TRANSPORT SCOTLAND
CÒMHDHAIL ALBA

CALMAC FERRIES
Operators of Caledonian MacBrayne

CMAL
Caledonian Maritime Assets Ltd
Stòras Mara Caileannach Eta

Subject:

Vessel Replacement and Deployment Plan

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1 CONTENTS

2 INTRODUCTION

1. In December 2016 Transport Scotland (TS) published the second Vessel Replacement and Deployment Plan (VRDP) Annual Report providing updates to the end of 2015. This third Annual Report summarises the outputs of the VRDP project up to the end of 2016. An update on progress made since the 2014 and 2015 Annual Reports were published can be found in Section 3.

2. Since the first annual report was published in 2015, the 'tri-partite' group of TS, Caledonian Maritime Assets Limited (CMAL) and CalMac Ferries Limited (CFL) has continued to meet on a monthly basis as the Network Strategy Group. The scope of the Network Strategy Group (NSG) meetings covers current and future major and non-major vessels and the supporting infrastructure required for the delivery of the Clyde and Hebrides Ferry Services contract (CHFS).

3. The group analyses the existing provision of CHFS services and uses the outputs from the analysis to identify, prioritise and recommend to the Scottish Ministers where future spending may be targeted. Central to this process is the delivery of the *Scottish Ferry Services: Ferries Plan (2013-2022)*[1], as it relates to CHFS.

4. The Ferries Plan was published in 2012 and sets out the Scottish Ministers' strategic guidance for all publicly funded ferry services in Scotland. This includes TS policy for the services it supports covering items such as timetables, fares and the replacement of vessels/ports.

5. The means by which publicly funded ferry services which fall within TS's remit are regulated are as follows:-

a) Policy Responsibility - this sits with TS under Scottish Ministers
b) Statutory Controls - the maritime sector is bound by international law and convention through a broad range of international, European and domestic laws
c) Contractual Controls - all TS subsidised ferry services are tightly regulated by means of the public service contracts which stipulate precisely how the services will operate (fares, timetabling, vessels, performance measures etc.) thereby protecting the interests of ferry users

6. The Ferries Plan included a proposed vessel replacement programme as well as a proposed programme of Port and Harbour Works. These programmes were broadly developed to replace assets which were life expired; however, the NSG now takes a more analytical and service delivery driven view in its activities.

7. In October 2015 the final tranche of CHFS services to join the Road Equivalent Tariff (RET) fares mechanism was completed. The reduction in ferry fares for passengers, cars and coaches on a large number of the busiest CHFS services had a significant bearing on demand for services, especially from cars. This is covered in detail in Section 9.

[1] https://www.transport.gov.scot/publication/scottish-ferry-services-ferries-plan-2013-2022/

8. The VRDP is founded upon:-

a) The Routes and Services proposals set out in the Ferries Plan
b) The capacity and demand analysis set out in this Report
c) The need to replace vessels as they reach the end of their working life
d) The upgrading and replacement of the associated infrastructure required to support current and future vessels

9. As set out in the Ferries Plan (Chapter 2, paragraph 9): "*Projects will be taken forward when resources are available and funding will be prioritised according to need.*"

10. The Ferries Plan also noted the sustained pressure on public spending – which has continued – and therefore concluded that: *"All of our proposals are subject to future Spending Review commitments".*[2]

11. This continues to be the case with the budget available for investment across the Scottish Government under considerable pressures and subject to a number of competing strategic priorities.

12. This third Annual Report includes the analysis undertaken by the NSG up to the end of 2016. It also sets out, in Section 11, TS's emerging conclusions and recommendations.

3 PROGRESS UPDATE SINCE THE 2014 & 2015 ANNUAL REPORTS

13. Progress updates on the major items identified in the 2014 Annual Report are as follows:-

a) The construction of 2 new 102 metre vessels - one for initial deployment on the Ardrossan to Brodick route and one for initial deployment on the Uig 'triangle' – continues with the first vessel, the MV Glen Sannox, due to be handed over to CFL in winter 2018-19;
b) Work to prepare the ports for these dual-fuel vessels is progressing.

14. The main recommendations for further consideration from the 2015 Annual Report, and which are looked at in more detail below, were as follows:-

a) Oban-Craignure route: short and medium term options
b) Mallaig-Armadale route: short and medium term options
c) Outer Hebrides: long term options for the routes to/from the mainland and the inter-island 'Sounds' services
d) Islay: short, medium and long term options

15. The Oban-Craignure service was identified in the Ferries Plan as a route which was to be served by two vessels in the summer season. Post the full roll out of RET, and despite the introduction of additional capacity and frequency with a two vessel summer service, the route was forecast

[2] paragraph 27 on page 7

to be under severe pressure for capacity. Two elements of the route were considered by the NSG as priority for intervention:-

a) Craignure – the port was identified as being physically limited in its ability to accommodate some of the larger vessels in the CHFS fleet which may have been available for re-deployment – notably the MV Isle of Lewis, as foreseen by the VRDP 2014 annual report. These limitations also affect the ability of larger vessels to berth overnight. A working group has been established to explore and develop options for how Craignure could be improved. This group (the Argyll Ferry Infrastructure Group, AFIG) is made up of the main stakeholders involved in service delivery aspects of the Oban-Craignure service. This is the NSG membership augmented by Argyll and Bute Council (ABC) officers. The group meets on a regular basis and has commissioned further engineering support to assist its progress.
b) An additional vessel sourced from outwith the CHFS fleet – both CFL and CMAL undertook an extensive worldwide search for another vessel to join the fleet. A potential non-UK vessel was identified for purchase and additional work undertaken to determine its suitability for west coast services. Prior to the conclusion of this work the vessel's owners intimated that it was no longer available for sale. CFL and CMAL continue to explore the global market place for suitable vessels, however, it is unlikely that this will yield results in the short-term.

16. The route between Mallaig and Armadale has undergone a change in the way the service is provided. Since RET was introduced the summer single vessel service (which was provided by MV Coruisk prior to its re-deployment to provide additional capacity on the Oban-Craignure service) has been changed to a two/three vessel service. A combination of tidal restrictions and a vessel (MV Lord of the Isles) shared with another community (Lochboisdale) has resulted in a sub-optimal service. Short term 'fixes' have been considered and, within the resources available, some adjustments were made in an effort to improve the service in Summer 2017. A Mallaig-Armadale Infrastructure Working Group has commenced work to consider medium (from Summer 2019) to longer term route options. The scope of the work includes both ports as well as future vessel provision.

17. Routes to/from and within the Outer Hebrides have undergone significant changes in the delivery of services in recent years. Carryings growth from RET fare reductions on the inter-island services combined with strong growth on all services between the mainland and the Outer Hebrides has led to these services being identified as requiring a more thorough analysis of long-term options. A Scottish Transport Appraisal Guidance (STAG) assessment has been commissioned.

18. Services to Islay were highlighted in a case study in the 2015 Report. With strong underlying growth on the route and limited opportunities to satisfy the conveyance of ever greater volumes, the need for an assessment of the short to medium terms options for the route was identified. The assessment includes both vessel and shore infrastructure requirements and considers these for the period to 2035. The Islay route is one of the busiest for freight in the CHFS network and the options for supporting this vital economic activity were included in the assessment. Both the NSG and AFIG groups have reviewed a range of options for future service

delivery in the short to medium term but also maintained a long-term perspective through to 2035. Service disruptions in 2016 meant that the enhanced timetable introduced in April 2016 was not fully delivered. Summer 2017 saw the utilisation of this additional capacity – the need for which was identified in 2015.

19. Action has been undertaken in a number of other areas in line with Ferries Plan commitments as follows:-

a) Oban – options for increasing the space available for vehicle marshalling are being progressed by CMAL in conjunction with Network Rail
b) Fionnphort - Iona service – ABC are developing plans for the construction of a berthing facility at Fionnphort and of a breakwater at Iona. CMAL have been considering the potential impacts of re-classification of route waters by the Maritime and Coastguard Agency (MCA)
c) Kerrera – having implemented the Ferries Plan commitment to provide short-term grant support for the ferry operation and funded urgent improvements to infrastructure of £1.7million; this service was added to the CHFS route network in July 2017 with the provision by CMAL of a new purpose-built vessel, the MV Carvoria, soon afterwards.
d) Gigha – initial consideration by ABC of meeting the long-term Ferries Plan aspiration for a vessel berth at Ardminish

4 BACKGROUND

20. In 2016 CFL operated a fleet of 32 vessels (10 major and 22 non-major) in the delivery of the CHFS passenger and vehicle services. All of these vessels were chartered from CMAL by CFL.

21. The major vessels were built between 1984 and 2014 with the non-major vessels ranging from 1974 to 2016. The average ages of the two 'fleets' in 2016 was 20 years and 21 years respectively. (The definition of a major vessel is a vessel which was designed to operate principally to/from a linkspan and which has Euro Class B certification. Non-major covers all other vessels in the fleet.)

22. CFL will on occasions utilise charter vessels to supplement the CMAL vessels. Such use can range from one day up to two or three weeks to cover periods of short-term increased demand or during periods of scheduled/unscheduled unavailability (of the CMAL vessels). In 2016 short-term charter vessels were operated on the Mallaig-Small Isles, Kennacraig-Islay and Wemyss Bay-Rothesay services.

23. The CHFS fleet of vessels serve 52 ports across the west coast of Scotland with facilities ranging from unmanned slipways to ports with multiple linkspan berths. A further three facilities are used to provide overnight berthing. These three facilities are maintained separately from the ports used in the delivery of services.

24. As operator, CFL is solely responsible for deciding, in line with contractual and operational requirements, which vessels are deployed on which routes in order to deliver the CHFS contract.

5 ASSUMPTIONS

25. In developing the VRDP, the NSG agreed a number of assumptions which were to shape the analysis and outputs from the work. The key assumptions, which are kept under annual review, are as follows:-

a) The fundamental scope of the project is the Ferries Plan and End of Life / Use
b) Any recommendations will be based broadly on current (Summer 2017 and Winter 2017/18) timetables and will take into account future Ferries Plan enhancements
c) Demand in excess of 70% of the available weekly capacity is unsatisfied
d) 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
e) Changes in fuel prices for road going vehicles will not have a significant bearing on demand
f) Average vehicle sizes and weights will be unchanged during the analysis period

26. The full list of assumptions can be found in Appendix 2.

27. The Ferries Plan sets out a future service requirement for Colonsay which is based around a dedicated vessel, the MV Lochnevis – a non-major vessel. Further work needs to done around this option so the assumption used in this report for generating forecasts remains that Colonsay will continue to be served by a major vessel. On the basis of this assumption the full delivery of the Ferries Plan would require a fleet of 11 major vessels, one more than assumed by the Ferries Plan itself.

28. Services between the mainland and Barra/South Uist have undergone a significant restructuring with both islands being served from Summer 2016 independently by separate dedicated vessels. Whilst this was not a stated output from the Ferries Plan, the re-structuring has allowed the delivery of the Ferries Plan commitments albeit in a slightly different way from what the Plan envisaged.

29. Where timetable and vessel deployment assumptions have been made these do not pre-judge any future decision making. As stated in the Ferries Plan, vessel deployment is entirely a matter for CFL. CFL keeps deployment plans under regular review to ensure optimal fleet deployment.

6 PRIORITIES

30. The 2015 Annual Report re-affirmed the operator's main criteria for vessels undertaking the lifeline CHFS services. The prioritised list, which is unchanged, was as follows:-

a) Safe
b) Reliable
c) Cargo deadweight capacity
d) Manoeuvring, berthing and station keeping
e) Sea keeping and passenger/crew comfort
f) Redundancy
g) Fuel efficiency and emissions reduction

31. This priority list was agreed by NSG members as a common set of principles by which new vessels, engaged in the provision of lifeline services, should be designed and built. With the exception of safety the other criteria will be kept under regular review.

7 APPROACH TO MODELLING AND FACTORS INFLUENCING DEMAND

7.1 The Ferries Plan

32. In December 2012 TS published *Scottish Ferry Services: Ferries Plan (2013-2022)* on the back of the earlier Scottish Ferries Review. The Ferries Plan provides a basis for the shape of all of Scotland's ferry services until 2022 (and beyond as vessels have a 30 year design life) and underpins the development of this Vessel Replacement and Deployment Plan as it pertains to the operator of the CHFS contract.

33. The Transport Minister in his December 2012 Introduction to the Routes and Services Needs Based Assessment in the Ferries Plan stated that: *"One of the key elements for the Ferries Review has been the development of a robust overarching framework or methodology for the determination of routes and services for those communities served by a ferry service. We developed this approach because we felt that it was absolutely essential that any changes to routes and services are based on objective evidence. Second, it is important that each community is treated on an equal footing by the Review. By choosing to develop and adopt an evidence-based methodology, we have insured against the prospect of favouring one community over another. Finally, we want a methodology that can be replicated to inform future changes to routes and services."*

34. The Routes and Services Proposals contained in the Ferries Plan focus primarily on frequency of service and length of operating day. They do not directly address meeting volume demand, either by further increasing frequency or by increasing the capacity through the vessels utilised. It is a matter for the operator to deploy the fleet as they see fit to best meet capacity (as well as other operational and contractual) requirements.

35. The VRDP is intended to complement the Ferries Plan by considering historical and projected customer demand and the on-going provision of capacity to meet that demand.

7.2 Independent Forecasts

36. Updated estimates of unconstrained demand for a number of the services operated by CFL were prepared by Reference Economic Consultants. The following services were reviewed for the analysis for the 2016 Annual Report:-

a) Ardrossan-Brodick
b) Kennacraig-Islay
c) Oban-Craignure
d) Ullapool-Stornoway
e) Uig-Tarbert/Lochmaddy
f) Oban-Colonsay
g) Oban-Coll/Tiree
h) Mallaig-Armadale
i) Sound of Barra and
j) Sound of Harris

37. Traffic types included were passenger, car, coach and commercial vehicle (CV) and covered the period 2017 to 2040. The base carryings year was 2016 and this was for satisfied demand only.

38. The remaining CHFS services not selected for review in the 2016 Annual Report, and for which the 2015 forecasts of demand were used, were as follows:-

a) Oban-Castlebay
b) Oban/Mallaig-Lochboisdale
c) Claonaig/Tarbert-Lochranza
d) Largs-Cumbrae Slip
e) Wemyss Bay-Rothesay
f) Colintraive-Rhubodach
g) Tarbert-Portavadie
h) Tayinloan-Gigha
i) Fionnphort-Iona
j) Oban-Lismore
k) Lochaline-Fishnish
l) Tobermory-Kilchoan
m) Mallaig-Small Isles
n) Sconser-Raasay

39. The routes which were not selected were generally those which had undergone a change in service delivery during the year as a result of the following:-

a) a change of primary route vessel

    i. Oban-Castlebay
    ii. Oban/Mallaig-Lochboisdale
    iii. Claonaig/Tarbert-Lochranza

b) added to the RET pricing mechanism in October 2015

i. Claonaig-Tarbert/Lochranza
ii. Largs-Cumbrae Slip
iii. Wemyss Bay-Rothesay
iv. Colintraive-Rhubodach
v. Tarbert-Portavadie
vi. Tayinloan-Gigha
vii. Fionnphort-Iona
viii. Oban-Lismore
ix. Lochaline-Fishnish
x. Tobermory-Kilchoan
xi. Mallaig-Small Isles
xii. Sconser-Raasay

c) a change in 'via' or mainland port(s)

i. Oban-Castlebay
ii. Oban/Mallaig-Lochboisdale

d) and /or where levels of vehicle deck capacity utilisation were not giving rise to significant volumes of unmet demand

i. Claonaig/Tarbert-Lochranza
ii. Colintraive-Rhubodach
iii. Tarbert-Portavadie
iv. Fionnphort-Iona
v. Oban-Lismore
vi. Mallaig-Small Isles
vii. Sconser-Raasay

40. At this time no definitive measurement exists for the true levels of unsatisfied (or unmet) demand. This is not limited to the CHFS network as it is also a feature of air and rail services as well as in the accommodation and visitor attractions sectors.

41. Reference Economic Consultants, in their review of capacity and carryings data for 2016, provided an estimate of the potential levels of unmet demand. This was based on an analysis of monthly carryings from 2000 to 2016 and sailing-by-sailing carryings/capacity provision for more recent years. Forecasts of unmet demand were limited to cars (and their passengers) as the current booking process generally gives coach and CV customers the first call on space on a sailing and it is rare for these customer types to be displaced/denied travel due to a lack of capacity.

42. The annual forecasts, which provided the basis for the analysis in this report, included uplifts for unmet demand in 2017. This is essentially a new vessel effect i.e. the carryings which may be realised if a new vessel of unlimited capacity was in service.

7.3 Capacity/Demand Model

43. To assist with the qualitative assessment of a demand led solution for vessel deployment and replacement, two spreadsheet models were developed – one for the major fleet of vessels and the other for the non-major fleet. The models included the following methodologies:-

a) All CHFS routes modelled on a week-by-week basis for the period to 2040
b) 2012 to 2016 actual weekly carryings for passengers, cars, coaches and CVs with 2016 used as the base year for demand
c) 2012 to 2016 actual weekly capacity supplied
d) 2017 scheduled weekly capacity (number of sailings multiplied by the vessel capacity, including mezzanine deck usage, and adjusted for tidally disrupted sailings) as the base level for capacity provision
e) Unconstrained demand forecasts by traffic type for 2017 to 2040
f) The ability to change weekly capacity provision (vessel and no. of sailings) over the life of the model
g) Ability to apply RET demand uplifts (split over two years) independently of the unconstrained forecasts

44. In order that an analysis of capacity utilisation can be performed, the model calculates the percentage utilisation of both actual and forecast passenger capacity and vehicle deck capacity. See Appendix 1 for an explanation of how capacity utilisation is calculated and the factors which can affect it. (It should be noted that the available passenger capacity was adequate to satisfy current and projected demand and that no further detail modelling was considered in this area.)

45. The numbers shown in Sections 8.1 and 8.2 are the average weekly capacity utilisation percentages across the nine busiest consecutive weeks on a route. For the majority of routes this equates to July and August, however, some routes vary slightly from this and the model takes this into account.

46. As a guide to what the capacity utilisation figures mean the following can be considered as a rough guide:-

a) Less than 30% - customers are almost always able to travel on their first choice of sailing. Full sailings are infrequent and overall utilisation levels are not a barrier to travel
b) Between 30% and 50% - an increase in the number of full sailings will be evident, however, customers will almost certainly be accommodated on the next sailing if their first-choice sailing is full. Full sailings are more frequent, however, customers are not deterred from travelling as a result
c) Between 50% and 70% - Full sailings are even more frequent and some customers may find that their choice of available sailings is limited. Some customers may choose not to travel as a result, however, volumes are not considered significant
d) Above 70% - Full sailings are a regular occurrence and an increasingly significant number of customers choose not to travel as alternative sailing times are not suitable. In some cases customers may displace to another route if an alternative is available

47. The data available for the models has some limitations as it is derived from the current business information system. Nevertheless, the same basis is used across the models ensuring that all routes are analysed on a consistent comparative basis.

48. The spreadsheet models and the methodology followed will give the required evidence based process which can be replicated in future years.

7.4 Impact of Changing Vehicle Type/Mix on Vessel Capacity

49. Increasing car sizes are continuing to have an impact on the number of vehicles which the CHFS vessels can convey. As an example vessels which were constructed in the 1980s were designed to accommodate cars from that era. Based on today's average car dimensions, the older vessels' effective car capacity, by number, is up to 20% less than it was originally. As well as car lengths and widths increasing, weights are also increasing. This increase in weight manifests itself when cars are stowed on vessel mezzanine decks. In order that safe working limits are not exceeded the number of cars stowed on the mezzanine decks of the older vessels may be reduced.

50. The number and length of CVs which can be conveyed by the vessels is largely unchanged from 'as built'. Exceptions to this are where vehicle decks have been modified or where cargo deadweight has reduced.

51. The full roll-out of RET across the CHFS network has resulted in a change of vehicle choice for many small commercial operators and tradesmen. The commercial attractiveness (i.e. fare price and the lifting of previous five metre length threshold to six metres) of a Light Goods Vehicle (LGV) as opposed to a small Heavy Goods Vehicle (HGV) has resulted in a number of customers switching to LGVs. This transition from HGVs to LGVs will continue for a few years as operators gradually replace their vehicles. The impact of this change in customer behaviour affects the data recorded in current business information systems. HGV activity is recorded as CVs whilst LGV activity is recorded as cars. This change in classification makes it more difficult to identify the trends associated with LGVs as they are now collated with cars. As LGVs are larger than cars, the effect of this is to understate the actual capacity utilisation. CFL continues to review other data sources to assist with the analysis of this changing behaviour.

7.5 Customer Booking Patterns

52. Increased demand for services is encouraging customers to make changes in the way they reserve space on services:-

a) Advance bookings – customers are booking further in advance to ensure they can access their sailing of first choice
b) Making a reservation for journeys which they previously turned up for (confident there would be space available)

53. CV customers are given priority when sailings become available for bookings. These customers, by their nature, are engaged in the supply/export of essential goods and services for the communities. Surety of travel is a must for these customers.

54. Coach customers are also given a high priority as the movement of large numbers of passengers is planned well in advance of travel and is usually combined with a block purchase of accommodation.

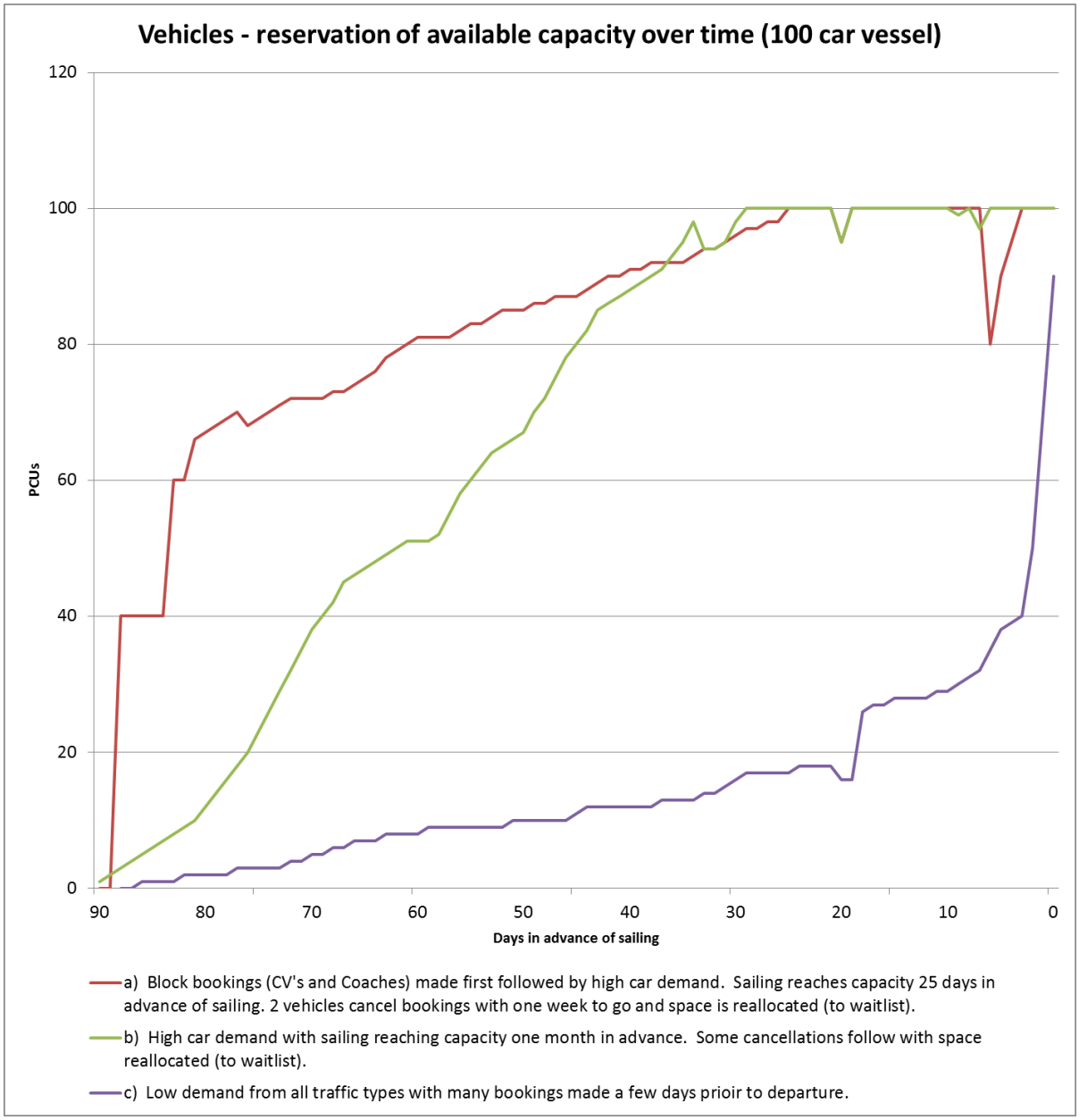
55. Some allocation of space for different vehicle types is practised to ensure that CV and coach customers do not fully utilise 100% of vehicle deck (or passenger) capacity.

56. All customers (within the respective vehicle types) are booked on a first-come-first-served basis.

57. Three booking profiles are typical of the demand for space on reservable sailings:-

a) Block bookings for CVs are first followed by coaches with remaining capacity being fully booked by cars (and/or additional coaches/CVs) several weeks before departure. Some late cancellations from CVs made days in advance of departure. Space 'released' quickly filled from the waitlist or from last minute demand for space
b) No CV or coach bookings made with all space being taken up by cars, caravans and motorhomes. Sailings booked out several weeks in advance of departure with any cancelled space being taken up immediately it is released
c) Sailing with low initial demand and then demand ramping up significantly a few days before departure. Capacity of vessel is not reached

58. These time-period profiles, based on actual data from CFL's reservation system, are illustrated in the graph below. The horizontal (*x*) axis indicates the number of days in advance of the sailing departure whilst the vertical (*y*) axis shows the vessel vehicle capacity (expressed in passenger car equivalent units - PCUs).



59. With the introduction of a new ticketing and reservations systems, the ability to undertake more complex analyses of data will be possible. This will allow an earlier identification of the 'hotspots' and assist with the planning of future capacity provision.

8 ROUTES – 2016 DEMAND AND CAPACITY ANALYSIS

8.1 Model Outputs – Major Vessel Routes

60. The spreadsheet model developed to support the analysis for the major vessel fleet has been updated to reflect:-

a) 2016 actual carryings

b) The addition of the Oban-Castlebay and Mallaig-Lochboisdale routes
c) 2017 to 2040 forecast carryings (of unconstrained demand) by Reference Economic Consultants
d) 2016 actual capacity provision
e) 2017 to 2040 forecast capacity based on the 2017 published timetables and vessel deployment plan, and with an assumed initial deployment for the two new 102 metre vessels from 2019 (there first whole year of operation)

61. The model outputs were limited to the major vessel routes which formed the majority part of a vessel's deployment. This means the following 'spin-off' routes, i.e. routes which have resulted from the development of primary lifeline routes, were excluded from the detailed analysis:-

a) Ardrossan-Campbeltown
b) Kennacraig-Islay-Colonsay-Oban
c) Oban-Coll-Tiree-Castlebay

62. The NSG members agreed that the priority order for vessel deployment and replacement should be driven specifically by the average vehicle deck utilisation during the busiest consecutive nine weeks for the route. The forecast (from the 2015 Annual Report) and actual capacity utilisation levels for 2016 and the forecast capacity utilisation levels for 2017 to 2022 during the peak nine weeks are shown below. (Red highlighting indicates the highest level of capacity utilisation whilst blue indicates the lowest level.):-

Peak 9 Weeks Vehicle Capacity Utilisation

	Forecast 2016*	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Ardrossan-Brodick	64%	68%	**77%**	**79%**	**63%**	**64%**	**65%**	**67%**	29-Aug
Kennacraig-Islay	65%	**81%**	**75%**	**77%**	**79%**	**83%**	**85%**	**87%**	07-Nov
Mallaig-Lochboisdale		69%	69%	**72%**	**73%**	**75%**	**77%**	**79%**	29-Aug
Oban-Coll/Tiree	**74%**	65%	68%	69%	**71%**	**72%**	**73%**	**74%**	15-Aug
Oban-Castlebay		43%	43%	45%	46%	47%	48%	50%	22-Aug
Oban-Colonsay	36%	20%	20%	20%	21%	21%	21%	21%	29-Aug
Oban-Craignure	**76%**	**81%**	**96%**	**98%**	66%	67%	68%	**70%**	29-Aug
Uig-Tarbert/Lochmaddy	**71%**	**73%**	**81%**	**84%**	**72%**	**74%**	**75%**	**77%**	15-Aug
Ullapool-Stornoway	62%	69%	**72%**	**73%**	**75%**	**77%**	**78%**	**80%**	22-Aug

*-Based on July and August 2015 Note-Values in excess of 70% are **shown in bold**.

63. The Ferries Plan commitments have been largely delivered for the routes served by the major vessels. A commentary on how these commitments have impacted the peak nine weeks for the routes has been added to the analysis below.

64. Taking each route in turn the modelled outcomes, which are repeated alongside each route, were as follows:-

8.1.1 Ardrossan-Brodick (Arran)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Ardrossan-Brodick	66%	68%	77%	79%	63%	64%	65%	67%	29-Aug

65. The figures for 2016 were forecast at 66%, however, the vehicle deck capacity utilisation levels achieved in the second full year of RET exceeded this at 68%. Whilst this figure was achieved across the July/August period, the peak nine weeks for utilisation on the route actually occurred in March and April - during the period of the single vessel service by MV Caledonian Isles. The March/April figure exceeded the July/August level by half a percentage point. In recent years, a two vessel service has been provided in April, however, this did not happen in 2016 as a result of accommodation upgrades to MV Isle of Arran and the April utilisation figure was as a result much higher than is normal. The route, which was served by MV Caledonian Isles and MV Isle of Arran from May to September in 2016, is planned to be the initial deployment for one of the new 102 metre vessels, MV Glen Sannox.

66. Owing to capacity constraints, the level of unsatisfied demand for car space is high during peak periods. If every car which sought to travel could be accommodated then capacity utilisation would reach a level of 77% in 2017. The impact of the additional capacity in 2019, i.e. the new vessel effect, can be seen above as a reduction in vehicle deck utilisation levels from 79% to 63%. (This assumes that the new 102 metre vessel, the MV Glen Sannox, and MV Caledonian Isles will cover the route from May until September, as the MV Caledonian Isles and the MV Isle of Arran do now, and that sailing frequency will be as Summer 2017.)

67. Once MV Glen Sannox is fully operational, MV Isle of Arran will not be required for the delivery of the Ardrossan-Brodick (and Campbeltown) summer schedules.

68. The Ferries Plan short-term commitment for this route in the summer was the provision of a two vessel service between May and September. This has been in place since 2013. Longer-term proposals indicate an extension to the period of the two-vessel service.

8.1.2 Kennacraig-Islay (Port Ellen/Port Askaig)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Kennacraig-Islay	68%	81%	75%	77%	79%	83%	85%	87%	07-Nov

69. Capacity utilisation levels on the Kennacraig-Islay route were forecast to be at 68% in July and August 2016. The actual level was 79% with a peak nine week figure of 81% evident in the period to the first week in November. This higher than forecast July/August level of utilisation was due to the unscheduled unavailability of one of the route vessels (MV Hebridean Isles) combined with a defective mezzanine deck on the MV Finlaggan significantly restricting capacity. The lack of a functioning mezzanine deck was also a factor in the peak nine weeks occurring from the first week of September through to the first week of November. A scheduled single vessel service on the route at the start of the winter timetable period (commencing 23 October) added to the lack of capacity and the higher than normal utilisation levels. Based on an analysis of peak carryings from 2012 to 2016 the reduction in the number of sailings, and therefore capacity, at the start of the winter timetable continues to see the peak nine weeks for capacity utilisation occur at this time i.e. from the first week of September to the first week of November.

70. The second busiest nine week period occurred between mid-May and mid-July with utilisation levels c. 1% less than those of the peak nine week period. On the Kennacraig-Islay route the

overall utilisation level across the majority of the summer varies little. CV carryings reduce slightly at the height of the holiday season increasing again as the holiday period comes to an end. Car carryings display the opposite characteristics resulting in a relatively consistent demand for vehicle space.

71. The route is estimated as having a high level of unsatisfied demand for cars. If every car which required to travel was accommodated within the existing weekly capacity available, peak nine week vehicle deck capacity utilisation of c. 75% in 2017 is estimated. Separate, more detailed analysis, shows that demand for car space is at its strongest on summer Saturdays and on sailings to the island. Historical patterns of tourism demand have given rise to this demand profile and little can be done to move this demand to other points in the week.

72. The level of unsatisfied demand amongst CVs is low as they typically have the first call on available capacity. Some short-term capacity constraints may exist on occasions, however, generally all CVs which require to travel can do so within an acceptable time frame.

73. The 2015 Annual Report highlighted services to Islay as being in need of additional capacity. The forecast level of capacity utilisation from 2019 (highlighted in red) reinforces this with the route being forecast to be the most heavily utilised of all of the major routes once the forecast direct and indirect effects of the two new major vessels have been taken into account.

74. An assessment of future options for the route, including vessel and port infrastructure provision, was commissioned following the publication of the 2015 Report. Outputs from the assessment are described in Chapter 11.

75. The Ferries Plan committed to an overall increase in frequency of sailings to Islay (as well as a more equal spread of calls between Port Askaig and Port Ellen). This enhancement has taken place. However, a separate commitment to serve Colonsay with a dedicated vessel (which would indirectly increase frequency to Islay further still) remains undelivered.

8.1.3 Mallaig-Lochboisdale (South Uist)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Mallaig-Lochboisdale	-	69%	69%	72%	73%	75%	77%	79%	29-Aug

76. A summer service between Mallaig and Lochboisdale was re-instated in 2016. At the same time the summer service between Oban and Lochboisdale ceased and a dedicated link between Oban and Castlebay was established. Services across the Sound of Barra joined the RET pricing mechanism in October 2015 introducing yet another factor which may have influenced customers' travel patterns in Summer 2016.

77. In the first summer of operation of the Mallaig-Lochboisdale service, peak levels of capacity utilisation on the route achieved 69%. This is forecast to grow steadily over the years; however, the long term patterns of demand on the various services to (and within) the Outer Hebrides are unclear as customer behaviour adapts to the re-configuration of services and the deployment of vessels.

78. The service was provided by MV Lord of the Isles with the vessel shared with the Mallaig-Armadale service.

79. The Ferries Plan identified that a service between Mallaig-Lochboisdale would only come about as a result of other service adjustments taking place and creating an opportunity. This 'new' route will be included in the STAG assessment of Outer Hebrides services to be commenced in 2017. In the meantime, TS and CMAL have been working with Storas Uibhist, the local community landowner, on an appraisal of future port options for the delivery of a facility within Lochboisdale bay that will upgrade or replace the existing CMAL-owned berth, which is approaching life expiry.

8.1.4 Oban-Coll/Tiree

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Oban-Coll/Tiree	59%	65%	68%	69%	71%	72%	73%	74%	15-Aug

80. Capacity utilisation levels in 2016 were higher than forecast. This was due to an adjustment in the peak nine week period combined with a 24% increase in car demand and a 10% increase in CV traffic in July and August. More capacity was provided around the Tiree Music Festival weekend which had not been considered in the forecast.

81. In Summer 2016 the service was significantly enhanced with MV Clansman becoming the sole route vessel. Services were previously shared with the smaller MV Lord of the Isles so capacity levels in 2015 were lower than in 2016. An additional round trip was also added to the route on peak Saturdays giving a welcome increase on the principal self-catering changeover day. The combined service enhancements in Summer 2016 have resulted in levels of unsatisfied demand being low.

82. The Ferries Plan did not include any commitments for the summer service on this route.

8.1.5 Oban-Castlebay (Barra)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Oban-Castlebay	-	43%	43%	45%	46%	47%	48%	50%	22-Aug

83. Services between Oban and Castlebay/Lochboisdale were fundamentally restructured at the start of Summer 2016. A dedicated vessel (MV Isle of Lewis) was allocated to a direct Oban to Castlebay service whilst another major vessel (MV Lord of the Isles) provided services between Mallaig and Lochboisdale. Capacity utilisation levels on the new service were at 43% between the late June to late August peak. With this low level of overall utilisation it is unlikely that there was any unsatisfied demand on the route other than on occasional peak demand sailings.

84. The Ferries Plan did not include any commitments for the summer service on this route, however, changes to the re-deployment of MV Isle of Lewis have resulted, as indicated above, in daily services provided by dedicated vessels serving both Castlebay (from Oban) and Lochboisdale (from Mallaig).

85. Barra continues to be further served by the Oban-Coll/Tiree/Castlebay service which MV Clansman operates on Wednesdays during the summer.

86. All routes to/from and within the Outer Hebrides are the subject of a STAG assessment, which is now underway.

8.1.6 Oban-Colonsay

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Oban-Colonsay	18%	20%	20%	20%	21%	21%	21%	21%	29-Aug

87. Levels of capacity utilisation on this route are the lowest (as indicated by the blue highlighting) of the major vessel routes. Operationally, demand on this route could be met by a smaller vessel than MV Clansman, which is shared with Coll/Tiree, or the MV Hebridean Isles, which provides a connection to Islay and Oban, and with service frequency reduced by one return journey per week to Summer 2015 levels. As set out in Section 5 above, the Ferries Plan proposed an alternative vessel deployment. Further work on the future solution for this service will be required which also takes account of the interaction with services to the islands with which current vessels are shared.

8.1.7 Oban-Craignure (Mull)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Oban-Craignure	85%	81%	96%	98%	66%	67%	68%	70%	29-Aug

88. In 2016 the Oban-Craignure service was the most heavily utilised of all the major vessel CHFS services – see red highlighting. Even with two dedicated vessels, the MV Isle of Mull and the MV Coruisk operating a full timetable across the summer (as opposed to one vessel in Summer 2015), the service struggled at times to cope with the demand generated by RET.

89. Whilst MV Isle of Mull and MV Coruisk continue to cover the route, demand will continue to be significantly constrained. High levels of unsatisfied car demand (likely to have been fuelled by further growth in year two of RET) exist on the route. If this demand could be accommodated on the existing service, overall vehicle deck utilisation levels would rise to 98% by 2018.

90. Following the deployment of the new vessel 802 to the Uig 'triangle' services, the Oban-Craignure summer service will be operated by MV Hebrides and either MV Isle of Mull or MV Isle of Arran. This will give a significant uplift in capacity on the route with forecast levels of peak capacity utilisation estimated to reduce to c.66% from 2019.

91. The working group, AFIG, (see above) is assessing the requirement for, and extent and cost of, modification works at Craignure to safely berth the second vessel overnight.

92. The Ferries Plan required a two vessel summer service on the route from Summer 2016. This was achieved through fleet re-deployment, however, it was at the cost of a sub-optimal arrangement for the Mallaig-Armadale service and it is therefore not intended that this re-deployment continues once additional major vessels are added to the fleet.

8.1.8 Uig-Tarbert (Harris)/Lochmaddy (North Uist)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Uig-Tarbert/Lochmaddy	75%	73%	81%	84%	72%	74%	75%	77%	15-Aug

93. Actual capacity utilisation levels in the peak of 2016 were slightly lower than forecast. Reasons for this may be the 'northwards' displacement of demand to the Ullapool-Stornoway route and 'southwards' demand to the re-configured Oban-Castlebay and Mallaig-Lochboisdale services. These significant changes in service delivery, combined with RET on the inter-island services between Harris and North Uist and between Eriskay and Barra, are giving rise to a period of re-adjustment. This will be further influenced by the introduction of 802 on the 'triangle' services in late 2018. 802 will replace the current route vessel MV Hebrides (which will be re-deployed to Oban-Craignure services).

94. Levels of unsatisfied demand for services between Uig-Tarbert/Lochmaddy are forecast to be high. The capacity utilisation figure for 2017 includes these volumes and shows a marked increase on the 2016 actual figures. The impact of the additional capacity in Summer 2019 will see peak capacity utilisation levels reduce to 72%.

95. Whilst the figures presented above are for the whole 'triangle' route, closer analysis of vehicle deck capacity utilisation on the Uig-Tarbert and Uig-Lochmaddy segments of the route reveals some variations between the two. In 2016 peak capacity utilisation on the Uig-Tarbert element of the route was estimated at c.77% whilst the Uig-Lochmaddy element was an estimated c.70%. The Lochmaddy leg is heavily utilised by CVs whilst the Tarbert leg is dominated by cars. The difference in the annual profile of demand across the two legs is quite marked with Tarbert being lightly used by CVs and with strong peaking of car demand in July and August.

96. Like Ullapool-Stornoway the Ferries Plan did not include any service commitments for the Uig-Tarbert/Lochmaddy route, however, the route will be included in the STAG assessment, which is now underway.

8.1.9 Ullapool-Stornoway (Lewis)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Peak 9 weeks Ending
Ullapool-Stornoway	71%	69%	72%	73%	75%	77%	78%	80%	22-Aug

97. Car demand on the Ullapool-Stornoway service grew by 8.5% in July and August 2016 compared to the same period the previous year (when MV Isle of Lewis provided additional sailings in the peak summer). Overall utilisation levels were slightly lower than forecast and the introduction of MV Loch Seaforth (in 2015) has resulted in levels of unsatisfied demand being reduced. These outcomes are typical of a new vessel effect.

98. Capacity utilisation on this route is forecast to continue increasing although a new vessel effect on the Uig-Tarbert service, following the introduction of 802, may result in some displacement of demand back to the Harris service. (This has not been included in the forecasts.) Forecast

growth in demand in the longer term would require an increase in capacity to maintain utilisation at optimal levels.

99. The Ferries Plan did not include any service commitments for this route, however, the route will be included in the STAG assessment, which is now underway.

8.1.10 Summary: Major Vessel Routes

100. A number of routes served by the major vessel fleet are displaying levels of vehicle deck utilisation which suggest that unsatisfied demand is currently at, or will be during the CHFS2 contract period, a significant level. The revised pattern of vessel deployment on Oban 'long-haul' services, enabled by the full use of MV Isle of Lewis on services to Barra, combined with the change in mainland port for Lochboisdale services, is expected to address the short-term challenges on these two routes. The addition of the two new 102 metre vessels to the fleet will further address some of the challenging areas notably the Uig 'triangle' and Ardrossan-Brodick as well as enabling the deployment of the MV Hebrides to Oban-Craignure and releasing the MV Coruisk for deployment back to Mallaig-Armadale. Services to Islay are already significantly constrained and ways of addressing the high levels of unsatisfied demand are required. Overall demand for CHFS services continues to grow, in some cases at levels above general economic performance (i.e. GDP). The full effects of RET pricing on car demand on the 'late' routes has yet to fully mature, however, significant capacity constraints mean that the true levels of post RET demand may not be evident until these constraints are released.

101. The major vessel capacity utilisation model also considered the levels of passenger capacity provided. Whilst some short-term peaking in demand is evident levels of utilisation are not at a stage where solutions need yet be explored.

102. No major vessel disposals, life-extensions or modifications to increase capacity have been confirmed, however, these areas remain under review and will be concluded prior to the introduction of the two new major vessels.

8.2 Model Outputs – Non-Major Vessel Routes

103. An identical approach to that used for the major vessels has been adopted for the non-major vessels i.e. an update of the original spreadsheet model to reflect the most recent carryings data, planned and demand forecasts.

104. All of the routes served by non-major vessels became part of the RET pricing mechanism in October 2015 (with the exception of the Tayinloan-Gigha and Claonaig-Lochranza routes which were covered by earlier roll-outs). Figures shown for 2016 include the first year effects of RET whilst the 2017 figures included an estimate of the RET year two uplifts.

105. It should be noted that the non-major vessels can be subdivided into two groups – those which only (or regularly) operate to linkspans and those which operate to slips. Within the group which operate to linkspans (MV's Bute, Argyle, Coruisk and Lochnevis) there is a degree of interchangeability which addresses seasonality factors and relief cover. For the vessels which operate to slips this flexibility also exists, however, a factor which can limit the deployment of

larger 'slip' vessels to routes is the availability and suitability of overnight berthing facilities (including charging points for the hybrid vessels to re-charge their batteries from the national grid). Height of tide limitations can also be amplified when a 'slip' vessel is required to operate to a linkspan – this is especially true during spring low tides with coaches being the most heavily impacted vehicle type.

106. With the exception of the service between Mallaig and the Small Isles, the Ferries Plan does not envisage extensive changes to the routes and services on the non-major CHFS routes. Where a Ferries Plan commitment was made this has been included in the route commentary.

107. The routes were reviewed to determine when the peak nine weeks occurred. The only route which varied significantly (i.e. by more than 1%) from the July/August peak nine week period was the Sound of Harris (where it occurred between mid-June and mid-August).

108. With 2016 as the base year for carryings data and with 2017 Summer timetables and vessel deployment setting capacity levels the projected levels of vehicle deck utilisation across the non-major routes are as shown below. (Red highlighting indicates the highest level of capacity utilisation whilst blue indicates the lowest level.):-

Peak 9 Weeks Vehicle Capacity Utilisation

	Forecast 2016*	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Claonaig & Tarbert-Lochr	55%	54%	36%	37%	38%	38%	39%	40%
Colintraive-Rhubodach	23%	25%	27%	27%	28%	28%	28%	28%
Fionnphort-Iona	19%	14%	15%	15%	15%	15%	15%	15%
Largs-Cumbrae	39%	37%	41%	42%	42%	42%	43%	43%
Lochaline-Fishnish	29%	32%	41%	42%	30%	31%	31%	32%
Mallaig-Armadale (tidal)	**87%**	**74%**	**88%**	**92%**	**71%**	**73%**	**75%**	**76%**
Mallaig-Small Isles	23%	38%	39%	40%	40%	40%	40%	40%
Oban-Lismore	29%	29%	34%	35%	35%	36%	36%	37%
Sconser-Raasay	24%	29%	34%	35%	35%	36%	36%	36%
Sound of Barra	57%	59%	69%	**70%**	**72%**	**73%**	**75%**	**76%**
Sound of Harris (tidal)	**71%**	**80%**	**86%**	**88%**	**90%**	**93%**	**95%**	**97%**
Tarbert-Portavadie	37%	35%	42%	42%	28%	28%	28%	29%
Tayinloan-Gigha	39%	38%	39%	39%	40%	41%	41%	42%
Tobermory-Kilchoan	44%	42%	42%	42%	43%	44%	44%	45%
Wemyss Bay-Rothesay	48%	48%	52%	53%	54%	55%	55%	55%

*-Based on July and August 2015 Note-Values in excess of 70% are **shown in bold**.

109. Overall levels of vehicle deck utilisation in the nine week peak period are generally lower than those typically seen on the routes served by the major vessels – the exceptions to this being the Mallaig-Armadale, Sound of Harris and Sound of Barra routes. (The Sound of Harris service can experience high loading levels in the winter as the route is limited to daylight operation only. During this period the frequency of sailings can be limited to as few as two round-trips per day.)

110. The routes from Fionnphort to Iona and Mallaig to the Small Isles exhibit very low levels of vehicle deck utilisation. This is principally due to the restrictions placed on vehicles travelling to these communities – limited to residents only and to other vehicles connected with the provision of lifeline services e.g. refuse collection, tradesmen and utilities.

111. The majority of the non-major vessel routes are non-bookable for cars i.e. they operate on a turn-up-and-go basis. This can lead to short-term periods of high demand, full sailings and vehicles being left behind (usually until the next sailing but occasionally longer).

112. For the routes which are forecast to see capacity utilisation exceed 40% in 2017 a more detailed analysis of their demand versus capacity relationship is considered further as follows:-

8.2.1 Largs-Cumbrae Slip

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Largs-Cumbrae Slip	39%	37%	41%	42%	42%	42%	43%	43%

113. This route is served by MV Loch Shira and MV Loch Riddon during the peak season. Vehicle deck utilisation figures are forecast to rise to 41% in 2017 – the second summer of RET on the route. At these levels of utilisation there will be a number of occasions where vehicles will be short-shipped (i.e. left behind as a result of the vehicle deck being full), especially at peak times stimulated by day-trippers, good weather and festivals/events. The levels of capacity utilisation are such that vehicles for shipment which cannot be carried on the next available sailing will be accommodated with a level of delay which does not ultimately deter travel. Growth in demand on the route is forecast to be slight in the medium term with peak season capacity utilisation continuing at manageable levels.

114. The Ferries Plan did not include any commitments for the services on this route.

8.2.2 Lochaline-Fishnish (Mull)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Lochaline-Fishnish	29%	32%	41%	42%	30%	31%	31%	32%

115. This route is being served by MV Lochinvar in Summer 2017. This is an interim vessel deployment with the larger MV Loch Fyne (currently deployed between Mallaig and Armadale) planned to return to the route in Summer 2019. This is reflected in vehicle deck utilisation figures which are forecast to be slightly above 40% in 2017 and 2018 before returning to c. 30% from 2019. At these levels of peak utilisation there will be a very limited number of occasions where vehicles will be short-shipped (i.e. left behind as a result of the vehicle deck being full). Growth in demand on the route is forecast to be low in the medium term with peak season capacity utilisation continuing at levels which do not give any cause for concern.

116. This route is the only route which has not seen increased car demand in the first year of RET. Anecdotally, the reduced cost of travelling Oban-Craignure (as a result of RET) and the increased frequency of sailings on the Oban-Craignure route have displaced traffic from Lochaline-Fishnish.

117. The Ferries Plan did not include any commitments for the services on this route.

8.2.3 Mallaig-Armadale (Skye)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Mallaig-Armadale (tidal)	87%	74%	88%	92%	71%	73%	75%	76%

118. The route was served by MV Coruisk in 2015 and then by MVs Lord of the Isles, Lochinvar and Loch Bhrusda in 2016. The three vessel operation gave a small increase in the capacity available (when compared to 2015). This additional capacity was quickly taken up with increased demand brought about through RET. 2016 was the first summer of RET on the route with volumes of cars carried in the peak nine weeks being 10% greater than in 2015. This increase, which was lower than was forecast, was depressed as a result of service disruptions due to tidal constraints affecting the vessels used.

119. For 2017 (and for 2018) the route was served by MV Loch Fyne and MV Lord of the Isles. The route was forecast, in 2017, to have the highest levels of vehicle deck utilisation across the whole CHFS network – see red highlighting. With levels forecast to be near 92%, volumes of unsatisfied demand would be high.

120. In Summer 2019 it is planned that MV Coruisk will return to the route and serve alongside MV Lord of the Isles. This will give an increase in capacity and utilisation levels will reduce to a forecast 71%. Short to medium term growth is forecast to continue thereafter with levels of unsatisfied demand growing as capacity constraints re-emerge. A Mallaig-Armadale Infrastructure Working Group has been set up to look at medium to long-term vessel and port options, also taking into account the needs of the Lochboisdale route being served from Mallaig.

121. The Ferries Plan did not include any commitments for the provision of services on this route.

8.2.4 Barra-Eriskay (Sound of Barra)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Sound of Barra	57%	59%	69%	70%	72%	73%	75%	76%

122. The vessel undertaking this service is MV Loch Alainn. In October 2015 RET was rolled out to the route with Summer 2016 being the first real test of available capacity on the route. Vehicle deck utilisation levels of 57% were forecast for 2016 – the actual was 59%. Growth in car demand in July and August was 27.5% with another 10% forecast in Summer 2017. Forecast levels of unsatisfied demand are modest, however, growth projections point to this becoming a bigger issue in the short to medium term.

123. The transportation of tri-axle coaches and fully laden HGV's on this service can be a challenge at certain states of the tide.

124. The Ferries Plan did not include any service commitments for this route. The route will be included in the STAG review of Outer Hebrides services, which is now underway.

8.2.5 Berneray-Leverburgh (Sound of Harris)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Sound of Harris (tidal)	71%	80%	86%	88%	90%	93%	95%	97%

125. Following the roll-out of RET to this route in October 2015 peak summer capacity utilisation levels reached 80% in 2016. Similar to the Sound of Barra route car demand grew by 27% in the peak. Tidal restrictions on the route are greater than they were in previous years (following modifications to the regular vessel MV Loch Portain) adding to the overall increased capacity utilisation. With further growth forecast in the second year of RET and beyond, from 2019 this route will be the most heavily utilised in the CHFS network – see red highlighting.

126. The Ferries Plan did not include any service commitments for this route. The route will be included in the STAG review of Outer Hebrides services, which is now underway.

8.2.6 Tarbert (Kintyre)-Portavadie (Cowal)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Tarbert-Portavadie	37%	35%	42%	42%	28%	28%	28%	29%

127. This route is currently served by MV Isle of Cumbrae. This is an interim arrangement which will continue in 2018. From 2019 the route will be served by the larger MV Lochinvar – at this point utilisation levels are forecast to fall from 42% to 28%. Peak season growth in car traffic in the first year of RET was 30% with another 12% forecast for the second year.

128. The Ferries Plan did not include any commitments for the provision of services on this route.

8.2.7 Tobermory (Mull)-Kilchoan (Ardnamurchan)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Tobermory-Kilchoan	44%	42%	42%	42%	43%	44%	44%	45%

129. This route, which was served by MV Loch Linnhe in 2016, saw the largest year-on-year growth in car demand following the roll-out of RET. Fare price reductions of c.70% saw demand increasing by 67% with another significant increase forecast for year two. A 50% larger vessel, MV Loch Tarbert, has been deployed to the route to cope with this demand. This will maintain utilisation at a manageable level of c.40%.

130. The Ferries Plan did not include any commitments for the provision of services on this route.

8.2.8 Wemyss Bay-Rothesay (Bute)

	Forecast 2016	Actual 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022
Wemyss Bay-Rothesay	48%	48%	52%	53%	54%	55%	55%	55%

131. This route is served by MV Argyle and MV Bute. Peak vehicle deck utilisation figures, in the first year of RET rose to 48% in the first summer of RET. Car demand increased by 19% during this period. With capacity utilisation forecast to increase to 52% there will be an increasing number of occasions where vehicles will be short-shipped (i.e. left behind as a result of the vehicle deck being full), especially at peak times of the week. The levels of capacity utilisation are such that any short-shipped vehicles will be virtually assured travel on the next sailing. Growth in demand on the route is forecast to be slight in the medium term with peak season capacity utilisation continuing for the time being at manageable levels.

132. The Ferries Plan did not include any commitments for the services on this route.

8.2.9 Summary: Non-Major Vessel Routes

133. With the exception of the Mallaig-Armadale, Sound of Harris and Sound of Barra routes, overall vehicle deck utilisation levels are considerably lower than that found on the major vessel routes. With the introduction of MV Catriona to the fleet during 2016 and the subsequent cascade of MV Loch Tarbert to Tobermory-Kilchoan, two of the routes which were forecast to see utilisation levels increase markedly post RET roll-out (Claonaig-Lochranza and Tobermory-Kilchoan) should now no longer be as heavily constrained.

134. An assessment of vessel disposal options has been undertaken - the expectation being that a number of the older small vessels would be retired from the CHFS fleet. As a result, the MV Eigg and the MV Raasay are being disposed of by CMAL.

135. Like the major vessels, passenger capacity utilisation was analysed with no evidence of any constraints apparent. One-off peaks in demand which may result in full loads of passengers do occur but are infrequent and do not require any further consideration at this time.

9 RET NETWORK-WIDE ROLL OUT

136. This report is the first to capture the actual impact on carryings of RET pricing applying across all CHFS routes. The final tranche of 'late' routes joined the RET pricing mechanism in October 2015. For this 2016 Annual Report the Major and Non-Major spreadsheet models include the actual carryings for passenger, car and coach demand following the first full year of the final phase of the RET roll-out.

137. An analysis of the changes in demand for passengers and cars on the late RET routes in the first full year is shown in the following table.

Changes in Carryings in First Year of RET

Route	Passengers	Cars
Ardmhor (Barra) to Eriskay	20.2%	27.6%
Berneray to Leverburgh	14.4%	24.5%
Colintraive to Rhubodach	18.4%	24.6%
Fionnphort to Iona	12.6%	22.6%
Fishnish to Lochaline	-3.1%	-4.1%

Largs to Cumbrae Slip	5.7%	16.6%
Mallaig to Armadale	0.3%	11.1%
Mallaig to Eigg/Muck/Rum/Canna	9.3%	59.4%
Oban to Craignure	14.2%	42.9%
Oban to Lismore	18.7%	55.4%
Sconser to Raasay	16.2%	22.9%
Tarbert LF to Portavadie	33.9%	42.0%
Tobermory to Kilchoan	28.2%	75.8%
Wemyss Bay to Rothesay (part year)	13.3%	30.6%

138. The Ardrossan-Brodick and Claonaig-Lochranza services, which commenced RET in October 2014, have shown a strong second year of RET uplift. This is estimated to be about 40% of the first year uplift. There are also emerging signs of a third year RET effect, however, a number of other factors may be at play and it is too early to draw conclusions.

139. A second year RET uplift has been applied at the above rate (of 40% of the first year increase) to the October 2015 'late' RET routes and is included in the figures contained in this Report.

10 PORTS

140. In order to deliver the recommendations of the VRDP, a number of ports may require modification to support the delivery of a programme of vessel replacements. For the ports which will be served by the new 102 metre vessels this process is well underway with ports either nearing completion or at the detail design phase.

141. Major redevelopment works at Brodick are approaching completion.

142. Following a decision by the Minister for Transport and the Islands to retain Ardrossan as the mainland port for Arran and Campbeltown, a Ministerial Task Force is overseeing the development of Ardrossan led by the owners Peel Ports (PP) in partnership with North Ayrshire Council (NAC).

143. A Skye Triangle Infrastructure Working Group is overseeing work at the three ports to be served by vessel 802: Uig owned by The Highland Council (THC), Lochmaddy owned by Comhairle nan Eilean Siar (CnES) and Tarbert, Harris owned by CMAL. Through this group, the harbour authorities are also working with CFL to develop plans for service continuity during periods of construction works.

144. Other port works either being considered, developed or at the construction stage include:-

a) Craignure (owned by ABC)
b) Oban (CMAL)
c) Port Askaig (ABC)

d) Lochboisdale (CMAL)
e) Iona (ABC)
f) Fionnphort (ABC)
g) Colintraive (CMAL – works commenced June 2017)
h) Rhubodach (CMAL – works commenced July 2017)
i) Gourock (CMAL)
j) Tayinloan (ABC)
k) Gigha (ABC)

145. Mallaig Harbour Authority (MHA) and Stornoway Port Authority (SPA) have both, in the past year or so, produced and published Masterplans for substantial developments at these ports which include prospective enhancements for ferry berthing alongside other service provision, economic development and regeneration goals.

146. CMAL are the major provider of port and harbour facilities for the CHFS services with 26 locations (half of the total) in their ownership. Of the other ports and harbours utilised in the provision of CHFS services, Local Authorities account for 19 sites with Harbour Trusts, private owners and other bodies accounting for the remaining seven.

147. A further three sites are used specifically for overnight berthing of vessels. CMAL own one of these facilities with the other two in local authority ownership.

148. A full list of all of the ports, harbours and overnight berths used in the provision of the CHFS services can be found in Appendix 3. The list details ownership of the various facilities.

11 EMERGING CONCLUSIONS

11.1 Priorities from VRDP 2015

149. VRDP 2015 set out four priorities for further examination based on those routes showing the most significant current or forecast capacity constraints:-

a) Oban-Craignure route: short and medium term options
b) Mallaig-Armadale route: short and medium term options
c) Outer Hebrides: long term options for the routes to/from the mainland and the inter-island 'Sounds' services
d) Islay: short, medium and long term options

11.1.1 Budgetary Constraints

150. The Ferries Plan noted the sustained pressure on public spending – which has continued – and therefore concluded that: *"All of our proposals are subject to future Spending Review commitments"*.[3]

[3] paragraph 27 on page 7

151. This continues to be the case with the budget available for investment across the Scottish Government under considerable pressures and subject to a number of competing strategic priorities.

11.1.2 Ferry Service Responsibilities

152. As mentioned in Section 2, paragraph 5 the means by which publicly funded ferry services which fall within TS's remit are regulated are as follows:-

a) Policy Responsibility - this sits with TS under the Scottish Ministers
b) Statutory Controls - the maritime sector is bound by international law and convention through a broad range of international, European and domestic laws
c) Contractual Controls - all TS subsidised ferry services are tightly regulated by means of the public service contracts which stipulate precisely how the services will operate (fares, timetabling, vessels, performance measures etc.) thereby protecting the interests of ferry users

153. CFL as operator is responsible for the delivery of the CHFS public service contract. This includes vessel deployment with the fleet vessels deployed to meet the CHFS contractual requirements.

154. The following sections in this chapter which set out the shape of potential services and infrastructure changes are the policy responsibility of TS. All have been developed by TS in conjunction with CFL and CMAL.

11.1.3 Oban-Craignure

155. CFL plan to deploy the MV Hebrides as the primary summer-season vessel on the route once the second of the new vessels under construction ("vessel 802") is delivered and deployed to the Uig-Tarbert-Lochmaddy services. An assessment of the foot passenger access to the vessels will be required at both Oban and Craignure.

156. Following the deployment of vessel 802, the second vessel on the Oban-Craignure route will be either the MV Isle of Mull or the MV Isle of Arran. Through AFIG, the NSG is working with ABC on what works may be required to accommodate each of these vessels overnight at Craignure. In either case, in combination with the MV Hebrides this will provide a significant uplift in capacity and address current pressures until at least 2022 (accepting that there will always be peak days and popular sailings when it may not be possible to travel with a vehicle). This will also release the MV Coruisk.

157. However, growth potential on the route is strong and our long-term ambition is therefore to provide the necessary infrastructure that could support a vessel of the size and capacity of vessels 801 (MV Glen Sannox)/802. Work is already underway with the two harbour authorities at Oban (CMAL) and Craignure (ABC) to consider the upgrades that would be needed at both ports. These are likely to be extensive and expensive. The NSG, through the AFIG, will continue to consider the long-term options for the route.

158. Developments at Oban also interact with services to Lismore, see below.

11.1.4 Mallaig-Armadale

159. As noted above, the MV Coruisk will be available to return to the Mallaig-Armadale route from Summer 2019. However, on her own she will be not be able to cope adequately with forecast demand in peak season and so the intention is to retain a number of return sailings by the MV Lord of the Isles (LOTI). As a result, the pressure on the service will reduce substantially but is forecast to remain above the 70% average capacity utilisation level and so further attention is required. In addition:-

a) LOTI is approaching the end of her service life and is the only major vessel that can access Mallaig
b) If the Mallaig-Lochboisdale service continues to grow as forecast (see below) then there will, in time, be a competing pressure for additional sailings on that route by LOTI or her replacement (or a second vessel)

160. Evidently vessel deployment and replacement plans for Mallaig-Armadale and Mallaig-Lochboisdale need to be considered with reference to each other. The Mallaig-Lochboisdale service will be considered by the Outer Hebrides STAG (see below).

161. MHA has plans for significant upgrades to the port which would create the opportunity for CFL to deploy a larger vessel in place of LOTI. However, if that larger vessel was to maintain LOTI's current timetable and dual role in summer serving both Lochboisdale and Armadale then significant infrastructure upgrades would also be required at Lochboisdale and Armadale.

162. Infrastructure works of this size and cost tend to be long-term and therefore in terms of a medium-term approach we will be considering vessel options within existing infrastructure constraints. These options may include:-

a) A replacement for LOTI which can fit existing infrastructure but provide additional capacity for both Lochboisdale and Armadale services
b) A single vessel for the Mallaig-Armadale route which can operate year round from existing infrastructure but meet forecast demand in the medium term; with LOTI/her replacement serving Lochboisdale
c) A two vessel service on Mallaig-Armadale (e.g. MV Coruisk plus MV Loch Fyne); with LOTI/her replacement serving Lochboisdale

163. A Mallaig-Armadale Infrastructure Working Group has been established to take forward the development and consideration of medium to long-term options for the route. At the first meeting on 9 May 2017, it was agreed to invite a Lochboisdale representative to join this working group. A second meeting of the Group was held on 7 September 2017 and all of these issues, and more, were considered in detail. Further meetings will be arranged in 2018 to progress matters.

11.1.5 Outer Hebrides

Routes: - **Oban-Castlebay**
Sound of Barra
Mallaig/Oban-Lochboisdale

Uig-Tarbert/Lochmaddy
Sound of Harris
Ullapool-Stornoway

164. In the short to medium term, pressure is forecast to grow on these services; this was noted by the Minister for Transport and the Islands during a visit in summer 2017 to Lewis. The arrival of vessel 802 will provide some relief for Uig services and also potentially provide some outlet for pressures on other routes.

165. However, the NSG's analysis indicates that for demand to continue to be addressed in the medium to long-term, additional capacity will be required. The Outer Hebrides STAG mentioned above will therefore consider the long-term provision of ferry services to, from and within with the Outer Hebrides and its findings should be available to inform the conclusions of next year's annual report (VRDP 2017) and subsequent investment decisions.

11.1.6 Islay

166. Once the two new major vessels (801 (MV Glen Sannox) and 802) are in service, and the MV Hebrides deployed to Oban-Craignure, Islay services are forecast to become the most capacity constrained. Two relevant assessments have been commissioned following publication of the 2015 report.

167. Firstly, ABC have commissioned an initial assessment of the works and costs required at Port Askaig to accommodate a larger ferry – using the 801 (MV Glen Sannox) /802 design as the reference vessel. Plans already exist for the CMAL ports at Kennacraig and Port Ellen and cost estimates have been updated.

168. The current vessels on the Kennacraig-Port Askaig/Port Ellen routes are the MV Finlaggan and the MV Hebridean Isles. In addition to capacity constraints, the MV Hebridean Isles is also one of the oldest major vessels in the fleet. Only two other vessels in the CMAL fleet, the MV Isle of Arran and the MV Lord of the Isles, are capable of operating on the Islay route. Both of these vessels are old, 33 years and 28 years respectively, so there is a sustainability question going forward on the Islay route without new vessel investment.

169. Secondly, therefore, CFL have undertaken an assessment of vessel options and requirements to achieve 70% average capacity utilisation in the medium-term. This has concluded that continued use of the MV Finlaggan combined with a second vessel with the same vehicle deck capacity as the MV Finlaggan would be able to provide adequate capacity (under the terms used for the VRDP reports) until around 2022. However, if the Ferries Plan commitment to a dedicated vessel for Colonsay is implemented and additional capacity is released for Kennacraig-Islay services then the option of 2 vessels with similar vehicle-carrying capacity of the MV Finlaggan would be sustainable until around 2028.

170. We are therefore recommending that the next major vessel procured by CMAL is initially allocated to the Islay services to replace the MV Hebridean Isles. This vessel would complement the MV Finlaggan, potentially more oriented towards a freight service (including consideration of designing the capability to operate a possible overnight service) but with sufficient passenger accommodation to meet anticipated demand. We are examining whether she could be

designed with the intention to be lengthened in the future, from 90m up to c.100m, if the ports were developed to enable larger vessels. (MV Finlaggan could also be considered for lengthening at this time.) Details will be determined through consultation with the community and through the development of a business case.

171. Looking further ahead, it is clear that, in order to satisfy forecast demand on the Islay services in the long-term, either substantial harbour works (enabling bigger vessels) and/or more frequent services would be required. There are a number of options, none straightforward and all likely to be costly. As foreseen in the VRDP 2015 report, a comprehensive appraisal of the long-term options will be undertaken; this is envisaged to commence once resource is available following the conclusion of the Outer Hebrides STAG.

11.2 Other Major Vessel Routes

11.2.1 Ardrossan-Brodick

172. The arrival of the new vessel "801" (MV Glen Sannox) will provide significant additional capacity.

173. The Ferries Plan noted that:-

> *"Ministers have also made the strategic decision to increase the overall size of the fleet by one vessel capable of taking both passengers and vehicles. The impact of this measure will allow for the Isle of Arran (and the replacement vessel for the Isle of Arran) to be assigned all year to Ardrossan/Brodick, Kintyre (subject to the findings of the new pilot service during the summer timetable period) and the Firth of Clyde. This offers the prospect of an enhanced winter time-table on the Ardrossan to Brodick route and a possible strengthening of a Campbeltown service, depending on the outcome of the pilot."*[4]

174. The Ferries Plan makes our intentions clear, however, it also acknowledges that final decisions have to be taken and we need to establish the correct level of frequency required. This does not mean any diminution in the existing service levels but that any increase in services would need to be proportionate and affordable.

175. We propose to supplement the findings set out in this report by undertaking a more detailed analysis of forecast demand and capacity requirements that will feed into the development of costed options. In doing so we will engage with local communities on Arran and Kintyre.

11.2.2 Oban – Coll/Tiree

176. With average peak season capacity utilisation forecast to rise above 70% by 2019, we will keep these routes under review. At present, a vessel (MV Clansman) is shared with Colonsay; if an alternative solution is found for Colonsay (see below) then there would be the opportunity to increase capacity by increasing service frequency to Coll and Tiree, subject to an assessment of additional costs and affordability.

[4] paragraph 26 on page 19 of the Ferries Plan

11.2.3 Oban – Colonsay

177. The Ferries Plan included a medium-term proposal which:-

> *"envisages the current ro-ro vessel for the Small Isles (MV Lochnevis) being reassigned to provide an all year service dedicated vessel for Colonsay".*

178. This is dependent upon the implementation of the Ferries Plan proposals for the Small Isles which would free up the MV Lochnevis.

179. There are no capacity issues with the current Colonsay service which is arguably over-provided for by the size of vessel deployed: MV Clansman (five days a week) and the MV Hebridean Isles (twice a week providing a link to Islay on Wednesdays and Saturdays). However, the nature of the CHFS network means that Colonsay services are interlinked with other services.

180. Providing a dedicated vessel would:-

a) Provide an increase in capacity on Wednesdays and Saturdays to Islay
b) Release the additional capacity of the MV Clansman for use elsewhere

181. Across the network, there may be an opportunity to develop a medium/large class of major vessel capable of working effectively and efficiently on a number of routes such as:-

a) Colonsay – Oban/Port Askaig
b) Oban – Coll/Tiree
c) Mallaig – Lochboisdale
d) Mallaig – Armadale
e) Wemyss Bay – Rothesay (in the long-term)

182. This is something the NSG will consider further.

11.3 Other Non-Major Vessel Routes

183. As noted in the analysis sections of this report, there are relatively few capacity challenges associated with the non-major vessel network.

184. A number of the small Loch class vessels are approaching age expiry and a programme of like for like replacements will feature in our future investments, subject to affordability.

11.3.1 Sound of Harris and Sound of Barra

185. These routes will be covered by the Outer Hebrides STAG, see above. Both routes are forecast to experience increased capacity constraints. However, a recent reclassification of the waters means that any new vessel would require to be built to Euro B class standards, the same at those applying to the major vessels crossing The Minch. The current vessels can continue in service, and have a good anticipated working life ahead, but this does mean that capacity cannot be increased simply by bringing in a larger craft. A number of other options exist, which will be explored through the STAG.

11.3.2 Fionnphort – Iona

186. The Ferries Plan included a long-term proposal to construct a berthing facility at Fionnphort which allow for a longer operating day and provide a more suitable overnight berth in terms of crew access. The proposal is dependent upon new shore-side infrastructure which is now being taken forward by the harbour owners, ABC, who are also looking at an improved facility on the Iona side. The crossing has also been recently reclassified as requiring a Euro B class vessel (see the Sounds services, above); however, the need to replace the current vessel on age or capacity grounds is some years away.

11.3.3 Oban – Lismore

187. There are two ferry services that link Lismore with the mainland: CFL's Oban-Lismore vehicle-passenger service and a passenger-only service on the short crossing between Port Appin and Point provided on behalf of ABC. The Ferries Plan noted that:-

> *"We intend therefore to work towards a single route from Port Appin to Point, which is the shorter of the two crossings. The service would be a passenger vehicle service and would realise the improvements in frequency of sailing and length of operating day of the recommended model service profile.*
>
> *This is a longer-term proposal as we recognise considerable improvements will be required to port infrastructure, public transport and road links. This range of issues will require further work and engagement with the community. We also intend to work with the Local Authority and other partners on the precise arrangements for this future service."*

188. We are aware that, since the drafting of the Ferries Plan, RET fares and a larger vessel have been introduced to the Oban-Lismore service. It is therefore considered appropriate, prior to implementing these proposals, to review the appraisal published in June 2009. There is no specific timescale for this work which will take place when resources allow and within the context of CMAL's planning of future harbour requirements at Oban. This work has recently been reviewed by ABC and Highlands and Islands Transport Partnership (HITRANS) who have shared their report with the NSG.

11.3.4 Tayinloan – Gigha

189. The Ferries Plan included a long-term proposal to make improvements at Ardminish (Gigha) that would allow the ferry to be berthed overnight at this location. This would allow for a longer operating day. The proposal is dependent upon new shore-side infrastructure which is being taken forward by the harbour owners, ABC. This will include consideration of the installation of a charging point to enable the deployment of one of the new hybrid ferries.

12 ACTIVITIES IN 2017 / 2018

12.1 Annual Review 2017 - Re-Run of Demand/Capacity Model

190. It remains the intention of TS, CFL and CMAL that this VRDP will be kept under annual review.

191. The review of 2017, to be undertaken in early 2018, will include the second year impacts of the final CHFS roll out of RET providing the best indication yet of full network post RET volumes. Network changes in Summer 2017 were limited to a change in vessels deployed on the Mallaig-Armadale and Lochaline-Fishnish routes. Timetables were largely unchanged and fares at the same levels as in 2016 following a Ministerial decision to freeze fares.

192. The reconfigured summer services in the southern Outer Hebrides (to Castlebay and Lochboisdale) were in their second year of operation. This will provide a better insight into customer's changed behaviours providing a more robust dataset for the forthcoming Outer Hebrides STAG assessment.

193. Updated independent forecasts of demand will be produced to inform future volumes. This will be limited to routes with higher levels of capacity utilisation and/or where further insight is required to support secondary analysis.

12.2 Network Strategy Group Meetings

194. The program of monthly NSG meetings between TS, CFL and CMAL continued throughout 2016 and remained in place for 2017. Agenda items included the following:-

a) On-going construction and preparation for entry into service of the two new 102 metre vessels
b) Infrastructure requirements for the new build vessels
c) Options to address the demands on the routes with capacity constraints
d) Second hand tonnage
e) Review of CFL criteria for vessels undertaking CHFS services
f) Vessel disposals, modifications and life extension

12.3 Northern Isles

195. The first VRDP was developed to progress a fleet replacement programme for the CHFS network and so brought together TS with the operator, CFL, and the vessel owner, CMAL. In parallel, a separate and extensive STAG appraisal of the Northern Isles Ferry Services (NIFS) linking the Scottish mainland to Orkney and Shetland has been carried out by TS in conjunction with Orkney Islands Council, Shetland Islands Council, HITRANS, Shetland Transport Partnership (ZetTrans) and Highlands and Islands Enterprise (HIE) and this work was concluded in late December 2017. There is a need on the NIFS network, as on the CHFS network, to plan for the continued provision of suitable and adequate tonnage. Therefore, we intend to consider how to

bring these currently separate strands of work together before next year's report (VRDP 2017), to be produced during 2018.

196. The NIFS contract is currently served by five vessels:-

a) Three large passenger, vehicle and freight ro-pax vessels (MV Hrossey, MV Hjaltland and MV Hamnavoe) built for these routes and delivered in 2002
b) Two large ro-ro and lo-lo freight vessels which have been on charter since 2010 and 2011

197. The two freight vessels are owned by Fortress (having recently been sold by Seatruck) and under a change in arrangements during 2017 are now chartered to CMAL and sub-chartered to the operator, Serco NorthLink Ferries (SNF). This arrangement ensures that the vessels will remain available beyond the life of the current NIFS contract and until at least 2022 (with extension and purchase options provided).

198. The three passenger/vehicle vessels are now around 16 years old and in terms of their age and condition are in a position to remain providing these services for some time to come. The vessels are owned by the Royal Bank of Scotland (RBS) and are currently chartered to SNF until the end of the current NIFS contract in April 2018. Discussions have been underway for some time between TS, CMAL and RBS on securing continued use of the vessels and this is on track to be concluded in early 2018.

12.4 SUMMARY OF ACTIONS

Reference	Details of Action	Action Owner(s)
1	Continue with the construction of new vessels 801 (MV Glen Sannox) and 802. The MV Glen Sannox was launched on 21 November 2017. Vessel 802 launch is scheduled for summer 2018.	- CMAL
2	Complete redevelopment works at Brodick; formal opening in Spring 2018.	- CMAL
3	Take forward development works at Ardrossan through the Ministerial Task Force and the Ardrossan Harbour Project Board.	- TS - PP - NAC - CMAL - CFL -
4	Take forward development works at Uig, Tarbert and Lochmaddy through the Skye Triangle Infrastructure Group. Public meetings scheduled for week commencing 26 February 2018.	- TS - CMAL - - THC - CNES - CFL
5	Conclude consideration and make recommendations for short/medium term works in relation to future vessel overnight berthing requirements at Craignure.	- ABC
6	Consider and undertake any preparatory work required for MV	- ABC

Reference	Details of Action	Action Owner(s)
	Hebrides re-deployment to the Oban-Craignure service.	- CFL - CMAL
7	Undertake analysis and develop options for enhanced second vessel services on Ardrossan – Brodick/Campbeltown.	- TS - CFL
8	Undertake detailed design of a new 90 metre ro-pax vessel for Islay.	- CMAL
9	Carry out the Outer Hebrides STAG appraisal, through a suitable contactor.	- TS
10	Take forward consideration of Mallaig-Armadale through the working group.	- TS - CMAL - CFL - THC - MHA - Sleat Transport Forum
11	Develop a long-term strategy for the Oban-Craignure route through the AFIG group.	- TS - CMAL - CFL - ABC
12	Consider options for the future delivery of services to Colonsay through the AFIG group.	- TS
13	Continue to work on annual VRDP reports including consideration of the addition of NIFS services.	- TS - CMAL - CFL
14	Consider possible options to improve fleet resilience post 801 (MV Glen Sannox) and 802 entry into service.	- TS - CMAL - CFL
15	Consider vessel upgrades and life extensions once 801 (MV Glen Sannox) and 802 are in service.	- CMAL - CFL - TS
16	Consider the opportunity to develop a medium/large class of major vessel capable of working effectively and efficiently on a number of routes across the network. This is something the NSG will consider further.	- TS - CMAL - CFL

13 GLOSSARY & ACRONYMS

ABC	Argyll and Bute Council
AFIG	Argyll Ferry Infrastructure Group
CFL	CalMac Ferries Limited
CHFS	Clyde and Hebrides Ferry Services
CMAL	Caledonian Maritime Assets Limited
CnES	Comhairle nan Eilean Siar
CV	Commercial Vehicle
HGV	Heavy Goods Vehicle
HIE	Highlands and Islands Enterprise
HITRANS	Highlands and Islands Transport Partnership
LGV	Light Goods Vehicle
MCA	Maritime and Coastguard Agency
MHA	Mallaig Harbour Authority
MV	Motor Vessel
NAC	North Ayrshire Council
NIFS	Northern Isles Ferry Services
NSG	Network Strategy Group
PCU	Passenger Car equivalent Unit
PP	Peel Ports
RBS	Royal Bank of Scotland
RET	Road Equivalent Tariff
SNF	Serco NorthLink Ferries
STAG	Scottish Transport Appraisal Guidance
THC	The Highland Council
TS	Transport Scotland
VRDP	Vessel Replacement and Deployment Plan

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:- (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
Armadale
Brodick
Bull Hole (overnight berth Fionnphort-Iona ferry)
Castlebay
Claonaig
Colintraive (leased from Bute Estates)
Coll (Arinagour)
Colonsay (Scalasaig)
Cumbrae Slip
Fishnish
Gallanach
Gourock
Kennacraig
Kerrera Slip
Kilchoan
Largs
Lochaline
Lochboisdale
Lochranza
Oban
Port Ellen
Portavadie
Rhubodach (leased from Bute Estates)
Tarbert (Harris)
Tiree (Scarinish)
Tobermory
Wemyss Bay

The Highland Council
Eigg
Muck
Raasay
Sconser
Uig

Argyll and Bute Council
Lismore (Achnacroish)
Campbeltown
Craignure
Fionnphort
Gigha slipway
Gigha South Pier (overnight berth Gigha vessel)
Iona
Port Askaig
Rothesay
Tayinloan

Comhairle nan Eilean Siar
Ardmhor
Berneray
Eriskay
Leverburgh
Lochmaddy
Otternish (overnight berth Berneray ferry)

Others
Ardrossan - Ardrossan Harbour Company (Clydeport)
Canna - National Trust for Scotland
Mallaig - Mallaig Harbour Authority
Rum - Scottish Natural Heritage (managed by The Highland Council)
Stornoway - Stornoway Port Authority
Tarbert (Loch Fyne) - Tarbert Harbour Authority
Ullapool - Ullapool Harbour Trust