

Appendix 1 – List of Assumptions

Reference	Description
1	The funding (amount, source, etc.) of replacement vessels is out of the strategy scope, however, it is in scope when individual projects have been identified by the strategy/plan.
2	The strategy will be based on a rolling 11 year horizon, and will be reviewed annually.
3	Ports and Harbours need to be included in the strategy.
4	The fundamental scope of the project is the Ferries Plan and End of Life / Use.
5	Service operational data is available and accurate.
6	Definition of a major vessel is Euro Class B (linkspan operation only). NB – this assumption will be kept under review pending potential MCA re-classification from Euro C operation to Euro B operation.
7	Definition of a medium vessel (non-major) is: MV Argyle, MV Bute, MV Coruisk & MV Lochnevis
8	Definition of 'other' vessel (non-major) is: all other vessels not included in Large or Medium categories.
9	Any recommendations will be based broadly on current routes and timetables taking into account known changes once these have been agreed.
10	Location of ports will remain unchanged.
11	Fixed links will not be part of our considerations.
12	Previous demand increases will be used as a guide in the forecasting of future demand on all routes.
13	Increase in fuel prices will have no impact on car travel, and therefore car demand.
14	Fit with Passenger Access Systems to be ignored for purpose of fleet deployment
15	Weekly capacity utilisation will be unchanged post the intro of demand management
16	Demand in excess of 70% in a week is unsatisfied
17	Vehicle spacing allowance will be based on CMAL's "new" car spacing guidelines of December 2012
18	New vessel capacities will be broadly based on average 70% weekly capacity utilisation (across busiest consecutive nine weeks) being achieved in year 11 of the vessel's deployment – based on forecast demand.
19	The average length of cars, coaches and CVs will remain constant throughout the life of the model.
20	Mallaig is limited to a vessel size of 85 metres and the Islay route ports have a limitation of 90 metres. Any vessel replacements/redeployment would either be constrained by the port dimensions or would require a significant development of the ports.
21	Assumed that the earliest a new vessel can join the fleet is 3.5 years from commencement of procurement to delivery of vessel. (For repeat vessels a two year procurement is likely.)
22	On routes which serve more than one island (i.e. Coll/Tiree, Small Isles) it is assumed that the volume of shipped traffic leaving the mainland port is a

Reference	Description
	proxy for the capacity utilisation on the whole route.
23	When a new vessel is added to a route which is served by two vessels, the newer vessel will be assumed to be the major vessel on the route (e.g. a new vessel on Ardrossan/Brodick will not serve Campbeltown).
24	New vessel capacities will be based on vessel dimensions which fit the ports on the route(s) they will serve.
25	Vessel 'fit' defined as:- <ul style="list-style-type: none"> (i) Berth length suitability (ii) Fendering arrangements based on vessel displacement and approach speed (iii) Depth available at the pier and the ability of the pier structure to support dredging if required (iv) Linkspan geometry both vertical and horizontal (v) Passenger access arrangements relative to door position (vi) Pier Bollard capacity/strength and arrangement relative to vessel layout.
26	Default fuel options will be liquefied natural gas or dual-fuel for major vessels and diesel-electric hybrid for minor vessels.
27	Shoreside adaptations including provision of alternative fuels will form part of the business case for new vessel proposals.
28	Colonsay will continue to be served by a major vessel pending resolution of the proposals in the Ferries Plan for this service.
29	The Small Isles will continue to be served by MV Lochnevis.

Appendix 2 – Capacity Utilisation Explained

Capacity Utilisation Explained

Capacity utilisation is a measure of the capacity supplied and the volume of demand utilising it. For the ferry operation, this translates to the carrying capacity of the vessel and the number of passengers and vehicles actually carried. Whilst capacity utilisation can be measured on a sailing-by-sailing basis, it is more widely used over a week. The calculation then becomes the total volume carried in a week divided by the total capacity provided in the week.

Capacity utilisation is expressed as a percentage – the following example illustrates:-

- Number of cars carried in week 500
- Vessel capacity (based on PCU*) 100
- No. of sailings in week 10
- Capacity Utilisation (weekly) $500 / (100 * 10) = 50\%$

*PCUs – Passenger Car equivalent Unit; a homogenised metric applied within traffic capacity and flow analysis, reflecting the various types of vehicle carried by ferry. For the CFL vessels a conversion factor is used within the reservations system to manage the trade-off of space between cars and CVs (including coaches). Depending on the age and vehicle deck configuration the factors range between 2.5 and 4. For a 15 metre CV on a vessel with a conversion factor of 3 the CV would be referred to as 5 pcu's i.e. it would occupy the space of 5 cars.

In many forms of transport weekly capacity utilisation seldom reaches anywhere near 100%. This is for a variety of reasons:-

- Daily flows – demand is not uniform across the day
- Weekly flows – during the peak season when demand is at its greatest
- Weekend flows - demand to and from many islands can increase on Fridays and Mondays as weekend activity feeds demand on these days
- Annual flows – Short breaks and annual holidays combined with the popularity of the west coast islands as a holiday destination results in significant peaks in demand in the height of the summer

In addition to the above the method that CFL uses for recording vehicle deck loadings can have a bearing on the capacity utilisation figures for the following reasons:-

- Broken stowage – caravans and motorhomes are generally recorded as cars in the CFL statistics system. With the aforementioned vehicle types being wider than cars it is likely that a caravan will occupy an area greater than that of a family car. Where the vessel, or parts of the vessel, is two car lanes wide, one caravan can easily encroach into a second vehicle space and occupy the space of two cars (as there is no room for another car alongside the caravan). The recorded stats do not reflect this

- Lashed CVs – when CVs are lashed to the deck, the effective footprint of the vehicle is increased, as empty space around the vehicle may be inaccessible due to the lashings. The recorded statistics do not reflect the lost space
- Vehicles conveying mobility impaired passengers – often require a greater space around the vehicle either for vehicle doors to be fully opened for ease of access, or, for a wheelchair to be used
- Hazardous Goods – certain categories of hazardous goods require a ‘blast-zone’ around them i.e. a space in which no other vehicle can be carried. The statistics recorded by CFL do not take the additional space occupied by such vehicles into account
- Deadweight limit reached – A number of the CFL vessels can be full by cargo weight, but still have space available on the vehicle deck. In the statistics records the vessel will show as still having space available, however, the reality is that nothing further can be accommodated

Anecdotal evidence suggests that, for the CHFS network of services, 70% weekly capacity utilisation is around the point that demand starts to become significantly constrained. For reservable services this manifests itself with customers being unable to secure a reservation on a suitable sailing – invariably leading to a complaint about not being able to get a reservation. It is likely that there will be some variation across the routes and at different times of the year, however, a central assumption of 70% has been used for the purpose of our analysis.

For the avoidance of doubt many individual sailings in the CHFS network sail at 100% capacity utilisation with instances in July far outweighing those in December. Full sailings can occur frequently in the winter months especially after periods of adverse weather when back-logs of traffic can occur.

Appendix 3 – Ownership of CHFS Port and Harbours

Caledonian Maritime Assets Limited	Argyll and Bute Council
Armadale	Lismore (Achnacroish)
Brodick	Campbeltown
Bull Hole (overnight berth Fionnphort-Iona ferry)	Craignure
Castlebay	Fionnphort
Claonaig	Gigha slipway
Colintraive (leased from Bute Estates)	Gigha South Pier (overnight berth Gigha vessel)
Coll (Arinagour)	Iona
Colonsay (Scalasaig)	Port Askaig
Cumbræ Slip	Rothesay
Fishnish	Tayinloan
Gallanach	Comhairle nan Eilean Siar
Gourock	Ardmhor
Kennacraig	Berneray
Kerrera Slip	Eriskay
Kilchoan	Leverburgh
Largs	Lochmaddy
Lochaline	Otternish (overnight berth Berneray ferry)
Lochboisdale	Others
Lochranza	Ardrossan - Ardrossan Harbour Company (Clydeport)
Oban	Canna - National Trust for Scotland
Port Ellen	Mallaig - Mallaig Harbour Authority
Portavadie	Rum - Scottish Natural Heritage (managed by The Highland Council)
Rhubodach (leased from Bute Estates)	Stornoway - Stornoway Port Authority
Tarbert (Harris)	Tarbert (Loch Fyne) - Tarbert Harbour Authority
Tiree (Scarinish)	Ullapool - Ullapool Harbour Trust
Tobermory	
Wemyss Bay	
The Highland Council	
Eigg	
Muck	
Raasay	
Sconser	
Uig	