- The service does not readily facilitate access to shift work in Lochaber, or indeed on the peninsula.
- Whilst fares are comparatively low, they are nonetheless another cost which commuters must accrue when travelling to work.

There are therefore several potential benefits associated with a fixed link from the perspective of commuting:

- Existing commuters will receive a financial benefit equal to the cost of fares they would otherwise have paid. This will represent a direct benefit to the individuals in question but could also have a consequential benefit for the peninsular economy if some of this money is reinvested locally.
- New commuting related employment opportunities would emerge as the range of jobs which could be accessed would be wider. For example, tourism is a major industry in the Lochaber area and jobs in this sector often involve shift, evening and weekend work. Similarly, the proposed development at the Liberty British Aluminum Smelter at Fort William would create a range of new and potentially high value shift-work opportunities. This benefit would accrue to those:
  - currently commuting to work in Lochaber and who may wish to move to a new / more productive job;
  - currently working on the peninsula who may move to a new job, commuting to Lochaber to take advantage of e.g. higher wages, better hours, improved career prospects etc; and
  - those on the peninsula who are not in employment and would have access to a wider range of job opportunities – this could be particularly important for young people seeking weekend / summer work.
- Finally, for those who are currently commuting, there would be increased opportunities to work additional hours or adopt more flexible working practices to suit lifestyle needs.

Taken as a whole, the construction of a fixed link would likely be highly positive from the perspective of commuting and access to employment more generally. Whilst the absolute number of people impacted would be relatively small, the benefits for these people could be significant. This is especially important for an area classified as fragile.

6.2.3.3 Construction – Employment and Skills Development

The construction of a fixed link across the Corran Narrows would be a significant engineering project, particularly in the context of the West Highlands where it would be one of, if not the largest, single transport project delivered in several decades.

There would therefore be an opportunity through the procurement and contracting process to ensure that local contractors secure a proportion of the work and that skills development for local young people is enshrined within the design, build and ongoing manageament process. The new Firth of Forth Crossing project and others managed by Transport Scotland have included significant numbers of training and employment opportunities in the construction and transport sectors.

6.2.4 Productivity and New Business Formation

The other side of the coin from the labour market is the impact of a fixed link on business productivity and new business formation.

6.2.4.1 Productivity

As with the labour market, the long operating day, high frequency and comparatively low cost of the current ferry service contributes strongly towards business productivity in the peninsula and Lochaber. However, a fixed link would nonetheless remove several of the constraints associated with the ferry service at present. The productivity benefits which could emerge would therefore be as follows:

- There would be a direct financial benefit to existing businesses using the crossing associated with not having to pay a ferry fare (unless the fixed link is tolled). This would be particularly beneficial for haulage firms or those businesses making use of a haulier, such as the high volume and time sensitive aquaculture sector. Several haulage firms interviewed as part of the Corran Ferry STAG Appraisal identified this as a potentially major benefit of a fixed link.
- As well as the cost advantages, the reduction in journey times and improvements in journey time reliability would allow businesses to access current opportunities more cost effectively. For example:
  - Shiel Buses could plan their schedules with greater certainty.
  - Haulage firms would be guaranteed year-round access to the peninsula, removing the restrictions currently imposed by the MV Maid of Glencoul (although this could also be addressed by a ferry solution).
  - It would allow those travelling long distances to / from the peninsula to do so more easily, removing the 'cut-off' at either end of the day. For example, a major local business consulted as part of the Corran Ferry STAG Appraisal noted that their customers often arrive into Glasgow Airport in the early evening but cannot get to the ferry on time to make a same-day crossing, and thus accrue additional time and accommodation costs

41 | https://www.hie.co.uk/media/6492/2018-young-people-maximising-opportunities-slwr.pdf

associated with their business.

- A fixed link would also support businesses on both sides of the crossing to access new opportunities, although the scope for this would be limited as the ferry supports most 'daytime' business.
    - One specific opportunity in this respect however is closer economic integration between Lochaber, the peninsula and the Isle of Mull. Recent business interviews undertaken by Stantec for a project assessing the impact of the Road Equivalent Tariff (RET) fares structure found that, as a result of fares reductions on the Lochaline – Fishnish route, opportunities had increased for tradesmen and other small businesses to extend their activities to Mull (and vice versa, although to a lesser extent). The introduction of a fixed link at Corran would further reduce the time and costs associated with such activities.

Whilst a fixed link would facilitate increased productivity at the regional level, it is important to bear in mind that transport is bidirectional or mutual a 'two-way road'. The lower cost of accessing the peninsula, when combined with the journey time reductions and improved reliability, would open the area up to increased competition from Lochaber and beyond. Evidence from the case studies and the aforementioned RET Evaluation suggests that this would mainly impact on small-scale retail on the peninsula and tradesmen (e.g. painters & decorators, joiners etc).

6.2.4.2 Business Formation

Improved and lower cost connectivity between the peninsula, Lochaber and beyond is likely to increase the demand for movement across the Corran Narrows. This may in turn provide a stimulus to new business formation. Given the large land area of the peninsula and its low population density, this effect is likely to be limited to meeting increased tourism demand (see Section 5.1.6 below) or at specific nodal points, Lochaline for example, where the number of people travelling to the village to access the Mull ferry would likely increase.

6.2.5 Access to services and leisure opportunities

On a day-to-to basis, it can be argued that the most significant effect of a Corran Narrows fixed link would be to improve access to services and leisure opportunities, particularly for peninsular residents. This would include, for example, facilitating improved access to:

- a wider retail offer, including a large supermarket in Fort William (Morrisons), new retail park (Marks & Spencer and Aldi) and lower cost fuel (although it is debatable whether this would be a good thing for the peninsular economy, again highlighting the 'two-way road' effect);
- Belford Hospital in Fort William, and indeed larger hospitals in Glasgow for planned operations.;
- West Highland College (University of the Highlands & Islands) and other educational opportunities such as evening classes;
- evening and weekend social activities in Fort William and beyond, which is likely to be of particular importance for young people; and
- participatory sports events, allowing any sports teams from the peninsula to travel further afield with the guarantee of being able to return across the Narrows, rather than the height restricted 'long way around'.

The evidence from the case studies, and indeed other projects from around the UK where connectivity has been significantly improved, suggests the economy of an area tends to gravitate towards the 'end' of the route with the greater economic concentration. For example, the economies of the Outer Hebrides and the Shetland Islands have becoming increasingly centralised in recent years, with Stornoway and Lerwick becoming increasingly dominant as connectivity across the island chains improved. It is likely that this would also happen in the peninsula, with the economic gravity of the area gradually shifting towards Fort William. However, the large land mass and long journey times suggest that this effect is likely to be weaker than elsewhere, Shetland for example.

6.2.6 Tourism

The volume of tourism in the peninsula could also reasonably be expected to increase with the opening of a fixed link. There are three components to this:

- 'Planned' tourism to the peninsula, either as a destination in its own right or as part of a wider trip incorporating e.g. Mull, Lochaber and onwards to Skye.
- 'Unplanned' tourism, where motorists / cyclists on the A82 make a spontaneous trip across the fixed link.
    - It can be argued that the requirement to obtain information on, wait and pay for a ferry may act as a deterrent to the casual visitor.
- Local tourism, where residents on either side of the crossing take advantage of the new crossing to visit or attend events on the other side.
    - An example of this provided in the Corran Ferry STAG Appraisal is the Three Lochs Book and Arts Festival in Strontian, where it was noted that it was not possible for residents of Lochaber to attend this event and return home on the same evening.

The evidence presented in the case studies highlighted the different ways in which fixed links in the Highlands & Islands have contributed to tourism. For example, the Skye Bridge released significant latent tourist demand, whilst the Kylesku Bridge has become an attraction in its own right as well as a key component of the North Coast 500; and the Berneray and Eriskay causeways have formed an integral part of the Hebridean Way, selling the Outer Hebrides as a single destination rather than as individual islands.

It is highly likely that a fixed link across the Narrows would support tourism growth in the peninsula, whilst also integrating it more widely into the tourism product in the West Highlands, potentially supported by appropriate marketing. Specific research would be required to establish the type, volume and value of this tourism.

6.2.7 Supply-chain

A fixed link would enhance the efficiency of the supply-chain for:

- Peninsular communities, and the hauliers which serve them; and
- The Isle of Mull, both in terms of providing resilience and an alternative route to access markets in the north and north-west of Scotland.

There were several responses from haulage firms to the engagement undertaken as part of the Corran Ferry STAG Appraisal. Whilst they commended the quality of the current ferry service and highlighted its importance to the peninsula, they also reiterated the challenges posed by the following issues:

- The 44-tonne weight restriction when the MV Maid of Glencoul is in operation adds to the cost of serving the peninsula. As large commercial vehicles cannot use the alternative route onto the peninsula, there is a requirement to use smaller vehicles, which compromises the load efficiencies associated with conventional HGVs and reduces already slim profit margins. Whilst the profit level of haulage firms is not an issue for the public sector per se, it is important to note that in deep rural areas, one or a small number of haulage firms can be integral to the economic wellbeing of an area. Any transport initiative which supports the viability of this sector can therefore be considered beneficial.
- It was also noted that ferry capacity-related delays at peak periods or when the MV Maid of Glencoul is in operation can be negative for hauliers. Logistics firms, particularly when carrying time sensitive freight, generally work on a 'just-in-time' basis, working around driver hours, slots at distribution centres and in some cases connecting with onward movements to England or Europe.
- The Corran crossing is also of importance for haulage firms based in or serving Mull, TSL Contractors for example. There are three aspects to this:
    - The Corran Ferry and Lochaline – Fishnish crossing provide the dangerous goods route onto Mull when the closed-deck MV Isle of Mull is operating the Oban – Craignure route on her own during the winter timetable period. It should however be noted that this issue is expected to be resolved in the near future (and well ahead of any fixed link) when the open-deck MV Hebrides is deployed on the route.
    - The introduction of RET on the Oban – Craignure route in 2015 has also led to significant vehicle-deck capacity constraints during peak periods. Whilst block bookings protect a degree of deckspace for hauliers, it can be more challenging to move short notice consignments or for non-account / irregular customers which do not have the opportunity to block book. The combination of the Lochaline – Fishnish route and the Corran Ferry therefore provide much needed additional vehicle capacity to / from Mull.
    - Finally, the combined Corran and Lochaline crossings provide resilience for Mull in the event that the Oban – Craignure route is suspended due to weather (the Lochaline – Fishnish crossing is shorter and more sheltered) or for technical reasons.

The construction of a fixed link across the Corran Narrows would therefore provide efficiency, journey time reliability and resilience benefits for both the peninsula and the Isle of Mull supply-chain (albeit acknowledging that the latter still has a dependence on a second ferry crossing) and also communities that might be impacted by unplanned closures on the trunk road network who would then require a diversion route via a new fixed link. Strong support for a fixed link was expressed by several haulage firms as part of the Corran Ferry STAG Appraisal.

6.2.8 Public service provision

A prominent outcome of other fixed links in the Highlands & Islands has been the delivery of cost savings to the public sector, either through reducing the cost of service delivery or facilitating a rationalisation of services.

In the context of the peninsula, it is likely that these impacts would however be less prominent. Consultation with THC Health & Social Care, the NHS, THC Education and THC Waste Management as part of the Corran Ferry STAG suggested that the ferry service largely meets their needs. Whilst there would be some efficiency benefits to be gained from reduced wait and journey times, it was not considered that these would lead to a fundamental reorganisation of services. A fixed link would provide a cost saving for these organisations associated with the removal of fares.

From a wider public sector perspective, the following benefits of a fixed link were however identified:

- From the perspective of Police Scotland, a fixed link would reduce the road safety risk associated with traffic backing out from the ferry terminal during periods of peak demand. This is a particularly key issue on the A82 as it is a trunk road, but there is also a safety risk on the A861 where traffic can queue back onto the blind bend.
- In the event of a road closure incident between Corran and Fort William, a fixed link would more readily allow the peninsula to be used as a diversionary route, the current diversionary route being several hours long. It is though important not to overstate this potential benefit as much of the road network on the peninsula is single track and there are also height restrictions on all routes to the A830. It may

nonetheless provide a diversion opportunity for the emergency services, cyclists and some motorists, particularly those bound for Mallaig, facilitating routing via Salen and Acharacle.

- The removal of the capacity constraint and fares associated with the Corran Ferry would increase the attractiveness of Lochaline – Fishnish, and a to a much lesser extent Kilchoan – Tobermory, as a route onto Mull. This could, at the margins, assist in relieving some of the pressure on the Oban – Craignure route, an important issue for Transport Scotland and its contracted operator CalMac Ferries Ltd. It should though be acknowledged that this could bring its own challenges, not least motorists 'racing' to catch a ferry at Lochaline or Kilchoan on single track roads.

6.2.9 Quality of life / sense of community

The key, but much less tangible, question around a fixed link is how it would impact on the quality of life and sense of community. This issue has been touched upon in each of the above sections, weighing up for example the benefits and disbenefits of increased out-commuting or lifestyle in-migration, and is to some degree summarised here.

The case studies presented in Chapter 2 suggest that, on the whole, the construction of fixed links have made highly positive contributions to rural and island communities. The quality of life benefits have included:

- Improved employment opportunities and, by extension, higher disposable incomes.
- Improved business confidence
- Contributing towards population stability / growth, particularly amongst younger cohorts (albeit the causal evidence with respect to this is limited). In-migration has typically been a factor in this, but brings both positives and negatives.
- 24-hour access to nearby service centres for health, education, personal business and leisure opportunities
    - Improved access to education and leisure opportunities are essential in retaining young people / families in an area.
- Increased tourism, creating new business opportunities for local people.
- Reduced cost of living, particularly in terms of removing the need for overnight accommodation when a journey has to be made outwith the ferry service hours.
- Ability to visit / receive visits from family and friends more easily.

Whilst fixed links have on the whole been positive, they have also brought a range of negative quality of life impacts, although the extent of these impacts varies from project to project, principally due to geography. These impacts have included:

- An increased concentration of economic activity in the nearest major service centre – this includes:
    - Employment, which can lead to a 'dormitory' effect in communities.
    - Leisure, retail etc spending being off-island / peninsula, undermining the economic viability of local businesses.
    - It should be noted that these effects are likely to be limited in the context of the peninsula as Fort William can be readily accessed at present, but they may occur at the margins.
- A watering down of the local culture / character of the area due to in-migration, particularly if this puts upward pressure on house prices making them less affordable for local young people.
- Increased second-home ownership, which can lead to vacant properties for much of the year, again undermining the local businesses and the public service base.
- An influx of tourism demand which the local infrastructure cannot accommodate – for better or for worse, the ferry service effectively provides a cap on the level of demand which can access the peninsula at any one time. This has been a very prominent problem in several remote and island communities – not least neighbouring Mull - where transport links have been improved or the cost of travel reduced. Example issues include:
    - Increased traffic on local roads, and the 'platooning' effect on single track roads.
    - An increase in larger vehicles, such as motorhomes, which can cause verge damage on single track roads.
    - Wild or irresponsible camping, on occasions borne of a lack of official campsite provision.
    - Littering and waste dumping, again on occasions as a result of limited or no official provision.
- Rationalisation / centralisation of public services, albeit this is not anticipated to be a major issue in this context.

Overall, whilst fixed links can bring their own challenges and problems, the evidence suggests that, on balance, they have been a good thing for the communities to which they have been introduced. Moreover, the impact of some of the perceived disbenefits at the community level (e.g. out commuting, undertaking leisure activities elsewhere) are questionable. Whilst the above may be seen as disadvantageous for the community overall, the fact that individuals are making these choices suggests that they derive a benefit from doing so, and indeed it may be a benefit that convinces them to stay in rather than leave the area.

In summary, this section has presented a qualitiative summary on the potential wider societal impacts of a fixed link across the Corran Narrows, exploring how such a scheme may change the way in which individuals, businesses and the public sector behave. Should a commitment be made to further explore the concept of a fixed link, a parallel programme of research should be undertaken to explore the likelihood and scale of each of the above impacts, positive and negative, in the context of the peninsula.

Ferry Slips,
Corran Narrows

7.0 Conclusions And Next Steps

7.1 Conclusions

This high-level feasibility study has demonstrated that, subject to more detailed option development and costing, a fixed link across the Corran Narrows appears a potentially viable proposition. In particular, it should be noted that:

- There are no 'showstopper' issues preventing the construction of a fixed link, albeit there are environmental, planning and construction issues which would need to be taken into consideration. The fixed link is therefore technically feasible.
- The costs of a fixed link are not significantly out of step with a continued ferry service when set against the range of benefits on offer from the former.
- BCR for fixed link options vary from <1 to <13

Under the majority of the scenarios developed here, the fixed link proposal generates a benefit-cost ratio of greater than 1. The analysis and evidence presented in this report therefore suggests that there is a case for further exploring the comparative merits of a fixed link, either within the context of STPR2 or as a standalone business case.

The feasibility work suggests that there are three potential corridors in which a fixed link could be delivered, two for a bridge-based option and one for a tunnel. Whilst a preferred option is not specified within this study:

- There are potentially significant obstacles to be overcome with regards to Route Corridor 1, and in particular the requirement to develop temporary arrangements to maintain the ferry service during construction and build a structure which maintains the shipping lane without causing disproportionate delays to motorists.
- Route Corridor 5, which would accommodate a tunnel, is by some margin the most expensive.
- Route Corridor 3, which would entail a high-level bridge option, appears the most advantageous alignment at this feasibility stage.

Whilst RC1 and RC3 would require a low-level and high-level bridge structure respectively, there are a range of structural options available within each corridor, each with varying costs and benefits.

In all cases, the construction and lifetime maintenance costs of a fixed link are more expensive than the capital costs and O&M costs associated with a continuing with a ferry service, particularly with respect to a tunnel. However, a fixed link will provide a range of benefits over and above a continued ferry operation ranging from, and in the majority of scenarios considered here, a benefit cost ratio of greater than 1 is derived.

In addition to the quantified economic benefits of a fixed link, a key question is how such a connection would impact on the society and economy of the peninsula in particular. Case study evidence suggests that a fixed connection would offer a range of benefits over and above a ferry, including improved connectivity to employment & key services; improved business confidence; improved tourism access; a more efficient supply-chain; and the promotion of population retention, particularly amongst younger cohorts. Whilst the impacts are likely to be largely positive, there would of course also be negatives such as increased pressure on peninsular infrastructure and a potential erosion of the character of that area.

7.2 Next Steps

Whilst this study has demonstrated that a fixed link is a potentially viable option for the Corran Narrows, it is essential to bear in mind that it is only a feasibility study, drawing together high-level option development, costing and economic narrative. Further development work will be required if a fixed link at Corran Narrows is to be taken forward as a major infrastructure investment similar to the Skye Bridge and Kyelsku Bridge.

7.2.1 STPR2

The Lochaber Area Committee meeting on 19th February 2020 confirmed the proposal to submit this report to Transport Scotland for consideration within the STPR2 options appraisal process. There are however a number of issues to consider in the context of STPR2, namely:

- The process, outcomes and timelines of STPR2 are not entirely clear at this stage. In particular, it is not evident at this stage whether the reporting will identify specific schemes to be progressed or whether there will be a commitment in principle to explore concepts such as new fixed links that provide more resilient connections to the ferry connections to the islands

- In the event that a Corran fixed link is specifically sifted-in to the long list of options within STPR2, it is unlikely that it would be an immediate priority and delivery of the scheme could therefore be some time after 2022. This potentially creates a dilemma for THC in that investment in the ferry service may still be required until such a time as a fixed link is delivered, and thus investment priorities at this stage will have to be considered in this context. The need for potentially 'sunk' investment in ferry infrastructure should prioritise early investment in the fixed link if this scheme emerges from STPR2.

- Finally, it is unclear at this stage whether any options sifted-out in STPR2 have an 'alternative route' back into the Scottish Government spending envelope. Whilst STPR2 represents an important opportunity to realise a fixed link at Corran, it should not be considered the only avenue for realising this aspiration. There is therefore will be a requirement for further development of the case for investing in a fixed link.

7.2.2 Corran Transport Link – Outline Business Case

There are now two recent studies exploring future transport provision across the Corran Narrows:

- Corran Ferry STAG Appraisal: This report was published in 2018 and considered the different options for the future of ferry services at Corran, mainly form a technical and financial perspective. This study did not cover fixed links and thus was focussed on ferry-based options only.

- Corran Narrows Fixed Link Feasibility Study (i.e. this report): This report develops the fixed link options to a level equivalent with ferry options in the Corran Ferry STAG Appraisal.

Transport Scotland has published guidance with respect to the development of business cases in Transport Scotland[42]. This guidance provides a framework for the delivery of transport projects and sets out a 3-stage process comprising Strategic, Outline and Final Business Cases (SBC, OBC and FBC respectively). Each Business Case comprises five 'cases', these being: Strategic, (Socio)Economic, Commercial, Financial and Management and these five 'cases' are developed to differing degrees as the three stages progress.

The SBC is broadly the equivalent of a STAG-based project, whilst the OBC develops the analysis to determine a preferred option. The FBC deals with the procurement stage.

To ensure compliance with best practice, the two studies undertaken to date should be brought together under an 'umbrella' **Corran Narrows SBC**. As no further substantive technical development of the options would be necessary, around two-thirds of the material required for this task is already available. The two existing reports would be brought together under a single overarching narrative (incorporating the key 'case for change' stage) and a common set of Transport Planning Objectives. The main 'gap' in terms of the SBC would be public and stakeholder engagement. No engagement has been undertaken to date as the two studies have been focussed more on technical matters and engineering feasibility. Whilst the Covid19 situation is likely to preclude face-to-face engagement for some time, it is still possible to undertake this type of engagement effectively remotely by using online material, webinars etc. Resident and business survey-based primary research would be required to establish the extent to which current arrangements prevent / impact on travel and how a fixed link would change travel behaviours. Additional, largely qualitative appraisal would be undertaken to cover all the requirements of STAG not covered to date and this would be captured in Appraisal Summary Tables.

This study has scoped out a range of potential **social and economic impacts** of a fixed link with respect to the peninsular communities served by a fixed link, and these have been set out in a Logic Map. In order to further inform the case for a fixed link, there would be merit in now gathering the evidence to support or otherwise the potential impacts which have been highlighted in this study, including population, labour market, productivity, the potential for new business formation, the benefits of improved access to public services and leisure and sporting opportunities, and public sector efficiencies. This would be framed in the context of the impacts of fixed link on the fragile peninsular communities and the prevailing policy context.

This evidence would be important in informing the narrative within both the SBC and the OBC and / or could be used as supporting information in the SPTR2 context.

The 'umbrella' SBC would therefore bring the two options together on a common footing, completing the Strategic Case, progressing the (Socio)Economic Case and bringing in the early stages of the Commercial, Financial and Management Cases.

The SBC would then be progressed to an Outline Business Case (**OBC**) where a preferred option for the long-term future of transport across the Narrows would be definitively determined. This OBC would include:

- Further refinement and costing of the preferred Route Corridor, alignment and structural form of a fixed link, homing in on a preferred fixed link option and increasing cost certainty. This would be undertaken in line with DMRB up to and including Stage 3, Scheme Assessment.

More detailed modelling of the benefits of a fixed link relative to the ferry option. This would refine the assumptions regarding induced traffic in the light of public engagement, and determine the average travel time savings across the year, based on surveys carried out of current ferry traffic, all allowing the development of more robust benefit-cost ratios.

- Further refinement of the ferry options to arrive at a preferred infrastructure solution and, ideally, delivery model.

- Further stakeholder, business and public engagement on the process to date, the emerging ferry and fixed link options and views on the preferred option.

- Establishment of an ultimate preferred option – fixed link or ferry. This would have to be determined within the prevailing institutional and financial position.

- Through the Financial Case, establishment of the full life financial costs of the preferred option.

- Through Commercial and Management Cases, establishment of how the preferred option would be procured, managed and delivered.

The OBC would therefore provide the basis for then procuring the preferred option, a process with would be covered in a subsequent **FBC**.

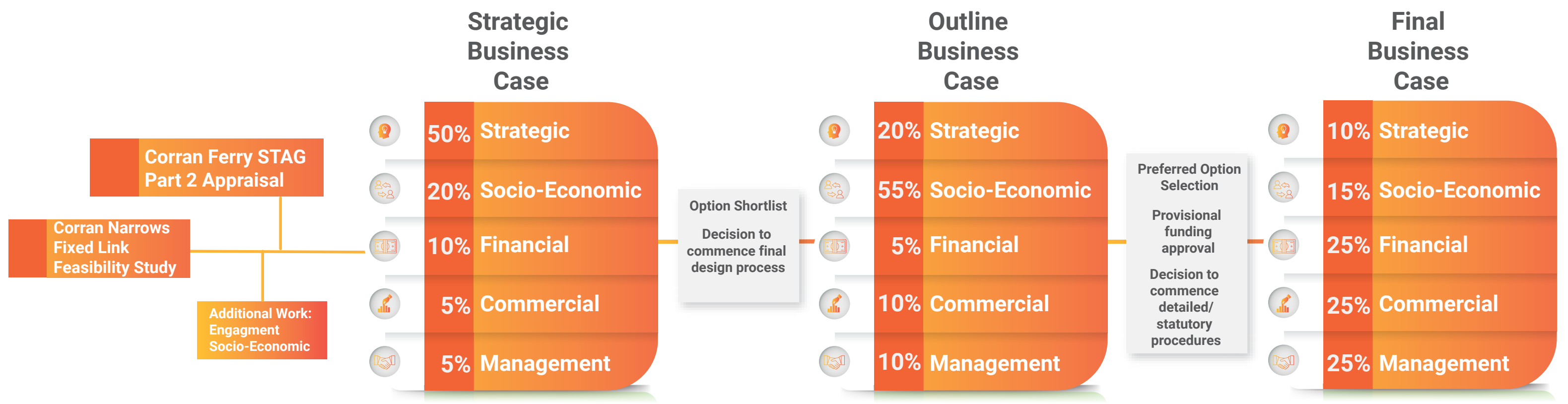


Figure 35: Workflow and Business Case Process

7.3 Recommended Next Steps

The immediate priority is to collate and supplement the work undertaken to date to produce a **Corran Narrows Strategic Business Case (SBC)** which is compliant with Transport Scotland guidance, as set out above. As noted above, around two-thirds of the material required for this exists in the current reports, with the key additional activity revolving around engagement. Effective engagement can still be undertaken in the current climate.

Given the fragility of the local economy, we also recommend undertaking bespoke, freestanding analysis of the potential **economic and social impacts** of the fixed link. The findings of this analysis would be vital in 'making the case' for this investment and would strengthen the evidence base for both the SBC and the OBC.

Ideally, a programme of **data collection** would also be undertaken to establish

- true end to end journey times at the ferry – this could be ANPR based

- foot passenger use of the ferry

- cyclists on the ferry

In the current climate of disruption to travel, the data collection programme should not however be undertaken.

42 | https://www.transport.gov.scot/media/10165/idm-guidance-annex-d-business-case-guidance-for-publication-jan-2016.pdf

Appendices

A. Model Assumptions

ASSUMPTIONS

Value	Description	Source
All Scenarios		
Assesment Years		
2019	Current Year	-
2027	Opening Year (DS/Reference)	PBA Assumed
2056	Forecast Year	Traffic growth assumed to plateau at 30 years
2086	Final Year in Appraisal Period	60 year appraisal period agreed with THC
Ferry Carryings		
1	Average CV Occupancy	PBA Assumed
30	Bus capacity (including driver)	PBA Assumed
94%	% passengers travelling by car	PBA Calculation
2%	% passengers travelling by bus	PBA Calculation
2%	% passengers travelling by CV	PBA Calculation
0%	% passengers travelling by bike	PBA Assumed
2%	% passengers travelling on foot	PBA Calculation
15%	% Cyclists as a proportion of Pedestrians + Cyclists	PBA Calculation
1.1%	Average Annual Walk/Cycle Passenger Growth	PBA Assumed
1.1%	Average Annual Car Traffic Growth (2007-2017). Assumed to already capture effects of declining occupancy.	PBA Assumed
1.1%	Average Annual CV+Bus Traffic Growth (2008-2017)	PBA Assumed
-0.6%	Average annual change in car occupancy	Table TD9, SHS Tables, TATIS 2018
0%	Average annual change in Bus/CV occupancy (neither assumed to change - bus services would be cut/added in	PBA Assumed
85%	% Adult Passengers	CHFS RET Evaluation - Travel Surveys 2019
12%	% Child Passengers	CHFS RET Evaluation - Travel Surveys 2019
3%	% Infant Passengers	CHFS RET Evaluation - Travel Surveys 2019
Travel Purpose		
100%	% CV Pax travelling In Work	PBA Assumed
100%	% Walk/Cycle Pax travelling for non-work other purposes	PBA Assumed
13%	% Bus passengers travelling in work	PBA Calculation
9%	% Bus passengers commuting to/from work/education	PBA Calculation
78%	% Bus passengers travelling for non-work other purposes	PBA Calculation
8%	% Car passengers travelling in work	PBA Calculation
9%	% Car passengers commuting to/from work/education	PBA Calculation
82%	% Car passengers travelling for non-work other purposes	PBA Calculation
Travel Characteristics		
	Travel by car/bus: Destination (North) - Fort William town centre	PBA Assumed
	Travel by car/bus: Destination (South) - North Ballachulish	PBA Assumed
	Travel by car/bus: Origin - Approximately Glenborrodale (estimated based on distribution of respondent origins	PBA Assumed
Bus Ticket Revenue		
£ 9.27	Average Bus Fare	PBA Assumed
2%	Annual increase in bus fares (approximately equivalent to Bank of England CPI forecasts for next 5 years)	PBA Assumed
Do Nothing		
2031	Year ferry ceases operation	PBA Assumed
50%	**Loss of trips as a result in end of ferry service (all modes)**	**Variable to be adjusted by user**
	Assumed that lost car/cv/bus trips are not rerouted or transferred mode	PBA Assumed
	Ferry fares revenue is equal to ferry operating and maintenance costs	PBA Assumed
	Growth in trips transferred from ferry to road, as expected on ferry.	PBA Assumed
Access - When ferry operating		
50%	% Users travellng between peninsula and the north (Fort William assumed)	PBA Assumed
50%	% Users travellng between peninsula and the south (North Ballachulish assumed)	PBA Calculation
50	Average speed by car/CV kph	PBA Assumed
40	Average speed by bus (kph)	PBA Assumed
57	Average distance driven if travelling between peninsula and the North if using ferry (Used data from 2014 surve	PBA Calculation
53	Average distance driven if travelling between peninsula and the South if using ferry (Used data from 2014 surve	PBA Calculation
55	Average distance driven if travelling between peninsula and North+South if using ferry (Used data from 2014 su	PBA Calculation
66	Average travel time by road between Peninsula and North+South (min)	PBA Calculation
82	Average travel time by bus between Peninsula and North+South (min)	PBA Calculation
15	**Wait Time for car/bus/cv passengers (min)**	**Variable to be adjusted by user**
5	Crossing Time (min)	PBA Assumed
Access - When ferry service ends		
87	Average distance driven entirely by road if travelling between Peninsula and North (Used data from 2014 surve	PBA Calculation
109	Average distance driven entirely by road if travelling between Peninsula and South (Used data from 2014 surve	PBA Calculation
98	Average distance driven entirely by road if travelling between Peninsula and North+South (Used data from 201	PBA Calculation
117	Average travel time by car/cv between Peninsula and North+South (min)	PBA Calculation
147	Average travel time by bus between Peninsula and North+South (min)	PBA Calculation
Bus Ticket Revenue - When ferry service ends		
15.0%	% reduction in bus fare to address fact that no ferry fare component once ferry fails	PBA Assumed
£ 10.50	Average Bus Fare based on mileage - once ferry fails	PBA Calculation
Reference		
	Ferry fares revenue is equal to ferry operating and maintenance costs	PBA Assumed
Ferry Access		
15	**Wait Time for car/bus/cv passengers (min)**	**Variable to be adjusted by user**
Ferry Replacement Schedule		
2031	QP Main Vessel Replacements Year 1	PBA Assumed
2041	QP Support Vessel Replacement Year 1	PBA Assumed
2061	QP Main Vessel Replacement Year 2	PBA Assumed
2024	ST Main Vessel Replacement Year 1	PBA Assumed
2054	ST Main Vessel Replacement Year 2	PBA Assumed
Capital Costs (Straight through - High)		
£ 23,000,000.00	Infrastructure cost	PBA Calculation
£ 17,000,000.00	Main Vessel Replacement ferry cost	PBA Assumed
£ -	Support Vessel replacement cost	PBA Assumed
1	No. years construction	PBA Assumed
£ 100,000.00	Annual Calmac fleet vessel cost	
Do Something		
50%	**Uplift in trips as a result of bridge opening/replacement of ferry with bridge**	**Variable to be adjusted by user**
£ 7.88	Average Bus Fare based on mileage - once ferry fails	PBA Calculation
	Growth in trips transferred from ferry to road, as expected on ferry.	PBA Assumed
Fixed Link		
56	Average distance driven entirely by road (Used data from 2014 survey on passenger origins to generate weight	PBA Calculation
67	Average travel time by road (min)	PBA Calculation
84	Average travel time by bus (min)	PBA Assumed
8%	% car/van occupants travelling In Work	PBA Calculation
17%	% car/van occupants commuting	PBA Calculation
75%	% car/van occupants travelling for other purposes	PBA Calculation
5%	% bus occupants travelling In Work	PBA Calculation
21%	% bus occupants commuting	PBA Calculation
75%	% bus occupants travelling for other purposes	PBA Calculation
Costs (Tunnel, Low)		
£ 69,267,982.40	Capital Cost (Low End Estimate)	PBA Calculation
£ 333,333.33	Operating & Maintenance cost (Low end estimate, assumed to be distributed evenly across lifetime)	PBA Calculation
3	No. years construction	PBA Calculation

B. Model Parametres

KEY DATA TO SUPPORT ASSUMPTIONS

Value	Description	Source
All Scenarios		
Carryings		
580,000	Annual passenger carryings on Corran Ferry (2017)	STS No 37, Table 9.16
257,500	Annual car carryings on Corran Ferry (2017)	STS No 37, Table 9.16
12,600	Annual Bus + CV carryings on Corran Ferry (2017)	STS No 37, Table 9.16
7%	Buses as a proportion of buses +CVs	2017-2018 Corran Ticket Sales data
1%	Average annual growth in vehicle km in Highland Council area	STS No 37, Table 5.5
96%	% Respondents who usually travel on the ferry accompanying a vehicle driven by them or another household member	Corran Ferry Socio-economic Study, Aecom, 2014
2%	% Respondents who usually travel on the ferry as foot passengers (assumed to include foot+cycle passengers)	Corran Ferry Socio-economic Study, Aecom, 2014
2%	% Respondents who travel by bus	Corran Ferry Socio-economic Study, Aecom, 2014
15%	% Camusnagaul Ferry passengers who travel with a bicycle (walk/cycle pax only)	Camusnagaul ferry cycling data.xlsx
-1%	Average annual change in car occupancy (Based on 2008-2018 SHS Travel Diary)	Table TD9, SHS Tables, TATIS 2018
85%	% Adult Passengers	CHFS RET Evaluation - Travel Surveys 2019
12%	% Child Passengers	CHFS RET Evaluation - Travel Surveys 2019
3%	% Infant Passengers	CHFS RET Evaluation - Travel Surveys 2019
Travel Purpose		
10%	% Pax travelling In Work (Corran Ferry)	CorranFerry Socio-economic Study, Aecom, 2014
9%	% Pax commuting across (Corran Ferry)	Corran Ferry Socio-economic Study, Aecom, 2014
81%	% Pax travelling for other non-work purposes (Corran Ferry)	Corran Ferry Socio-economic Study, Aecom, 2014
Travel Characteristics		
10-15 min	Timetabled Headway (min)	2019 Corran Ferry Timetable, THC Website
Ticket Revenue		
0%	% Cars which travel free	2018-19 Corran Ferry Revenue Data
42%	% Cars paying standard single fare	2018-19 Corran Ferry Revenue Data
£ 1.00	Foot passenger fare - Adult - 2019 prices	Item 7, Lochaber Committee Minutes 29/08/19, THC Website
£ 1.50	Cycle passenger fare - Adult - 2019 prices	Item 7, Lochaber Committee Minutes 29/08/19, THC Website
£ 0.27	Average cost of Single Ticket for adult foot passenger if using 30 ticket book - 2019 prices	Item 7, Lochaber Committee Minutes 29/08/19, THC Website
£ 0.40	Average cost of Single Ticket for adult cycle passenger if using 30 ticket book - 2019 prices	Item 7, Lochaber Committee Minutes 29/08/19, THC Website
19%	Average rate of indirect taxation in the UK economy	STAG Technical Database Section 9.2.2.5
Do Nothing		
Bus Ticket Revenue		
£ 12.35	Average Bus Fare based on mileage - once ferry fails	PBA Calculated based on Aecom report distribution of passenger
Ferry Access		
2.5	Multiplier to reflect higher value of time spent waiting for PT services IW	STAG Technical Database, Section 9, Economy, December 2017
Reference		
Capital Costs		
£ 14,800,000.00	Quarter Point Ferry Infrastructure Cost (Option 1a infrastructure costs (2019 prices))	PBA Calculation
£ 23,000,000.00	Straight Through Ferry Infrastructure Cost (Option 2b infrastructure costs (2019 prices))	PBA Calculation
£ 8,000,000.00	Conventional ferry cost (low end cost estimate, 2019 prices)	PBA Calculation
£ 17,000,000.00	Hybrid ferry cost (high end costs estimate, 2019 prices)	PBA Calculation
£ 100,000.00	Annual cost of use of 'straight through' vessel from Calmac fleet for support vessel (2019 prices)	PBA Calculation
Do Something		
47%	Uplift in vehicular trips (Average uplift seen in year following opening of a fixed link. Figure relates to tolled links, but data does not suggest big variation between tolled and untolled)	Shetland Fixed Links Strategy: Socio Economic Study: Final Report
Bridge Access		
1.00	Length of new link (km)	
General Traffic on A82		
1.57	Average car occupancy - Highland Council Area	Table 6, LA Tables, TATIS 2018
12%	% car/van drivers travelling In Work	National Travel Survey, 2018
24%	% car/van drivers commuting	National Travel Survey, 2018
64%	% car/van drivers travelling for other purposes	National Travel Survey, 2018
2%	% car/van passengers travelling In Work	National Travel Survey, 2018
5%	% car/van passengers commuting	National Travel Survey, 2018
93%	% car/van passengers travelling for other purposes	National Travel Survey, 2018
1%	% bus passengers travelling In Work	National Travel Survey, 2018
21%	% bus passengers commuting	National Travel Survey, 2018
77%	% bus passengers travelling for other purposes	National Travel Survey, 2018
Capital Costs - Cable Tied Bridge with 2 towers (Option A)		
£ 61,609,511.92	Capital Cost (Low End Estimate, 2020 prices)	PBA Calculation
£ 150,000.00	Operating & Maintenance cost (Low end estimate, assumed to be distributed evenly across lifetime, 2020 prices)	PBA Calculation
£ 87,975,106.36	Capital Cost (High End Estimate, 2020 prices)	PBA Calculation
£ 183,333.33	Operating & Maintenance cost (High end estimate, assumed to be distributed evenly across lifetime, 2020 prices)	PBA Calculation
Capital Costs - Opening Bridge (Option D)		
£ 42,000,000.00	Capital Cost (Low End Estimate, 2020 prices)	PBA Calculation
£ 216,666.67	Operating & Maintenance cost (High end estimate, assumed to be distributed evenly across lifetime, 2020 prices)	PBA Calculation
£ 50,000,000.00	Capital Cost (Low End Estimate, 2020 prices)	PBA Calculation
£ 250,000.00	Operating & Maintenance cost (High end estimate, assumed to be distributed evenly across lifetime, 2020 prices)	PBA Calculation
Capital Costs - Tunnel (Option E)		
£ 69,267,982.40	Capital Cost (Low End Estimate, 2020 prices)	PBA Calculation
£ 333,333.33	Operating & Maintenance cost (Low end estimate, assumed to be distributed evenly across lifetime, 2020 prices)	PBA Calculation
£ 116,333,805.72	Capital Cost (Low End Estimate, 2020 prices)	PBA Calculation
£ 550,000.00	Operating & Maintenance cost (Low end estimate, assumed to be distributed evenly across lifetime, 2020 prices)	PBA Calculation

Appendix C Corran Ferry Socio-Economic Study

CORRAN NARROWS

Socio-Economic Study

September 2021

In partnership with: Stantec

Prepared by: **Steven Reid**

Reviewed by: **Stephen Canning**

Approved by: **Scott Leitham**

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1.0 WHAT IS THE VALUE OF THE CORRAN FERRY?

The Corran Ferry provides the short passenger and vehicle crossing between Lochaber and Ardgour, providing an essential connection linking the communities of Ardgour, Sunart, Ardnamurchan, Acharacle, and Morvern (collectively referred to as the peninsular communities in this report, with a combined population of 2,177 in 2019) with their main service centre at Fort William and the wider strategic road network (A82 / A830). The service also provides a connection between Lochaber and the Isle of Mull via the Lochaline – Fishnish route, an important connection for supply-chain and personal travel needs of the residents of Mull. The Highland Council (THC) operated service carries over 270,000 cars each year, delivering over 30,000 sailings, early morning to late night, 363 days per year. The crossing of the Narrows is the busiest single vessel route in Scotland, and indeed is reputed to be the busiest single vessel route in Europe.

1.1 WHY IS THE CORRAN FERRY SO WELL USED?

The peninsular communities of Ardgour, Sunart, Ardnamurchan, Acharacle, and Morvern are amongst the most geographically remote and sparsely populated areas of mainland Scotland. Whilst the peninsula is home to a vibrant and growing population, its economic vitality (and, to a lesser extent, the economic vitality of the Isle of Mull) is dependent on connections to Lochaber and beyond for:

- Travel to work and education
- Accessing personal services such as Further and Higher Education, and hospitals
- Accessing leisure opportunities and visiting friends and relatives
- Attracting tourists, one of the primary economic sectors on the peninsula
- Inbound and outbound supply-chain movements
- Public service delivery, such as e.g., supply teachers, refuse vehicles and utilities maintenance etc

Residents of Lochaber also commute into the peninsula for work, whilst Lochaber businesses benefit from the wider labour supply offered by those living on the peninsula.

The scale of these economic interactions and the importance of the ferry to them is highlighted by its usage, which is greater than ferry routes to e.g., Arran, Mull, Islay, and the totality of the Outer Hebrides, despite having a lower population.

Such interactions are only possible because the Corran Ferry reduces the geographic peripherality of the peninsula by connecting it to the trunk road network south of Fort William, acting as a ‘bridge’ between the peninsula and Lochaber. Without the ferry, journey times from, for example, Sunart and Morvern to Fort William and Ballachulish would increase significantly. Google Distance Matrix API[1] data[2], validated by Transport Scotland INRIX[3] data, suggests that the population weighted average increase in journey times from Sunart and Morvern to Fort William would be just over 15 minutes. The increase in journey times to Ballachulish (taken as a proxy for all points south) would be around 45 minutes, whilst the cost of these journeys would also increase. It is important to note however that data-based changes in journey time do not tell the full story – it should be noted that:

- The data are based on the average change in journey time. The single-track design of most of the peninsular road network however means that journey times are unreliable and thus, when making these journeys, motorists will be build-in a healthy contingency on top of the actual journey time increase.
- The change in population weighted average journey times set out above is also based on the current transport network in the area. However, the absence of the ferry would lead to significant traffic rerouting, adding to traffic volumes on the peninsular road network. This is particularly important in the context of single-track roads, where more frequent stopping in passing places and increased platooning could be expected, significantly extending journey times.
- There would also be seasonal impacts on journey times. For example, in the summer months, there will be an increase the volume of motorists on the peninsula, a change in the traffic mix (e.g. increased motor home traffic and coaches) and a higher proportion of motorists which are less familiar with single track roads. This seasonality effect can be most clearly seen in Mull where the journey time from the main ferry terminal at Craignure to Fionnphort (the embarkation point for Iona) increases significantly between Easter and October.

In the absence of the Corran Ferry, it can therefore be reasonably assumed that journey times would increase significantly, and journey time reliability would worsen. At the margin, this would make certain journeys less attractive and would weaken the economic interactions between the peninsula and Lochaber / wider Scotland.

1.2 WHY IS IT IMPORTANT TO UNDERSTAND THE VALUE OF THE CORRAN FERRY?

Despite its importance and usage, the future of the ferry service is under significant pressure. A replacement for the secondary vessel, MV *Maid of Glencoul* is urgently required, whilst there are several operational challenges including the size of the crew complement - which is close to the minimum number required to deliver the current level of service - and the ageing crew demographic. Whilst the requirement for investment is evident, the scale of that investment is substantial, incorporating two new vessels in the medium-term and upgrades to terminal infrastructure at Corran and Ardgour to accommodate them. Added to this is the requirement for additional revenue

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[1] Travel times were extracted using a departure time of 8am. Travel times represent historically informed trends and provide an average travel time based on the day and time of day selected.
[2] Historical data was extracted, providing observed travel times and although this will mostly be based on information over a number of years Pre-Covid, there will be an element of travel times informed by times in the past year. Journey times are informed through actual journeys captured by users using Google Maps to navigate, thus provide average times captured across a time period no shorter than a year.
[3] INRIX collates in-vehicle GPS data establishing a daily database of travel times and speeds on the road network. This provides a robust database of daily travel patterns and behaviours on the network.

expenditure to establish a sustainable human resource position. Without investment, the level of service offered could be compromised and indeed the whole operation could ultimately cease in the fullness of time. The farebox revenue, whilst covering operating costs, is also insufficient to meet the future capital investment needs of the route.

1.3 HOW CAN THE VALUE OF A FERRY SERVICE BE DETERMINED?

Our approach in this study has been to consider the different ferry user types – resident, business, and visitor – and develop a ‘logic map’ setting out how they would respond in a hypothetical ‘no ferry’ scenario. Having developed these logic maps, we then tested and refined the logic chains through a programme of research including resident and business surveys, stakeholder engagement and desk-based economic research. Collectively, these research strands highlight the consequences of a ‘no ferry’ scenario and, by extension, the socio-economic value of the service.

1.4 WHAT ARE THE IMPLICATIONS OF A ‘NO FERRY’ SCENARIO FOR RESIDENTS?

The implications of a ‘no ferry’ scenario for residents of both the peninsula and Lochaber are as follows:

- Residents – particularly peninsular residents – would experience **poorer employment outcomes** and **thus significant reductions in disposable income**, particularly in Sunart and Morvern, which would be the most severely affected communities.
- This loss of disposable income would both **reduce aggregate demand in the peninsula** and **incentivise some families to leave the area** - indeed, **9% of survey respondents noted that they would resign their job and leave the area**. Increased travel costs would impact more on those in low / minimum / living wage jobs, often ‘key workers’. This group would be most at risk of having to give up their jobs, meaning those on low incomes are most affected and service provision (e.g. social care) could be impacted.
- Such a loss of working age population would be highly detrimental to the peninsula, weakening the **critical mass required to maintain economic viability**, increasing the age profile and thus **dependency ratio** and threatening the **viability of local services such as primary schools, bus connections etc**. It would also **reduce the attractiveness of the peninsula to families minded towards in-migration**. The impacts again would be particularly stark in Sunart and Morvern, which would go from being relatively well-connected to a position of extreme rurality in a very short space of time.
- The reduction in income and loss of employment in the peninsula would potentially **increase the number of people claiming benefits** (a net cost to society).
- The evidence from the resident survey clearly highlights the **extensive economic interactions between the peninsula and the Lochaber area**. Cumulatively, the ability to engage in the social activities is important in making the peninsula an attractive place to live, particularly for families. A reduction in connectivity to e.g., shopping or cultural and entertainment activities would diminish quality of life and, together with job / income impacts, would be a ‘**push’ factor in encouraging out-migration**.

Overall, the ’no ferry’ scenario would **significantly reduce the ability for residents to access employment, employment opportunities / training, key services, and social activities**. This in turn, would diminish the quality of life for many and act as a ‘push’ factor in encouraging population out-migration, posing a risk to the future sustainability of communities and businesses on the peninsula.

1.5 WHAT ARE THE IMPLICATIONS OF A 'NO FERRY' SCENARIO FOR BUSINESSES?

The implications of a 'no ferry' scenario for businesses are as follows:

- The size of the **customer base would diminish**, particularly in the peninsula which has a relatively large tourism sector. It is likely that this would make some businesses unviable, and thus may put further downward pressure on population.
- The **size of the labour pool** available to employers in the peninsula and the wider study area would be reduced. This in turn would make it **harder to fill vacancies** or, where these are filled, effectively **match skills to jobs**. Both of these effects would impact negatively on **productivity**. The impacts would be most keenly felt on the peninsula, where the labour market is already very small in absolute terms.
- **Business costs would increase**, particularly for those firms physically moving goods, either by contracted haulier or on their own account.
- Rural haulage businesses – or the rural operations of regional / national haulage businesses – are generally marginal operations, where even small increases in cost can make the operation unviable. The incidence of this impact depends on the haulier in question, the scale of their operation and the extent to which they can pass increased costs onto the end customer or otherwise. The key **risk for the peninsula** outwith increased cost of delivery is the **withdrawal of one or more haulage businesses** in the area, which could threaten an already marginal supply-chain.

Overall, the 'no ferry' scenario implies an **immediate increase in the cost of serving and doing business in the peninsula**. The extent of the impacts would vary by business sector and company depending on the size and geography of the market they serve, the extent to which the business can pass on costs and, where cost pass on is possible, who the end customer is. Nonetheless, it is reasonable to assume that the **cost of least some goods and services would increase**. There is also a risk that some firms may also withdraw from the peninsular market, which could increase cost through reducing competition. The 'no ferry' scenario also implies a reduction in the size of the **labour pool** for the combined peninsular and Lochaber areas. This could exacerbate job vacancy rates and **skills shortages** which already exist and reduce local, regional, and national **productivity**. The impacts would be most keenly felt on the peninsula, where the labour market is already very small in absolute terms.

1.6 WHAT ARE THE IMPLICATIONS OF A 'NO FERRY' SCENARIO FOR VISITORS?

The implications of 'no ferry' scenario for visitors are as follows:

- The visitor survey suggests that there would be a **significant reduction in day-trippers** to the peninsula, reducing direct expenditure in peninsular businesses and with consequential 'multiplier'[4] effects. There would also be a potential **redistribution of the remaining visitor trips** as a result of the changes in journey times – it is expected that Morvern and Sunart would be particularly affected.

[4] The Multiplier effect is a measure of how many times money spent in an area circulates through its economy, effectively recognising that £1 of initial spend will have a greater impact than that initial spend alone. For example, if a tourist books a hotel night for £100, the hotelier will buy stock from say a local provider. The local provider will in turn pay staff who may then spend a part of their income in a local shop of restaurant. Therefore, a proportion of the £100 initial spend is recycled through the local economy several times, creating a larger overall impact.

- The NCN78 – the cycle route from Campbeltown to Inverness – would be **severed** thus reducing passing trade for peninsular businesses and the overall attractiveness of long-distance cycle trips to and from the area. It would also increase the **THC subsidy required for the Camusnagaul Ferry**, which is well-used by cyclists. This could however be to the benefit of Lochaber if there is a redistribution of trips to that area.
- For car-based visitors, rerouting to avoid the peninsula would result in a **loss of passing trade for businesses**, with direct and multiplier effects on the peninsula – this could affect the market as far south as Oban / Mull and as far north as Skye if people fundamentally change their holiday plans. This could however be to the benefit of Lochaber if there is a redistribution of trips to that area.
- There would also be a reduction in **overnight stays** on the peninsula. This would be the **most significant tourism impact** as overnighting visitors tend to spend more money in an area, even when accommodation costs are excluded. This loss of direct expenditure would be amplified by multiplier effects within the local economy. Moreover, a long-term contraction in demand would lead to the **gradual diminution of the supply-side (e.g., bed stock, cafes / restaurants etc)**, reversing long-term initiatives to grow the attractiveness of the peninsula for tourists.

Overall, it is unquestionable that, in a 'no ferry' scenario, **the scale of the peninsular tourism market would reduce**, and there could also be both negative and positive (redistribution) impacts in Lochaber. This reduction would directly reduce visitor spending, with consequential multiplier impacts, and would thus **reduce employment in one of the primary economic sectors in the area**. Moreover, it would lead to a **long-term erosion of the supply-side** in the area, undoing much of the market development work undertaken in recent years.

1.7 WHAT IS THE COST OF A 'NO FERRY' SCENARIO?

There are two components to the 'cost' of a no ferry scenario – these are:

- The monetised 'disbenefit' that current ferry users would experience as a result of longer journey times and high vehicle operating costs – these are the (dis)benefits typically accounted for in the 'Transport Economic Efficiency' component of a Scottish Transport Appraisal Guidance (STAG) appraisal, which are used as the basis for benefit-cost ratio (BCR) calculations. The TEE disbenefits amount to on average **£1.9m per annum**, or between **£71m to £78m when considered as a discounted 60-year present value of benefits (PVB)**[5].
- The economic impact of ferry withdrawal on employment and Gross Value Added (GVA)[6]. The withdrawal of the ferry would lead to a loss of **106 jobs on the peninsula out of 990 (including 14 crew jobs)** and **£58m in GVA over a 30-year period**.

[5] The present value of benefits (PVB) is the benefit / disbenefit is a means of equating a long-term benefits stream to its current or 'present' value.
[6] Gross Value Added (GVA) is the measure of the value of goods and services produced in an area, industry or sector of an economy.

1.8 SHOULD THE A861NOT JUST BE UPGRADED INSTEAD?

One potential alternative to investing in the Corran Ferry is to upgrade the A861 between Ardgour ferry slip and Drumsallie to single carriageway standard, reducing the travel time disbenefits of travelling to Fort William by road. However, high-level cost estimates developed as part of this study suggest that this would cost in the region of **£190m**. Moreover, it is evident that:

- The cost of upgrading the A861 to a standard single carriageway would be tens of millions of pounds more expensive than the Stromeferry Bypass, which THC has been pursuing for many years. It would also only serve the eastern part of the peninsula, so the benefits of such an investment would be unevenly distributed.
- Whilst the conversion of the A861 to single carriageway would reduce journey times from Ardgour and Morvern, journey times and distances would still be significantly longer than travelling via the ferry.
- As the A861 is a road for which THC has responsibility, it would bear the costs of the upgrade unless funds could be secured from external sources. Given the backstory with Stromeferry, this seems unlikely in the medium-term. The capital cost of such a road upgrade would therefore likely be unaffordable from a THC perspective. **Crucially, such an upgrade would also be significantly more expensive than a fixed link across the Corran Narrows, which is understood to be the preferred long-term solution of peninsular communities for crossing the Narrows.**
- There would also likely be significant environmental consenting issues with upgrading a road which hugs the western shore of the scenic Loch Linnhe.

Overall, it is clear from the above that, even without a full appraisal exercise, the upgrading of the A861 to single carriageway cannot realistically be considered as an appropriate or value for money mitigation in a ‘no ferry’ scenario.

1.9 CONCLUSION

The above analysis clearly highlights the importance of the Corran Ferry to both the peninsular communities and Lochaber more generally. The approach adopted has been to consider a ‘no ferry’ scenario from the perspective of different users, which made it easier to distil the different impacts for the purposes of the research. In practice however, the impacts on each of these groups would overlap and reinforce the negative consequences of a ‘no ferry’ scenario. For example, the loss of peninsular jobs would be compounded by a reduction in visitor income and a potential increase in supply-chain and delivery costs. Multiplier effects would compound these losses creating a vicious circle of decline.

All these impacts would ultimately coalesce around a threat to the economic viability of the area. The peninsula has a small and sparse population, but one which the Corran Ferry helps to ensure is viable. Increased costs, reduced income, and difficulty accessing employment, personal business and leisure opportunities would act as a significant ‘push’ factor to out-migration, particularly amongst younger cohorts, and would also act as a deterrent to families minded to in-migration. In fragile rural communities, it only takes a small number of families to leave for local businesses to become unviable and services reduced, creating a cycle of decline. The benefits of improved connectivity across the Highlands and Islands (e.g., the Skye Bridge, Scalpay fixed link, the Sound ferries in the Outer Hebrides, the Shetland Ro-Ro ferry network etc) have been seen and evidenced in recent years, and the loss of a ferry at Corran could therefore be readily assumed to reverse the types of benefits delivered in these similarly remote areas.

In short, in the absence of a fixed link across the Narrows, the provision of a frequent, reliable, and high-capacity ferry service at Corran is simply fundamental to the economic viability and future sustainability of the peninsula as evidenced by the potential cost of the loss of 106 jobs and £58m in GVA.

Introduction

CORRAN NARROWS

Socio-Economic Study

2.0 INTRODUCTION

2.1 THE CORRAN NARROWS

The Corran Narrows marks the boundary between the upper and lower section of Loch Linnhe, a circa 30-mile-long sea loch which runs along the Great Glen Fault. The section of the loch upstream of Corran separates Lochaber from Ardgour and the areas beyond, albeit it is possible to drive around the head of the loch via Fort William and Drumsallie. At its narrowest point at Corran, Loch Linnhe is circa 300 metres wide. It is at this point, that the Corran Ferry service operates.

MV *Corran* operates the short passenger and vehicle crossing between Lochaber and Ardgour, providing an essential connection linking the communities of Ardgour, Sunart, Ardnamurchan, Acharacle, and Morvern with their main service centre at Fort William and the wider strategic road network (A82 / A830). The service also provides a connection between Lochaber and the Isle of Mull via the Locahline – Fishnish route, an important connection for supply-chain and personal travel needs.

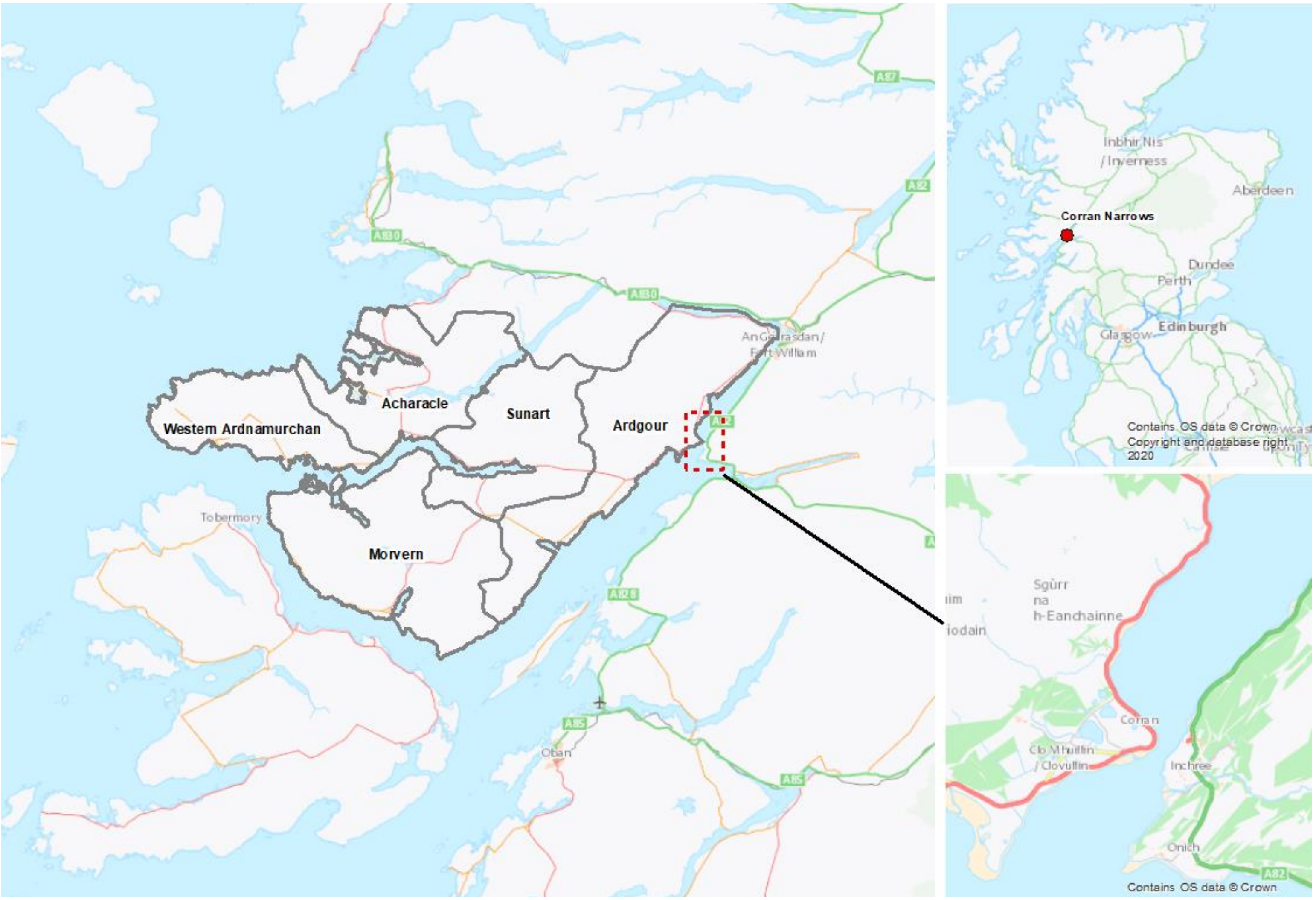

Figure 2-1: Location of Corran Narrows

The Corran Ferry serves a wide variety of purposes including providing access to employment and other key services for residents, acting as a gateway for tourists visiting the peninsula, and supporting the supply-chain needs of the above communities as well as those of the Isle of Mull.

The Highland Council (THC) is responsible for operating the service, which is the busiest single vessel route in Scotland carrying over 270,000 cars each year, delivering over 30,000 sailings, early morning to late at night, 363 days of the year.

2.2 PURPOSE OF THIS STUDY

The purpose of this study is to provide a comprehensive statement of the socio-economic role of the Corran Ferry in meeting the needs of the people and businesses who use the ferry. It will support both the internal and external case for investment in the service and the assets which deliver it.

2.2.1 Why is this study required?

The Corran Ferry forms the primary transport connection between peninsular communities and Lochaber, providing connectivity to Fort William as the regional service centre and the A82 trunk road. It is a multi-functional service, connecting peninsular residents to employment, education, and personal services; supporting the peninsular and Mull supply-chains; and facilitating tourism visits to the area. The alternative route connecting to Fort William and beyond is via the A861 which connects onto the A830. However, the road-based infrastructure is single track with passing places and has many constrained horizontally and vertically constrained sections which limit the movement of certain vehicle types, such as the low bridge at Drumsallie. The ferry service is therefore integral to the economic and social wellbeing of the peninsula and the wider Mull and Lochaber areas.

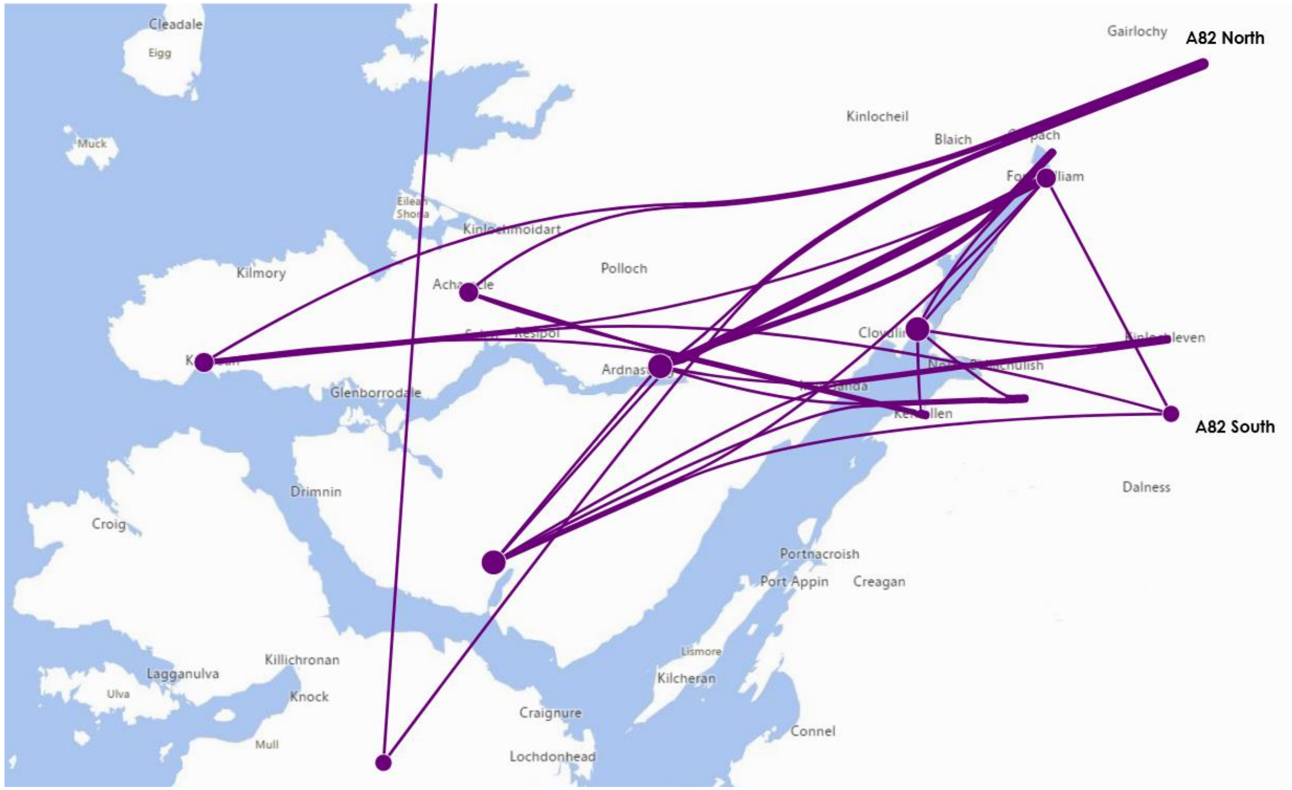

Figure 2-2: Resident Flows from *Voice of the Customer Survey*

Despite its importance to the area, there are growing pressures on the sustainability of the service. The crossing is currently operated by two vessels, the relatively modern MV *Corran* (2001) and the 1970s vintage MV *Maid of Glencoul*. The requirement to maintain two vessels arises from their ‘quarter-point’ vehicle ramp design, which is required to allow safe and efficient operation in the strong tidal conditions experienced at Corran. MV *Corran* is the main vessel, with MV *Maid of Glencoul* stepping in when the primary vessel is out of service for scheduled or unscheduled maintenance. The impending life expiry of MV *Maid of Glencoul*, together with recent reliability issues with MV *Corran*, has highlighted the requirement for capital investment to maintain the integrity of the service. The vessel situation is compounded by a challenging human resource position. As an entirely self-contained service, the Corran Ferry is dependent on a small number of highly dedicated crew. However, the combination of an aging crew demographic and recruitment difficulties has reduced crew headcount to near the minimum level required to operate the service at its current level.

Whilst the requirement for investment is evident, the scale of that investment is substantial, incorporating two new vessels in the medium-term and upgrades to terminal infrastructure at Corran and Ardgour to accommodate them. Added to this is the requirement for additional revenue expenditure to establish a sustainable human resource position. As is almost always the case with essential ferry services, it is challenging to make a conventional transport appraisal case for investment based on a positive net present value (NPV) and benefit-cost ratio (BCR). It is thus necessary to draw out evidence on the social and economic benefits of the ferry service, highlighting both the benefits of investment and the risks of a 'do nothing' approach. This is the role which this study fulfils – it will be used to support internal investment considerations within THC, but also as a case making piece for Scottish Government or other investment in the service.

2.2.2 What work has been done to date?

In response to the emerging challenges with the ferry service, THC commissioned Stantec (then Peter Brett Associates), Mott MacDonald and WSMD Associates to undertake an appraisal of options using the Scottish Transport Appraisal Guidance (STAG) in 2018. The STAG study was focused exclusively on shortlisting vessel and infrastructure options which could address the problems on the route and setting out how these could be funded and delivered. It did not therefore consider a fixed link across the Narrows and, as a largely technical exercise, took a light touch approach to public engagement.

In 2019, the STAG study was supplemented by a High-level Outline Feasibility Study of a Fixed Link across the Corran Narrows, which was completed by Stantec and submitted to Transport Scotland for further consideration within the Strategic Transport Projects Review 2 (STPR2)[7] process. Taken together, the ferry and fixed link pieces provided a comprehensive statement of all possible future options for crossing the Corran Narrows. A fixed link is understood to remain the preferred option of the community and is actively being pursued through THC submissions to the STPR2 process. However, even if a fixed link was to be approved in the short-term, the design, consenting and construction timelines mean that it remains a medium-term proposition. To this end, an at-least interim ferry solution is required, and this is now being progressed through the business case process set out below.

2.2.3 Corran Ferry Business Case

The progression of a future ferry solution is being developed using the Transport Scotland *Guidance on the Development of Business Cases*, which is based on the H.M. Treasury *Green Book* 'Five Case Model', the standard approach to business case development in the UK. The business case process is split into three stages:

[7] STPR2 is the process through which Transport Scotland's capital investment priorities for the next two decades will be defined.

- **Strategic Business Case (SBC):** The purpose of the SBC is to establish the rationale for intervention, detailing the problems and opportunities which the business case is seeking to address. It sets objectives, generates and appraises an initial long list of options, and establishes a shortlist to be progressed for further consideration.
- **Outline Business Case (OBC):** The purpose of the OBC is to revisit the SBC in more detail and to identify a preferred option which demonstrably optimises value for money. It also sets out the likely solution; demonstrates its affordability; and details the supporting procurement strategy, together with management arrangements for the successful rollout of the preferred scheme.
- **Final Business Case (FBC):** The FBC is an updated version of the OBC and takes place following the procurement phase of the project to confirm that the project remains on track and provides value for money.

Within each 'stage' of the business case, there are five 'cases', which provide a structured approach to detailing each component of the overall proposition. These are as follows:

- **Strategic Case:** Defines the case for change / rationale for intervention and identifies a shortlist of options which could deliver the project-specific and wider policy objectives.
- **(Socio)[8] Economic Case:** Assesses the options to determine their value for money in terms of economic, social and environmental benefits and costs.
- **Financial Case:** The financial case involves undertaking a full financial appraisal of the preferred option, based on resource accounting and budgeting principles, including information on funding, budgeting over the life of the project and scheme cash flow.
- **Commercial Case:** The commercial case provides evidence on the commercial viability of a proposal and the procurement strategy that will be used to engage the market.
- **Management Case:** Details the project management plans, outlining the framework for managing risk, benefits realisation and post-project evaluation.

The focus on each 'case' varies by stage of the business case – this is highlighted in the figure below, with the size of the box showing the emphasis placed on that component of the business case at each stage of the process.

[8] The Economic Case is sometimes referred to as the Socio-Economic Case in Scotland, by Transport Scotland for example. This subtlety reflects a desire to more fully reflect wider social and economic factors alongside the traditional estimation of value for money determined by a cost-benefit ratio and net present value.

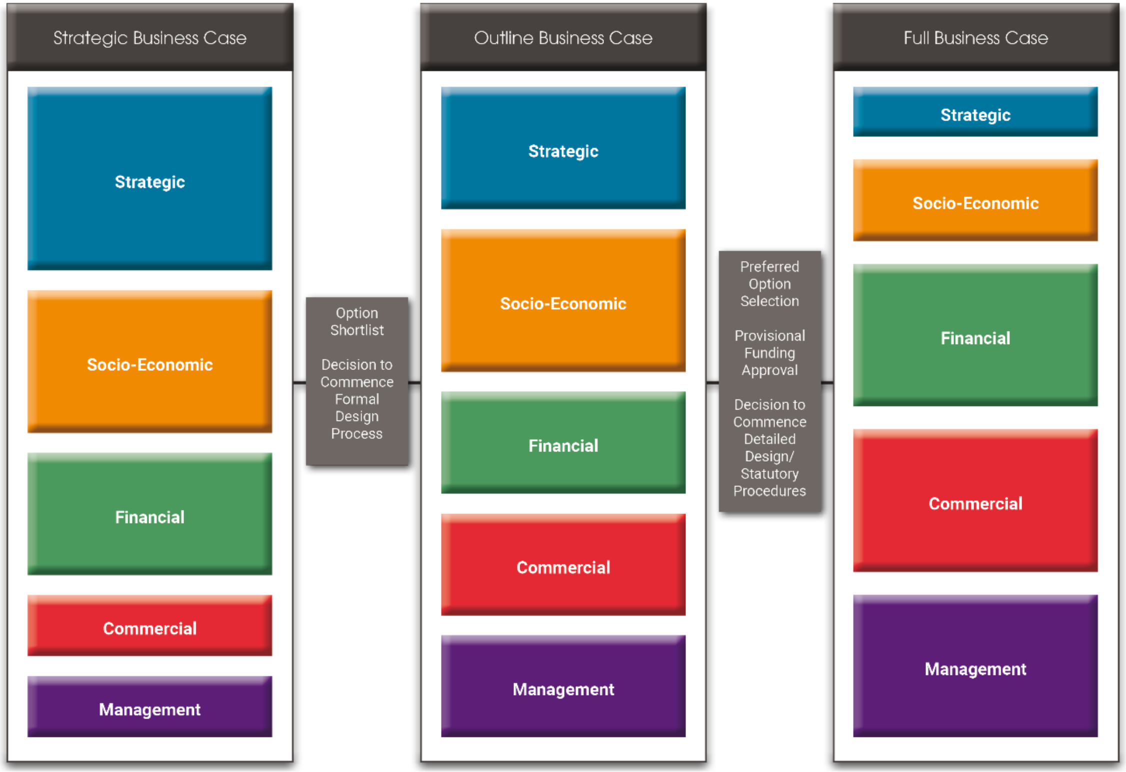

Figure 2-3: Business Case Stages

Taken together, the **Corran Ferry STAG Appraisal** and **High-level Outline Feasibility Study of a Fixed Link across the Corran Narrows** form the SBC for future transport provision across the Corran Narrows. THC is now pursuing the OBC for the ferry service. The Strategic Case is complete, and the Socio-Economic Case is well-developed in terms of the options. **However, there remains a gap in terms of understanding socio-economic benefits of investing in the ferry service, and it is this gap that this study will address.** Upon completion, THC will be in a position to select a preferred ferry option and proceed in developing the Commercial, Financial and Management Cases.

Scene Setting

CORRAN NARROWS

Socio-Economic Study

3.0 SCENE SETTING

This chapter provides background to the geography of the study area, the transport network within it and the operation of the Corran Ferry, providing the context for the socio-economic analysis which follows in the subsequent chapters.

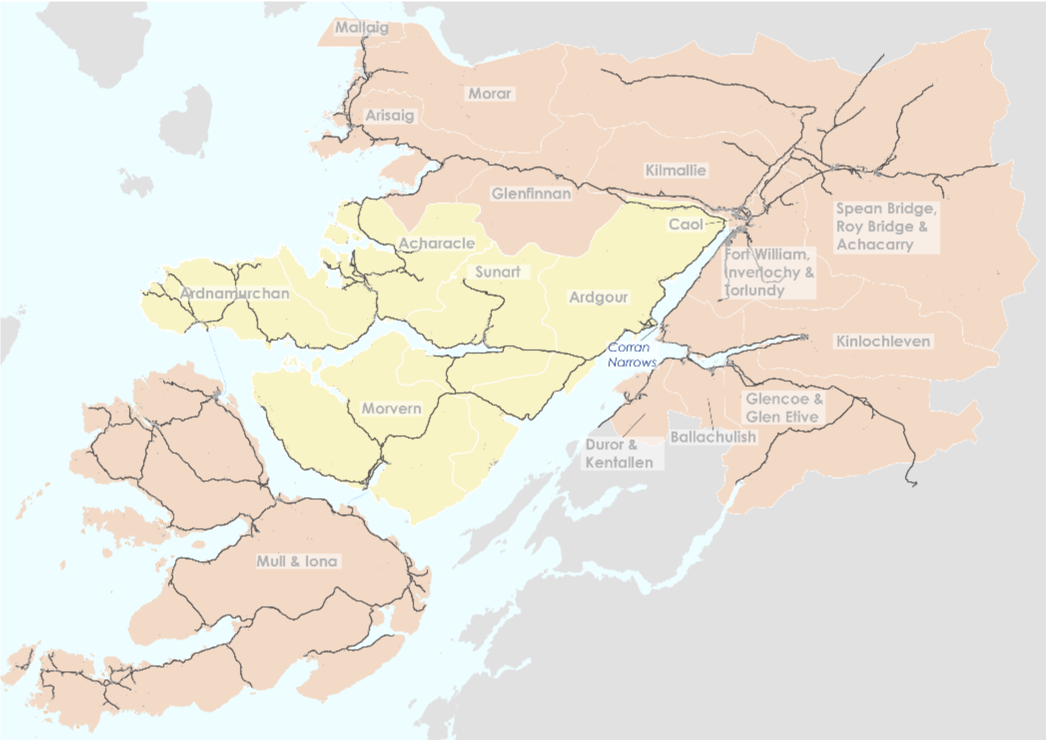

Figure 3-1: Peninsula Communities & Wider Study Area

3.1 DEFINING THE AREA

In defining the study area, the primary focus is on the five peninsular communities of Ardgour, Acharacle, Ardnamurchan, Morvern and Sunart. However, the sphere of influence of the Corran Ferry is wider - in addition to providing a short link across the Narrows to the Peninsula, the crossing also provides:

- A secondary route to / from Mull via the CalMac Ferries Limited (CFL) operated Lochaline – Fishnish crossing, especially for transporting dangerous goods when MV *Isle of Mull* is operating the Oban – Craignure route on her own.
- A road-based divisionary route during occurrences when the A830 Fort William to Mallaig trunk road is closed between Kinlocheil and Fort William.

To this end, the study area for the project has been summarised into two distinct areas as highlighted in **Figure** 3-1, (i) the five peninsula-based communities shaded yellow; and (ii) the wider study area shaded in orange, incorporating Mull and Iona and Lochaber.

3.2 GEOGRAPHY

The Scottish Government Urban Rural Classification is used to identify rural communities and better understand the impact that issues such as transport, education and health can have on them, and to reflect this when developing or implementing policy.

The classification provides a consistent way of defining urban and rural areas across Scotland and is based upon two main criteria: (i) **population**, as defined by the National Records of Scotland (NRS), and (ii) **accessibility**, based on drive time analysis to differentiate between 'accessible' and 'remote' areas in Scotland[9].

Both the peninsular communities (collectively) and the wider study area for this project are classified using the following 8-fold classification: (1) Large Urban Areas, (2) Other Urban Areas, (3) Accessible Small Tows, (4) Remote Small Towns, (5) Very Remote Small Towns, (6) Accessible Rural Areas, (7) Remote Rural Areas and (8) Very Remote Rural Areas.

Table 3-1 below provides the classification for each of the community council areas considered within the study and the 2019 population[10]. The peninsular communities are coloured orange.

Table 3-1: Scottish Government Urban Rural Classification 8-Fold 2016 (Source: Scottish Government, 2016)

Community Councils	8-Fold Classification	2019 Population
Acharacle	**8**	**529**
Arisaig, Glenfinnan, Kilmallie	7	1,041
Ballachulish, Kentallan, Glencoe	7	649
Caol	2	4,577
Fort William, Inverlochy, Torlundy	2	5,658
Morar, South Knoydart	8	902
Morvern, Sunart, Ardgour	**8**	**1,076**
Mull	8	3,021
Nether Lochaber, Kinlochleven	6	510
West Ardnamurchan	**8**	**572**

The peninsula-based communities are all classified as 'Level 8, ***Very Remote Rural Areas***'. These are therefore defined as fragile communities in the view of the Scottish Government using this measure.

3.3 ROAD BASED CONNECTIONS

The peninsular road network is sparse, both in terms of the coverage of the network and the form, standard and horizontal and vertical alignment of those roads – this reinforces the use of the ferry as an integral part of the road network, connecting the peninsular communities to Fort William and the trunk road network. In Lochaber, the A82 at Corran provides the trunk road connection south to Oban and the Central Belt and north to Fort William, Inverness, and Skye. The A82 connects with the A830 in Fort

[9] Three population thresholds are used to categorise settlements into 4 categories; 125,000+ = Large Urban Areas, 124,999 - 10,000 = Other Urban Areas, 9,999 - 3,000 people = Small Towns, and less than 3,000 = Rural Areas. Accessibility is measured in terms of drive times to an urban area. This is done by calculating 30 and 60 minute drive times from the population weighted centroids of Settlements with a population of 10,000 or more.

[10] 2019 Mid-Year Population Statistics, National Records of Scotland 2021

William and provides connections to Mallaig and onward ferry services to Skye, Knoydart, the Small Isles and the Outer Hebrides. The A830 connects with the A861 on the peninsula at both Drumsallie and Lochailort and has one low bridge constraint to the east of Glenfinnan. The A861 provides a circuitous route looping around the peninsula between Drumsallie, Ardgour, Strontian, Salen and Lochailort.

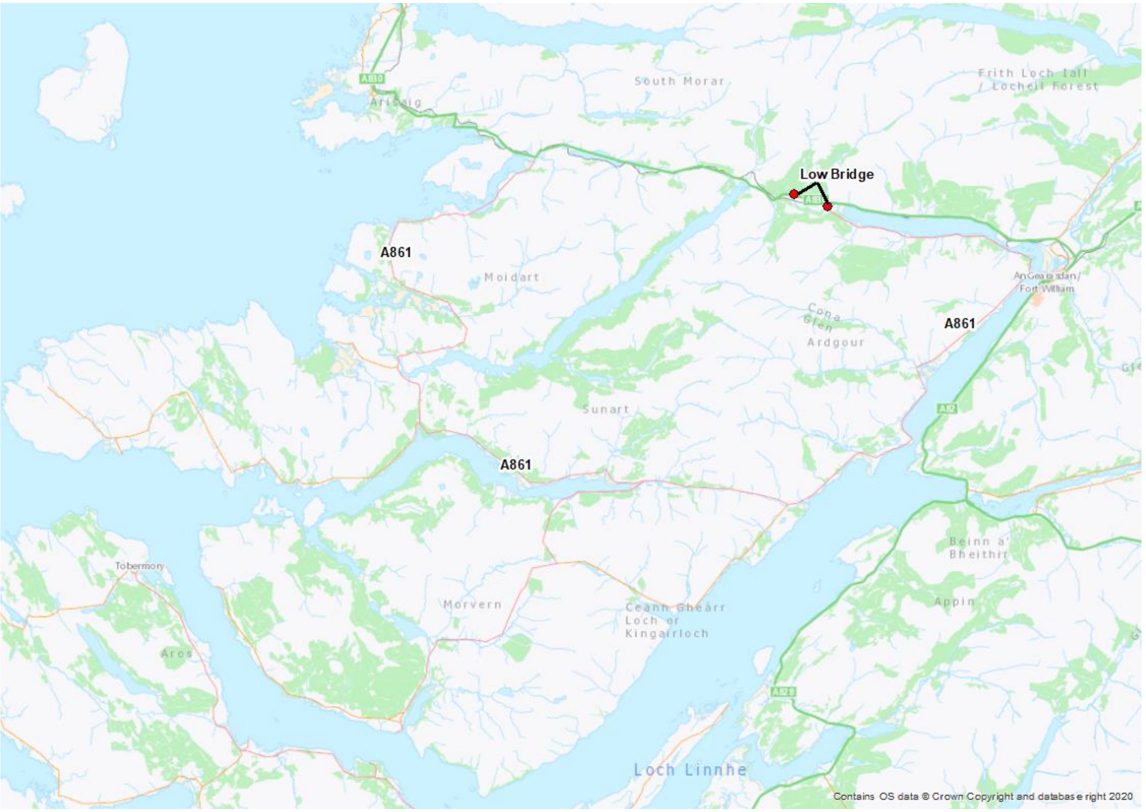

Figure 3-2: Road Network and Constraints

The A861 varies in standard along its length, consisting mainly of single track with passing places, low bridges and tight turns and bends. The physical characteristics of the road restrict the movements of certain vehicle types, such as the low bridge at Drumsallie which restricts certain HGV movements from using the A861 between the A830 and the ferry slip at Ardgour along the western shore of Loch Linnhe.

3.3.1 Road Closures

The lack of alternative routing increases the dependence of the on the core road network. This is an issue on both the A82 north of Corran and the A830 west Fort William, for which routing via the peninsula and Corran Ferry is the only diversion opportunity, albeit not an ideal one. Incidents can therefore cause long delays and can prevent the emergency services from accessing incidents. Road closure information was sourced from BEAR, who maintain both the A82 and A830 trunk roads on the behalf of Transport Scotland, to ascertain the frequency of road closures.

Between July 2016 and July 2021, **33** road closures of the A830 were recorded between Fort William and Mallaig. These closures can be categorised into two categories:

24 – Closures due to maintenance (incorporating planned maintenance)

9 – Closures due to Road Traffic Collisions (RTCs)

From Transport Scotland's access to INRIX data, road incident data were extracted for 2019 to identify the number of incidents on the A82 and A830 that would impact those using the road network and potentially using the ferry for diversionary purposes. Overall, 147 incidents were recorded over the year, which resulted in heavy traffic flows, queuing and congestion. These incidents can be classified as follows:

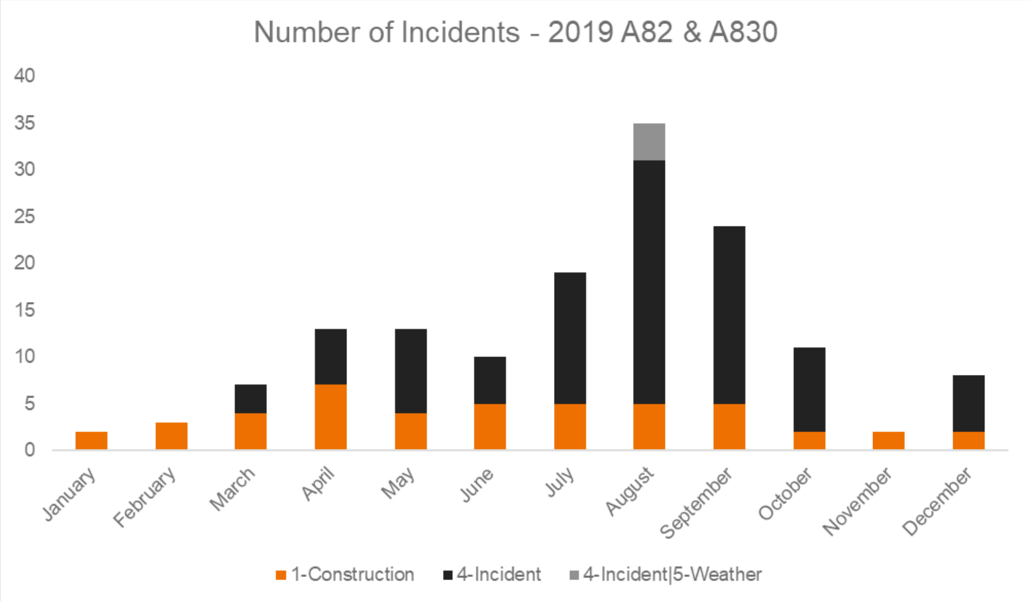

Figure 3-3: Road Incident Data (Source: INRIX 2019, Transport Scotland)

As is evident from the graph above, the majority of incidents took place in August, which could align with increased visitor numbers and thus heavier traffic volumes during this period. However, when considering the level of impact of these incidents, those taking place in April had the largest impact on the network, lasting for 43 days, while construction in January impacted the network for 28 days. So, although most incidents occurred in August, these only occurred over nine days.

3.3.2 Accident Data

Between 2015 and 2019, 18 Road Traffic Collisions (RTC) occurred on the A82 between the Corran Ferry access road and the junction with the A830 in Fort William. These comprised 16 slight incidents, 1 serious and 1 fatal. **It is also worth noting that 4 of these slight incidents and 1 serious all occurred at the access junction to the Corran Ferry**, which implies a potential road safety issue there. Over this same period, 18 RTCs were also recorded on the A830 between Fort William and Lochailort. These comprised of 14 slight, 2 serious and 2 fatal. One of these fatal incidents in August 2019 led to the A830 being closed between the junction with the A861 at Drumsallie and Corpach for several hours, effectively severing access to the peninsula from the east except via the Corran Ferry.

3.4 CYCLE NETWORK

The Caledonia Way (National Cycle Route 78) runs from Campbeltown to Inverness, including through the centre of the study area. The Corran Ferry fulfils an integral role in this cycle route as it provides a link for cyclists to avoid the busy A82 for the relative safety of the much quieter single-track road between Ardgour and the Camusnagaul Ferry. As such, the Corran Ferry helps to contribute to the success and attractiveness of the Caledonia Way and adoption of active travel more generally.

3.5 THE CORRAN FERRY

The Corran Ferry service is operated by THC – the Council funds the services, owns the vessels and infrastructure, and employs the crew. THC defines the service specification, with the ferry operating towards the limit of what can be delivered within the current crewing envelope. All capital and revenue costs accrue to THC and all revenue is retained by the Council.

The Council receives an increment on its annual Grant Aided Expenditure (GAE)[11] settlement from the Scottish Government to account for the additional costs it accrues from having to operate ferry services. For further detailed information, please refer to the ***Corran Ferry Service Option STAG Appraisal***[12], while below is a brief summary of the main points of the current Corran Ferry service.

3.5.1 Infrastructure and Vessels

Nether Lochaber Ferry Terminal is located approximately nine miles south of Fort William and is accessed via a priority junction off the A82. The terminal comprises of a slipway and a marshalling area that officially accommodates approximately 15 cars. At peak times, this marshalling area can reach capacity quickly causing queuing further back up the hill towards the junction with, and on occasions, onto the A82 – this frequently happens on Mull Rally weekend for example. On such occasions, Police Scotland traffic management support can be required.

On the opposite bank, Ardgour Ferry Terminal is located on the southern edge of the village. Again, the terminal comprises of a slipway and marshalling area, however, this area can accommodate approximately 45 cars. Again, traffic can back out of the marshalling area, where presents a risk given there is a blind bend when approaching the marshalling area from the west.

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[11] GAE is the means by which the funding allocated from the Scottish Government Spending Review is apportioned fairly amongst local authorities.
[12] Stantec (formerly PBA), August 2018

MV *Corran* and MV *Maid of Glencoul* are unique in Scotland in that they are quarter-loading vessels (as opposed to the more typical bow and stern loading vessels found elsewhere in the country). This is a consequence of the tidal conditions at the Narrows and the absence of any berthing / aligning structures on either side of the crossing.

Figure 3-4: MV *Maid of Glencoul* – quarter loading vessel

The absence of a berthing / aligning structures means that, when loading and discharging traffic, a standard bow and stern loading vessel would be getting pushed off the slipway by the current running through the Narrows, making it difficult for the vessel to hold its position and allow safe loading and discharge of vehicles. The requirement for quarter-loading has an impact on the resilience of the service if one or both vessels are off for any reason, as a replacement vessel is not available (hence the requirement to maintain a second vessel for occasional use and all of the cost inefficiencies associated with that).

MV *Corran* is the main vessel for 11 months of the year. She was designed to carry 28 cars (at that time) and does not have any significant restrictions with respect to the height or weight of vehicles carried.

MV *Maid of Glencoul* is scheduled to operate for around 4-6 weeks a year when MV *Corran* is in drydock. Originally, she could carry 14 cars, which was recently reduced due to the middle lane not having the necessary width to cope with larger modern vehicles whilst still allowing satisfactory space to evacuate in an emergency (it is estimated that she now carries 9-10 cars). MV *Maid of Glencoul*, being smaller, is also limited to carrying shorter articulated lorries of 15m long (12m if rigid), a maximum of 38t in weight and with loads no higher than 16ft. Consequently, and because there are height and weight restrictions on the alternative road routes, many large commercial vehicles must reroute via Lochailort when MV *Corran* is not in service and any vehicle over 13'6" cannot access the peninsula at all due to the low bridge at Drumsallie and the low bridge to the east of Glenfinnan (Figure 3-2: Road Network and Constraints).

3.5.2 Timetable

The service operates 7 days a week, 363 days a year. Monday to Saturday, the service begins at 06:30 and is timetabled to sail every 20 minutes during the peak and every 30 minutes thereafter up until the last sailing at 21:30. On a Sunday, the service starts slightly later at 08:30 and operates every 30 minutes through to 21:30.

Although the service provides significant capacity across the day, there are frequent periods where the number of vehicles awaiting carriage exceeds scheduled capacity. When queues develop, the service operates in 'shuttle' mode until the backlog is cleared. These periods are becoming ever more frequent, particularly during the peak summer months when the service will often operate in 'shuttle' mode every day. Operating in shuttle mode also puts significant additional pressures on the crew.

3.5.3 Journey Times

The time to cross the Narrows is less than 5 minutes (typically 2-3 minutes) excluding any wait time. The Corran Ferry, therefore, provides a 'shortcut' from the peninsula to Fort William and indeed the rest of Scotland. From the ferry terminal at Ardgour, the alternative road route to Fort William is 35 miles, much of it on single track road. This route, the A861 which connects Ardgour to the A830 at Drumsallie (and onwards to Fort William) also has a 12-foot height restriction at Drumsallie immediately south of the junction restricting access for many commercial vehicles. Service outages therefore significantly extend journey times to all destinations, particularly for larger commercial vehicles, which need to route via Lochailort.

3.5.4 Carryings

The figure opposite illustrates the carryings trends on the Corran Ferry indexed to 2013 figures (i.e., 2013=100).

As can be seen, there has been a steady growth in both car and passenger[13] carryings since 2013. The combined trend in commercial vehicle (CV) and bus carryings fluctuates more widely as this is often underpinned by changes in demand for the movement of goods in the supply-chain, in addition to being influenced by any disruption on the Oban-Craignure service.

Overall, there has been a Compound Annual Growth Rate (CAGR) of **2.1%** in car carryings, **1.1%** in passenger numbers and **-0.4%** in CVs and buses. It is the car-based growth, both as the dominant

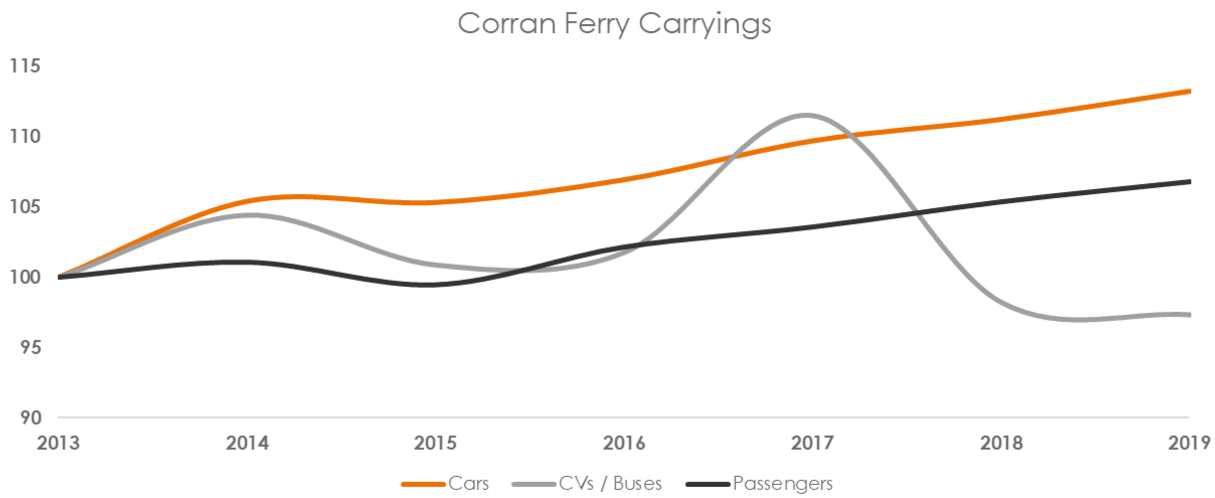


Figure 3-5: Corran Ferry Carryings (Source: Scottish Transport Statistics No. 39 2020 Edition)

[13] A formal record of passengers and cyclists is not currently maintained, although estimates are recorded.

user of the ferry and that which puts most pressure on capacity, which is of greatest note here.

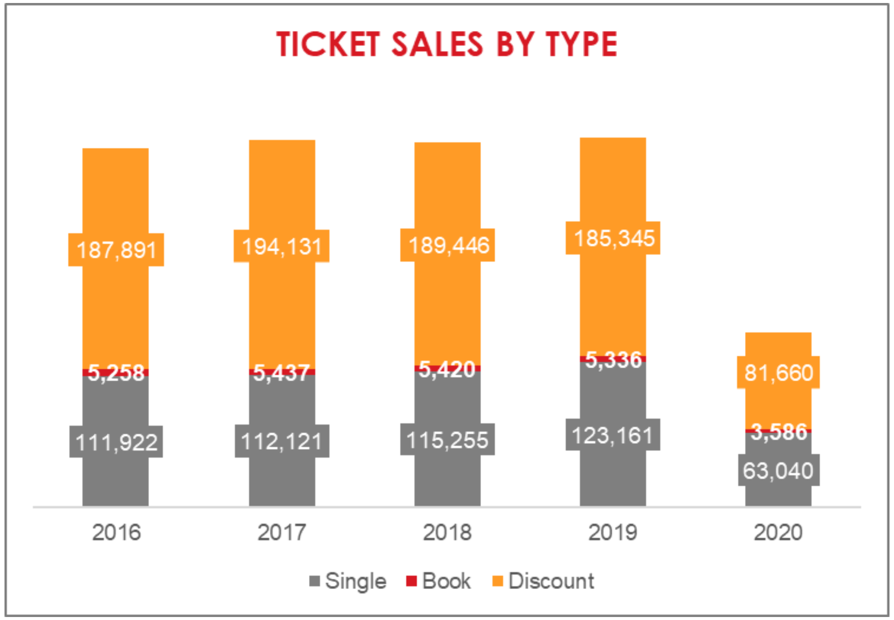
3.5.5 Fares

Due to the short crossing time combined with the limited turnaround time, the fares' structure is designed to be quick and simple to administer, consisting of single tickets and books of discounted tickets for different classes of vehicle.

Until this year (2021), foot passengers and cyclists were not charged which made the service something of an outlier in Scotland. Late 2021 will see the introduction of new fares for passengers and cyclists, dispensed from a ticket machine on each slipway at a cost of £1 and £1.50 respectively.

For private and light goods vehicles, three fares are available, (i) single fare – which consists of a flat rate based on vehicle type, (ii) book of 30 tickets (valid for 1 year) and (iii) book of 20 tickets – open to Lochaber OAP (valid for 2 years). The single fares are comparatively expensive for such a short route; however, the discounted 30 ticket book offers a substantial 72**%** saving on the single drive-up fare.

Commercial vehicles are defined as being over 3,500kg gross vehicle weight (GVW) and are charged based on the number of axles, rather than the more commonly used lane metre measure. This reflects the historic issue of weight rather than deck lane meterage being the constraining factor on the vessel. Buses are charged based on the number of seats (17-35 seats and 36 seats+). Single fares are available as are discounted ticket books. The multi-journey ticket books require a different number of tickets to be surrendered based on the type of vehicle. For example, a lorry / van under 7.5t 'pays' two tickets for a single journey, whereas a 5/6-axle HGV would have to 'pay' seven tickets.



The chart on the left illustrates the breakdown in ticket sales over the past five years, covering 2016 – 2020.

As can be viewed in the chart, discounted tickets account for the largest proportion of ticket sales each year and these are most commonly used by local residents. Car and LGV tickets account for on average 83% of all tickets used on this crossing.

It should be noted that this study will not directly comment in the fares structure, which is taken as a given for the purpose of the analysis.

3.5.6 Service Reliability / Resilience

The Corran Ferry is a very reliable service, with data showing very few service outages over the period 2013-17. The short and relatively sheltered nature of the crossing means that its weather-related reliability is much better than other routes in Scotland, whilst the presence of MV *Maid of Glencoul* means the service can continue to operate (albeit at reduced capacity) when MV *Corran* is out of service. The major reliability and resilience issue occurs when one of the two vessels breaks down when the other is away for scheduled maintenance. This is what happened in summer 2017, when the service was suspended in its entirety for several days**.**

3.6 WIDER FERRY NETWORK

3.6.1 Mull and Iona

The CalMac Ferries L Oban – Craignure ferry service is currently operated on a year-round basis by MV *Isle of Mull*, which is supplemented by MV *Coruisk* in the summer timetable period (April to October). MV *Isle of Mull* is a closed deck vessel and therefore cannot carry certain categories of dangerous goods – when she is operating the Oban – Craignure route on her own, goods such as fuel and fertiliser route via Lochaline – Fishnish and the **Corran Ferry**. The reliability of the Corran Ferry service is therefore important in meeting this island need during the winter timetable, when MV *Isle of Mull* is operating on her own.

Further to this, consultation, and survey evidence from other studies we have undertaken has identified that the Corran Ferry is used as a divisionary route for accessing Mull via Lochaline - Fishnish during disruption on the main Oban-Craignure route, or when a vehicle booking cannot be secured on that route, an increasingly common issue since the introduction of Road Equivalent Tariff on that route in 2015. Analysis of CFL carryings data between July 2017 and December 2019 validated this assumption. In circumstances when the Oban-Craignure route was disrupted, average vehicle deck utilisation on the Lochaline - Fishnish route increased from **27% to 33%**. Some **177** sailings during this time exceeded **85%** of available car deck capacity, which has never occurred when the Oban-Craignure service is not affected by disruption.

The analysis also indicated that the Corran Ferry is more likely to be used as a divisionary route by Mull residents, rather than by mainland visitors. Analysis of the vehicle deck utilisation figures by direction during periods of disruption on the Oban-Craignure service shows that Lochaline - Fishnish utilisation only increased from **27%** to **33%** on average, whereas in the opposite direction Fishnish - Lochaline this figure increased from **28%** to **37%**.

Furthermore, consultation with CFL staff indicated that Mull residents often travel to Fort William to access services and shops that are not present in Oban. As such, the Corran Ferry plays a key role in providing connectivity for Mull residents to Fort William, in addition to providing a link for the main haulier on Mull, to the north of Scotland.

3.6.2 Mallaig and Skye

Although not having a direct impact on connectivity to the Mallaig ferries and onward connections to the isles, the Corran Ferry does play a role in providing a divisionary route for those travelling to or from Mallaig during times when the A830 may be closed. It also facilitates ‘island hopper’ journeys for those travelling up the west coast via Mull, and the peninsula to Skye, the Small Isles, Knoydart and South Uist.

3.7 WHAT ROLE DOES THE CORRAN FERRY PLAY?

The analysis above highlights that the Corran Ferry:

- Plays a pivotal role in providing connectivity between the peninsula and the wider area, providing access to employment, education and personal services as well as supporting the service delivery and supply-chain needs of the peninsula (and Mull and Iona with respect to the supply-chain)
- Provides a strategic diversionary route in circumstances of road closures or Oban – Craignure service disruption
- Provides wider network resilience for local communities
- Provides a safer cycling route between Corran and Fort William on the NCN78
- Plays a strategic role in connecting wider Scotland to local businesses on the peninsula and Mull, particularly freight and logistics
- Provides a gateway to the peninsula for tourists, as well as a link in wider island-hopping holidays

Methodology

CORRAN NARROWS

Socio-Economic Study

4.0 METHODOLOGY

4.1 METHODOLOGY

Having defined the service context, this section sets out the methodology for establishing the socio-economic benefits of the Corran Ferry. This methodology is focused on outlining the social and economic impacts of the ferry service with respect to the peninsular communities, Lochaber and beyond.

The only way to fully understand the **socio-economic value** of the Corran Ferry is to consider a hypothetical scenario of the ferry service **no longer operating**. Within the *Corran Narrows Fixed Link Feasibility Study*, we scoped out a range of potential social and economic impacts of a fixed link framed within a logic-map, and this is the approach we have adopted for this project, detailing the potential consequences of a 'no ferry' scenario.

4.1.1 Logic Maps

The Corran Ferry supports three user groups:

- **Residents**, based both on the peninsula and the wider study area
- **Businesses**, based both on the peninsula and the wider study area
- **Visitors / Tourists** to / through the peninsula and surrounding study area

For each of these groups, a logic map has been developed setting out the impact of a 'no ferry' scenario. Each logic-map is focused on capturing the chains of transport and socio-economic cause and effect associated with the absence of a ferry service and are structured as follows:

- **Context**: the current situation in the study area
- **Input**: the removal of the ferry service
- **Output**: changes in the transport supply-side – e.g., longer journey times and increased costs
- **Outcomes**: changes in travel behaviour – e.g., higher costs incurred, re-routing, modal shift, changes in destinations, trips no longer being made etc
- **Impacts**: the societal impacts associated with these transport outcomes – e.g., reduced disposable income, increased business costs and reduced efficiency, loss of markets or suppliers, withdrawal from the workforce, health impacts, social exclusion through reduced contact, reduction in-tourism, out-migration etc.

The logic maps were used to guide the development of the engagement programme to ensure that a structured set of questions was posed to provide the evidence to underpin or otherwise the hypothesis presented in each logic map. The logic maps were then refined on the basis of the evidence collected.

4.1.2 Engagement

Surveys were developed to capture the views and opinions of the three user groups mentioned above, supplemented with consultation with Community Councils, Local Elected Members and other stakeholders, such as Highlands and Islands Enterprise (HIE) and CalMac Ferries Ltd (CFL). Four online surveys were created (i) *Resident / Visitor Voice of the Customer Survey*, (ii) *Accommodation and Tourist Businesses*, (iii) *Freight and Logistics Businesses* and (iv) *All other businesses* and were open for a period of six weeks to capture as many responses as possible. Telephone depth interviews with stakeholders were also undertaken to supplement the responses received.

Each survey was structured around the corresponding logic map to ensure that they derived the information required to either validate other datasets or provide anecdotal evidence to fill any gaps where freely available data / evidence are lacking.

Data collated through the engagement process were aggregated to the community council area to maintain compliance with General Data Protection Regulations (GDPR) regulations and to map across to the spatial geography of published datasets (e.g., Census, NOMIS, etc).

4.1.3 Data

As part of the study, data were sourced and extracted from various published datasets to assist in the development of the profiles of the communities within the study area. It should be noted that, due to the rural nature of the study area, these data are only available at aggregated levels. As such, data were captured at the community council level in order to produce meaningful insights. In some cases, this has resulted in some communities being grouped, rather than discussed individually to maintain anonymity. For example, on the peninsula, West Ardnamurchan and Acharacle are considered individually as the geographic coverage aligns with the community council areas. Ardgour, Sunart and Morvern, however, are grouped as one area within the data.

4.1.4 COVID-19

This study was undertaken throughout the COVID-19 pandemic. As such, data for 2020 and 2021 have been excluded from the study as they would distort underlying trends. With this in mind, 2019 has been selected as the base year to inform all secondary data analysis and any future forecasting. Respondents to the survey were also directed to frame their responses in relation to their travel behaviours in 2019.

Context, Input & Output

CORRAN NARROWS

Socio-Economic Study

5.0 CONTEXT, INPUT AND OUTPUT

This chapter provides an overview of the **Context**, **Input** and **Output** elements of the logic map exercise, as to an extent these elements are similar for each user of the Corran Ferry service. It is the **Outcomes** and **Impacts** from these elements where the focus lies in determining the value of the ferry service for each affected group in a 'no ferry' scenario, and these will be discussed in turn for each group in the following chapters.

5.1 CONTEXT

An initial step within the logic map process is to understand more about the people and businesses that the Corran Ferry currently serves. Understanding more about these communities helps to inform the narrative in defining the importance of maintaining the link across the Narrows. The 'Context' sets out the current situation with regards to demographics, employment, social circumstances, and current behaviour in terms of use of the ferry service, incorporating travel behaviours such as origin-destination, purpose, and frequency. Below we have summarised the context for each of the three main user groups of the ferry based on the responses to the survey (total responses indicated by N=), with more detailed supporting information in **Appendices A-D**.

Residents (N=400[14])

Demographics

- Between 2015 and 2019 the population on the peninsula experienced **4%** growth, while the population of the wider study area reduced by **-0.2%**. Population forecasts predict the peninsula population to grow by a further **1.1%** by 2024, while the wider study area is expected to grow by **0.9%** over the same period

  This demonstrates a potentially growing customer base for the ferry and highlights its

Businesses[15] (N=24)

Accommodation Providers

- **10** accommodation providers within the study area responded to the survey (6 self-catering, 3 B&Bs and 1 Hotel)
- **Seven** of these businesses were based on the peninsula
- **Eight** of the businesses employed staff based solely on the peninsula

Visitor / Tourist[16] (N=155)

Demographics

- **73%** of visitor respondents to the survey were classed within the working age category
- **26%** were over the age of 65

Economics

- **64%** of respondents were employed
- **Over a third** of respondents earn more than £50,000 per annum

[14] N= is the number of survey responses
[15] Based on information extracted from the three Business Surveys (May – June 2021)
[16] Based on information extracted from the *Voice of the Customer Survey* (May - June 2021)

role in connecting the current and future population of the peninsula to key services etc.

- **75%** of the population is under 65 years of age on the peninsula, with **59%** falling into the working age category and **16%** in the under-16s. The wider study area displays a similar profile with **78%** of the population under the age of 65, with **61%** of working age and **17%** under 16

This is an important statistic as these are the age groups who are most likely to use the ferry as part of a journey for employment, education, and social activities.

Economics

- Accommodation and food services, Transport and storage (inc postal) and Education account for **49%** of all employment on the peninsula. In the wider study area, **44%** of employment can also be categorised in three main sectors; (i) Accommodation and Food services, (ii) Health and (iii) Retail
- Peninsula-based residents earn on average **£21** less per week (4%) than the wider study area average
- There is widespread car dependency on the peninsula as a result of a lack of alternative modes, with over a **third** of homes having access to two or more cars, while this is **6%** lower for households in the wider study area
- **All 10** are classed as small enterprises as they employ less than 50 members of staff
- **Eight** of the business turned over less than £85,000 per annum, while **five** forecast minor to moderate growth over the next five years and **five** expecting no change
- **Five** businesses indicated that the average length of stay for visitors is 7+ nights
- **Four** businesses use the ferry service weekly, while the remaining 6 use it monthly
- The most common use for the ferry is to obtain supplies for the business or to visit the premises to clean / collect linen etc
- **Three of the 10** businesses currently have an issue with the ferry service

The ferry plays an important role in connecting accommodation provider businesses with customers and is used very frequently by peninsula-based businesses to obtain supplies and allow customers to access the accommodation

Freight and Logistics

- **Four** businesses responded to the survey, all of which are well established in the area operating for over 20 years each

Tourism

- **30%** of respondents indicated they were visiting the area as part of a long holiday (4+ nights)
- **13%** travelled for a short holiday (1-3 nights)
- **Morvern** was the most popular destination with 21% staying there, with a further 19% staying in western Ardnamurchan
- **28%** of respondents were visiting their second home
- **49%** of respondents indicated they did not pay for their accommodation
- **60%** of respondents indicated they had spent up to £300 on expenses out with accommodation

Ferry Use

- **91%** of respondents used the Corran Ferry for both legs of their journey
- **4%** were using the ferry for the first time
- **34%** of respondents were travelling as part of a group of two adults
- A further **29%** of respondents were travelling alone

The economic structure of the peninsula is heavily geared towards tourism and thus good transport connectivity is key to ensuring their ongoing vitality. Moreover, there are relatively few jobs on the peninsula and thus good connectivity to Fort William, the regional service centre, is essential in ensuring access to employment.

Social Indicators

- Using the Sottish Indices of Multiple Deprivation (SIMD), there is relatively little deprivation on the peninsula, although areas in Ardnamurchan do display lower levels of performance against employment and income indicators, reflecting the peripherality of the area

  Although, currently no areas on the peninsula are classed as deprived, there are a few lower performing areas, which the evidence suggests is at least in part due to their peripherality. Any further reduction in transport connectivity would diminish access to employment further.

Ferry Use

- Most peninsular residents use the Corran Ferry service regularly, at least weekly, and mainly for purposes such as retail/shopping and employment. Residents of the wider study area predominately use the ferry service to

- **Three** businesses employ staff from both the peninsula and outwith the peninsula, and **one** employs staff solely from outwith the peninsula
- All businesses employ between **50-249** full-time staff
- All businesses turn over more **than £5m per annum** with two businesses turning over **£15m per annum**
- All four businesses expect to see growth over the next five years, with **two expecting moderate growth** and **two expecting significant growth**
- All four businesses use the Corran Ferry Service **daily**
- Two businesses currently have an issue with the Corran Ferry service, with one stating fares as being too high and the other acknowledging the reliability issue if the service is disrupted or MV *Maid of Glencoul* is operating

  Growth expectations will rely heavily on the connectivity afforded by the Corran Ferry, as this will provide the connectivity required for freight and logistics operators to reach the trunk road network and the wider Scottish and UK markets.

  The ferry plays an important role in broadening the labour pool for businesses in both the peninsula and Lochaber.

visit family and friends and as such use the ferry less regularly (on a monthly basis)

- When peninsular residents do travel, they tend to take their car onboard the ferry, use the discounted book of tickets and travel to Fort William, for almost all purposes. Wider study area residents also opt to take a car onboard, use single tickets and visit a variety of locations across the peninsula and Mull
- **59%** of peninsular residents indicated that they would still make their journey if the ferry was off due to disruption. Residents of the wider study area would be less inclined to still make the journey, with over **a third** stating that they would not still make the journey if the ferry was disrupted

This information from the Voice of the Customer Survey highlights the importance of the Corran Ferry for providing vital connections to Fort William for peninsular residents to access to employment and key services, whilst also demonstrating the importance of the link to the residents of the wider study area to retain a connection to family and friends on the peninsula and further afield.

Other Businesses

- 10 other businesses responded to the survey, of which five are based on the peninsula
- In general, nine of the ten businesses are classed as small enterprises employing less than 50 people, while one can be classed as a large enterprise employing between 50-249 staff
- Three businesses solely employ people from the peninsula, three employ people from out with the peninsula, two employ staff from both locations and a further two do not employ anyone other than themselves
- Eight of the businesses turn over less than £85,000 per annum, while one turns over between £1m and £2m and the last business turns over more than £25m per annum
- In terms of growth six businesses expect to experience growth over the next five years (3 minor, 2 moderate and 1 significant), while two expect to see no change and a further two expect minor shrinkage
- Ferry use is varied with four businesses using the ferry daily, four weekly and two monthly
- Only three businesses indicated current issues with the ferry service, those being capacity and wait times during peak summer season and

	the impact of disruption resulting in long road-based diversions *The ferry plays an important role in connecting businesses with customers and staff and is used very frequently by peninsula-based businesses*	

5.2 INPUT

Within the Logic Map process, the **'Input'** is a hypothetical scenario where the Corran Ferry is withdrawn.

5.3 OUTPUT

The 'no ferry' scenario would give rise to two '**outputs**' - longer journey times and increased travel costs. These two outputs would likely have differing effects on users of the Corran Ferry service and there would be differential effects across the peninsula and wider study area – some areas would be much more adversely affected than others. This is summarised below.

5.3.1 Changes in Journey Times

5.3.1.1 Residents

Some residents of the peninsula and the wider study area would experience changes in travel times as a result of the ferry no longer operating across the Narrows. As mentioned above, these changes would impact some more than others and based on the **Context** section, the residents of the peninsula use the ferry service more often and for a wider range of purposes than Lochaber or Mull users and would thus be impacted to a higher degree. To determine the expected changes in travel time, the following analysis therefore focusses on the movements between the peninsula and the mainland from a peninsular resident perspective. This analysis broadly also applies to Lochaber and Mull residents, but the corresponding impacts are likely to be of a smaller magnitude as their dependence on the Corran Ferry service is less.

An assessment of the impact of the 'no ferry' scenario on journey times was undertaken to quantify the change in travel time and distance for residents of the peninsula to reach two key points on the network; (i) **Fort William** as the main destination for most trips from the peninsula as well as linking into the A82 North; and (ii) **Ballachulish**, as a single reference point for those making travel movements on the A82 south[17].

[17] So informed by the Voice of the Customer Survey May-June 2021

Using Google Distance Matrix API[18] travel times[19] and distances from each postcode on the peninsula to each of these two destinations, were extracted and assessed. The Distance Matrix API is a service that provides travel distance and time for a matrix of origins and destinations. The API returns information based on the recommended route between start and end points, as calculated by the Google Maps API. Table 5-1 below summarises the **population weighted average** change in travel time from each peninsular community to both Fort William and Ballachulish in a 'with' and 'without' ferry scenario, in addition to the change in network distance.

Table 5-1: Population Weighted Changes in Journey Time and Distance (Source: Google API, 2021)

	Change in Travel Time		*Change in Distance (Miles)*	
Community	***Ballachulish***	***Fort William***	***Ballachulish***	***Fort William***
Acharacle	***00:13:17***	*00:00:00*	***22.7***	***2.2***
Ardgour	***00:23:37***	***00:07:26***	***25.5***	***12.0***
Morvern	***00:45:19***	***00:16:29***	***41.2***	***23.9***
Sunart	***00:44:38***	***00:15:48***	***40.9***	***23.6***
West Ardnamurchan	***00:26:26***	*00:00:00*	***32.2***	***14.9***

As can be seen from the table, the communities of Morvern and Sunart see the greatest increase in both travel times and distance to both destinations, almost double that of the other three communities, as would be expected based on geography. Disaggregating these data to the individual postcode areas within each of the community areas, a greater level of disparity emerges, not only between communities, but also within the same community. Figure 5-1 highlights the range of differences in travel times from each postcode within each community council area to both Ballachulish and Fort William.

[18] Travel times were extracted using a departure time of 8am. Travel times represent historically informed trends and provide an average travel time based on the day and time of day selected.
[19] Historical data was extracted, providing observed travel times and although this will mostly be based on information over a number of years Pre-Covid, there will be an element of travel times informed by times in the past year. Journey times are informed through actual journeys captured by users using Google Maps to navigate, thus provide average times captured across a time period no shorter than a year.

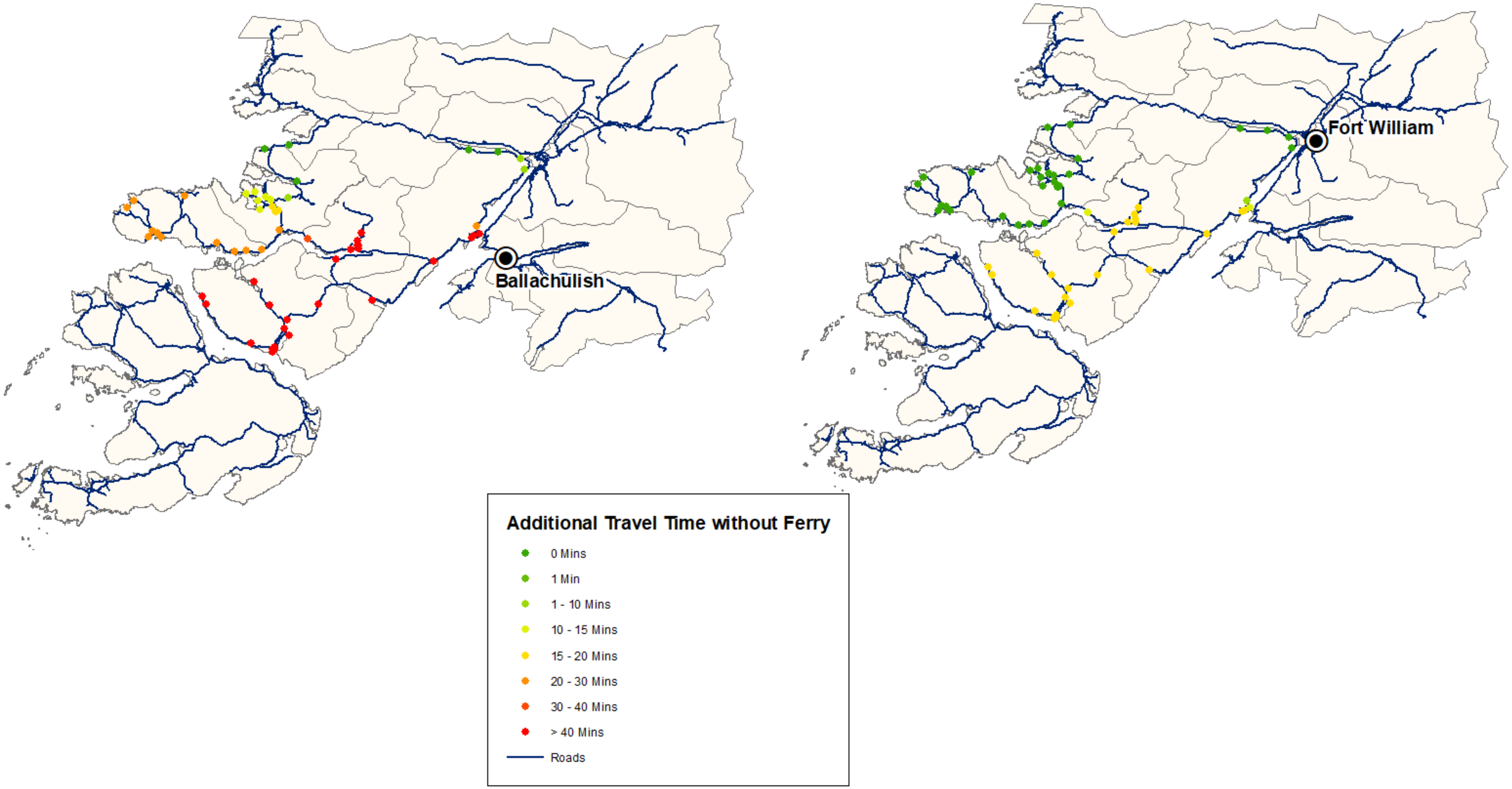


Figure 5-1: Change in Travel Time (Mins) by Postcode

As can be seen in the figure, residents of Ardgour experience a significant difference in travel time depending on where they live within the community council area, with some postcodes only experiencing a difference in average travel time of just over a minute, to others experiencing an increase of nearly 43 minutes. Residents of Morvern all experience nearly an average **43-minute** increase in travel time to Ballachulish as a result of travelling by road. These areas would therefore experience the greatest impacts in the 'no ferry' scenario.

Postcodes within Acharacle and Ardnamurchan do not witness any change to Fort William as the time taken to travel by road, is the same as travelling by ferry when including wait time. This calculation will obviously not account for every single journey or resident experience and is solely based on the best journey time data available.

It should also be noted that the changes in journey times are based on current road traffic volumes, which are very light. However, if even if a majority proportion of the current 270,000 cars per annum carried on the Corran Ferry rerouted onto peninsular roads, journey times would be expected to increase. Whilst conventional congestion is unlikely to ever be an issue, vehicle platooning on single track roads and over capacity passing places would increase journey times, particularly in summer when volumes are higher and there is a larger proportion of tourists who will be less familiar with driving on single track roads. This effect was highlighted in the CHFS RET Evaluation Study (Transport Scotland, 2020), which found that the increase in road-based traffic in Mull as a result of RET significantly worsened journey time reliability between Craignure and Fionnphort (and, to a lesser degree, Tobermory) as a result of the above issues with single track roads.

5.3.1.2 Journey Time Reliability

Although the data above provides historic average journey time data, an important factor is the reliability of being able to make these journey times consistently on a daily basis or even across the same day. To determine journey time variability, INRIX data was extracted using Transport Scotland's INRIX licence. INRIX collects real journey time data from in-vehicle GPS devices providing a database of journey times representing real-time traffic conditions, which have been used on various Transport Scotland funded projects to evidence the need for an intervention or to monitor and evaluate an intervention, such as the Queensferry Crossing.

Journey times from Kilchoan and Lochaline on the peninsula to Ballachulish were extracted to provide a representation of weekday and weekend journey times using both the ferry and the road alternative route. This information is presented in the table below, with further supporting information provided in Appendix E, including weekend travel data. The tables below highlight the travel times experienced across five separate hours of a weekday for the whole of 2019, with the percentile value demonstrating the percentage of journeys at that respective time that can generally achieve the recorded journey time, i.e. the 50th percentile illustrates that half of all journeys undertaken at that time can generally achieve that journey time.

Table 5-2: Journey Time variability (INRIX, Transport Scotland, 2019)

Kilchoan to Ballachulish Bridge (Weekday [Mon-Thu]) by Road				
	25th Percentile	***50th Percentile***	***75th Percentile***	***95th Percentile***
8am	2h 22m 51s	2h 26m 44s	2h 30m 20s	2h 35m 17s
10am	2h 25m 49s	2h 30m 50s	2h 35m 22s	2h 39m 31s
4pm	2h 23m 1s	2h 26m 44s	2h 32m 29s	2h 26m 44s
6pm	2h 19m 35s	2h 23m 37s	2h 25m 18s	2h 23m 37s
10pm	2h 17m 28s	2h 20m 32s	2h 21m 24s	2h 20m 32s
Lochaline to Ballachulish Bridge (Weekday [Mon-Thu]) by Road				
	25th Percentile	***50th Percentile***	***75th Percentile***	***95th Percentile***
8am	2h 38m 24s	2h 44m 8s	2h 46m 21s	2h 44m 8s
10am	2h 35m 55s	2h 40m	2h 43m 47s	2h 40m
4pm	2h 29m 31s	2h 34m 43s	2h 39m 28s	2h 34m 43s
6pm	2h 28m 18s	2h 32m 34s	2h 36m 23s	2h 32m 34s
10pm	2h 28m 12s	2h 29m 59s	2h 30m 11s	2h 29m 59s
Kilchoan to Ballachulish Bridge (Weekday [Mon-Thu]) by Ferry				
	25th Percentile	***50th Percentile***	***75th Percentile***	***95th Percentile***
8am	1h 33m 25s	1h 36m 32s	1h 39m 40s	1h 36m 32s
10am	1h 35m 18s	1h 39m 33s	1h 43m	1h 39m 33s
4pm	1h 32m 51s	1h 34m 8s	1h 35m 12s	1h 34m 8s
6pm	1h 32m 58s	1h 36m 15s	1h 36m 9s	1h 36m 15s
10pm	1h 28m 25s	1h 30m 7s	1h 30m 52s	1h 30m 7s
Lochaline to Ballachulish Bridge (Weekday [Mon-Thu]) by Ferry				
	25th Percentile	***50th Percentile***	***75th Percentile***	***95th Percentile***
8am	1h 11m 4s	1h 13m 12s	1h 15m 4s	1h 13m 12s
10am	1h 9m 33s	1h 11m 34s	1h 13m 30s	1h 11m 34s
4pm	1h 4m 59s	1h 6m 51s	1h 8m 40s	1h 6m 51s
6pm	1h 7m 1s	1h 8m 56s	1h 10m 21s	1h 8m 56s
10pm	1h 3m 47s	1h 5m 13s	1h 6m 35s	1h 5m 13s

As is evident from the table, journey times vary across the day by as much as 10 to 15 minutes for road-based journeys and are considerably more consistent for ferry-based journeys. On average, across the five hours selected in the table, road-based travel between Kilchoan and Ballachulish is **47.5** minutes longer by road than travelling by ferry.

Between Lochaline and Ballachulish, road-based journeys are **81.6** minutes longer on average across the day. These times account for all traffic interactions and behaviours on the road network across 2019 and will include journey times observed during outages of the ferry service and increased vehicular flows on the peninsula road network.

So, in summary, the increase in journey times to Ballachulish (taken as a proxy for all points south) would be around **45** minutes from a population weighted centre, but could vary depending on conditions up to 81.6 minutes, whilst the cost of these journeys would also increase. It is important to note however that data-based changes in journey time do not tell the full story – it should be noted that:

- The data are based on the average change in journey time. The single-track design of most of the peninsular road network however means that journey times are unreliable and thus, when making these journeys, motorists will be build-in a healthy contingency on top of the actual journey time increase.
- The change in population weighted average journey times set out above is also based on the current transport network in the area. However, the absence of the ferry would lead to significant traffic rerouting, adding to traffic volumes on the peninsular road network. This is particularly important in the context of single-track roads, where more frequent stopping in passing places and increased platooning could be expected, significantly extending journey times.
- There would also be seasonal impacts on journey times. For example, in the summer months, there will be an increase the volume of motorists on the peninsula, a change in the traffic mix (e.g. increased motor home traffic and coaches) and a higher proportion of motorists which are less familiar with single track roads. This seasonality effect can be most clearly seen in Mull where the journey time from the main ferry terminal at Craignure to Fionnphort (the embarkation point for Iona) increases significantly between Easter and October.

In the absence of the Corran Ferry, it can therefore be reasonably assumed that journey times would increase significantly, and journey time reliability would worsen. At the margin, this would make certain journeys less attractive and would weaken the economic interactions between the peninsula and Lochaber / wider Scotland.

5.3.1.3 Accommodation Providers and All other Businesses

As evidenced above, there would be considerable differences in distances and journey times to travel to/from locations across the peninsula as a consequence of the cessation of the Corran Ferry service. This may limit the market for those only willing to travel for a certain length of time to their holiday accommodation, although a small segment of the market would be attracted by increased remoteness. For accommodation providers, the increased travel time is more likely to be felt by their guests in the first instance, which in turn could impact future demand, while for other businesses it is likely to impact their customer base. A significant number of accommodation units on the peninsula are self-catering, with the owners either living elsewhere on the peninsula or indeed further away in the wider study area.

5.3.1.4 Freight and Logistics Businesses

The additional distance and time taken to complete journeys is most likely to have a significant impact on the freight and logistics sector. These businesses are constrained by schedules / timetables and driver hours - the additional journey time associated with rerouting, together with the use of lower standard roads, would impact on both reliability and operating costs Indeed, it is important to note that commercial vehicle drivers' hours are monitored by tachograph, which precludes the option of simply extending their working day in the way that a van driver could. This would then require additional stopovers which again would extend the overall journey time. Links into the ferry service to Mull would also be impacted by this additional journey time, as drivers would need to time/schedule their journeys to meet Mull ferry timetables.

As the main bus operator on the peninsula, Shiel Buses currently operates services via the Corran Ferry in addition to running summer tour buses during the peak period. In a 'no ferry' scenario, bus journey times would be extended and the coach tour market more difficult to deliver commercially.

The cost of delivery to peninsular businesses – and in particular local shops – is currently minimised through the use of groupage services. This is where a haulier moves palletised goods and thus only charges by the pallet rather than a 'full load' HGV. Similarly, the likes of the Co-Op and Nisa will deliver to multiple stores using a single commercial vehicle. This arrangement is most efficient where route planning facilitates multiple deliveries within a single day. The Corran Ferry is an important part of that arrangement and, in a 'no ferry' scenario, it is not unreasonable to assume that freight costs would increase, or surcharges could be levied to account for 'remoteness'. This would particularly be the case for 'full load' or bulk products such as fuel, housing kits etc.

5.3.1.5 Service Delivery

A further implication of the additional journey times is the ability to deliver Council services across the peninsula. This additional travel time is likely to have an impact on local services, such as:

- Roads Maintenance
- Waste collections
- Supply teachers
- Locum doctors
- Emergency services, for which the Corran Ferry is essential in providing rapid access to the peninsula in an emergency.

5.3.2 Changes in Costs

5.3.2.1 Residents

In addition to extended journey times, there would also be a cost implication for peninsular residents associated with the removal of the ferry service. The additional distances to be covered by road would increase the costs associated with maintaining and operating a vehicle as well as the increase in fuel costs associated with making a journey, albeit there would be a saving in the ferry fare. Using the values calculated above and combining this with WebTAG[20] parameters[21], the cost of a return journey in both a 'with' and 'without' ferry scenario was considered.

Ferry fares were included in the calculation using the return fare equivalent from the discount book of 30 tickets, as this is the most commonly used ticket type by residents of the peninsula, as evidenced via the *Voice of the Customer Survey* and ticket sales data. At this stage, Value of Time (VoT) has not been included within the calculation but is represented within the quantification of impacts section in Chapter 10.0. The table below again represents the population weighted travel costs equivalent for each community council area.

Table 5-3: Change in Cost to complete Return Journey

	Change in Cost of Return Journey	
Community	***Ballachulish***	***Fort William***
Acharacle	***-£0.47***	*£0.00*
Ardgour	***+£0.47***	***-£2.49***
Morvern	***+£3.91***	***+£0.11***
Sunart	***+£3.85***	***+£0.05***
West Ardnamurchan	***+£1.93***	***-£1.86***

As expected, residents of both Morvern and Sunart would suffer the greatest negative impact due to the significant increase in distance to Ballachulish and the A82 South. West Ardnamurchan and to a lesser extent Ardgour, also witness increases in the cost of travel to varying degrees to undertake a return journey. The -£0.47 reduction for residents travelling from Acharacle to Fort William is a reflection of the removal of the ferry fare from the cost of the journey which would mean the additional cost of fuel to travel by road is just -£0.47 cheaper than the ferry fare. This implies that residents of Acharacle use the ferry for southbound journeys due to the journey time savings rather than cost savings on offer.

Error! Reference source not found. illustrates the estimated change in cost by population for making a return journey from each postcode on the peninsula to both B allachulish and Fort William.

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[20] TAG (Web-based Transport Analysis Guidance) is the Department's transport appraisal guidance and toolkit. It consists of software tools and guidance on transport modelling and appraisal methods that are applicable for highways and public transport interventions. These facilitate the appraisal and development of transport interventions, enabling analysts to build evidence to support business case development, to inform investment funding decisions.

[21] DfT TAG Book 2021, Fuel Consumption Module A1.3.8 and Fuel Costs Module A1.3.7

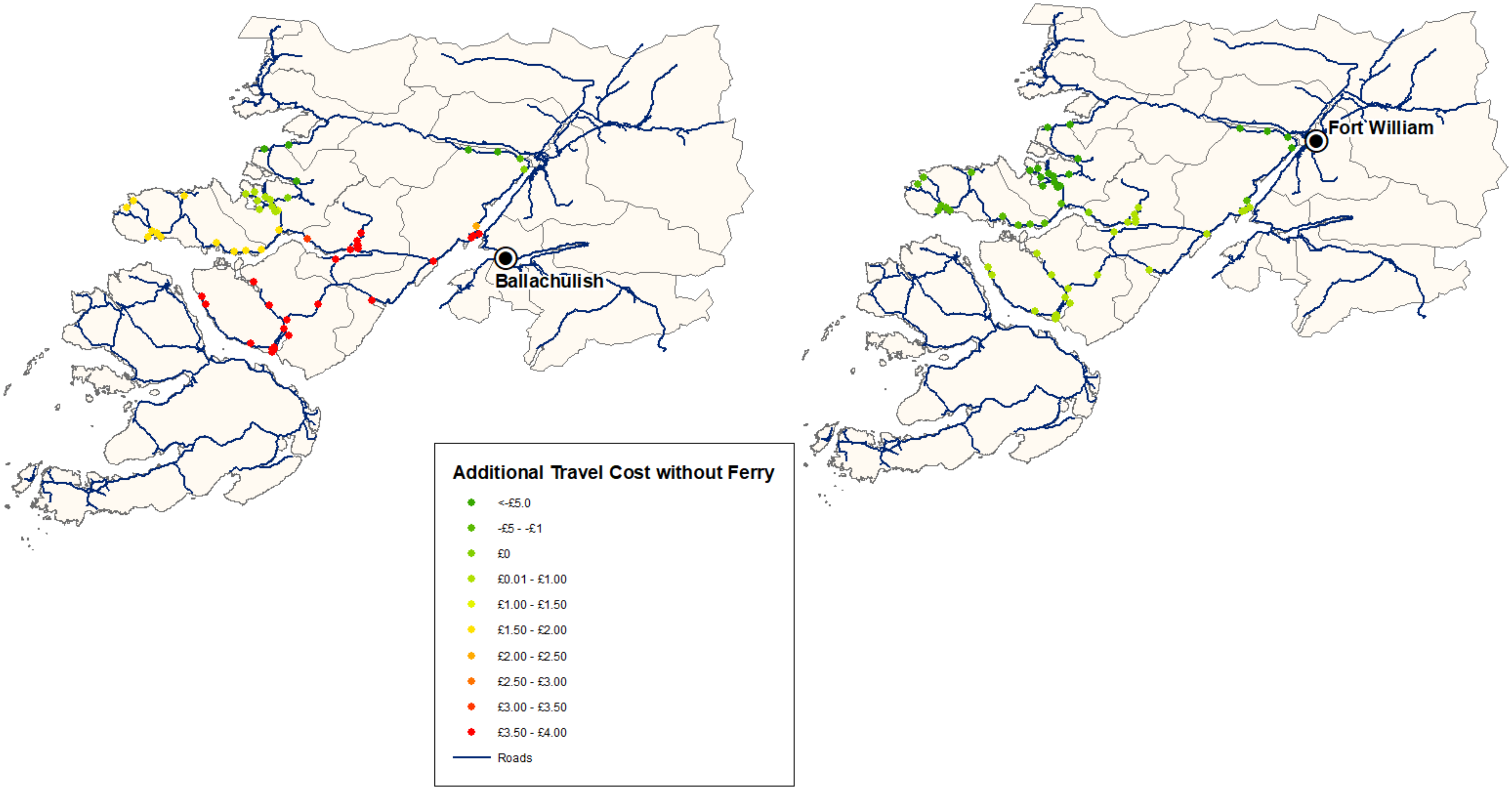

Figure 5-2: Change in Travel Cost To/From Ballachulish and Fort William

Figure 5-3 and Figure 5-4 below summarise the total population within each of the five peninsula communities and the percentage increase in cost they would experience to undertake a return journey as outlined above. For example, 379 residents of Acharacle would experience between a 1% and 10% increase in cost to/from Ballachulish.

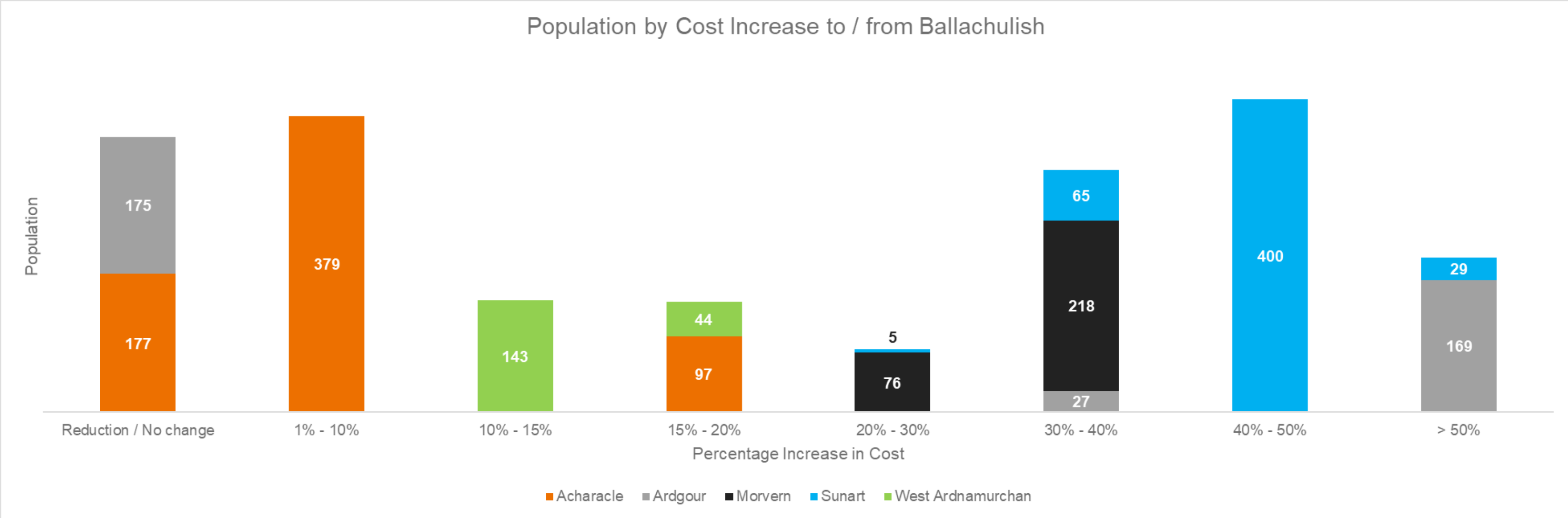

Figure 5-3: Population by Cost increase to Ballachulish

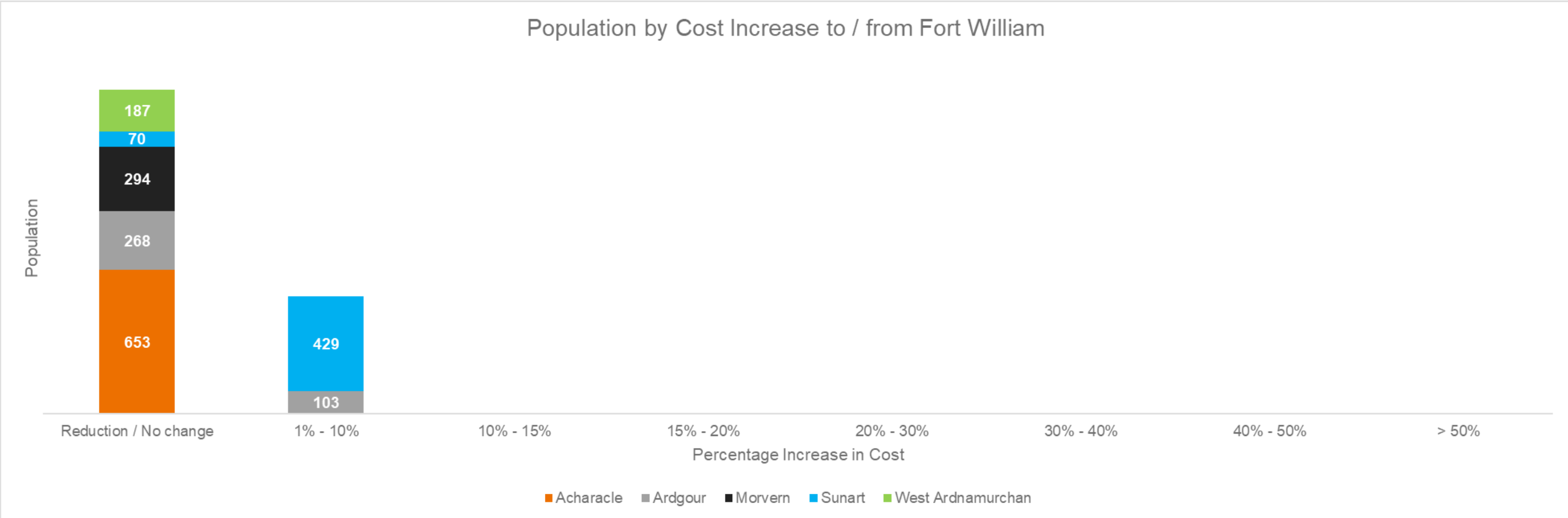

Figure 5-4: Population by Cost increase to Fort William

In total, **30%** of peninsular residents would incur an increase in travel cost greater than **40%** (£3.91 on average) when undertaking a return trip to Ballachulish. Those undertaking a return trip to Fort William would see **27%** of peninsular residents incur an increase of travel cost between **1%** and **10%** (£0.11 on average). From the Ballachulish chart, it can be seen that the communities of Morvern and Sunart in particular would witness the most significant increase in costs, in addition to **52%** of the population of Ardgour. **This is a significant increase in costs in an area where wages are lower than the national average and would clearly have negative impacts on those who live there, particularly when combined with longer drive times.**

5.3.2.2 Accommodation Providers and All other Businesses

The increased travel costs incurred to visit the peninsula would impact these businesses in two ways (i) **Direct Costs** - increased costs for the business to transport supplies / undertake maintenance / travel for business, and (ii) **Indirect Costs** - increased costs to customers / guests. To avoid repetitive analysis, reference to section 5.3.2.1 should be considered, as these increases in cost incurred by a business not involved in the transporting of goods are likely to align with the equivalent additional costs for a peninsula-based resident.

5.3.2.3 Freight and Logistics Businesses

Using average haulage rates[22] per HGV load type and the change in distance as a result of a 'no ferry' scenario, the additional cost to the haulier has been calculated. In theory, this cost plus a profit mark-up would be passed on to the customer, but the extent to which this happens would vary by customer, product line and geography. These calculations are based on the additional distance to travel to the population weighted centre of each of the five community council areas. The graphs below highlight the additional costs associated with a one-way journey to travel from/to Ballachulish and Fort William (as undertaken previously for residents).

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[22] https://www.returnloads.net/how-to-price-haulage-work/

Figure 5-5: HGV Change in Travel Costs to/from Ballachulish and Fort William

Due to these calculations being distance based, as expected, journeys to or from Sunart and Morvern are penalised the most due to the additional mileage incurred to reach these destinations. Those journeys travelling beyond Ballachulish, A82 south, would on average witness an increase of **£48.79** for a 7.5-tonne load, **£65.65** for an 18-tonne load, **£73.18** for a 26-tonne load and **£89.44** for a 44-tonne load, from the peninsula.

To undertake a similar journey to Fort William, these average costs reduce (as distance based) to an average cost of **£22.98** for a 7.5-tonne load, **£30.64** for 18-tonne load, **£34.47** for 26-tonne load and **£42.13** for a 44-tonne load from the peninsula.

The use of less appropriate roads for HGV routing would also accelerate wear and tear on the road network, increasing the cost of maintenance to THC. Increased traffic volumes would also likely lead to community demands for improvements, such as construction of sections of single carriageway or improvements to passing places.

5.3.2.4 Service Delivery

THC, NHS Highland, Scottish Water etc are also likely to incur increased costs associated with the additional distance covered by service vehicles, such as through general wear and tear, parts and maintenance and impact on the road network as mentioned above. The increased journey times are also likely to require an increase in working hours for service providers' staff, which again adds additional cost to the current service delivery budget for these organisations.

5.4 SUMMARY

From the analysis above, the following conclusions can be drawn from the **Context**, **Inputs** and **Outputs** elements of the Logic Map:

- The ferry service is well used by peninsular residents, who depend on the link to provide connectivity to key services and in particular shopping
- Tourism is an essential industry for the economic wellbeing of the peninsula, with a significant number of businesses in this sector providing accommodation or services to tourists / visitors
- There are a few large-scale (for the region) freight and logistics companies based in the area who rely on the ferry to provide connectivity to the trunk road network
- **53%** of residents would see an increase in travel cost greater than **50%** to travel to Ballchulish and beyond in a 'no ferry' scenario
- Residents of Morvern and Sunart would be most heavily penalised in a 'no ferry' scenario through longer journey times and increased costs to make a return journey to both Forth William and southbound on the A82.
- The cost to operate HGVs in the region would increase as a result of the longer journey times, incurring higher vehicle operating costs, including driver wages
- Service delivery costs from the perspective of the public sector would also increase
- Journey times by road could also be expected to increase if even a majority proportion of the Corran Ferry traffic rerouted via the peninsular road network. This would increase maintenance costs to THC and likely give rise to local demands for investment in the road network
- Whilst the loss of the ferry would be detrimental for the peninsula as a whole, it is important to note there would be strong distributional impacts, with Morvern and Sunart suffering disproportionately large negative impacts in a 'no ferry' scenario

Outcomes & Impacts - Residents

CORRAN NARROWS

Socio-Economic Study

6.0 OUTCOMES AND IMPACTS – RESIDENTS

Having defined the travel time and cost impacts of a ‘no ferry’ scenario, this chapter considers the potential behavioural responses **(outcomes)** to these increases and their consequential ‘societal **impacts**’ through the logic mapping approach introduced earlier in the report. This chapter is focused on residents – the first of the three ferry user categories defined earlier – and separately considers peninsular and wider study area residents. The focus is primarily on peninsular residents however, as the differences in behavioural responses and impacts between these two groups would tend to relate more to magnitude than type.

6.1 THE PENINSULAR RESIDENT LOGIC MAP

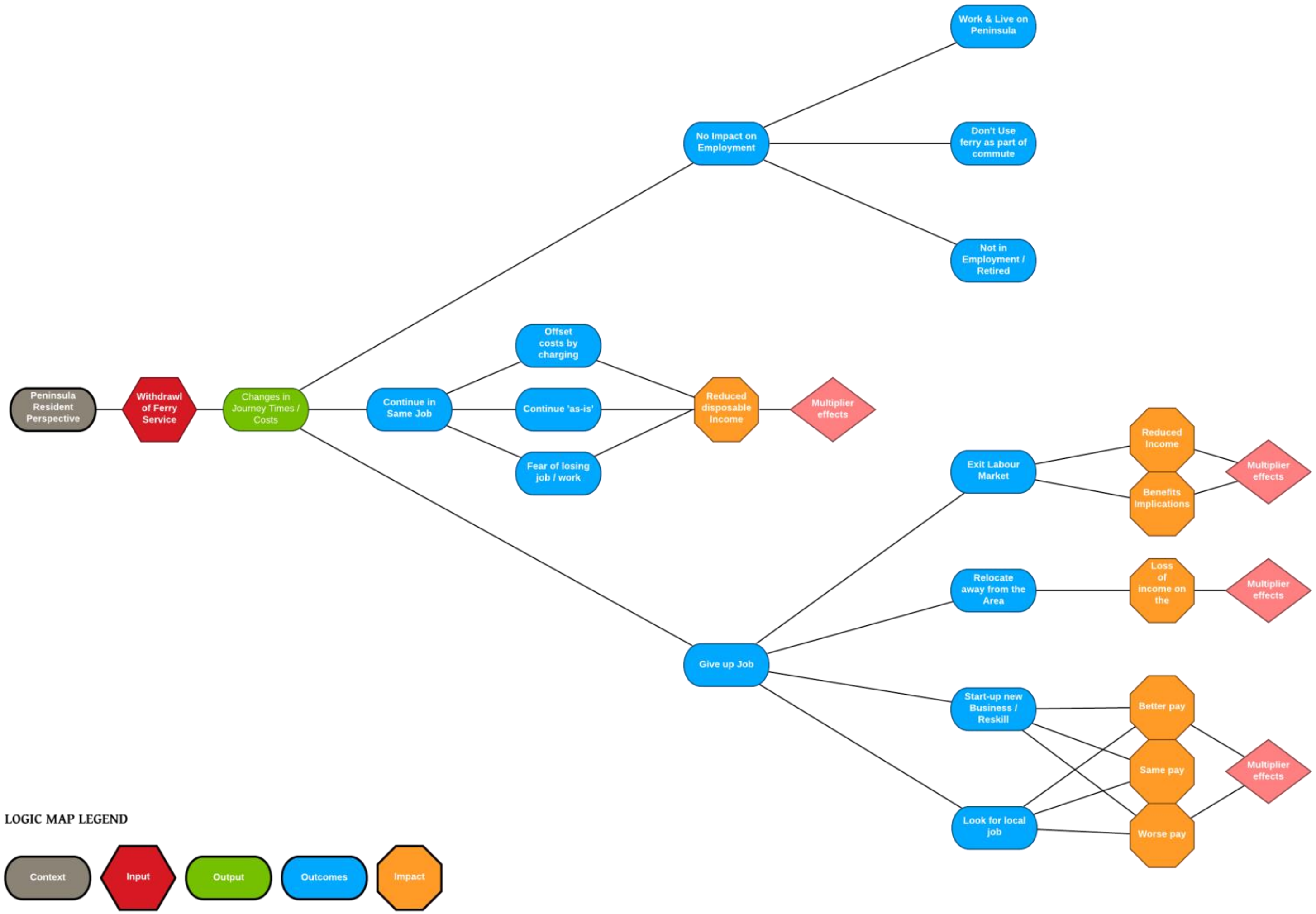

Figure 6-1: Peninsular Resident Perspective Logic Map 'No Ferry' Scenario

6.2 THE WIDER STUDY AREA RESIDENT LOGIC MAP

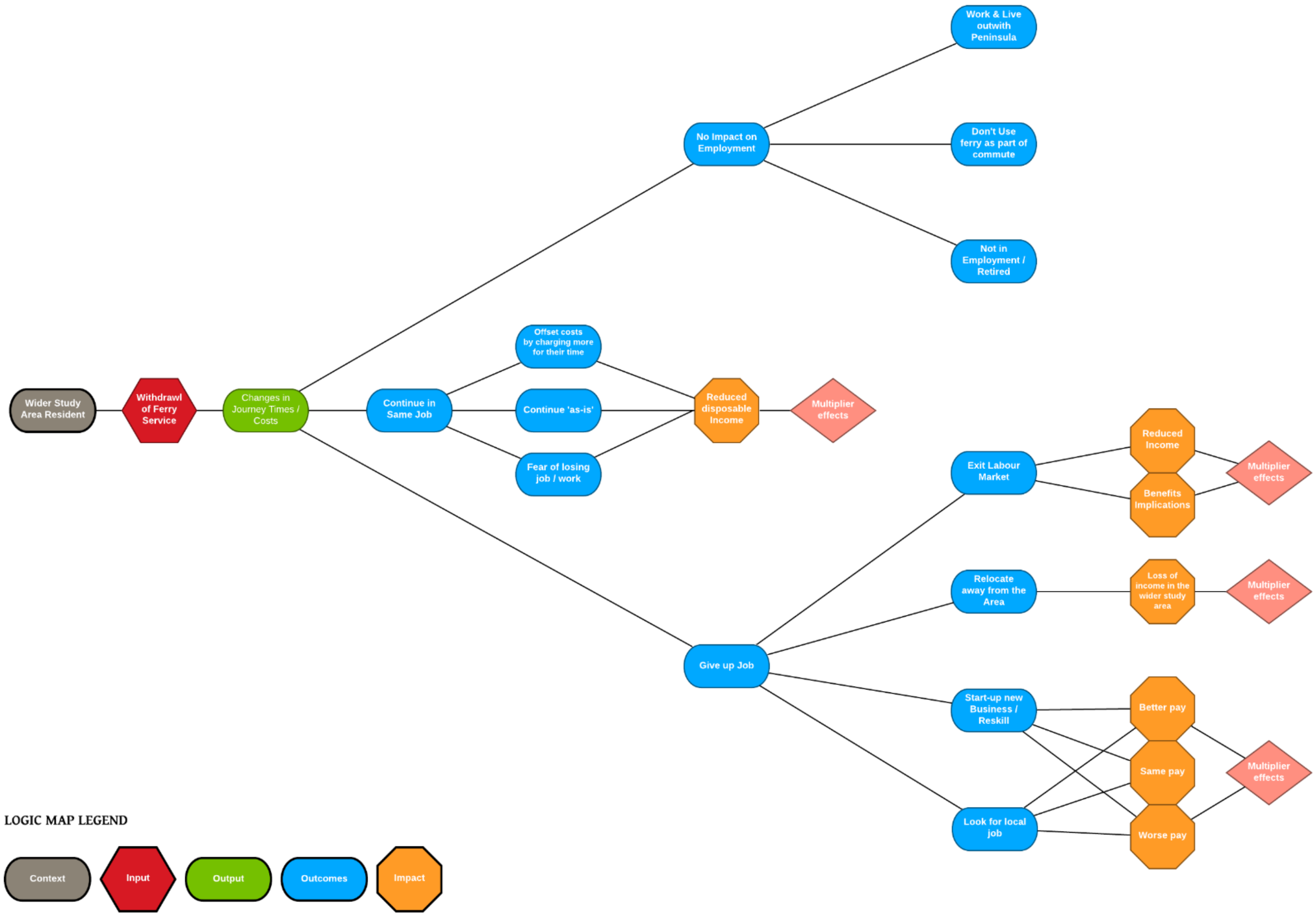

Figure 6-2: Wider Study Area Resident Perspective Logic Map 'No Ferry' Scenario

6.3 OUTCOMES

As a direct consequence of the outputs of the ‘no ferry’ scenario, increased journey times and costs are likely to have a direct impact on travel behaviour, including the frequency, purpose and destination of any journeys made by residents of the peninsula and the wider study area, including Mull. An element of trip making would remain non-discretionary, such as accessing health appointments or undertaking the larger weekly shop at a supermarket. However, residents may choose not to make some discretionary trips in the immediate term (which could be a good or a bad thing), and there may be a longer-term change in travel behavioural patterns, for travel-to-work and business trips for example. **It is the impact on travel-to-work and subsequent labour market choices which are explored in this section as these more than anything else would shape how people respond in a ‘no ferry’ scenario**.

From the Logic Map process, **Error! Reference source not found.** and Figure 6-2, for those who currently use the ferry, there are three potential behavioural responses as a consequence of the **‘Outputs’** - changes in journey times and costs incurred – these are: **(i) give up current job**, **(ii) continue in the same job**, and **(iii) No direct impact on employment** for residents (i.e. for those who have no dependence of the ferry for travel-to-work). The *Voice of the Customer Survey* included a question to establish which of these behavioural responses residents would adopt if the ferry was discontinued. It is important to note that the question within the survey concentrates on the residents’ perspective for accessing work, whilst it is the role of the business survey to determine the impact / viability of those ‘jobs’ that residents are travelling to/from. The results below represent the residents’ perspective across the entire study area.

6.3.1.1 Give Up Current Job

The first behavioural response chain to consider within the ‘no ferry’ scenario in the Logic Map, are those employed residents that would give up their current job as a direct consequence of the change in the transport supply-side. There are four sub behavioural responses to this choice:

(i) those who would choose to **exit the labour market altogether**

(ii) those who would choose to **relocate away from the area**

(iii) those who would choose to **start-up a new business / reskill**

(iv) those who would **either look for a new local job, or search for a new job altogether**

From the total resident (peninsular and wider study area) responses of the survey:

- **3% (n = 10)** of residents indicated that they would choose to exit the labour market completely, a direct negative impact on Scotland’s productivity
- **9% (n = 31)** would give up their current job and relocate away from the area altogether, which would have a detrimental impact on the peninsula
- **2% (n = 5)** would look to start-up their own business or undertake some form of reskilling, which could benefit the peninsula depending on the success of that individual

- **3% (n = 13)** would look for a local job instead, which could have benefits in terms of retaining skills locally, but which would also likely lead to lower total disposable income on the peninsula (the assumption being that a person travels further for work to take advantage of higher pay or better career prospects)

17% (n = 59) of residents, therefore, stated that they would look to **give up their current job** and follow one of the four possible chains of Logic. **24** of these residents can be classed as 'key workers[23]', with **12** earning over £50,000 per annum and **11** earning between £20,000-£49,999 per annum. This potential reduction in employment on the peninsula would have significant consequential societal impacts, which will be explored in the next section.

6.3.1.2 Continue in the Same Job

The second behavioural response considered was those that would remain in the same job despite the increased journey times and costs.

- **13% (n = 48)** of respondents indicated that they would continue with the same job, accepting the increased time and costs incurred. This would lead to reduction in disposable income in the peninsula
- **8% (n = 23)** would also continue in the same job but would consider other ways to offset the additional costs incurred, such as increasing their charges for their time, renegotiating their current contracts, searching for a higher paying job in the same location and altering their travel behaviours

Overall, **21% (n = 71)** of people would, therefore, **continue in the same job**, thus continue making the journey to work at the same destination. In transport appraisal, these respondents would be defined as experiencing a *social welfare disbenefit* in terms of the 'Transport Economic Efficiency' criterion of STAG. This effectively involves monetising their change in journey time using published information on people's value of time for different travel purposes (discussed further in Transport Economic Efficiency Analysis (TEE)).

6.3.1.3 No Direct Impact on Employment

The final consideration is those residents who would experience no direct impact on their current employment. This constitutes those who both live and work on the peninsula or are retired, etc.

[23] Defined as those employed in Health, Education, Public Administration and Defence, and Transport and Storage.

- **25% (n = 92)** of respondents are not in employment
- **36% (n = 138)** of respondents do not use the ferry as part of their commute

61% (n = 230) of all resident responses therefore would **not experience any direct impact** on their employment if the ferry was removed.

6.3.1.4 Summary of Outcomes

Overall, **39% (n = 90)** of residents in the study area believe that in a 'no ferry' scenario, their current employment would be directly impacted in some form, which validates the assumption that the Corran Ferry plays an integral role in connecting labour to employment for residents of the peninsula, wider study area and Mull.

6.4 IMPACTS

From the above behavioural responses and transport outcomes, there would ultimately be an economic and societal impact of a 'no ferry' scenario. These potential impacts are considered below (with reference to the Logic Map) while the quantification of these impacts is discussed further within the 'Quantification of Impacts' in Chapter 9.0.

6.4.1.1 Reduced Disposable Income

Disposable income is the amount of money that an individual or household has to spend or save after taxes etc. have been deducted. Focusing on the two chains of logic that affect **39%** of the resident population, it is clear that their decision to give up their current job or accept the higher cost of travelling to employment would reduce household disposable income on the peninsula. The impacts are likely to be most keenly felt in Morvern and Sunart, where the increase in journey time and cost is likely to be most significant. Studies have indicated that, to have a minimum acceptable standard of living in remote rural Scotland (which the peninsula is classed as), typically requires between **1/10th** and **1/3rd** more household income than in urban parts of the UK[24]. Given the limited employment opportunities and higher cost of living on the peninsula and the lower-than-average wages, there would be a 'tipping point' at which it is rational for an individual / household to leave the peninsula and move elsewhere.

While the sources of these additional costs are varied, two indicators which are of particular interest to this study are **the costs of travelling** and **paying for goods and their delivery,** which are often higher for residents in remote rural locations. While travel costs have been discussed above, in terms of delivery costs, a report by Citizens Advice Scotland (CAS) found that individuals living in the North and North-East of Scotland (which are significantly less rural in nature) pay at least 30% more than consumers in the rest of the UK, while residents of the Scottish Islands have to pay 50% more on average[25].

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[24] A Minimum Income Standard for Remote Rural Scotland: A Policy Update, Highlands and Islands Enterprise (HIE), October 2016
[25] https://www.gov.scot/publications/economic-analysis-postal-delivery-pricing-scotland/pages/3/

Disposable income is also further eroded in remote and rural areas with more expensive home energy costs[26], and higher prices at local shops which do not benefit from the economies of scale of chains (although the Co-Op and Nisa network go some way to offsetting this). These costs, compounded by the additional costs of travel incurred in a 'no ferry' scenario, are highly likely to a have a net negative impact on disposable income on the peninsula.

A direct impact on income would also be felt by the current crew of the Corran Ferry if the ferry service was discontinued. There are 14 crew members with the majority of them (12) based on the peninsula. Currently, crew wages and costs account for circa £700,000 a year, which would be lost through the discontinuation of the service, with further impacts felt locally over time through negative multiplier[27] effects.

Key Point: The 'no ferry' scenario implies a significant reduction in disposable income in the peninsula, particularly in Sunart and Morvern, which would be the most severely affected communities. This loss of disposable income would both reduce aggregate demand in the peninsula and, at the margin, incentivise some families to leave the area.

6.4.1.2 Cost to Society

Aligned to the reduction in disposable income is the potential for an increased dependency on benefits such as Universal Credit to offset any reduction in income as a result of leaving the labour market or accepting a lower paid job. Although many may adopt this solution in the short-term in the hope of identifying other employment opportunities, there is an inherent risk that this becomes semi-permanent if no new opportunities arise or such opportunities are e.g., lower paid, seasonal etc.

At this stage, it is not possible to robustly quantify the likely scale of this potential impact (with exception of crew members discussed above), however, it is possible to glean some insight through the change in those claiming Universal Credit/Job Seekers Allowance as a consequence of the COVID-19 pandemic, which effectively closed the tourism industry in the peninsula. As was evidenced in the **Context**, many of those living on the peninsula and wider study area, are employed in sectors which are likely to have been worst hit by the pandemic, such as tourism/visitor-based employment. Between March 2019 and March 2021, the number of recipients on the peninsula claiming UC/JSA increased by **170%**, while in the wider study area, this also increased by **135%**[28]. This trend points towards the possible future scenario for those in employment on the peninsula if there was a future reduction in the number of tourists visiting the peninsula as a direct consequence of a 'no ferry' scenario.

Key Point: The reduction in income and loss of employment on the peninsula as a result of a 'no ferry' scenario would potentially increase the number of people claiming benefits (a net cost to society).

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[26] A Minimum Income Standard for Remote Rural Scotland: A Policy Update, Highlands and Islands Enterprise (HIE), October 2016
[27] The multiplier effect is a measure of how many times money spent in an area circulates through its economy, recognising that £1 of initial spend will have a greater impact than that initial spend alone. For example, if a tourist books a hotel night for £100, the hotelier will buy stock from say a local provider. The local provider will in turn pay staff who may then spend a part of their income in a local shop of restaurant. Therefore, a proportion of the £100 initial spend is recycled through the local economy several times, creating a larger overall impact.
[28] This number will include those classed as self-employed who were not eligible for the furlough scheme

6.4.1.3 Population Retention and Growth

The trend in population and the age profile of that population is a key barometer of the economic wellbeing of an area. In absolute terms, areas with a stable or growing population tend to be more vibrant and resilient, with areas of declining population less so. Similarly, in areas with a high dependency ratio (the ratio of working age to non-working age population) – i.e., an ageing population or large numbers of children – pressure can emerge on service delivery and the filling of vacancies. The baseline data suggests that the peninsular communities demonstrate both a growing population, but also an aging population, possibly related to lifestyle migrants moving to the area. Conversely the peninsula has also witnessed a depopulation amongst younger people leading to an increasingly ageing population in some communities, which in turn could lead to skill shortages, threatening community sustainability, and putting pressure on public services. This can be driven by several factors including limited employment opportunities[29], high house prices or leaving to pursue further education.

High quality transport connectivity plays an important role in supporting population retention and a positive dependency ratio, both through providing connections to employment and education (e.g., in Fort William) and in making the area attractive to in-migration by families, where one or more adult household members can work remotely but travel occasionally on business or to visit family. A 'no ferry' scenario increases the risk of population loss in peninsular communities, as is evident in the *Voice of the Customer Survey*, where **9%** of respondents indicated that they would give up their job and relocate away from the area. Moreover, the cohort who do so are likely to be the young and economically active. Our experience from studies across Scotland highlights that, in areas of small population, it only takes a small number of families leaving to make public services unviable (e.g., the local primary school) or vacancies hard to fill. This in turn can create a vicious cycle for an area as it becomes less attractive for families to move into. In a 'no ferry' scenario, peninsular settlements like Ardgour would immediately go from being relatively well connected to a position of extreme rurality in a very short period of time.

A recent study undertaken by HIE[30] has reported that there are four key elements that those between the age of 16 and 30 felt were essential for them to want to remain in the community: (i) a critical mass population of young people, (ii) connectivity, both digital and transport, (iii) a feeling of community/community spirit, and (iv) social activities and services (shops, cinemas, restaurants etc). Recent efforts across these four areas in the Lochaber, Skye and Wester Ross region has seen the proportion of young people identifying as 'committed stayers' increase from **31%** in 2015 to **45%** in 2018, with the number of 'committed leavers' falling from **39%** to **22%**. This positive work could be at risk in the peninsula if the ferry was to cease, thereby limiting opportunities to undertake activities such as employment, leisure pursuits, social activities etc.

In a scenario where the ferry remains and applying the current underlying population trends, over the period from 2019 to 2050 (one lifecycle of a vessel), the population of the peninsula could potentially grow by **13%**, from 2,177 to 2,457 (assuming no exogenous impacts). That growth could be vital to sustaining the communities on the peninsula and further strengthens the argument for investment in the Corran Ferry to retain a sustainable link across the Narrows.

Key Point: The loss of economic and social opportunity in a 'no ferry' scenario could lead to a reduction in the population of the peninsula – indeed, 9% of survey respondents noted that they would leave their job and move away from the area. Such a loss of population would be highly detrimental to the peninsula, weakening the

[29] Enabling the Next Generation, Young People and the Highlands and Islands Maximising Opportunities: Lochaber, Skye and Wester Ross, HIE, 2018
[30] Enabling the Next Generation, Young People and the Highlands and Islands Maximising Opportunities: Lochaber, Skye and Wester Ross, HIE, 2018

critical mass required to maintain economic viability, increasing the age profile and thus dependency ratio, and threatening the viability of local services such as primary schools, bus connections etc. It would also reduce the attractiveness of the peninsula to families minded towards in-migration. The impacts again would be particularly stark in Sunart and Morvern, which would go from being relatively well-connected to a position of extreme rurality in a very short space of time.

6.4.1.4 Access to Key Services

In remote rural locations, it is almost always necessary to travel to access many services, a trend being reinforced by recent centralisation of services, specialist medical treatment for example. While some services are provided in part across the peninsula (e.g., primary and secondary education), many are centralised in Fort William (as reflected within the origin-destination distribution analysis from the *Voice of the Customer Survey*).

Health, some of the specialised hospital services have been relocated to Raigmore Hospital in Inverness, as Belford Hospital has had certain procedures/services relocated, downgrading the classification of the hospital. To attend these health appointments in Inverness is a significant journey currently, and in a 'no ferry' scenario, these journeys would become longer, with residents of Morvern and Sunart expected to see a return journey increase by up to 33 minutes on average when travelling by car (and longer when journey time contingency is built in). From the responses from the *Voice of the Customer Survey*, **76% (n = 279)** of residents agreed or strongly agreed that a 'no ferry' scenario would limit the opportunities to access health appointments.

Education, the connectivity afforded by the Corran Ferry service has been highlighted as one of the key supporting features behind the construction of Ardnamurchan High School in Strontian. There is a critical mass of young people on the peninsula as a result of local families choosing to remain in the area as opposed to relocating, creating sufficient demand for the high school to be established. This ties into the previous point about population retention – any reduction in population would threaten the viability of key services such as primary schools and would also make recruitment of e.g., teachers, school cleaners etc. more difficult as the size of labour pool which can be drawn on diminishes. Indeed, many schools in remote and rural Scotland experience recruitment and retention difficulties.

Shopping / Retail, as discussed previously, residents in remote and rural Scotland can be penalised by shopping locally with higher prices, although it is acknowledged that this can retain income within the local area, generating positive multiplier effects. Fort William allows residents of the peninsula to access a larger chain supermarket to complete their weekly shop, increasing choice and reducing the impacts of the local premium on everyday goods. In a 'no ferry' scenario, these trips are less attractive, and the savings generated from shopping in these larger supermarkets may be eroded through the increased cost of travel. **84% (n = 308)** of respondents to the survey agreed or strongly agreed that the cessation of the Corran Ferry service would limit their opportunities for shopping/retail. Whilst it is acknowledged that travel to Fort William to access shopping represents economic 'leakage'[31] from the peninsula, the fact that residents choose to make such a journey highlights that they place a value on being able to do so (in economic terms, they derive 'utility' from doing so).

[31] Leakage in this context refers to a transfer of income from the peninsula to other areas. For example, a peninsular resident shopping in Morrisons in Fort William would represent leakage of income from the peninsula, and potentially the area overall of that money is ultimately repatriated to a central head office.

6.4.1.5 Access to other services / leisure opportunities

In addition to the key services highlighted above, respondents to the survey were also asked to express their thoughts on the limitations on other opportunities including:

- **Eating / Drinking out: 65% (n = 245)** of respondents agreed or strongly agreed that their opportunities would be limited in a ‘no ferry’ scenario
- **Sporting Activities: 63% (n = 236)** of respondents agreed or strongly agreed that their opportunities would be limited in a ‘no ferry’ scenario
- **Cultural / entertainment: 81% (n = 298)** of respondents agreed or strongly agreed that their opportunities would be limited in a ‘no ferry’ scenario
- **Visiting Friends / Relatives: 86% (n = 315)** of respondents agreed or strongly agreed that their opportunities would be limited in a ‘no ferry’ scenario
- **Deliveries to the peninsula: 86% (n = 315)** of respondents agreed or strongly agreed that it would be more expensive / difficult in a ‘no ferry’ scenario
- **Tradespeople to the peninsula: 85% (n = 313)** of respondents agreed or strongly agreed that it would be more expensive / difficult in a ‘no ferry’ scenario

Cumulatively, the reduction in access to each of these features of everyday life would make the peninsula a less attractive place to live.

Key Point: The evidence from the resident survey clearly highlights the extensive economic interactions between the peninsula and the Lochaber area. Cumulatively, the ability to engage in the above listed activities will be important in making the peninsula an attractive place to live, particularly for families. A reduction in connectivity to e.g., shopping or cultural and entertainment activities would diminish quality of life and, together with job / income impacts, would be a ‘push’ factor in encouraging out-migration.

6.5 SUMMARY

The resident survey and secondary data analysis highlight the importance of the Corran Ferry in accessing employment, personal and leisure opportunities and for service delivery in the peninsula. This level of connectivity is therefore essential in retaining population and encouraging in-migration. The data suggests that the ‘no ferry’ scenario would weaken or in some cases break the connection between the peninsula and Lochaber for many of these activities, reducing income, employment, and leisure opportunities, which would in turn act as ‘push’ factor in encouraging population out-migration.

Outcomes & Impacts - Businesses

CORRAN NARROWS

Socio-Economic Study

7.0 OUTCOMES AND IMPACTS – BUSINESSES

This chapter presents the equivalent anticipated outcomes and impacts for businesses in the ‘no ferry’ scenario.

7.1 PENINSULAR BUSINESS LOGIC MAP

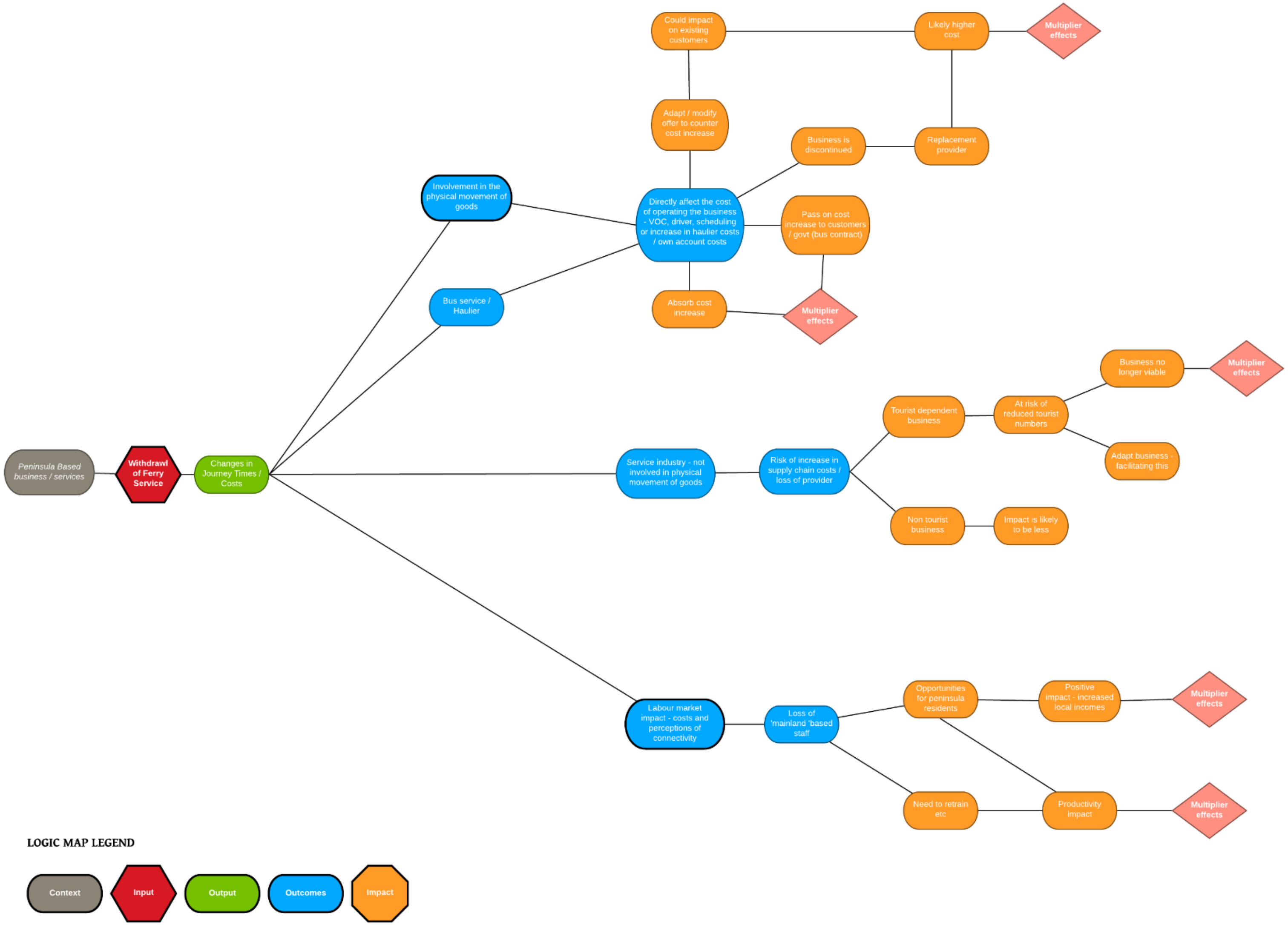

Figure 7-1: Peninsular Business Perspective Logic Map 'No Ferry' Scenario

7.2 WIDER STUDY AREA BUSINESS LOGIC MAP

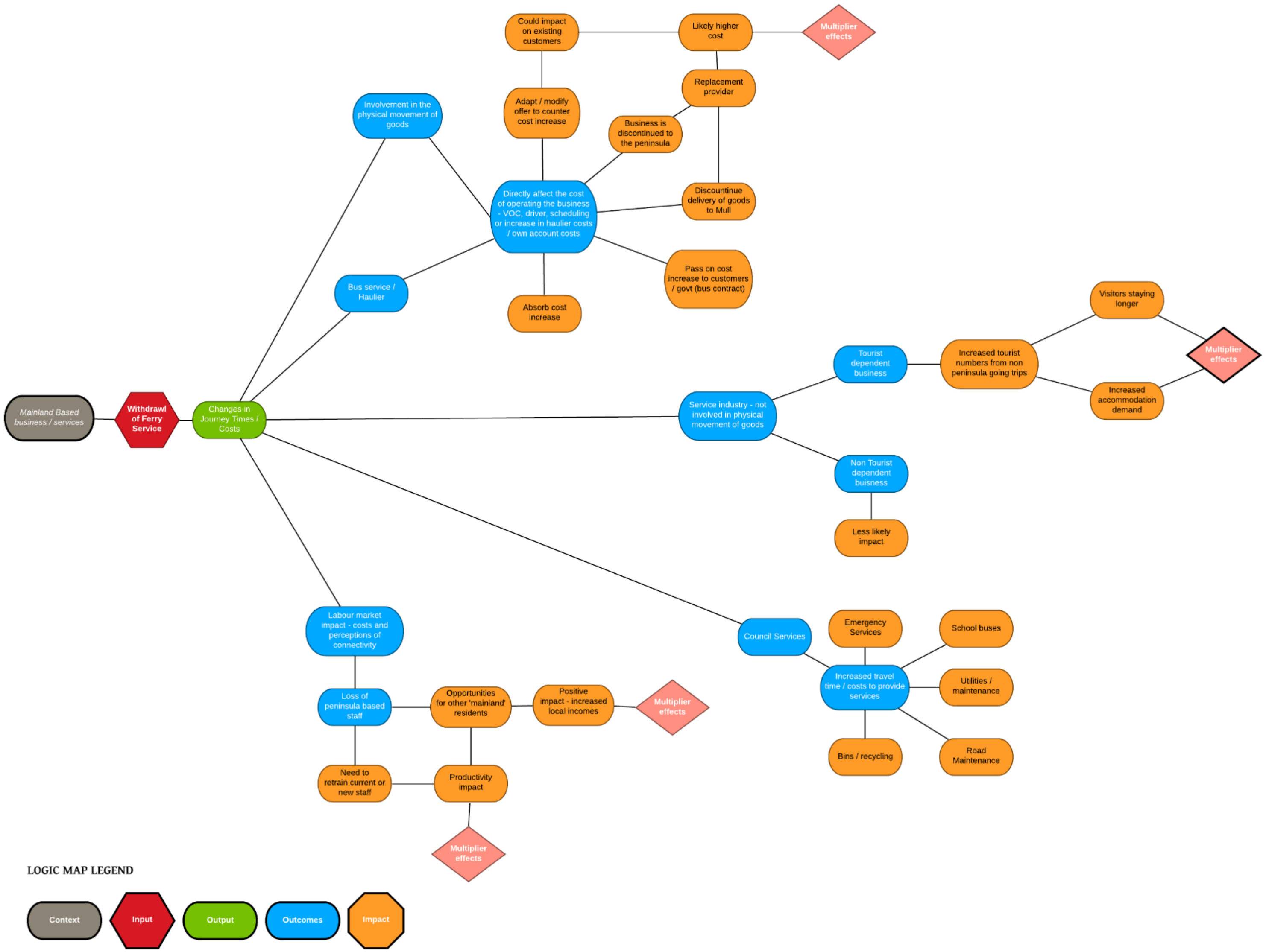

Figure 7-2: Wider Study Area Business Perspective Logic Map 'No Ferry' Scenario

7.3 OUTCOMES

7.3.1.1 Accommodation Providers and All Other Businesses

In a ‘no ferry’ scenario, the likely outcomes for the service industry and those businesses not involved in the physical movement of goods (i.e. producers of goods who contract out haulage and service businesses) is a risk of increased supply-chain costs or even the potential of losing a provider (discussed further below). For accommodation and leisure businesses, there is also a risk of lost custom if fewer people travel to and through peninsula.

7.3.1.2 Freight and Logistics Businesses

For those businesses involved in the transport of goods (either via a contracted haulier or on their own account), the increased travel time, distance and subsequent costs are likely to have outcomes that directly affect the operating costs of the business.

(i) **Vehicle Operating Costs (VoC):** these costs would be highly likely to increase as vehicles would operate longer and on less suitable roads, further increasing wear and tear in addition to the increased fuel costs, as touched on above. The additional running of these vehicles would likely lead to increased servicing, repairs, maintenance and replacement of parts such as tyres and brakes.

(ii) **Drivers and Vehicles:** the additional time taken to complete journeys would impact on driver hours. There are two consequences of this: (i) for commercial vehicle drivers operating on a tachograph, their hours of work are fixed – longer journey times would mean fewer deliveries in a day and thus increase costs to the business or end customer if passed on; (ii) the same issue arises for those not operating on a tachograph, but the outcome could be a longer day rather than increased cost, which gives rise to clear road safety risks. To offset this time impact, there may be a requirement to hire additional staff or have existing staff work longer hours, whilst the total company vehicle requirement may increase.

(iii) **Scheduling:** as touched on above, there would be significant implications on the scheduling of deliveries and transporting goods, especially time sensitive cargo. Much of this freight (e.g., seafood) is routed to Central Belt distribution depots (e.g., Bellshill, Larkhall) for onward shipment to England and the continent. These deliveries must be on time and, if the connection is missed, the stock could lose much of its value if it is delayed until the next day. This would increase the costs to the business through solutions such as mentioned in point (ii) with additional staff and vehicles to offset the time implications or, in the worst-case scenario, the business may withdraw from the market if the ‘hassle factor’ increases or the operation becomes unprofitable. There are examples of this from the Outer Hebrides when RET was withdrawn for commercial vehicles, with the increase in cost leading to some firms exiting specific low margin markets.

For most haulage firms, margins are tight, and the market is highly competitive, so there is often limited scope to pass on cost increases to customers, although this does vary by geography and market. Firms moving goods on their own account may have greater flexibility to pass on costs to customers, but this again depends on the market they are serving (it is typically easier when moving small and / or high-volume goods).

7.4 IMPACT

7.4.1.1 Accommodation Providers and All Other Businesses

Non-tourism businesses on the peninsula are likely to witness less significant direct impacts as a result of increased costs. Impacts are likely to be centred around the ability to obtain supplies / goods, and the likely increased costs associated with obtaining these items as a potential pass-through cost from hauliers, as discussed in the ‘Freight and Logistics’ section below. These businesses could see a reduction in possible revenue / turnover, although such impacts are not anticipated to be significant for ‘less than full load’ customers given that the cost of any one HGV movement is spread over multiple customers (this point was evidenced when RET was withdrawn for hauliers serving Coll, Tiree, and the Outer Hebrides – whilst the costs were keenly felt by hauliers and ‘full load’ customers, changes in cost were less evident to groupage customers).

Tourist based businesses on the other hand are likely to experience significant impacts of a ‘no ferry’ scenario. The biggest risk to these businesses would be the potential of reduced visitor numbers. This could significantly impact the sustainability / viability of any business, resulting in either a need to adapt and change their offering or, in the worst-case scenario, closure of the business. As part of the business surveys that were undertaken, respondents were asked what they felt the likely impacts to their business would be in a ‘no ferry’ scenario. Responses are summarised below:

- Several businesses indicated that they felt visitors would still come to the peninsula, but that they would be fewer in number.
- All businesses indicated that they felt the biggest danger was to the day-tripper market, much of which would be lost – in effect, this market would be almost entirely discontinued for areas closest to the ferry such as Ardgour, Morvern and Sunart.
- The increased journey times would impact those who run AirBnB and other self-catering accommodation and live elsewhere, when visiting the property to clean / turnover for new guests arriving, as pointed out in a number of returns to the accommodation providers business survey.
- Without the ferry, Ardgour would be at risk as there are few other reasons to specifically visit there, therefore, businesses such as the hotel would be significantly impacted. Indeed, Ardgour would become something of a cul-de-sac.
- A major benefit of the Corran Ferry for the peninsula is that it provides visitors with quick and easy access to a wild and scenic part of Scotland – it is the presence of the ferry which makes this area feel ‘close’ for visitors to Lochaber, Glencoe etc. In a ‘no ferry’ scenario, there would undoubtedly be a change in the perception of the peninsula (at least the east side of it), which would then be considered ‘remote’, even if the drive times to the main destinations were in fact reasonable. This perception of the peninsula being ‘a long way away’ would reduce its overall attractiveness to casual visitors (although it may also appeal to some visitors who specifically seek remote locations for their holidays).

Key Point: In a 'no ferry' scenario, business costs would increase, particularly for those firms physically moving goods, either by contracted haulier or on their own account. For tourism businesses, particularly those in Ardgour, Morvern and Sunart, much of the day tripper market would be lost, potentially jeopardising the financial viability of tourism businesses in that area.

7.4.1.2 Freight and Logistics Businesses

From the possible outcomes in the Logic Map in a 'no ferry' scenario, there are the implied impacts on peninsula-based businesses to consider - these are:

(i) **Business is discontinued:** The additional operating costs of running a freight/logistics business may pose a financial risk to a number of businesses who may already be struggling from other significant external changes such as Brexit, increased fuel costs etc. In a recent Business Panel Survey, businesses within the region highlighted that the two main risks to their business were **increased costs** (89%) and **political and economic uncertainty** (84%)[32]. Additionally, other common risks identified were (i) poor transport links (66%), (ii) increased competition (65%), (iii) continued weakness of Sterling (64%) and (iv) difficulty recruiting or retaining staff (57%, although likely to be a much larger proportion in the current environment). Haulage firms in rural areas are often marginal operations (albeit these areas are also served by several national operators) and, when combined with a 'no ferry' scenario and the additional costs of transporting goods, such firms could become unviable and cease trading. This could then lead either to a loss of provision or a replacement provider entering the local market, and the likely higher cost implications associated with this.

(ii) **Adapt/Modify offer to counter cost increase:** A second possible business decision would be for a firm to either adapt or modify their current service offerings to offset the increase in costs. This could potentially impact on their existing customer base and again could involve higher costs associated with this.

(iii) **Absorb increase:** Businesses may also choose to simply absorb the increase in costs, which would reduce profitability and potentially growth aspirations. A reduction in profitability could also have wider implications for staff, such as retention / salary / pay rise opportunities, training opportunities, removal of other benefits and by association the further societal impacts associated with these as discussed in section 6.3.

(iv) **Pass costs on to customers:** precedent suggests that this response is the most likely and could also have the largest impacts. The increased costs for customers could potentially see those customers in turn taking one of these four responses themselves, thus producing a cyclical impact across the peninsula for other businesses and residents (staff). Such impacts would be most keenly felt by 'full load' rather than groupage customers.

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[32] HIE Business Panel Survey Wave 14: Business Resilience, Brexit and Climate Change, 2019

Key Point: Rural haulage businesses – or the rural operations of regional / national haulage businesses – are generally marginal operations, where even small increases in cost can make the operation unviable. The incidence of this impact depends on the haulier in question, the scale of their operation and the extent to which they can pass increased costs onto the end customer or otherwise. The key risk for the peninsula outwith increased costs of delivery is the withdrawal of one or more haulage businesses in the area, which could threaten an already marginal supply-chain.

7.4.1.3 Labour Market Impact

The evidence from the resident survey found that 12% of respondents would exit the labour market or relocate from the peninsula in a 'no ferry' scenario. From a business perspective, there would be two labour supply impacts:

- For both peninsular and wider study area businesses, the size of the labour pool would diminish, making it harder to fill vacancies or effectively align skills to jobs.
- From a peninsular perspective only, the size of the local labour market would contract by 12%

Much of north-west Scotland is already suffering from labour shortages, particularly in the hospitality and leisure industry (e.g., waiters, bar staff, cleaners etc) and social care sectors. The job density for the Fort William workplace region has increased over the last five years ahead of population to 0.97 (14% growth), which indicates that there is almost one job per working age person in the region. From the engagement exercise, respondents indicated staff resourcing issues as a result of Brexit, with many accommodation providers responding by altering their service offering, such as limiting the number of short-stay bookings in favour of encouraging longer stay bookings due to this labour shortage. The 'no ferry' scenario would exacerbate this problem on both sides of the Narrows, although the effects would be most directly felt on the peninsula, where the labour market is already very small. From a regional economic perspective, unfilled vacancies and ineffective skills matching would impact negatively on productivity at the local, regional and likely national level.

Key Point: The 'no ferry' scenario would reduce the size of the labour pool in the peninsula and the wider study area. This in turn would make it harder to fill vacancies or, where these are filled, effectively match skills to jobs. Both of these effects would impact negatively on productivity. The impacts would be most keenly felt on the peninsula, where the labour market is already very small in absolute terms.

7.5 SUMMARY

The 'no ferry' scenario implies an immediate increase in the cost of serving and doing business on the peninsula. The extent of the impacts would vary by business sector and company depending on the size and geography of the market they serve, the extent to which the business can pass on costs and, where cost pass on is possible, who the end customer is. Nonetheless, it is reasonable to assume that the cost of at least some goods and services would increase. There is also a risk that some firms would also withdraw from the peninsular market, which would increase cost through reducing competition.

The ‘no ferry’ scenario also implies a reduction in the size of the labour pool for the combined peninsular and Lochaber areas. This could exacerbate job vacancy rates and skills shortages which already exist and reduce local, regional, and national productivity. The impacts would be most keenly felt on the peninsula, where the labour market is already very small in absolute terms.

Outcomes & Impacts – Visitors / Tourists

CORRAN NARROWS

Socio-Economic Study

9.0 OUTCOMES AND IMPACTS – VISITORS / TOURISTS

This chapter presents the equivalent anticipated outcomes and impacts for visitors / tourists in the 'no ferry' scenario.

9.1 VISITOR / TOURIST LOGIC MAP

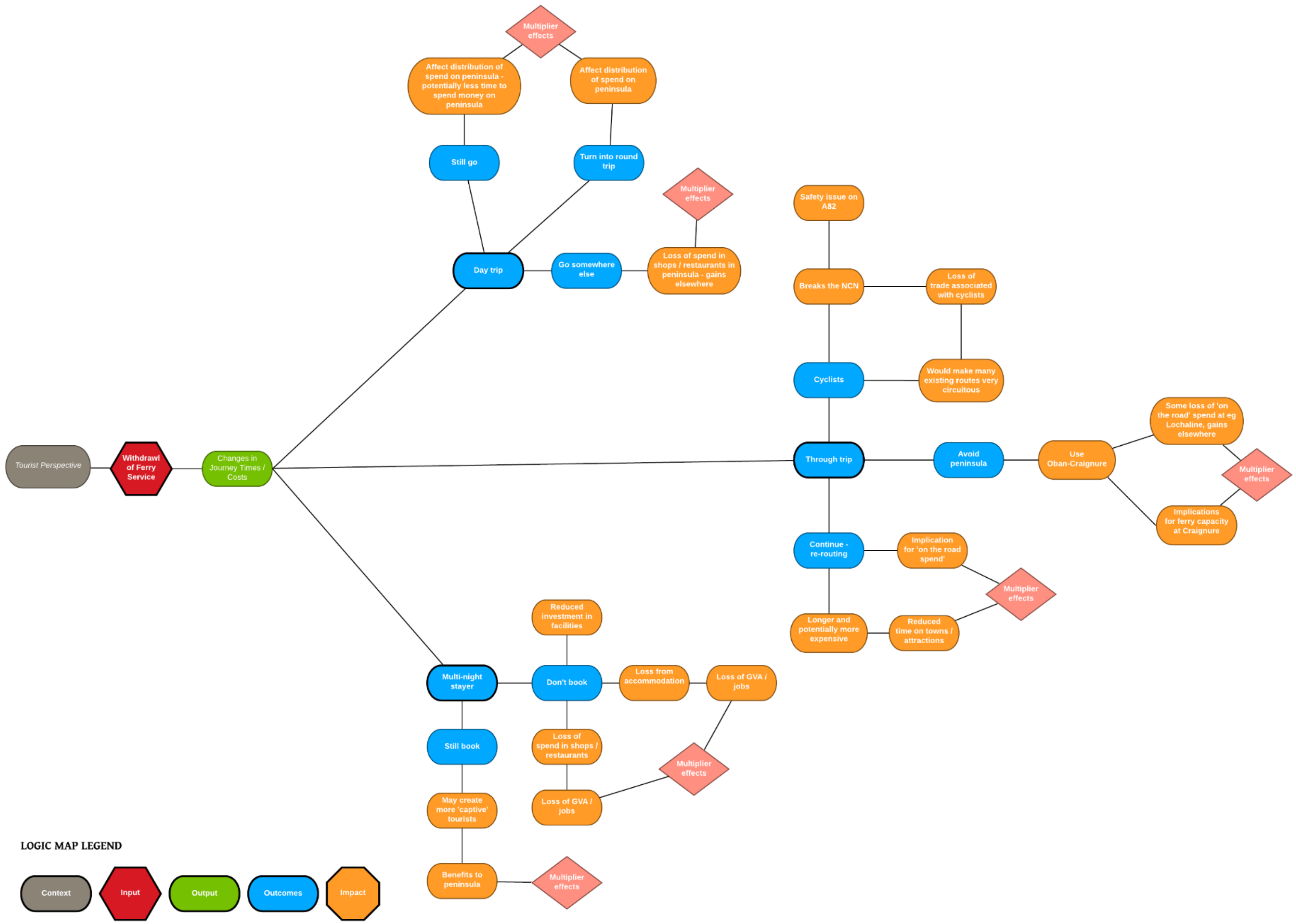

Figure 9-1: Tourist / Visitor Perspective Logic Map 'No Ferry' Scenario

9.2 OUTCOMES

The likely outcomes from the cessation of the Corran Ferry service would be orientated around the three potential visitor market types **(i) the day tripper**, **(ii) the through tripper**, and **(iii) the overnight stayer**. As previously discussed, a large proportion of employment in the study area is in tourist related activities with over 2,500 jobs in 'accommodation and food services' and a further 650 jobs in 'arts, entertainment, recreation and other services' in 2019.

9.2.1 Day Tripper

The day tripper market is popular on the peninsula, attracting visitors from within the wider study area and further afield. Three outcomes are possible as a result of the Corran Ferry no longer operating; (i) visitors still make the journey to the peninsula as the main destination, (ii) visitors turn the journey into a through trip, i.e., the peninsula is no longer the main destination, and (iii) visitors go elsewhere.

9.2.2 Through Tripper

Through trippers are those that include a journey to the peninsula as part of a trip to another ultimate destination and so travel through the area en-route. Examples include cyclists using the Caledonia Way and those undertaken an island-hopping trip up the west coast. Again, there are three possible outcomes for through trippers as a result of the ferry no longer running, including (i) cyclists having to reroute, (ii) visitors avoiding the peninsula, and (iii) continue making the journey but re-route.

9.2.3 Overnight Stayer

Multi-night stayers are those who are travelling to the peninsula as a destination and spend one or more nights staying on the peninsula. There are two possible outcomes for this type of visitor in response to the ferry no longer operating: (i) still book to stay on the peninsula; or (ii) do not book to stay on the peninsula.

9.3 IMPACT

9.3.1.1 Day Tripper

From the anticipated outcomes from the possible day tripper responses, there are two possible impacts. Those who choose to still make the journey or turn it into a round-trip are likely to have reduced time to spend money on the peninsula. There would also be a likelihood of redistribution of spending across the peninsula, giving rise to 'winners and losers' within the peninsular communities – for example, visitors in Sunart and Morvern could travel instead to Ardnamurchan. Where before, people had more time to spend visiting locations, the additional journey time would reduce this, or alter the routing visitors may take. **65** respondents to the *Voice of the Customer Survey*, indicated they were making a day-trip with **an average spend of £180 per travelling party response as part of their journey to the peninsula[33].**

[33] Based on weighted average responses against bottom spend bracket. This is per response, of which exists different permutations of party composition. Includes all spend other than accommodation.

For those who may instead choose to not visit the peninsula and go elsewhere, there would be a loss of expenditure in the peninsular shops, cafes / restaurants, and other businesses. In turn, other locations may benefit from this loss of custom for the peninsula, either in Lochaber or elsewhere. Whilst there may be a limited or no net effect at the regional and national level, there would be significant disbenefits in the peninsula itself. The reduction in direct spend would be amplified by multiplier effects meaning the total reduction in spending would be greater than that of the tourist spend alone. This would negatively impact both businesses which benefit from tourist custom and the area more generally from a reduction in aggregate income.

Key Point: The ‘no ferry’ scenario would likely lead to a significant reduction in day-trippers to the peninsula, reducing direct expenditure in peninsula businesses, with consequential multiplier effects. There would also be a potential redistribution of the remaining visitor trips as a result of the changes in journey times – it is expected that Morvern and Sunart would be particularly affected.

9.3.1.2 Through Tripper

As set out in Section 3.4, the Corran Ferry is an integral link in the Caledonia Way as part of the NCN78, which allows cyclists to avoid the busy and dangerous section of the A82 to and from Fort William. The removal of the ferry service would then break this link in the NCN, resulting in cyclists choosing between cycling on the A82 with all of the risk that that implies or choosing not to make the journey. This would lead to a reduction in cyclist-based trade for peninsular firms, such as at the Inn at Ardgour, in addition to reducing the patronage on the Camusnagaul Ferry (and thus increasing the net cost of that ferry service to THC).

For those who would choose option (ii) above – i.e., continue to make the journey but reroute - and avoid visiting the peninsula as part of a through trip, this would lead to a reduction of ‘on-the-road’ visitor spend on the peninsular through trip, for example in the local shop in Lochaline when arriving from Fishnish. For multi-centre trips including Mull, there would be a redistribution of trips from the more lightly used Lochaline – Fishnish route (average loading capacity 26%[34]) to the highly capacity pressured Oban – Craignure route (average loading capacity 81%[35]), amplifying peak summer utilisation issues on that route, with negative implications for residents of, and visitors to, Mull.

The final response for through trippers is to still make the journey, re-routing via the most appropriate route on the peninsula dependent on the vehicle. This would likely make journeys longer and more expensive, potentially further reducing time for people to spend money in peninsular restaurants and shops and impact on time/spend on local activities and attractions.

Each of these responses would give rise to similar multiplier effects as discussed previously, with implications for business viability, jobs, income, and the wider peninsular economy.

[34] Evaluation of Road Equivalent Tariff on the Clyde and Hebridean Network, Stantec, 2020
[35] Evaluation of Road Equivalent Tariff on the Clyde and Hebridean Network, Stantec, 2020

Key Point: The 'no ferry' scenario would break NCN78, thus reducing passing cycling trade for peninsular businesses and the overall attractiveness of long-distance cycle trips to and from the area. It would also increase the THC subsidy for the Camusnagaul Ferry, which is well-used by cyclists. This could however be to the benefit of Lochaber if there is a redistribution of trips to that area.

Key Point: For car-based visitors, rerouting to avoid the peninsula would result in a loss of passing trade for businesses, with direct and multiplier effects on the peninsula, and a potential redistribution of activity within the peninsula. This could however be to the benefit if Lochaber if there is a redistribution of trips to that area.

9.3.1.3 Overnight Stayer

The first response to the outcomes for overnight stayers considers those who would choose to still book and visit the peninsula. This decision is likely to deliver **positive** impacts for the peninsula. The absence of a ferry may create more 'captive' tourists which could potentially lock-in spend on the peninsula supporting local jobs and businesses, bringing wider benefits to the peninsula, such as further job creation, job security and increased wages / salaries. In terms of approximate spend per overnight stayer, 67 responses to the *Voice of the Customer Survey* were received suggesting an average spend of **£451**[36] (excluding accommodation) and a further average spend of **£714** on accommodation[37] per travelling party composition.

Conversely, if the response is to instead not book to stay on the peninsula, the impacts would be more significantly felt. 48 responses to the *Voice of the Customer Survey* indicated they would either no longer visit the peninsula or reduce the frequency at which they visit. Supply outweighing demand may lead to a reduction in investment in facilities and even the possibility of the loss of accommodation as businesses change their operating model – this is a not unlikely outcome given the small scale and family-based nature of accommodation on the peninsula. This would lead to a loss of GVA and jobs. Furthermore, a reduction in the number of tourists would see less spend in shops and restaurants and again impact the viability of local peninsular businesses, leading to a loss of GVA and jobs as a consequence.

Key Point: The 'no ferry' scenario would likely lead to a loss in overnight stays in the peninsula, with 48 responses to the *Voice of the Customer Survey* indicating they would either no longer visit the peninsula or reduce the frequency at which they visit. This would be the most significant of tourism impact as research shows that staying visitors tend to spend more money in an area, even when accommodation costs are excluded. This loss of direct expenditure would be amplified by multiplier effects within the local economy. Moreover, a long-term contraction in demand would lead to the gradual diminution of the supply-side (e.g., bed stock, cafes / restaurants etc), reversing long-term initiatives to grow the attractiveness of the peninsula for tourists.

[36] Spend includes all other expenditure out with accommodation, i.e. food, meals, fuel, retail etc.
[37] Based on weighted average responses against bottom spend bracket. This is per response, of which exists different permutations of party composition.

9.4 SUMMARY

The Corran Ferry plays an integral role in the tourism offer of the peninsula and the Lochaber area more generally, effectively making an area that would otherwise be remote easily accessible, even on a day-trip. It is unquestionable therefore that, in a ‘no ferry’ scenario, the scale of the peninsular tourism market would reduce, and there could also be negative impacts in Lochaber depending on the behavioural response of visitors. This reduction would directly reduce visitor spending, with consequential multiplier impacts, and would thus reduce employment in one of the primary economic sectors in the area. Moreover, it would lead to a long-term erosion of the supply-side in the area, undoing much of the market development work undertaken in recent years.

Looping back to the resident and business analysis, a reduction in visitor numbers and a loss of employment associated with this would likely be a major ‘push factor’ in people choosing to leave the area.

Quantification of Impacts

CORRAN NARROWS

Socio-Economic Study

10.0 QUANTIFICATION OF IMPACTS

This chapter sets out to quantify the impacts of a 'no ferry' scenario where it is possible to do. There are three components to this:

- Monetising the increases in travel time and vehicle operating costs
- Providing a high-level estimate of the costs of potentially upgrading the A861 to mitigate the loss of the ferry
- Undertaking a high-level economic impact assessment of a 'no ferry' scenario in terms of employment and Gross Value Added (GVA) impacts

10.1 TRANSPORT ECONOMIC EFFICIENCY ANALYSIS (TEE)

Transport Economic Efficiency (TEE) covers the benefits ordinarily captured by cost-benefit analysis and is a key component of the STAG[38] process. These are the transport impacts of a scheme or policy and estimate the changes in journey time (which are monetised) and vehicle operating costs.

TEE analysis captures the benefit or disbenefit of a transport scheme by comparing its costs and benefits and deriving a Benefit Cost Ratio (BCR). Costs include all capital, operating and maintenance costs of the project. Benefits on the other hand are generally determined through an analysis of the impact of a scheme on transport users, and are thus predominately, although not exclusively, **social welfare**, rather than financial benefits.

A key issue with transport schemes is that the costs tend to be accrued up-front, with the benefits emerging over a much longer time period. To account for this, in line with HM Treasury Green Book guidance, an appraisal typically works over a 30 or 60-year time horizon to provide an equitable comparison of costs and benefits. This recognises that a cost or benefit accrued in the future is 'worth' less than a cost or benefit in the present day (this is known as 'rate of time preference'). To account for this, appraisal uses the convention of 'discounting', which equates future benefits and costs to a single point in time (known as present value), thus providing a consistent and equitable comparison.

10.1.1 Present Value of Benefit (PVB)

10.1.1.1 No Ferry Scenario

The 'no ferry' scenario assumes that the ferry service would continue until the existing vessel(s) fail and the service is discontinued, whereby there would be no crossing provided across the Narrows. As this scenario is hypothetical, for the purposes of this analysis, this is assumed to take place in 2021. After this point, residents, businesses, and visitors to and from the peninsula would travel by road.

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[38] https://www.transport.gov.scot/publication/stag-technical-database/section-9/#s911 section 9.1.1

A bespoke, WebTAG-based[39] economic benefits spreadsheet model was developed to determine the level of transport (dis)benefits associated with the cessation of the Corran Ferry service. As mentioned above, a PVB was calculated over a 60-year horizon period and included the consideration of three ferry related scenarios based on the average wait time to board the ferry, comprising; (i) 5-minute wait for the ferry, (ii) 10-minute wait for the ferry, and (iii) 15-minute for the ferry – these scenarios reflect the frequent requirement to queue at peak times of the year. Within the TEE analysis, the transport benefits that comprise PVB have been defined as consisting of:

- **Vehicle Operating Costs (VoC)** – which include changes in operating costs incurred by a user, such as fuel, repairs, maintenance etc.
- **Travel Time Benefits** – journey time benefits or disbenefits associated with the scenario, such as the removal of ferry wait times, or the additional road-based journey times
- **User Charges** – any changes in charges incurred by users, such as the removal of ferry vehicle fares in the 'no ferry' scenario etc

As this analysis is high-level, assumptions have been based on a continuation of the patronage trends pre-COVID-19, and therefore do not reflect the possible future impacts of the pandemic on travel patterns and behaviours. Due to current uncertainty on the long-term impacts and possible changes in demand, we have assumed a continued growth in traffic based on pre-COVID-19.

From the spreadsheet model, the following results were determined for the 'no ferry' scenario:

Table 10-1: 60 Year PVB

60 Year PVB	
Ferry Wait Time Scenario	***PVB***
5-Minute Wait	**-£75.8** million
10-Minute Wait	**-£73.5** million
15-Minute Wait	**-£71.1** million

As can be viewed in the table, there is a difference of -£4.7m between the top and lower values as a result of the wait scenario. As the assumed ferry wait time increases, the disbenefit reduces as the differential in travel times by road and ferry diminishes. On average, the 'no ferry' scenario is likely to disbenefit users of the ferry by **-£1.9m per annum**[40] for the next 60 years, as an average across the three different wait scenarios. As is evidenced by the numbers above, there would be a significant disbenefit to current ferry users associated with the discontinuation of the Corran Ferry service.

[39] WebTAG is the Department for Transport's guidance on appraising transport projects, within which is a databook of parameters for use in analysis.
[40] Discounted to 2010 base prices

10.2 UPGRADE OF A861

As discussed previously, the road network on the peninsula is predominantly single track with passing places and is constrained at points in terms of horizontal and vertical alignment and bridge heights. As it currently stands, there would be difficulties in accommodating a significant proportion of the number of vehicles on the A861 between Corran and the A830 as the Corran Ferry carries due to the single-track design of the road, blind bends, and make-up of the vehicle fleet (cars, campervans, motorhomes, CVs, buses etc). To this end, a potential mitigation in a 'no ferry' scenario would be to upgrade the A861 from the junction with the A830 to the ferry slipway at Ardgour. A high-level assessment was undertaken to estimate the approximate costs associated with upgrading this section of road. The cost estimate is based on upgrading the section of road to a DMRB S2 rural all-purpose 7.3m wide (excluding hardstrips) as shown in Figure 10-1 below and works to provide clearance for CVs under the low railway bridge at Drumsallie.

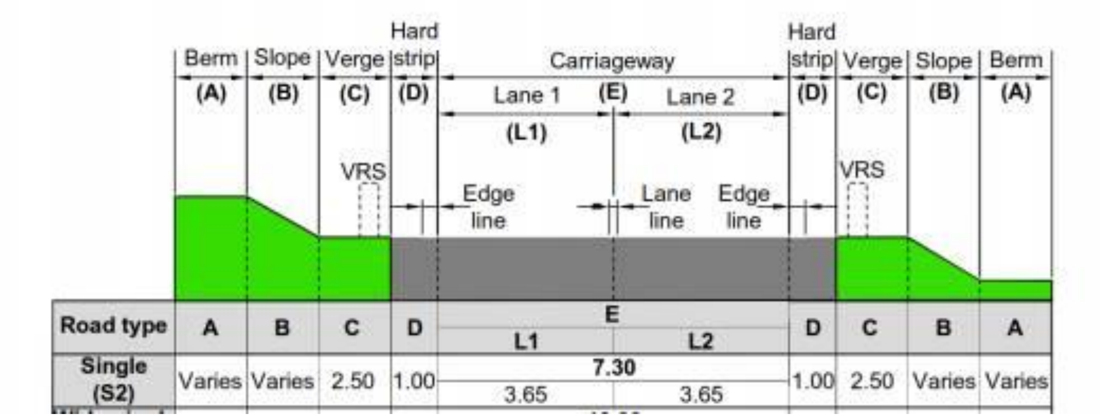

Figure 10-1: DMRB S2 rural all-purpose 7.3m carriageway cross section

The road corridor was disaggregated into sections and a typical cross-sectional cost to bring the existing road up to this standard was applied (Appendix F). The total cost is provided in Table 10-2 below. The costs have been verified against approximate estimating rates for new road construction.

Table 10-2: Cost Estimate upgrade of A861 (undiscounted 2021 prices)

Item	*Cost*
Civil Construction Cost	*£95,330,000*
Optimism Bias @ 44%[41]	*£41,945,000*

[41] Standard % application at this stage in design as per Green Book guidance

Design Fees @ 10%[42]	*£9,533,000*
Construction Prelims @ 15%[43]	*£14,299,000*
Utility Diversions @ 30%[44]	*£28,599,000*
Total Cost	***£189,706,000***[45]

Whilst the above figures are high-level, it is evident that:

- The cost of upgrading the A861 to a standard single carriageway is significant, and indeed would be tens of millions of pounds more expensive than the Stromeferry Bypass, which THC has been pursuing for many years. It would also only serve the eastern part of the peninsula, so the benefits of such an investment would be unevenly distributed.
- Whilst the conversion of the A861 to single carriageway would reduce journey times from Ardgour and Morvern, journey times and distances would still be significantly longer than travelling via the ferry.
- As the A861 is a road for which THC has responsibility, it would bear the costs of the upgrade unless funds could be secured from external sources. Given the backstory with Stromeferry, this seems unlikely in the medium-term. The capital cost of such a road upgrade would therefore likely be unaffordable from a THC perspective. **Crucially, such an upgrade would also be significantly more expensive than a fixed link across the Corran Narrows, which is understood to be the preferred long-term solution of peninsular communities for crossing the Narrows. It would also be an inferior solution.**
- There would also likely be significant environmental consenting issues with upgrading a road which hugs the western shore of the scenic Loch Linnhe.

Overall, it is clear from the above that, even without a full appraisal exercise, the upgrading of the A861 to single carriageway cannot realistically be considered as an appropriate or value for money mitigation in a 'no ferry' scenario.

[42] Typical value
[43] Typical value
[44] Conservative estimate, given the lack of information available at costing. This is likely to decrease through investigations and design progression, given the rural nature of the site
[45] Undiscounted 2021 prices

10.3 ECONOMIC IMPACT ASSESSMENT

10.3.1 Overview

The evidence presented in this study highlights that the Corran Ferry acts as an essential link across the Narrows, supporting the movement of goods and people from peninsular communities to Fort William, Ballachulish, and the Central Belt. The surveys described above demonstrate that a reliable crossing underpins key elements of the local economy, including commuting and business travel and the integrity of local supply-chains.

An economic impact assessment (EIA) has been undertaken to quantify the scale of economic activity that is dependent on a reliable link across the Narrows. This brings together the findings of the resident survey with labour market and business data published by the Office for National Statistics (ONS) and the Scottish Government. It monetises forecast changes in employment on the peninsula in terms of resident income and gross value added (GVA) – a measure of the value of the total goods and services produced.

In line with the recent H.M. Treasury *Green Book* review (2020) and its emphasis on 'place-based impacts', economic impacts have been considered at the peninsula level. Without a reliable link across the Narrows, activity on the peninsula is likely to be displaced by similar activity across the Highlands, in some cases by the same workers who have relocated from the peninsula (a potential effect which the survey provides good evidence for).

In the absence of a link across the Narrows, the resident survey suggests that adverse economic impacts would likely be realised in one of the following ways:

- **Residents give up their current job and move away from the peninsula:** resulting in a reduction of GVA on the peninsula, a decrease in local expenditure, and multiplier impacts as the job market contracts in response to this
- **Residents continue to travel to their mainland job, spending more on transport:** resulting in a reduction of disposable income and thus expenditure on the peninsula, leading to multiplier impacts as the job market contracts in response to this
- **Residents change job to a lower paid or lower productivity role on the peninsula:** resulting in a reduction of GVA on the peninsula, a decrease in local expenditure, and multiplier impacts as the job market contracts in response to this

The current Corran Ferry crew would be included in either the first or third response above.

10.3.2 Population Characteristics and Decision Making

Peninsula residents were asked how they were likely to approach their employment if the ferry service was to cease. Figure 10-2 below presents the responses, highlighting the above categories.

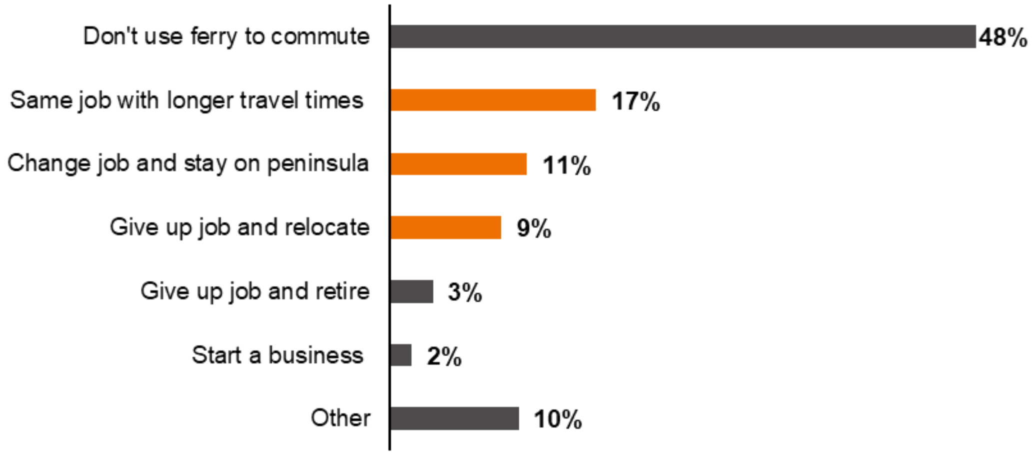

Figure 10-2: Survey respondents' intentions if ferry service were to cease

Note: excludes those not currently in employment

This suggests that over a **third** (37%) of residents in employment would be adversely impacted by the cessation of ferry services, in addition to a further **3%** who would give up their job and retire. Respondents' intentions were likely influenced by the role they are currently employed in, with those who are likely to relocate in higher value, and more mobile, sectors, such as construction and transport. Table 10-3 below shows the results of this survey, controlled for employment sector.

Table 10-3: Intentions of survey respondents by employment sector[46]

Employment sector	All respondents	Same job with longer travel times	Change job and stay on peninsula	Give up job and relocate	Other (including no impact)
Accommodation and food services	***15%***	7%	10%	0%	83%
Education	***14%***	11%	13%	12%	64%
Health	***13%***	14%	24%	12%	50%
Agriculture, forestry and fishing	***11%***	9%	13%	8%	70%
Arts, entertainment, recreation and other services	***8%***	18%	0%	12%	70%
Professional, scientific and technical	***6%***	7%	7%	0%	86%
Construction	***5%***	7%	6%	16%	71%
Transport and storage	***5%***	7%	3%	12%	78%
Public administration and defence	***4%***	9%	3%	4%	84%
Retail	***3%***	2%	0%	4%	94%
Business administration and support services	***3%***	2%	10%	4%	84%
Information and communication	***3%***	5%	7%	4%	84%
Financial and insurance	***2%***	2%	0%	4%	94%
Manufacturing	***2%***	0%	0%	0%	100%
Mining, quarrying and utilities	***2%***	0%	3%	0%	97%
Motor trades	***2%***	0%	0%	4%	96%
Property	***1%***	0%	0%	4%	96%

Applying these rates to the wider population of the peninsula – aged between 16 and 64 and economically active – derives an estimate of how many jobs are likely to impacted by these changes. **Table 10-4** below presents these estimates.

[46] The information is based on the returns to the survey and as such, sample sizes at the sectorial level are relatively small. This should be acknowledged when considering the context of this table and the reflection of employees in that sector as a whole.

Table 10-4: Estimated jobs impacted by employment sector

Employment sector	Same job with longer travel times	Change job and stay on peninsula	Give up job and relocate	Total jobs affected	Total Jobs on Peninsula
Accommodation and food services	12	11	-	23	
Education	19	15	11	45	
Health	23	27	11	61	
Agriculture, forestry and fishing	15	15	7	37	
Arts, entertainment, recreation and other services	31	-	11	42	
Professional, scientific and technical	12	7	-	19	
Construction	12	7	15	34	
Transport and storage	12	4	11	27	
Public administration and defence	15	4	4	23	
Retail	4	-	4	8	
Business administration and support services	4	12	4	20	
Information and communication	8	7	4	19	
Financial and insurance	4	-	4	8	
Manufacturing	-	-	-	-	
Mining, quarrying and utilities	-	4	-	4	
Motor trades	-	-	4	4	
Property	-	-	4	4	
Wholesale	-	-	-	-	
Total	**169**	**113**	**92**	**374**	**990**

Source: National Records for Scotland (2020). Small Area Population Statistics; ONS (2021). Annual Population Survey.

This suggests that approximately **169** people would continue in the same job with longer travel times, **113** would aim to change job and stay on the peninsula, and **92** would relocate away from the peninsula. This represents **37%** of all economically active peninsular residents, which is a significant upheaval to the local labour market in such a rural location.

10.3.3 Direct Impacts

10.3.3.1 Gross Value Added

As people relocate away from the peninsula, the total output of the local economy would decline. The GVA associated with the 92 lost jobs has been quantified using average productivity rates, derived from an analysis of the Scottish Annual Business Survey and the Business Register and Employment Survey. This process is shown in **Table 10-5** below.

Table 10-5: Peninsular GVA lost due to residents relocating[47]

Employment sector	Jobs lost	Productivity	Annual GVA lost
Education	11	£14,300 / job	£157,200
Health	11	£14,300 / job	£157,200
Agriculture, forestry and fishing	7	£30,300 / job	£222,370
Arts, entertainment, recreation and other services	11	£14,900 / job	£164,100
Construction	15	£46,751 / job	£686,220
Transport and storage	11	£50,000 / job	£551,200
Public administration and defence	4	£38,400 / job	£141,000
Retail	4	£27,900 / job	£102,400
Business administration and support services	4	£38,400 / job	£141,000
Information and communication	4	£68,900 / job	£252,900
Financial and insurance	4	£48,300 / job	£177,400
Motor trades	4	£32,000 / job	£117,400
Property	4	£72,400 / job	£265,800
Total	**92**		**£3,136,400**

Source: Stantec analysis of resident survey, *Scottish Annual Business Survey*, and *Business Register and Employment Survey*.

Note: all values in 2021 prices.

The peninsular jobs anticipated to be lost have an average productivity of **£34,200**[48] GVA per job, suggesting that up to **£3.2 million** in annual GVA could be lost from the peninsula in the absence of reliable link across the Narrows.

10.3.3.2 Expenditure

Levels of resident expenditure on the peninsula are also anticipated to decline as residents move away, spend more on travel, or shift to lower-paid jobs.

The households which relocate away from the peninsula are anticipated to reduce annual levels of expenditure by **£1.5 million**. This estimate is based on weekly spending data per (adult) published by the ONS.[49] Of this, approximately **£847,000** could have been spent in local businesses.[50] This would result in a loss of **£245,800** in GVA associated with a reduction in retail expenditure.

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[47] Numbers presented below are rounded to the nearest whole number

[48] Weighted average

[49] Office for National Statistics (2019). *Average weekly household expenditure on goods and services in the UK.* Table 35: Detailed household expenditure by countries and regions.

[50] Including food and drink, clothing, household goods and services, communication, recreation and culture, hospitality, and miscellaneous goods and services.

Analysis of changes in journey times, cross-referenced with the stated destinations of survey respondents, suggests that those who would continue to commute from the peninsula would spend an additional **£81** on average annually, as calculated as part of the TEE analysis above. This suggests a reduction in annual levels of cumulative disposable income of **£18,200** annually.

Finally, those who would seek a local job on the peninsula are likely to take lower-paying positions. Analysis of the Annual Survey of Hours and Earnings suggests that on average, jobs on the peninsula tend to pay less (**£26,328** p.a.) than those held by ferry-using commuters in higher value sectors (**£32,173** p.a.). If the earnings of this group were to converge to the peninsular average, this would result in an annual decrease in gross earnings of approximately **£524,000**. Adjusted for tax and pension contributions, this is equivalent to a reduction in disposable income of approximately **£439,000** annually.

In total, annual cumulative disposable income on the peninsula would reduce by £457,200.

10.3.4 Multiplier Impacts

The anticipated decline in population, output, and expenditure on the peninsula would give rise to 'induced[51]' and 'indirect' contractions in economic activity. Lower demand in local sectors and reduced turnover to businesses is likely to result in job losses, further compounding the adverse impacts of not maintaining a link across the Narrows. In an area of small population, this can also create a spiralling impact – a reduction in population can in turn lead to a loss of local amenities (e.g. shops, cafes etc) and services (e.g. the primary school), which in turn creates a further incentive to leave.

The above estimates (Table 10-4) suggest that cessation of the ferry service could impact **374** peninsular residents resulting in an annual reduction of **£1.3 million**[52] in retail expenditure. The Highland retail sector requires turnover of **£97,547** to support one job on average.[53] A reduction in sector turnover of **£1.3 million** could therefore cost a further **13** retail jobs, generating an output of **£376,100** GVA every year.

10.3.5 Cumulative Impacts

The monetised impacts presented above relate to a decrease in annual output and expenditure. In the absence of intervention, these impacts are likely to persist, permanently reducing the economic activity on the peninsula. **Table 10-6** below presents the cumulative impact of this reduction in activity, associated with the loss of 106 jobs. For the purposes of this assessment, it has been assumed that ferry services cease in 2021 and impacts take five years to build up.

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[51] Induced contractions are those impacted by the reduced spend in disposable income by residents of the peninsula. Indirect contractions are those resulting from reduced business to business transactions.

[52] This consists of the cumulation of: a reduction in take home pay, reduction in retail expenditure and change in overall income

[53] Stantec analysis of resident survey, Scottish Annual Business Survey, and Business Register and Employment Survey.

Table 10-6: Cumulative Economic Impacts

	First Year of Full Impact (2029) *Undiscounted*	Over 10 years*	Over 20 years*	Over 30 years*
Direct impacts				
GVA lost to relocation	*£3.1m*	*£9.7m*	*£28.5m*	*£41.7m*
Expenditure lost to relocation	*£245,800*	*£760,400*	*£2.2m*	*£3.2m*
Disposable income lost to Increased travel costs	*£18,200*	*£56,200*	*£165,000*	*£241,300*
Disposable income lost jobs changed	*£439,000*	*£1.4m*	*£3.9m*	*£5.8m*
Multiplier impacts				
Loss of retail GVA	*£376,100*	*£1.2m*	*£3.4m*	*£5.0m*
Total	**£4.2m**	**£13.0m**	**£38.3m**	**£56.0m**

*Note: Impacts are discounted to 2021. All impacts are net additional, i.e., relative to the counterfactual.

10.4 SUMMARY OF IMPACTS

As is evident, the discontinuation of the Corran Ferry service would have a significant detrimental impact on the peninsular communities. It is also important to note that supply-chain and visitor impacts have not been included within the above EIA, as the data to support these calculations is not currently available, and as such would be additional to these impacts.

Considering the TEE analysis, the costs of upgrading the A861 and the Economic Impact Assessment, there is a strong argument for investment in the Corran Ferry service to protect the sustainability of these peninsula communities.

Routes to Investment

CORRAN NARROWS

Socio-Economic Study

11.0 ROUTES TO INVESTMENT

11.1 OVERVIEW

As noted at the outset of this report, THC will use the findings of this study to conclude the Socio-Economic Case of the Outline Business Case, selecting a preferred option to progress. At this stage, it will be necessary to more fully develop the Financial, Commercial and Management Cases, which will identify how THC will fund, procure, manage and deliver their preferred option. As part of the brief for this study, THC requested an overview of the potential routes to funding for new vessels and landside infrastructure. This chapter briefly summarises these sources of funding and the advantages and disadvantages associated with each.

11.2 VESSELS

There are various options available for procuring new tonnage, each with its own advantages and disadvantages in terms of cost, affordability, strategic control and both financial and operational risk. This section considers the particulars of these options and the advantages and disadvantages of each.

11.2.1 Public Sector Capital Funding

This option would involve the public sector (either local authority or central government) providing up-front capital funding for the purchase of the new vessels. This has been the most commonly adopted approach for purchasing vessels for subsidised or publicly owned ferry services within the UK. Funding could be provided through one or a combination of:

- direct funding through the local authority or Transport Scotland / Scottish Government capital budgets and / or
- grant funding through external schemes such as e.g., the UK Government 'Levelling-Up' Fund and / or
- prudential borrowing (local authorities and Tier 3 Regional Transport Partnerships only) and / or
- drawdown on capital reserves

The primary benefit of this approach is that the cost is internalised within the public sector and there is no ongoing cost liability or interest payments except in the case of prudential borrowing. However, the disadvantage of this approach is that the required funding must be found up-front, which could present an affordability challenge as well as questions over opportunity cost.

As a public sector example, the up-front capital funding approach is typically favoured by Transport Scotland in its procurement of new vessels to serve its relatively large ferry network, albeit other financing models have been used when the required funding has not been available or for other technical accounting or government policy reasons. However, up-front funding is much less common for a commercial ferry operator.

11.2.2 Prudential Borrowing

The advantage of using capital budgets or reserves is that all costs are covered up-front. Borrowing on the other hand removes the requirement for up-front capital but creates a long-term liability in terms of financing that borrowing (albeit one which would be partially offset by revenues from the ferry service).

The decision as to whether to fund tonnage through the capital budget / reserves or prudential borrowing would be driven by available resources and the comparative costs and benefits of each approach. For many local authorities at present, the cost of borrowing is low, and their invested reserves are generating reasonable returns, thus borrowing options represent better value for money than up-front capital funding.

Note that the Scottish Government, and by extension Transport Scotland, does not have borrowing powers and thus this option would be less likely in a 'transfer of responsibilities' situation.

11.2.3 Finance or Operating Lease

An alternative option for procuring new tonnage would be to arrange a finance or operating lease.

A **finance lease** is where a bank or other lending house would meet the up-front costs of an asset (i.e., a vessel) and then provide it to a lessee (e.g., a local authority) for an agreed period and payment schedule. Under this arrangement, the finance company would remain the legal owner of the asset, with the lessee having control over it. The two parties share the economic risks and returns in terms of any changes in the residual value of the asset at the conclusion of the contract. An **operating lease** is a similar arrangement, the main difference being that at the end of the lease, the title to the asset does not pass to the lessee and thus the residual value risk remains with the lessor. In the past, the benefit of an operating lease from the public sector perspective was that it does not appear on balance sheet and thus does not count against the Public Sector Net Cash Requirement (PSNCR – i.e. borrowing), whilst on the other side, the lessor benefits from tax concessions. However, changes in accounting standards and definitions make operating leases less attractive than they once were.

The primary benefits of a lease arrangement are:

- There is no up-front capital cost for the buyer – the bank or finance house would pay for the construction and equipping of the vessel. Placing an order following price negotiations with one or more shipyards regularly results in a lower price in comparison to 'one-shot' public sector tendering. There may also be longer-term savings associated with the private sector being in a better position to manage risk, lever economies of scale in the build process and design a vessel to maximise its long-term residual value.
- The design and build risk is taken by the private sector rather than the public sector.
- An operating lease would mean that the asset would be off-balance sheet and would thus not contribute towards the PSNCR (albeit these leases are less attractive than they once were).

The disadvantages of a lease arrangement are:

- There is a commitment of future revenue budgets to fund the lease. As the lease fee will be based on commercial interest rates, this approach could be more expensive in the long-run compared to lower cost prudential borrowing (although this advantage is reduced by the private sector driving efficiencies in risk management - minimising the purchase price whilst maximising the residual value - and levering its economies of scale).
- With an operating lease, the local authority would never own the vessel and the lease period would need to be limited to ensure the company financing the vessel is taking a genuine residual value risk
- Whilst a more subjective point, lease arrangements of this nature can attract negative publicity as private shareholders are seen to benefit at the expense of the public purse, irrespective of whether this is the case or not. For example, Scottish Ministers have been questioned in Parliament on several occasions about the lease used to fund the new Stornoway – Ullapool ferry MV *Loch Seaforth* despite Audit Scotland not identifying any concerns with the procurement approach used.[54]

11.2.4 Shipbuilder Financing

Under this option, a shipyard would pay for the cost of a new vessel and then rent it to the operator for a lengthy period.

The key advantages of this approach are:

- As with a finance or operating lease, the up-front cost of the vessel is covered, in this case by the shipbuilder. In addition, it is in the interest of the shipyard to ensure a high-quality build as they retain liability for any future issues with the vessel.
- At the end of the lease period, there is flexibility as to whether the vessel is purchased, leased for a longer period or permitted to go off-hire and replaced with a new vessel

The disadvantages are similar to those of a finance or operating lease.

11.2.5 Tendering

The final procurement option is for the ultimate procuring party to wrap-up the procurement of a new vessel within a wider tendering of the service. Under this option, the procuring body would invite bidders to operate a clearly defined service specification and task them with identifying their own vessels to deliver this service, albeit within agreed parameters defined in the tender (e.g., capacity, speed, fuel type etc).

The primary advantages of this approach are:

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[54] https://www.theyworkforyou.com/sp/?id=2018-09-06.6.0&s=speaker%3A25496

- There would be no up-front capital cost, rather the cost of a new vessel would be recovered over the contract period. Indeed, it is possible that a bidder could bring existing vessels to operate the service, thus reducing the vessel charge element of the tender (although it is acknowledged that this is unlikely given the specific operating conditions at Corran).
- The incoming operator would likely have experience in procuring and managing the build of vessels and may thus be better placed to manage the risks associated with this. They may also bring innovative approaches to operating the service.

The primary disadvantages of this option are:

- A contract of at least 10 years, and likely 12-15 years, would likely be required for a bidder to fully recover the cost of their vessel(s). Whilst there are several ferry service contracts of this duration around Europe at present, the length of contract could be open to challenge.
- At the end of the contract period, there is a risk that if the incumbent operator was to lose the next tender, they would remove the vessel from the route. Whilst in theory an alternative bidder could bring a new vessel, there is a risk of service disruption during any transition period, or more likely no other bids would be received given that the incumbent has an appropriate vessel which would be heavily written down (i.e., a *de facto* monopoly). A transfer of assets clause is a possibility but this may be considered discriminatory if it prevents other operators bringing their own vessel.
- In the event that the incumbent operator went bust, arrangements would be required for an operator of last resort, which would need to have plans in place to take control of the vessel and the financial liabilities associated with it.

It should be noted that THC recently undertook a market testing exercise to gauge interest in operating the service through the issue of a Prior Information Notice. Following this exercise, THC chose not to progress with the tendering option and thus it is unlikely that this model would be used for funding new assets.

11.3 LANDSIDE INFRASTRUCTURE

It is highly likely that the investment in landside infrastructure will be funded by the public sector (in its widest sense) and thus the question is the form which that funding will take. There are three main options, each of which could be pursued on its own, or in combination with another option (i.e., they are not mutually exclusive). These options are listed below and explained thereafter:

- public sector capital funding
- Transport Scotland Ports and Harbours Scheme
- increased harbour access charges

11.3.1 Public Sector Capital Funding

This option would involve the public sector (either local authority or central government) providing up-front capital funding for the purchase of the new infrastructure. Funding could be provided through one or a combination of:

- direct funding through the local authority or Transport Scotland capital budgets
- grant funding through external schemes
- prudential borrowing (local authorities and Tier 3 Regional Transport Partnerships only)
- drawdown on capital reserves.

The advantages, disadvantages and key considerations are the same as those for the procurement of new vessels.

11.3.2 Transport Scotland Ports and Harbours Scheme Funding

The Scottish Government runs the Transport Scotland Ports and Harbours Scheme, which allows local authorities, trusts and commercial organisations to make an application for grant funding. Grant funding made by Transport Scotland will be at an 'intervention rate', with the applicant contributing the balance. The intervention rate is based on the value of the project involved, typically 80% payable by grant with the applicant contributing 20%.

There are a range of key requirements and principles underpinning this scheme, with any application having to be supported by an appropriate business case.[55] Whilst this an attractive model from a cost perspective, there is significant competition for central government funding.

11.3.3 Increased Harbour Access Charges

The final option would be to fund the infrastructure through increasing the harbour access charges paid by ferry operators for use of the infrastructure. However, as almost all local authority services involve a publicly owned ferry operator calling at publicly owned infrastructure, this would be a zero-sum game. It would only be a practical option in the event of a transfer for services to Transport Scotland, whereby the local authority would effectively be levying dues on central government to pay for infrastructure, as happens on the CHFS network at e.g. Port Askaig, Craignure, Lochmaddy etc.

Any funding through this avenue could, based on the stated principles of a transfer of responsibilities, be deducted from the block grant received by the local authority.

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[55] https://www.transport.gov.scot/public-transport/ferries/infrastructure-projects/#60717

11.4 NEXT STEPS

Identification of the preferred funding option(s) for new infrastructure at Corran will be determined in the Financial, Commercial and Management Cases, set within the context of the both the preferred procurement approach and the management and delivery strategy for the project overall.

Appendices

CORRAN NARROWS

Socio-Economic Study

12.0 APPENDIX A

A.1 Peninsula Resident Context

12.1.1 Socio-Economic Context

12.1.1.1 Demographics

In 2019, the total population of the five peninsula Community Council areas was **2,177**[56], accounting for **12%** of the overall wider study area population and **1%** of the total Highland local authority area population. The population is split almost evenly across the peninsula with the Acharacle and West Ardnamurchan populations totalling 1,101 and Morvern, Sunart and Ardgour the remaining 1,076.

Over the four-year period between 2015 and 2019, the peninsula experienced a **4% growth in population**[57]. Looking at the CAGR[58] values for each of the five peninsula communities, Acharacle witnessed a rate of **0.2%,** Morvern, Sunart and Ardgour a combined rate of **1.1%** and West Ardnamurchan a rate of **1.7%.** Over this same period, the study area as a whole witnessed an equivalent CAGR of **0.1%,** while Highland and Scotland experienced a CAGR of **0.2%** and **0.4%** respectively.

From the Experian data forecasts, the population across the peninsula, is expected, on average, to grow by a further **1.1%** between 2019 and 2024.

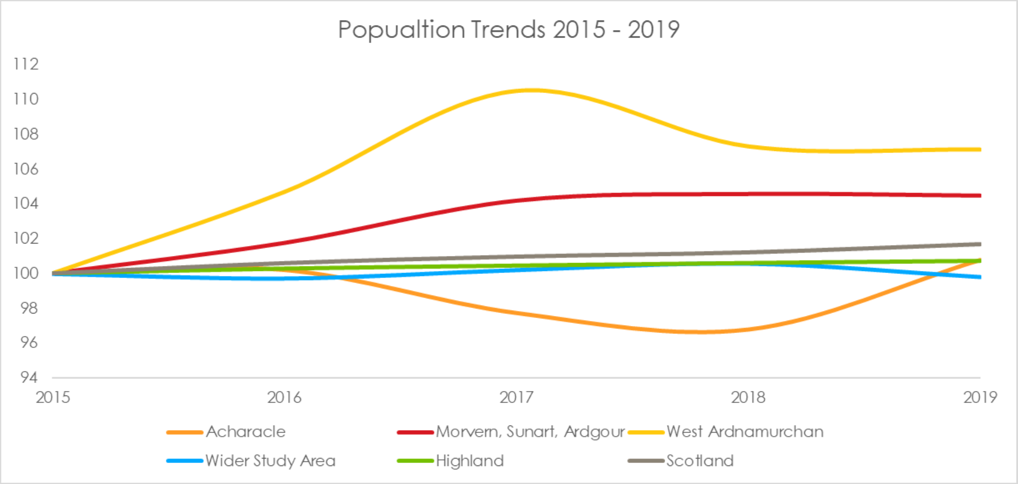

Figure 12-1: Population Trends 2015-2019 (Source: National Records of Scotland, 2021)

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56 2019 Mid-Year Population Statistics, National Records of Scotland 2021
57 2021 Experian Mosaic Data via CoStar
58 Compound Annual Growth Rate

In terms of the age categorisation of the current population, **59%** of the peninsula population falls into the working age category (16-65), **16%** in the Under 16s and **25%** in the over 65s. While the population has grown since 2015, most of this growth falls in the over **65s category**, which could point towards a trend of in-migration of retirees to the peninsula. Acharacle in particular has witnessed a **20.8%** increase in the over 65 age bracket.

Conversely, West Ardnamurchan has witnessed a reduction in the over 65s, and an increase in the under 16s and working age brackets.

The average age of the peninsula population in 2019 was **49**, while the population forecasts to 2024, predict this average age will increase to **50** as a result of the current underlying population trends.

In terms of the total dependency ratio[59] there are **70 dependents for every 100 people of working age** on the peninsula. This figure is higher than the wider study area ratio of 62 dependents for every 100, the Highland Council value of 64 dependents to every 100 of working age, and the Scottish national figure of 56 dependents to every 100 of working age.

***Voice of the Customer Survey*: Resident Insight**

- **22% (n = 55)** of peninsula-based responses were from the over 65s category
- In total, **77% (n = 199)** of responses from peninsula-based residents could be categorised within the working age category (16-64)

[59] The proportion of the population not in the work-force who are ‘dependent’ on those of working-age. One of the obvious limitations of dependency ratios is the assumption that people under 16 years and over 65 years (65+) are outside of the labour force, as well as the assumption that those aged 16-64 are participating in the labour force.

12.1.1.2 Housing

In 2019, there were approximately **1,300** homes on the peninsula, with an average household size of **2.1**[60]. In terms of property prices, **53%** of properties are valued under £200,000, **46%** of properties between £201,000 and £500,000 and **1%** of properties valued over £501,000.

Compared to the wider study area, on average, property values are higher on the peninsula, while the composition of those households remain comparable at 2.1 on average.

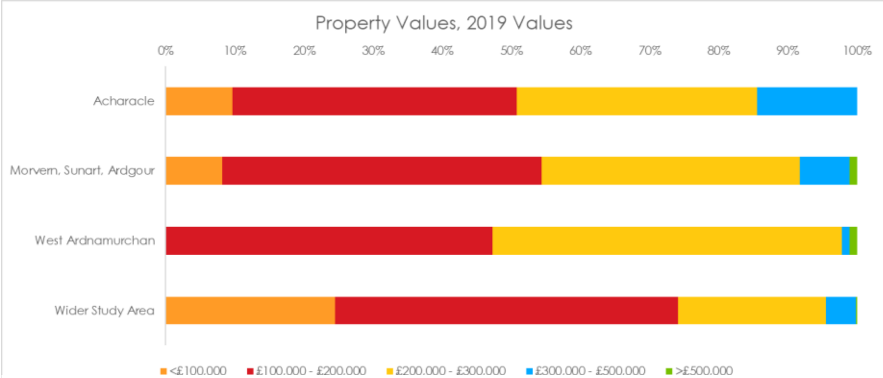

Figure 12-2: Property Values, 2019 Prices (Source: Experian Mosaic 2021)

***Voice of the Customer Survey*: Resident Insight**

- **42% (n = 107)** of responses were from 2 Adult Households
- A further **21% (n = 53)** were from small family households (2 Adults + 2 Children)

12.1.1.3 Economic

Based on the 2019 employment figures from the Business Register and Employment Survey (BRES)[61], the top three employment sectors within the peninsula are; (i) **Accommodation and food services**, (ii) **Transport and storage (inc postal)** and (iii) **Education**, accounting for **49%** of all employment.

Between 2015 and 2019, the largest growth sector on the peninsula was in Transport and storage (inc postal), followed closely by Accommodation and food services. Conversely, the sector to see the largest decrease in jobs was the Arts, entertainment and other services sector.

In terms of income, analysis of average Gross Household Income[62] indicates that peninsula-based residents earn on average **£21** less than the wider study area average at **£532**. Disaggregating the data down into the five community areas, residents of Morvern, Sunart and Ardgour earn on average **3%** more than the wider study area average, while both Acharacle and West Ardnamurchan earn **12%** and **3%** less than the wider study area average, respectively.

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[60] 2021 Experian Mosaic via CoStar
[61] NOMIS 2021
[62] Experian Mosaic via CoStar 2021

Often used as an indicator of economic wealth, car ownership can provide several insights. **33%** of households on the peninsula have at least two cars, compared to an average of **28%** of households across the wider study area. Just **12%** of properties own no cars, which is **5%** lower than the wider study area.

***Voice of the Customer Survey*: Resident Insight**

- **87% (n = 185)** of those in the working age category are employed, either full-time, part-time, or self-employed
- Four sectors account for **56% (n = 103)** of employment on the peninsula; (i) ***Health 15% (n = 28),*** (ii) ***Education 14% (n = 26)***, (iii) ***Accommodation and Food Services 15% (n = 27)*** and (iv) ***Agriculture, Forestry and Fishing 12% (n = 22)***.
- **19% (n = 35)** of respondents earn less than £20k a year, **46% (n = 84)** earn between £20k and £50k a year and **20% (n = 37)** earn more than £50k a year

12.1.1.4 Social Factors

No areas within the peninsula sit within the Scottish Index of Multiple Deprivation (SIMD) and most communities display favourable characteristics against the nine indices. Acharacle, however, although the data does not highlight any immediate concerns, does highlight a lower level of performance against both the employment and incomes indicators, as alluded to in the statistics above.

The number of residents claiming benefits on the peninsula accounts for approximately **11%** of the total claimant count in the wider study area.

12.1.2 Use of the Corran Ferry Context

Resident based responses were extracted from the Resident and Visitor *Voice of the Customer Survey* to inform the study of the current resident behaviours and attitude towards the Corran Ferry service. In total **256** responses were received from residents of the peninsula, accounting for **50%** of all responses to the survey.

From the analysis of the responses the general profiles and travel behaviours related to the use of the Corran Ferry by residents of the peninsula are summarised below. Note, questions were prefaced with the instruction for responses to be framed in the context of **Pre-COVID**, i.e. 2019.

12.1.2.1 Purpose

Residents were asked what their **main purpose** for using the ferry service was, and subsequently what other purposes they used the ferry for:

MAIN PURPOSE:

- **55% (n = 140)** of responses indicated Shopping as the main purpose for travel on the ferry
- A further **23% (n = 60)** indicated commuting purposes
- **8% (n = 21)** indicated travelling for employers' business

OTHER PURPOSE:

- This was a multiple selection question and the two most popular choices selected by **155** and **154** respondents were **Visiting Friends/Relatives** and **Health Appointment** respectively.
- **Social / Entertainment** and **Shopping** were the next most selected options at **126** and **122** respectively.

12.1.2.2 Destination

In using the ferry for their main purpose, residents were asked to indicate where their **main destination** was located for that purpose:

- **77% (n = 198)** of responses indicated Fort William as their main destination
- A further **9% (n = 23)** indicated another destination out with the study area using the A82 South
- **2% (n = 6)** stated another destination out with the study area using the A82 North
- The remaining **12% (n = 29)** of responses were spread widely across the other community council areas within the study area

12.1.2.3 Day of the Week, Frequency and Time

Respondents were asked to consider how frequently they used the ferry service prior to COVID19 and at what time of day they normally travelled on the ferry:

DAY OF THE WEEK:

- This question allowed for multiple answers to be selected. From the number of times a day was selected, **Thursday**, **Friday** and **Saturday** emerged as clear candidates for preferred days to travel, being selected **161**,**152** and **153** times each respectively.

- **Monday to Wednesday** displayed similar support to one another, while **Sunday** was much lower at **98** times selected.

FREQUENCY:

- **82% (n = 208)** of residents indicated that they used the ferry service at least weekly
    - **28% (n = 71)** use the ferry service twice a week
    - **19% (n = 48)** use the ferry 3-4 times a week
    - **19% (n = 48)** use the ferry once a week
    - **8% (n = 21)** use the ferry 7 times a week
    - **8% (n = 20)** use the ferry 5-6 times a week

TIME:

- **52% (n = 134)** of residents use the ferry for their outbound trip during the morning service (0900-1159)
- A further **37% (n = 95)** indicated they undertake their outbound trip during the AM Peak (0630-0859)
- In the inbound direction (home leg), **40% (n = 102)** of residents return between 1600-1859
- **32% (n = 82)** make their return journey between 1200-1559

12.1.2.4 Travel Behaviours

In a serious of questions, residents were asked to summarise how they travel with respect to mode for travelling on board the ferry, ticket type and the number of people making the journey:

- **94% (n = 241)** of responses indicated that they travel onboard the ferry by car (86% Car Driver, 8% Car Passenger)
- **92% (n = 235)** of residents use the discount book of 30 tickets
- **48% (n = 104)** of all journeys are solo journeys, i.e. travelling alone
- **19% (n = 40)** of journeys are made by two adults

12.1.2.5 Travelling out with the Study Area

Residents were also asked to indicate how frequently they used the Corran Ferry as part of their journey to areas out with the general study area:

A82 NORTH:

- **21% (n = 53)** of responses indicated that they travel North on the A82 at least weekly
- A further **36% (n = 94)** of residents undertake this journey at least monthly

A82 SOUTH:

- **13% (n = 32)** of residents travel south on the A82 at least weekly
- **48% (n = 121)** undertake this journey at least monthly

A86 EAST

- **33% (n = 84)** of residents indicated that they do not travel east on the A86
- A further **33% (n = 84)** indicated that they undertake this journey less often than every 3 months

MALLAIG FERRIES

- **68% (n = 173)** of residents do not use the Corran Ferry as part of their journey to connect with Mallaig ferries

MULL FERRIES

- **59% (n = 151)** of residents do not use the Corran Ferry as part of their journey to Mull

12.1.2.6 Queuing and Disruption

With a view to understanding any capacity issues and impacts of any disruption to the service on residents, respondents were asked about their ability to board the first ferry that arrived during specific times in the year and what behaviours they undertook when the ferry is off:

QUEUING:

- **Outbound:**

    - **46% (n = 119)** of residents indicated that during June–August, they sometimes have to wait on a later ferry
    - **57% (n = 145)** stated that during April-May and September-October, that they can always or nearly always board the first ferry
    - **87% (n = 223)** stated that they can always or nearly always board the first ferry during November-March
    - **42% (n = 107)** indicated that when the MV *Maid of Glencoul* is operating that they have to sometimes wait on a later ferry
- **Inbound:**
    - **50% (n = 129)** of residents indicated that during June–August, they sometimes have to wait on a later ferry
    - **44% (n = 113)** stated that during April-May and September-October, that they can always or nearly always board the first ferry
    - **80% (n = 205)** stated that they can always or nearly always board the first ferry during November-March
    - **45% (n = 115)** indicated that when the MV *Maid of Glencoul* is operating that they have to sometimes wait on a later ferry

DISRUPTION:

- If the Corran Ferry service is disrupted, **36% (n = 122)** of residents indicated that they still undertake their journey but drive instead using the A861|A830 via Drumsallie
- **23% (n = 89)** of residents indicated that they would still make the journey but drive using the A861|A830 via Lochailort
- **9% (n = 67)** indicated that they would not make the journey at all
- A further **8% (n = 52)** indicated that they would wait until the service resumes
- The remaining **23% (n = 89)** was spread across various connotations of the options, such as either sometimes not making the journey or still make the journey but drive instead, or drive via an alternative route to that suggested in the survey

13.0 APPENDIX B

A.2 Peninsula Business Context

13.1.1 Accommodation Provider Businesses

13.1.1.1 Business Profiles

Seven businesses based on the peninsula responded to the survey. Four responses were from those who own self-catering accommodation (houses / cottages), two responses from Bed and Breakfast providers and one response from a hotel. Five of these businesses are well established, having been operating for longer than six years (three businesses for 6-10 years, and two businesses for 11-20 years).

13.1.1.2 Employment

All seven businesses hire locally, with all employees based on the peninsula. Based on the number of employees employed by each of these seven businesses, they are classed as small enterprises (under 50 employees). Four businesses hire between 1-9 full-time employees, five hires between 1-9 part-time employees and three hire 1-9 seasonal employees.

13.1.1.3 Turnover and Growth

In terms of turnover six of the businesses turn over less than £85,000 a year and one turns over between £250,000 and £500,000 a year. When asked to indicate their level of expected growth over the next five years, four businesses expected to witness no change in that time period. A further two expected to experience some minor growth, while one expected to see moderate growth over this time period. It is notable that, despite the circumstances, there is local optimism on market conditions.

13.1.1.4 Business Use of the Corran Ferry

Five businesses use the Corran Ferry weekly, while the other two businesses indicated that they use the ferry service at least monthly. The most common use of the ferry was to obtain supplies with five businesses stating this practice. Two businesses highlighted the use of the ferry to partake in shopping for their businesses (not supplies) travelling to Fort William to do so.

Four businesses indicated that they currently do not experience any issues with the current Corran Ferry service offering, while the other three did indicate an issue. All three were in agreement and felt that fares were unsustainable and too high for such a short crossing. One business in particular felt that motorhomes were being unfairly penalised by being charged more than like-sized vans, as they bring business to the area even if they are not paying for accommodation in some circumstances.

13.1.1.5 Disruption Impact

All seven businesses agreed that, when the Corran Ferry is disrupted, it has a negative impact on their business. The main concerns were the additional travel times and costs associated with the alternative road-based route, and the disruption this causes guests, especially after an already long journey.

13.1.2 Freight and Logistics Businesses

13.1.2.1 Summary

Only one freight and logistics business responded to the survey from the peninsula. This particular business has been operating for more than 20 years, with employees residing both on the peninsula and in the wider study area. The business employs between 50-249 employees (i.e. it is a small to medium enterprise, SME) on a full-time basis and between 1-9 on a part-time basis. Turnover is in the region of £5m - £10m and over the next five years they expect to see moderate growth.

In terms of business and distribution, only between 1-25% of business is peninsula based, while the remainder is split evenly between the wider Highland Council area and elsewhere in Scotland.

13.1.3 All Other Businesses

13.1.3.1 Business Profiles

Six businesses based on the peninsula responded to the ‘all other businesses’ survey. Two of these businesses are classified as retail, one is in accommodation and food services; one in the education sector; one in the arts, entertainment and activities sector; and finally one in the wholesale sector.

13.1.3.2 Employment

Three of the businesses have employees based on the peninsula, one has employees based both on the peninsula and in the wider study area, while the remaining two businesses do not employee any additional staff. In total, five businesses are classed as small enterprises employing between 1-9 employees, while one is classed as a large enterprise employing over 250 staff members.

13.1.3.3 Turnover and Growth

In relation to annual turnover, five businesses turnover less than £85,000 a year and the final business turns over £25m+ annually. Four businesses expect to experience varying degrees of growth over the next five years, while two business expect to experience minor shrinkage.

13.1.3.4 Business Use of the Corran Ferry

In terms of their use of the Corran Ferry service, two businesses indicated they use the ferry on a daily basis, three indicated weekly use of the ferry while the remaining businesses indicated they use the ferry once a month for business needs.

13.1.3.5 Disruption Impact

Only two businesses provided comment on current issues and disruption with the ferry service. Both highlighted the issue with queuing during peak times which negatively impacts their business and schedules in particular. During times of disruption to the service, both businesses feel the additional journey times to be both tiring and frustrating, especially when travelling long distances to reach the ferry slips.

14.0 APPENDIX C

A.3 Wider Study Area Resident Context

14.1.1 Socio-Economic Context

14.1.1.1 Demographics

In 2019, the total population of the wider study area was approximately **16,358**, accounting for **7%** of the total Highland local authority area population. The Fort William, Inverlochy and Torlundy Community Council area is home to the largest number of residents, accounting for **35%** of the wider study area population.

Over the four-year period between 2015 and 2019, the wider study area experienced a **-0.2%** reduction in population. Looking at the CAGR values for each of the seven communities in the wider study area, five communities experienced positive growth with two communities registered negative growth. Nether Lochaber and Kinlochleven, recorded the largest growth at **1.5%**, whilst Fort William, Inverlochy and Torlundy recorded the largest reduction at **-0.5%**. over this same time period, the wider study area witnessed an equivalent CAGR of **0%**, while Highland and Scotland experienced a CAGR of **0.2%** and **0.4%** respectively.

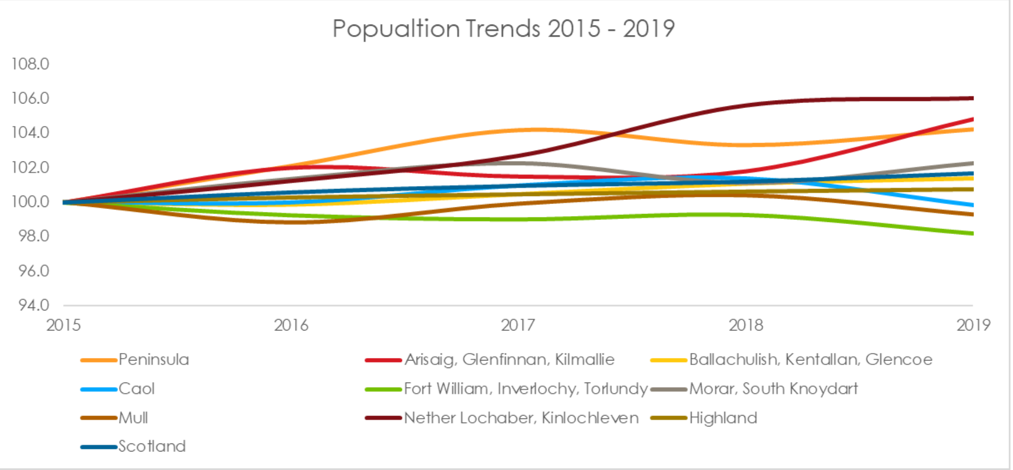


Figure 14-1: Population Trends 2015-2019 (Source: national records of Scotland, 2021)

From the Experian data forecasts, the population across the wider study area is expected, on average, to grow by a further **0.9%** between 2019 and 2024.

In terms of age categorisation of the current population, **61%** of the wider study area population falls into the working age category (16-65), **17%** in the under 16s and **22%** in the over 65s. while the population growth has stagnated, this has been the consequence of the growth in the over 65s (**3%**) offsetting the reduction in the under 16s (**-4%**). As with the peninsula communities this could be a reflection on people choosing to retire to the region. Mull has seen the largest increase in the over 65s at **7.9%**, while Arisaig, Glenfinnan and Kilmallie, witnessed a **-5.1%** decrease in over 65s.

In terms of the younger cohorts, Fort William, Inverlochy and Torlundy witnessed the largest reduction in the under 16s at **-10.7%.**

The average age of the wider study area population in 2019 was **45**, while the population forecasts to 2024, predict this average age will increase to **46** as a result of the current underlying population trend.

In terms of the total dependency ratio there are **62 dependents for every 100 people of working age** in the wider study area. This figure is lower than both the peninsula and Highland Council area values of **70** and **64** respectively, but higher than the Scottish national value of **56** dependents to every 100 of working age.

***Voice of the Customer Survey*: Resident Insight**

- **28% (n = 32)** of peninsula-based responses were from the over 65s category
- In total, **67% (n = 76)** of responses from peninsula-based residents could be categorised within the working age category (16-64)

14.1.1.2 Housing

In 2019, there were approximately **15,400** homes in the wider study area with an average household size of **2.2**. In terms of property values, **74%** of properties are valued under £200,000, **26%** between £201,000 and £500,000 and no properties are valued over £501,000.

***Voice of the Customer Survey*: Resident Insight**

- **37% (n = 42)** of responses were from 2 Adult Households
- A further **19% (n = 21)** were from small family households (2 Adults + 2 Children)

14.1.1.3 Economics

Based on the 2019 employment figures from BRES, the top three employment sectors within the wider study area are: (i) Accommodation and Food services, (ii) Health, and (iii) Retail, accounting for **44%** of all employment.

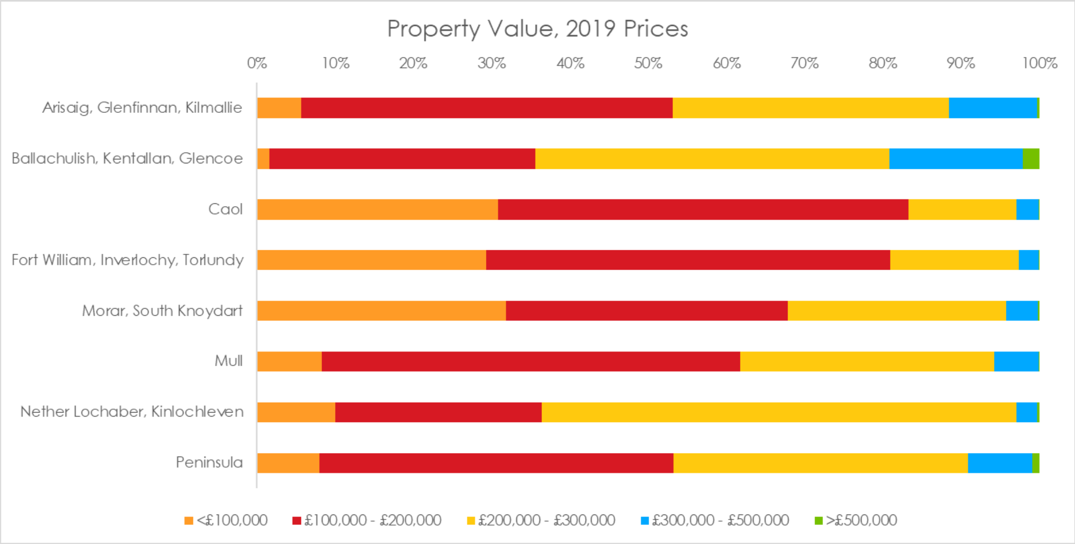


Figure 14-2: Property Values, 2019 Prices (Source: Experian Mosaic 2021)

Between 2015 and 2019, the largest growth sector in the wider study area has been the property sector, followed by agriculture, forestry and fishing. Conversely, the sector to see the largest decrease in jobs was the Wholesale and Finance sectors.

In terms of income, analysis of average Gross Household income indicates that wider study area residents earn on average **£21** more than peninsula residents. Disaggregating the data down into the seven community areas, Ballachulish, Kentallan and Glencoe, earn on average **10%** more than the wider study area average, while residents of Morar and South Knoydart earn **-16%** less.

Often used as an indicator of economic wealth, car ownership can provide several insights. **28%** of households in the wider study area have at least two cars, compared to **33%** of households on the peninsula. **17%** of properties own no cars, which is **5%** higher than the peninsula.

***Voice of the Customer Survey*: Resident Insight**

- **80% (n = 67)** of those in the working age category are employed, either full-time, part-time or self-employed
- Two sectors account for over a third (**31% (n = 21)** of employment in the wider study area; (i) ***Education 16%* (n = 11),** (ii) ***Accommodation 7 food services 15%* (n = 10)**
- **14% (n =** of respondents earn less than £20k a year, **41% (n =** earn between £20k and £50k a year and **21% (n =** earn more than £50k a year, **24% (n =** preferred not to say

14.1.1.4 Social Factors

Two areas within the wider study area sit within the 20% most deprived areas within the Scottish Index of Multiple Deprivation (SIMD). Both locations sit within Fort William, in particular around the train station and south Fort William. Both locations track poorly across all nine indices.

The number of residents claiming benefits in the wider study area accounts for approximately **6%** of the total claimant count for the Highland Council area.

14.1.2 Use of the Corran Ferry Context

14.1.2.1 Resident use of the Ferry

Resident responses from the wider study area were extracted from the Resident and Visitor *Voice of the Customer Survey* to inform the study of the current resident behaviours and attitude towards the Corran Ferry service. In total **113** responses were received from residents of the wider study area, accounting for **22%** of all responses to the survey.

From the analysis of the responses the general profiles and travel behaviours related to the use of the Corran Ferry by residents of the wider study area are summarised below. Note, questions were prefaced with the instruction for responses to be framed in the context of Pre-COVID, i.e. 2019.

14.1.2.2 Purpose

Residents were asked what their **main purpose** for using the ferry service was, and subsequently what other purposes they used the ferry for:

MAIN PURPOSE:

- **27% (n = 31)** of responses indicated Visiting Friends / Relatives
- **19% (n = 21)** of responses indicated Shopping as the main purpose for travel on the ferry
- A further **14% (n = 16)** indicated commuting purposes

OTHER PURPOSE:

- This was a multiple selection question and the top three popular choices selected were **Visiting Friends / Relatives**, **Social / Entertainment / Cultural** and **Short Holiday (1-3 Nights)**.
- Two further options which were also slightly favoured above the remaining options were **Shopping** and **Leisure / Sport / Gym**.

14.1.2.3 Destination

In using the ferry for their main purpose, residents were asked to indicate where their **main destination** was for that purpose:

- **26% (n = 29)** of responses indicated Fort William as their main destination
- A further **17% (n = 19)** indicated Ardgour, **14% (n = 16)** Sunart and **11% (n = 12)** Morvern
- The remaining responses were distributed across the other options

14.1.2.4 Day of the Week, Frequency and Time

Respondents were asked to consider who frequently they used the ferry service prior to COVID19 and at what time of day they normally travelled on the ferry:

DAY OF THE WEEK:

- This question allowed for multiple answers to be selected. From the number of times a day selected, **Friday** and **Saturday** emerged as clear candidates for preferred days to travel, being selected **73** and **69** times each respectively.
- **Monday to Thursday** displayed similar support to one another, while **Sunday** was much lower at **55** times selected.

FREQUENCY:

- **25%** of residents indicated that they used the ferry service at least weekly
  - **3% (n = 4)** use the ferry service twice a week
  - **10% (n = 11)** use the ferry 3-4 times a week
  - **5% (n = 6)** use the ferry once a week
  - **3% (n = 3)** use the ferry 7 times a week
  - **4% (n = 5)** use the ferry 5-6 times a week

TIME:

- **53% (n = 60)** of residents use the ferry for their outbound trip during the morning service (0900-1159)
- A further **22% (n = 25)** indicated they undertake their outbound trip during the AM Peak (0630-0859)
- In the inbound direction (home leg), **49% (n = 44)** of residents return between 1600-1859
- **32% (n = 36)** make their return journey between 1200-1559

14.1.2.5 Travel Behaviours

In a serious of questions, residents were asked to summarise how they travel with respect to mode for travelling on board the ferry service, ticket type used and the number of people making the journey:

- **81% (n = 82)** of responses indicated that they travel onboard the ferry by car (86% Car Driver, 8% Car Passenger)

- **58% (n = 65)** of residents purchase single tickets
- **47% (n = 43)** of all journeys are solo journeys, i.e. travelling alone
- **24% (n = 22)** of journeys are made by two adults

14.1.2.6 Travelling out with the Study Area

Residents were also asked to indicate how frequently they used the Corran Ferry as part of their journey to areas out with the general study area:

A82 NORTH:

- **47% (n = 53)** of responses indicated that they do not use the Corran Ferry as part of their journey to travel on the A82 North
- **19% (n = 22)** of responses indicated that they travel North on the A82 less often than once every three months
- **9% (n = 10)** of residents undertake this journey at least weekly

A82 SOUTH:

- **47% (n = 53)** of responses indicated that they do not use the Corran Ferry as part of their journey to travel on the A82 South
- **17% (n = 19)** of responses indicated that they travel South on the A82 less often than once every three months
- **7% (n = 8)** of residents undertake this journey at least weekly

A86 EAST

- **65% (n = 74)** of residents indicated that they do not travel east on the A86
- A further **25% (n = 28)** indicated that they undertake this journey less often than every 3 months

MALLAIG FERRIES

- **78% (n = 88)** of residents do not use the Corran Ferry as part of their journey to connect with Mallaig ferries

MULL FERRIES

- **35% (n = 39)** of residents do not use the ferry service as part of their journey to Mull
- **20% (n = 23)** use the ferry monthly to travel to Mull

14.1.2.7 Queuing and Disruption

With a view to understanding any capacity issues and impacts of any disruption to the service on residents, respondents were asked about their ability to board the first ferry that arrived during specific times in the year and what behaviours they undertook when the ferry is off:

QUEUING:

- **Outbound:**
  - **49% (n = 55)** of residents indicated that during June–August, they sometimes have to wait on a later ferry
  - **61% (n = 69)** stated that during April-May and September-October, that they can always or nearly always board the first ferry
  - **87% (n = 98)** stated that they can always or nearly always board the first ferry during November-March
  - **38% (n = 43)** indicated that when the MV *Maid of Glencoul* is operating that they have to sometimes wait on a later ferry
- **Inbound:**
  - **43% (n = 49)** of residents indicated that during June–August, they sometimes have to wait on a later ferry
  - **50% (n = 56)** stated that during April-May and September-October, that they can always or nearly always board the first ferry
  - **83% (n = 94)** stated that they can always or nearly always board the first ferry during November-March
  - **40% (n = 45)** indicated that when the MV *Maid of Glencoul* is operating that they have to sometimes wait on a later ferry

DISRUPTION:

- If the Corran Ferry service is disrupted, **34% (n = 48)** of residents indicated that they would not make the journey
- **42% (n = 60)** indicated they would still make the journey but using the road instead; **21% (n = 30)** driving via A861/A830 Drumsallie and **21% (n = 30)** driving via A861/A830 Lochailort
- A further **14% (n = 20)** indicated that they would travel via Mull Ferries instead

The resident survey helped provide significant insight to the current context for residents of the wider study area and the relationship with the Corran Ferry service. Further questions were directed at respondents and these will be used to help validate the assumptions with the Outcomes aspect of the Logic Map.

A.4 Wider Study Area Business Context

14.1.3 Business Context

14.1.3.1 Business Profiles

In total eight businesses based in the wider study area replied to the business surveys, with three businesses replying to each of the accommodation provider and other business surveys and two to the logistics survey. In terms of community council areas represented, three of the responses were from businesses located in Kilmallie, and then one business from each of the following; Arisaig, Ballchulish, Fort William, Inverlochy and Torlundy, Glencoe and Glen Etive and Mull. Seven of the businesses are well established having operated for over six years, with the one remaining accommodation based business having operated for between 0 and five years thus far.

14.1.3.2 Employment

All three accommodation-based businesses are small enterprises employing between 1-9 full-time employees, 1-9 part-time employees and with employees based either solely on the peninsula or out with the peninsula.

Both logistics-based businesses employ between 50-249 full-time employees and one also employing between 1-9 part-time employees. One of these businesses has employees that reside both on the peninsula and out with the peninsula, while the other has employees solely based out with the peninsula.

Finally, the other businesses employ a range of employees, with one employing between 50-249 full-time employees and 10-49 part-time employees, a second hiring between 10-49 full-time employees and 1-9 part-time employees, with the last employing between 1-9 full-time employees. The first two enterprises employ staff based out with the peninsula, while the last hires staff based across both the peninsula and out with the peninsula.

14.1.3.3 Turnover and Growth

Two of the accommodation provider businesses turnover less than £85,000, while one turns over between £85,000 and £249,000. Growth expectations are low for these businesses, with one indicating no growth over the next five years, while two indicated minor growth is forecast over this same period.

For the logistic based businesses, one turns over between £10m and £14.99m while the second turns over between £15m and £24.99m. There are higher expectations for growth over the next five years for these companies with one indicating an expectation of moderate growth and one forecasting significant growth.

Responses to the all other business survey highlights a range of turnover, with one business turning over each of the following; less than £85,000, between £1m and £1.99m and more than £25m. Two of these businesses expect to experience no change in terms of growth over the next five years while one expects to obtain moderate growth.

14.1.3.4 Business Use of the Corran Ferry

Two of the accommodation providers use the ferry for business use, while the third business indicated that while they do not, their guests do. Use for business is moderate, with one business using the ferry at least once a month during the peak summer season and the other using the ferry occasionally.

Both logistic businesses use the ferry for business purposes and indicated doing so on average twice daily throughout the year.

Finally, those who responded to the all other businesses survey indicated a much higher use of the ferry for business. One indicated use of the Corran Ferry every day, a second indicated six times per week and the last indicated between two and four times a week during the season and occasionally out with the season.

14.1.3.5 Disruption Impact

None of the businesses that responded to the accommodation providers survey indicated having issues with the current Corran Ferry service and when the service is disrupted, there was little comment other than to note the long drive around.

Just one of the logistic providers noted a current issue with the Corran Ferry related to the cost of travel and the lack of resilience if the ferry is off or at capacity, with the inability to accommodate multiple HGVs being an issue. Both businesses did provide an indication to the impacts experienced when the ferry service is disrupted, with one saying they cannot fulfil their orders to customers, while the second noted that they need to reroute via Oban instead due to the low bridge restrictions near Fort William.

Only one other business indicated a current issue with the ferry service and that is resilience and the inconvenience for staff if the ferry is off and the drive they then face as an alternative. Two businesses indicated that when the ferry is disrupted, they may have to change their plans/schedules to accommodate the delay associated with the road-based journey. One also indicated the increased risk to safety of travelling on the alternative single-track road.

14.1.4 Context Summary

- **Population:** Population growth in the wider study area has been stagnant. The reduction in under 16s has been offset by a similar increase in over 65s. The underlying trends point towards an ageing population, which could pose many potential issues for the future of the area.
- **Housing:** Property values are generally in the lower valuation brackets; thus housing costs may be less than on the peninsula with lower council tax and rates. Household compositions are also marginally larger than peninsula communities
- **Economics:** There is a good level of economic activity in the wider study area, with most people employed in education and accommodation and food services. Household incomes vary across the wider study area, but on average are higher than those on the peninsula.

- **Social:** Two areas fall within the 20% most deprived locations in Scotland. Both score relatively poorly across all indices
- **Ferry Use:** Most residents use the Corran Ferry service monthly, and mainly for purposes such as visiting relatives/friends. When residents do travel, they tend to take their car onboard the ferry, use single tickets and travel to Ardgour, Sunart and Morvern. 32% of residents also indicated that they would still make their journey if the ferry was off due to disruption.
- **Businesses:** Only eight responses were received across the three surveys. Responses reflected a variety of businesses of various sizes and ambitions for growth.
- **Business Use of the Ferry:** all the businesses highlighted similar issues with disruption to the Corran Ferry and the subsequent additional journey times, without a viable alternative option

15.0 APPENDIX D

A.5 Visitor / Tourist Context

139 survey responses were received from tourists / visitors and second homeowners.

15.1.1 Socio-Economic Context

DEMOGRAPHICS

- **73% (n = 101)** of respondents to the survey fall within the working age category (16-65)
- **26% (n = 36)** were over the age of 65

EMPLOYMENT

- **64% (n = 89)** of respondents were employed (38% **(n = 53)** Full-time, 11% **(n = 15)** Part-time and 15% **(n = 21)** Self-Employed)
- A further **30% (n = 42)** of respondents were retired
- In total, **81% (n = 113)** of those in the working age category are employed

INCOME

- **7% (n = 9)** of respondents earn less than £20,000 a year, **38% (n = 53)** earn between £20,000 and £50,000 a year, **23% (n = 20)** earn between £50,000 and £75,000 and finally, a further **10% (n = 14)** earn more than £100,000 a year

15.1.2 Use of the Corran Ferry Context

JOURNEY LEG

- **91% (n = 125)** of respondents indicated that they used the Corran Ferry for both legs of their journey
- Of the **9% (n = 13)** who used the ferry for only one leg, **77% (n = 10)** undertook the second leg using the road network, **15% (n = 2)** travelled via Mull and the final **8% (n = 1)** travelled as a passenger/cyclist on the Camusnagual ferry

FREQUENCY

- Only **4% (n = 6)** of respondents used the Corran Ferry for the first time as part of this journey
- **37% (n = 51)** of respondents use the ferry less often than once every three months, **16% (n = 22)** use the ferry once every 3 months, **12% (n = 17)** indicated 2-3 times a month and **12% (n = 17)** use the ferry at least once every 2 months
- **16% (n = 23)** of respondents use the ferry more frequently than monthly

ONBOARD THE FERRY

- **91% (n = 125)** of respondents indicated that they travelled onboard the ferry with their car
- **34% (n = 47)** of respondents were travelling as part of a group of two adults
- **29% (n = 40)** of respondents were travelling alone

15.1.3 Tourist Sector Context

REASON FOR VISITING

- **30% (n = 42)** of respondents indicated that they were visiting the area as part of a long holiday (4+ nights)
- A further **30% (n = 42)** indicated that they were visiting family and friends
- While **13% (n = 18)** indicated they had travelled to the area for a short holiday

AREA VISITED

- **21% (n = 29)** were staying in Morvern, **19% (n = 26)** were visiting Western Ardnamurchan, **16% (n = 22)** Sunart, **14% (n = 19)** Ardgour, **13% (n = 18)** Acharacle, **12% (n = 17)** were travelling through tot Mull and Iona
- **5% (n = 7)** indicated elsewhere within the study area outwith the peninsula

TYPE OF ACCOMMODATION USED

- **28% (n = 39)** were visiting their second home
- **22% (n = 30)** were staying in self-catering (house / cottage)

- A further **22% (n = 30)** were staying with friends / relatives

SPEND ON ACCOMMODATION

- **49% (n = 68)** of respondents indicated that they did not pay for accommodation
- **16% (n = 22)** spent up to £300 on accommodation
- **22% (n = 30)** spent between £300 and £750
- While **13% (n = 18)** indicated they spent over £750 on accommodation

OTHER SPEND IN THE REGION

- **60% (n = 83)** of respondents indicated that they had spent up to £300 on other items – such as food and activities
- **31% (n = 64)** indicated spending between £300 and £750
- While a further **9% (n = 12)** indicated they had spent over £750

16.0 APPENDIX E

17.0 APPENDIX F

Appendix D Carryings and Capacity Utilisation

D.1 What is the long-term trend in carryings?

D.1.1 Over the 21-year period since 1999, estimated car carryings[41] on the Corran Narrows have increased by **123%** (50,300 abs). This equates to a Compound Annual Growth Rate (CAGR) of **1.1%** over this period. For commercial vehicles (CVs) and buses, this growth is recorded as **145%** (3,400 abs) and a CAGR of **1.9%.**

D.1.2 The figures below illustrate the trend in annual carryings for cars and for CVs and buses for the Corran Ferry, indexed to 1999 (1999=100). For comparative purposes, the same information has been presented for the Western Ferries route between Hunter's Quay and McInroy's Point (Gourock – Dunoon)[42] to demonstrate trends on the most similar high-volume short route in Scotland, in addition to wider vehicle kms trends on Scottish roads.

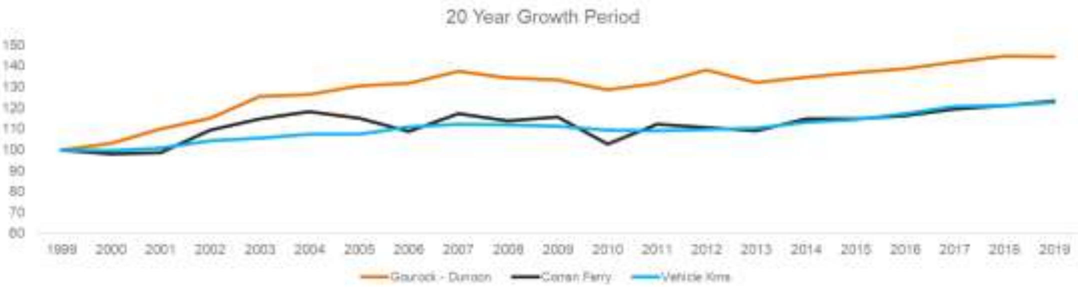


Figure D1: 20-Year Car Carrying trend (1999=100)

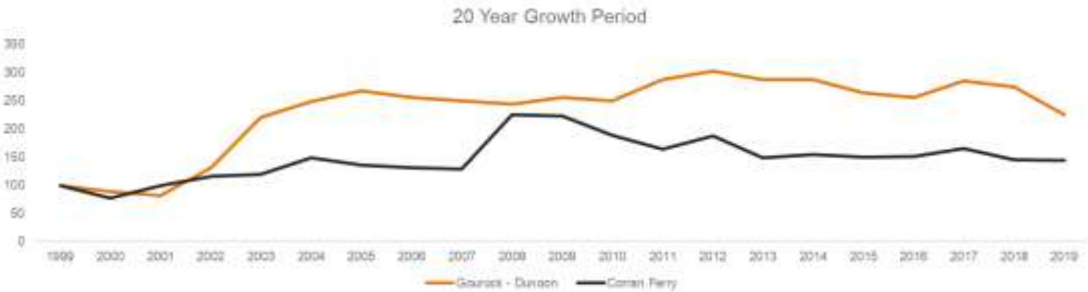


Figure D2: 20-Year CVs & Buses Carrying trend (1999=100)

D.1.3 As is evident in the car carryings chart, both routes demonstrate a slow but positive growth trend over the twenty-year period. Both routes experience an upward trajectory between 1999 and 2006, before fluctuating over the next seven years. Since 2013, both routes again have maintained slow, but positive year-on-year growth.

D.1.4 Of particular note is that the growth in car carryings on the Corran Ferry service has closely matched general traffic on all roads in Scotland. This similar rate of growth highlights the importance of a resilient and reliable link across the Corran Narrows.

[41] The Corran Ferry operates a ticket system, whereby the number of tickets required for each crossing depends on the number of axles that a vehicle has. Therefore, on any one sailing, the number of tickets can vary between one for a car to seven for a large HGV. In addition to drive up ticket sales, tickets can also be purchased in books with tickets handed in on each crossing. This adds a further layer of complexity when estimating carryings as tickets may have been sold in the months prior to being used onboard..

[42] Two vessel service operating a 20 minute crossing between Gourock and Dunoon, providing links between the central belt of Scotland with the Cowal peninsula and beyond.

D.1.5 In terms of CVs and buses, as is often common with this type of carryings data, the trend profiles are volatile. This is due to the fluctuations in supply and demand associated with the movement of goods for e.g., one-off construction projects, in addition to bus tours driven by the tourist market.

Implications for this OBC: While other ferry services across the CHFS network demonstrate growth in ferry carryings above that of vehicle kms on the road network, this is normally an outcome of factors such as RET. The fact that the Corran Ferry carryings growth reflects that of the national vehicle kms highlights the continued importance of the link to both local residents and visitors to the area, who treat the crossing equivalent to a ‘road’ link.

D.2 How is the service currently operating?

D.2.1 The current timetable provides for **67** single crossings per day (Monday-Saturday), consisting of 34 crossings from Corran and 33 from Ardgour, with the vessel overnighting in Ardgour. On Sundays this reduces to **53** scheduled crossings, with 27 from Corran and 26 from Ardgour.

D.2.2 The frequent service across the Narrows (timetabled every 20 minutes during peak periods and every 30 minutes outwith this) does provide significant total capacity across the day (around 1,876 vehicles in total). However, there are periods where the number of vehicles awaiting carriage exceeds available capacity. When such a situation arises, **the service will operate in ‘shuttle’ mode**, departing from the timetable to clear the backlog.

D.2.3 There are no fixed criteria for switching the service into shuttle mode, and the decision rests entirely with the Master. Factors which may influence this decision include weather conditions and tidal streams, the length of the queue at either end, whether there are any service vehicles / buses waiting to cross, and proximity to the next scheduled departure.

D.2.4 The table below sets out the average number of shuttles by day by month across 2017, the most recent year for which comprehensive data are available.[43]

[43] More contemporary data are not available as an accurate record is not maintained

Table D1: Recorded Shuttling 2017

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Average
January	3	2	4	1	12	0	0	*3*
February	6	5	4	6	10	1	0	*5*
March	9	8	7	5	8	2	4	*6*
April	20	7	12	15	15	11	4	*12*
May	16	14	14	14	24	11	3	*14*
June	11	12	12	17	18	18	2	*13*
July	16	11	9	12	17	19	2	*12*
August	16	14	14	17	24	20	4	*16*
September	10	14	8	19	18	11	2	*12*
October	16	11	7	8	22	20	8	*13*
November	27	27	29	29	36	17	16	*26*
December	20	17	12	21	18	8	3	*14*

D.2.5 Key points to note from the above figures include:

- The number of shuttles increases significantly when MV *Maid of Glencoul* is in operation due to her lower vehicle carrying capacity (November / December).
- Fridays tend to the busiest days across the week and as such record the largest number of shuttles, particularly in summer.
- Saturdays also demonstrate an increased demand for shuttle mode.
- On average, 18% more crossings than timetabled are operated each month.

D.2.6 The shuttling that occurs on the Corran Ferry service has implications for the future viability of the service if it continues to persist or increase. The additional number of sailings over and above the timetabled sailings requires additional fuel, which is an added expense, in addition to having a negative contribution to targeted reductions in emissions. From a human resource perspective, these additional sailings also apply further pressures / stress on the existing crew which cannot continue to persist under the current crewing model.

D.3 Is capacity currently a problem?

D.3.1 To fully understand the capacity utilisation pressures on the current Corran Ferry service, a targeted data collection programme was undertaken.

D.3.2 Ideally, vehicle deck utilisation would be calculated on a sailing-by-sailing basis across a defined period. However, in the case of the Corran Ferry, the number of vehicles on each sailing is not recorded[44]. Recognising this gap in the data, a two-day count was undertaken in **August 2021** (Friday 27th and Saturday 28th), across the bank holiday weekend to determine peak loadings.

D.3.3 As this was a bank holiday weekend, it was intended that this would provide a reasonable worst-case scenario, to demonstrate how the service operates during periods of intense demand. This two-day count was also supplemented with a 28-day Automatic Traffic Count (ATC), with loops installed at the top of the slipway at the Corran end of the crossing, covering the period between 27th August and 23rd of September 2021.

[44] Ticket sales are used as a proxy for calculating carryings

D.3.4 The following section briefly summarises the findings from the analysis of the data collected during the survey period and the implications for current capacity utilisation. It does have to be borne in mind throughout that this is the absolute peak use of the service rather than the average of even the median.

Two Day Manual Count

D.3.5 This section summarises the manual two-day count. Vehicle numbers are presented in Passenger Car Units (PCUs)[45].

- Shuttling was evident on both survey days, with **85** crossings undertaken on the Friday and **81** on the Saturday which is **+18** and **+14** more crossings than timetabled.
- Carryings on Friday (1,617 PCUS) were **27%** higher than Saturday (1,276 PCUs).
- On both days carryings were higher **travelling to Corran** (eastbound).
- With regards to vessel deck capacity / utilisation:
  - Corran - Ardgour: On Friday utilisation reached **64%** of the overall total capacity that day (including shuttles), which would have reached **81%** if based on **total timetabled capacity only**. Considering the same capacity levels, on Saturday, these figures reached **53%** of total daily capacity and **64%** of total daily timetabled capacity.
  - Ardgour - Corran: On Friday utilisation reached **72%** of overall total daily capacity and 91% of the total timetabled capacity. Saturday witnessed levels of **60%** and **72%** respectively.
- There was evidence of short-shipped vehicles on both days. On Friday, **3%** of all vehicles were short-shipped in the Corran-Ardgour direction, with this number increasing to **9%** on Saturday. In the opposite direction, on Friday **47%** of all vehicles could not get on their first sailing travelling from Ardgour-Corran, which dropped to **9%** on Saturday.
- Overall, **46%** of total sailings on Friday resulted in vehicles being short-shipped and **33%** of all sailings on Saturday.
- Short-shipped vehicles added capacity pressures to marshalling areas, with these areas reaching high-levels of utilisation across both days in both directions.
- From the analysis it is evident that shuttling is required during specific time periods, as most recorded shuttle services occur in blocks rather than one-off additional sailings between timetabled services.

D.3.6 From the two-day manual counts, it would appear that, in total, daily capacity is sufficient to accommodate the demand for crossing the Corran Narrows. However, what is evident, is that at **specific times of the day**, capacity is inadequate to facilitate the demand at the crossing as demonstrated by the number of vehicles short-shipped. The number of vehicles short-shipped also implies capacity issues for the marshalling areas, which then triggers the service to enter shuttle mode.

D.3.7 Although this bank holiday count can be used as a demonstration of a worst-case scenario, it does highlight that capacity utilisation can be a problem currently at peak times.

[45] PCU is a measure primarily used to assess capacity, where different vehicles are assigned a value according to the space they accommodate. For the purposes of this analysis, Cars are assigned a value of 1, Cars + trailers and Campervans/Motorhomes are assigned 1.8 and CVs and buses are assigned 5 (i.e. they accommodate the same space as 5 cars).

Marshalling Area Observations

D.3.8 As part of the data collection programme, the operation of the marshalling areas across both days was monitored. Noteworthy points from this review are as follows:

- **Corran:**
  - Queuing traffic does not always fully utilise Lanes 1 and 2.
  - Vehicles which are not using the service occasionally park in Lane 1.
  - Vehicles do not appear to queue as closely together as they could, leaving gaps which can cause backing-up out of the marshalling area.
  - Curved and relatively narrow marshalling lanes can make it harder to maintain lane discipline, particularly for larger vehicles or vehicles with trailers.
- **Ardgour:**
  - Vehicles occasionally park within Lane 1 who are not using the service.
  - Large vehicles such as HGVs queue within the 'boxed out 'area.
  - Queuing vehicles do not appear to queue as closely as they could.
  - Curved and relatively narrow marshalling lanes can make it harder to maintain lane discipline, particularly for larger vehicles or vehicles with trailers.
  - It is difficult for smaller vehicles and almost impossible possible for larger vehicles to enter the marshalling area coming from the North.

D.3.9 It is apparent from the evidence above that the marshalling areas place an additional constraint on capacity, with these areas not fully delivering the capacity they were initially designed to.

D.3.10 As these areas are unpoliced, it is difficult to manage their use and maximise the benefit from the full capacity available. The curved design is also a constraining feature to stacking capacity. Combined, these issues are likely to make the marshalling areas seem busier than they may be and so trigger shuttling from the ferry crew who are looking to mitigate the risks of traffic blocking back onto both the A82 and A861.

Automatic Traffic Counts (ATCs)

D.3.11 The ATCs provided supporting information over a longer although still limited period of time, providing the ability to undertake analysis of trends.

High-level points

- Carryings remained consistent in terms of directionality with eastbound carryings (to Corran) slightly higher than to the peninsula - reflecting the manual count data.
- There is a noticeable drop-off in carryings on a Sunday, with Sundays on average, carrying **48%** fewer vehicles than the rest of the week.
- Over the three-week period, a common trend was apparent with carryings slowly increasing towards peaks on Friday / Saturday, dropping-off on a Sunday and then repeating.
- Overall, the carryings recorded start to decrease as the end of September approached, highlighting the end of the peak summer traffic.

Data-specific points:

- **36,220** PCUs were carried in total across the 28-day period.

- On average **1,509** PCUs were carried daily (751 average Corran-Ardgour, 758 average Ardgour-Corran).
- Friday 27th August was the busiest day across those recorded, with **1,843** PCUs carried, **22% more than the average** across the survey period.
- Considering a daily timetable capacity (**1,876** PCUs [67 crossings*28 PCU capacity]), on average **80%** of this daily capacity would be utilised across this 28-day period, with a maximum of **98%** recorded on 27th August as above. Without the number of shuttles operated each day during this period, actual utilisation figures cannot be produced.

D.3.12 The ATC information demonstrates that despite the daily average carryings being a fifth lower than the bank holiday weekend Friday, they still on average utilise 80% of available daily timetabled capacity. With such a high rate of utilisation, it would be safe to assume that similar levels of shuttling occurred over this period to facilitate the movement of demand across the Narrows.

Implications for this OBC: Overall, whilst at the daily level there is sufficient capacity to accommodate the demand for crossing the Narrows, there is sufficient evidence to suggest that at **specific times of the day capacity is currently a problem**. The requirement to shuttle looks not only to be driven by capacity constraints on the vessel vehicle deck, but also in part by the **capacity of the marshalling areas**, and to a lesser degree the absence of traffic management there.

The carryings also go some way towards demonstrating the importance of resilience of the ferry service as without the provision of the crossing, **there would be a significant number of trips made on the local road network**, through Fort William and local villages on the peninsula.

D.4 Other factors impacting current capacity

Mull and Iona Traffic

D.4.1 The CFL Oban – Craignure ferry service is currently operated on a year-round basis by MV *Isle of Mull*, which is supplemented by another vessel in the summer timetable period (April to October)[46]. MV *Isle of Mull* is a closed deck vessel and therefore cannot carry certain categories of dangerous goods – so when she is operating the Oban – Craignure route on her own, goods such as fuel and fertiliser have to route via Lochaline - Fishnish and the **Corran Ferry**. The reliability of the Corran Ferry service is therefore important in meeting this island need during the winter timetable, when MV *Isle of Mull* is operating on her own.

D.4.2 Further to this, consultation and survey evidence from other studies has identified that the Corran Ferry is also used as a diversionary route for accessing Mull via Lochaline-Fishnish during disruption on the main Oban - Craignure route, or when a vehicle booking cannot be secured on that route (an increasingly common issue since the introduction of Road Equivalent Tariff on that route in 2015). Analysis of CFL carryings data between July 2017 and December 2019 confirms this. When the Oban - Craignure route was disrupted, average vehicle deck utilisation on the Lochaline-Fishnish route increased from **27%** to **33%**. Some 177 sailings during these times exceeded 85% of vehicle deck capacity, which has never occurred when the Oban-Craignure service is not affected by disruption.

D.4.3 The analysis also indicated that the Corran Ferry is more likely to be used as a diversionary route by Mull residents, rather than by mainland visitors. Analysis of the vehicle deck utilisation figures by direction during periods of disruption on the Oban - Craignure service shows that Lochaline - Fishnish utilisation only increased from **27% to 33%** on average,

[46] MV *Loch Frisa* June 2022

whereas in the opposite direction Fishnish - Lochaline this figure increased from **28% to 37%.**

D.4.4 Furthermore, consultation with CFL indicated that Mull residents often travel to Fort William to access services and shops that are not found in Oban. As such, the Corran Ferry plays a key role in providing connectivity for Mull residents to Fort William, in addition to providing a link for the main haulier on Mull to the north of Scotland.

D.5 Carryings and Capacity Utilisation update

D.5.1 From the analysis of the carryings information available, the following conclusions can be drawn:

- There has been steady **growth** in carryings year-on-year this century.
- **CV carryings**, whilst fluctuating, have increased generally, impacting on available deck space.
- Across the survey period, **the average daily capacity utilisation was 80%**, however much of this was within a concentrated period of time.
- **There are capacity issues during peak periods**, which leads to queuing on both sides of the crossing. Switching to 'shuttle mode' does prevent, in most cases, full capacity utilisation on the ferry, but this comes **at the expense of having to run an additional 18 sailings above the published timetable**.
- **Added to vehicle deck capacity issues, is the issue with the size of the marshalling areas**¸ which although reached significant utilisation levels, were only prevented from becoming oversubscribed by the additional shuttles.

D.5.2 Whilst the evidence above demonstrates that capacity is on occasions a prominent issue, there is significant uncertainty around a range of macro factors which could impact on future demand. These include:

- Longevity of the **staycation** impact, especially as international borders have reopened providing a much greater choice of holiday destinations.
- Wider **policy measures** such as the desire to reduce vehicle kilometres by 2030, which although fundamentally will not impact local travel movements, may have wider impacts on tourist movements.
- Rising **costs of living, energy prices and fuel prices**.

Appendix E SVRP Design Brief

Revision Overview:

Revision	Date	Description
0	16/09/2021	Draft
1	30/09/2021	Amendments related to CMAL comments
2	14/12/2021	Amendments related to Design C for The Highland Council as well as further updates
3	03/02/2022	Crabbing capability added under "Propulsion Concept", minor updates, document cleaned up

SVRP / Design Brief

Rev. 3 – 3-Feb-2022

Table of Contents:

Key Objectives

- Modern, state-of-the-art shuttle ferries for 150 Pax and 15, 25 and 32 cars
- Common design platform for up to three different vehicle capacity requirements
- Capability to operate from 1:8 slipways without mooring assistance
- Emission-free operation on various routes along the West Coast of Scotland by maximized use of shore-side electrical energy
- High resilience

Main Particulars

Maximum length over all	~45 – 50 m	No limitation defined yet
Maximum length between perpendiculars	~42 – 47 m	Note: Vessel design will have 2.50 m sills for accesses to spaces below Bulkhead Deck
Maximum beam (moulded)		No physical limitation defined yet
Maximum draught (moulded) - Design A, C	2.14 m	Still to be confirmed
Maximum draught (moulded) - Design B	t.b.d. m	Still to be confirmed
P.O.B.	153 – 154 pers.	150 pax plus 3 to 4 crew
Gross tonnage	~500 GT	Vessel can be over 500 GT if required to accommodate 25 or 32 cars
Design / contract speed	9.0 kn	
Service speeds	7.0 - 9.5 kn	
Main electrical supply voltage	415 / 240 VAC, 50 Hz	

Carrying Capacities

	Design A	Design B	Design C	Notes
Passengers	150 pax	150 pax	150 pax	Internal seat capacity on CATRIONA = 67 seats, plus 84 external seats
PCUs	25 PCUs	15 PCUs	32 PCUs	L = 4.50 m + 200 mm spacing x B = 1.95 m + 450 mm spacing (410 mm acceptable for Design C)
HGVs	2 HGVs	1 HGV	2 HGVs	L = 18.00 m + 600 mm spacing x B = 2.55 m
Passenger walkway clearance	min. 600 mm	min. 600 mm	min. 600 mm	Outboard of outboard PCUs
Ro-ro concept	Drive-through	Drive-through	Drive-through	

Free height on car deck	min. 5.10 m	min. 5.10 m	min. 5.30 m	Ideally no overhangs in way of car lanes, Noting that free height on CORRAN is 5.5 m
Free driving widths of ramps	min. 4.50 m	min. 4.50 m	min. 4.50 m	Separate passenger walkway on ramps may be dispensed of if weight impact is too significant

Regulatory Regime

EU Directive 2009/45 as amended by e.g.: EU Directive 2010/36 EU Directive 2016/844 EU Directive 2017/2108	EU Safety Rules and Standards for Ro-Ro Passenger Ships	
MCA MSN 1855	Domestic Passenger Ships Directive – Equivalent Standards	Including alternative equivalent Weather Criterion, dispensation from both rescue boat and helicopter winching area (subject to MCA support)
IMO Resolution A.749(18) as amended by Resolution MSC.75(69)	Intact Stability Code	see MSN 1855 for equivalent Weather Criterion
International Loadline Convention		Special consideration to be given to minimum bow height and arrangement of freeing ports.
International Tonnage Convention		
MCA MSN 1823 (Edition 2) (if relevant)	Safety Code for Passenger Ships Operating Solely in UK Categorised Waters	May be relevant for following routes: • Largs – Cumbrae • Tarbert (Loch Fyne) – Portavadie • Colintraive – Rhubodach • Nether Lochaber - Ardgour

Flag & Classification Standards

Flag	UK, home port: Glasgow (Design C: Inverness)
Class	• LR, DNV or equivalent • to be built under the special survey of the classification society • to include 'ECO' or equivalent

	• LR +100A1, Passenger / Vehicle Ferry, EU(C), +UMS, +LMC, (Hybrid Power,) EP, Green Passport, ECO

Propulsion Concept

Potential machinery configurations	Three configurations to be compared: • Fully Electric • Fully Electric with back-up diesel gensets, e.g. movable range extender (see below) • Hybrid (Serial and Parallel)	*The vessel shall be capable of providing the power for any onboard systems that are identified to require continuous support to the vessel overnight and/or not in service. Such as, but not limited to, sewage treatment plant, heating and lighting.*
Propulsor type	Cycloidal propellers or azimuth thrusters	Note: intention is to arrange four propulsors, two at either end.
Engine power	max. 749 kW "registered power"	Design C: max. 900 kW propulsion power rating!? Noting that total rating of VSP 16's on CORRAN = 2x 470 kW = 940 kW
NOx standard	IMO Tier III, if relevant at all	
Movable Range Extender (MRE)	A containerized generating set (below 375 kW) on a wheeled trailer with means for feeding the vessels main switchboard(s) through the shore connection(s).	The MRE will be used for longer travel distances to docks (up to approx. 264 n.m.) and in case where the shore power station will be out of operation.
Station-holding capability	To be evaluated	CORRAN is operated until Bft. 8 to 9

Spaces below Car Deck

Workshop space and storage	min. 8 m^2	
Propulsor rooms		One at either end, may incorporate further equipment such as (stand-alone) FW tanks
Engine room(s), battery room(s)	t.b.d.	Number and size to be defined during project

Passenger Facilities and Spaces

Passenger Lounge	75 seats	*An area should be provided within the passenger accommodation for recycling stations*
External sun deck seating	75 seats	
Internal area for stowage of luggage		Luggage racks in or in vicinity to Passenger Lounge and/or overhead shelves / lockers in the lounge *CMAL, 23/9/21: To be proposed via design. Only a small area is required. Or overhead as you would have on a plane/ train?*

External area for stowage of bicycles	min. 6 – 10 bikes	
Toilets	min. 4 pcs.	e.g., as per CATRIONA: 1x accessible WC 1x ladies toilet 1x gents toilet 1x urinal in gents toilet
Internal accessible WC	~3.0 m²	See aft end of passenger lounge on CATRIONA *CMAL, 23/9/21: This size would be acceptable – ensure 1.5m turning circle within toilet*

Working Areas, Stores & Lockers

	Min. Net Sizes*		Notes
Wheelhouse	to be proposed via design	similar to Hybrids, to be served by self-contained A/C unit	
Elec Room		CATRIONA: 7.3 m²	
Crew Dayroom		*space within the crew mess for table with seating and basic self-catering facilities incl. "crew lockers for secure storage of PPE and personal items"*	
Ship's Office	4.5 m²	CATRIONA: 3.5 m², may be combined with ticket office (see below)	
Crew Toilet incl. shower	x m²	Similar to CATRIONA	
Drying Room	1.2 m²	heated locker for crew weather gear with adequate drainage	
Crew Gangway Area	x m²	Safe crew access at overnight berths at Sun Deck level	Second access on deck level above sun deck req'd?
Ticket Office	2.2 m²	CATRIONA: 1.2 m²	
Deck Store	2.6 m²	See Mezz. Deck PS on CATRIONA, currently used as server room (or MES stowage?)	Final number and size of stores and lockers will be agreed upon considering final concept GA
Locker	1.0 m²	See vehicle deck aft PS on CATRIONA	
Deck Store	6.5 m²	See vehicle deck aft SB on CATRIONA	
Deck Store & Fire-Fighting Gear	6.5 m²	see vehicle deck fwd SB on CATRIONA	
Locker	1.0 m²	see vehicle deck fwd PS on CATRIONA	
Paint Locker	1.3 m²	see vehicle deck fwd PS on CATRIONA	
Shore Connection Space	~2.5 m²	see CATRIONA: Deck 3, Fr. 35 – 39, SB	
F.O., L.O. Bunkering &	~0.3 m²	see CATRIONA: Car Deck, Fr. 35 – 36, PS	

Sludge Discharge Station			
FW filling stations	2x pipe sockets	see CATRIONA: Car Deck, Fr. 12 & 54, SB	
Emergency Equipment Locker (2 pcs.)	760 x 665 mm	One at either ship side; MSN.1823 (Ro-Ro): one, at open deck, as high up as possible	
Mooring decks		One at each “corner”	

**CMAL, 23/9/21: Happy for these to be determined and proposed as design develops.*

Further Design Features

Life-saving equipment	t.b.d.	as per EU 2009/45 as amended
Vehicle deck loads	14 t/axle	The vehicle deck shall be designed for a minimum axle load of 14 tonnes; LHA: 14 tonnes should be used as a starting point but CalMac may see 12 tonnes as acceptable as was done for the Islay vessel
Belting	PS & SB	One set of belting to be provided on either ship side at Main Deck elevation.
Dangerous goods	Yes	Dangerous goods including but not limited to explosives, petrol oils and gases as normally transported by road, capacity for at least two HGV’s
Vehicle ramps	One at either end	• Suitable to land at 1:8 slipways • Minimized deployment and recovery time
Mooring equipment	t.b.d.	Similar to CATRIONA
Adjustable climate control?	Details?	Self-contained A/C unit serving the wheelhouse
Grey & black water	1x Sewage Treatment Plant	Vacuum-system preferred for easier pipe routing
Crew access	1x gangway davit?	

Minimum Tank Capacities

Fuel Tank(s)	~10.0 m^3	if any diesel engine(s) onboard to be sized for seven days endurance
Emergency Generator Fuel Tank	to be proposed via design	As per regulation, if any
Lub Oil Tank(s)		if any diesel engines onboard
Bilge Water Holding Tank		Hybrids: 1.8 m^3
Hydraulic Oil Storage Tank(s)		Depending on whether ro-ro equipment is operated hydraulically
Fresh Water Tank(s)		Min amount of water needed for water mist system(s)? One or two? Stand-alone or integrated?

Deadweight

	Design A	Design B	Design C	
Lightship weight growth margin	5.00 t	4.00 t	5.00 t	
Payload:				
HGVs	88.00 t	44 t	88.00 t	44 t per HGV
PCUs	15.00 t	15.00 t	27.00 t	estimated PCU capacity on top of HGV(s) at 1.7 t/PCU Design A = +9 PCUs, Design C = +16 PCUs
Passengers including luggage:	12.75 t	12.75 t	12.75 t	150 Pax a 85 kg
Crew and effects:	0.25 t	0.25 t	0.25 t	3 – 4 Crew
Stores & miscellaneous	3.00 t	3.00 t	3.00 t	Figure taken from Hybrids' Stability Manual
Bunkers & Stores:				
MGO	(~8.00 t)	(~8.00 t)	(~8.00 t)	Subject to number of diesel engine(s) onboard (if any)
MGO for emergency generator	(~0.22 t)	(~0.22 t)	(~0.22 t)	Given figures taken from Hybrids' Stability Manual
Lub oil	(~0.44 t)	(~0.44 t)	(~0.44 t)	
Hydraulic oil	t.b.d. t	t.b.d. t	t.b.d. t	
Fresh water	t.b.d. t	t.b.d. t	t.b.d. t	Amount depends on amount of water needed for water mist system(s) plus abt. 1.0 t for sanitary use
Bilge water	~1.00 t	~1.00 t	~1.00 t	
Dirty oil	(~1.00 t)	(~1.00 t)	(~1.00 t)	
Total:	**125.00 + x t**	**80.00 + x t**	**137.00 + x t**	

Primary Routes

	Distance[1]	Crossing Time	Sailing Speed[2]	Route Class	Minimum Vehicle Capacity	
1. Largs – Cumbrae	1.0 n.m.	8.5 min.	8.5 – 9.5 kn	UK Class D	25 PCUs or 2 HGVs + x PCUs	
2. Tarbert (Loch Fyne) – Portavadie	3.0 n.m.	25 min.		UK Class D	15 PCUs or 1 HGV + x PCUs	
3. Tayinloan - Gigha	2.5 n.m.	20 min.		Euro C	15 PCUs or 1 HGV + x PCUs	
4. Colintraive – Rhubodach	0.25 n.m.	5 min.	max. 6.5 kn	UK Class D	25 PCUs or 2 HGVs + x PCUs	
5. Mallaig – Armadale	5.5 n.m.	35 - 45 min.	9.0 kn	Euro C	25 PCUs or 2 HGVs + x PCUs	
6. Oban – Lismore	6.0 n.m.	50 - 55 min.	8.0 kn	Euro C	15 PCUs or 1 HGV + x PCUs	
7. Tobermory – Kilchoan	4.5 n.m.	35 min.	8.0 kn	Euro C, Euro B	15 PCUs or 1 HGV + x PCUs	
8. Nether Lochaber – Ardgour	0.4 n.m.	5 min.	6- 7 kn	UK Class D	32 PCUs or 2 HGVs + x PCUs	Tidal range = 4 – 4.5 m, prevailing wind from south, 2.5 min transit, 1 – 1.5 min manoeuvering

Primary Ports

	Berth	Overnight Berth	Notes
Largs	1:8 slipway	L-shaped pier	Three overnight berthing options
Cumbrae	1:9.38[3] slipway	-	
Tarbert (Loch Fyne)	1:7 slipway	Inner harbour	
Portavadie	1:8 slipway	-	
Tayinloan	1:8 slipway	-	
Gigha	1:8 slipway	Separate port / pier	
Colintraive	1:8 slipway	Outside of L-shaped pier	
Rhubodach	1:8 slipway	-	

[1] Feedback from visit of vessels
[2] Feedback from visit of vessels
[3] At lower end of slipway only?

Mallaig	Linkspan		*CMAL, 23/9/21: Two options of overnight berth – will provide photos*
Armadale	Linkspan	-	
Oban	1:8 slipway	North Pier - t.b.c.	Slipway is angled, overnight berth is temporary solution *CMAL, 23/9/21: North Pier is the current overnight berth until work is done at Oban (i.e. Oban Masterplan) which is a number of years away.*
Lismore	1:8 slipway	-	
Tobermory	1:8 slipway	Separate pier	
Kilchoan	1:8 slipway	-	
Nether Lochaber	1:8 slipway	Along aligning structure?	Part of future infrastructure
Ardgour	1:8 slipway		

<u>Note:</u> 300 mm under keel clearance to be provided at slipways.

Secondary Routes

	Distance[4]	Crossing Time	Sailing Speed[5]	Route Class	Minimum Vehicle Capacity
9. Iona – Fionnphort	0.8 n.m.	10 min.		Euro B	15 PCUs or 1 HGV + x PCUs
10. Claonaig – Lochranza	3.5 n.m.	25 - 30 min.	7.5 – 8.0 kn	Euro C	25 PCUs or 2 HGVs + x PCUs
11. Fishnish – Lochaline	1.8 n.m.	18 min.	8.5 kn	Euro C	25 PCUs or 2 HGVs + x PCUs
12. Sconser - Raasay	2.5 n.m.	25 min.		Euro C	25 PCUs or 2 HGVs + x PCUs

Secondary Ports

	Berth	Overnight Berth	Notes
Iona	?	?	
Fionnphort	?	?	
Claonaig	1:8 slipway	-	
Lochranza	1:8 slipway	At pier	

[4] Feedback from visit of vessels
[5] Feedback from visit of vessels

Fishnish	1:8 slipway	-	
Lochaline	1:8 slipway	At pier, north of slipway	
Sconser	?	?	
Raasay	?	?	

Note: 300 mm under keel clearance to be provided at slipways.

Appendix F Risk Register

Risks and opportunities are assessed using two criteria:

- **Inherent Impact:** What would be the impact and severity if the risk materialised?
- **Inherent Probability:** How likely is the opportunity to occur within the period stated?

To produce a risk score, a risk is first judged for its inherent impact (extreme, high, medium, low or negligible) and for its inherent probability (almost certain, likely, possible, unlikely or rare) and scored from 1 to 5, where 1 is negligible / rare and 5 is extreme / almost certain. The maximum score for a risk is 25 – i.e., an extreme impact and almost certain likelihood. The table below, developed by Liverpool John Moores University, indicates the status of risks coded in terms of a 'traffic lights system'. A score of above 12 is regarded as needing full risk management.

It should be noted that all scoring is, by its nature subjective. In addition, the scoring is relative, solely intended to demonstrate the highest risk items. Risk assessment is not an exact science and best estimates and frequent reviews are required to make such appraisals robust – indeed, the risk profile should be updated at Final Business Case stage.

Table F1: Risk Mitigation Table

Significance	Extreme	5	M	M	H	H	H
	High	4	L	M	M	H	H
	Medium	3	L	L	M	M	H
	Low	2	L	L	L	M	M
	Negligible	1	L	L	L	L	L
			1	2	3	4	**5**
			Rare	Unlikely	Possible	Likely	Almost Certain
	Likelihood						

Risks are sorted on the basis of residual risk followed by inherent risk.

Table F2: Risk Register

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
1	Financial	External funding for the project is not secured.	5	5	25	THC is working with partners including the Scottish Government and other local authorities to explore options for future ferry funding. Opportunities have also arisen to bid into UK Government funds such as the Levelling-Up Fund and Shared Prosperity Fund. However, it has to be acknowledged that all major funding sources are heavily over-subscribed, and the Scottish Government has recently reported a challenging fiscal position, which will result in a reduction in central government and local authority budgets. **Securing funding therefore remains the overwhelming risk to the project.**	5	5	25
2	Financial	Future energy prices present a risk for the cost of operating an all-electric ferry service.	5	5	25	Little can be done to mitigate against this risk beyond hedging on prices, although this would be a wider Council consideration. A potential hydropower scheme has been provided with both planning consent and a water abstraction licence, 5km west of the Corran Ferry. Subject to financing, the scheme could be operational in 2024/25. This could potentially provide locally generated renewable electricity to power the Corran Ferry. As this project is still subject to securing financing, energy prices remain a risk to the project.	5	5	25
3	Financial	All prices in this business case are based on Q2 2022 prices, adjusted for forecast inflation over the build period. However, global pressures	5	5	25	Evidenced inflation assumptions have been included in the OBC and contingency included to account for cost increases.	5	4	20

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
		mean that inflation rates are uncertain at present.				Detailed design will be undertaken ahead of the FBC. The FBC will reflect on affordability in the context of available funding and additional / alternative funding will be sought if required. All costs and allocated contingency will be regularly reviewed to the point of procurement and thereafter controlled through the project management framework.			
4	Financial	The allocated contingency of 3% by CMAL for the vessels appears low.	5	5	25	Ownership of financial risks will be determined through the ultimate procurement model adopted. However, THC may need to allocate additional contingency to protect against unexpected cost increases.	5	4	20
5	Contractual	The vessel design has been undertaken by NaValue under contract to CMAL, who own the Intellectual Property Rights. There is therefore a question over how vessel procurement will proceed and how potentially required contractual interfaces between THC and CMAL will be managed.	5	5	25	The Commercial Case sets out three broad approaches through which the new Corran tonnage could be delivered: (i) directly by THC; (ii) directly by CMAL under contract to THC; (iii) or a joint venture between the parties. All three approaches have their advantages and disadvantages. THC will open further dialogue with CMAL on potential delivery models and contractual arrangements post completion of the business case.	5	4	20
6	Financial	Shipyard encounters financial difficulties during the build process. This is a particular risk at present given uncertain energy and commodities prices.	5	4	20	It is recommended that the Council transfer this risk through: - Requesting a refund guarantee within the contract. - Applying an appropriate financial standing threshold in the PQQ. - The purchase of FD&D insurance. If the premiums for FD&D insurance	5	4	20

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
						are excessive, this risk would have to be managed by THC. It nonetheless has to be acknowledged that the current trading environment is very challenging. Shipyards will build-in cost risks to any bid, but at the same time will need to ensure that they are competitive in any tender and thus this risk will remain.			
7	Financial	Limited contractor market availability / resource.	5	4	20	The Scottish marine maintenance and construction market is buoyant due to the generational nature of maintenance and replacement work. The financial contingency included in the project is intended to account for the risk of inflated costs associated with a buoyant market.	5	3	15
8	Schedule / Timescales	General programme slippages	5	4	20	(i) THC to maintain progress on design and consenting work and update on any slippages through the governance framework; (ii) At construction stage, appointment of Vessel and Port Infrastructure Project Manager(s) and Supervisor(s) to oversee programme; (iii) potential inclusion of delay damages in tender documentation for each package of work to be considered.	5	3	15
9	Schedule / Timescales	Landside infrastructure project completion delayed once on site. This is a particular risk given current issues around the supply of construction materials.	4	4	16	Delays to marine infrastructure projects are not uncommon and the Council may wish to transfer this risk by including delay damages and / or an early delivery bonus within the contract. However, delay damages may increase the cost of the contract if bidders price in the risk, or indeed may deter firms from bidding at all. Tender acceptance involves adoption of works programme by contractors.	4	3	12

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
						In the event that delays do emerge, a contingency plan will be required to minimise disruption.			
10	Contractual	The shipyard or landside infrastructure contractor(s) do not perform as anticipated.	4	4	16	Risk partially mitigated through use of PCS procurement route. Any quality or timescale risks will be flagged by the Vessel and Port Infrastructure Project Manager(s) and Supervisor(s) and addressed through liaison with the contractor(s). The works contract(s) will require sufficient levels of insurance to indemnify the Council against any losses in the event that contractors are negligent in their duties.	4	3	12
11	Legal	Continuing use of 1:8 slipways will lead to a challenge around accessibility, which would add costs and the threat of legal action.	4	4	16	Vessel ramp access will be investigated during feasibility studies.	4	3	12
12	Technical	The use of onboard electric power for propulsion could mean service disruptions associated with a power outage and could be insufficient for moving the vessels to drydock.	5	3	15	Propulsion options and back up (mobile range extender, MRE) are being investigated through the SVRP programme and via engagement with classification society and the MCA	4	3	12
13	Contractual	Landside infrastructure design errors lead to delay or additional cost on the project.	5	4	20	The proposed infrastructure works are being developed by Wallace Stone, a highly respected marine civil engineering firm with extensive experience of working on the west coast of Scotland. The works included within this project are relatively common place and thus low risk.	5	2	10
14	Regulatory / Legal	MCA / Lloyds Register approvals.	5	4	20	Request for design changes from the regulatory authority or classification society could lead to a	5	2	10

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
						need for contract variations and a delay in the process. This risk has however already been partially addressed at outline design phase through the appointment of a respected firm of naval architects (NaValue). The risk is also low given that the proposed Corran vessels will be part of the wider CMAL-led SVRP.			
15	Financial	Landside infrastructure contractor(s) experiences financial difficulties.	5	3	15	The tendering process will include a financial standing threshold which prospective bidders must pass.	5	2	10
16	Timescales	Vessel completion is delayed.	4	4	16	Delays to new vessels are highly common and the Council may wish to transfer this risk by including delay damages and / or an early delivery bonus within the contract. However, delay damages may increase the cost of the contract and, if this is considered likely, it would have to be managed through regular progress meetings with the yard. The new vessels should be ordered as soon as possible to minimise this risk. However, a contingency plan will be required in the event that one or both of the vessels are delayed. If both vessels are delayed, the mitigating measure would the minimum required life extension of MV *Maid of Glencoul*, the extent of which would be determined at FBC stage.	3	3	9
17	Financial	There will be uncertainty on vessel costs until the market has been engaged.	4	4	16	Detailed design will be undertaken ahead of the FBC. The FBC will reflect on affordability in the context of available funding and additional / alternative funding will be sought if required. Particularly close attention to emerging vessel costs will be required, as prices are influenced	3	3	9

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
						by UK / European rather than local demand and thus are subject to considerable fluctuation It should however be noted that indicative costs for the vessels are based on the procurement of similar vessels in recent years and thus there is a baseline figure from which to work. In addition, all costs will be regularly reviewed to the point of procurement and thereafter controlled through the project management framework.			
18	Technical	Vessel(s) is not built to necessary specification	4	4	16	As the Council has limited recent experience in managing a ship build, it is strongly recommended that they transfer this risk by appointing a Vessel Project Manager and Supervisor to supervise and manage the build. Whilst this approach will have up-front costs, it significantly reduces construction risk and also likely reduces the required time for addressing 'snagging' once the build is completed. An appropriately experienced individual should also be recruited by the Council to liaise with the yard and supervisory consultants. If CMAL lead the vessel procurement process, this risk would be mitigated for THC.	3	3	9
19	People / Societal	There is insufficient resource within the Council (Members and salaried staff) to meet the multiple needs of the project.	4	4	16	Potential outsourcing of the vessel procurement to CMAL Appointment of Vessel and Port Infrastructure Project Manager(s) and Supervisor(s) to oversee the day-to-day delivery of the project.	3	3	9

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
						Appointment of a dedicated Client Project Manager to oversee the contract from the Council side.			
20	Contractual	Consent applications, land agreement and CPO may take longer than expected. The impact would be a delay in the project delivery and costs	3	4	12	Identify areas of land required, how much this is worth (opportunity gain) and what THC is willing to pay. Approach landowners to establish if they would be willing to sell land. The "preparation" of the CPO would be included in the scope of design works. The preferred option will be factored into the Local Development Plans.	3	3	9
21	People / Societal	Stakeholder conflict or disagreement over the project.	4	4	16	Council Project Manager will develop and implement a Stakeholder Management Plan, which will detail which stakeholders will be engaged, how they will be engaged and when they will be engaged. It should be noted that there has been significant stakeholder engagement to date, which has identified strong support for the project.	4	2	8
22	Contractual	The Vessel and Port Infrastructure Project Manager(s) and Supervisor(s) do not perform as anticipated.	5	3	15	Only suitably qualified and experienced consultancies to be appointed and will require to have sufficient levels of professional indemnity insurance to indemnify the Council against any losses in the event that they were negligent in their duties.	4	2	8
23	Professional	Contractor(s) and / or Vessel and Port Infrastructure Project Manager(s) and Supervisor(s) are not sufficiently competent for the scale of work.	5	3	15	Adoption of proposed procurement approach through Public Contracts Scotland will ensure the widest possible competition for the works contracts and will also establish a minimum quality threshold which will have to be met.	4	2	8

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
						Vessel and Port Infrastructure Project Manager(s) and Supervisor(s) will be selected on a similar basis, with emphasis placed on their experience in this field and knowledge of ferry infrastructure and operations on the west coast of Scotland			
24	People / Societal	Limited experience within the Council of delivering a vessel and civil engineering project package of this scale.	3	4	12	(i) Potential sub-contracting of vessel procurement and delivery to CMAL; (ii) Appointment of Vessel and Port Infrastructure Project Manager(s) and Supervisor(s) for works contracts; and (iii) appointment of a specific Client Project Manager to oversee the project.	4	2	8
25	Schedule / Timescales	Inclement weather delays on-site work.	4	2	8	This risk can only be managed rather than resolved. Note that NEC form of contract defines weather conditions for a compensation event to apply, and such circumstances are comparatively rare.	4	2	8
26	Financial	Detailed landside infrastructure design has not yet been completed and thus there remains uncertainty around costs.	3	4	12	Detailed design will be undertaken ahead of the FBC. The FBC will reflect on affordability in the context of available funding and additional / alternative funding will be sought if required. All costs will be regularly reviewed to the point of procurement and thereafter controlled through the project management framework. It should again be noted here that the landside infrastructure work which will be delivered here is relatively small scale and low risk.	2	3	6
27	Financial	Cost of obtaining marine insurance.	3	3	9	Cost of marine insurance underestimated. Accurate insurance quotations difficult to obtain without complete detail of methodologies and liabilities. Advice to be obtained from appropriate insurance brokers. Detail	3	2	6

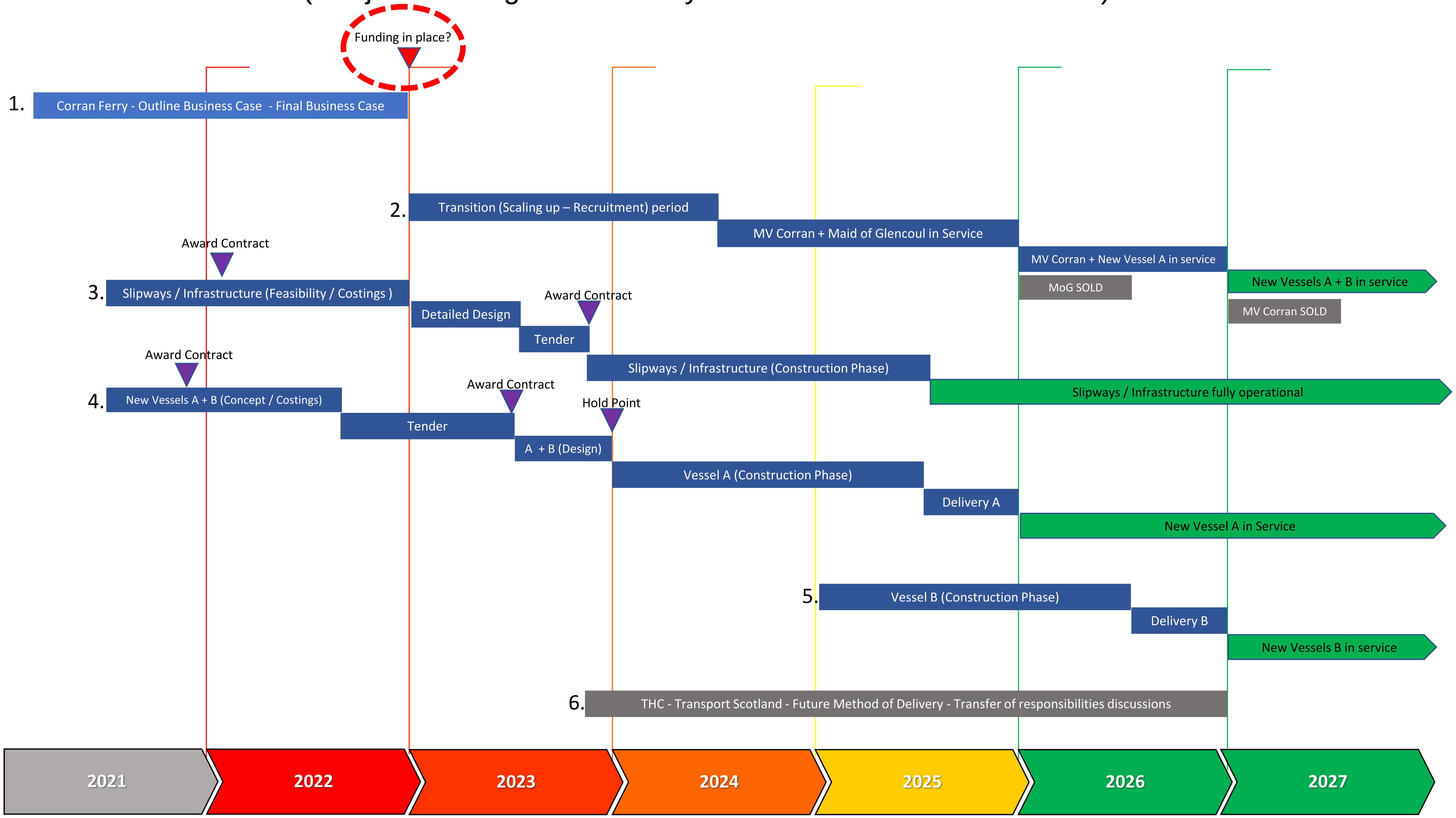
No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
						requirement for marine insurance within scope. Will be assessed in risk schedules when building up the price.			
28	Technical	Vessel design changes through process.	4	2	8	Changes to vessel design during the process can impact the critical path and lead to a request for contract variations from the yard. To mitigate this risk, governance arrangements must include a formal sign-off for the vessel design and an agreement that this will not be amended unless there are extenuating circumstances. A financial contingency should be retained for this. The above said, the purpose of the SVRP is in part to guard against this risk through establishing a common set of designs.	3	2	6
29	Health and Safety	COVID-19 related restrictions lead to project delays and / or increased cost once on-site.	5	2	10	The extensive vaccination programme has allowed for a lifting of COVID-19 restrictions and a large-scale reimposition of these restrictions appears unlikely. Moreover, COVID-19 and its impacts are now well understood and, as such, this risk should be transferred as far as practically possible.	5	1	5
30	Reputation	The Council cannot demonstrate the benefits of the investment to Members, funders or the community.	3	3	9	OBC contains a benefits realisation plan and monitoring and evaluation plan which will track the outcomes and impacts of the project. Moreover, the Corran Ferry Socio-Economic Study highlights the impacts of the 'Do Nothing'	2	2	4
31	Financial	Risk of currency fluctuations if vessel is built outwith the UK or landside infrastructure components have to be sourced from abroad.	3	3	9	Agreements as close as possible to award to guarantee quoted and entered rates. Risk contingency allowance in tender price. Early material purchase with supplier on lower rates (assuming rates increasing) will maximise margin, particularly in the current environment.	2	2	4

No.	Type	Description	Inherent Impact	Inherent Probability	Inherent Risk Score	Control Actions	Residual Impact	Residual Probability	Residual Risk Score
32	Contractual	The procurement approach for the vessel or landside infrastructure works is challenged.	4	2	8	Following PC(S)R 2015 minimises / eliminates the risk of challenge. Nonetheless, the Council should ensure that the procurement and approach and all documentation is signed-off by the in-house procurement and legal team.	3	1	3
33	Technical	The new vessel proves to be unreliable.	4	2	8	Requirement for a warranty / after sales service. There would also be benefit in retaining MV *Corran* as a short-term back-up in the event of any reliability issues with one or both of the new vessels immediately after they enter service.	3	1	3
34	Physical / Assets	Service outages during construction.	3	2	6	The new slipways will be built away from the main area of operation, so there should be minimal disruption to services.	2	1	3

Appendix G Programme

Corran Ferry High Level Programme Timeline (THC)

(Subject to budget for delivery at Final Business Case - FBC)



Appendix H Project Management Governance Policy – Construction Projects

The Highland Council
Comhairle na Gàidhealtachd

Project Management Governance Policy

Construction Projects

March 2019

www.highland.gov.uk

Introduction

The Highland Council implemented the Project Management Governance Policy in April 2016 which provides a framework for the governance of projects being managed across the Council.

However, it is recognised that construction projects are very different from other types of projects and this policy is therefore specific to construction.

Aim

This policy utilises guidance from the Scottish Government's Construction Procurement Manual which draws together key principles and procedures to be followed by those responsible for managing or delivering construction projects. The objectives of this policy are to:

- Provide Project Management governance arrangements, specific to construction projects
- Ensure consistency within all construction projects being procured and delivered within the Council
- Ensure value for money by having effective and efficient arrangements

Principles

The policy will apply, generally, to all construction projects being designed, delivered or managed within the Council. However, project procedures will be tailored accordingly to the value, size and complexity of project as outlined in the Scheme Quality Plan or determined by relevant Principal Officer.

All projects should incorporate the appropriate level of the following Project Management guiding principles:

Definition	Clearly defined project objectives including outcomes and benefits to be achieved
Accountability	Clearly defined roles and responsibilities, particularly relating to project owner and sponsor
Financial Management	Compliance with Council's Financial Regulations and Contract Standing Orders
Risk Management	Risk and issues management process, proportionate to size and complexity of project

Project categories are defined in the table below, having regard to Audit Scotland and current procurement legislation. The project size and complexity will determine a range of operational procedures which will apply.

minor	Up to £50k
medium	£50k - £2M
major	Over £2M
OJEU	OJEU level and above

The risks involved with undertaking any project can vary considerably but in determining the proportionate level of risk management, the following characteristics should be taken into account:

- lack of experience of similar projects or project delivery
- project interdependencies
- a significant impact on the public and other organisations
- business criticality and/or political sensitivity
- a significant resource commitment
- site and ground conditions
- weather sensitivity
- statutory undertakers and requirement for diversions/connections

Project Boards

A Project Board shall be established for all schemes over OJEU level. Regular Board meetings shall be held throughout the progress of the project to provide oversight and scrutiny. Appendix A provides model templates for a dashboard report, which would be provided to the Board by the Project Manager in advance of the meeting, and an agenda.

Gateway Reviews

A Gateway Review process should be followed on all projects but should be tailored to suit the size and complexity of project. For Major and OJEU projects, a formal review should be undertaken at each gateway outlined below but for minor and medium projects, agreement should be sought by the Project Manager, in conjunction with the project sponsor, as to when reviews are required. Additional gateways can be included, as agreed by the Project Manager in conjunction with the Project Sponsor and should be determined at project initiation.

A Gateway Review template is provided in Appendix B.

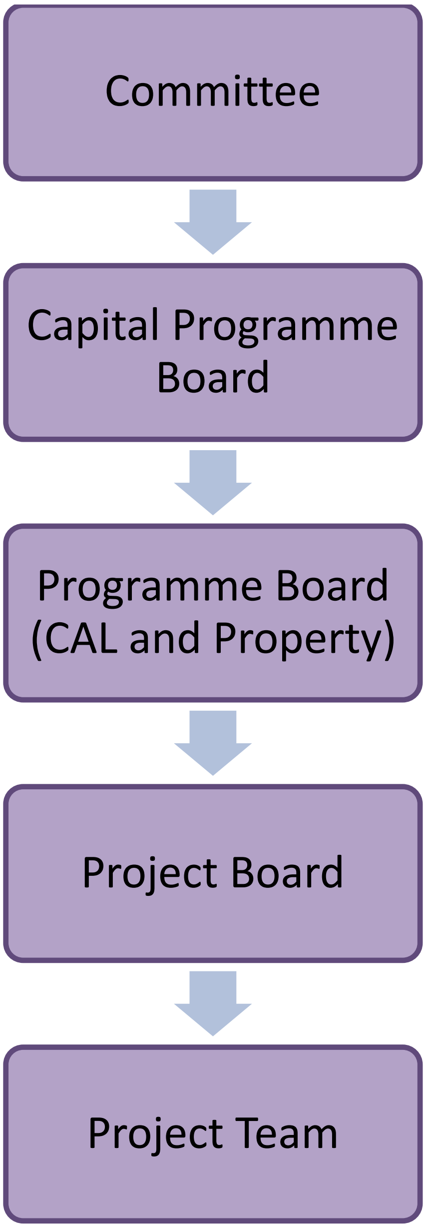
Project Stage	Types of Review
Brief preparation and project initiation	Gateway
Outline proposals and initial budget costing	Gateway
Developed Design/Pre-tender	Gateway / Lessons Learned
Construction/Handover	Lessons Learned

At each Gateway, the project should be generally examined and reported on, under some of the following headings as applicable at the time:

- Compliance with the project brief
- Assessment of the delivery approach or proposed solution
- Review of the current phase
- Programme compliance
- Adherence to budget
- Risk planning and management
- Plans for ongoing improvements or value engineering relating to Value for Money or performance
- Outstanding actions or information
- Readiness to proceed to the next phase or requirements for further review
- Health & Safety

Governance structure

Roles and responsibilities vary per project and in some cases can be combined. The diagram below provides a general governance structure for most projects. Appendix C provides an alternative structure for Care & Learning projects. The roles and responsibilities for these key posts must be clearly defined at the outset of each project with named personnel allocated to each role.



Appendix A

PROJECT BOARD AGENDA/MINUTES

Project Title: Date:	
Board Membership:	
Chair	
Board Members	
Project Manager	

Item No	Item	Action By
1	**Introductions and Apologies**	
2	**Minutes of previous meeting/Actions arising**	
3	**Compliance with Requirements/Standards**	
4	**Land/Interface with other organisations**	
5	**Statutory Approvals/Consents**	
6	**Progress and Programme**	
7	**Budget and Change Approvals**	
8	**Risks and Issues**	
9	**Health and Safety**	
10	**AOB**	

Project Title – Dashboard Report					
Author:		Issue Date:		File reference:	

Management Summary

Summary	Project Status	Approved Programme (Completion Date)	Approved Construction Budget	Anticipated Final Construction Costs	Risks	Issues
This report						
Last Report						

1. Executive Summary

2. Key Decision or actions required in next period

3. Key actions undertaken in this reporting period

4. Summary of Key Milestones

Item Ref	Completion of Milestone	Baseline	Target	Actual	Variance	RAG Status	Explanation
1							
2							
3							

5. Programme Summary

6. Cashflow: Actual against forecast

7. Summary of costs against Budget

8. Project Risk

ID	Description:	Mitigation:	RAG Status	Risk Owner
01				
02				

9. Project Issues

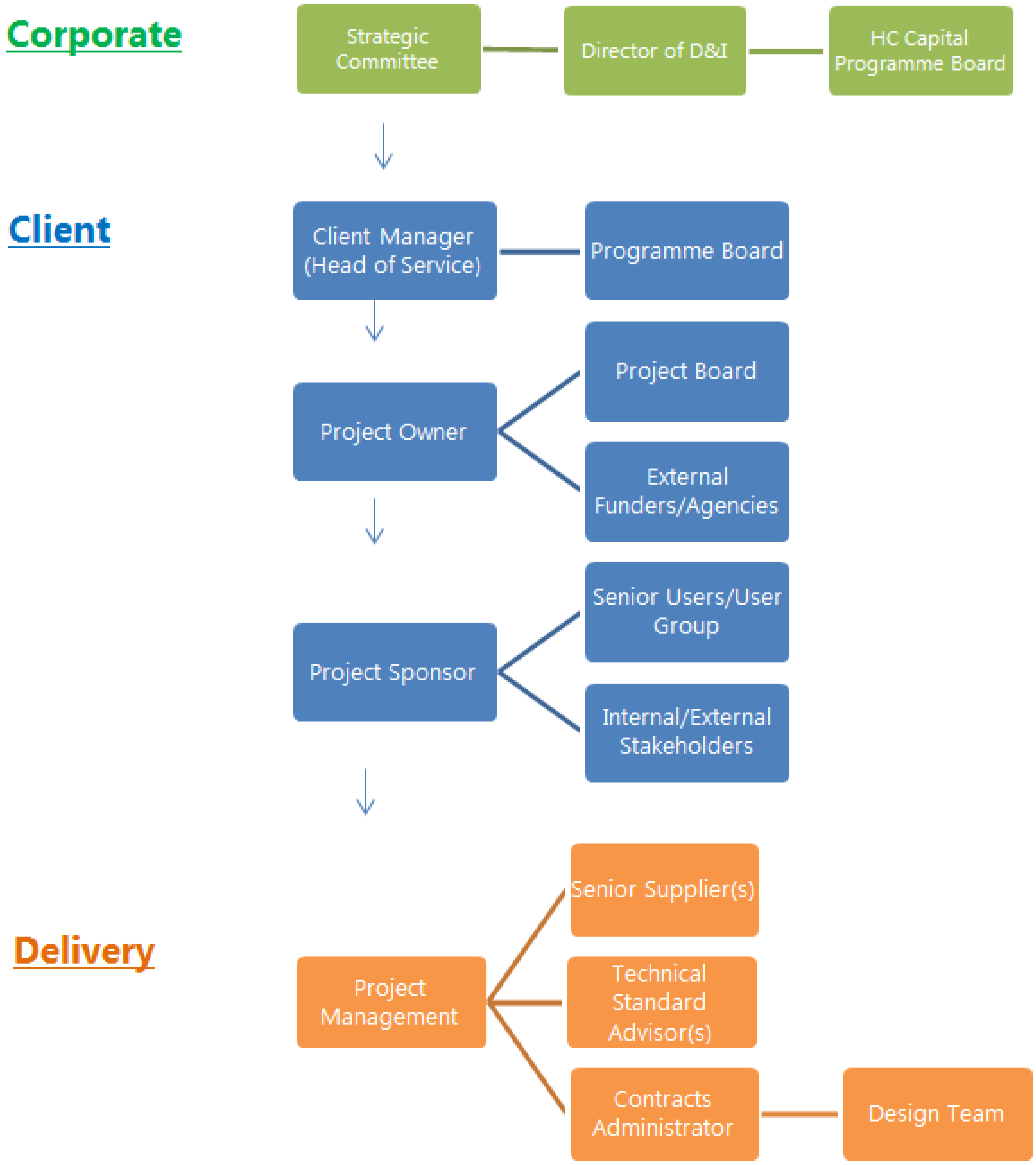
ID	Description:	Mitigation:	RAG Status	Risk Owner
01				
02				

Appendix B

GATEWAY REVIEW TEMPLATE

<table>
<tr><td>Gateway Lead name (PM)</td><td colspan="2"></td></tr>
<tr><td rowspan="2">Gateway participants</td><td>Name</td><td>Role</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Background

• Project overview
• Budget/target cost
• What is project expected to deliver
• Detail benefits to be achieved</td><td colspan="2"></td></tr>
<tr><td>Summary of current status
• Cost
• Review fee levels to date
• Programme/timescale
• Scope/quality</td><td colspan="2"></td></tr>
<tr><td>Risks/Issues</td><td colspan="2"></td></tr>
<tr><td>Comments/recommendations</td><td></td><td>Advise if recommendations are essential or desirable</td></tr>
<tr><td>Conclusion</td><td colspan="2"></td></tr>
<tr><td>Project Sponsor signature/date</td><td colspan="2"></td></tr>
</table>


Corporate
Strategic Committee
Director of D&I
HC Capital Programme Board
Client
Client Manager (Head of Service)
Programme Board
Project Board
Project Owner
External Funders/Agencies
Senior Users/User Group
Project Sponsor
Internal/External Stakeholders
Delivery
Senior Supplier(s)
Project Management
Technical Standard Advisor(s)
Contracts Administrator
Design Team

Appendix D

Individual Roles and Responsibilities		
Role	Individual/Committee	Responsibilities
Investment Decision Maker	Strategic Committee	Decides whether or not the proposed investment in a project should be made. Any risks or proposed changes to the project which may vary the original approval should be referred to the investment decision maker, seeking guidance or re-approval as appropriate.
Project Owner	Manager in relevant service	Oversees the preparation of the business case and budget for the project. Closely monitors progress and changes to the project plan. Responsible for delivering the project and programme requirements within the approvals given.
Project Sponsor	Designated Officer	Agrees the project objective with the Project Owner and develops the project definition, design brief and success criteria for the project. Coordinates and directs user input and liaises with stakeholders, including Members. Acts as the point of contact with the Project Manager (PM), and assists in the resolution of problems. Receives and reviews detailed reports on the project from the PM and ensures that client decisions are made on time. Ensures that gateway reviews are undertaken.
Senior User	Designated Representative or other body, such as High Life Highland or NHS	Represents the interests of the users. Helps client service to identify their needs, to ensure the solution will meet those needs and to communicate with the users.
Senior Supplier	Representative from the Service delivering the project, normally D&I	Represents the delivery team which will comprise internal and/or external suppliers. Advises on technical issues and ensures that adequate resources are allocated.

Project Manager	Member of D&I Programme Management Team or Consultant PM	Responsible for the day-to-day detailed management of the project and provides the interface between the Project Sponsor and the supply side of the project team. Provides regular progress reports, in particular with regard to cost, quality and time, and highlights any problems or issues.

Group Roles and Responsibilities		
Group	Members	Responsibilities
Project Board	Project Owner, Senior Supplier, Senior User and others as required	Reviews reports on progress at regular intervals or key stages. Provides necessary decisions, determines how the project will proceed and addresses any problems. Signs off each stage of the project before authorising the start of the next stage.
Programme Board (CAL and Property)	Normally comprises Heads of Service from sponsoring service and D&I, Finance Manager, Project Owner and other relevant managers	Reviews progress of individual major projects and the programme generally. Receives reports on projects and deals with any highlighted issues.
Capital Programme Board	Chaired by Director of D&I Representatives from various Services	Monitors progress on the overall Council programme and any highlighted issues. Coordinates input on reviews of the capital programme.

Appendix I Project Board Terms of Reference

Corran Ferry Project Board - Terms of Reference

Project Purpose

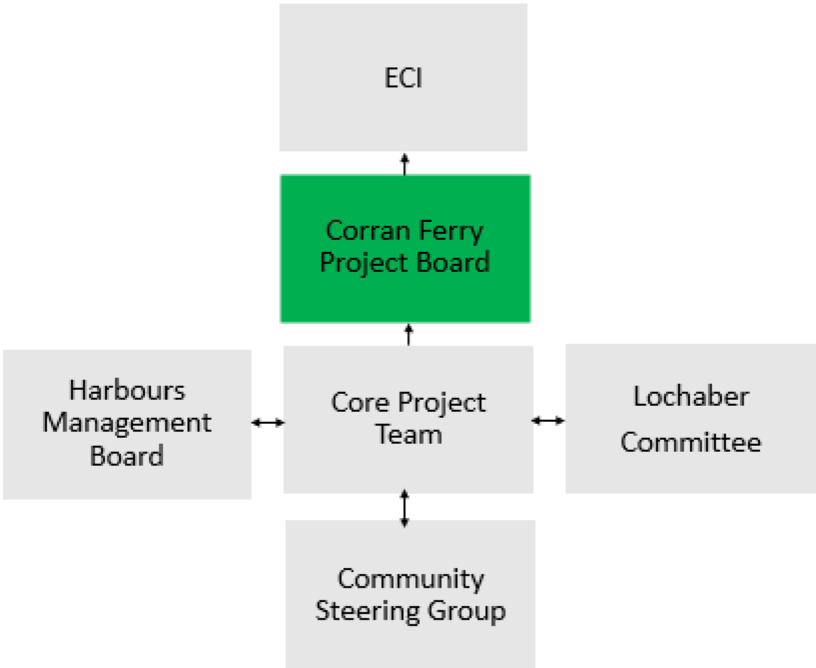
The key purpose of the Project is to produce an Outline Business Case (OBC) from which the preferred option for replacement Corran Vessels / Slipways can subsequently be taken through a Final Business Case to procurement.

Project Board Purpose

The Corran Ferry Project Board will be a formal working group following a gateway review process that will provide oversight, scrutiny and decision making throughout the progress of the project.

Reporting Arrangements

The Corran Ferry Project Board will be part of a larger project governance structure that will involve Lochaber Committee and Harbours Management Board, with Final decision-making powers being deferred to the Economy & Infrastructure Committee. The Corran Ferry Steering group will ensure that links between the community and officers involved are maintained and regular users of the service are given a strong voice to represent their communities.



Membership

Name		Position	Role
Malcom Macleod	MM	ECO - Infrastructure, Environment and Economy	Chair
Colin Howell	CH	Head of Roads and Infrastructure	Project Sponsor
Murray Bain	MB	Project Manager	Project Manager
Richard Porteous	RP	Roads and Corran Ferry Operations and Manager	Project Lead
Andrew MacIver	AM	Principal Engineer	Internal Consultant
Ed Foster	EF	Head of Corporate Fin & Commercialism	Internal Consultant
Nicola Bain	NB	Solicitor as/when required	Internal Consultant
Ruairidh Campbell	RC	CMAL - Harbour and Engineering Liaison Manager	External Consultant
Lewis Hammell	LH	CMAL - Naval Architect (SVRP)	External Consultant

Working Practices

A dashboard report and agendas will be set and circulated in advance and action notes taken.

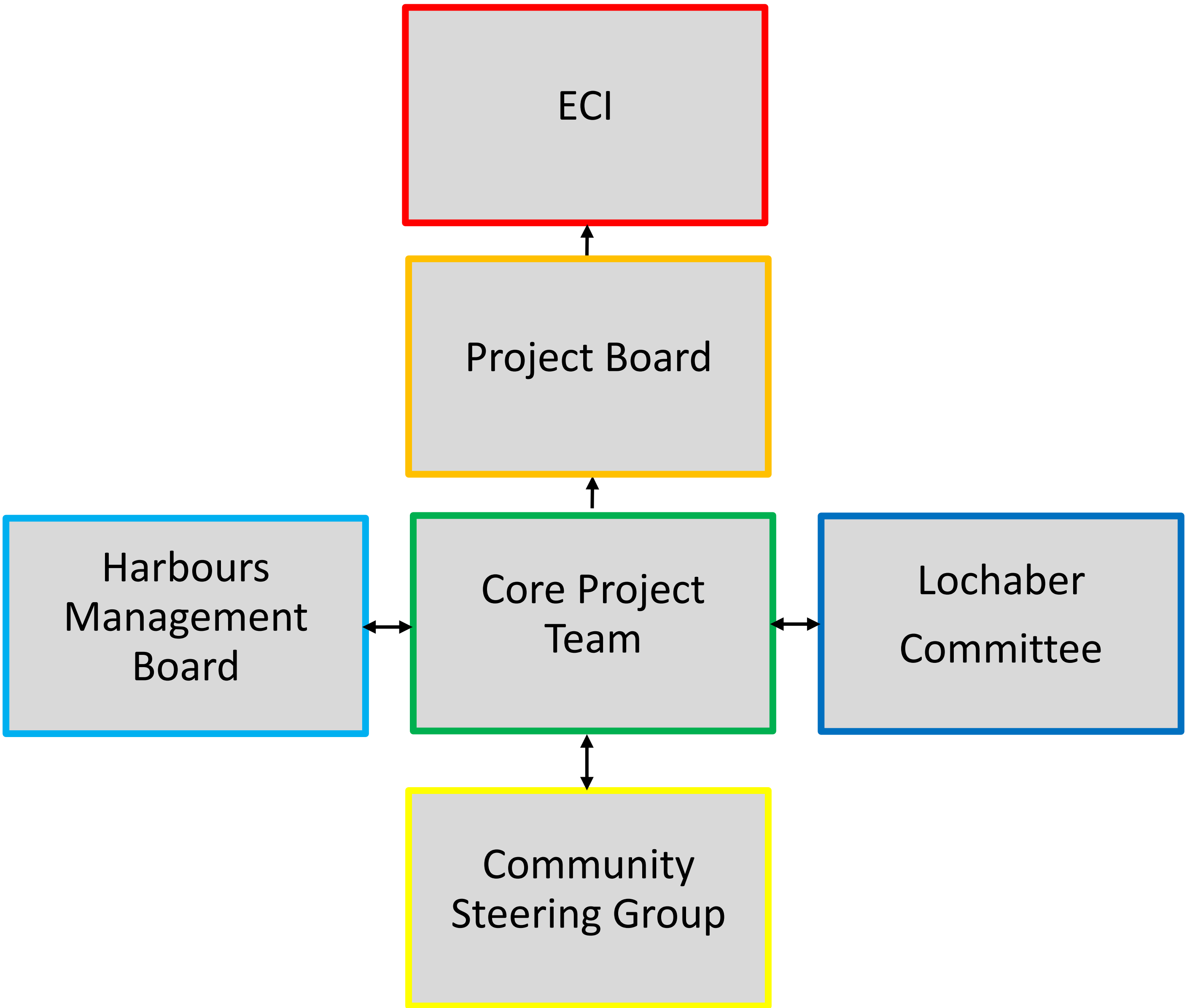
Additional internal/external stakeholders can be invited to attend as required to support the work of the group.

The group will follow a gateway review process.

Working documents along with information and data gathering will be stored in the Corran Ferry OBC SharePoint Site

The frequency of meetings will be 6 weekly lasting 1½ hrs. (Frequency and time may be amended as the project evolves) through MS Teams with the option for on-site face-to-face meetings depending on the Covid situation.

When unable to attend the group members should submit their apologies to the Project Manager in advance of the meeting or send a nominated deputy.


ECI
Project Board
Harbours Management Board
Core Project Team
Lochaber Committee
Community Steering Group

Appendix J THC Construction Project Manager Specification

J.1 Role Description

Purpose

To represent The Highland Council, ensuring appropriate project governance is applied to the project and that the project is delivered in line with the project governance principles to ensure the project is completed within scope, budget and timeframe.

Reporting to:

The Highland Council Project Board

Key Accountabilities

- Familiarisation with the Business Case
- Develop and keep up-to-date a project budget
- Clarify and agree project objectives
- Establish the scope of the project, what is included and what is not
- Identify all stakeholders and develop a stakeholder matrix to inform the communications and consultation plan.
- Establish and agree the roles and responsibilities of the project team
- Set up the project folders
- Agree reporting requirements with the Project Board
- Develop, agree and implement Stakeholder communications and consultation plan
- Develop and keep updated the following project control documents
- Project Plan
- Communications Tracker
- Project Risk Register
- Project Issue Register
- Change control request
- Change control log
- Budget / cost control log
- lessons learnt log
- Ensure agreed reporting is maintained
- Attend Project Progress meetings with contractors, Vessel PM and Port Infrastructure PMs
- Undertake a project review and complete a project closure report.

Communications

- Communicating across a wide range of stakeholders

- Maintaining good communications and information flow between project board, Vessel and Port Infrastructure PMs and contractors
- Develop, reach agreement on and implement a communication and consultation plan for delivery of the project

J.2 Person Specification

Characteristics	Minimum	Desirable
Physical attributes	• Good attendance record • Tidy appearance	
Mental attributes	• Understanding of general construction projects • Ability to evaluate technical specifications, results and budget figures • Ability to accommodate unpredictable work patterns • Complex problem solving	• Sustained high performance and results • Have the ability to handle situations diplomatically. • Conflict management
Education and qualifications	• Technical qualification at HNC level as minimum. • Formal qualification in management, business or related field or a number of years relevant experience / proven track record • End-to-end experience in project lifecycle management • Driving licence	• IOSH managing safely/ H&S training • Formal Project Management qualification
Experience, training and skills	• Experience in managing / coordinating and supervising vessel and marine infrastructure construction projects, and contractors / trades • Working with range of stakeholders • Working with civil engineering and other consultants • Working with contractors • Project and budget management experience • Experience in H&S legislation • Competent in use of MS office software packages • Experience in report writing • Working within a QA environment	• Ability to communicate with people at all levels, in all professions and maintain good client relations • Excellent verbal and written communication skills • Experience in/working with public sector organisations
Personality	• High level of self-motivation • Ability to listen to others • Positive proactive approach required and ability to cope with the unexpected • Creative approach to problem solving • Flexible approach to work • Willingness to contribute to the team effort	• Confident • Good communicator • Firm negotiator

Characteristics	Minimum	Desirable
Special circumstances	• Ability to work to strict deadlines and during unsocial hours	

The Corran Ferry Carbon Emissions Annually & Comparisons

Corran Ferry

Gas Oil = 2.76 kg CO2e/litre

1 day using **850** litres of gas oil = **2346 kg CO2e**

363 day = **308,550** litres of gas oil = **851,598 kg CO2e**

Winter Gritters

Photo by Ewen Weatherspoon

1 Corran Ferry for the year equates to the **CO2** emissions of **250** winter gritters.

Average diesel car

1 Corran Ferry for the year equates to the **CO2** emissions of **355** cars.

Tree

Absorbs **25kg** carbon per year.

To offset the emissions from the Corran Ferry we would need roughly **34,036.27** healthy trees*.

Peatland

Absorbs **30kg-70kg** carbon per cubic meter.

To offset the carbon from the Corran Ferry we would need roughly **12,155 – 28,363** cubic meters of healthy peatland*.

*Unhealthy peatland and poorly managed forests can be net emitters.

All photos by The Highland Council unless otherwise stated

Appendix 3

Corran Ferry Outline Business Case

Outline Business Case

On behalf of **The Highland Council**

Project Ref: 330610591 | Date: July 2022

Registered Office: Buckingham Court Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire, HP11 1JU
Office Address: 5th Floor, 9 George Square, Glasgow, G2 1DY

Document Control Sheet

Project Name: Corran Ferry Outline Business Case

Project Ref: 330610591

Report Title: Outline Business Case

Date: 14th July 2022

	Name	Position	Signature	Date
Prepared by:	Steven Reid	Senior Associate		07/07/2022
Reviewed by:	Stephen Canning	Senior Associate		12/07/2022
Approved by:	Scott Leitham	Director, Transport Planning		14/07/2022
For and on behalf of Stantec UK Limited				

Revision	Date	Description	Prepared	Reviewed	Approved
V2.3	14.09.2022	Update and address of comments in outline first draft.			
V2.4	03.10.2022	Update and address comments for Final Delivery			

Executive Summary

This report sets out the Outline Business Case (OBC) for investment in new ferries and terminal infrastructure for the Corran Ferry service. It builds on a range of previous studies, including the 2018 Corran Ferry Scottish Transport Appraisal Guidance (STAG) / Strategic Business Case (SBC) study.

Located approximately seven miles south of Fort William, the Corran Narrows is the narrowest section of Loch Linnhe. The Narrows is home to the Corran Ferry service, which carries passengers and vehicles between Nether Lochaber (Corran) and Ardgour. Although a short crossing, the service provides an essential connection for the peninsular communities of Ardgour, Sunart, Ardnamurchan, Moidart, Morar, Morvern and the Isle of Mull beyond.

Figure ES1: Location of the Corran Narrows and Community Council Areas

The ferry serves a wide variety of purposes including: providing access to employment, health, education, and retail for peninsular residents; facilitating The Highland Council (THC) service delivery; acting as a gateway for tourists visiting the peninsula; and meeting the supply-chain needs of communities and businesses, including those of Mull via the Fishnish – Lochaline route. THC owns, funds, and operates the Corran Ferry service, which is the busiest single vessel operated route in Scotland, carrying over **270,000** cars each year, delivering **30,000** sailings from early morning to late in the evening, **363** days of the year.

What is the 'Case for Change'?

From an infrastructure perspective, the 'case for change' can be summarised as follows:

- The **current ferries are ageing**. MV *Maid of Glencoul* is 47 years old and is in urgent need of replacement, with the sourcing of spare parts becoming both difficult and expensive. In having deck space for only 14 cars, when she is operating the route on her own (i.e., when the main vessel MV *Corran* is at refit or out of service), she is too small thus requiring frequent shuttling. Even with this shuttling, the vessel frequently cannot keep pace with demand, and this creates problematic delays, particularly for commercial users. MV *Corran* is now also 22-years old and due to the timescales for construction (estimated delivery for replacement vessels is 4 - 5 years) the ordering and commissioning of replacement vessels needs to commence in the immediate-term, otherwise loss of **reliability and more frequent service failure could become a reality**.

- When the service is suspended, the road-based diversion time can be up to two hours, with certain high vehicles excluded entirely from the peninsula due to low bridge heights.
- The two **vessels overnight on 'swing' moorings**, which requires a vessel-to-vessel transfer at the start and end of the operating day – this is a comparatively high-risk arrangement and is a practice which has been gradually phased out in Scotland in recent decades.
- **Vehicle-deck capacity is insufficient at peak times**. When there is short-shipped traffic (i.e., vehicles left behind), the service will routinely depart from timetable and 'shuttle' until the backlog is cleared. Whilst this is effective, it cannot always keep pace with demand, and it increases the pressures of an already intense service on the crew.
- The **marshalling areas on both sides of the crossing are too small to accommodate peak demand queueing**. This increases road safety and network performance risks, particularly where traffic on the Corran side backs out onto the A82 trunk road and on the Ardgour side queues beyond the blind corner south of the lighthouse.
- When MV *Maid of Glencoul* is in operation, her height and weight restrictions **limit access to the peninsula for the largest of commercial vehicles due to bridge height restrictions on the alternative road routes (4.1m A830 and 3.65m A861)**. As well as affecting the peninsula, this also impacts on the Isle of Mull as there is a reliance on the Corran Ferry (and Fishnish – Lochaline) for shipping certain categories of dangerous goods onto the island should the closed-deck MV *Isle of Mull* be operating the route on her own, as she has historically done over the winter timetable period.

The tidal conditions experienced in the Corran Narrows exacerbate the above challenges. In the absence of a berthing / aligning structure on both sides of the crossing, the route is operated by quarter-point vessels rather than more conventional 'straight-through' vessels. This relatively unusual operational arrangement is compounded by the fact that **the Corran Ferry is the only major ferry service operated by THC. It therefore must function as a standalone service with built-in resilience.**

What options were considered?

There were three key considerations in refining the options presented in the STAG / SBC:

- A transfer of responsibilities to Transport Scotland for the Corran Ferry services has been ruled out in the short to medium-term. THC has also explored and rejected the option of private sector involvement in the ferry service. As a result, the **Corran Ferry will remain a standalone Highland Council operated service and thus a two-vessel service remains necessary to ensure reliability and resilience**.
- Caledonian Maritime Assets Ltd (CMAL), the Scottish Government's marine asset owning company, has embarked on a replacement programme for its small ferry fleet, known as the Small Vessels Replacement Programme (SVRP). THC has been invited to join this programme and a specific design for a new Corran Ferry has been prepared. This has strengthened the already convincing argument to **convert the service to straight through operation**. As well as future proofing the service, there will be opportunities to benefit from economies of scale (and thus lower costs) in vessel design and construction.
- Finally, the enacting of the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 and the declaration of a climate and ecological emergency by THC in 2019

emphasises the necessity to **reduce emissions and pursue low carbon infrastructure solutions**.

Reflecting the above points, the single question facing this OBC is whether both Corran vessels should be replaced in the immediate-term or whether there is a case for retaining MV *Corran* as the secondary / stand-by vessel in the medium to longer-term. This is expressed through the two remaining options from the original STAG / SBC long-list:

- **Option 2c:** One larger 32 PCU[1] straight through fully electric vessel, with MV *Corran (diesel)* retained as the refit / relief / second vessel
- **Option 2f:** Two larger 32 PCU straight through fully electric vessels

What are the benefits and disbenefits of the options?

Transport Planning Objectives

The table below reassesses the performance of both options against the TPOs compared against the present-day situation.

Table ES1: Appraisal of options against the TPOs

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f:** Two larger 32 PCU straight through fully electric vessels
TPO1: The infrastructure and operational practices of the Corran Ferry should be aligned with comparable routes elsewhere in Scotland	✓	✓✓✓
TPO2: The Corran Ferry should facilitate year-round access to Ardgour and beyond for all vehicle types	✓✓✓	✓✓✓
TPO3: The available vehicular capacity of the ferry service should as far as possible, facilitate compliance with the published timetable	✓	✓✓✓

Both options perform strongly with respect to the TPOs. However, **Option 2f – Two larger 32 PCU straight through fully electric vessels** performs better as it would ensure the adoption of standard infrastructure and operational practices. In particular, it would negate the need for a quarter point vessel to operate from the new slipways and would address the inherent operational challenges associated with such a solution, such as crew having to be familiar with the operation of two completely different vessels and propulsion systems; maintaining / repairing different vessels; sourcing of spare parts etc Option **2f** would also offer increased capacity.

STAG Criteria

As the primary difference between the options is one of timing rather than substance, their performance against the STAG criteria is broadly similar. However, key points of note from this appraisal are as follows:

- The desire of THC to decarbonise its major ferry route is a principal driver of this project. The early adoption of two all-electric vessels **(Option 2f)** would deliver the early decarbonisation of the route, supporting local and national policy in relation to emissions reduction thus scoring positively in relation to the **Environment** criterion. Option 2c

[1] PCU is a measure primarily used to assess capacity, where different vehicles are assigned a value according to the space they accommodate.

involves retaining a diesel vessel for a longer period of time and will therefore not deliver these benefits in the short-term.

- It should though be noted that the new landside infrastructure issues associated with either option could give rise to landscape and / or visual amenity impacts which would have to be mitigated.
- **Option 2f** would also have the most significant **'Safety'** benefit as it would deliver two identical vessels with standard operating practices.
- Both options would make a strong contribution to the **'Economy'** criterion through increasing capacity and providing improved reliability and resilience. **Option 2f** performs better as it offers additional capacity and two new vessels in the immediate term.
- The landside infrastructure work to enable both options will significantly improve **transport integration** by improving the marshalling areas, which in turn improves safety and reduces queuing back onto the A82 and A861 and improves safety for foot passengers and cyclists accessing the vessels.
- Both options also align well with **policy**, but **Option 2f** performs better because it would accelerate the point at which the service would become 'tailpipe' emission free.

Value for Money

The table below shows the present value of costs (PVC) of the two options presented in 2010 prices[2]. These costs reflect the purchase of the vessels, construction of the associated infrastructure, and the operation of the vessels (fuel / batteries / refit and maintenance).:

Table ES2: Options 2e and 2f – Present Value of Costs in 2010 prices

	Option 2c: One larger 32 PCU straight through fully electric vessel / MV *Corran* as relief	**Option 2f: Two larger** 32 PCU straight through fully electric vessels
Present Value of Costs	£50.1m	£52.8m
Risk Adjusted PVC	£56.9m	£59.5m

The PVC in the above table shows that there is no real significant difference in the costs between the options. The differences that do exist are a result of the horizon period for delivery of the additional new vessel and the OPEX costs accrued over this time when delivering both new vessels at the same time.

As a sensitivity, by extending MV *Corran* to 40-years, the (risk adjusted) PVC of Option 2c would reduce to £51.8m. Such an approach would however clearly come with a range of disadvantages including continued tailpipe emissions, operational inefficiency and the increased costs and challenges associated with maintaining an aging vessel.

What is the preferred option?

Upon careful analysis of the evidence presented, THC has confirmed that the preferred option is **Option 2f: two larger 32 PCU straight through fully electric vessels**. A primary driver of this decision is the Highland Council's desire to decarbonise its main ferry route, where it has defined the **'journey to net zero'** as a priority. Whilst Option 2c would ultimately deliver the net zero outcome, (i.e., when the MV *Corran* is taken out of service) it would occur several years

[2] The H.M. Treasury *Green Book* requires that all prices are presented in a common base year. The Department for Transport (DfT)'s current base year in their Transport Appraisal Guidance (TAG) is 2010 and thus prices are deflated to this year for appraisal purposes.

later and would not contribute to the Council's stated aims in relation to emissions reductions nor wider national targets.

Outwith net zero aspirations, there are several operational benefits from operating two common vessels, including:

- **Common berthing arrangements** at both sides of the crossing, avoiding the challenges associated with using both a quarter point and straight through vessel from the same infrastructure.
- **Crew familiarity** – there would be obvious challenges associated with operating two very different vessels in terms of machinery and propulsion systems, particularly if the secondary vessel is only operated infrequently
- **Reliability and resilience** – having two new vessels will remove the reliability and resilience risks associated with maintaining an older second vessel.

Whilst it is accepted that MV *Corran* will need to be retained as the relief vessel for a short transitional period of time when the second vessel is being built, THC does not consider this to be a suitable medium / long-term arrangement.

Finally, the SVRP provides an opportunity to realise economies of scale in design and procurement. The project has significant momentum behind it at present and represents a major opportunity for THC.

The following sections refer to the preferred option only.

Financial Case

The table below sets out the anticipated capital spend profile as provided by CMAL and marine civil engineers Wallace Stone. It should be noted that the **table is based on Q2 2022 prices**.

Table ES3: Capital spend profile (£thousands) by financial year, rounded to nearest £000

Description	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26	Total
Vessels						
Vessels[3]	£0	£7,000	£15,000	£10,600	£2,600	**£35,200**
Vessel Contingency (3%)	£0	£0	£0	£528	£528	**£1,056**
Naval Architecture Consultancy	£69	£0	£0	£0	£0	**£69**[4]
Tools / spares	£0	£0	£0	£200	£200	**£400**
Site supervision	£0	£45	£160	£65	£30	**£300**
Sub-total by financial year	*£69*	*£7,045*	*£15,160*	*£11,393*	*£3,358*	***£37,025***
Ferry terminal infrastructure						
Slipways and associated infrastructure	£0	£0	£2,000	£12,000	£6,000	**£20,000**
Civil Engineering Consultancy	£10	£760	£225	£60	£40	**£1,095**

[3] Based on construction in a UK yard.

[4] This is the cost to THC. It is assumed that wider naval architecture costs are internalised within CMAL representing a saving to THC of 181k as part of the opportunity presented by the SVRP.

Description	FY21/22	FY22/23	FY23/24	FY24/25	FY25/26	Total
Surveys and Ground Investigation (GI)	£0	£250	£0	£0	£0	**£250**
Infrastructure Contingency (15%)	£2	£152	£334	£1,809	£906	**£3,203**
Sub- total by financial year	*£12*	*£1,162*	*£2,559*	*£13,869*	*£6,946*	***£24,548***
Total	**£81**	**£8,207**	**£17,719**	**£25,262**	**£10,304**	**£61,573**

Factoring in projected inflation, **the total cost of the project could be expected to increase by circa £7.2m to £68.7m**.

A variety of funding sources are being considered to deliver this project.

Commercial Case

Vessel

THC's **preferred option is the development of a concept design to take to the market to complete detailed design and build.** Reflecting this preference, THC has been inputting into the wider CMAL SVRP Design Brief and provided a 'Statement of Requirements (SoR)' for the new Corran vessels. The Design Brief includes the development of 'Design C', the template for new Corran Narrows vessels, the main particulars of which are set out below:

Table ES4: Design C – main particulars

Characteristic	Minimum Specification
Length overall	45m-50m
Maximum draught (moulded)	2.14m
Gross tonnage	~500GT
Design / contract speed	9.0 knots
Passengers	150
Crew	3-4
Cars (PCUs)	32
Propulsion concept	The working proposal is that the vessel will be fully electric with mobile range extender
Class	UK Class V[5]

Landside Infrastructure

The table below summarises the preferred approach to delivering the slipway and enabling infrastructure works for the new Corran vessels:

Table ES5: Summary of the Council's preferred slipway and infrastructure works procurement strategy

	Corran Infrastructure Works
Type of Contract	Traditional

[5] Class V passenger vessels are those vessels licenced to carry more than 12 passengers and are certified by the Maritime & Coastguard Agency to operate on Category C water (tidal rivers, estuaries and large, deep lakes).

	Corran Infrastructure Works
Single or Multiple Contracts	1 No. contract
Open or Restricted	Restricted (shortlist established before tender documents issued)
Lump Sum or Remeasurable	Lump Sum. Building works could be separated out as a remeasurable Scottish Buildings Contracts Committee (SBCC) contract
Fixed Price or Target Price	Fixed Price
Form of Contract	ECC Option A (NEC4)

Management Case

Programme

The table below shows the key milestones for the project:

Table ES6: Key Project Milestones

Milestone	Commencement Date	Notes
Terminal Infrastructure Milestones		
Infrastructure design services award date - *Outline Design and GI Design*	03/05/2021	Given the requirement for new slipways regardless of the vessel design chosen, feasibility and preliminary design was commenced in May 2021 and will be completed in December 2022.
Completion of ground investigations	Q1 2023	
Infrastructure design services award date - detailed design	Q3 2023	
Award construction contract	Q1 2024	6-week tender evaluation period is scheduled to take place in Q4 2023
Completion of construction	Q3 2025	
Vessel Infrastructure Milestones		
Vessel design services – award naval architect	02/08/2021	NaValue appointed by CMAL and work has progressed
Appoint shipyard	Q2 2023	
New vessel 1 enters service	Q4 2025	
New vessel 2 enters service	Q4 2026	

Project Management Framework

The table below summarises the organisations and individuals which will fill each role in the project team:

Table ES7: Roles and Responsibilities

Role	Individual / Organisation
Capital Programme Board	Chaired by the Director of the Development and Infrastructure Service, with representatives from other Services as required

Role	Individual / Organisation
Project Board	Defined in the Project Board Terms of Reference, which is included in **Appendix I**
Council Project Manager	Council Officer(s); and / or fixed-term appointment; and/or consultant
Client's Designers (Vessel and Infrastructure)	Vessel designers: NaValue (contracted to CMAL) Infrastructure designers**:** Wallace Stone
Vessel Project Manager and Contract Supervisor	External appointment through competitive tender
Port Infrastructure Project Manager & Contract Supervisor	External appointment through direct appointment or mini-competition via Scotland Excel Engineering and Technical Consultancy Framework Lot 7 or via competitive tender
Financial advisers	The Highland Council Resources and Finance Service, with external advice procured where required
Legal advisers	The Highland Council Performance and Governance Service, with external advice procured where required
Vessels contractor	To be determined through competitive tender
Landside infrastructure contractor	To be determined through competitive tender