Employment Research Institute

Western Isles Ferry Fares Mechanism Study

A Report For Comhairle nan Eilean Siar

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Executive Summary

1. Western Isles ferry fares came down in real terms over the first half of the 20th century. From 1960-2004 car fares fell in real terms while passenger fares increased slightly.

2. Traffic growth on Western Isles routes is relatively sluggish (CVs declining over the last 15 years), while subsidies are high and rising. The short "Sounds" crossings are a success and have generated new traffic.

3. Route frequencies are low and some timetables inconveniently vary from day to day. On most routes passenger loadings are low and crewing levels and costs seem higher than necessary for passenger volumes carried. Crew costs are about a third of all operating costs Vessel utilisation is also less than optimum.

4. Some fifty routes were compared world wide and distinction between subsidised ferry operations and those operating commercially to maximise profit was noted. Western Isles passenger fares are around the middle of the comparative range but a high compared with other subsidised routes; car rates are relatively high compared with all routes and significantly higher than other subsidised routes, and CV charges are about three times higher than the general trend for other subsidised routes. Subsidised ferries world wide normally run on the shortest practicable crossings, cheaply, frequently and from early morning till late evening

5. CalMac's CFARES are inconsistent and the “Sounds” unfairly penalized. A pilot scheme suggests how commercial vehicle fares may be reduced on the “Sounds” crossings

6. A purely commercial approach would raise all fares very substantially, would reduce traffic and necessitate frequency reductions but would eliminate subsidy. Under RET (Road Equivalent tariff) all fares would be reduced, mostly very substantially, traffic would also increase substantially requiring capacity increase and subsidy would be increased significantly. Under a distance related (length based) (revenue/subsidy neutral) tariff CVs would be cheap, but passengers and cars would be expensive on long routes

7. A Tailored Tapered Tariff (TTT) can be adjusted to match subsidy available, can contain fares on long routes, and can be calibrated to approximate most current fares; with “Sounds” fares much reduced. If revenue neutrality were relaxed, a Reduced TTT would reduce fares and increase traffic but with increased subsidy requirement. Under present operating conditions, however, the scope for reducing fares is limited unless subsidy is increased

8. In view of the last above comment, we have set out an illustrative alternative operating scenario featuring the TTT fares mechanism combined with: shorter routes; new capital investment; and different vessel types, utilisation and operating practices. This alternative mechanism leads to beneficial effects on fares and traffic generation. Many fares and charges are reduced, very significant traffic growth is stimulated, increased revenue is

generated and overall subsidy requirements are reduced, including annualised costs of new capital investment.

9. Such a radical improvement in ferry services would bring significant economic benefits to the Western Isles. A comparison is made between the economic impact of the present fares regime and ferry services, and the impact of the five selected scenarios:

    - RET under current conditions
    - TTT under current conditions
    - Reduced TTT under current conditions
    - TTT under our illustrative alternative operating conditions
    - Reduced TTT under our illustrative alternative operating conditions

10. Each scenario will result in differing levels of increased local resident and visitor expenditure, and increased business competitiveness. The overall effect of these mechanism scenarios on change to Western Isles gross economic output are as follows:

    - RET, increase in gross output by £29.8m
    - TTT under current conditions, increase in gross output by £7.0m
    - Reduced TTT under current conditions, increase in gross output by £22.4m
    - TTT under alternative operating conditions, increase in gross output by £41.3m
    - Reduced TTT under alternative operating conditions, increase in gross output by £60.6m

11. The increase in gross output will generate extra employment as local businesses increase production of goods and services. The above fares mechanism scenarios generate the following resulting employment effects:
    - RET, total employment rises by 894
    - TTT under current conditions, total employment rises by 213
    - Reduced TTT under current conditions, total employment rises by 671
    - TTT under alternative operating conditions, total employment rises by 1,240
    - Reduced TTT under alternative operating conditions, total employment rises by 1,817

12. In terms of tax receipts, this translates into additional annual income tax revenue of:
    - £3.57m under RET;
    - £850k under TTT;
    - £2.68m under TTT (reduced);
    - £4.95m under TTT alternative operating conditions;
    - £7.25m under TTT (reduced) alternative operating conditions.

13. The above impacts will take effect annually after some 10 years, assuming that infrastructure, for example accommodation for tourism, expands to meet it.

14. Overall, this study concludes that the current fares regime and operating pattern appears to be inconsistently applied, is expensive, especially on the “Sounds” crossings, is not

contributing to economic growth and may be encouraging decline. It is our opinion that alternatives must be considered.

15. There are a number of alternatives fare mechanisms possible under the present operating conditions but it is difficult to effect radical change if subsidy/revenue neutrality is a requirement. Alternative mechanisms such as RET would have a very positive economic impact, but would require a large increase in subsidy. A Tailored Taper Tariff (TTT) is a fair and consistent mechanism that can be calibrated to apply to any operating regime and any subsidy/revenue requirement. However, applied in a revenue neutral format, the impact of TTT is limited. A more significant economic impact could be achieved through a reduced fare TTT of around 30%. This would require an increased subsidy, but less than RET, and may be a good compromise.

16. However, the best long term solution lies in introducing alternative operating conditions. Combining TTT with shorter routes, different vessel types and utilization is likely to result in significant economic benefit, e.g. through increased tourism, cheaper imports of materials and export of products and services and resulting social improvements and reversal of population decline.

17. We recommend that in the interest of turning round the Western Isles economy, Comhairle nan Eilean Siar use this report to negotiate the following changes to the provision of Western Isles ferry services with the Scottish Executive:

    1. Develop an equitable "Tailored Taper Tariff" (TTT) fares mechanism for Western Isles ferry services and make its implementation a requirement of future tenders for operators providing these services
    2. Mount a pilot scheme immediately to reduce commercial vehicle charges on the Sounds of Harris and Barra services
    3. In the light of that experience, and by re-calibrating the TTT mechanism, apply a reduced scale of charges for all services
    4. Signal and explain the need for a radical change to the way in which ferry services are operated, including the creation of a "short sea bridge", as illustrated in this report featuring specifically:
        a. Shore based crews (based in the Western Isles)
        b. Shorter routes with more frequent sailings and longer operating hours
        c. Different vessel types and utilisation
        d. Capital investment in road links and two new terminals
    5. Undertake a detailed study of how such a radical change may be implemented

1 Introduction

Napier University's Employment Research Institute and Transport Research Institute Maritime Research Group, in partnership with Pedersen Consulting were commissioned by Comhairle nan Eilean Siar to undertake a study into alternative ferry fare mechanisms in the Western Isles. The key purpose of this study is to examine the methods and benefits of re-casting the fares and charges regime in the Western Isles, with the aim of increasing traffic volume and income on island ferry services and thereby enhance the economic performance of the Western Isles.

In light of this, the specific goals of this study are to achieve the following.

- To assess the current ferry operation under the existing fare pattern.
- To identify potential ferry fare and operational models that could be applied or adapted to Western Isles ferry routes.
- To assess the economic and social impact of the models identified above if applied to Western Isles ferry routes.
- To recommend the most effective ferry fare mechanism and operational model for stimulating economic growth and social stability in the Western Isles.

The findings of this study will allow the Comhairle to assess the likely impact of each alternative scenario on the economy of the Western Isles and will inform decision making on the best choice of mechanism to take forward. The report has been discussed in detail with Caledonian MacBrayne and reflects their comments, although all opinions remain those of the authors.

2 The Historical Background

2.1 Introduction

The Gaelic saints, the Vikings, the Lords of the Isles all used the sea as their means of communication to achieve power and dominance. In fact archaeological evidence confirms the presence of Mesolithic settlers on the islands to the west of Scotland about 7,000 years ago. Clearly these supposedly primitive men and women were capable of constructing and navigating seaworthy craft. Seafaring has been a defining characteristic of the Hebrides ever since.

2.2 Early History

Until the eighteenth century overland travel in the Highlands was difficult, and dangerous. The balance only shifted from the sea to land as overland travel improved through the droving trade, and later the work of the Commissioners of Roads. Cattle moved themselves comfortably over land but a water crossing presented a challenge. It was possible to swim beasts over narrow sounds. Where swimming was impracticable it was necessary to ship island cattle to the mainland in smacks. In that circumstance the sea was an inconvenient barrier. To minimise the cost and hazard of shipment, the shortest feasible crossing was used – usually to landing points in Skye at Glendale (Loch Pooltiel), Dunvegan, Uig or Kilmoluaig (Rubha na h-Aiseig).

Prior to the middle of the eighteenth century, the conveyance of mails to and from the Isles was sporadic. In 1756 George Mackenzie, "Steward and Receiver of Lewis" presented a request to the Postmasters General for a weekly packet boat from Stornoway to Poolewe and a foot runner from there to Inverness. It seems this request was granted and in 1758, representatives of the Uists sought a similar postal connection between Lochmaddy and Dunvegan, the traditional Skye link with the Long Island. Post office funding was refused for almost a further half century and it was left to the proprietors in Uist to provide their own boat between Lochmaddy and Dunvegan. The foot runner who made the 226 mile round trip from Dunvegan to Inverness received 5/- (25p) for his efforts. A Post Office was eventually opened in Carnish North Uist in 1802 to which place the Dunvegan boat was diverted until transferred back to Lochmaddy in 1830. The onward overland link to Benbecula, South Uist and Barra remained a private responsibility until 1834. From 1840 Harris had a separate packet twice weekly in summer, one in winter, from Uig in Skye. The Dunvegan – Uist packet improved gradually from fortnightly, to weekly, bi-weekly, thrice-weekly and daily by the cutter *Dawn* in 1876.

2.3 Steam Navigation

With the development of steam navigation the balance of long distance movement shifted back again to the sea. A network of steamer services from Glasgow, Greenock to the West Highlands were pioneered by men like Henry Bell, Robert Napier, James Thomson, Archibald McConnell,

George and James Burns. These early routes served Argyll and Inverness-shire but it was some time before the Outer Hebrides received a regular steamship service. This was rectified by the then proprietor of Lewis Mr. (later Sir) James Matheson who in 1846 introduced his steamer *Mary Jane* on the Stornoway trade.

In 1851 the bulk of the West Highland steamboat trade was consolidated under the ownership of Messrs David and Alexander Hutcheson and they were soon operating their own service from Glasgow to Oban, Skye and Stornoway. By 1858 the Stornoway service was operated bi-weekly by *Clansman* (the first of the name) and *Stork*. On the retrial of the Hutcheson brothers in 1879, the business was carried forward by their nephew David MacBrayne in his own name. With his flair for publicity, traffic expanded under David MacBrayne's management particularly in catering for "society" summer tourist trade on the "Royal Route" by "swift steamers" from Glasgow by *Columba* to Ardrishaig, through the Crinan Canal on *Linnet* and thence by *Chevalier* to Oban (with onward connections to Iona, Mull, Skye, Gairloch, etc) and Corpach (connecting with the Caledonian Canal steamers for Inverness). The year round Stornoway route was in a sense the main line, operated for many years by the elegant clipper bowed duo *Clansman* (II) and *Claymore*. *Claymore* remained on the route for a remarkable 50 years until 1931.

Until the 1860s, the southern isles of the Outer Hebrides had received only occasional calls by steamers. Captain Martin Orme was the first to pioneer calls at Lochboisdale, Lochmaddy, Tarbert (Harris) and west Skye ports with the vessel *Islesman*. *Islesman* was succeeded by *Dunvegan Castle* and eventually by the long-lived *Dunara Castle* in 1875. By the mid 70s John McCallum had also entered the same trade with a series of vessels of which the *Hebrides* of 1898 is best remembered.

In the Highlands, the relatively late development of the railways when they emerged, reduced the prevalence of the long distance sea routes by concentrating shipping on railheads. With the opening of the Dingwall and Skye Railway to Strome Ferry in 1870 a Stornoway mail steamer connection was introduced by the railway. The early service was troubled and intermittent but was eventually taken over by David MacBrayne, in 1880 and after a period run on a daily basis. With the extension of the line to Kyle in 1897 the Stornoway mail steamer was transferred thence.

The railway reached Oban in 1880 and around 1888, MacBrayne took over the mail contract to the Uists and Barra inaugurating a service with two steamers conveying passengers, cargo and mails, each departing from Oban on alternate days, so giving a daily service. One steamer went clockwise: Oban → Tobermory → Castlebay → Lochboisdale → Lochmaddy → Dunvegan → Glendale → Loch Bracadale → Canna → Rum → Tobermory → Oban. The other steamer did the round in the anti-clockwise direction. A third mail steamer based at Portree, connecting with the Oban steamers, ran three days a week to Staffin, Kilmoluaig, Tarbert (Harris), Rodel, Lochmaddy and Dunvegan, returning on the intervening days.

The last rail-head to open was Mallaig in 1901. In due course the route of the daily Stornoway mail steamer was extended to include Mallaig as well as Kyle. And so David MacBrayne Ltd., now a limited company, maintained more or less this pattern of services for a further quarter of a century.

2.4 The Seeds of Change

Unable to finance replacement tonnage from earned revenue and the mail contract, the company was taken over by the LMS Railway and Coast Lines and re-formed as David MacBrayne (1928) Ltd. The new concern was obliged to re-organise its services and build new ships. These were *Lochness* for the Stornoway mail service; *Lochearn* for a new tri-weekly mail service from Oban to Tobermory, Coll, Tiree, Castlebay and Lochboisdale; and *Lochmor* for a new Outer Isles mail service from Kyle and Mallaig, circumnavigating Skye and calling at the Small Isles, Lochboisdale (connecting with *Lochearn*), Lochmaddy, Rodel, Stockinish, Tarbert (Harris), and Scalpay. The Glasgow – Stornoway service, now weekly was reduced to a cargo run.

Around this time too the McCallum and Orme businesses were amalgamated in 1929 and the venerable *Dunara*, *Heb* and a converted trawler *Challenger* continued to provide a three steamer service from Glasgow to ports from Castlebay to Tarbert including, occasional summer calls at St Kilda. In 1948, simultaneously with the nationalisation of the railways, McCallum Orme Steamers and their service was absorbed by David MacBrayne.

Further change came on the back of a 1952 white paper which provided a subsidy to the company of £360,000 per annum, subject to certain conditions. So far as the Western Isles were concerned, these conditions were: building of one new mail vessel for the Stornoway mail service – *Loch Seaforth*; a new cargo vessel – *Loch Carron* for the Glasgow – Outer Isles (former McCallum Orme) cargo service; and substitution of road services for cargo calls at Kallin, Flodda, Scotvin, Grimsay, Carnan, Petersport, Loch Eport, Leverburgh and Finsbay. Erisksay was in future to be served by boat from Ludaig. This arrangement was planned to last until 1961.

2.5 New Thinking

In 1960 MacBraynes announced proposals for the introduction of three vehicle ferries, one of which was to operate between Uig (Skye) and Tarbert (Harris) and Lochmaddy. The new vehicle ferry *Hebrides* took up her post on the "Uig triangle" in 1964. The ferries were to be built by the Government and leased to the company at commercial rates. This was a very significant advance, although being side-loading, these vessels were by no means state of the art. More efficient sea-going end loading RO-RO ferries had even then been in operation in North America and Norway for some decades.

Until this time cargo on ships was charged according to a complex commodity scale based on either tonnage or per item. In 1961 the Highland Panel recommended that charges to remote mainland centres (e.g. Thurso) should be used as a yardstick for determining sea service charges. This concept came to be known as the "mainland comparison". Pressure from the Panel in promoting this and other ideas resulted in the Government of the day setting up the Highland Transport Board.

Meantime in 1963, a report of the Highland Transport Enquiry to the Ministry of Transport, the Secretary of State for Scotland and the Minister of Aviation – *Transport Services in the Highlands and Islands* noted that the introduction of vehicle ferries would, on the one hand,

increase the need for Government assistance to cover annual charges, but on the other hand, development in new traffic and rationalisation of services would in time reduce the need for grant. The report pointed out that the annual grant to MacBrayne was paid on social grounds, "because without this help necessary transport services could not be maintained throughout this area at rates which traffic could bear and if it were not paid, charges for both passenger and freight would have to be increased by about 30%". The report noted the need for services and facilities to be progressively developed and that "unless the Highlands and Islands are provided with adequate modern transport they will fall further behind the rest of the country". The report noted that improvement would involve radical change.

The Highland Transport Board under the chairmanship of Lord John Cameron, was appointed in December of the same year (1963) for a period of three years with much the same personnel as had produced the earlier report. The Board, in its 1967 report *Highland Transport Services*, made a number of radical recommendations affecting all modes of transport in the Highlands and Islands.

In considering the "mainland comparison" concept, the Board reiterated the Highland Panel's view and recommended that "for the purpose of deciding the need for subsidy to shipping companies, the Secretary of State should adopt the criterion that the general level of charges to islands should not be materially in excess of charges to distant parts of the mainland".

A further concept stressed by the Board was the Norwegian experience of vehicle ferry operations and in particular that of the Norwegian county of Møre and Romsdal whose Chief Roads Surveyor Mr K H Oppegård had recently recommended the adoption of simple Norwegian style roll through vehicle ferries in Shetland (see further detail under Route Comparison). The essence of the Norwegian approach is selection of the shortest crossings with standardised vessels and terminals, resulting in low operating costs, high frequency and low fares. The technique was adopted in Shetland and by Western Ferries firstly to Islay and subsequently on the Clyde but not elsewhere in Scotland.

2.6 The Road Equivalent Tariff (RET) Concept

The Highland Transport Board's report was submitted to the newly appointed Highlands and Islands Development Board (HIDB). The HIDB considered it and prepared a detailed paper which described how a meaningful "mainland comparison" might be realised. The HIDB concluded that the simplest solution was:

"to create conditions for transport to the islands which are truly comparable with those on the mainland. This means considering the appropriate ferry and shipping links as roads or bridges. The car ferry to an island and the piers are, in fact, parts of a flexible road over which cars and commercial vehicles can pass to and from islands."

The paper, which also recommended a scale of lineal charges on vehicles on RO-RO ferries should replace commodity charging, was submitted to the Scottish Development Department in 1968 and after four years of correspondence and discussion, the Government's decision was

announced by the Secretary of State in a parliamentary statement in 1972. The statement maintained the principal that charges levied on sea services should be based on operating costs; it agreed to the introduction of RO-RO ferries and to linear charging for vehicles but it rejected the concept that ferries should be regarded as part of the road system.

A year later in 1973 the Caledonian Steam Packet Company Ltd. was amalgamated with the greater part of David MacBrayne Ltd. of to form Caledonian MacBrayne. The new company, then part of the nationalised Scottish Transport Group (STG), was made responsible for most of the regular shipping services and cruises on the Firth of Clyde and the West Highlands and Islands. It was expected that these services would be operated on a commercial basis, i.e. cover their costs from revenue. The new company was committed to conversion of most of its routes to RO-RO and in that year a new RO-RO Stornoway – Ullapool route was opened replacing the traditional Stornoway – Kyle – Mallaig mail run. This was the first modern "roll-through service to the Western Isles. Although also part of the STG, a rump of the old David MacBrayne Ltd. remained to operate unviable services with continuing subsidy under the 1960 Highlands and Islands Shipping Services Act.

By the 1970s the growth and then dominance of road transport did cause a fundamental reorientation of shipping services with the gradual introduction of end-loading roll on – roll off (RO-RO) vehicle ferries to supersede the old style of operation. The effect of this was indeed to connect island road systems with the mainland road system albeit infrequently and at considerable cost to the user. The introduction of RO-RO ferries made possible the introduction of a simple system of lineal charging on vehicles to replace the old and complex commodity based cargo rates. It had been hoped that this change would have the effect of reducing the cost of transporting at least full lorry-loads to the islands but this was found in practice not to have been the case.

Concern about the burden of freight charges to island economies intensified and in 1974 the HIDB re-examined the issue. Case study analysis revealed that in many cases island business was indeed disadvantaged by sea freight charges. The HIDB case was re-stated and refined in its 1974 paper *Roads to the Isles – A Study of Sea Freight Charges in the Highalnds and Islands*. In this document the concept of "Road Equivalent Tariff" or "RET" was born.

The case may be summarised as follows:

Payment of Road tax entitles road users to drive anywhere on the road system. Tax is used to construct and maintain roads. Roads go everywhere except for reasons of geography to islands (and a few very remote peninsulas). If it were possible to build conventional roads to islands, in the same way as they are provided between points on the mainland, these would have been provided. [note: since that time numerous fixed links have indeed replaced ferries] Islanders pay road tax but are uniquely denied access to the great bulk of the road system without paying a substantial ferry surcharge. Vehicle ferries act as roads between island and mainland. To be equitable, the cost to the road user of crossing the ferry ought to be related to the cost of travelling along an equivalent length of road. This would be achieved by charging a vehicle the equivalent of its road running costs that cease when the vehicle is being conveyed on the ferry's deck. The shortfall between resultant revenue to the ferry operator and his costs would be met from taxation.

That was the logic. In preparing the report, operating costs of different types of vehicle were examined. It became clear that vehicle operating costs can be expressed on mileage basis and related to the length of each type of vehicle and it was found that, on average, the cost at that time was around 2p per kilometre, per meter of vehicle length. As an approximation of then current passenger fares, passengers were regarded as a one meter vehicle for the purposes of calculating an appropriate fare.

A formula was created to translate this concept into a lineal ferry charge. The formula included a "toll", equivalent to 4 kilometres of distance; similar to tolls charged to road users for exceptional capital expenditure, such as on certain bridge crossings. Thus a one kilometre crossing would be charged as a five kilometres, two kilometres, as six, etc. The formula was set out as follows:

$$C = L\,O\,D + T \quad \text{or} \quad L\,O\,D + 4\,L\,O$$

Where:
C = charge for a single journey
O = operating cost per km, per meter of vehicle length (average)
L = length of vehicle in meters
D = passage distance in kilometres
T = toll element = 4LO

When these fates were compared with existing fares at that time, it was noted that the general effect was that passenger fares remained broadly in line with those then obtaining but vehicle rates were generally at a lower level those then in force, particularly for commercial vehicles, although not in all cases.

A criticism made was that the application of a formula of this kind detached the charge levied for passage from an exact link with the operating cost of the vessel. It was in fact doubtful then, that such exact link existed, with the charging regime in force then nor indeed that it exists now.

As a counter argument, the analogy was made of the postal service which does not surcharge island letters and parcels despite the necessity for the cost of sea or air transport. The ship or aircraft operator is paid from general Post Office revenue for providing transport. Similarly under RET, the ferry operator would provide the road on an agency basis to the road authority and would be paid for so doing from the roads budget, while acting as a collecting agent for RET.

In the event RET excited much interest but was ultimately rejected by Government on grounds of expense.

2.7 Debate and Development

The HIDB's 1975 *Highlands and Islands Transport Review* set out a raft of transport policies for the area which took into account the following general aims:

1. Reduce economic disparity between the Highlands and Islands and the more affluent areas of the UK and the EEC
2. Reduce disparity of economic opportunity with various parts of the Highlands and Islands
3. Increase and maintain population within the Highlands and Islands
4. Improve social conditions and alleviate social problems associated with future development
5. Have regard to the impact of development on the environment

In pursuing these aims, HIDB committed itself to devoting a higher proportion of resources than in the past to, among other areas, the Western Isles. It was noted that these areas had a variety of transport problems.

Among the numerous recommendations made were:

- Reiteration of the case for RET
- Designation of the Stornoway – Lochboisdale (spinal) road for special development
- As part of this: creation of a Berneray causeway and frequent ferries across the Sounds of Harris and Barra
- Upgrading of RO-RO ferry links with the mainland
- Improvements to mainland trunk road links, e.g. Tarbet – Ardlui
- Cessation of the Glasgow cargo boat service
- Multi-lingual presentation of information including specifically Gaelic
- More visually attractive transport terminals

A further unpublished HIDB consultative paper of 1978 on ferries set out a more refined and detailed analysis of how the ferry system might be improved to the benefit of island economies in cost effective ways. The concept of "road equivalence" was expanded to:

- Ensuring the compatibility of costs between travel by road and ferry
- Ensuring that access by ferries comes as close as possible to that by road in terms of frequency, convenience and comfort.

It illustrated how a radical restructuring of all Scottish ferry services could be achieved over the ensuing twenty years. It set out a programme based on Norwegian principles (see under Route Comparisons). The main principles were:

- Adopt the shortest practical crossings
- Introduce economical Norwegian style standardised vessels (designs were outlined)
- Standardise link-spans
- Develop capacity through frequency rather than size of vessel
- Control costs (capital, crew, etc.)
- Allocate routes to operators by means of competitive tender
- Allocate subsidies by route rather than by operator

- Require mandatory annual reporting of operating costs according to set standards

Fundamental to all of this was the "shortest route" principle because it has the effect of reducing fares, operating costs and the requirement for subsidy, while increasing frequency. To illustrate the point: if a 30 mile (two hour) crossing can be replaced by a (one hour) passage of 15 miles, a ferry would be able to make five or six round trips per day instead of say three. It follows that to carry the same volume of traffic a ship of roughly half the size and therefore roughly half the operating costs is required. Where implemented the effect of increased frequency coupled with reduced charges always generates new traffic and a requirement for increased capacity. It is in the generation of new traffic that lies the scope for growth in GDP.

Among ten crossings in Scotland identified for shortening at that time was replacement of the 48 km Uig (Skye) – Lochmaddy with a 30 km Glendale - Lochmaddy route and short frequent Sounds of Harris and Barra crossings. If all the changes suggested had been implemented, it was estimated that the savings on operating costs could have enabled the level of subsidy then budgeted to reduce charges Scotland-wide to near RET levels.

Unfortunately in the event, the opportunity was not taken to institute such a Scotland-wide programme. Where such methods were employed, in particular in Shetland and by Western Ferries on the Clyde, traffic volumes have soared while subsidy costs per passenger or per vehicle have been much reduced to the benefit of these local economies.

In due course, however, full end-loading RO-RO services were developed in the West Highlands generally and the Western Isles specifically, with Island link-span terminals at Stornoway, Tarbert (Harris), Lochmaddy, Lochboisdale and Barra. The mainland landfalls were at Ullapool, Oban and Uig (in Skye). However, the operational approach remained that of a traditional shipping company, rather than a modern ferry provider, such that in the main, a big ship – big crew policy was pursued resulting in low frequencies and high costs.

2.8 Subsidies Trends over Time

The original ambition that Caledonian MacBrayne would operate as a commercial concern, covering its costs from revenue proved long ago to be untenable. The 2003 accounts indicated that company received a subsidy of £18.9 million annually – about 30% of its operating expenditure of £61.9 million. An operating deficit of £8.5 million was attributable to the Western Isles. Before this commission was completed the 2004 accounts were announced. These revealed an increase in subsidy to £25.9 million overall with £11.2 million attributable to the Western Isles – an increase of over 30%.

2.9 Fares Trends

Despite this large subsidy, charges for vehicles remain high as compared with subsidised operators in other areas as will be demonstrated below and later under the chapter Route Comparisons.

In coming to an understanding of fares trends on shipping services to/from the Western Isles we have first considered the long-term and selected two routes where comparison can be made over the last hundred years. We have plotted passenger fares levels at intervals from 1907 until 2004 and car rates from 1960 until 2004. Inflation figures are sourced from long term data produced from Miami University and Wake Forest university in the US[1]. Because of the change from commodity charging to lineal charging for commercial vehicles, it is not practicable to deduce long-term historical comparisons with freight rates.

Until the 1960s, two classes were provided for passengers on steamer services. Cabin or first class provided a superior level of comfort and service for a higher fare. Steerage, 3rd or 2nd class as it was varyingly known offered basic accommodation at a lower price. We have compared former fares for both classes with the "one class" fares charged in more recent decades.

Having ascertained the various fare levels, we then adjusted these against the retail price index to ascertain their current values (see Annex 2.9). The table below summarises the outcome of this exercise.

Figure 2.9.1 Historical Fares Trends 1907-1960

Years:	*1907*	*1939*	*1960*
Passengers (Cabin/1st/One Class)			
Oban - Castlebay	100	58.6	55.4
Stornoway - Kyle/Ullapool	100	117.2	55.0
Passengers (Steerage/3rd/2nd/One Class)			
Oban - Castlebay	100	145.3	96.2
Stornoway - Kyle/Ullapool	100	127.0	61.2

Source: EH.net

It will be noted that during the period 1907-1960, fares and car rates generally fell as one would expect with increased efficiency of ships and operating methods. In terms of freight, as previously stated, there is no comparable long term data on freight rates but it is to be noted that commercial vehicle rates on the Stornoway and Uig routes were kept unchanged through 2001 and 2002 despite substantial increase in Stornoway harbour dues to £56 per artic.

Analysis over more recent years using RPI figures produced by National Statistics shows that passenger fares on the above routes have risen slightly higher than the rate of inflation from 1960-2004 and car fares have fallen in real terms during this period. The table below illustrates this by repricing 1960 fares to 1976, 1989 and 2004, i.e. the fares that would be expected given the rate of inflation, and comparing the resulting figures with the actual fares for each year. This information is graphed in Appendix 2.9.

[1] http://eh.net/hmit/ukcompare/

Figure 2.9.2 Recent Fare Trends 1960-2004

Fares 1960 base	**1960**	**1976**	**1989**	**2004**
Oban - Castlebay/Lochboisdale (Cars)				
Actual fare	£8.69	£19.29	£41.00	£74.00
1960 fare repriced	£8.69	£27.80	£80.42	£134.02
Stornoway - Kyle/Ullapool (Cars)				
Actual fare	£8.69	£18.41	£33.20	£69.00
1960 fare repriced	£8.69	£27.80	£80.42	£134.02
Oban - Castlebay (Steerage/3rd/2nd/One Class)				
Actual fare	£1.10	£4.10	£9.05	£20.20
1960 fare repriced	£1.10	£3.52	£10.18	£16.97
Stornoway - Kyle/Ullapool (Steerage/3rd/2nd/One Class				
Actual fare	£0.84	£2.75	£7.30	£14.05
1960 fare repriced	£0.84	£2.69	£7.77	£12.96

Source: National Statistics

2.10 Traffic Trends

With changes in operating methods, over the last half century, traffic growth in passengers and vehicles was significant until the seventies but the rate of growth, particularly in terms of passengers, has been sluggish in the last decade and a half, at approximately 1% per annum compounded for passengers and around 2% per annum compounded for cars. This trend has been offset, however, by significant growth on the Sounds of Barra and Harris crossings, a small proportion of which was abstracted from the Uig triangle and Barra – Lochboisdale routes. See table below.

Figure 2.10.1 Traffic Growth to and from the Western Isles

Passengers	*1952*	*1960*	*1965*	*1974*	*1989*	*1998*	*2003*
Oban - Castlebay/Lochboisdale	11,000	21,000	30,439	49,966	37,100	46,100	44,665
Uists and Harris	18,526	14,703	54,234	76,938	132,000	129,800	146,027
Stornoway	43,700	74,071	37,905	82,168	141,300	162,100	179,874
Sounds of Harris & Barra						36,600	75,280
Totals	**73,226**	**109,774**	**122,578**	**209,072**	**310,400**		**445,846**
Cars							
Oban - Castlebay/Lochboisdale	300	700	940	5,700	8,000	11,300	12,268
Uists and Harris	296	590	1,200	22,700	37,600	37,400	47,080
Stornoway	780	3,400	82,200	15,000	28,000	33,800	43,795
Sounds of Harris & Barra						11,500	26,515
Totals	**1,076**	**3,990**	**83,400**	**37,700**	**65,600**		**117,390**

Commercial Vehicles & Coaches						
Oban - Castlebay/Lochboisdale			-	1,464	4,000	2,100	1,420
Uists and Harris			1,785	3,066	6,500	7,700	6,055
Stornoway			54	7,831	9,500	12,800	12,224
Sounds of Harris & Barra						1,500	2,331
Totals	**-**	**-**	**1,839**	**10,897**	**20,000**		**22,030**

Taking the years 1998 to 2003, the annual cumulative traffic growth in the period for the Western Isles' three access routes was for passengers, cars and CVs respectively

Figure 2.10.2 Annual Traffic Growth 1989 – 2003 (Not Compounded)

	Pax	Cars	CVs
Oban - Castlebay/Lochboisdale	1.5%	3%	-7%
Uists and Harris	0.7%	1.6%	-0.6%
Stornoway	1.6%	3.2%	1.8%

Car traffic growth on the Ullapool and Oban routes are broadly in line with what may be expected but in all other respects these levels of traffic growth are well below international trends and in fact over this 14 year period commercial vehicle traffic actually fell overall on these external connections. In the more recent period between 1998 and 2003 carriage of commercial vehicles fell overall at an accelerated rate as set out below:

Oban – Castlebay – Lochboisdale	-34.3%
Uig – Tarbert – Lochmaddy	-22.2%
Stornoway – Ullapool	-4.6%

These figures reflect a serious and worrying economic decline bearing in mind that UK and EU wide commercial vehicle traffic over the same period grew at approximately twice the rate of GDP growth.

Notwithstanding this very worrying and accelerating trend, the end of the 1990s, Stornoway hauliers complained of capacity constraints on the Stornoway – Ullapool service and as this issue remained unresolved, they supported the introduction of a competitive freight ferry on the route under Taygran Shipping. CalMac responded by temporarily reducing rates and providing a nightly freight service. The withdrawal of Taygan's Ro-Ro service in 2001 led to CalMac introducing a series of vessels specifically for the night freight service culminating in the 776 lane metre Ro-Ro ferry, *Belard*, now renamed *Muirneag*.

One noteworthy success is the creation of short ferry crossings of the Sounds of Harris and Barra. Since first promoted by HIDB over a quarter of a century ago, market research indicated for many years that there was little demand for such an inter-island service. It is to the credit of the Comhairle that it persevered with the concept and as part of developing its "Spinal Road" these two ferry crossings have been created and surpassed the doubters' pessimistic traffic projections by a wide margin.

2.11 Population Trends

Before concluding this historical overview, reference is made to population trends. Since the early years of the twentieth century the population of the Western Isles has declined to just over half its Edwardian level, indicating long-term economic decline relative to the rest of Scotland. Such decline is not inevitable as illustrated by comparison with the Isle of Man and the Faroe Islands.

Figure 2.11.1 Population Trends Compared

Decade	*Western Isles*	*Isle of Man*	*Faroe Islands*
1900s	46,000	50,000	16,000
1960s	33,000	47,000	40,000
2000s	27,000	76,000	46,000

Of course the administrations in Isle of Man and Faroe Islands with their fiscal autonomy have been able to focus on differentiating those economies to achieve economic growth in ways that may not be open to the Western Isles. Nearer to home, however, the Isle of Skye has been able to sustain rapid economic and population growth over the last three decades within the same fiscal framework as that of the Western Isles. This is partly attributable to good transport links with the Scottish mainland.

This study will consider how a revised ferry fares mechanism and operating pattern could help turn around the Western Isles' downward economic and population trend.

2.12 Summarized Findings – History

The Historical background described in this chapter highlights a number of issues that have a bearing on why current Western Isles ferry services are as they are. These issues are summarised thus:

- Sea links have been an essential aspect of the Western Isles economy for millennia
- The importance of a short sea crossing as compared with a long passage has varied with economic conditions and technological practicalities at different historical periods
- There has been a longstanding debate on service quality, fares, and subsidies
- The Norwegian concept of short frequent crossings, cost effective operation and low fares in the form of Road Equivalent Tariff (RET) was recommended as a solution
- This approach was rejected by government in favour of an evolution of traditional shipping services adapted to roll on – roll off (RO RO) by Caledonian MacBrayne formed in 1973
- Over the most of the 20th century fares and charges fell in real terms but have tended to rise again in recent decades
- Subsidy levels have risen significantly
- In the last two decades traffic growth has been sluggish on most routes and commercial vehicle traffic has declined and this decline has been accelerating
- On the other hand the creation of short routes across the Sounds of Harris and Barra have generated significant new traffic
- The Western Isles have suffered long term economic and population decline which may be reversible given a new approach to ferry fares and operating patterns

The next chapter considers the current operating pattern, fare structure and its impact on economic and social well-being of the Western Isles.

3 Current Operating Pattern and Fare Structure

3.1 Introduction

State owned Caledonian MacBrayne (CalMac) operates all Western Isles vehicle ferry services and their style of operation is well known to our clients. In summary they link the mainland with the three main island groups of Barra, Uists and Lewis/Harris and also provide island-island links. As a result of active development work by Comhairle nan Eilean Siar, aided by other agencies and European Regional Development Funding, there now exists a spinal road from Vatersay, the southernmost inhabited island of the archipelago to Ness in the north of Lewis. The creation of this road has involved construction at various times of fixed links (causeways and bridges), firstly between Benbecula and South and North Uist, then between Vatersay and Barra, Berneray and North Uist and most recently South Uist and Eriskay. As mentioned in the previous chapter the two inter-island vehicle ferry passages across the Sounds of Harris and Barra respectively link the last remaining water gaps in the on the spinal road.

3.2 Route Characteristics

To put the current fares structure in context it is necessary also to examine the overall characteristics of each route and the vessels employed thereon. The following table shows route distances and frequencies for Western Isles ferry services considered in this report.

Figure 3.2.1 Routes, Distances and Frequencies

Route	*Distance (km)*	*Daily Frequency (Averaged)*	
Mainland-Island		Summer	Winter
Castlebay-Oban	144	2	1
Lochboisdale-Oban	144	1	1
Castlebay-Lochboisdale		1	0.5
Uig-Lochmaddy	48	3	3
Uig-Tarbert	47	3	1.5
Stornoway-Ullapool (Pax/Vehicle)	84	5	4
Stornoway-Ullapool (Freighter)	84	2	2
Island-Island			
Berneray-Leverburgh	18	8	5
Barra-Eriskay	10	10	8

Note: The above frequency figures represent the number of single journeys per day. Thus two single journeys represent one round trip.

Some observations about the style of operation on each route are appropriate at this stage.

The Oban – Castlebay – Lochboisdale route is operated in summer by two vessels *Lord of the Isles* and *Clansman*. These two vessels are not on the route full time but are also utilized on routes to Coll, Tiree, Colonsay, etc. These multifarious duties are worked into an ingenious pattern of vessel rostering (see Annex 3.2). The resulting schedule provides fourteen single

journeys between Oban and Castlebay, eight between Oban and Lochboisdale. Most of these passages are direct between the respective ports but a few are indirect allowing four single journeys per week between Lochboisdale and Castlebay and two single journeys between Tiree and Castlebay. The timetable is somewhat complex varying from day to day. In winter the schedule is simpler but less frequent with six single journeys per week between Oban and Lochboisdale with all sailings calling at Castlebay *en route*.

The routes between Uig (Skye) and Lochmaddy and Tarbert (Harris) respectively, formerly known as the "Uig Triangle" (now a "V" since the introduction of the Sound of Harris ferry), are operated by one dedicated vessel *Hebrides*. Since one vessel has to serve both routes, the schedule is alternated, such that on one day the vessel starts her day in Lochmaddy and ends up in Tarbert, providing three single journeys daily between each port and Uig. On the following day the sequence is reversed, thus the sailing times from each port are completely different on successive days. Occasional positioning trips operate direct between Lochmaddy and Tarbert. In winter the frequency of Harris sailings is reduced to ten single journeys per week (i.e. five return trips).

The Stornoway – Ullapool passenger and vehicle ferry route is operated by *Isle of Lewis*, the basic pattern being four single journeys (i.e. double return) daily except Sundays, augmented on peak summer Wednesdays and Fridays by an additional return sailing (two single journeys). On this route the pattern of sailings is such that for the most part departure and arrival times are standard from day to day. The Stornoway service is augmented by a freight vessel *Muirneag* that makes a return trip overnight between Stornoway and Ullapool.

The Sounds of Harris and Barra routes are operated respectively by *Loch Portain* and *Loch Bhrusda* on short crossings with respectively eight and ten single journeys per day in summer, reducing to four and eight in the depth of winter. A Sunday service is provided on the Sound of Barra route but not on the Sound of Harris route. Both sounds are shallow, and feature strong tidal currents, shoals, reefs, other hazards and relatively rudimentary navigational aids. For that reason, both routes operate in daylight only which constricts operating hours particularly in winter.

During the period when each route's regular vessel is overhauled in winter, a relief vessel is provide to operate the route. *Clansman* and *Lord of the Isles* normally relieve each other; *Hebrides* and *Isle of Lewis* are normally relieved by Clansman; and *Loch Portain* and *Loch Bhrusda* are normally relieved by *Loch Linnie*.

The above Caledonian MacBrayne fleet serving the Western Isles is of traditional type and on average of relatively recent build. The principal characteristic of each vessel normally employed on each Western Isles route is summarized in the table below.

Figure 3.2.2 Vessel Specifications

Name	*Route*	*Built*	*Length meters*	*Cost £ m*	*Kts*	*Crew Max*	*Crew Min*	*Cars*	*CVs alt*	*Pax*
Clansman	Relief + Barra	1998	99.0	15.5	16.5	32		100	10	635
Hebrides	Uig	1999	99.0	15.5	16.5	34	14	90	10	612
Isle of Lewis	Stornoway	1995	101.2	15.0	18.0	30	18	123		680
Loch Bhrusda	Eriskay	1996	35.4	3.8	8.0	4	3	18		150
Lord of the Isles	Barra/S Uist	1989	84.6		16.0	28		56		500
Loch Portain	Berneray	2003	50.0	4.9	10.5	6	5	36		195
Muirneag	Storn'y freight	1979	105.5	Char	15.5				50	12
Loch Linnie	Relief	1985	30.2		9.0	3		12		203

2003 traffic statistics for each route are provided by Caledonian MacBrayne for passengers, cars, coaches and commercial vehicles (CVs) and are provided for the summer (29 March to 19 October) and winter respectively and are summarized in the table below.

Figure 3.2.3 Traffic Statistics 2003

Route	*Summer*				*Winter*				*Total*			
	Pax	*Cars*	*Bus*	*CVs*	*Pax*	*Cars*	*Bus*	*CVs*	*Pax*	*Cars*	*Bus*	*CVs*
Oban/C'bay/L'b'dale	35786	9192	92	748	8879	3076	5	575	44665	12268	97	1323
Ullapool/Stornoway	129239	30190	351	6636	50635	13605	300	?	179874	43795	120	?
Uig/Lochmaddy	53331	17081	122	2656	14765	5278	24	1549	68096	22359	146	4205
Uig/Tarbert	60557	18159	207	583	5071	2021	0	129	65628	20180	207	712
Tarbert/Lochmaddy	7	4	0	0	0	0	0	0	7	4	0	0
Tarb't/Uig/L'maddy	4498	1436	19	87	7798	3101	5	674	12296	4537	24	761
Berneray/L'burgh	39160	12411	80	1053	8885	4219	2	555	48045	16630	82	1608
Barra/Eriskay	24010	8219	50	337	3225	1666	0	154	27235	9885	50	491
Stornoway Freighter												11,805

From the above data it is possible to calculate capacity (total number of passenger and vehicle spaces) provided on each route per week and from that the average vessel utilization. The calculation for passengers is relatively straightforward and is set out for each route below.

Figure 3.2.4 Vessel Utilization (Passengers)

Route	*Summer (29 Weeks)*					*Winter (23 Weeks)*				
	Pax/Wk	*Trips/ Wk*	*Ave/ Trip*	*Ship Cap*	*%*	*Pax/Wk*	*Trips/ Wk*	*Ave/ Trip*	*Ship Cap*	*%*
Oban/Castlebay/L'boisdale	1,234	21	59	560	10	386	12	32	560	6
Ullapool/Stornoway	4,457	25	178	680	26	2,202	24	92	680	13
Uig/Lochmaddy	1,994	23	87	612	14	1,177	18	65	612	11
Uig/Tarbert	2,088	19	110	612	18	220	10	22	612	4
Berneray/Leverburgh	1,350	48	28	195	14	386	30	13	195	7
Barra/Eriskay	828	60	14	150	9	140	52	3	150	2

The calculation for vehicles is more complex and speculative but we have translated all vehicles into PCUs giving a rule of thumb value to one commercial vehicle or coach as equivalent to six cars. Our earlier estimates had been based on a PCU value of four cars per CV which Messrs Caledonian MacBrayne indicated gave a result that "grossly underestimated" actual utilisation. The revised figures set out below should still be regarded as an approximation of the current position and these are set out below.

Figure 3.2.5 Vessel Utilization (PCUs)

Route	*Summer (29 Weeks)*					*Winter (23 Weeks)*				
	PCU/Wk	Trips/ Wk	Ave/ Trip	Ship Cap	%	PCU/Wk	Trips/ Wk	Ave/ Trip	Ship Cap	%
Oban/Castlebay/L'boisdale	491	21	23	75	31	285	12	24	75	32
Ullapool/Stornoway	1,362	25	54	123	44	885	24	37	123	30
Uig/Lochmaddy	1,213	23	53	90	59	952	18	53	90	59
Uig/Tarbert	626	19	33	90	37	122	10	12	90	14
Berneray/Leverburgh	662	48	14	36	38	329	30	11	36	30
Barra/Eriskay	363	60	6	18	34	113	52	2	18	12
Stornoway Freighter	1,241	12	103	200	52	1,565	12	130	200	65

These are crude measures but they do give an indication of the extent to which capacity provided is commensurate with demand. 100% utilization is of course not feasible as traffic peaks, particularly for passengers in summer need to be accommodated. As a broad rule of thumb, 30% utilization or above for passengers and 50% or above for PCUs may be taken as industry norms.

In terms of passenger traffic, with the exception of Stornoway – Ullapool, it appears that significantly more capacity is being provided on Western Isles ferry routes than is demanded at current fare and or service levels. As crewing levels required by the MCA, and, therefore, costs, are broadly proportional to a vessels passenger capacity, a higher level of operating costs may be incurred than is required by the normal requirements of the route. If so these costs can only be recouped through either higher fares or higher subsidy.

The position regarding PCUs, although less than 50% in most cases, seems better attuned to demand, with Uig – Lochmaddy being the best overall performer.

Another aspect of vessel utilization is the number of hours per day, each vessel is in operation. The longer the operating day; the more capital costs can be spread, thereby sweating the assets and improving vessel and route economics. Many operators seek to utilize their ships 24 hours a day if they can. Under current crewing arrangements, with some exceptions, most Caledonian MacBrayne vessels operate a 14 hour day or in some cases less. We believe that if assets are not exploited to the maximum practicable extent then service quality may be less and overall costs (and therefore, fares) may be higher than would otherwise be the case.

3.3 Current Fares and Charges

The existing fare mechanism for all Caledonian MacBrayne ferries is categorized as CFARES, a system that has been in operation since 1994. CFARES was designed to meet the objectives of local and national economic priorities and operator profitability. However, this mechanism has been criticized as being inconsistent. One criticism is that CFARES purport to reflect operating costs but in practice it is difficult to perceive any consistent correlation between costs and the fares structure.

The current structure of fares and charges is composed of three separate elements for passengers, cars and commercial vehicles, the later including busses and coaches. Passenger and car rates are published in Caledonian MacBrayne's timetables and brochures. On most routes winter (off-peak) fares are set at a lower level than those for summer (peak). Ex-island bookings are charged at the winter rate year round. Commercial vehicle rates are published in a separate leaflet, the method of charging being a charge per half meter of vehicle length for vehicles in excess of five meters in length. Light commercial vehicles of less than five meters are treated as cars in terms of the charge levied. There is no seasonal variation in commercial vehicle rates but regular customers receive a bulk discount of up to 15% and the Stornoway – Ullapool chartered freight ferry *Muirneag* attracts an additional discount of 10%. The main fares and charges applied on Western Isles ferry routes, ignoring discounts (other than seasonal variations), are summarise in the table below.

Figure 3.3.1 Current Fares Comparisons (2004-05)

Route	*Summer*		*Winter*		*Half m*
	Pax	*Car*	*Pax*	*Car*	*CV*
	£	£	£	£	£
Oban/Castlebay/L'boisdale	20.20	74.00	15.70	64.00	12.89
Castlebay/L'boisdale	5.75	33.50	5.75	33.50	6.65
Uig/Lochmaddy/Tarbert	9.15	44.00	8.15	37.50	7.25
Ullapool/Stornoway	14.05	69.00	11.70	55.00	10.36
Berneray/Leverburgh	5.20	23.70	5.20	23.70	6.37
Barra/Eriskay	5.50	16.25	5.50	16.25	4.44

Leaving aside for the present comparisons with routes out-with the Western Isles, which are dealt with later in a separate chapter, a number of anomalies are apparent. Why for example is the passenger fare on the short (10 km) Barra – Eriskay crossing more than on the longer (18 km) Berneray – Leverburgh crossing? Why is the CV rate on the Berneray – Leverburgh crossing almost as high as that on the Uig – Lochmaddy/Harris crossings at some two and a half times the distance? The relative difference between seasonal fares also pose questions: on a rough average the peak fares are some 15% higher but the rate varies considerably from route to route as illustrated by the following examples:

Figure 3.3.2.Peak and Off-peak Discounts Compared

Route	*Fare Type*	*Peak*	*Off-Peak*	*Discount %*
Stornoway - Ullapool	Passenger single	14.05	11.70	17
	Car single	69.00	55.00	20
Uig - Lochmaddy	Passenger single	9.15	8.15	11
	Car single	44.00	37.50	15
Oban - Barra	Passenger single	20.20	15.70	22
	Car single	74.00	64.00	14
Eriskay - Barra	Passenger single	5.50	5.50	0
	Car single	16.25	16.25	0

We have been unable to ascertain a rationale for this wide variation in the levels of discount for passenger and car rates on different routes as between summer and winter and in the case of the Sounds of Barra and Harris for no seasonal discounts at all.

On each route as elsewhere on the Caledonian MacBrayne system and in common with many other operators, further discounts are made for return fares, excursion returns, multiple journeys and Island Hop-Scotch tickets with across the board half fare reductions for children.

Before considering how alternative fares mechanisms may be constructed, it is necessary firstly to consider the revenue generated by the present system and its costs.

3.4 Current Revenue and Costs

Although Caledonian MacBrayne was in receipt of some £18 million of public subsidy for the financial year 2002/3, the company is not obliged to publish route by route revenue and cost information. In the absence of such published data, it has been necessary to construct a model that computes on a route by route basis, current income from fares and other revenue, and then to set these against costs of operation and capital charges. Messrs Caledonian MacBrayne have confirmed that the methodology employed is generally sound and, while the computed revenues and costs are not actual outcomes, they are an acceptably close approximation of reality.

Our starting point was to take published traffic data for each route for the year 2003, and from this to calculate derived revenues based on peak and off-peak single ticket prices for passengers and cars. Commercial vehicle and coach income for the longer routes was based on an average vehicle length of eleven meters; slightly shorter for the short “Sounds” routes. Estimated on-board sales were then added and commissions subtracted. This total theoretical or nominal total figure was then discounted to 80% of the derived sum to allow for return fares, children, freight discounts, etc.

The result represents a ballpark computation of actual revenue income for each route as set out in the table below. The route codes in the column headings are:

OB/CY/LB = Oban/Castlebay/Lochboisdale;
Uig = Uig/Lochmaddy/Tarbert;
SY/UL = Stornoway/Ullapool;
SY Fr = Stornoway freighter;
S of H = Sound of Harris, and
S of B = Sound of Barra.

Figure 3.4.1 Revenue Computation

	OB/CY/LB	*Uig*	*SY/UL*	*SY Fr*	*S of H*	*S of B*	*Totals*
			£ thousands				
Low Season Revenue							
Pax	139	225	592		46	18	1,020
Cars	197	390	748		100	27	1,461
CVs	165	384	228	1488	78	15	2,358
High Season Revenue							
Pax	723	1,083	1,815		204	132	3,957
Cars	753	1,615	2,084		294	134	4,879
CVs	239	592	228	1488	159	38	2,743
On-board sales	134	438	539		24	0	1,135
Total Derived Revenue	2,349	4,727	6,234	2,976	904	363	17,554
Commissions (Pax)	- 43	- 65	- 120		- 6	- 4	- 239
Commissions (Cars)	- 47	- 100	- 142		- 10	- 4	- 303
Total Net (80%) Revenue	1,807	3,649	4,778	2,381	710	285	13,610

It will be observed that the total computed revenue for the Western Isles ferry routes is some £13.6 million per annum based on 2003 traffic figures and 2004 fares and charges. About half of the total is attributable to the two vessels serving the Stornoway – Ullapool route.

The next element of the modelling process was to calculate the direct operating expenses of each route/ship. For the most part this is relatively straight forward as the crewing levels are known and wages, social costs, fuel consumption and other costs are based on those that apply in the UK maritime industry and augmented by the consultants' knowledge, local research and Caledonian MacBrayne's accounts. It should be again stressed that as the resulting figures are not based on company data they are, therefore, an approximation of actual costs but, as confirmed by Caledonian BacBrayne, they are sufficiently accurate for the purposes of comparability. Fuel costs, for example, are significantly variable from year to year and have risen significantly since these costings were undertaken.

On all but one of the routes, a single vessel is allocated full time to that route (or pair of routes in the case of Tarbert and Lochmaddy) as indicated in the "Vessel Specifications" table. The exception is Oban – Castlebay and Lochboisdale which in summer utilises part of the time of two separate vessels of somewhat unequal size, *Lord of the Isles* and *Clansman*, but only one of these in winter. At other times these ships sail to Coll, Tiree and Colonsay. To illustrate this

arrangement the normal summer and winter rosters for the two vessels are set out in Annex 3.2. We have allocated operating costs pro-rata to each vessel in proportion to the time of each on the Oban – Castlebay and Lochboisdale route. We have estimated the cost of providing a relief vessel to cover the period of annual overhaul for the main vessel on each route except for the Oban route where *Lord of the Isles* and *Clansman* normally relieve each other.

One further direct operating expense is the charter fee to Messrs Harrison's for the Stornoway freighter *Muirneag*. The summation of this represents the total operating costs of the Western Isles ferry routes.

Figure 3.4.2 Direct Operating Expenses

	OB/CY/LB	*Uig*	*SY/UL*	*SY Fr*	*S of H*	*S of B*	*Totals*
				£ thousands			
Fuel	403	696	558	214	49	26	1,945
Crew Wages	1,479	1,783	1,618	732	278	232	6,122
Social costs/pensions	266	321	291	132	50	42	1,102
Insurance	233	310	300	130	96	50	1,119
Port Costs	114	270	1,227	620	5	5	2,241
Maintenance	583	775	900	325	240	125	2,948
Charter Fee				1,500			1,500
Relief Vessel		221	217	91	31	31	784
Total Op Expenses	3,078	4,374	5,111	3,744	749	512	17,568

By subtracting the calculated direct operating expenses for each route from the estimated revenue, a computed direct operating loss for each route can be arrived at, the total for all Western Isles routes by our calculation being just under £4 million.

Figure 3.4.3 Direct Operating Losses

	OB/CY/LB	*Uig*	*SY/UL*	*SY Fr*	*S of H*	*S of B*	*Totals*
				£ thousands			
Total Computed Revenue	1,807	3,649	4,778	2,381	710	285	13,610
Total Op Expenses	3,078	4,374	5,111	3,744	749	512	17,568
Operating Loss	- 1,271	- 725	- 333	- 1,363	- 39	- 227	- 3,958

Allocation of overhead costs is in some ways more problematic as these cover shore staff wages, social costs, rents, reserve vessels, capital charges, depreciation, etc. Company wide the proportion of shore based personnel to seafarers is approximately three to seven and a notional allocation of this cost, with social and pensions costs may be assumed as approximately £2.1 million. Much of the capital cost CalMac fleet was in the past grant aided at 70% from the Scottish Office with additional EEC/EU funding in a number of cases. This is no longer the case but the historical effect of this on Caledonian MacBrayne's accounts will be present for many years to come. We have not attempted to disentangle this complex issue and have assumed a total overhead allocation to Western Isles ferry services of £4.5 million. Adding this to the direct operating loss, the overall loss attributable to these services is brought to £8.5 million, being the sum quoted in Caledonian MacBrayne's 2003 annual accounts. This is summarised thus:

Summary of Revenue, Costs and Losses	*£ million*
Total net revenue	13.6
Subtract direct operating expenses	17.6
Giving direct operation losses	4.0
Add assumed overhead allocation	4.5
Giving an overall loss of	8.5

Whereas formerly Caledonian MacBrayne obtained most of its vessels at much less than full price, this will no longer be the case in future. To provide a more commercial comparison between the current style of operation and alternative future scenarios a discounted capital charge for vessels based on 20 years capital and repayments at 6% has been calculated for each route. This is provided at this stage for information and comparison only and is not otherwise included within the above calculations.

Figure 3.4.4 Discounted Annual Capital Charges

	OB/CY/LB	*Uig*	*SY/UL*	*SY Fr*	*S of H*	*S of B*	*Totals*
			£ thousands				
Capital interest & repay'ts	887	1,090	1,054		337	176	3,544

3.5 Local Users Perspectives on the Current Service

As part of the consultation process, key user groups were interviewed in order to determine their views on the strengths and weaknesses of the current fare mechanism, and to suggest areas for improvement. All ferry crossings no matter how short, frequent and cheap are to some extent a barrier to communication. They can on that account alone generate negative comment. One of the authors of this report recalls a passenger on the two hour Cedar Island – Okracoke ferry crossing in North Carolina (see chapter 4) complaining about the high cost of $1.00 (i.e. 55p) per passenger and £8.28 for a car. When Western Isles ferry costs were described, the reaction was incredulity. This illustrates that perceptions are relative to the perceiver's perhaps limited experience. Against that background, it is wise to treat anecdotal evidence with a degree of care. In carrying out this study, however, we have uncovered a body of opinion that does tend to bear out some of the 'down' side of the current operating pattern.

Consultees included: local businesses in the tourism, retail, distribution and primary sectors; local residents and community groups and local policy actors. A complete list of consultees is provided in Annex 3.6.

The Current Fare Mechanism

We sought the views on the appropriateness of the current fare mechanism, with the aim of establishing exactly how current fares affect businesses and residents of the Western Isles. This chapter presents a brief summary of the key issues arising from interviews held in the Isles in November 2004. It should be noted that the views set out below are not necessarily ours but are those of interviewees and, therefore, reflect divergence of opinion.

Hauliers

- When transporting goods to the mainland and other islands, high costs are passed onto retailers and fish farmers.
- Some of the of the largest hauliers already receive a substantial discount on the mainland ferries and make only limited use of inter-island services.
- Many hauliers found the inter-island fares to be the biggest problem. Examples were quoted of £400 return fares for transporting loads of goods, which was seen as commercially unviable. Other examples were given of building supplies being imported from Ireland to South Uist as the cheapest option.
- The current cut-off of 5m for CVs forces small hauliers to operate uneconomically small vans, many of which are specially built. If fares for CVs were reduced, this would make it worthwhile for smaller hauliers to invest in larger and refrigerated vehicles that would be more economical to operate in the long run.
- The Ullapool-Stornoway service was seen as expensive, but not prohibitive, by the majority of hauliers.
- One Stornoway haulier involved in Continental trade commented that it cost almost as much to convey his vehicle from Stornoway to Ullapool as between Rosyth and Zeebrugge – some eight times the distance on an unsubsidised service.
- Only one haulier regularly uses the Castlebay-Oban service due to time and cost. Most operators in the Uists and Barra find it more convenient to route through Skye.

Manufacturers

- Manufacturers supplying to the fish processing industry are severely hit by the cost of the ferries. The costs of inputs to manufacturing are raised by the fares on the Ullapool-Stornoway ferry.
- Manufacturers are operating on the edge of viability.
- Potential expansion of markets to the mainland is constrained by the cost of the Ullapool-Stornoway ferry, which limits the market to the Western Isles.
- However, even here, the cost of the Sounds ferries, are a problem, particularly as firms must make journeys to specific customers and cannot back-load. E.g. Fish processors in Barra were sourcing packaging from Aberdeen rather than Stornoway, due to the cost of supplying via the Sounds ferries.
- Manufacturers who carried their own goods could pass all the cost savings onto customers - their goal is market expansion.
- Other manufacturers stated that ferries have a dual effect. Supplies of goods-in and goods-out also cost more. This has resulted in one manufacturer moving 90% of his production capacity out of the Isles.
- One example is found in a seaweed processing factory that moved from the Western isles because of the costs of transport. Seaweed is now imported to the iodine plant in Girvan from Tasmania and Chile because this is cheaper than sourcing it from the Western Isles.

Primary Sector

- Ferry costs make fish farming and processing less competitive compared with mainland locations.
- For many businesses there is no cheap option to export. The Uig ferries are comparatively cheap, but infrequent.

- Many fish farmers are limited by the frequency of ferries as much as the fares. For example, farmers on South Uist are limited to 3 ferries per week from Lochboisdale during winter months. Ideally it would be possible to send fish to Glasgow 5 days per week.
- The high fares cause a negative downward spiral in demand. For example, the fish processing industry could have supported more traffic and a bigger ferry on the Sound of Harris crossing, but this will no longer happen due to the demise of the industry.
- The Lochboisdale-Oban ferry is very expensive, large producers spend up to £150K per annum on ferry fares exporting fish.
- There is also a cost passed on in importing fish food.

"CalMac priced themselves out of the market"
"The fish processing industry is voting with its feet"

Access to labour, wages and environmental regulations are also a limiting factor in fish processing. In addition, Livestock exporters are hit by charges on cattle and regulations on carrying animals. It is now no longer viable for some farmers to export livestock and cattle and sheep are kept on the Isles for food.

Tourism

- Ferry fares discourage some tourists, particularly those intending to travel by car. Potential domestic tourists are dissuaded because flights abroad are often cheaper.
- Costs incurred by CVs and hauliers are passed onto hoteliers and then to tourists.
- Tourist numbers in some areas (e.g. Barra) is at capacity in the summer months, but off-season fare reductions may help spread demand mode evenly throughout the year.
- The Ullapool-Stornoway return fare is a major impediment to tourism on the Isles and we picked up several examples of tourists who were interested to visit the Western Isles but were subsequently dissuaded by the high level of fares.
- One couple planned an off-season weekend in Harris but on discovering the inconvenience of the schedule, and the high costs they settled for Skye instead.
- A fare of £50 for a car return Uig-Lochmaddy would attract spontaneous tourists who would like to see the Western Isles.
- The time and cost of the Oban ferries in particular are a barrier to increasing tourism, passage time, particularly to Barra was described as "a trial" and surprise was expressed that Caledonian MacBrayne still operated "old-fashioned" vessels rather than "modern" fast craft.
- Skye is hugely popular, but this effect does not seem to feed through to the Western Isles.
- The Sound of Barra ferry is a good service, but it does mean that some spinal tourist traffic now bypasses Lochboisdale. This is particularly the case for coach parties.
- The cost of the Sounds ferries also hinder inter-island tourism, for example Stornoway residents visiting Uist.
- Interestingly, it was noted that most English tourists come from Oban to Castlebay to access the southern Isles, whereas most Scottish tourists travel Uig to Lochmaddy (possibly because they have travelled on the Oban ferry once before!)

Retail

- Retailers in Barra have the choice of paying more for fresh stock (via Uig-Lochmaddy) or having direct, infrequent deliveries via Oban.
- Feedback from retailers indicates that location in the Western Isles involves around £50 (8% average) per palate surcharge for transport, of which 60% of this is ferry costs.
- The Uig-Lochmaddy service is also expensive for CVs transporting goods. This makes up £600 of a round trip of £1000 per articulated lorry to, say, Inverness.
- The fish farming industry is important to local retailers as it allows delivery trucks to backload to the mainland, thus reducing overall transport costs.

Local policy actors

Local policy actors were in agreement with much of what has already been stated, although they also outlined the situation in a macro-perspective.

- The Western Isles suffer from "Super-peripherality"
- Development of a single market is the key to economic growth in the Western Isles.

The Effect on the Western Isles economy in general

- Tourist fares are very high and deter tourists.
- Ferry fares hold back the fish farming industry. Around 1m kilos per week are exported from the Isles. Fish farmers are fighting to survive.
- Business trips to the mainland are expensive.
- Manufacturing and fish processing industries may choose to desert the Islands altogether in favour of more cost-effective mainland bases.
- The Western Isles currently do not operate as a single market, but there is potential to have a single goods, service and labour market if problems of costs and access of ferries are resolved. This may achieve significant economies of scale and reduce costs.
- Reducing the Sounds ferries would stimulate inter-island trade. This was perceived as a relatively easy effect to measure, as the economy was a 'closed system'.
- The high fares do have the advantage of keeping out imports that may displace local produce, but the Western Isles economy is small and therefore needs to be able to import many goods to ensure a standard of living comparable with that on the mainland, and hence retain population.
- Many respondents stated that the Isles are unattractive for young people as they cannot access services that are available on the mainland.

Interviewees' Suggestions for Alternative Fare Mechanisms

Many alternative mechanisms were suggested, not all of which we were able to integrate into this study. However, they do reflect the views of local residents.

- A small reduction in CV fares across the board would be welcomed by many industries. Even a reduction of £1 would help the fish farming industry.
- As with fish farmers, retailers believe that any reduction in CV rates would be helpful.
- The larger hauliers were keen to stress that any new fare mechanism should keep their existing discount. On average, hauliers suggested that a reduction of around 30% would be necessary to allow them to operate competitively.

- The Danish example was quoted, where fares were cheaper, no bookings required and instant cash payment could be made.
- When there is no Uig-Tarbert sailing (during winter), the Sound of Harris ferry should be free to those using the Lochmaddy service.
- If summer fares were to rise to capitalise on the tourist market, it would be important to ensure that local residents are not hit by higher fares.
- Reduce all fares on Ullapool-Stornoway by around 30%, and Lochmaddy and Sound of Barra by 25%.
- A resident discount card and resident business discount card was suggested by several consultees. This would give around a 20% discount to locals.
- Tender the ferry services based on a package of specified routes and times and fares.
- For a RET tariff, a rate of 50p/mile was suggested. This would not have to be a precise measure.
- Charge a fixed rate for all CVs, regardless of length. For example Uig-Lochmaddy CV return of £100 for artic trial for 12 months.

A comparison with the former Western Ferries service to Islay was highlighted, where a maximum of 10 crew (10 on, 10 standby and 10 cover), whereas CalMac had 3 times that crew. Also Western Ferries only paid crew for the time working.

Timetables and Scheduling

- The frequency of the Castlebay-Lochboisdale link has been reduced since the introduction of the Sound of Barra service. However, the Sound ferry does not fill all the gaps, particularly at nighttime.
- Sunday ferries on the Sound of Harris would be useful for tourists and fish farmers, and operating the Sound of Harris ferry after dark, especially in winter.
- More than one business highlighted that the Sounds ferries are not scheduled to connect with each other, making spinal day trips difficult.
  "It's wacky races to get to the Sound of Barra on time."

- Tarbert-Uig ferries could be rescheduled to allow weekend trips to the mainland in winter. Also sailings at regular times each day for Tarbert-Uig in winter months. Some consultees suggested separate vessels for Uig-Tarbert and Uig-Lochmaddy.
- In general, Uig-Lochmaddy is seen as being a good service.

- The infrequency and time taken to sail from Castlebay-Oban causes problems as producers cannot always guarantee the delivery date that customers want. A daily Castlebay-Oban service with a morning departure time would be useful.
- Time the Oban-Castlebay ferry to arrive in Barra during business hours. One problem is the ferry arrives in Oban 10 minutes *after* the bus leaves for Glasgow. This could be easily changed.
- Another related problem is The ferry has often to wait 1 or 2 hours outside Oban for the Mull ferry to turn around. This is particularly inconvenient after such a long journey.
- The Oban ferry arrives very late into Lochboisdale.

- Suggested Saturday afternoon (around 1.30pm) Lochboisdale-Oban sailing, and overnight Lochboisdale-Oban sailing arriving around 7am.

Suggestions for New or Revised Routes

The overwhelming consensus here was for a Lochboisdale-Mallaig sailing using a dedicated vessel. As would be expected, businesses in South Uist were particularly keen to see this, however, the was support from across the Western Isles. A few businesses raised concerns that the introduction of this route may affect the viability of the Uig-Lochmaddy service, although looking at traffic statistics we do not believe this necessarily to be the case. A Lochboisdale-Mallaig service may take some demand from the Uig service, but this may allow the use of a smaller, more efficient vessel on this service.

Other comments included:

- This service must be priced competitively, preferably using a distance-based tariff and be comparable per km to the Uig-Lochmaddy service. Any trial of this must be a dedicated service with a specified timetable (daily) at a particular price (distance related say half the current price of Oban-Lochboisdale). The demand is for this combination and any partial introduction (for example a twice weekly service with prices similar to the Oban service) would be a waste of time as the demand would not exist.
- Using a smaller, faster, cheaper ferry. This could be operated daily in winter and twice daily (say 7am and 2pm) in summer, with lower fares than operating a larger vessel less frequently.
- Could tie in with Mallaig-Glasgow train with short 2.5 hour crossing.
- Would increase spontaneous tourism from Mallaig.
- Lochboisdale-Mallaig would be shorter for tourists doing the spinal route (although of course it would miss out Barra).
- There was a view that this would result in a significant increase in tourism.
- Stability on a small, fast boat could be obtained by having a deeper keel.

- One suggestion was to have a Lochboisdale-Mallaig and Oban-Castlebay service on alternate days.
- An Uig-Castlebay ferry was even suggested to allow a shorter crossing time to/from Barra.
- A freight ferry to a Clyde port (such as Greenock) as most business traffic heading to the central belt.

An alternative long-run solution suggested was to work towards causeways and bridges linking the entire spinal route and to rationalise the mainland ferries to two services, most likely Stornoway-Ullapool and Lochmaddy-Uig.. We believe that it would also be necessary to upgrade the spinal route to double-track before this becomes a viable option.

Additional Comments on the Current Service

- The Stornoway night ferry is a substandard vessel, with no ro-ro facilities, which costs users in terms of repairing damaged vehicles caused by loading in reverse. Some hauliers would prefer the MV Isle of Lewis to be used for the night run.
- The introduction of the night freight ferry has been useful for many businesses.
- The facility to drop trailers on board would be welcomed by some hauliers.

3.6 Summarised Findings – Current Situation

To draw together some key findings identified in this chapter on the current situation, the above data suggests that:

- Route frequencies are low and some timetables inconveniently vary from day to day
- On most routes passenger loadings are low
- Crewing levels and costs seem higher than necessary for passenger volumes carried
- Crew costs are about a third of all operating costs
- Vessel utilisation is less than optimum
- Fares are inconsistently applied and seem high due to high operating costs
- Local residents and businesses see fares as a serious economic constraint
- There is (understandably) widespread support for a moderate (30%) fare reduction and the introduction of a Lochboisdale-Mallaig service.

The above data and calculations provide a framework for comparisons with ferry routes world wide and for considering alternative fare mechanisms and operating patterns for Western Isles routes.

4 Route Comparisons

4.1 Introduction

One way of identifying alternative fare mechanisms and operating practices with those that currently obtain in the Western Isles, is to look at different approaches taken by governments and ferry operators elsewhere in the UK and internationally.

4.2 Our Approach

It would not be practicable to examine the policy environment, operation and fare structure on every one of the world's ferry routes: their number is simply too large. We have therefore selected 44 routes, in 17 different administrations world-wide with which, for the most part, our team has some first hand knowledge. They form a representative, and still sizable, international sample of countries and routes that have characteristics in some way comparable with the six/seven Western Isles routes.

In the interests of maintaining valid comparability, all operations considered are located in the developed world in cool or temperate climate areas. To assemble comparative data route against route we have created a data base and logged, where available, the following:

Route name – normally the terminals or ports at each end of the route; where appropriate qualified by naming the island or community served with an indication of population.

Operator – indicated by a code shown below against operator lists

Route length – in kilometres; a key comparator

Passage time – in hours and minutes

Operating frequency – number of single crossings per day (average in summer and in winter), as an indicator of road equivalence and user friendliness

Operating hours – first departures and last arrivals, again an indicator of road equivalence

Route capacity – being vessel capacity times daily frequency, expressed as passengers and cars, or PCUs (passenger car units, where by convention an average commercial vehicle is taken a three PCUs)

Route traffic figures – passengers, cars, commercial vehicles carried per year

Single peak fares – the most expensive normal single fare charged expressed in GB pounds for an adult passenger, normal sized car and commercial vehicle (per half meter)

Single off-peak fares – as above but least expensive normal single fare excluding multiple journey, group fares, etc.

From the resulting data base we have been able to make telling comparisons for different categories of fare against distance. Before setting this out, it is important first to look at the context within which ferry operators in different parts of the world ply their trade.

The national regimes, fares structures and operating characteristics for each of the routes examined is considered within the context of firstly of the policy objectives set by the governing administration and then by the company operating the route(s). These fall within two broad categories – commercial operations and subsidised operations. Each of these categories is now dealt with separately below.

4.3 Operator Profiles – Commercial

In some countries it is government policy to leave it to the private sector in an unregulated competitive environment to provide ferry services as a commercial operation subject only to the normal legal constraints of health, safety, employment legislation, etc. In that circumstance it is up to operating companies to set fares and rates at whatever levels will maximise shareholder value while securing and maintaining market share against the incursions of competitors. This commercial approach predominates in England, Isle of Man, Channel Islands, Australia, New Zealand and to some extent in Canada. Profitable commercial operations are also found in Scotland. We have examined commercial routes in each of the above administrations as provided by the following operators:

Bay Ferries, Nova Scotia (BF)
Blackball Transport Inc (BBT)
Condor Ferries (CF)
Interislander, New Zealand (IINZ)
Isle of Man Steam Packet (IOMSP)
Isles of Scilly Travel (IST)
Northumberland Ferries, Nova Scotia (NF)
P&O Ferries, English Channel (P&O)
Pentland Ferries, Orkney (PF)
Red Funnel, Isle of Wight (RF)
Sealink Kangaroo Island, South Australia (SLKI)
Stena Ferries, Irish Sea (STENA)
Western Ferries (Clyde) Ltd (WF)
Wightlink, Isle of Wight (WL)

Profiles of each of the above commercial ferry operators (with code letters indicated for each) is set out below in alphabetical order. As there are no subsidy implications with regard to these operators, we have not attempted ascertain route costs. The fares charged reflect each company's judgement as to what the market will bear.

Bay Ferries (BF) www.nfl-bay.com
During peak season, Bay Ferries sail across the Bay of Fundy from between Nova Scotia and New Brunswick Digby, NS and Saint John, NB, three times daily (twice daily on Sundays). The journey takes about three hours. The Princess of Acadia has an on-board cafeteria and a lounge.

Blackball Transport Inc (BBT) www.cohoferry.com
This company is a remnant of the Blackball Line, most of whose routes were taken over by Washington State Ferries and BC Ferries (which see). The company now operates one ferry, MV *Coho Ferry*, between Port Angeles, WA and Victoria, BC, with four return trips in summer and two in winter. She has a capacity for 100 cars and 1,000 passengers.

Condor Ferries (CF) www.condorferries.co.uk
Condor Ferries operates two RO PAX and two fast catamaran passenger and vehicle ferries between the English ports of Portsmouth, Weymouth (and in Poole summer) and the Channel Islands of Guernsey and Jersey. Condor Ferries also operates between Guernsey and Jersey and from there to St Malo in France.

Interislander (ILNZ) www.interislandline.co.nz
Interislander provides ferry services across Cook Strait – between New Zealand's North and South Islands for passengers, cars, commercial vehicles and rail freight. The fleet consists of four vessels – two multi-purpose conventional vessels, one conventional freight only vessel and *Lynx* one high speed passenger vessel. The two conventional ferries – *Arahura* and *Aratere* – take three hours to cross Cook Strait, with passengers (including vehicles), commercial vehicles and railway wagons. The *Lynx* vessel is dedicated to the passenger and car market, and can cross Cook Strait in 2 hours, 15 minutes. The *Lynx* is a 91-metre catamaran that carries up to 760 passengers and 230 cars. *Purbeck* is dedicated to the freight market, and offers commercial customers two return sailings a day, Monday to Friday. Each year Interislander vessels accommodate over 1 million passengers, 230,000 cars, almost 2 million lane metres of road and rail freight, and operates over 5,700 sailings. In total, Interislander employs 567 full time staff. 68 work in the Head Office, 98 at the terminals, and 401 onboard the ships themselves. Ship crew is made up of 67 officers, 62 engineers, 175 catering crew and 97 deck crew. Interislander is a part of the Toll Group – a leading provider of integrated transport and logistics services throughout Australia and New Zealand.

Isle of Man Steam Packet (IOMSP) www.steam-packet.com
The Isle of Man is a prosperous independent self-governing territory with a population of some 70,000. The Isle of Man Steam Packet Company was founded on the island in 1830 and has served the island continuously since then. The company is now owned by Sea Containers and provides year-round services between Heysham and Liverpool to Douglas with additional seasonal services between Douglas and Dublin and Belfast. The fleet consists of one large RO-PAX vessel *Ben my Chree*, one conventional ferry and two fast ferries. All carry passengers and vehicles.

Isles of Scilly Travel (IST) www.islesofscilly-travel.co.uk
Purpose built and launched in 1977 the Scillonian III has carried some 2.5 million passengers. She is a lift on, lift off vessel, refitted in 1999 to include reclining seats, a bar, buffet area and a walk in shop. The journey lasts approximately 2 hours 40 minutes.

Northumberland Ferries (NF) www.nfl-bay.com
Northumberland Ferries carry passengers, cars and commercial vehicles between Nova Scotia and Prince Edward Island from Wood Islands, PEI, and Caribou, NS, nine times daily in peak season saving 100 driving km or an estimated $54.50 in car owning and operating costs. The The journey takes about 75 minutes. All prices are flat rates, no matter how many people are in the car. There's an onboard cafeteria and a lounge.

P&O Ferries (P&O) www.poferries.com
The Peninsular and Oriental Steam Navigation Company has a history dating back to the 1830s. It was incorporated by a Royal Charter in 1840, thus its name includes neither "PLC" nor "Limited". Since October 2002 the English Channel and North Sea ferry operations of the P&O Group have taken on a new branding identity under the collective name of P&O Ferries. P&O Ferries is the brand name for services previously known as: P&O Stena Line (routes from Dover), P&O Portsmouth (routes from Portsmouth), P&O North Sea ferries (routes from Hull).

Pentland Ferries (PF) www.pentlandferries.com
Pentland Ferries is entirely unsubsidised and offers a frequent, low cost year round route to Orkney; a short crossing time - around one hour between Gills Bay, Caithness and St. Margarets Hope, Orkney - for passengers their cars and commercial vehicles. Pentland Ferries is now the busiest Orkney route. Four return crossings are offered in summer and three in winter. Ferry vessel Pentalina B can carry 250 passengers (summer) and 46 cars. The winter vehicle ferry vessel is Claymore with a winter passenger passenger capacity is 70.

Red Funnel (RF) www.redfunnel.co.uk
Red Funnel has the newest cross-Solent fleet and operates the largest vehicle ferries serving the Isle of Wight. They sail around the clock, 364 days a year between Southampton, the gateway to the Island and East and West Cowes, the home of world yachting.

Sealink Kangaroo Island (SLKI) www.sealink.com.au
The company operates two modern, fast and comfortable, roll-on - roll-off catamaran passenger and vehicle ferries. The crossing to Kangaroo Island (KI) takes 45 minutes. The ships have air-conditioned lounges with comfortable aircraft type seating and a licensed café. *Sealion*, built in 2000**, is** 49.8 metres long, 16 metres wide Draught 2.5 metres, Top speed 16 knots 354 passengers 63 cars or 4 coaches & 42 cars. *Spirit of Kangaroo Island* is 50.37 metres long, 18.25 metres wide, Draught 2.5 metres, Top speed 17.8 knots, 244 passengers, 53 cars or 8 semi-trailers & 18 cars

Stena Line (STENA) www.stenaline,co.uk
The Stena Line operates a range of services between British, Irish, and Continental ports and within Scandanavia. The company pioneered HSS (high speed (40 knot) catamarans) services

between Stranraer and Belfast and on other routes. The Belfast route is operated by both HSS and a conventional ferry.

Western Ferries (Clyde) Ltd (WF) www.western-ferries.co.uk
Privately owned, the short ferry crossing between Hunter's Quay (Dunoon) and McInroy's Point (Gourock) was started in 1973 by Western Ferries (Argyll) Ltd. Change of ownership in 1985 saw the birth of Western Ferries (Clyde) Ltd. At present Western Ferries uses a fleet of 4 vessels on the route, giving a carrying capacity (in each direction) of approximately 134 cars per hour – Scotland's busiest ferry route.

Wightlink (WL) www.wightlink.co.uk
Wightlink Isle of Wight ferries operates a round-the-clock service between the English mainland and the Isle of Wight. They run every day of the year on three routes across the Solent and sail up to 200 times a day and have the fastest fleet on the Solent: Portsmouth to Fishbourne in 35 minutes; Lymington to Yarmouth in 30 minutes (both car ferries), and Portsmouth to Ryde in a quarter of an hour (foot passenger fast catamaran).

4.4 Operator Profiles – Subsidised

As in Scotland a number of governments have adopted a policy of subsidising ferry services. The way this has come about and the rationale for maintaining such an arrangement varies from administration to administration but one objective seems to be common to all: that is to reduce the level of fares and charges to a level below those that would obtain if left solely to commercial forces and to provide more frequent services than would otherwise be the case. Selected routes undertaken by the following operators have been examined:

Alaska Marine Highway (AMH)
BC Ferries, British Columbia (BCF)
Campania Regionale Marittima, Italy (CRM)
Highland Council (HC)
Inter-island Ferry Authority, Alaska (IIFA)
La Société Morbihannaise et Nantaise de Navigation, Brittany, France (SNNN)
Marine Atlantic, Newfoundland (MAN)
Møre og Romsdal Fylkesbåter, Norway (MRF)
Northlink (Orkney and Shetland) (NL)
Shetland Islands Council (SIC)
State of North Carolina Department of Transportation Ferry Division (NCRD)
Strandfaraskips Landsins, Faroe Islands (SSL)
Troms Fylkes Dampskipsselskap, Norway (TFDS)
Washington State Ferries, Washington, USA (WSF)

Before considering individual operators and routes, however, it is useful also to look in detail at the historical evolution, policy and fiscal environment in some key countries where ferry operations may be compared with Western Isles routes. These are now considered in turn.

NORWAY

The extreme geography of Norway (population 4.5 million) features steep and high mountains, a deeply indented coast and numerous islands. By virtue of this, "state-granted road-ferries", as they are defined, are important and are regarded as an integral part of the road system. In fact the word "ferry" itself is of Norwegian origin (N. *ferje*). Although in recent years many ferry services have been replaced by fixed links, there are still in total160 ferry vessels, with a combined capacity of some 9,000 PCUs (passenger car equivalent units), operated by 18 different companies on 124 routes, or "connections" (*forbindelsen* in Norwegian, signifying "binding together"). Connections (routes) vary in length from 0.6 km to 113 km. The ferries transport some 21 million passengers and 16 million vehicles. Under the Norwegian system, road-ferries are regulated, state subsidised (with one exception), obliged to apply a national scale of charges and to adopt laid-down operating methods and standards.

The origin of the present system can be traced back to the 1950s when ferries linking points on the national road system became a state responsibility and a systematic approach began to evolve. A leader in the process of systematisation was Mr K H Oppegård, Chief Roads Surveyor of the county of Møre and Romsdal whose ferry committee undertook an in-depth analysis of the principles of ferry operations. Their report was presented in 1963-4 and it became the foundation from which Norwegian ferry policy has been developed subsequently. Key principles were:

- adoption of the shortest practicable sea crossing
- as a result, minimise costs and maximise frequency
- adopt standardised vessel designs and terminal types to aid inter-changeability
- where possible employ shore based crews in shifts

A key policy aim of the Norwegian government has been the retention of population in the more rural parts of the country by encouragement of economic development and good social provision there. Good road transport with cheap frequent ferry connections were seen as fundamental components in this policy. The standardised terminals are defined as part of the road network and are owned by the state.

Since the systemisation of the road-ferry system, it has been an aim that the cost of a ferry crossing should be no more than the cost of driving the same length of road – road equivalent tariff. In practice, for budgetary reasons, this has not been wholly achieved although a fairly close approximation has. The national fare system is based on two elements – the passage distance (zone) and vehicle length. Fares on routes of say 10 km are equal wherever in the country they are. In this way costs in different parts of the country are levelled out. The low level of fares means that in most cases they do not cover the running costs of the ferry. The difference is covered by subsidy.

In recent years new and improved standards have been laid down for different category of route. Busy trunk routes are open round the clock. Through regional routes, equivalent to the Sounds of Harris and Barra, for example, should be frequent and open at least 18 hours with 97% of vehicles shipped on the departure desired. Local connections may be to a lesser standard.

In setting these standards the state purchases the service from each of the ferry operators under a ten year contract, negotiable each year. The contracting arrangement, which is considered to have worked well, is now under review. Recent total financial outcomes are as follows:

	£ million
Total operating cost	164
Revenue	90
State grant	74

Operating costs are kept under tight review and are made available publicly in detail on an operator by operator, route by route basis. Collectively operating costs break down broadly as follows:

Wages and Social costs	60%
Fuel	19%
Repairs and maintenance	13%
Insurance	5%
Other	3%

Since all Norwegian road-ferry connections are subject to a standard (near RET) tariff we give specific examples of only two Norwegian operators outlined briefly below together with the Norwegian style Faroese operation.

Møre og Romsdal Fylkesbåter (MRF) www.mrf.no
MRF is the largest domestic ferry company in Norway, operating 42 vessels on 26 ferry connections and 5 high speed passenger boat services all over the *fylke* (county) of Møre and Romsdal. More than 11 million people travel by MRF ferries and fast passenger boats every year. As elsewhere in Norway the MRF ferries are an integral part of the public road and transport system in this district, - linking up the main roads, crossing fjords and connecting the islands to the mainland.

Troms Fylkes Damskipsselskap AS (TFDS) www.tfds.no
In Troms *fylke* TFDS operate 12 ferry connections, of which seven are national connections and six county connections. Three private summer only routes are operated as well as fast catamaran passenger craft on five routes including that between Tromsø and Harstad. TFDS owns 16 ferries (capacity from 12 to 120 PCUs and from 57 to 399 passengers, and six fast craft.

Strandfaraskips Landsins (SSL) www.ssl.fo
Although out-with the scope of Norwegian regulations, ferry services in the Faroe Islands are similar in style to those of Norway. All Faroese ferries are operated by the state owned company Strandfaraskips Landsins. The company operates five vehicle ferries and three passenger only ferries on six routes and we have profiled three Faroese routes operated by SSL.

SHETLAND

Another area that has adopted Norwegian methodology with remarkably beneficial results is Shetland. This is how the transformation came about.

Prior to the early 1970's Passengers and goods to the smaller Shetland isles had been carried by a service run by the North of Scotland, Orkney and Shetland Shipping Company, using the *Earl of Zetland*, subsidised by the Department of Agriculture and Fisheries and the "overland route" from Lerwick to the North Isles which consisted of three different coach operators and two different boat operators that had been started just before WWII, which grew to rival the *Earl*. These two were supplemented by private charters and local fishing boats.

The *Earl's* schedule consisted of three trips per week (weather permitting). Goods would be handled many times between their despatch and arrival destinations, and sometimes arrived damaged. The overland route provided more crossings for passengers, luggage and motorcycles only and even with the use of small boats it was popular. In 1960 a report to Zetland County Council as it was then known, decided that a Vehicle Ferry System would be needed.

A visit to Norway by an Advisory Panel of the Highlands and Islands in 1961 observed a system similar to what would be needed. Mr K H Oppegård of Møre and Romsdal Fylke (see Norway above) visited Shetland and made a report as to what would be needed. From what they had seen in Norway the council believed the introduction of vehicle ferries could do more to offset the disadvantages of life in the Outer Isles than any other single amenity that was ever likely to be provided. The principal objective of the council was to retain and sustain population in the isles through improved inter-island communications.

Initially five new ferries were ordered, of a type very similar to ones being used in Norway. An extensive pier and link span building program was undertaken. As had been the case in Norway, the new ferries proved immensely popular and usage increased rapidly. It later became apparent that the earlier type of ferry was inadequate on the busier routes which necessitated augmentation of the fleet by larger vessels over the next two decades.

As in Norway, vehicle ferries run for 18 hours per day and it has been the policy of the council to set fares and charges at a very low level to encourage usage. The success of this policy may be judged by the following figures which give a sense of the enormous growth in traffic since the last days of the Earl to the present.

Year	*Passengers*	*Vehicles*
1965 *Earl of Zetland*	20,000	173
Vehicle Ferries		
1961 (original estimate)	42,700	14,150
1976	178,000	75,000
1999	659,000	265,000

These services are funded by a combination of revenue receipts and subsidy from the Shetland Islands Council. The financial outcomes for 1997-8 were as follows:

	£ million
Total operating costs	6.0
Revenue	1.1
Subsidy	4.9

The ferry division of the council is run as a self contained operation employing 163 persons of whom 148 serve on ferries. The operator profile is outlined below.

Shetland Island Council (SIC) www.shetland.gov/ferries
Shetland Islands Council now own and operate a fleet of 14 ferries providing services entirely within the Shetland archipelago between mainland Shetland and the islands. The services run from 16 terminals serving 9 islands with a total population of just under 3,500 people. The ships make over 70,000 crossings each year and carry almost 700,000 passengers and over 300,000 vehicles. Roll on / roll off services, carrying passengers and all types of vehicles, operate frequently every day from early morning to late evening to the islands of Yell, Unst, Fetlar, Whalsay and Bressay. Freight and limited passenger services operate to Skerries, Fair Isle, Foula, and Papa Stour.

The SIC is now looking at the possibility of providing fixed links between mainland and Bressay, Yell and between Yell and Unst and has in the meantime agreed to make its ferry operations free to users.

OTHER BRITISH AND EUROPEAN SUBSIDISED OPERATIONS

Before considering major North American systems, we briefly profile a number of other British and European subsidised ferry operations whose fare and charges make useful comparison with those in the Western Isles but for which we have not been able to ascertain operating cost and other data.

Campania Regionale Marittima (CRM) www.caremar.it
The Campania Regionale Marittima S.p.A. (Caremar) has operated since 1976 to the islands in the Gulf of Naples. By 1980 the fleet had become obsolete and a modernisation programme resulted in six new vehicle ferries and three fast craft. This allowed Caremar to introduce accelerated services to Capri and other islands for the benefit of residents and tourists. A high standard of security is employed on bord Caremar vessels including closed circuit television monitoring of the vehicle decks. In 2003 Caremar conveyed over 3 million passengers. Caremar is part of the large Tirrenia Group whose 92 coastal and trans-Med ships each year collectively makes 60 thousand trips, cover 4 million miles, carrying 13 million passengers, 2 million cars and 6 million lineal meters of commercial vehicles.

Færgeselskabet Vestsjælland A/S (FSVJ) www.faergevest.dk
Færgeselskabet Vestsjælland has a fleet of five passenger and vehicle carrying vessels providing local ferry services in Denmark from West Zealand to the small islands of Agersø, Omø, Sejerø and Nekselø.

Highland Council (HC) www.highland.gov.uk
The Highland Council operates Scotland's second busiest ferry linking the Lochaber peninsula of Ardgour, Morvern and Ardnamurchan at Corran. The council awarded a £2.9 million contract for the construction of a 30-vehicle, the successful bidder being George Prior Engineering (Yorkshire) Ltd of Hull, who delivered the vessel Corran in spring of 2001. The new ferry joined the MV Maid of Glencoul, on the route replacing the Rosehaugh, which was retired after more than 32 years service.

Northlink (NLF) www.northlinkferries.co.uk
In October 2002 NorthLink Ferries launched its cruise-standard ferry service to Orkney and Shetland replacing the services previously operated by P&O. Scottish Executive subsidy was won as a result of open tender. NorthLink Ferries operate three main routes – Lerwick - Aberdeen, Kirkwall - Aberdeen and Stromness – Scrabster, for passengers, cars and commercial vehicles. NorthLink's freight service is integrated with its passenger vessel service. Two 125 metre new drive-through passenger/ro-ro sister ships operate out of Aberdeen. The new Pentland Firth vessel is slightly smaller (110 metre passenger/ro-ro). Each of the three vessels has the capacity to carry 600 passengers plus cars and commercial vehicles. The specialist freight vessel MV *Hascosay*, can deal with heavy and outsized ro-ro traffic, large livestock consignments and hazardous cargoes. A second charter vessel covers livestock sailings in order to cope with peak demands. A new Commercial Traffic Rebate scheme has been announced. The company has been unable to meet its traffic and financial targets and the tender is currently in process of re-negotiation.

La Société Morbihannaise et Nantaise de Navigation (SNNN)
www.smn-navigation.fr
SNNN has departures by ferry to Bell Île off the south Brittany coast from Quiberon-Port-Maria all year round providing a year-round service for both passengers and vehicles (between 5 an 15 return trips per day according to season). Services are also provided from Quiberon-Sauzon and from Lorient. (April to September).

Samsø Linien (SL) www.samsoelinien.dk
Samsø Linien provides a vehicle and passenger ferry service from the Danish island of Samsø (population 4,400) to Hou in Jutland and to Kalundborg in Sjaelland. Samsø is a centre for suatainable energy. The company operates three vessels: *Kyholm*, 14.5 knots, 90 cars and 550 passengers; *Kesborg*, 11.7 knots, 70 cars and 440 passengers; and *Sam-Sine*, 10.5 knots, 36 cars and 248 passengers.

BRITISH COLUMBIA (CANADA)

Ferry service on the west coast of British Columbia started with the Hudson's Bay Company as the early pioneer of regular passenger and freight service between Vancouver Island and the Lower Mainland in the mid 1800's. By 1901, Canadian Pacific Railway had taken over ferry service across the Strait of Georgia and continued transporting passengers and vehicles on a five-hour journey between downtown Vancouver and downtown Victoria until the 1960's. Further north, the Black Ball Line had arrived on the scene in the early 1950's to offer service between Horseshoe Bay in West Vancouver and Departure Bay in Nanaimo, as well as to the Sunshine

Coast and Jervis Inlet south of Powell River. The company had been established by Captain Alexander Marshall Peabody, whose family's Puget Sound Navigation Company (see under Washington State Ferries).

Recognizing the need for continued reliable ferry service on the West Coast in the late 1950's, BC Premier W.A.C. Bennett announced on July 18, 1958, that the British Columbia Ferry Authority would take over the service under mandate from the provincial government. British Columbia Ferry Services Inc., or BC Ferries, started out with two ships, two terminals, and around 200 employees. The service linked Victoria, the provincial capital on Vancouver Island, with Tsawwassen near the City of Vancouver and the rest of mainland British Columbia. In November 1961, the Authority acquired the Black Ball Line and took over service between West Vancouver and mid-Vancouver Island. By late 1962, Canadian Pacific had conceded its Victoria service to the Authority after which the company and its services expanded exponentially. The company is profiled below.

B C Ferries (BCF) www.bcferries.com
By the beginning of the twenty first century, BC Ferries had 40 vessels, serving 48 destinations on 25 routes. Schedules include frequent, year-round sailings to some of the most remote corners of the coast as well as some of the busiest. The full-time staff complement is some 2,900, augmented by some 1,600 casual employees in the summer months. BC ferries is now one of the largest, most sophisticated ferry systems in the world. The 2001/2002 annual report indicates that the company carried 21.3 million passengers (over 402.6 million passenger miles) and 8.1 million vehicles (8.9 million PCUs). Average load factors were 30% for passengers and 55% for vehicles (PCUs). Financial outcomes were as follows:

	£ million
Total operating cost	256
Revenue	206
Provincial funding from Fuel tax	32
Federal grant	10
Profit	8

These figures exclude a large write down of £17.5 million set against three fast catamarans that proved unsuitable for BC service. This debacle and a change of provincial government led to an investigation into the otherwise exemplary affairs of BC Ferries. On April 2, 2003, after intense examination by the provincial government and BC Ferries' Board of Directors, a new corporation was officially re-launched as an independent commercial company and renamed British Columbia Ferry Services Inc.

WASHINGTON STATE (USA)

The ferry system in the State of Washington has its origins in the "Mosquito Fleet," a collection of small steamer lines serving the Puget Sound area around Seattle during the early 20th century.

The first sea-going vehicle ferry *Leschi* was introduced in the area in 1913. By the beginning of the 1930s, two lines remained: the Puget Sound Navigation Company (known as the Black Ball Line) and the Kitsap County Transportation Company. A strike in 1935 forced the KCTC to close, leaving only the Black Ball Line under the control of the indominatable Captain Charles E Peabody.

Toward the end of the 1940s the Black Ball Line sought to increase its fares, to compensate for increased wage demands from the ferry workers' unions, but the state refused to allow this, and so the Black Ball Line itself shut down. In 1951, the state bought substantially all of Black Ball's ferry assets for $5 million. It only intended to run ferry service until cross-sound bridges could be built, but these were never approved, and the state Department of Transportation runs the system to this day. A profile of the company follows.

Washington State Ferries (WSF) www.wsdot.wa.gov/ferries
The State of Washington now maintains the largest fleet of passenger and vehicle ferries in the United States – 29 vessels calling at 20 ports, carrying some 26 million passengers and 11 million vehicles annually. The system, known as Washington State Ferries, serves communities on Puget Sound and in the San Juan Islands. Current vehicle ferry routes are: Seattle to Bremerton, Seattle to Bainbridge Island, Southworth to Vashon Island to Fauntleroy (West Seattle), Point Defiance to Tahlequah (south end of Vashon Island, Clinton to Mukilteo, Edmonds to Kingston, Keystone to Port Townsend, Anacortes to (any or all of the following) Lopez Island, Shaw Island, Orcas Island, Friday Harbor (on San Juan Island) and Anacortes to Sidney, B.C. (The service's only Canadian port-of-call, via any of the above stops). There is one passenger-only fast ferry route: Vashon Island to Seattle. As in British Columbia the system is subsidised from a state-wide 1¢ tax on motor fuel.

NORTH CAROLINA (USA)

Ferry transport in Eastern North Carolina began in the mid-1920's when Captain J.B.(Toby) Tillett established tug and barge service across Oregon Inlet along North Carolina's Outer Banks. In 1934, the North Carolina Highway Commission began subsidizing Tillett's business, thereby keeping tolls at an affordable level. In 1942, the Highway Commission began full reimbursement of costs to eliminate the tolls altogether. Tillett was fully subsidised in this way until 1950 when he sold his business to the state. Just before that in 1947, the commission purchased the ferry operation of T.A. Baum, who had operated a route that ran across Croatan Sound linking Manns Harbor and Roanoke Island. This became the first route of the N.C. Ferry System.

State of North Carolina Department of Transportation (NCRD) www.ncferry.org
Today, the N.C. Department of Transportation's Ferry Division extends over seven routes, has 24 ferries and employs over 400 workers. The operations are supported by a full service shipyard, dredge, military-style landing craft utility vehicles (LCU's), tugs, barges, and other support vessels. Each year, North Carolina ferries transport over 1.1 million vehicles and more than 2.5 million passengers across five separate bodies of water - the Currituck and Pamlico sounds and the Cape Fear, Neuse and Pamlico rivers. NC ferries are toll free for both passengers and vehicles

except for the longer Cedar Island-Ocracoke, Swan Quarter-Ocracoke and Southport-Fort Fisher routes on which tolls are charged.

OTHER NORTH AMERICAN SUBSIDISED OPERATIONS

We have looked at services provided in three other North American states/provinces. These are profiled under their operator titles as follows:

Alsaka Marine Highway (AMHC)
Alaska has a greater length of coastline than the rest of the USA combined and half of Alaska's cities are not accessible by conventional roads. In 1960 Alaskans voted the bonding to establish the state's waterborne highway system. The resulting Alaska Marine Highway System has been operating year-round since 1963, with regularly scheduled passenger and vehicle service to 30 communities in Alaska, plus Bellingham, WA, and Prince Rupert, BC. There are currently ten vessels in the AMHS fleet, with additional other ferries either under construction or planned. During the past ten years the Alaska Marine Highway System has carried an average of 400,000 passengers and 100,000 vehicles per year.

In February of 2002 Derecktor Shipyards was awarded the contract to design and build two high-speed passenger and automobile ferries as the first phase of Alaska's plans to re-tool its regional water transportation system with fast, modern, efficient, environmentally-friendly vessels. The first vessel, the M/V *Fairweather*, operates between Juneau and Sitka, Haines and Skagway in southeast Alaska. Designed by the naval architecture firm of Nigel Gee & Associates, of Southampton, England, each of the vessels is 235 ft. (72 m) long, carries 250 passengers and 35 cars (or a combination of cars, trucks, and RVs), and travels at speeds up to 36 knots (55 kph). The vessels employ a catamaran (twin-hull) design of lightweight aluminum construction. They are powered by four MTU medium-speed diesel engines, each driving a Kamewa waterjet propulsor. The second vessel, M/V *Chenega* will sail in the Prince William Sound area of south-central Alaska, connecting the ports of Cordova, Valdez, and Whittier.

Inter-Island Ferry Authority (IIFA) www.interislandferry.com
The Inter-Island Ferry Authority was formed in 1997 in recognition of the need for improved transportation to island communities in southern Southeast Alaska. The Prince of Wales Island communities of Craig, Klawock, Thorne Bay and Coffman Cove joined in a coalition with Wrangell and Petersburg to create the IFA, which is a public corporation organized under Alaska's Municipal Port Authority Act.

The IFA development plan included both Hollis-Ketchikan and Coffman Cove-Wrangell-Petersburg passenger/vehicle ferry routes. Alaska Department of Transportation support for both routes was received in 1998. Alaska's Congressional Delegation secured funding for the first of two planned IFA vessels and construction started on the M/V Prince of Wales early in 2001. Daily scheduled service between Hollis-Ketchikan-Hollis commenced in January 2002. The Hollis-Ketchikan ferry route is now Alaska's busiest, according to IFA research. Construction of the sister vessel, the M/V Stikine will start in June of 2004, with service planned

on the Coffman Cove-Wrangell-Petersburg route in the summer of 2006. Both ships are 198 ft long by 51 ft beam, service speed 15 knots with a capacity for 160 passengers and 30 cars.

The original concept for the IFA was that operating costs would be fully supported by the fare box. At a meeting earlier this week the IFA board approved their fiscal year 2003/04 budget, which reflects a $123,000 surplus after covering operating expenses and capital costs. "The key to cost control is that the M/V Prince of Wales is designed to operate as a day boat with a crew of five". 12 full time crew, 5 part time terminal staff, 2 ticket agents, 3 admin and management staff and 5 on-board concession catering staff bring the annual payroll to $1.4 million.

Marine Atlantic Inc (MA) www.marine-atlantic.ca
Marine Atlantic is a Canadian Federal Crown Corporation that provides a vital marine transportation link across the Cabot Strait between Newfoundland and Labrador and mainland Canada. This service is provided in compliance with the constitutional agreement between the Province of Newfoundland and Labrador and the Government of Canada. The company operates two ferry routes. A year-round ferry service is operated on the 96 nautical mile route between Port aux Basques, Newfoundland and Labrador and North Sydney, Nova Scotia. During the summer, the company operates a 280 nautical mile route between Argentia, Newfoundland and Labrador and North Sydney, Nova Scotia.

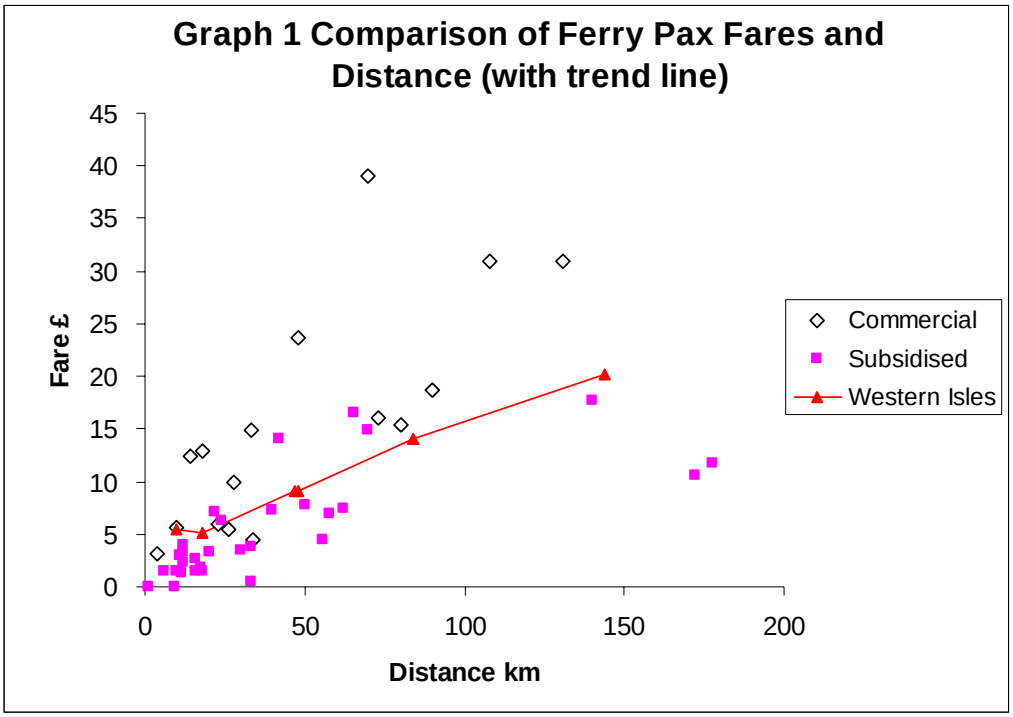
MA underwent sweeping change in 1993, when the Government of Canada approved a fixed link "Confederation Bridge" to Prince Edward Island thus abolishing the Borden, PEI to Cape Tormentine, New Brunswick ferry route. Under another Federal Government initiative, Marine Atlantic withdrew from the Bay of Fundy service in 1997, and is now operated by Bay Ferries Ltd. (which see). Finally, the Newfoundland and Federal Governments reached a fincial agreement whereby the province assumed responsibility for the Labrador coastal service. To provide this service, the company owns and operates four ocean class vessels and employment peaks at approximately 1200 employees during the summer season. In 2002 the company's vessels carried 528,975 passengers, 172,728 cars, and 79,092 commercial vehicles.

4.5 Comparative Analysis

From the large amount of data assembled from this world-wide selection of administrations, operators and routes, we have undertaken a comprehensive analysis that makes in a number of cases very telling comparisons with the current mode of operation and level of fares obtaining in the Western Isles. Annex 4.5 lists all routes considered, comparing passage length, single high season passenger, fares, car and CV rates. These comparisons are described below.

Passenger Fares
Our first task was to list normal peak single passenger fares for each route with the passage distance. These data were then graphed with commercial operations, subsidised services and Western Isles routes given separate identifiers as shown on Figure 4.5.1 below.

Figure 4.5.1 Comparison of Pax Fares and Distance

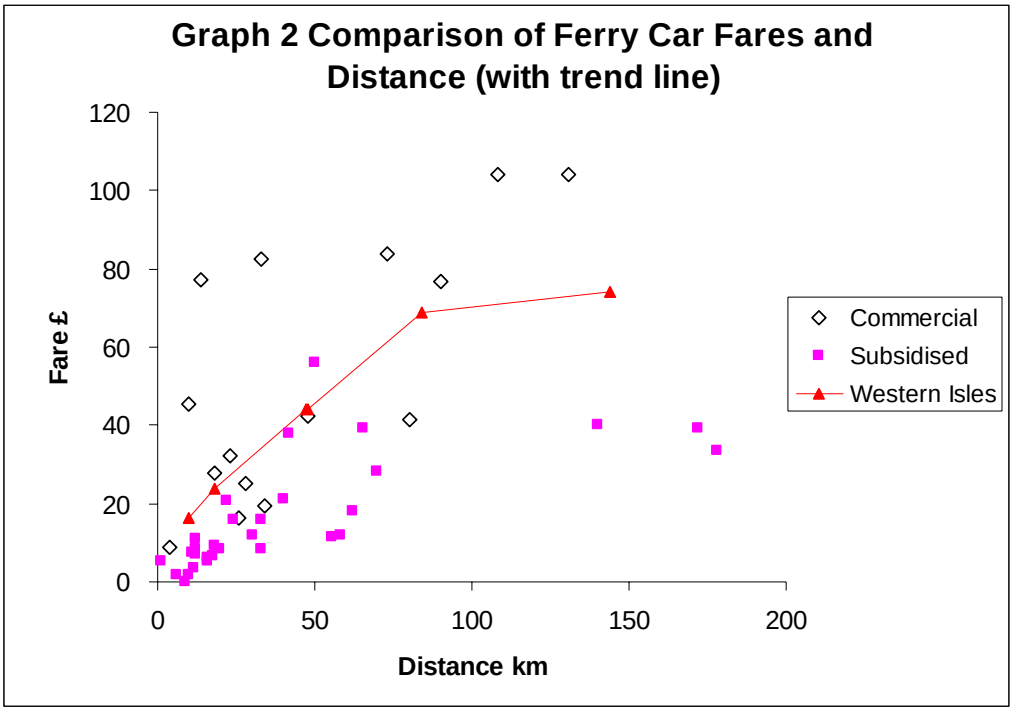


The trend line shows Western Isles passenger fares in roughly the middle of the scatter but at the high end of the subsidised routes, and still higher in the case of the short Sounds of Barra and Harris routes.

Car Rates

We next listed normal peak single car rates for each route with the passage distance. As with passenger fares, these data were graphed with commercial operations, subsidised services and Western Isles routes given separate identifiers as shown on Figure 4.5.2 below.

Figure 4.5.2 Comparison of Car Fares and Distance

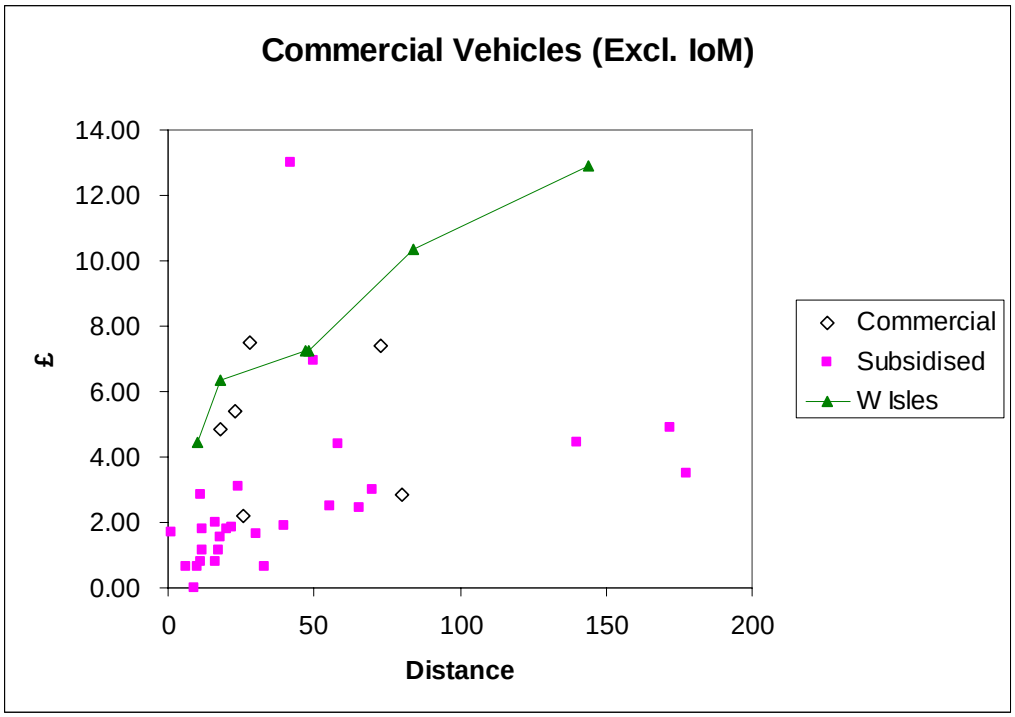


In this case trend line shows Western Isles car rates quite high on the scatter and with one exception (Kennacraig to Islay) higher than any other subsidised routes, mostly by a wide margin.

Commercial Vehicle Rates

The process was repeated for commercial vehicle rates as shown on Figure 4.5.3 below.

Figure 4.5.3 Comparison of CV Fares and Distance



The list and graph includes CV rates for all subsidised operators covered by our analysis but time available was not sufficient for us to get a complete list for all commercial operators rates. We do, however, have sufficient to draw telling comparisons. One commercial operator's rate is particularly high (that of the Isle of Man Steam Packet Co's route between Heysham and Douglas) and this has been removed for clarity of presentation. That one commercial route aside, the Western Isles routes come out higher than all but one of the other examples. Indeed compared with other subsidised routes, the Western Isles commercial vehicles charges are about three times higher than the general trend. It should be noted also that the Western Isles trend line has a pronounced upwards kink at the second reference point (Sound of Harris) this indicates an exceptionally high CV rate on that route. The relatively high fares in the Western Isles are not intended to show that Cal Mac or any other operator is running services inefficiently given current operating constraints and practices. However, the comparisons do illustrate what is achievable elsewhere given the right mix of subsidy, operating constraints and efficiency.

Incentives and Discounts

The passenger and car fares analysed above are, as previously stated, the normal full single peak rates for each route. Most operators, however, offer a range of incentives and discounts. Of these, discounted return and excursion tickets, reduced fare child tickets and multi-journey or group tickets are almost universally available. Many operators also apply high and low season rates. In these respects they mirror Caledonian MacBrayne's practices on its Western Isles routes. In general, commercial operators, whose full fares tend to be high, are more likely to apply yield management techniques to maximise utilisation. In these instances deep discounts

may be offered during otherwise slack periods, e.g. during the night, bringing fares more into line with those provided by subsidised operators. Subsidised operators whose fares tend to be lower in the first place do not as a rule apply such deep discounts.

Quality of Service

As may be expected, there is a wide variation in styles of operation, frequencies and hours of operation among our sample. A few further observations may, however be relevant at this stage. In those administrations where ferries operate as part of the road system, in Scandinavia, Canada and the United States, the normal practice is for them to run on the shortest practicable distance between terminals, frequently, at easy to remember times, cheaply and from early morning till late evening, typically 18 hours per day. Consequently, in comparison with the best practice elsewhere, the Western Isles ferry routes tend to be long, infrequent, at irregular times, expensive and restricted in operating hours. We believe that in addressing the fares issue, there is an opportunity to consider how the quality of service may also be improved.

4.6 Summarised Findings – Route Comparisons

The key findings identified in this chapter on comparison of Western Isles routes with 44 other routes world wide, are as follows:

- There is a distinction to be made between subsidised ferry operations and those operating commercially to maximise profit
- Western Isles passenger fares are around the middle of the comparative range but a high compared with other subsidised routes, and still higher in the case of the short Sounds of Barra and Harris routes
- Western Isles car rates are relatively high compared with all routes and significantly higher than other subsidised routes
- Western Isles commercial vehicle charges are very high compared with all routes and about three times higher than the general trend for other subsidised routes and that on the Sound of Harris service particularly so
- Data was also gathered on route operating characteristics and where ferries are subsidised, they normally run on the shortest practicable crossings, frequently, cheaply and from early morning till late evening.

The above comparisons with ferry routes world wide provide a framework for considering alternative fare mechanisms and operating patterns for Western Isles routes.

5 Alternative Fares Mechanisms under Current Conditions

5.1 Introduction

The principal task of this study is to examine and recommend alternative fares mechanisms for Western Isles ferry services. We have interpreted the Comhairle's objective of creating a ferry fares mechanism that enhances rather than inhibits the economic and social development of the Western Isles in terms of – the cost effective and efficient import of supplies, materials and export of products; prompt delivery of mail, newspapers and parcels; facilitating business and official travel; encouraging inbound tourism; attracting inward investment; providing access to health facilities, education and services and improving quality of life by facilitating social, family and leisure travel.

Fares systems cannot readily be separated from the way services are operated. The advantage of a cheap fare may, for example be offset by poor timings or inconvenient hours of operation. The previous chapters demonstrate that there is a contrast in operating style between state systems in other countries where ferries have been developed as part of the road system and the style of operation that obtains in the Western Isles that has evolved from traditional shipping services. In the case of the Western Isles ferry routes the reasons for the differences appear to be linked with:

- A multiplicity of routes, several of them long
- Low frequency of service
- Inconvenient and variable timetables
- Low passenger loadings
- High crewing levels and costs
- Non-optimised vessel utilisation
- High fares due to high operating costs
- Fares inconsistently applied

In the light of this we have looked at the task in two ways.

- What alternative mechanisms are possible under present operating conditions?
- What alternative mechanisms are possible under altered operating conditions?

This chapter considers the first of these approaches, i.e. options for alternative fares mechanisms under current conditions. It will be shown that under the current style of operation, and financial regime, there are limits to the scope for radical change. We assess the options, however, below.

5.2 CFARES

The current fare mechanism aspired to by Caledonian MacBrayne on all of its routes is called CFARES. It is designed to meet a requirement of the Scottish Executive of striking a balance set for CalMac of:

- Maintaining/improving local economic and social conditions (not achieved in the case of the Western Isles)
- Efficient and cost effective use of national resources
- Generating a reasonable financial return

CFARES has five underlining principles – namely – that they should be set and designed to:

- cover costs on a route by route basis
- firstly encourage carryings and secondly generate more revenue
- spread demand
- manage capacity
- be simple to understand and to apply

The first principle that *"fares should be set to cover costs on a route by route basis"* does not seem to accord with actuality. In practice there seems to be little relationship between costs and fares. To use examples out-with the Western Isles, the revenue collected on, say, the Colonsay or Small Isles routes is a tiny proportion of the operating costs, whereas the revenue on, say, the Ardrossan-Arran or Oban-Craignure routes appears broadly to match operating costs, although not full capital recovery.

To take a Western Isles example, as already indicated in the chapter on "Routes Comparisons", fares on the relatively short Sounds of Barra and Harris crossings are particularly high even as against other Caledonian MacBrayne routes of similar length, and very high as compared with other subsidised systems. The following table illustrates this.

	Eriskay – Barra (10 km)	*W Bay – Rothesay (11 km)*	*Vidlin – Whalsay (Shetland) (10 km)*
Passenger	£5.50	£3.55	£1.50
Car	£16.25	£14.20	£1.90
CV	£4.44/half m	£2.86/half m	£0.67/half m

The second CFARES principle that *"fares should be set first, to encourage carryings and second, to generate more revenue"* represents two disparate aims. In practice a compromise is applied which fulfils neither aim wholly. Two other CFARES principles of "*spreading demand, managing capacity"* appear to be appropriate. The remaining principle of *"simplicity"* appears not to be met as it is, to quote Caledonian MacBrayne "a very complex method for setting fares" and certainly not a transparent one.

Some other fares anomalies have already been alluded to under the chapter 3 "Current Operating Pattern and Fare Structure", and as the first two CFARES principles do not seem fully tenable we suggest that CFARES does not form an appropriate fares mechanism for Western Isles ferries. We now consider alternatives.

5.3 The Pilot Scheme for the 'Sounds'

As part of the brief for this study we were asked separately and at an early stage to look at how a reduction of 30% in commercial vehicle rates on the Sound of Harris and Sound of Barra ferry services could be achieved for an initial pilot period of two years and what the impact of this may be on inter-island economic activity. An important concern was that such an arrangement should not breech European state aid rules.

In approaching this task we took into account the special and unusual characteristics of these routes, current (2003) traffic levels, route operating revenues and costs, the current economic impact, state aid rules, options for a fares reduction mechanism, a recommended solution, the likely future economic impact of the recommended solution, and finally we indicated that we would consider further opportunities for improvement within this the main study.

The recommended solution was described as non-discriminatory discounted CV charges, whereby a scheme would be designed reduce CV rates by 30% but would not directly favour CalMac, one haulier as distinct from another or any specific interest group. The concept was that a budget be set equivalent to the value of 30% of the CV receipts, based say on 2003 traffic levels. Subject to agreement of this amount, CalMac would reduce all CV rates for the ensuing period by 30%, logging each transaction (as it does as a matter of course). On the basis of a detailed quarterly claim, CalMac would be reimbursed by the amount of the actual reduction up to, but not beyond, the budgeted level. In this way hauliers (including own account carriers) and (indirectly) shippers would benefit from cheaper rates and CalMac would not loose revenue. If, however, CV traffic were to grow beyond the budgeted levels, no further payment would be made to CalMac but they would benefit from the revenue gain from that additional traffic[2]. This would represent a win-win situation for all concerned. It was considered that the measure would not breech state aid rules.

The scheme has the merit of simplicity, ease of administration; it is for a fixed price, so would not breech any budget set. It would have the further merit of focus on hauliers who are specifically disadvantaged by the high current rates. It was stated in discussions with hauliers that competition would ensure that cost savings would be passed on to shippers of goods, thereby ensuring that the scheme would achieve its objective of encouraging inter-island trade.

A suggested refinement of the scheme was that if, as was hoped, traffic exceeded the agreed level, CalMac would benefit from the increased revenue at little marginal cost to it. In that circumstance it would be reasonable for CalMac to pay a proportion (say 30%) of the increased revenue back into the scheme to help extend its scope.

The full pilot study report was made available separately to Comhairle nan Eilean Siar. Some of the costings have subsequently been refined as we developed our financial modelling.

[2] Assuming that traffic would not have increased anyway.

5.4 Purely Commercial

The concept of purely commercial unsubsidised ferry services to, from and within the Western Isles is now considered. There are many island communities so served, e.g. the Isle of Man, Isle of Wight, Channel Islands, etc., all of which have buoyant economies, despite high passenger fares and freight rates. The Route comparisons table shows for example the CV rate for the 73 km passage between Heysham and Douglas (IoM) as £27.13 per half meter as compared with £12.89 for the 144 km between Oban and Castlebay.

Applying charges on each of the Western Isles routes as currently operated sufficient to eliminate subsidy and therefore to recoup all operating and overhead costs, but excluding a return to shareholders would be a challenge under current operating and crewing conditions.

In broad terms, assuming no loss of traffic due to higher fares (in practice not realistic), fares would have to rise (as a percentage of the current fares at 100%) to approximately the following amounts:

Oban – Barra/Lochboisdale	205 %
Uig – Tarbert/Lochmaddy	145 %
Stornoway – Ullapool	150%
Sound of Harris	140%
Sound of Barra	230%

In practice such steep increases in fares would undoubtedly reduce traffic levels significantly, further eroding revenue. In that circumstance a commercial operator, under present operating methods would be forced to reduce service provision to reduce costs. As this would be a departure from the current operating practice. It is not considered further in this section.

5.5 Road Equivalent Tariff (RET)

There are and have long been inconsistencies in the scales of fares and charges on Scottish state supported ferries as illustrated above when considering CFARES. It is difficult to imagine any rationale, other than historical accident, for such inconsistency and apparent unfairness in the application of substantial public funds to favour some communities compared to others. It was to address such anomalies that the concept of 'Road Equivalent Tariff' (RET) was developed in the mid 1970s. As described in some detail under the chapter The Historical Background, RET is based on Norwegian practice and it attempted to create a system of charging on vehicle ferries which was consistent, fair and transparent together with a regime of standardisation and operating principles designed to maximise economy with utility. One of the key principles is the selection of the shortest feasible crossing, thereby reducing vessel size, costs, fares and charges while maximising frequency and capacity.

In the event these principles were not adopted, with the result that RET was uneconomic to apply at that time and since and we recognise that under current operating methods, RET, if fully applied as originally proposed, would continue to be costly in terms of state subsidy.

RET using the original formula but with updated data based on current vehicle operating costs would yield the following fares levels.

Figure 5.5.1 Road Equivalent Tariff (RET)

	Dist	Toll	Rate/km	5m Car	Pass	CV/half m
	km	*km*	£	£	£	£
Eriskay - Barra	10	4	0.09	**6.30**	**1.26**	**0.63**
Leverburgh - Berneray	18	4	0.09	**9.90**	**1.98**	**0.99**
Uig - Tarbert	47	4	0.09	**22.95**	**4.59**	**2.30**
Uig - Lochmaddy	48	4	0.09	**23.40**	**4.68**	**2.34**
Stornoway - Ullapool	84	4	0.09	**39.60**	**7.92**	**3.96**
Oban - Barra/L'boisdale	144	4	0.09	**66.60**	**13.32**	**6.66**

The resulting fares are in every case lower than current rates, in many cases by a very substantial margin. If no traffic growth were assumed (unrealistic), the revenue would be reduced to less than £6.5 million, such that the 2004 subsidy of £8.5 million attributable to Western Isles routes would have to be increased by over £7 million to some £15.5 million. A fares reduction of these levels would, however, unquestionably increase traffic levels. We describe the theory of this "price elasticity" on demand in the following chapter. Based on these elasticity ratios, the estimated increase in traffic due to application of RET (compared with current traffic levels) would be as follows.

Figure 5.5.2 RET Traffic Generation

	Current Traffic 2003			
	Pass	*Cars*	*Coach*	*CVs*
Barra/Eriskay	27,235	9,885	50	491
Berneray/Leverburgh	48,045	16,630	82	1,608
Uig/Lochmaddy	68,096	22,359	146	4,205
Uig/Tarbert	65,628	20,180	207	712
Ullapool/Stornoway	179,874	43,795	419	11,805
Oban/Castlebay/L'boisdale	44,665	12,268	97	1,323

	Revised Traffic due to RET introduction			
	Pass	*Cars*	*Coach*	*CVs*
Barra/Eriskay	52,430	15,938	74	723
Berneray/Leverburgh	83,746	26,313	120	2,355
Uig/Lochmaddy	91,383	34,921	200	5,771
Uig/Tarbert	88,522	31,765	285	979
Ullapool/Stornoway	234,809	66,188	561	15,816
Oban/Castlebay/L'boisdale	67,484	14,599	123	1,675

This increased traffic would generate some £11 million in revenue, a reduction of some £2.6 million as compared with the current £13.6 million; however, capacity constraints would be encountered, necessitating an increase in capacity on a number of routes, thereby increasing costs. As a consequence the subsidy requirement would be considerably in excess of current levels. As this would necessitate departing from current operating conditions we do not consider RET further in this chapter.

5.6 Distance Related Tariffs

Although under present operating conditions, RET is likely to require a relatively high level of subsidy, it is possible to create a scheme of charges which, like RET, is consistent, transparent, fair, and cost effective to both user and the public purse. To achieve this, a modified set of underlying principles for subsidised ferry services is suggested – namely – that a revised system of fares and charges should be:

Distance based – as the concept that longer journeys justify higher charges than shorter is well understood and widely accepted. In recognition of this, the scale of charges for passengers, cars, commercial vehicles, etc. should reflect passage length.

Consistently applied – such that fares and charges for routes of equal length are equally applied, thereby ensuring equity. Congestion charging or off peak rebates, if applied, should also be applied in a transparent and consistent manner across the system.

Financially balanced – such that the level of charging is related to the total cost of the system as a whole (not on a route by route basis) minus the total amount of public funds allocated for support. Such a system focuses on equity and fairness of treatment (e.g. distance based) rather than upon demand and economies of scale for individual routes. As discussed later economies of scale and increased frequency may be achieved by altering routes and operating arrangements.

There are different ways of devising a distance related tariff. The simplest may be described as a "per metre" charge for vehicles based directly on passage distance plus a fixed terminal charge, similar to the RET principle. This can be encapsulated in a formula:

$$C = r\ d\ m + t$$

where C = the charge, r = the rate per metre, d = passage distance in kilometres, m = metres vehicle length, and t = the terminal charge.

The formula can be calibrated to approximate current rates, reflect operating costs and to strike an appropriate balance between traffic categories. On this basis summer peak charges, where "t" is equivalent to say 7km passage distance (equivalent to about 20 minutes waiting time).

The charge or rate "r" may either be set at a fixed rate for all traffic or separately classified for different categories of traffic broadly in accordance with the space occupied by each category on the ship. For vehicles this would be related to either, the length, area or volume occupied on the vehicle deck.

Passengers also occupy volume but more flexibly than is possible with vehicles because they are not limited to a single deck. A significant cost in carrying passengers is the crewing required on larger Class IIA passenger vessels by MCA regulations, particularly on the longer more exposed routes. Currently under CFARES there is no coherent relationship between passenger fares and vehicle rates. The passenger/car ratio for charges on Stornoway – Ullapool is 4.9 to 1 compared

with 2.9 to 1 on Eriskay – Barra. The average is around 4 or 5 to 1 and we have selected this range for the variants of distance related tariff we illustrate. Thus, if a car is charged at £10.00 per meter (£50.00 for a five meter car), the passenger fare would be one fourth or one fifth of this, i.e. £12.50 or £10.00. This is the range that has been applied in all the above cases.

As regards fares applied to vehicles we set out tariffs based respectively on vehicle length, area occupied on deck and volume occupied. These are set out in Annex 5.6. If length alone is the criterion, the commercial vehicle rates and all fares on the "Sounds" routes work out at much less than current rates but car and passenger rates would tend to be more expensive on the longer routes. If area is taken as the criterion for differentiation, the effect brings commercial vehicle, car and passenger charges more closely into line with current charges with the exceptions of the "Sounds" routes (much cheaper for all categories) and the Oban routes (more expensive). If volume were taken as the criterion CV rates are more expensive for all the longer routes (double in the case of the Oban routes), cars are cheaper (except for Oban) and passenger fares are cheaper on the short routes, around parity on the medium length routes and dearer on the long routes.

Each of these distance related tariff options were calibrated against current traffic levels to yield a similar total level of revenue to that currently earned. Each option has its plusses and minuses, the long Oban – Barra and Lochboisdale route is disadvantaged by fares significantly higher than those charged at present, whereas the "Sounds" routes are cheaper in each case. Of the three above options, however, with those exceptions, the "area based" tariff comes closest to replicating the current fares. We now consider how the "area based" tariff can be modified to ameliorate the downside effect of high charges on the longest route.

5.7 Tailored Taper Tariff (TTT)

When the above distance related tariffs (see Annex 5.6) are represented on a graph they appear as a straight line. This is an equitable method of determining fare levels in that operating costs are broadly proportional to passage distance. Under the current CFARES system, the long Oban – Barra and Lochboisdale route is charged at a lower rate per kilometre than other routes and this is reflected in the significantly greater subsidy per unit on that route. We have assumed that the logic for such an arrangement is that additional subsidy is attributed to this route in an attempt to reduce the effect of the particularly high (and economically detrimental) fares that would otherwise apply.

In recognition of this logic we have modified the "area based" distance related tariff by inserting a "taper" in the scale such that above a selected distance the rate per kilometre of passage distance is reduced. On a graph the "taper" is represented by a kink (see Annex 5.7). The effect of this "kink" is to lower the charges for long routes to below those that would obtain on a "pure" distance related tariff. We have given this concept the name "Tailored Taper Tariff" or TTT.

In the first instance we consider a "revenue neutral" application of such a concept. The effect is as follows:

Figure 5.7.1 Tailored Taper Tariff (TTT)

		Current Fares			*TTT Charges*		
	Dist	*5m Car*	*Pass*	*CV/half m*	***5m Car***	***Pass*** *at 1m*	***CV/half m*** *at half 1.6r*
	km	*km*	*£*	*£*	*£*	*£*	*£*
Eriskay - Barra	10	16.25	5.50	4.44	**13.60**	**2.72**	**2.31**
Leverburgh - Berneray	18	23.70	5.20	6.37	**20.00**	**4.00**	**3.40**
Uig - Tarbert	47	44.00	9.15	7.25	**43.20**	**8.64**	**7.34**
Uig - Lochmaddy	48	44.00	9.15	7.25	**44.00**	**8.80**	**7.48**
Stornoway - Ullapool	84	69.00	14.05	10.36	**64.53**	**12.91**	**10.97**
Oban - Barra/L'boisdale	144	74.00	20.20	12.89	**78.03**	**15.61**	**13.26**

It will be observed that with two exceptions the resulting fares are fairly close to those currently applied on Western Isles ferry routes with some, mostly minor, variations up and down. The main exceptions are the "Sounds" routes on which the charges for passengers, cars and CVs are more significantly less than those currently applied, thereby righting a current inequity and at the same time providing a basis for stimulating inter-island travel.

The above TTT is flexible and dynamic to the extent that each variable can be adjusted to suit policy requirements. By adjusting the variables (see Annex 5.7) the balances between charges on say long and shorter routes, or passenger fares and car rates, etc can be easily adjusted. The fundamental principle is, however, that what ever adjustment is made, the scale of charges should apply in its totality to all routes. In this way equity is served. The scheme is capable of being applied as a "National Ferry Tariff" to any subsidised ferry route in Scotland. The spread-sheets on which it is based have been designed to permit virtual automatic calibration to yield whatever overall revenue/subsidy is sought for any given set of operating conditions. The above example achieves near revenue/subsidy neutrality and the effect on traffic is as follows.

Figure 5.7.2 The Effect of TTT on Traffic

	Current Traffic 2003			
	Pass	*Cars*	*Coach*	*CVs*
Barra/Eriskay	27,235	9,885	50	491
Berneray/Leverburgh	48,045	16,630	82	1,608
Uig/Lochmaddy	68,096	22,359	146	4,205
Uig/Tarbert	65,628	20,180	207	712
Ullapool/Stornoway	179,874	43,795	419	11,805
Oban/Castlebay/L'boisdale	44,665	12,268	97	1,323

	Revised Traffic due to TTT			
	Pass	*Cars*	*Coach*	*CVs*
Barra/Eriskay	43,754	11,497	63	621
Berneray/Leverburgh	61,350	19,226	103	2,020
Uig/Lochmaddy	70,753	20,668	206	683
Uig/Tarbert	67,385	22,359	142	4,193
Ullapool/Stornoway	190,090	47,200	405	11,423
Oban/Castlebay/L'boisdale	59,889	10,999	95	1,302

In this chapter the above options are set out under the assumption that no change is made to the current manner in which Western Isles services are provided in terms of schedules, routes, vessel types, crewing, etc. If current operating conditions are maintained and "revenue neutrality" is required, the scope for radical change is very limited.

Even under current operating conditions, however, if revenue neutrality is relaxed somewhat, then benefits can be achieved. We illustrate this by the following Reduced TTT which may be described as a half way house between RET and the current system in which key variables are adjusted as indicated in Annex 5.7 to give an approximately 30% reduction in fares.

The effect is as follows:

Figure 5.7.3 Reduced TTT

		Current Fares			*Reduced TTT Charges*		
	Dist	*5m Car*	*Pass at 1m*	*CV/half m at half 1.6r*	***5m Car***	***Pass*** *at 1m*	***CV/half m*** *at half 1.6r*
	km	£	£	£	£	£	£
Eriskay - Barra	10	16.25	5.50	4.44	**8.50**	**1.70**	**2.13**
Leverburgh - Berneray	18	23.70	5.20	6.37	**12.50**	**2.50**	**2.25**
Uig - Tarbert	47	44.00	9.15	7.25	**27.00**	**5.40**	**4.59**
Uig - Lochmaddy	48	44.00	9.15	7.25	**27.50**	**5.50**	**4.68**
Stornoway - Ullapool	84	69.00	14.05	10.36	**41.75**	**8.35**	**7.10**
Oban - Barra/L'boisdale	144	74.00	20.20	12.89	**56.75**	**11.35**	**9.65**

The resulting fares are in every case significantly lower than current rates. If no traffic growth were assumed (again unrealistic), the reduction in revenue (to some £9 million) would be such that the current subsidy of £8.5 million attributable to Western Isles routes would have to be increased by £4.6 million to some £13 million (at 2003 costs). As with RET fares reduction of these levels would of course in practice increase traffic levels due to "price elasticity" and the estimated increase in traffic due to application of the above Reduced TTT (compared with current traffic levels) would be as follows.

Figure 5.7.4 The Effect of TTT and Reduced TTT on Traffic

	Current Traffic 2003			
	Pass	*Cars*	*Coach*	*CVs*
Barra/Eriskay	27,235	9,885	50	491
Berneray/Leverburgh	48,045	16,630	82	1,608
Uig/Lochmaddy	68,096	22,359	146	4,205
Uig/Tarbert	65,628	20,180	207	712
Ullapool/Stornoway	179,874	43,795	419	11,805
Oban/Castlebay/L'boisdale	44,665	12,268	97	1,323

	Revised Traffic due to Reduced TTT			
	Pass	*Cars*	*Coach*	*CVs*
Barra/Eriskay	49,815	14,599	64	631
Berneray/Leverburgh	77,981	24,489	111	2,180
Uig/Lochmaddy	87,632	30,546	236	1,561
Uig/Tarbert	83,954	31,440	186	4,344
Ullapool/Stornoway	230,956	64,550	492	13,848
Oban/Castlebay/L'boisdale	74,018	17,702	110	1,506

This increased traffic would generate some £10.8 million in revenue, still a reduction of some £2.8 million as compared with the current £13.6 million. Thus the subsidy requirement would rise to some £11.3 million. Like the RET scenario we believe that there would be some capacity constraints particularly at peaks. We have not speculated how these capacity issues would be addressed.

5.8 The Impact of TTT on the Rest of Scotland

Our brief was to look specifically at ferry fares mechanisms as they relate to the Western Isles. We have, however, been asked how the concept of "tailored taper tariff" (TTT) as set out in our report might impact on the Caledonian MacBrayne services out with the Western Isles.

To address this properly we would have to carry out a detailed analysis, of costs, revenues, elasticities, etc. route by route. This is, of course, well beyond the original brief to study Western Isles ferry fares mechanisms. Such a task would in fact have been an important part of our input to the "Strategic Sea Crossings" study currently being undertaken for HITRANS, had we secured that commission.

Although we were unsuccessful in getting that contract we are able to make some general observations, as follows:

For the current commission we calibrated the TTT options as set out in the report with a view to maximising benefit specifically to the Western Isles. This is not necessarily the most appropriate calibration for a CalMac wide application. To illustrate how a wider application of TTT might pan out we have prepared and attach three tables comparing different TTT calibrations with current charges. For comparability we have included some non-CalMac routes and a few alternative short crossings, the latter being indicated in the tables in bold type.

The tables, detailed in Annex 5.8 show: Table A – TTT as currently calibrated; table B – TTT as currently calibrated and reduced by circa 30%, and Table C – A Revised TTT calibration more closely matching existing fares Scotland wide.

In the case of Table A, charges on most routes would be at a somewhat lower level than at present, necessitating some increase in subsidy overall assuming the current operating pattern were maintained.

Table B, in which all TTT fares are reduced by some 30%, if implemented, would necessitate a significant increase in subsidy under present operating conditions.

Table C more closely matches present fares with some higher and some lower. Car rates on Ardrossan – Arran and Oban – Craignure would still be much below current high levels. Without further study and refinement of the calibration, it is difficult to assess the effect on subsidy but of the three options Table C is likely to be the closest to revenue neutrality.

5.9 Summarised Findings – Alternative Fares Mechanisms under Current Conditions

The relative effect of each of the above fares mechanisms as applied to the current ferry operating pattern may be summarised as follows:

- CFARES are inconsistent and the “Sounds” unfairly penalised
- The Pilot Scheme gives reduced CV fares, but limited to two routes (the Sounds)
- A Purely Commercial approach would raise all fares very substantially, but subsidy would be eliminated
- Under RET all fares would be reduced, mostly very substantially, necessitating capacity increase and subsidy would be significantly increased
- Under a distance related (length based) (subsidy neutral) tariff CVs would be cheap, but passengers and cars would be expensive on long routes
- Distance related (area based) (subsidy neutral) tariff approximates to current fares but long route would be expensive
- Distance related (volume based) (subsidy neutral) tariff give expensive CVs rates and long routes
- TTT (revenue neutral) can be calibrated to give a close approximation to most current fares with “Sounds” fares somewhat reduced
- Reduced TTT gives lower fares all round but requires at least some £2.8 million increase in subsidy.

We next consider the effect of applying the TTT fares mechanism in a scenario in which the operating pattern is changes to improve the effectiveness of this tariff structure.

6 Fares Mechanism Options Under Alternative Conditions

6.1 Introduction

The above scenarios have illustrated the effects of applying a variety of fares mechanisms to the Western Isles ferries as currently operated and we have seen how fares may be applied consistently and equitably. It is not, however, possible to achieve a significant reduction in fares unless one of two things happens, *viz*.

- Subsidy is increased
- Operating costs per unit are reduced

The level of subsidy is already high and we have assumed that significant network wide subsidy increase would be difficult to justify. We will now, therefore, consider whether or not alternative operating styles can reduce unit costs, and therefore, reduce fares overall without undue increase in subsidy, and whether or not it is possible at the same time to improve services.

We have already illustrated how Western Isles route frequencies are low and some timetables inconveniently vary from day to day. On most routes passenger loadings are low while crewing levels and costs are high. As described in the Historical Background, the quest for reduced costs lies in adopting the shortest practical crossing, using economical vessel types, controlling costs (capital, crew, etc.) and developing capacity through frequency rather than size of vessel.

6.2 Alternative Operating Patterns

Without mounting a detailed analysis, we have as illustrative examples and in broad terms modelled a number of alternative operating scenarios to demonstrate what may be possible. We do not suggest that these illustrative options are the only or best way of arranging Western Isles ferry services; we present them, rather, to show how alternative approaches based on best practice elsewhere, when coupled with fare restructuring measures, such as TTT, could significantly improve the integration of the Western Isles with the world economy as follows.

Manning Arrangements

Most ferry operators seek to "Sweat their assets" by utilising vessels 24 hours per day where possible. Caledonian MacBrayne, because of current manning arrangements on its larger vessels, operates its vessels typically for only some fourteen hours per day. As crews live on-board, significantly longer hours would breach rest period requirements. Each vessel requires two and a half crews working fortnight on and fortnight off with generous allowance for leave in addition.

The alternative is for crews to live ashore and work vessels in shifts. The Isle of Man Steam Packet Company, for example, works its main vessel *Ben my Chree* round the clock, with two twelve hour shifts; Shetland Council ferries operate for eighteen hours per day with shore based

crews normally working one twelve hour and one six hour shift. The shifts of individual crew members are rotated from week to week for fairness. Besides offering improved operational flexibility, this arrangement is family friendly as crews are normally home at night and during their rest periods.

Adoption of shore based crews working shifts for Western Isles ferry services would at a stroke facilitate longer operating hours, improved service provision and more efficient utilisation of capital assets. For this reason we see this change in manning arrangements as a key component in creating a better alternative operating pattern for Western Isles ferry services. In the illustrative alternative service scenarios we explore below, all vessels and crews would be based in the Western Isles thereby preserving jobs and family life in local communities. Caledonian MacBrayne informed us that network wide at present only 30% of seagoing personnel are normally resident in the island communities served by the company.

Shortening the Stornoway Route

The current Stornoway – Ullapool passage is 84 km. The service is operated by two vessels, the passenger and vehicle ferry *Isle of Lewis* undertaking normally two return trips through the day and the freight ferry *Muirneag* providing a nightly return freight service. A somewhat shorter passage distance of 70 km would be possible by switching the mainland landfall to Aultbea – a deep water port with adequate road connections. This would permit a time saving of some 25 minutes per single crossing at current vessel speed. There would be some extra road time involved, however the overall journey time would be likely to be shorter – and cheaper.

With changed manning, for example using shore based crews working shifts, the shortened passage time between Stornoway and Aultbea, would make it possible for one vessel (e.g. *Isle of Lewis*) to undertake up to four round trips per day if required on a 24 hour operation. The capacity increase created by this measure would remove the necessity and expense of the *Muirneag* as a separate freight only operation.

A suggested schedule is set out below to illustrate the practical application of such an arrangement.

Figure 6.2.1 Suggested Stornoway – Aultbea Timetable

					M2F
Stornoway	*dep*	07:00	12:30	18:00	00:01
Aultbea	*arr*	09:15	14:45	20:15	02:15
Aultbea	*dep*	09:45	15:15	20:45	03:00
Stornoway	*arr*	12:00	17:30	23:00	05:15

M2F = Freight sailing (reduced crew) Monday to Friday

It will be noted that in contrast to current schedules between Stornoway and Ullapool, this schedule offers attractive day and weekend return possibilities in each direction year round.

We have not made an in depth study of all the practicalities of a move to Aultbea but we have estimated the annual operating costs to be as follows:

	£k
Fuel	1,016
Crew Cost	2,265
Insurances	300
Port Expenses	1,227
Maintenance	900
Relief Vessel	217
Total	5,975

This compares with our current estimated total operating cost for Stornoway – Ullapool of £8,855k (being £5,111 for the *Isle of Lewis* and 3,744 for the *Muirneag*), representing an overall saving in operating costs of some £2.88 million per annum.

The Skye Routes

The shortest links currently between the Western Isles and the mainland are those between Lochmaddy and Tarbert and Uig (Skye) at 48 km and 47 km respectively. These are not, however, the shortest feasible links which are Glendale (Loch Pooltiel) – Lochmaddy and Kilmaluag – Scalpay, each about 30 km.

One of the most unsatisfactory features of the two Uig routes is that they are operated by a single vessel which, in summer provides two departures from Lochmaddy on some days and but one departure at a different time on the other days. On alternate days Tarbert receives the two and one calls respectively. This inconvenient arrangement could be satisfactorily resolved by providing two vessels, i.e. one dedicated to each route.

Such a solution may seem to have the effect of increasing rather than reducing costs, but if coupled with route shortening, this effect can be ameliorated. To illustrate this, a conventional vessel of appropriate size dedicated to the Lochmaddy – Glendale crossing, could undertake five or six return trips within an eighteen hour day.

On such a frequency, a vessel with a crew of around 14, passenger capacity of 250 and a car capacity 60 could provide around twice the current capacity of *Hebrides*. We estimate annual operating costs in £k as follows:

Fuel	335
Crew Cost	1,083
Insurances	200
Port Expenses	861
Maintenance	600
Other (+5%)	154
Relief vessel	200
Total	3,433

To illustrate the radical improvement a service pattern of this kind would bring we have set out a suggested schedule below.

Figure 6.2.2 Suggested Lochmaddy Glendale Timetable

Lochmaddy	*dep*	06:00	09:00	12:00	15:00	18:00	21:00
Glendale (Loch Pooltiel)	*arr*	07:10	10:10	13:10	16:10	19:10	22:10
Glendale (Loch Pooltiel)	*dep*	07:30	10:30	13:30	16:30	19:30	22:30
Lochmaddy	*arr*	08:40	11:40	14:40	17:40	20:40	00:10

For the purposes of our illustrative alternative operating scenario we have assumed that a similar vessel would be employed on the Harris station, between Uig and Tarbert as at present but more than doubling the frequency to up to eight single trips (i.e. four return trips) per day as demonstrated by the following schedule.

Figure 6.2.3 Suggested Tarbert – Uig Timetable

Tarbert	*dep*	07:00	11:00	15:00	19:00
Uig	*arr*	08:40	12:40	16:40	20:40
Uig	*dep*	09:00	13:00	17:00	21:00
Tarbert	*arr*	10:40	14:40	18:40	22:40

Alternatively, possibly at a later date, new terminals at Kilmaluag and Scalpay would also permit an increase to up to six return crossings per day on a pattern similar to the Lochmaddy – Glendale schedule above.

Such a radical improvement in frequency would for the first time create a "short sea bridge" or "road equivalence" to the Western Isles with very significant potential for driving forward economic regeneration as will be illustrated later in this paper.

The annual operating cost of a service of this kind would be around £3.5 million, giving a total operating cost for both Skye routes of some £7 million. This compares with a current figure of £4.37 million, an increase of £2.63. Although the overall costs would increase, the traffic generation effect of the much improved frequencies and regularity engendered by the changes illustrated above have the potential to offset this increase as will be demonstrated later.

Barra and Lochboisdale – Mainland Routes

The Oban – Barra – Lochboisdale link has existed since the nineteenth century but is lengthy, at irregular times, relatively expensive, lightly used, especially by commercial vehicles and heavy on subsidy. As a (partial) alternative there has been pressure of late for a regular link between Lochboisdale and Mallaig.

The steaming distance from Lochboisdale to Mallaig is considerably shorter than that to Oban – 92 km compared with 144 km offering the prospect of a somewhat cheaper and possibly more frequent mainland link. The difficulty with re-introduction of a Mallaig connection is that, compared with Lochboisdale, it is more distant and less attractive as a landfall from Barra where

the desire for retention of the Oban link is strong. Thus a switch to Mallaig alone, while feasible would not be popular in that quarter. Operating both routes will of course tend to increase costs and dilute the already thin traffic base available to each route, thereby tending to increase the subsidy requirement unless some novel solution can be found. While this report was being prepared, Caledonian MacBrayne commissioned a STAG report on the re-introduction of a Lochboisdale – Mallaig service which concluded that within the terms of the study, such a re-introduction could not be justified. Nevertheless, for the purposes of illustrating possibilities we have considered two alternative solutions. These are set out below.

The Extended "Lochnevis" Option

The *Lochnevis* was purpose built in 2000 for the lightly trafficked service to the Small Isles (total pop. 131) (eight round trips per week in summer, six in winter). She has a passenger capacity of 190 (Class IIA) and is capable of carrying up to 14 cars although the number of vehicles carried on the rout is negligible. Average summer loadings for passengers was 38 in terms of single journeys (11 in winter). The *Lochnevis* also serves as the winter morning and evening Mallaig – Armadale vehicle ferry service, where the average load per trip is 14 passengers and 7.5 vehicles.

An option for consideration would be to lengthen *Lochnevis* by about 15 meters to enable her better to carry full size commercial vehicles and to extend her roster daily on Mondays to Fridays to Lochboisdale, calling at either Rum or Canna on alternate days *en-route*. Canna, the outermost of the Small Isles is midway between Mallaig and Lochboisdale. The downside of the *Lochnevis* option is that she is a slow 13 knot vessel and the crossing would take over four and a half hours. One advantage of this option, however, is that besides opening up Mallaig as a land-fall from Lochboisdale, it would offer day visits to Rum and Canna and re-establish traditional links between these islands and Uist. Thus genuinely new traffic could be developed.

Under this option the Small Isles and winter Armadale schedules would have to be adjusted. Much of the summer traffic to/from Eigg and Muck is conveyed by Arisaig Marine's *Shearwater* from Arisaig and during *Lochnevis's* annual overhaul this winter she was relieved CalMac's island class ferry *Raasay* and by Gordon Grant's small vessel *Ullin of Staffa.*

It is well beyond the scope of this study to model this in detail but the additional direct operating cost of such an arrangement would be little more that that of the present Small Isles/Armadale operation, so long as the passenger certificate remained at 190 thus retaining the present small crewing. Excluding capital charges, we have assumed that the additional annual cost of the Small Isles part of the operation would be £400k. We have further assumed that this could be offset by savings due to reduction in the summer frequency of Oban sailings.

The Incat Option

One of the difficulties of utilising an existing CalMac vessel on Mallaig – Lochboisdale is that the larger Class IIA ships carry very large crews and are expensive to operate on what would be a lightly used route. An option for consideration is charter or purchase second-hand of an Incat (or similar) fast (up to 40 knot) vehicle carrying catamaran, which by virtue of its speed would be able to operate daily on both Oban and Mallaig routes as a dog leg. Canna and/or Rum calls could also possibly be made. Such vessels are in successful use commercially in the Irish Sea and

examples are available for sale or charter on the world market. These older fast vessels are generally not able to handle full-height commercial vehicles which would have to be routed via Skye. The operating cost of an Incat is likely to be less than that of a conventional vessel and of course the utilisation potential is much greater as demonstrated by the following illustrative schedule.

Figure 6.2.4 Suggested Lochboisdale/Barra – Mainland Timetable

		(Peak)
Lochboisdale	07:00	20:30
Mallaig	08:45	22:15
Mallaig	09:15	22:45
Lochboisdale	11:00	24:30
Lochboisdale	12:00	
Castlebay	13:00	
Oban	15:30	
Oban	16:00	
Castlebay	18:30	
Lochboisdale	19:30	

In this way with one fast vessel it would be possible to maintain the current Oban – Barra summer frequency, double the Oban – Lochboisdale summer frequency plus provide a new daily return service with Mallaig (twice daily in summer). The winter schedule would be double that at present provide, however, it should be born in mind that fast craft of this kind tend to be uncomfortable in bad weather, are subject to wave height limitations and would, therefore be more prone to traffic disruption than a conventional ferry.

Under this option we have assumed Lochboisdale shore based crews of 14 per shift and our model suggests the following annual operating costs:

	£k
Fuel	720
Crew Costs	915
Insurances	60
Port Expenses	500
Maintenance	180
Other (+5%)	119
Relief Vessel (Charter)	500
Total	2,994

Thus the cost of operation of a fast Incat as outlined above would approximate that of the current Lochboisdale and Barra – Oban service.

The "Sounds" Routes

The Sound of Barra and Sound of Harris ferry routes are recently introduced short routes that have demonstrated their merit by generating new traffic. Inter-island traffic growth is, however, constrained by short operating hours. We believe that every effort should be made to provide

sufficient navigational aids to permit night operation, preferably on an 18 hours per day basis year round. The additional cost of this may be estimated at around £300k per year. Ultimately we assume that these ferries will be replaced by fixed links which could have far reaching cost saving effects out-with the scope of this commission.

6.3 Costs Summarised

As already stated the above alternative scenarios are illustrative, have not been worked out in detail and should not be taken as definitive solutions to the ferry requirements of the Western Isles. The purpose of setting them out is to explore what effect such changes could have on the fares regime when the Tailored Taper Tariff (TTT) is applied.

In terms of overall operating costs we have estimated that the differential between current costs and those of our alternative scenario (all figures £k) are as follows:

Route	*Current*	*Alternative*	*Difference*
Stornoway	8,855	5,975	(2,880)
Skye Routes	4,374	7,000	2,630
S Uist/Barra Routes	3,078	2,994	(84)
The Sounds	1,261	1,561	(300)
Total	17,568	17,530	(38)

Thus as estimated the overall operating costs of the alternatives are virtually the same as those obtaining at present. This does not, however, at this stage, take account of new and additional capital expenditure that would be incurred for new link spans at Aultbea and Loch Pooltiel, for alternative vessels for the Skye routes (new) and the Lochboisdale/Barra routes (second-hand) and for road improvements in Skye. We have assumed a total capital expenditure of £57 million made up as follows:

	£ million
Two new 60 car capacity vessels for Skye routes	20
Second hand INCAT	7
New terminals Aultbea and Loch Pooltiel	20
Road upgrade to Loch Pooltiel	10
Total	57

This could be partly offset by the disposal of two existing and expensive to operate vessels *Hebrides* and *Clansman* which may yield some £12 million. This leaves a net capital cost of some £45 million which at 6% interest over 25 years represents an annual capital amortisation cost of £3.6 million.

Thus taking full capital costs into account, the totality of our illustrative alternative scenarios is some £2.2 million more expensive annually than present style of operation. This cost differential could be eliminated if for example the Harris service were made summer only. However, benefits of the alternative as illustrated are much increased frequency and regularity of service, traffic growth potential and, as will now be demonstrated, cheaper fares.

6.4 The Effect of the Alternative Scenario on Fares

We now apply the TTT as set out in the previous chapter to the routes as re-organised under the alternative scenarios. The fares are set out below.

Figure 6.4.1 TTT Applied to the Alternative Operating Scenario

		Current Equivalent Fares			*TTT Fares* ***(Bold)***		
	Dist	**5m Car**	**Pass**	**CV/half m**	**5m Car**	**Pass** *at 1.25m*	**CV/half m** *at half 1.5r*
	km	*£*	*£*	*£*	*£*	*£*	*£*
Eriskay - Barra	10	16.25	5.50	4.44	**13.60**	**2.72**	**2.31**
Leverburgh - Berneray	18	23.70	5.20	6.37	**20.00**	**4.00**	**3.40**
Glendale - Lochmaddy	30	44.00	9.15	7.25	**29.60**	**5.92**	**5.03**
Uig - Tarbert	47	44.00	9.15	7.25	**43.20**	**8.64**	**7.34**
Stornoway - Aultbea	70	69.00	14.05	10.36	**61.60**	**12.32**	**10.47**
Lochboisdale - Mallaig	92	74.00	20.20	12.89	**64.53**	**12.91**	**10.97**
Oban - Barra	144	74.00	20.20	12.89	**78.03**	**15.61**	**13.26**

It will be noted that almost all fares are cheaper under the alternative scenario particularly for the shortened routes. The commercial vehicle rates on the Barra – Oban and Lochboisdale – Mallaig routes are shown for completeness but as commercial vehicle height would be restricted on an Incat vessel provided in our illustrative model, the relatively small number of large CVs currently presented for shipment would have to be routed via Skye. It should be noted, however, that the TTT tariff for CVs from Barra via the Sound of Barra and Lochmaddy – Glendale would be much reduced to about 55% of the current charge via Oban. When coupled with increase in frequency and the recent removal of tolls from the Skye Bridge, this becomes a relatively attractive option despite the somewhat longer road mileage to destinations south.

We were asked to examine the effect of an approximately 30% reduction in tariff under current operating conditions. For comparability we have applied the same reduced tariff to our alternative scenario.

The result is as set out in the table below.

Figure 6.4.2 Reduced TTT Applied to the Alternative Operating Scenario

		Current Equivalent Fares			*TTT Fares* ***(Bold)***		
	Dist	5m Car	Pass	CV/half m	**5m Car**	**Pass**	**CV/half m**
						at 1.25m	*at half 1.7r*
	km	£	£	£	£	£	£
Eriskay - Barra	10	16.25	5.50	4.44	**8.50**	**1.70**	**2.13**
Leverburgh - Berneray	18	23.70	5.20	6.37	**12.50**	**2.50**	**2.25**
Glendale - Lochmaddy	30	44.00	9.15	7.25	**18.50**	**3.70**	**3.15**
Uig - Tarbert	47	44.00	9.15	7.25	**27.00**	**5.40**	**4.59**
Stornoway - Aultbea	70	69.00	14.05	10.36	**38.50**	**7.70**	**6.55**
Lochboisdale - Mallaig	92	74.00	20.20	12.89	**43.75**	**8.75**	**7.44**
Oban - Barra	144	74.00	20.20	12.89	**56.75**	**11.35**	**9.65**

6.5 "Impedance" and Elasticities Calculations

Reduced fares will generate additional traffic and the extent to which it will do so is defined as the elasticity of price. The price elasticity measures the responsiveness of ferry traffic demand to a change in fare. The higher the value the more responsive traffic will be to a change in price. We selected values for car and passenger traffic from the Scottish Office Industry Department (SOID, 1992) study on fare price elasticities on the Cal Mac network. This is the most comprehensive elasticity study conducted to date and has the advantage of estimating values specifically for Western Isles routes. The value for CV price elasticity was taken from the SOID (1993) study on the evaluation of impact of ferry subsidies. In calculating revenue for the current operation we have taken account of child fares, muli-journey and other discounts and have done likewise in applying price elasticities to our illustrative alternative scenarios. We feel that the SOID elasticities indicated for car traffic may be high in current circumstances and in the interest of taking a conservative approach we have reduced them somewhat. The modified values used for each route in these studies are given below.

Figure 6.5.1 Estimated Price Elasticities

	Pax	*Cars*	*CVs*
Barra/Eriskay	-1.2	-1	-0.55
Berneray/Leverburgh	-1.2	-1	-0.55
Uig/Lochmaddy	-0.7	-1.2	-0.55
Uig/Tarbert	-0.7	-1.2	-0.55
Ullapool/Stornoway	-0.7	-1.2	-0.55
Lochboisdale/Mallaig	-0.7	-1.2	-0.55
Oban/Castlebay/L'boisdale	-1.5	-1.9	-0.55

Source data from SOID (1992, 1993)

Price is, however, by no means the only stimulant of traffic. Increased frequency, improved reliability and passage time and extended operating hours can also reduce the barrier to travel or "impedance" which a ferry crossing presents. The classic Scottish examples of this are the

competing Cowal – Inverclyde ferry services where the short frequent, Western Ferries service operating until late at night has developed a large new traffic flow and captured four fifths of the business despite slightly higher fares in some categories. Likewise the recently introduced Gill's Bay to St Margaret's Hope (Orkney) short frequent vehicle service has developed new traffic and captured much of the existing traffic that formerly went via Scrabster and Stromness. These effects are all the more telling when it is borne in mind that both services are wholly unsubsidised and profitable.

While there is strong empirical evidence that traffic will increase with improved frequency, regularity and hours of operation, we are not aware of any systematic analysis previously undertaken of the actual elasticity of these "impedance" factors. We have, however, been able to estimate a "frequency elasticity of demand (FED)" by examining data on a number of comparable routes, e.g. islands with similar populations but with dissimilar fares and frequencies. These 'comparator' routes were similar in length and destinations served, to those in the Western Isles, but with a higher service frequency. In most cases the comparator routes were also cheaper, but in one case (Kennacraig – Islay/Jura) the route was more frequent and more expensive. On these routes, we estimated the likely difference in traffic that could be accounted for by the lower/higher fare, using the above elasticities. Any residual change in traffic after taking this into account will be due to higher frequency, and differences in other service levels, such as timing, comfort and speed of crossing, on the comparator route. In fact in many of our illustrative examples significant reductions in passage time are achieved, which in themselves have a traffic generational effect, although we have not taken account of this separately. On this basis we were able to work out a frequency elasticity of demand (i.e. the responsiveness of ferry traffic to a change in service frequency) for each of the comparator routes and apply this value to the Western Isles routes to estimate the likely change in traffic on each route resulting from application of our alternative mechanisms to these changed operating patterns.

The value of this FED in practice refers to frequency and other service levels such as timing and speed of crossing, however, we have applied it as a pure frequency for the purposes of this study, as it was not possible to separate out every non-price demand factor. Factors such as frequency and speed of crossing will, in any case, be related. A list of the exemplars used in arriving at this calculation is provided in Annex 6.5. The estimated values for FED used are as shown in Figure 6.5.2 below. Our analysis suggests that shorter routes tend to be more responsive to changes in frequency.

Figure 6.5.2 Estimated Frequency Elasticities

Route	*FED*
Eriskay - Barra	1.18
Leverburgh - Berneray	1.18
Glendale - Lochmaddy	0.90
Uig - Tarbert	0.90
Stornoway - Aultbea	0.90
Lochboisdale - Mallaig	0.90
Oban - Barra/L'boisdale	0.55

In broad terms the practical effect of this FED is that increasing route frequency (i.e. number of single journeys per day) on a route with FED around 1, e.g. Stornoway, by 50% would have a similar effect as halving fares on an existing frequency. If at the same time both fares were reduced and frequency increased the two elasticities require to be multiplied, resulting significantly greater traffic growth than if only one elasticity applied.

The proposed frequency change on each altered route as compared with the current situation (taken as 100%) is as follows:

Route	*Summer*	*Winter*
Stornoway	110%	100%
Uig - Tarbert	200%	300%
Glendale – L'maddy	330%	330%
L'boisdale – Mallaig	∞ *	∞ *
L'boisdale - Oban	200% *	400% *
Barra - Oban	100% *	200% *
The Sounds	150%	150%

** Asterisked routes under this scenario would not cater for full size commercial vehicles which would be routed via Skye*

6.6 The Effect on Ferry Traffic

The effect on traffic of the fare reductions attributable to the introduction of RET under current operating conditions was described in the previous chapter. That scenario did not, however, assume any change in frequency of service.

The impact on ferry traffic of improved frequency coupled with the alternative fare mechanisms outlined above will be more substantial than a simple change in fares. This is because ferry traffic will be influenced by both:

- fares and;
- frequency of service.

In addition there are a number of other determinants of traffic, for example ferry speed, timings and local conditions. Quantifying these would require further research well beyond the scope of this commission. For that reason we have based our traffic estimates around the two elasticities of fares and frequency, which means that our estimates of traffic increase are likely to be slightly conservative.

The 2003 traffic figures used as a baseline, as repeated below.

Figure 6.6.1 Existing Traffic (2003)

	Pax	*Cars*	*Coach*	*CVs*
Barra/Eriskay	27,235	9,885	50	491
Berneray/Leverburgh	48,045	16,630	82	1,608
Uig/Lochmaddy	68,096	22,359	146	4,205
Uig/Tarbert	65,628	20,180	207	712
Ullapool/Stornoway	179,874	43,795	419	11,805
Tarbert/Lochmaddy	7	4	0	0
Tarbert/Uig/L'maddy indirect	12,296	4,537	24	761
Oban/Castlebay/L'boisdale	44,665	12,268	97	1,323

The projected increase in traffic when the TTT fares mechanism is applied under the altered operating conditions taking account of both price and frequency elasticities, and rerouting traffic, was then estimated as summarised below.

Figure 6.6.2 Traffic under Altered Operating Scenario (TTT)

	Pax	*Cars*	*Coach*	*CVs*
Eriskay - Barra	59,851	17,339	78	766
Leverburgh - Berneray	89,746	29,055	127	2,496
Glendale - Lochmaddy	225,576	77,323	418	10,579
Uig - Tarbert	118,018	35,113	299	911
Stornoway - Aultbea	206,984	52,142	432	12,034
Lochboisdale - Mallaig	42,414	11,294	0	0
Oban - Barra/L'boisdale	50,674	8,940	0	0
All Routes	793,263	231,206	1,354	26,785

In summary, this highlights the following.

- total passenger traffic increases by 359,720 to 793,263, and increase of 83%
- total car traffic increases by 106,089 to 231,206, an increase of 85%
- total coach traffic increases by 353 to 1,354, an increase of 35%
- total CV traffic increases by 6,641 to 26,785, an increase of 33%.

These substantial increases in traffic may at first sight seem too good to be true but this reflects the current low level of Western Isles ferry traffic compared with islands of similar population but with more frequent services. The comparison between the busiest "new" route, Glendale – Lochmaddy and say Oban – Craignure (Mull an island with a smaller population than the Uists) is telling:

	Pax	Cars	CVs
Glendale – Lochmaddy	225,576	77,323	10,579
Oban – Craignure	618,427	109,089	9,137

It will be seen that the Glendale – Lochmaddy figures are by no means "out of scale". The high Mull passenger figure reflects the developed day trip market to Mull and Iona. It has not been possible in the past to develop such a market in the Western Isles because of high fares and low frequencies. The proposed new schedules would, however, allow development of a new day and

extended trip market based on the Skye tourism "honeypot". It is through such development that a major new economic driver could be created for the Western isles. Although tourism capacity such accommodation will have to expand, we believe this to be possible in the long run in response to an increase in demand, with help from WIE and CnES.

We have made some minor adjustments to some of these values to take account of the creation of the creation of a new Mallaig – Lochboisdale route on which there is no opportunity to travel at present. We have assumed that the new route would abstract one third of the existing Oban – Castlebay – Lochboisdale traffic and that an equivalent amount of new traffic would be generated by the Mallaig route before applying our elasticities. The revised figures are:

	Pax	Cars
Oban route	50,674	8,940
Mallaig route	42,414	11,294

We regard these figures as quite conservative (compare with Lochmaddy or Mull) because, under our illustrative alternative scenario, the route would be operated to a much more attractive and regular timetable by a much faster vessel than hitherto available. For the first time a summer day return facility would be available from Mallaig to both Uist and Barra allowing almost a full day ashore. As the INCAT vessel modelled does not carry commercial vehicles, we have assumed for the purposes of this scenario that CVs would be routed via the much cheaper Lochmaddy and Glendale route. With a much increased frequency of the Uig – Tarbert crossing, it is likely that there would also be some diversion of commercial vehicle traffic to that route from Stornoway – Aultbea. This could offer a prospect of reducing costs on the Stornoway route. For simplicity we have not taken this into account.

On the basis of these revised figures we have computed the revenue attributable to each route under our altered operating conditions and applying the FFF mechanism under our altered operating scenario. The results taking, child, winter and multiple journey discounts in account, are as follows.

Figure 6.6.3 Revenue Calculations: Altered Operating Scenario (TTT)

Eriskay	*Berneray*	*L'maddy*	*Tarbert*	*SY*	*OB/CY*	*Mallaig*
355	883	4109	2332	6840	1247	1067

In sum the total revenue so generated is £16.8 million, as compared with the current revenue of £13.6 million.

As were asked to consider the effect of an approximately 30% reduction in fares under present operation conditions, we now examine the effect of such a reduction under our altered operating scenario.

Before considering the positive economic impact of reduced fares, increased frequency, and most importantly increased traffic, we now make a comparison between the overall financial implications of our revised operating scenario with current practice. The projected increase in

traffic when the Reduced TTT fares mechanism is applied under the altered operating conditions taking account of both price and frequency elasticities was then estimated as summarised below.

Figure 6.6.4 Traffic under Altered Operating Scenario (Reduced TTT)

	Pax	*Cars*	*Coach*	*CVs*
Eriskay - Barra	65,912	20,442	88	865
Leverburgh - Berneray	106,377	34,318	136	2,672
Glendale - Lochmaddy	237,141	84,092	439	11,179
Uig - Tarbert	134,285	44,029	342	1,060
Stornoway - Aultbea	248,387	69,737	520	14,491
Lochboisdale - Mallaig	51,321	15,359	0	0
Oban - Barra/L'boisdale	64,803	15,643	0	0
All routes	908,226	283,618	1,525	30,266

In summary, this highlights the following.

- total passenger traffic increases by 474,683 to 908,226, an increase of 109%
- total car traffic increases by 158,501 to 283,618, an increase of 127%
- total coach traffic increases by 524 to 1,525, an increase of 52%
- total CV traffic increases by 10,122 to 30,266, an increase of 50%.

On the basis of these revised figures we have computed the revenue attributable to each route under our altered operating conditions and applying the FFF mechanism under our altered operating scenario. The results, taking winter, child and multiple journey discounts into account, are as follows.

Figure 6.6.5 Revenue Calculations: Altered Operating Scenario (Reduced TTT)

Eriskay	*Berneray*	*L'maddy*	*Tarbert*	*SY*	*OB/CY*	*Mallaig*
258	635	2925	1735	5403	1080	869

In sum the total revenue so generated is £12.8 million, as compared with the current revenue of £13.6 million.

Comparison of Financial Implications of Current and Revised Operating Scenarios

Values are £ million annually	*Current*	*Alternative (TTT)*	*Alternative (Reduced TTT)*
Total net revenue	13.6	16.8	12.8
Subtract direct operating expenses	17.6	17.5	17.5
Giving direct operation losses	4.0	1.1	4.7
Annualised charge for new capital invested	0.0	3.6	3.6
Add assumed overhead allocation	4.5	4.5	4.5
Giving an overall loss of	8.5	9.0	12.8

Thus it will be noted that, under the alternative scenario where TTT is applied we have illustrated, the annual subsidy requirement for Western Isles routes based on 2003 values would increase slightly by around half million to £9 million but when the Reduced TTT is applied the at the same values the annual subsidy requirement would increase by over £4 million to £12.8 million.

In comparing our alternative operating conditions with the present pattern of services we have taken care to apply the same modelling techniques to both. We stress again, however, that these alternative scenarios are intended to illustrate what may be possible and should not be taken as final recommended solutions. Before proper recommendations are made as to how future Western Isles ferry services may be recast, alternative operating scenarios should be subject to a rigorous and detailed analysis which is out-with the scope of this commission. We are, none-the-less convinced that our illustration does point to a realistic and cost-effective approach to achieving radically improved sea crossings to, from and within the Western Isles.

As has been stressed above, it is not the fares mechanism alone that will bring economic benefit but that coupled with a more radical change in the operating pattern (shorter, more frequent, faster passages) that will bring real benefit. There are numerous opportunities throughout Scotland for change of this kind, which if implemented could provided cheaper chares and much better access while containing subsidy within broadly current levels. Examples of such opportunities are set out in Annex 6.6.

6.7 Process and Timescales

Our discussions with Caledonian MacBrayne stimulated useful debate on a number of issues covered by this study and we have endeavoured to incorporate or explain points raised. One important issue was the process by which the sorts of changes in operating practice we have illustrated could be carried trough and as a consequence of that what might be a realistic timescale.

It should first be stressed that our primary task was to identify a ferry fares mechanism beneficial to the development of the economy of the Western Isles. In so doing it was clear that a fares mechanism alone was insufficient to bring the sorts of benefits sought. Fares are only one component in the barrier or "impedance" that a sea crossing represents. Frequency and passage time are at least as important which is why we have illustrated and costed alternative operating methods that set out to reduce passage time, increase frequency, develop traffic, reduce unit costs and lower fares while containing subsidy levels within reasonable limits.

It was pointed out that we had not carried out detailed technical analyses of these illustrative options and this is of course true: we were not funded to do so. What we have set out are scenarios that should be appraised in more depth.

In terms of timescale it was suggested that it could take ten to fifteen years to bring about the kinds of changes suggested in this report, by the time feasibility studies, STAG appraisals, technical analyses, were undertaken, harbour orders processed, contracts set out and placed, capital works completed, etc. It is certainly true that in Scotland the process of managing change

is slow. It took twenty years from the first formal recommendation in 1975 (by one of the authors of this report) to create a Sound of Harris vehicle ferry and its inception – a concept that was originally met with scepticism but is now regarded as a key and successful inter-island connector.

We believe that given good will and political support the sorts of changes we outline could be achieved in a shorter timescale. Even if they do take ten to fifteen years, however, we suggest that the process should be put in train as soon as possible to secure the significant benefits that will be realised in the long-run.

6.8 Summarised Findings – Fares Mechanism and Alternative Operation

By setting out an illustrative alternative operating scenario for Western Isles ferry services featuring the TTT fares mechanism combined with shorter routes, new capital investment, different vessel types, utilisation and operating practices, and shore based crews, we have demonstrated that it is possible to:

- Reduce fares and charges
- Stimulate very significant traffic growth
- Generate increased revenue (when TTT is applied)
- Containing overall subsidy requirements (broadly within current limits) including annualised costs of new capital investment (when TTT is applied)
- Further traffic growth can be stimulated by applying a reduced TTT but revenue would fall and subsidy would increase

Such a radical improvement in ferry services would bring significant economic benefits to the Western Isles. In the next chapter a comparison is made between the economic impact of the present fares regime and provision of ferry services and the impact, firstly of the recommended TTT mechanism under present operating conditions, and then that mechanism as applied to our illustrative alternative operating scenario.

7 Economic Impact

7.1 Introduction

This chapter estimates the economic impact over approximately ten years of ferry fare and service changes under five scenarios selected from those outlined in Chapters 4 and 5 above, namely:

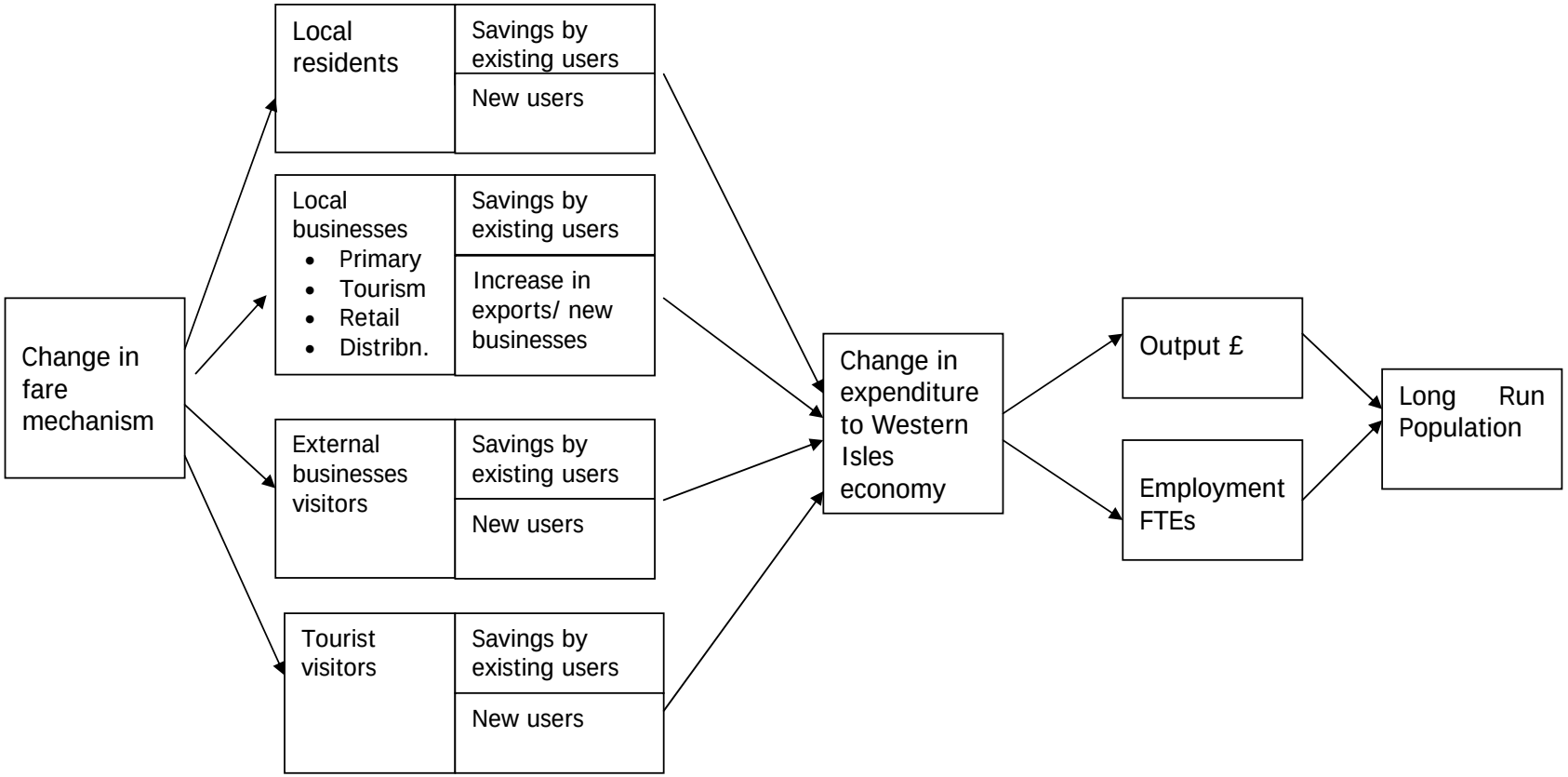
- Road Equivalent Tariff (RET);
- Tailored Tapered Tariff under current conditions (TTT);
- Reduced (30%) Tailored Tapered Tariff under current conditions (TTTR);
- Tailored Tapered Tariff under alternative scenario (TTT);
- Reduced (30%) Tailored Tapered Tariff under alternative scenario (TTTR)

The methodology used has been adapted from McQuaid and Greig (2002) and involves using the scenarios to estimate the likely effects of changes in the fare structure, taking the current fare mechanism as a baseline. This analysis will involve the following stages.

1. Calculate the changes in cost for existing users resulting from each scenario.
2. Estimate the price and frequency elasticities of demand (i.e. the % change in demand resulting from the % change in price or frequency) for each user group and calculate the change in traffic that would result from altering the current mechanism
3. Separate the change in traffic into each main user group – local residents, businesses and visitors
4. Estimate the resulting change in expenditure for each user group
5. Estimate resulting changes in annual output and employment in the Western Isles by applying appropriate multipliers to changes in expenditure
6. Estimate the impact on business efficiency, i.e. change in exports and imports

A summary of the model of the short-term impacts is shown in Figure 7.1.1.

Figure 7.1.1: Overview of Economic Model (Decrease in Fares)



7.2 The Current Situation

The economic impacts of each fare mechanism scenario are described below. The 2003 traffic figures have been taken as a baseline. Passenger statistics provided by CalMac do not distinguish between foot passengers and vehicle passengers, therefore we have estimated foot passengers by assuming an average of 2.2 occupants per car[3], 1 per CV, and 30 per coach[4].

Figure 7.2.1 Baseline Traffic, 2003

	Passengers (pax)	Foot Pax	Cars	Coach	CVs
Barra/Eriskay	27,235	1,520	9,885	50	491
Berneray/Leverburgh	48,045	4,065	16,630	82	1,608
Uig/Lochmaddy	68,096	5,849	22,359	146	4,205
Uig/Tarbert	65,628	10,274	20,180	207	712
Ullapool/Stornoway	179,874	50,391	43,795	419	11,805
Oban/Castlebay/L'boisdale	44,665	10,989	12,268	97	1,323
Total	433,543	83,088	125,117	1001	20,144

7.3 Existing Users

The savings made by existing users will have a positive impact on the Western Isles economy, as a proportion of money saved on ferry fares will be spent elsewhere within the Isles. Savings by existing users have been estimated by calculating the change in fare under each scenario, and scaling this up to current (2003) traffic levels. In calculating savings, we have assumed no multi-journey discounts. Table 7.3.1 below, provides our estimates of savings made by existing users under each scenario.

Figure 7.3.1 Savings made by existing users

	Current Expenditure	**Scenario Expenditure**	**Saving Over Current**
Current CFARES	£11,922,976	£11,922,976	£0
RET	£11,922,976	£4,334,075	£7,588,901
TTT	£11,922,976	£11,063,842	£859,134
TTT reduced by 30%	£11,922,976	£5,760,078	£6,162,898
TTT Alt Mechanism	£11,922,976	£9,938,862	£1,984,114
TTT Alt Mechanism reduced by 30%	£11,922,976	£6,070,792	£5,852,184

Calculating the impact of this increase in expenditure requires a breakdown of existing users. Based on the 2003 CalMac traffic figures it is assumed that existing users consist of:

- 57% tourists;
- 39% local residents and businesses;
- 4% business visitors.

[3] Estimated after discussions with CalMac
[4] Based on study of Mull traffic (Jackson and Lynch, 1994)

For the purposes of this study we have combined expenditure of tourists and business visitors under the category 'visitors'. This distinction between local residents and visitors is important in calculating the economic impact of ferry fare changes, primarily because only a small proportion of fare revenue saved by visitors will be actually spent in the Western Isles, whereas a much larger proportion of fare savings by residents will be spent there. For the purposes of this study, we have assumed 5% of savings by existing visitors and 80% of savings by existing residents would be spent in the local economy.

7.4 New User Numbers

A reduction in ferry prices under any of the scenarios will also result in new users and therefore new ferry traffic. New users will be either local residents or visitors.

To estimate the overall increase in traffic, the price (the change in demand due to change in ferry fare price) and frequency (the change in demand due to change in service frequency) elasticity calculations from Chapter 6 have been used. These changes will only occur in the Medium (say 5 years) and longer (say 10 years) terms assuming other things, including competition from air, remain the same. The estimates are shown in Table 6.5.1 above. The frequency elasticities of demand are shown in Figure 6.5.2 above. Frequency elasticity was only applied to passengers and cars to reflect the source data.

The following tables show the estimated increase in ferry use, by route, for each of the scenarios.

Figure 7.4.2 Long Term Increase in Traffic Under RET

	Pax	Cars	Coach	CVs
Barra/Eriskay	25,195	6,053	24	232
Berneray/Leverburgh	35,701	9,683	38	747
Uig/Lochmaddy	23,287	12,562	54	1,566
Uig/Tarbert	22,894	11,585	78	267
Ullapool/Stornoway	54,935	22,393	142	4,011
Oban/Castlebay/L'boisdale	22,819	2,331	26	352
Total	184,831	64,606	362	7,175

Figure 7.4.3 Long Term Increase in Traffic Under TTT

	Pax	Cars	Coach	CVs
Barra/Eriskay	16,519	1,612	13	130
Berneray/Leverburgh	13,305	2,596	21	412
Uig/Lochmaddy	2,657	488	-1	-29
Uig/Tarbert	1,757	0	-4	-12
Ullapool/Stornoway	10,216	3,405	-14	-382
Oban/Castlebay/L'boisdale	15,224	-1,269	-2	-21
All routes	59,678	6,831	15	98

Figure 7.4.4 Long Term Increase in Traffic Under TTT Reduced 30%

	Pax	Cars	Coach	CVs
Barra/Eriskay	22,580	4,714	14	140
Berneray/Leverburgh	29,936	7,859	29	572
Uig/Lochmaddy	19,536	10,366	29	849
Uig/Tarbert	18,326	9,081	40	139
Ullapool/Stornoway	51,082	20,755	73	2,043
Oban/Castlebay/L'boisdale	29,353	5,434	13	183
All routes	170,812	58,209	199	3,926

Figure 7.4.5 Long Term Increase in Traffic Under TTT Alternative Mechanism

	Pax	Cars	Coach	CVs
Eriskay - Barra	32,616	7,454	28	275
Leverburgh - Berneray	41,701	12,425	45	888
Glendale - Lochmaddy	157,480	54,964	272	6,374
Uig - Tarbert	52,390	14,933	92	199
Stornoway - Aultbea	27,110	8,347	13	229
Lochboisdale - Mallaig	42,414	11,294	0	0
Oban - Barra/L'boisdale	6,009	-3,328	-97	-1,323
All routes	359,720	106,089	353	6,641

Figure 7.4.6 Long Term Increase in Traffic Under TTT Alternative Mechanism Reduced 30%

	Pax	Cars	Coach	CVs
Eriskay - Barra	38,677	10,557	38	374
Leverburgh - Berneray	58,332	17,688	54	1,064
Glendale - Lochmaddy	169,045	61,733	293	6,974
Uig - Tarbert	68,657	23,849	135	348
Stornoway - Aultbea	68,513	25,942	101	2,686
Lochboisdale - Mallaig	51,321	15,359	0	0
Oban - Barra/L'boisdale	20,138	3,375	-97	-1,323
All routes	474,683	158,501	524	10,122

In terms of pure expenditure, an increase in ferry use by local residents will remove money from the economy, due to both increased spending on ferry fares and goods and services purchased while outside the Western Isles. In contrast, an increase in visitor traffic will lead to increased local expenditure.

We have estimated the amount of new local resident traffic by applying the estimated percentage of current local resident traffic to the overall increase. New visitor traffic has been estimated by applying the estimated percentage of current visitor traffic to the overall increase in ferry users. To separate new users into local and visiting, we have made the following assumptions:

- The proportion of visitor traffic is the difference between summer and winter foot passenger, cars and coach traffic on each route.[5]
- Tourist traffic will be the same proportion of the increased traffic
- The remaining increase in car an passenger traffic will be local residents
- CV traffic is 50% local and 50% non local all year round.

Using these assumptions, the percentage annual visitor traffic is given below. The percentage local traffic will be the remainder of this, for example the percentage local passengers on Ullapool/Stornoway will be 100% - 43.7% = 56.3%

Figure 7.4.7 Percentage Annual Visitor Traffic by Route (All Scenarios)

	Pax	*Cars*	*Coach*	*CVs*
Barra/Eriskay	76.3%	66.3%	100.0%	50%
Berneray/Leverburgh	63.0%	49.3%	95.1%	50%
Uig/Lochmaddy	56.6%	52.8%	67.1%	50%
Uig/Tarbert	84.5%	80.0%	100.0%	50%
Ullapool/Stornoway	43.7%	37.9%	67.5%	50%
Lochboisdale/Mallaig	53.5%	46.8%	74.8%	50.0%
Oban/Castlebay/L'boisdale	60.2%	49.9%	89.7%	50%

7.5 New User Expenditure

The estimated expenditure of the *new visiting* ferry users has been calculated using figures from the Western Isles Visitor Survey (1999)[6], which gives average spend per person per trip in the Western Isles as £203. This includes visitors on holiday, visiting friends and relatives (VFR) and business visitors. This figure has been used to calculate expenditure for all users, except non-resident CV drivers, where we have assumed an average spend of £47, as this group of users will stay for shorter periods. This was multiplied by the estimated number of new visitors on routes to/from the mainland.

The estimated expenditure of *new local* ferry users, which will have a negative impact, has been estimated by multiplying the traffic increase for passengers and for each vehicle type by the relevant fare for this.

The expenditure figures along with the resulting impacts are shown in the following section and summarised in Figure 7.6.1

7.6 Calculation of Output and Employment

The process used to calculate the impact can be summarised as follows:

1. The change in expenditure for new and existing users as detailed above was taken

[5] There will be some winter tourists, but also in the summer an increase in local resident traffic. Therefore we regard this as a sensible approximation.

[6] Macpherson research (1999)

2. From this the amount entering the Western Isles economy was estimated
3. Appropriate multipliers were applied to give gross output change
4. The gross output change resulting from increased business efficiency was estimated (see below)
5. Appropriate employment multipliers were applied to gross output to calculate change in employment.

Expenditure Entering the Western Isles Economy

Only a proportion of money spent by local residents and visitors will remain in the Western Isles economy. Much of this will be spent on imported goods and services and taxation. It is only this remaining expenditure that will be retained in the economy and be subject to multiplier effects. Drawing on existing data for the Western Isles[7], we have made the following assumptions regarding expenditure.

- 48% of resident expenditure will remain in the local economy
- 71% of visitor expenditure will remain in the local economy

Gross Output Change from Additional Expenditure

Gross output measures the change in output of local businesses resulting from changes in ferry fares and services. Essentially, it measures the size of the Western Isles economy. This can be due to increased expenditure by locals or visitors, or increased profits earned by businesses as a result of increased competitiveness driven by lower import/export costs and more reliable connections. In calculating the gross output change resulting from increased expenditure, the following assumptions were made[8].

- The multiplier for local resident spending is 1.24
- The multiplier for visitor spending is 1.49.

Applying the above multipliers to estimated changes in expenditure gives estimated change in gross output. These figures are summarised in Figure 7.6.1 for existing and additional local residents and visitors. Taking an example, under RET:

Expenditure entering WI from existing local residents and businesses = £1,136,514
Gross output change = £1,136,514 x 1.24 = £1,409,277

Business Competitiveness

In addition to extra spending by local residents and visitors, there will be increased competitiveness among Western Isles based businesses due to lower import prices and/or reduced cost of exporting goods and more frequent and reliable connections with markets and suppliers. The resulting increased business activity among export sector businesses will lead to increased output and employment in these sectors. There may also be a potential increase in the number of firms, although this is likely to be relatively small and is excluded from further analysis. A detailed breakdown of the methodology used is given in Annex 7.6, however, in summary increase in output was calculated in the following way.

[7] CnES (1999) Western Isles Regional Accounts
[8] Adapted from CnES (1999) Western Isles Regional Accounts. See Annex 7.5

- Six key exporting industries were selected: Agriculture; Sea fishing; Fish farming; Textiles; Fish processing, wholesaling, etc.; and Other manufacturing.
- The baseline output in the Western Isles for each of the above sectors was taken.
- Estimates for ferry price final demand multipliers[9] were multiplied by the weighted average ferry fare change in each scenario to calculate the percentage change in output for each sector.
- This was applied to total output to reveal estimated change in output for each of the key exporting sectors.
- The resulting total was between £3.4m and £14m per annum, depending on the scenario.

It should be noted that although the employment and output figures for business competitiveness are high, they are based on scaled down SOID figures (SOID, 1993), which themselves were designed to capture primarily the effect of lower import prices. Also this sectoral analysis includes only key exporting industries, excluding tourist related sectors. We do not therefore believe that these figures are unrealistic, although they are dated.

Employment Change

To calculate the resulting changes in employment, employment coefficients from the 1997 Western Isles Regional Accounts (CnES, 1999) were applied. These show the number of FTE jobs required for each £1000 of output. The values taken were 0.03 for output resulting from domestic expenditure, and 0.03 for output resulting from changes in visitor expenditure, to reflect the balance of sectors likely to experience changes in output. Full details are provided in Annex 7.5. This, of course, assumes that the coefficients are accurate and have not significantly changed since 1999. Figure 7.6.1 below shows the estimates for increased employment. Taking an example, under RET:

Gross output change from local residents and businesses = £1,409,277
Employment created = (£1,409,277 x 0.03) / 1000 = 42 FTE jobs

Tax Receipts

The extra employment generated will result in increased income tax receipts for the exchequer, Data from the Annual Survey of Hours and Earnings published by National Statistics show the average earnings for all employees (full and part time) in the Western Isles as £19,272. This can be used to calculate tax receipts resulting from additional employment created in each of the scenarios. The method is summarized as follows.

Tax revenue for the first £2,090 of income at 10%	=	£209
Tax revenue for remaining £17,182 of income at 22%	=	£3,780
Total income tax revenue per FTE created	=	£3,989

The resulting revenue figures are shown in Section 7.7.

[9] Using estimates from SOID (1993). See Appendix 7.6 for full details.

Overall Economic Impact: Output and Employment

A summary of the estimated expenditure and resulting impact under each scenario is given in Figure 7.6.1 below. This shows the estimated additional expenditure entering the Western Isles economy and the resulting increases in output and employment.

Figure 7.6.1 Overall Economic Impact

RET:	**Change in exp**	**After leakages, VAT, receipts**	**Multiplier**	**Gross output change**	**Employment Coefficient**	**Employment change**
Amount entering WI economy by existing local residents & business	£2,367,737	£1,136,514	1.24	£1,409,277	0.03	42
Amount entering WI economy by existing visitors	£231,461	£164,338	1.49	£244,863	0.03	7
Amount entering WI through local residents	-£1,607,953	-£771,817	1.24	-£957,054	0.03	-29
Amount entering WI economy through visitors	£14,270,427	£10,132,003	1.49	£15,096,685	0.03	453
Amount entering WI economy through increased competitiveness				£14,002,974	0.03	420
Total	**£15,261,673**			**£29,796,745**		**894**
TTT Current						
Amount entering WI economy by existing local residents & business	£268,050	£128,664	1.24	£159,543	0.03	5
Amount entering WI economy by existing visitors	£26,204	£18,605	1.49	£27,721	0.03	1
Amount entering WI through local residents	-£224,180	-£107,606	1.24	-£133,432	0.03	-4
Amount entering WI economy through visitors	£3,375,059	£2,396,292	1.49	£3,570,475	0.03	107
Amount entering WI economy through increased competitiveness				£3,463,333	0.03	104
Total	**£3,445,132**			**£7,087,639**		**213**
TTT Current -30%						
Amount entering WI economy by existing local residents & business	£1,922,824	£922,956	1.24	£1,144,465	0.03	34
Amount entering WI economy by existing visitors	£187,968	£133,458	1.49	£198,852	0.03	6
Amount entering WI through local residents	-£1,490,339	-£715,363	1.24	-£887,050	0.03	-27
Amount entering WI economy through visitors	£13,512,240	£9,593,691	1.49	£14,294,599	0.03	429
Amount entering WI economy through increased competitiveness				£7,607,558	0.03	228
Total	**£14,132,694**			**£22,358,424**		**671**
TTT Alt. Scenario B						
Amount entering WI economy by existing local residents & business	£619,043	£297,141	1.24	£368,455	0.03	11
Amount entering WI economy by existing visitors	£60,515	£42,966	1.49	£64,019	0.03	2
Amount entering WI through local residents	-£2,921,462	-£1,402,302	1.24	-£1,738,854	0.03	-52
Amount entering WI economy by tourists	£34,845,127	£24,740,040	1.49	£36,862,660	0.03	1,106
Amount entering WI economy through increased competitiveness				£5,782,815	0.03	173
Total	**£32,603,224**			**£41,339,095**		**1,240**
TTT Scenario B -30%						
Amount entering WI economy by existing local residents & business	£1,825,881	£876,423	1.24	£1,086,765	0.03	33
Amount entering WI economy by existing visitors	£178,492	£126,729	1.49	£188,826	0.03	6
Amount entering WI through local residents	-£3,228,364	-£1,549,615	1.24	-£1,921,523	0.03	-58
Amount entering WI economy by tourists	£45,335,192	£32,187,986	1.49	£47,960,099	0.03	1,439
Amount entering WI economy through increased competitiveness				£13,250,736	0.03	398
Total	**£44,111,200**			**£60,564,903**		**1,817**

7.7 Summarised Findings – Economic Impact

The scenarios selected to compare with the current situation were:

1. RET under current conditions
2. TTT under current conditions
3. Reduced TTT under current conditions
4. TTT under our illustrative alternative operating conditions
5. Reduced TTT under our illustrative alternative operating conditions

Each of the five selected scenarios resulted in differing levels of increased local resident and visitor expenditure, and increased business competitiveness. The overall effect of these mechanism scenarios on change to Western Isles gross economic output are as follows:

- RET, increase in gross output by £29.8m
- TTT under current conditions, increase in gross output by £7.0m
- Reduced TTT under current conditions, increase in gross output by £22.4m
- TTT under alternative operating conditions, increase in gross output by £41.3m
- Reduced TTT under alternative operating conditions, increase in gross output by £60.6m

The Western Isles Regional Accounts (CnES, 2005) eastimate Gross Regional Domestic product (GRDP) for the Western Isles at around £263m. The increase in output estimated from the proposed changes in ferry fares and operating conditions therefore equate to between 3% and 23% of Western Isles GRDP.

The increase in gross output will generate extra employment as local businesses increase production of goods and services. The above fares mechanism scenarios generate the following resulting employment effects:

- RET, total employment rises by 894
- TTT under current conditions, total employment rises by 213
- Reduced TTT under current conditions, total employment rises by 671
- TTT under alternative operating conditions, total employment rises by 1,240
- Reduced TTT under alternative operating conditions, total employment rises by 1,817

In terms of tax receipts, this translates into additional annual income tax revenue of:

- £3.57m under RET;
- £850k under TTT;
- £2.68m under TTT (reduced);
- £4.95m under TTT alternative operating conditions;
- £7.25m under TTT (reduced) alternative operating conditions.

Thus the increased taxation revenue to the public purse alone would more than cover the costs of introducing the alternative operating conditions scenarios including their annualised capital costs.

The impact of RET is substantial, but requires high levels of subsidy to maintain. TTT requires less subsidy but has a very limited economic impact. Reduced TTT has a moderate economic impact with less subsidy than RET. However, the largest economic impacts would be obtained by introducing alternative operating conditions.

It should be stressed that the impact of the kinds of changes in ferry fares mechanisms and alternative operating scenarios would not be immediate. It would take time for the economy to adjust, e.g. in terms of building tourism infrastructure. It is estimated that full achievement of the impacts indicated above would take around ten years.

8 Conclusions

8.1 History

- Western Isles ferry fares came down in real terms over the first half of the 20th century. From 1960-2004 car fares fell in real terms while passenger fares increased slightly.
- Traffic growth on Western Isles routes is relatively stagnant (CVs declining over the last 15 years)
- Subsidies are high and rising
- The short "Sounds" crossings are a success and generated new traffic
- Population is falling

8.2 Current Situation

- Route frequencies are low and some timetables inconveniently vary from day to day
- On most routes passenger loadings are low
- Crewing levels and costs seem higher than necessary for passenger volumes carried
- Vessel utilisation is less than optimum
- Fares are inconsistently applied and seem high due to high operating costs
- Local residents and businesses see fares as a serious economic constraint

8.3 Route Comparisons (World Wide)

Some fifty routes were compared world wide and distinction between subsidised ferry operations and those operating commercially to maximise profit was noted. Main findings were:

- There is a distinction to be made between subsidised ferry operations and those operating commercially to maximise profit
- WI passenger fares are around the middle of the comparative range but a high compared with other subsidised routes
- WI car rates are relatively high compared with all routes and significantly higher than other subsidised routes
- WI CV charges are about three times higher than the general trend for other subsidised routes
- Subsidised, ferries world wide normally run on the shortest practicable crossings, cheaply, frequently and from early morning till late evening

8.4 Alternative Fares Mechanisms (Present Operating Conditions)

Taking current CalMac operating patterns (routes, schedules, vessels) we examined a wide of options and permutations. The key points are:

- CalMac's CFARES are inconsistent and the “Sounds” unfairly penalised
- A pilot scheme suggested how commercial vehicle fares may be reduced on the “Sounds” crossings

- A Purely Commercial approach would raise all fares very substantially, would reduced traffic and necessitate frequency reductions but would eliminate subsidy
- Under RET all fares would be reduced, mostly very substantially, traffic would also increase substantially requiring capacity increase and subsidy would be increased significantly
- Under a distance related (length based) (revenue/subsidy neutral) tariff CVs would be cheap, but passengers and cars would be expensive on long routes
- A Tailored Tapered Tariff (TTT) can be adjusted to match subsidy available, is fair on long routes, and can be calibrated to approximate to most current fares with "Sounds" fares much reduced, however traffic growth is limited.
- If revenue neutrality were relaxed, a Reduced TTT would reduce fares and increase traffic but with some increased subsidy requirement
- Under present operating conditions, however, the scope for reducing fares is limited unless subsidy is increased

8.5 Alternative Operating Patterns

In view of the last above comment, we have set out an illustrative alternative operating scenario featuring the TTT fares mechanism combined with:

- shorter routes;
- new capital investment;
- different vessel types, utilisation and operating practices.
- shore based crews (all Western Isles based)

The main changes in the pattern of routes used to illustrate the above principles were:

- Replacing Stornoway – Ullapool (two vessels) with Stornoway – Aultbea (one vessel) offering an increase to four return crossings per day
- Splitting the current (one vessel) Uig – Tarbert and Lochmaddy service to provide separate vessels each on Uig – Tarbert and a new short Glendale (Loch Pooltiel) – Lochmaddy service with much increased frequency and an upgraded road link to Glendale thereby creating a "short sea bridge" to the Western Isles
- Replacing the current Oban – Castlebay – Lochboisdale service with a fast Mallaig – Lochboisdale – Castlebay – Oban "dog leg" service giving increased frequency
- Increasing the operating hours and frequency on the Sounds of Harris and Barra services

This alternative scenario leads to beneficial effects on fares and traffic generation. The key findings are:

- Many fares and charges are reduced
- Very significant traffic growth is stimulated
- Increased revenue is generated
- Overall subsidy requirements are reduced under TTT, including annualised costs of new capital investment
- With TTT reduced by approx 30%, traffic would increase further but with some increase in subsidy

Such a radical improvement in ferry services would bring significant economic benefits to the Western Isles. These are detailed below.

8.6 Economic Impacts

A comparison is made between the economic impact of the present fares regime and ferry services, and the impact of the following scenarios

1. RET under current conditions
2. TTT under current conditions
3. Reduced TTT under current conditions
4. TTT under our illustrative alternative operating conditions
5. Reduced TTT under our illustrative alternative operating conditions

Each scenario will result in differing levels of increased local resident and visitor expenditure, and increased business competitiveness. The overall effect of these mechanism scenarios on change to Western Isles gross economic output are as follows:

- RET, increase in gross output by £29.8m
- TTT under current conditions, increase in gross output by £7.0m
- Reduced TTT under current conditions, increase in gross output by £22.4m
- TTT under alternative operating conditions, increase in gross output by £41.3m
- Reduced TTT under alternative operating conditions, increase in gross output by £60.6m

The increase in gross output will generate extra employment as local businesses increase production of goods and services. The above fares mechanism scenarios generate the following resulting employment effects:

- RET, total employment rises by 894
- TTT under current conditions, total employment rises by 213
- Reduced TTT under current conditions, total employment rises by 671
- TTT under alternative operating conditions, total employment rises by 1,240
- Reduced TTT under alternative operating conditions, total employment rises by 1,817

In terms of tax receipts, this translates into additional annual income tax revenue of:

- £3.57m under RET;
- £850k under TTT;
- £2.68m under TTT (reduced);
- £4.95m under TTT alternative operating conditions;
- £7.25m under TTT (reduced) alternative operating conditions.

8.7 Overall Conclusions

From the findings above, we can draw a number of conclusions regarding current fare mechanisms and our recommended alternatives.

The current fares regime and operating pattern appears to be inconsistently applied, is expensive, especially on the "Sounds" crossings, is not contributing to economic growth and may be encouraging decline. It is our opinion that alternatives must be considered.

There are a number of alternatives fare mechanisms possible under the present operating conditions but it is difficult to effect radical change if subsidy/revenue neutrality is a requirement. Alternative mechanisms such as RET would have a positive economic impact, but would require a large increase in subsidy. A Tailored Taper Tariff (TTT) is a fair and consistent mechanism that can be calibrated to apply to any operating regime and any subsidy/revenue requirement. However, applied in a revenue neutral format, the impact of TTT is limited. A more significant economic impact could be achieved through a reduced fare TTT of around 30%. This would require an increased subsidy, but less than RET, and may be a good compromise.

8.8 Recommendations

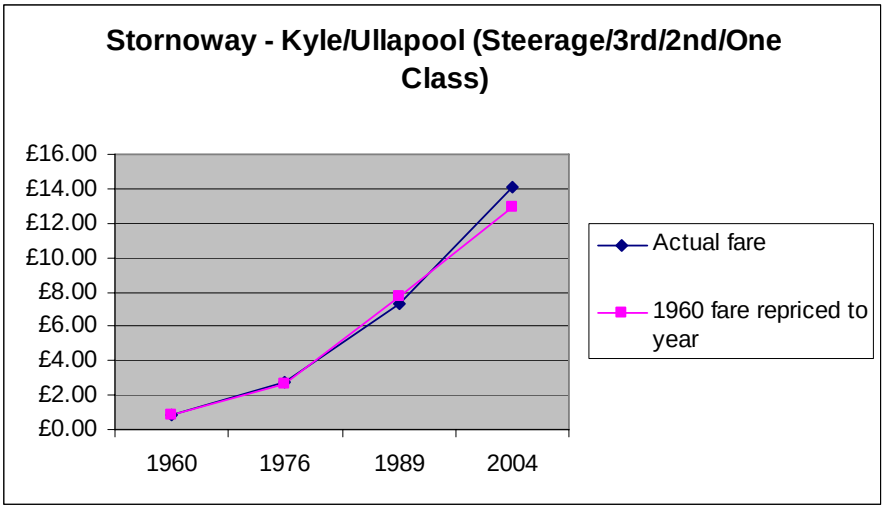
However the best long term solution lies in introducing alternative operating conditions. Combining TTT with shorter routes, different vessel types and utilization with shore-based crews, is likely to result in significant economic benefit, e.g. through increased tourism, cheaper imports of materials and export of products and services and resulting stabilization of population and social improvements over a ten year period.

We recommend that in the interest of turning round the Western Isles economy, Comhairle nan Eilean Siar use this report to negotiate the following changes to the provision of Western Isles ferry services with the Scottish Executive:

1. Develop an equitable "Tailored Taper Tariff" (TTT) fares mechanism for Western Isles ferry services and make its implementation a requirement of future tenders for operators providing these services
2. Mount a pilot scheme immediately to reduce commercial vehicle charges on the Sounds of Harris and Barra services
3. In the light of that experience, and by re-calibrating the TTT mechanism, apply a reduced scale of charges for all services
4. Signal and explain the need for a radical change to the way in which ferry services are operated, including the creation of a "short sea bridge", as illustrated in this report featuring specifically:
    a. Shore based crews (based in the Western Isles)
    b. Shorter routes with more frequent sailings and longer operating hours
    c. Different vessel types and utilisation
    d. Capital investment in road links and two new terminals
5. Undertake a detailed study of how such a radical change may be implemented

Annex 2.9 Historical Fares Trends

Years	*1907*	*1939*	*1960*	*1976*	*1989*	*2004*
Retail Price Index (1907 = 100)	*100*	*171*	*457*	*4,228*	*6,467*	*6,790*
Retail Price Index (1907 = 1)	*1.00*	*1.71*	*4.57*	*42.28*	*64.67*	*67.90*
Passengers (Cabin/1st/One Class)						
Oban - Castlebay	0.75	1.07	1.90	4.10	9.05	20.20
(Index linked to base 1907 = 100)	**100**	**58.6**	**55.4**	**12.9**	**18.7**	**39.7**
Stornoway - Kyle/Ullapool	0.60	1.20	1.51	2.75	7.30	14.05
(Index linked to base 1907 = 100)	**100**	**117.2**	**55.0**	**10.8**	**18.8**	**34.5**
Passengers (Steerage/3rd/2nd/One Class)						
Oban - Castlebay	0.25	0.62	1.10	4.10	9.05	20.20
(Index linked to base 1907 = 100)	**100**	**145.3**	**96.2**	**38.8**	**56.0**	**119.0**
Stornoway - Kyle/Ullapool	0.30	0.65	0.84	2.75	7.30	14.05
(Index linked to base 1907 = 100)	**100**	**127.0**	**61.2**	**21.7**	**37.6**	**69.0**
Cars (up to 1 ton or 4 meters)						
Retail Price Index (1960 = 100)			*100*	*289*	*442*	*462*
Retail Price Index (1960 = 1)			*1*	*2.89*	*4.42*	*4.62*
Oban - Castlebay/Lochboisdale			8.69	19.29	41.00	74.00
(Index linked to base 1960 = 100)			**100**	**76.8**	**106.7**	**184.3**
Stornoway - Kyle/Ullapool			8.69	18.41	33.20	69.00
(Index linked to base 1960 = 100)			**100**	**73.3**	**86.4**	**171.9**



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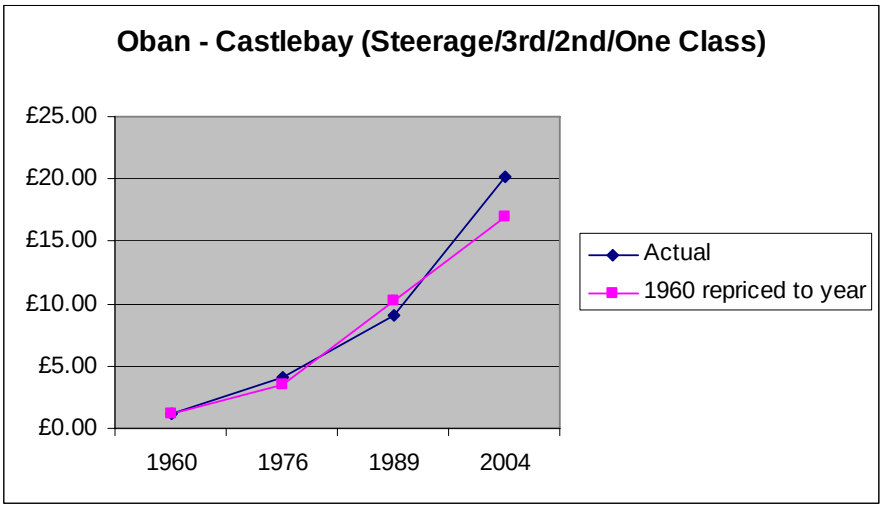
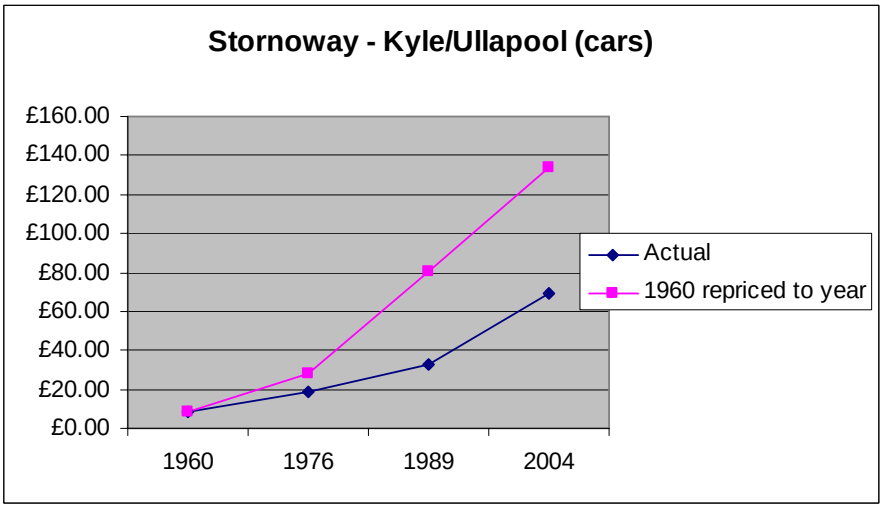
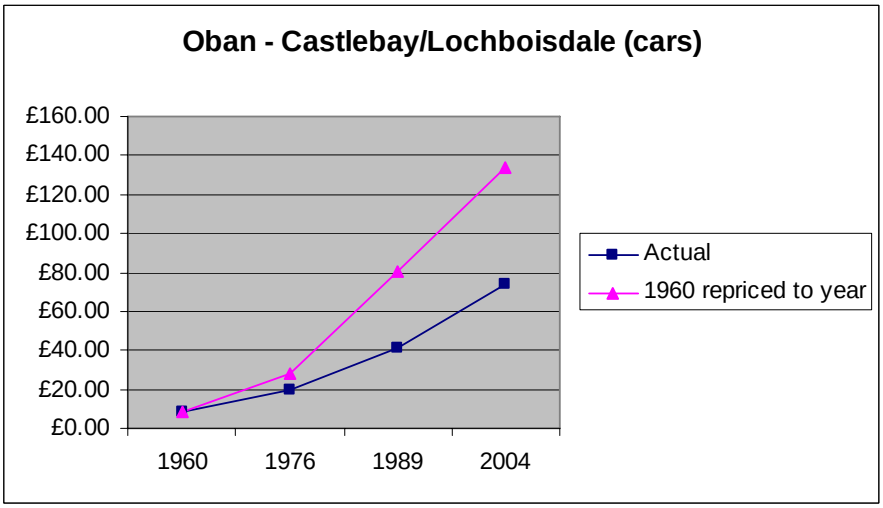

Oban - Castlebay (Steerage/3rd/2nd/One Class)
£25.00
£20.00
£15.00
£10.00
£5.00
£0.00
1960
1976
1989
2004
Actual
1960 repriced to year


Stornoway - Kyle/Ullapool (cars)
£160.00
£140.00
£120.00
£100.00
£80.00
£60.00
£40.00
£20.00
£0.00
1960
1976
1989
2004
Actual
1960 repriced to year


Oban - Castlebay/Lochboisdale (cars)
£160.00
£140.00
£120.00
£100.00
£80.00
£60.00
£40.00
£20.00
£0.00
1960
1976
1989
2004
Actual
1960 repriced to year

Annex 3.2 Oban – Castlebay and Lochboisdale Rosters

Summer

Vessel 1		*Vessel 2*	
MONDAY			
Lochboisdale dep	07:30		
Castlebay arr	09:00		
Castlebay dep	09:20		
Oban arr	14:10		
Oban dep	15:10		
Castlebay arr	20:00		
TUESDAY			
Castlebay dep	09:20		
Oban arr	14:10		
Oban dep	15:30		
Lochboisdale arr	20:30		
Castlebay arr	22:10		
WEDNESDAY			
Castlebay dep	07:30		
Lochboisdale arr	09:00		
Lochboisdale dep	09:20	*Ex Coll & Tiree Oban arr*	*13:05*
Oban arr	14:20	Oban dep	13:30
Thence to Colonsay & Pt Askaig		Castlebay arr	18:20
Oban dep	*15:00*	Castlebay dep	18:40
Oban return	*22:15*	Oban arr	23:30
THURSDAY			
Ex Colonsay & Pt Askaig		Oban dep	09:00
Oban arr	*14:30*	Tiree arr	12:15
Oban dep	15:10	Tiree dep	12:35
Lochboisdale arr	20:10	Castlebay arr	15:20
		Castlebay dep	15:40
		Tiree arr	18:25
		Tiree dep	18:45
		Oban arr	22:00
FRIDAY			
Lochboisdale dep	07:30	*To Coll & Tiree Oban dep*	*06:00*
Oban arr	14:20	*From Coll & Tiree Oban arr*	*13:05*
Thence to Colonsay Oban dep	*17:00*	Oban dep	13:30
Oban return	*21:45*	Castlebay arr	18:20
		Castlebay dep	18:40
		Oban arr	23:30
SATURDAY			
Oban arr from Tiree	*14:40*	Oban dep	09:00
Oban dep	15:10	Lochboisdale arr	14:00
Castlebay arr	20:00	Lochboisdale dep	14:30
		Oban arr	19:30
SUNDAY			
Castlebay dep	09:20		
Oban arr	14:10		
Oban dep	15:10		
Castlebay arr	20:00		
Castlebay dep	20:10		
Lochboisdale arr	21:40		

Number of Single Journey Sailings per Summer Week

Day	*OB/CY*	*OB/L B'dale*	*CY/L B'dale*	*Total Runs*
Monday	2	1	1	2
Tuesday	2	1	1	2
Wednesday	3	1	1	3
Thursday	2	1		3
Friday	2	1		3
Saturday	1	2		3
Sunday	2	1	1	2

Winter

MONDAY	
Lochboisdale dep	07:30
Castlebay arr	09:20
Castlebay dep	09:35
Oban arr	14:10
TUESDAY	
Oban dep	15:30
Castlebay arr	20:50
Castlebay dep	21:05
Lochboisdale arr	22:55
WEDNESDAY	
Lochboisdale dep	07:30
Castlebay arr	09:20
Castlebay dep	09:35
Oban arr	14:55
THURSDAY	
Oban dep	15:30
Castlebay arr	20:50
Castlebay dep	21:05
Lochboisdale arr	22:55
FRIDAY	
Lochboisdale dep	08:00
Castlebay arr	09:50
Castlebay dep	10:05
Oban arr	15:25
SUNDAY	
Oban dep	15:00
Castlebay arr	20:20
Castlebay dep	20:35
Lochboisdale arr	22:25

Number of Single Journey Sailings per Winter Week

Day	*OB/CY/L B'dale*	*CY/L B'dale*	*Total Runs*
Monday	1	1	1
Tuesday	1	1	1
Wednesday	1	1	1
Thursday	1	1	1
Friday	1	1	1
Sunday	1	1	1

Annex 3.6 List of Key Consultees

Alan Graham	Orasay Inn Lochcarnan South Uist	Hotel and Restaurant
Angus MacMillan	West Minch Salmon South Uist	Fish Farming and Processors
Bill MacKay	Stolt Seafarms Scalpay (Harris)	Fish Processors
Calum MacAulay	Lochboisdale Hotel South Uist	Hotel
Donald Joseph MacLean	Barratlantic Fish Processors Barra	Fish processors Hauliers
Donald MacAulay	Western Isles Enterprise Stornoway	Local Enterprise Company
Duncan MacPherson	Harris Development Ltd	Economic Development Agency
Finlay MacRae	Logistics Manager Stolt Seafarms Scalpay (Harris)	Fish processors
George MacLeod	Castlebay Hotel Barra	Hotel
Gerry MacLeod	Lochboisdale Community Trust South Uist	Community agency
Gerry Porter	Hebridean Toffee Barra	Confectionery Manufacturers
Graham Pilson	Castlebay Co-op Barra	Retail
Hector MacDonald	Hebridean Haulage	Distribution
Henk Graauwmans	MacAskill Haulage	Distribution
Ian MacKinnon	Grillburger	Wholesalers and Food distribution
Isobel MacDonald	Western Isles Enterprise Benbecula	Local Enterprise Company
Jimmy MacDonald	JA MacDonald South Uist	Hauliers & Builders

Joan MacCormick	Visit Hebridies Board South Uist	Tourist promotion agency
Joan Robertson	Arts Education Officer and Community Leader Taigh Chearsabhagh	Community facility
Malcolm Campbell	Polybox	Plastic packaging manufacturers
Morag Nicholson	Visit Hebrides North Uist Community Council Fishing community representative	Tourist agency and community group
	D R MacLeod Haulage	Distribution
Mrs Bell	Lochmaddy Hotel North Uist	Hotel
Ronald MacLennen	MacLennan Stores Benbecula	Retail
Sarah Morrison	Harris Hotel, Tarbert	Hotel
Stephanie Neugebauer	Taigh Chearsabhagh Museum & Arts Centre Lochmaddy North Uist	Tourist attraction and community facility
Yvonne MacDonald	Finance Director Stolt Seafarms Scalpay (Harris)	Fish processors

Annex 4.5 Ferry Route Comparisons: Charges

Key: C = Commercial, S = Subsidised, W = Western Isles

Route	*State*	*Operator*	*Type*	*Dist (km)*	*Charge (£) Pax*	*Cars*	*CVs/½km*
Belfast - Stranraer	SCO	Stena	*C*	73	16.00	84.00	7.42
Belle Île - Quiberon	F	SNNN	*C*	14	12.42	77.28	
Cape Jervis - Pennishaw	AUS	SLKI	*C*	18	12.93	27.88	4.85
Digby - St John	NS,CAN	BF	*C*	80	15.33	41.61	2.83
Douglas - Heysham	IOM	IOMSP	*C*	108	31.00	104.00	27.13
Douglas - Liverpool	IOM	IOMSP	*C*	131	31.00	104.00	
Dover - Calais	ENG	P&O	*C*	33	14.96	82.72	
East Cowes - Southampton	ENG	RF	*C*	23	6.00	32.00	5.40
Hunter's Quay - McInroy's Point	SCO	WF	*C*	4	3.10	8.70	2.66
Jersey - Guernsey	CI	CF	*C*	48	23.70	42.50	
Penzance - St Mary's	ENG	IST	*C*	70	39.00		
Portsmouth - Fishbourne	ENG	WL	*C*	10	5.70	45.30	
St Margaret's Hope - Gills Bay	SCO	PF	*C*	28	10.00	25.00	7.50
Victoria BC - Port Angeles WA	CAN/USA	BBT	*C*	34	4.42	19.32	
Wellington - Picton	NZ	IINZ	*C*	90	18.75	76.88	
Wood Island - Caribou	PEI,CAN	NF	*C*	26	5.48	16.21	2.22
Capri - Naples	I	CMAR	*S*	33	3.86	15.73	
Capri - Sorrento	I	CMAR	*S*	12	4.00	10.90	
Corran - Ardgour	SCO	HC	*S*	1	free	1.70	1.70
Earl's Cove - Saltery Bay	BC,CAN	BCF	*S*	18	1.86	6.57	1.17
Formia - Ponza	I	CMAR	*S*	62	7.45	18.08	
Harstad - Sørrollnes	N	TFDS	*S*	18	1.48	9.21	1.56
Hatteras - Ocrakoke	NC, USA	NCRD	*S*	9	free	0.00	0.00
Hollis - Ketchikan	AK, USA	IFA	*S*	66	16.56	39.19	2.45
Horseshoe Bay - Nanaimo	BC, CAN	BCF	*S*	56	4.49	11.28	2.50
Kennacraig - Pt Askaig/Pt Ellen	SCO	CM	*S*	50	7.75	56.00	6.94
Ketchikan - Wrangell	AK, USA	AMH	*S*	140	17.66	40.30	4.45
Klaksvik - Leirvik	FR	SSL	*S*	12	3.26	8.37	1.81
Kolby Kas - Kalundborg	DK	SL	*S*	40	7.25	21.30	1.92
Lopez - Anacortes	WA, USA	WSF	*S*	16	2.65	6.12	2.01
Molde - Vestnes	N	MRF	*S*	12	2.38	7.07	1.16
Ocrakoke - Cedar Island	NC, USA	NCRD	*S*	33	0.55	8.28	0.63
Otter Bay - Swartz Bay	BC,CAN	BCF	*S*	16	1.48	5.09	0.78
Port aux Basques - North Sydney	NF,CAN	MA	*S*	178	11.83	33.51	3.49
Powel River - Little River	BC,CAN	BCF	*S*	30	3.50	11.83	1.67
Prince Rupert - Skidegate	BC,CAN	BCF	*S*	172	10.62	39.20	4.91
Quadra Island - Cortes Island	BC,CAN	BCF	*S*	11	1.37	3.45	0.80
Rothesay - Wemyss Bay	SCO	CM	*S*	11	3.55	14.20	2.86
Saelvig/Kolby Kas - Hou	DK	SL	*S*	22	7.07	20.83	1.87
Sejero - Havnso	DK	FSVJ	*S*	24	6.23	16.09	3.12
Skopun - Gamlaraet	FR	SSL	*S*	20	3.26	8.37	1.81
Stromness - Scrabster	SCO	NLF	*S*	42	14.00	48.00	13.00
Symbister - Vidlin/Laxo	SCO	SIC	*S*	10	1.50	1.90	0.67
Toft - Ulsta	SCO	SIC	*S*	6	1.50	1.90	0.67
Torshavn - Drelnes	FR	SSL	*S*	58	6.98	12.09	4.42
Wrangell - Petersburg	AK, USA	AMH	*S*	70	14.90	28.15	2.99
Barra - Eriskay	SCO	CM	*W*	10	5.50	16.25	4.44
Berneray - Leverburgh	SCO	CM	*W*	18	5.20	23.70	6.37
Uig - Tarbert	SCO	CM	*W*	47	9.15	44.00	7.25
Uig - Lochmaddy	SCO	CM	*W*	48	9.15	44.00	7.25
Stornoway - Ullapool	SCO	CM	*W*	84	14.05	69.00	10.36
Loch Boisdale - Barra - Oban	SCO	CM	*W*	144	20.20	74.00	12.89

Annex 5.6 Distance Based Tariff Variants

Charges Based on Vehicle Length Alone

If length alone is the criterion, for fares applied to vehicles the charge "r" would be set at a fixed rate per meter for all types of vehicular traffic. Thus if a car was charged £10.00 per meter, a CV would also be charged £10.00 per meter. Assuming current revenue and subsidy the charges on this basis would be:

Vehicle Length Alone

	Dist	**Toll**	**Rate/km**	**5m Car**	**Pass** *at 1.25m*	**CV/half m** *at half 1r*
	km	*km*	£	£	£	£
	1	7	0.17	**6.80**	**1.70**	**0.68**
Eriskay - Barra	10	7	0.17	**14.45**	**3.61**	**1.45**
Leverburgh - Berneray	18	7	0.17	**21.25**	**5.31**	**2.13**
Uig - Tarbert	47	7	0.17	**45.90**	**11.48**	**4.59**
Uig - Lochmaddy	48	7	0.17	**46.75**	**11.69**	**4.68**
Stornoway - Ullapool	84	7	0.17	**77.35**	**19.34**	**7.74**
Oban - Barra/L'boisdale	144	7	0.17	**128.35**	**32.09**	**12.84**

It will be noted that when the charge is made by based on vehicle length and passage distance (plus toll element) the commercial vehicle rates and all fares on the "Sounds" routes work out at much less than current rates but car and passenger rates would tend to be more expensive on the longer routes and most notably so on the Oban – Barra and Lochboisdale route.

Charges Based on Area of Deck Space Occupied

If area is taken as the criterion for differentiation, a car (or light commercial) would occupy say 5 metres length by 2.5 metres width of deck space – an area of 12.5 sq meters metres. A large commercial vehicle would occupy say 16 by 3.5 metres giving an area of 56 sq meters. Translated into a lineal charge, an appropriate differential between the charge per metre for a car compared with a truck/coach, etc. would, therefore, be a ratio of 1:1.4. In other words if the charge for a car was £10.00 per meter, the charge for a CV would be £14.00 per meter. Assuming current revenue and subsidy the charges on this basis would be:

Area Based

	Dist	**Toll**	**Rate/km**	**5m Car**	**Pass** *at 1.25m*	**CV/half m** *at half 1.4r*
	km	*km*	£	£	£	£
	1	7	0.16	**6.40**	**1.60**	**0.90**
Eriskay - Barra	10	7	0.16	**13.60**	**3.40**	**1.90**
Leverburgh - Berneray	18	7	0.16	**20.00**	**5.00**	**2.80**
Uig - Tarbert	47	7	0.16	**43.20**	**10.80**	**6.05**
Uig - Lochmaddy	48	7	0.16	**44.00**	**11.00**	**6.16**
Stornoway - Ullapool	84	7	0.16	**72.80**	**18.20**	**10.19**
Oban - Barra/L'boisdale	144	7	0.16	**120.80**	**30.20**	**16.91**

The effect of this is to bring commercial vehicle, car and passenger charges more closely into line with current charges with the exceptions of the "Sounds" routes (much cheaper for all categories) and the Oban routes (more expensive).

Charges Based on Volume

If volume were taken as the criterion for differentiation, a car (or light commercial) takes up say 5 metres length by 2.5 metres width of deck space to a height of 2 metres, thus the volume "envelope" is 25 cubic metres. A large commercial vehicle would occupy say 16 by 3.5 by 4 metres giving an "envelope of 224 cubic meters. In this case the lineal charge differential between the charge per metre for a car compared with a truck/coach, etc. would, therefore, be a ratio of 1:2.8. Thus if the charge for a car was £10.00 per meter, the charge for a CV would be £28.00 per meter. Assuming current revenue and subsidy the charges on this basis would be:

Volume Based

	Dist	**Toll**	**Rate/km**	**5m Car**	**Pass** *at 1.25m*	**CV/half m** *at half 2.8r*
	km	*km*	£	£	£	£
	1	7	0.12	**4.80**	**1.20**	**1.34**
Eriskay - Barra	10	7	0.12	**10.20**	**2.55**	**2.86**
Leverburgh - Berneray	18	7	0.12	**15.00**	**3.75**	**4.20**
Uig - Tarbert	47	7	0.12	**32.40**	**8.10**	**9.07**
Uig - Lochmaddy	48	7	0.12	**33.00**	**8.25**	**9.24**
Stornoway - Ullapool	84	7	0.12	**54.60**	**13.65**	**15.29**
Oban - Barra/L'boisdale	144	7	0.12	**90.60**	**22.65**	**25.37**

Under this option CV rates are more expensive for all the longer routes (double in the case of the Oban routes), cars are cheaper (except for Oban) and passenger fares are cheaper on the short routes, around parity on the medium length routes and dearer on the long routes.

Annex 5.7 Tailored Taper Tariff

To get an initial approximate match to current charges, revenue and subsidy levels we have calibrated the tariff at a rate of 16 pence per kilometre of passage distance (plus a 7 km toll element) up to 70 km and then at 4.5 pence per kilometre thereafter. The effect is as follows:

Tailored Taper Tariff ***REVISED Jan 06***	**Dist** *km*	**New** *km*	**Toll** *km*	**Rate/km** £	**Taper** £	**1m**	**5m Car** £	**Pass** *at 1m* £	**CV/half m** *at half 1.6r* £
	1		7	0.16		1.28	**6.40**	**1.28**	**1.09**
Eriskay - Barra	10		7	0.16		2.72	**13.60**	**2.72**	**2.31**
Leverburgh - Berneray	18		7	0.16		4.00	**20.00**	**4.00**	**3.40**
Glendale - Lochmaddy	30		7	0.16		5.92	**29.60**	**5.92**	**5.03**
Uig - Tarbert	47		7	0.16		8.64	**43.20**	**8.64**	**7.34**
Uig - Lochmaddy	48		7	0.16		8.80	**44.00**	**8.80**	**7.48**
Stornoway - Aultbea	70		7	0.16		12.32	**61.60**	**12.32**	**10.47**
[Taper point]	71	1	7	0.16	0.045	12.37	**61.83**	**12.37**	**10.51**
Stornoway - Ullapool	84	13	7	0.16	0.045	12.91	**64.53**	**12.91**	**10.97**
L'boisdale - Mallaig	92	21	7	0.16	0.045	13.27	**66.33**	**13.27**	**11.28**
Oban - Barra/L'boisdale	144	73	7	0.16	0.045	15.61	**78.03**	**15.61**	**13.26**
Aberdeen - Lerwick	337	266	7	0.16	0.045	24.29	**121.45**	**24.29**	**20.65**

Variables (with values included above shown in parentheses) are:

- the toll element, (7 km)
- the rate per meter per kilometre, (15p)
- the taper rate, (5p per km)
- the point at which the taper is introduced (70 km)
- the ratio of passenger fare per kilometre to car rate (1 to 5)
- the ratio of CV charge per half meter per kilometre to car rate (half of 1 to 1.6)

Reduced TTT represents an approximately 30% reduction in charges in which key variables are adjusted (with values shown in parentheses) thus:

- the toll element, (7 km)
- the rate per meter per kilometre, (10p)
- the taper rate, (5p per km)
- the point at which the taper is introduced (70 km)

The effect is as follows:

Reduced TTT

	Dist	**Toll**	**Rate/km**	**Taper**	**5m Car**	**Pass**	**CV/half m**
						at 1m	*at half 1.6r*
	km	*km*	£	£	£	£	£
	1	7	0.10		**4.00**	**0.80**	**0.68**
Eriskay - Barra	10	7	0.10		**8.50**	**1.70**	**2.13**
Leverburgh - Berneray	18	7	0.10		**12.50**	**2.50**	**2.25**
Uig - Tarbert	47	7	0.10		**27.00**	**5.40**	**4.59**
Uig - Lochmaddy	48	7	0.10		**27.50**	**5.50**	**4.68**
Stornoway - Ullapool	84	7	0.10	0.05	**41.75**	**8.35**	**7.10**
Oban - Barra/L'boisdale	144	7	0.10	0.05	**56.75**	**11.35**	**9.65**

Annex 5.8 Impact of TTT on the Rest of Scotland

Table A: Original TTT Applied to Scottish Ferry Routes (Summer 2004 rates)

Tailored Taper Tariff	**Dist**	**New**	**Toll**	**Rate/km**	**Taper**	**1m**	**5m Car**	**Pass**	**CV/half m**	*Car*	*Pass*	*CV*
								at 1m	*at half 1.6r*	*Current (2004) rates*		
	km	*km*	*km*	*£*	*£*		*£*	*£*	*£*			
Colintraive - Rubodach	1		7	0.15		1.20	**6.00**	**1.20**	**1.02**	*7.15*	*1.15*	*0.98*
Largs - Cumbrae	2		7	0.15		1.35	**6.75**	**1.35**	**1.15**	*9.73*	*1.97*	*2.28*
Dunoon - McInroy's Pt	4		7	0.15		1.65	**8.25**	**1.65**	**1.40**	*8.70*	*3.10*	*2.66*
Gourock - Dunoon	7		7	0.15		2.10	**10.50**	**2.10**	**1.79**	*7.45*	*3.00*	*3.22*
Lochranza - Clonaig	8		7	0.15		2.25	**11.25**	**2.25**	**1.91**	*19.45*	*4.35*	*3.33*
Eriskay - Barra	10		7	0.15		2.55	**12.75**	**2.55**	**2.17**	*16.25*	*5.50*	*4.68*
Wemyss Bay - Rothesay	11		7	0.15		2.70	**13.50**	**2.70**	**2.30**	*14.20*	*3.55*	*2.86*
Lagg - Keills (Jura Overland)	11		7	0.15		2.70	**13.50**	**2.70**	**2.30**	*56.00*	*7.75*	*6.94*
Oban - Lismore	12		7	0.15		2.85	**14.25**	**2.85**	**2.42**	*22.10*	*2.65*	*3.77*
Gill's Bay - Burwick	13		7	0.15		3.00	**15.00**	**3.00**	**2.55**	*25.00*	*10.00*	*7.50*
Oban - Craignure	15		7	0.15		3.30	**16.50**	**3.30**	**2.81**	*34.50*	*3.85*	*4.91*
Leverburgh - Berneray	18		7	0.15		3.75	**18.75**	**3.75**	**3.19**	*23.70*	*5.20*	*6.37*
Ardrossan - Brodick	19		7	0.15		3.90	**19.50**	**3.90**	**3.32**	*35.00*	*4.80*	*4.68*
Glendale - Lochmaddy	30		7	0.15		5.55	**27.75**	**5.55**	**4.72**	*44.00*	*9.15*	*7.25*
Scrabster - Stromness	42		7	0.15		7.35	**36.75**	**7.35**	**6.25**	*38.00*	*12.00*	*8.55*
Uig - Tarbert	47		7	0.15		8.10	**40.50**	**8.10**	**6.89**	*44.00*	*9.15*	*7.25*
Uig - Lochmaddy	48		7	0.15		8.25	**41.25**	**8.25**	**7.01**	*44.00*	*9.15*	*7.25*
Kennacraig - Pt Ellen/Askaig	50		7	0.15		8.55	**42.75**	**8.55**	**7.27**	*56.00*	*7.75*	*6.94*
Stornoway - Aultbea	70		7	0.15		11.55	**57.75**	**11.55**	**9.82**	*69.00*	*14.05*	*10.36*
[Taper point]	71	1	7	0.15	0.05	11.60	**58.00**	**11.60**	**9.86**			
Stornoway - Ullapool	84	13	7	0.15	0.05	12.20	**61.00**	**12.20**	**10.37**	*69.00*	*14.05*	*10.36*
L'boisdale - Mallaig	92	21	7	0.15	0.05	12.60	**63.00**	**12.60**	**10.71**	*74.00*	*20.20*	*12.89*
Oban - Tiree	96	25	7	0.15	0.05	12.80	**64.00**	**12.80**	**10.88**	*72.00*	*12.30*	*9.63*
Oban - Barra/L'boisdale	144	73	7	0.15	0.05	15.20	**76.00**	**15.20**	**12.92**	*74.00*	*20.20*	*12.89*
Aberdeen - Lerwick	337	266	7	0.15	0.05	24.85	**124.25**	**24.85**	**21.12**			

Table B: Reduced TTT (by c30%) Applied to Scottish Ferry Routes (Summer 2004 rates)

	Dist	**New**	**Toll**	**Rate/km**	**Taper**	**1m**	**5m Car**	**Pass**	**CV/half m**	*Car*	*Pass*	*CV*
								at 1m	*at half 1.6r*	*Current (2004) rates*		
	km	*km*	*km*	*£*	*£*		*£*	*£*	*£*			
Colintraive - Rubodach	1		7	0.10		0.80	**4.00**	**0.80**	**0.68**	*7.15*	*1.15*	*0.98*
Largs - Cumbrae	2		7	0.10		0.90	**4.50**	**0.90**	**0.77**	*9.73*	*1.97*	*2.28*
Dunoon - McInroy's Pt	4		7	0.10		1.10	**5.50**	**1.10**	**0.94**	*8.70*	*3.10*	*2.66*
Gourock - Dunoon	7		7	0.10		1.40	**7.00**	**1.40**	**1.19**	*7.45*	*3.00*	*3.22*

Lochranza - Clonaig	8		7	0.10		1.50	**7.50**	**1.50**	**1.28**	*19.45*	*4.35*	*3.33*
Eriskay - Barra	10		7	0.10		1.70	**8.50**	**1.70**	**1.45**	*16.25*	*5.50*	*4.68*
Wemyss Bay - Rothesay	11		7	0.10		1.80	**9.00**	**1.80**	**1.53**	*14.20*	*3.55*	*2.86*
Lagg - Keills (Jura Overland)	11		7	0.10		1.80	**9.00**	**1.80**	**1.53**	*56.00*	*7.75*	*6.94*
Oban - Lismore	12		7	0.10		1.90	**9.50**	**1.90**	**1.62**	*22.10*	*2.65*	*3.77*
Gill's Bay - Burwick	13		7	0.10		2.00	**10.00**	**2.00**	**1.70**	*25.00*	*10.00*	*7.50*
Oban - Craignure	15		7	0.10		2.20	**11.00**	**2.20**	**1.87**	*34.50*	*3.85*	*4.91*
Leverburgh - Berneray	18		7	0.10		2.50	**12.50**	**2.50**	**2.13**	*23.70*	*5.20*	*6.37*
Ardrossan - Brodick	19		7	0.10		2.60	**13.00**	**2.60**	**2.21**	*35.00*	*4.80*	*4.68*
Glendale - Lochmaddy	30		7	0.10		3.70	**18.50**	**3.70**	**3.15**	*44.00*	*9.15*	*7.25*
Scrabster - Stromness	42		7	0.10		4.90	**24.50**	**4.90**	**4.17**	*38.00*	*12.00*	*8.55*
Uig - Tarbert	47		7	0.10		5.40	**27.00**	**5.40**	**4.59**	*44.00*	*9.15*	*7.25*
Uig - Lochmaddy	48		7	0.10		5.50	**27.50**	**5.50**	**4.68**	*44.00*	*9.15*	*7.25*
Kennacraig - Pt Ellen/Askaig	50		7	0.10		5.70	**28.50**	**5.70**	**4.85**	*56.00*	*7.75*	*6.94*
Stornoway - Aultbea	70		7	0.10		7.70	**38.50**	**7.70**	**6.55**	*69.00*	*14.05*	*10.36*
[Taper point]	71	1	7	0.10	0.05	7.75	**38.75**	**7.75**	**6.59**			
Stornoway - Ullapool	84	13	7	0.10	0.05	8.35	**41.75**	**8.35**	**7.10**	*69.00*	*14.05*	*10.36*
L'boisdale - Mallaig	92	21	7	0.10	0.05	8.75	**43.75**	**8.75**	**7.44**	*74.00*	*20.20*	*12.89*
Oban - Tiree	96		7	0.10	0.05	7.70	**38.50**	**7.70**	**6.55**	*72.00*	*12.30*	*9.63*
Oban - Barra/L'boisdale	144	73	7	0.10	0.05	11.35	**56.75**	**11.35**	**9.65**	*74.00*	*20.20*	*12.89*
Aberdeen - Lerwick	337	266	7	0.10	0.05	21.00	**105.00**	**21.00**	**17.85**			

Table C: Alternative TTT Applied to Scottish Ferry Routes (Summer 2004 rates)

Tailored Taper Tariff	**Dist**	**New**	**Toll**	**Rate/km**	**Taper**	**1m**	**5m Car**	**Pass**	**CV/half m**	*Car*	*Pass*	*CV*
								at 1m	*at half 1.6r*			
	km	*km*	*km*	£	£		£	£	£			
Colintraive - Rubodach	1		7	0.17		1.36	**6.80**	**1.36**	**1.16**	*7.15*	*1.15*	*0.98*
Largs - Cumbrae	2		7	0.17		1.53	**7.65**	**1.53**	**1.30**	*9.73*	*1.97*	*2.28*
Dunoon - McInroy's Pt	4		7	0.17		1.87	**9.35**	**1.87**	**1.59**	*8.70*	*3.10*	*2.66*
Gourock - Dunoon	7		7	0.17		2.38	**11.90**	**2.38**	**2.02**	*7.45*	*3.00*	*3.22*
Lochranza - Clonaig	8		7	0.17		2.55	**12.75**	**2.55**	**2.17**	*19.45*	*4.35*	*3.33*
Eriskay - Barra	10		7	0.17		2.89	**14.45**	**2.89**	**2.46**	*16.25*	*5.50*	*4.68*
Wemyss Bay - Rothesay	11		7	0.17		3.06	**15.30**	**3.06**	**2.60**	*14.20*	*3.55*	*2.86*
Lagg - Keills (Jura Overland)	11		7	0.17		3.06	**15.30**	**3.06**	**2.60**	*56.00*	*7.75*	*6.94*
Oban - Lismore	12		7	0.17		3.23	**16.15**	**3.23**	**2.75**	*22.10*	*2.65*	*3.77*
Gill's Bay - Burwick	13		7	0.17		3.40	**17.00**	**3.40**	**2.89**	*25.00*	*10.00*	*7.50*
Oban - Craignure	15		7	0.17		3.74	**18.70**	**3.74**	**3.18**	*34.50*	*3.85*	*4.91*
Leverburgh - Berneray	18		7	0.17		4.25	**21.25**	**4.25**	**3.61**	*23.70*	*5.20*	*6.37*
Ardrossan - Brodick	19		7	0.17		4.42	**22.10**	**4.42**	**3.76**	*35.00*	*4.80*	*4.68*
Glendale - Lochmaddy	30		7	0.17		6.29	**31.45**	**6.29**	**5.35**	*44.00*	*9.15*	*7.25*
Scrabster - Stromness	42		7	0.17		8.33	**41.65**	**8.33**	**7.08**	*38.00*	*12.00*	*8.55*
Uig - Tarbert	47		7	0.17		9.18	**45.90**	**9.18**	**7.80**	*44.00*	*9.15*	*7.25*
Uig - Lochmaddy	48		7	0.17		9.35	**46.75**	**9.35**	**7.95**	*44.00*	*9.15*	*7.25*
[Taper point]	50	1	7	0.17	0.06	9.41	**47.05**	**9.41**	**8.00**			
Kennacraig - Pt Ellen/Askaig	50	0	7	0.17	0.06	9.35	**46.75**	**9.35**	**7.95**	*56.00*	*7.75*	*6.94*
Stornoway - Aultbea	70	20	7	0.17	0.06	10.55	**52.75**	**10.55**	**8.97**	*69.00*	*14.05*	*10.36*
Stornoway - Ullapool	84	34	7	0.17	0.06	11.39	**56.95**	**11.39**	**9.68**	*69.00*	*14.05*	*10.36*
L'boisdale - Mallaig	92	42	7	0.17	0.06	11.87	**59.35**	**11.87**	**10.09**	*74.00*	*20.20*	*12.89*
Oban - Tiree	96	46	7	0.17	0.06	12.11	**60.55**	**12.11**	**10.29**	*72.00*	*12.30*	*9.63*
Oban - Barra/L'boisdale	144	94	7	0.17	0.06	14.99	**74.95**	**14.99**	**12.74**	*74.00*	*20.20*	*12.89*
Aberdeen - Lerwick	337	287	7	0.17	0.06	26.57	**132.85**	**26.57**	**22.58**			

Annex 6.5 Selected Elasticity Exemplars

2003 Comparisons Colonsay (pop 110) and Gigha (pop 110)

Gigha

Summer Crossings	20 per day
Number of cars	11,100 (annually)
Fare car plus driver	£19.30 + £5.15 = £24.45

Colonsay

Summer Crossings	2 per day
Number of cars	4,198 (annually)
Fare car plus driver	£53.00 + £10.90 = £63.90

2003 Comparison Mull (pop 2,800, Uists (pop 4,600 and Islay/Jura (pop 3,600))

Oban – Craignure (Main route circa 70% of traffic)

Summer Crossings	12 per day
Number of cars	109,000 (annually)
Fare car plus driver	£34.50 + £3.85 = £38.35

Uig – Lochmaddy (Main route circa 70% of traffic)

Summer Crossings	3 per day
Number of cars	22,400 (annually)
Fare car plus driver	£44.00 + £9.15 = £53.15

Kennacraig – Islay/Jura

Summer Crossings	6 per day
Number of cars	38,000 (annually)
Fare car plus driver	£56.00 + £7.75 = £63.75

Harris – N Uist Route change Comparison

In 1995 (last year of old Uig "triangle" route) the key data were:

Summer crossings	3 per day (mostly indirect about 5 hours)
Number of cars (circa)	2,500 (annually)
Fare car plus driver	£44.00 + £9.15 = £53.15

In 1998 (third year of new Leverburgh route) the key data were:

Summer crossings	8 per day
Number of cars (circa)	11,500 (annually)
Fare car plus driver	£23.70 + £5.20 = £27.90

Sound of Barra compared with Whalsay

In 2003 the Sound of Barra data were:		In 2003 the Whalsay data were:	
Passage distance	10 km	Passage distance	10 km
Barra Population	1,100	Whalsay Population	1,000
Summer crossings	10 per day	Summer crossings:	36 per day
Number of cars (circa)	9,900 (annually)	Number of cars (circa)	49,100 (annually)
Fare car plus driver	£16.25+£5.50=£21.75	Fare car plus driver	£1.90+£1.50=£3.40

Annex 7.5 Calculation of Multipliers

Output multipliers

The multipliers for changes in gross output resulting from additional expenditure in the Western Isles were calculated using data from the Western Isles Regional Accounts (CnES, 1999).

Local resident spending multipliers were calculated using figures for an estimated drop in population in the Western Isles. These figures indicated that a fall in household expenditure of £5,461,000 would result in a fall in gross output of £6,782,500 across all sectors. Taking the following ratio:

k = change in gross output / change in expenditure in WI
k = -£6,782,500 / -£5,461,000
k = 1.24

Assuming that output is similarly sensitive to a rise in expenditure as to a fall, the multiplier for local resident household expenditure is 1.24

Visitor spending was calculated using the values for change in output and increase in tourism for 1997. The regional accounts estimated that an increase in tourist expenditure of £4,496,000 in the Western Isles would lead to an increase in gross output of around £6.7m. Taking the following ratio:

k = Change in gross output / change in expenditure in WI
k = £6,700,000 / £4,496,000
k = 1.49

The value of the multiplier for tourist spending is 1.49.

Employment multipliers

Employment multipliers measure the FTE employment required per unit output of an industry sector. In this case they were were calculated using aggregate values from employment coefficients taken from the Western Isles Regional Accounts. Separate values were calculated for visitor and domestic spending to reflect the balance of industry sectors likely to experience an increase in output. Table 7.5.1 below details the values used in both the domestic and visitor multipliers.

Calculation of Employment Multipliers

Domestic spending		**Visitor spending**	
Construction	0.020	Distribution	0.022
Distribution	0.022	Hotels	0.038
Catering	0.069	Other accommodation	0.030
Land transport	0.013	Catering	0.069
Air transport	0.006	Land transport	0.013
Sea transport	0.024	Air transport	0.006
Average	**0.031**	Sea transport	0.024
		Average	**0.029**

Annex 7.6: Calculation of Business Competitiveness

The impact of the ferry fare mechanisms on business competitiveness captures the estimated effect of lower ferry fares on import and export costs to Western Isles based businesses. Lower costs will be likely to increase profitability and hence the competitiveness of exporting businesses, leading to increased in output and employment in these sectors.

The six key exporting industries selected: Agriculture; Sea fishing; Fish farming; Textiles; Fish processing, wholesaling, etc.; and Other manufacturing were taken from the Western Isles Regional Accounts CnES (1999). These give details on output and employment by sector. Data for the chosen sectors is shown below.

Table 7.6.1 Current Output and Employment in Key Exporting Sectors in W. Isles

Sector	Emp FTE	Output £k	FPFD Multiplier
Agriculture	690	9241	0.15
Sea fishing	640	16838	0
Fish farming	314	32681	0.375
Textiles	427	11132	0.45
Fish processing, wholesaling, etc.	273	19062	0.3
Other manufacturing	334	8057	0.45

Estimates for Ferry Price Final Demand (FPFD) multipliers were taken by using multiplier estimates for relevant sectors from the SOID (1993) study. These measure the responsiveness of industrial output to a change in ferry fares. However, the SOID (1993) study estimated the effect of a possible rise in ferry prices and the subsequent decrease in output. However it is likely that the effect may be asymmetric, in other words an equivalent decrease in fares may not lead to the equivalent increase in output, especially in the short run as industry takes time to gear up. To compensate for this we have assumed that the FPFD rate for a fall in fares will be 60% of the SOID level.

In addition, we believe that these parameters would be more feasible if applied to total transport costs, of which ferry costs are approximately one quarter, for a typical journey from the Western Isles to Glasgow. Therefore the final multiplier used is 25% of the 60% ferry response, in other words 15% of the SOID figure. For example, the FPFD we have used for agriculture is 0.15, in other words a 10% fall in ferry prices will raise output in the agriculture sector by 1.5%.

The FPFD multiplier is multiplied by the weighted average ferry fare change in each scenario to calculate the percentage change in output for each sector. This is shown below.

Table 7.6.2 Average Ferry Fare Change

Sector	Average Fare Change
RET	-50%
TTT	-12%
TTT Reduced	-27%
TTT Alternative	-21%
TTT Alternative Reduced	-47%

Multiplying these average fare changes by the FPFD multiplier for each sector gives the percentage change in output. Applying this percentage change to the baseline output gives the actual change in output for each sector.

Table 7.6.3 Actual (%) Output Change £000 in WI Key Export Sectors

Sector	RET	TTT	TTT -30%	TTT Alternative	TTT Alternative -30%
Agriculture	£752 (8%)	£235 (3%)	£369 (4%)	£346 (4%)	£657 (7%)
Sea fishing	£0	£0	£0	£0	£0
Fish farming	£6,652 (20%)	£2,073 (6%)	£3,262 (10%)	£3,063 (9%)	£5,806 (18%)
Textiles	£2,719 (24%)	£848 (8%)	£1,333 (12%)	£1,252 (11%)	£2,373 (21%)
Fish processing, wholesaling, etc.	£3,104 (16%)	£968 (5%)	£1,522 (8%)	£1,429 (7%)	£2,709 (14%)
Other manufacturing	£1,968 (24%)	£613 (8%)	£965 (12%)	£906 (11%)	£1,718 (21%)
All key export sectors	£15,195 (16%)	£4,736 (5%)	£7,450 (8%)	£6,998 (7%)	£13,263 (14%)