STRATEGIC TRANSPORT PROJECTS REVIEW

PROTECTING OUR CLIMATE AND IMPROVING LIVES

Appendix I: Recommendation Appraisal Summary Tables

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1. Detailed Appraisal Summary

An 'Appendix I: Recommendation Appraisal Summary Tables (ASTs) Explanatory Note' accompanies this AST.

1.1. Recommendation 24 – Ferry vessel renewal and replacement, and progressive decarbonisation

Recommendation Description

This recommendation involves renewal and replacement of the Clyde and Hebrides Ferry Services (CHFS) [i] and Northern Isles Ferry Services (NIFS) [ii] vessels including progressive decarbonisation by 2045.

Continued investment in ferry renewals would address the needs of rural and island communities by improving the resilience, reliability, capacity, accessibility and standardisation of ferries and reducing their emissions.

1.2. Relevance

Relevant to Scotland's island and remote communities on the CHFS and NIFS ferry networks

Ferry vessel renewal and replacement and progressive decarbonisation is relevant to Scotland's island and remote communities on the CHFS and NIFS ferry networks.

Progressive decarbonisation of the CHFS and NIFS ferry networks would support the 2018 – 2032 Climate Change Plan [iii] and the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. [iv]

1.3. Estimated Cost

£1 billion - £2.5 billion

The estimated costs of the renewal and replacement of the ferry fleet and decarbonising the ferry network would need further consideration as appropriate technologies for application on the Scottish ferry network are identified and taken forward for implementation.

1.4. Position in Sustainable Investment Hierarchy

Maintaining and safely operating existing assets

This recommendation would contribute to seven of the 12 NTS2 outcomes, as follows:

- Provide fair access to services we need;
- Be easy to use for all;
- Help deliver our net zero target;
- Promote greener, cleaner choices;
- Get people and goods to where they need to get to;
- Be reliable, efficient and high quality; and
- Be safe and secure for all.

1.5. Summary Rationale

Summary of Appraisal

	TPO					STAG					SIA				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Low Scenario	+++	+	++	+	++	+	++	+	+	+	+	++	++	+	++
High Scenario	+++	+	++	+	++	+	++	+	+	+	+	++	++	+	++

This recommendation contributes positively to each of the Transport Planning Objectives (TPOs), with a major positive impact on the Scottish Government's net zero emissions target. In terms of the STAG criteria, this recommendation contributes positively to each criterion and is expected to have a moderate positive impact against aspects of Climate Change. This recommendation is also likely to have positive impacts across all Statutory Impact Assessment criteria, with moderate positive impacts in terms of the Equalities Impact Assessment (EqIA), Island Communities Impact Assessment (ICIA) and Fairer Scotland Duty Assessment (FSDA).

Further work is required to understand the feasibility of decarbonising the ferry network and how this would be achieved over a number of years. In addition, further assessment and investigation is required to determine the optimum strategy for implementing and operating alternatively powered vessels on the CHFS and NIFS ferry networks. Further consideration of procurement and maintenance of new, decarbonised vessels would also have to be undertaken.

The cost of delivering and implementing a decarbonised ferry network across the CHFS and NIFS ferry networks would be significant and would require long-term investment over the next 25 years to achieve the final aim of a fully decarbonised ferry network, slightly beyond the 20 year horizon of STPR2.

Details behind this summary are discussed in Section 3, below.

2. Context

2.1. Problems and Opportunities

This recommendation could help to tackle the following problems and opportunities:

Relevant Problem & Opportunity Themes Identified in National Case for Change
▪ **Global Climate Emergency:** the Scottish Parliament committed to an ambitious target of net zero emissions by 2045 and transport needs to play its part. Transport is currently Scotland's largest sectoral emitter, responsible for 37% of Scotland's total greenhouse gas emissions (greenhouse gas emissions encompass CO_2 emissions) [v] in 2018 (National Atmospheric Emissions Inventory 1990-2017) [vi] . Our transport system needs to minimise the future impacts of transport on our climate. ▪ **Adapting to Climate Change:** climate change directly affects the transport sector through the increasing number of more severe and frequent extreme weather events and the disruption they cause to the transport system. Disruption often disproportionately impacts vulnerable communities with fewer and less resilient transport options and can lead to significant disruption and high economic costs. ▪ **Air Quality:** transport, and road transport in particular, remains a significant contributor to poor air quality. Air pollution increases the risks of diseases such as asthma, respiratory and heart disease, particularly for those who are more vulnerable. Air quality is often worse in areas of deprivation and is a health inequality issue. ▪ **Resilience:** a key challenge is providing a transport system that is resilient and speedily recovers from disruption, thus minimising impacts of delayed journeys on networks and users. ▪ **Vessel and Vehicle Quality:** there are linkages between vessel and vehicle quality and issues relating to resilience, reliability and safety which can result in cancellations and leave users unable to complete their journey.

2.2. Interdependencies

This recommendation has potential overlap with other STPR2 recommendations and would also complement other areas of Scottish Government activity.

Other STPR2 Recommendations
▪ Supporting integrated journeys at ferry terminals (18); ▪ Zero emission vehicles and infrastructure transition (28); ▪ Potential Sound of Harris, Sound of Barra fixed link and fixed link between Mull and Scottish mainland (41); and ▪ Investment in port infrastructure to support vessel renewal and replacement, and progressive decarbonisation (42).
Other areas of Scottish Government activity:
▪ Revised Draft Fourth National Planning Framework (Revised Draft NPF4)[vii]; National Development 1: Energy Innovation Development on the Islands; ▪ 2018 – 2032 Climate Change Plan [viii] and the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 [ix] ; ▪ Scottish Energy Strategy, 2017 [x] ; ▪ Carbon Neutral Islands project [xi] ; ▪ Islands Growth Deal [xii] ; ▪ The National Islands Plan, 2019 [xiii] ; and ▪ Islands Connectivity Plan (emerging).

3. Appraisal

This section provides an assessment of the recommendation against:

- STPR2 Transport Planning Objectives (TPOs);
- STAG Criteria;
- Deliverability criteria; and
- Statutory Impact Assessment criteria.

The seven-point assessment scale has been used to indicate the impact of the recommendation when considered under the 'Low' and 'High' Transport Behaviour Scenarios (which are described in Appendix F of the Technical Report).

3.1. Transport Planning Objectives

1. A sustainable strategic transport system that contributes significantly to the Scottish Government's net zero emissions target

Low Scenario	High Scenario
+++	+++

The CHFS and NIFS networks form an integral part of the strategic transport network, in many cases providing the only or major transport connection for island communities. The future sustainability of these communities, and the strategic transport network which is fundamental to their survival and future growth, is dependent on the provision of a reliable and resilient ferry fleet. It is now accepted by all parties that the fleet is ageing and lacks resilience and that major, sustained investment over the period to 2045 would be required to redress this.

The Decarbonising the Scottish transport sector study [xiv] has shown that the only way the Scottish Government target to achieve net zero carbon emissions by 2045 can be achieved is by a combination of rapid decarbonisation of passenger and freight transport, reduction in vehicle usage by switching to public transport and active travel, and reduced demand through shorter trips and, where possible, avoiding trips.

Ferry vessel renewal and replacement and progressive decarbonisation would contribute to the 2045 net zero emissions target and directly supports the 2018 – 2032 Climate Change Plan [xv] and the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. [xvi]

This recommendation is expected to have a major positive impact on this objective in both the Low and High scenarios.

2. An inclusive strategic transport system that improves the affordability and accessibility of public transport.

Low Scenario	High Scenario
+	+

Ferry vessel renewal and replacement and progressive decarbonisation would have a neutral impact on the affordability of public transport albeit if there was to be operational cost savings (which could be passed on to customers / passengers) arising from a low carbon fleet this may influence the affordability of ferries. This would depend on the balance of costs between user and government.

There would be a minor positive impact on accessibility associated with the introduction of new and upgraded ferry vessels.

This recommendation is expected to have a minor positive impact on this objective in both the Low and High scenarios.

3. A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.

Low Scenario	High Scenario
++	++

Ferries are a vital link in the strategic transport system for islands and, without a functioning and sustainable ferry fleet, communities as places would suffer and in the long-term would struggle to survive if confidence in the strategic transport system remains undermined by performance.

Health and wellbeing is specifically supported by ferries' role in providing access to health services that are often not available on individual islands.

There could be minor positive impacts on place, health and wellbeing for those living and/or working near ferry terminals who may benefit from less noise associated with ferry vessels arriving, departing and berthing overnight, and improved local air quality (which would have associated health benefits), as a result of encouraging sustainable access and a move away from diesel engines to alternatives such as electric or hydrogen.

This recommendation is expected to have a moderate positive impact on this objective in both the Low and High scenarios.

4. An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.

Low Scenario	High Scenario
+	+

Ferry services are an integral part of the strategic transport network, in many cases providing the only or major transport connection for island communities. The future sustainability of these communities, and their ability to achieve sustainable economic growth, is dependent on the provision of a reliable and resilient ferry fleet.

Ferry vessel renewal and replacement and progressive decarbonisation would have a minor positive impact on sustainable inclusive growth in Scotland.

This recommendation is expected to have a minor positive impact on this objective in both the Low and High scenarios.

5. A reliable and resilient strategic transport system that is safe and secure for users.

Low Scenario	High Scenario
++	++

Ferry services would be anticipated to be more reliable and resilient as a result of deployment of new vessels (regardless of carbon emissions/decarbonisation). However, there would be a neutral impact on safety: vessels are operated with adherence to strict safety guidelines as defined by agencies such as the Maritime and Coastguard Agency (MCA). There are also unlikely to be any significant impacts on security over and above those afforded by any deployment of new vessels.

This recommendation is expected to have a moderate positive impact on this objective in both the Low and High scenarios.

3.2. STAG Criteria

1. Environment

Low Scenario	High Scenario
+	+

See Strategic Environmental Assessment (SEA) below.

This recommendation is expected to have a minor positive effect on this criterion in both the Low and High scenarios.

2. Climate Change

Low Scenario	High Scenario
++	++

Ferry vessel renewal and replacement and progressive decarbonisation would help to reduce greenhouse gas emissions generated by shipping in Scotland.

This recommendation is unlikely to provide substantial additional resilience against vulnerability to the effects of climate change for the ferry sector or island communities beyond the design of vessels to withstand a greater range of bad weather impacts. No effect on the potential to adapt to effects of climate change is anticipated.

This recommendation is expected to have a moderate positive impact on this criterion in both the Low and High scenarios.

3. Health, Safety and Wellbeing

Low Scenario	High Scenario
+	+

This recommendation would have a neutral impact on accidents. Vessels are operated with adherence to strict safety guidelines as defined by agencies such as the MCA.

There are unlikely to be any significant impacts on security over and above those afforded by any deployment of new vessels.

Health benefits of decarbonised ferry services are likely to be dispersed and local to ferry ports. As such, the extent to which these benefits would be realised would depend on the impact within areas of the highest levels of air pollution and areas with high levels of deprivation.

There could be minor positive impacts on place, health and wellbeing for those living and/or working near ferry terminals who may benefit from less noise associated with ferry vessels arriving, departing and berthing overnight, and improved local air quality (which would have associated health benefits), as a result of encouraging sustainable access and a move away from diesel engines to alternatives such as electric or hydrogen.

Improving the resilience, reliability, capacity and accessibility of ferries would have a positive impact on access to health and wellbeing infrastructure.

Ferry vessel renewal and replacement and progressive decarbonisation is unlikely to have any significant effect on visual amenity.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

4. Economy

Low Scenario	High Scenario
+	+

Ferry services are an integral part of the strategic transport network, in many cases providing the only or major transport connection for island communities. The future sustainability of these communities, and their ability to achieve sustainable economic growth, is dependent on the provision of a reliable and resilient ferry fleet with adequate capacity to meet user needs, particularly for the affordable import and export of goods and services.

Vessel renewal and replacement would induce positive economic impacts through improved reliability, resilience, capacity and accessibility for communities. There may also be wider economic impacts associated with research and development / development of technology in the decarbonisation sector, although these are expected to be minor.

In addition, once the vessel fleet is operating with zero carbon fuel systems and once the design and build of zero carbon vessels is proven, the operator could also have some cost savings – for example if moving from diesel to electric or hydrogen there could be a reduction in the cost of fuel and these cost savings could be passed on to customers / passengers. However, vessels would be more expensive to build until such time that costs reduced, and the fluctuating energy market could see any fuel efficiency savings. However, there could be opportunities for both large and small scale development of hydrogen (or ammonia) production hubs capitalising on the green energy available.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

5. Equality and Accessibility

Low Scenario	High Scenario
+	+

Ferry vessel renewal and replacement and progressive decarbonisation would have a neutral impact on the public transport and active travel networks.

Benefits may be realised through the procurement of new ferry vessels and infrastructure which are being designed to higher accessibility standards. This would be of benefit to those with accessibility limitations including older people, disabled people and pregnant women or travellers with pushchairs or young children. Improved reliability, resilience and capacity would also benefit ferry users.

Ferry vessel renewal and replacement and progressive decarbonisation would have a neutral impact on comparative access by geographic location although more reliable and resilient services provided by modern vessels would help redress that geographic disadvantage.

Ferry vessel renewal and replacement and progressive decarbonisation would have a neutral impact in terms of affordability albeit if there was to be operational cost savings (which could be passed on to customers / passengers) arising from a low carbon fleet this may influence the affordability of ferries. This would depend on the balance of costs between user and government.

Also refer to EqIA/ICIA/FSDA/CRWIA Assessment in the next section.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

3.3. Deliverability

1. Feasibility
Fleet renewal and replacement is "business as usual" even if the rate of vessel replacement has fallen well short of the optimal over the last two decades. Expertise and experience within the public agencies and supply chain, and robust project management, gives confidence in the delivery of future vessels. Further work is required to understand the feasibility of decarbonising the ferry network and how this would be achieved over a number of years. Further assessment and investigation is required to determine the optimum strategy for implementing and operating alternatively powered vessels on the CHFS and NIFS ferry networks. Further consideration of procurement and maintenance of new, decarbonised vessels would also have to be undertaken.

2. Affordability
The cost of fleet renewal and replacement is inherent to assets with a 25-30 year operational life on these networks but is accentuated in the coming 10-15 years by slippage in the replacement programme. The cost of delivering and implementing a decarbonised ferry network across the CHFS and NIFS ferry networks would be significant and would require long-term investment over the next 25 years to achieve the final aim of a fully decarbonised ferry network. The adoption of new and emerging technologies may incur higher costs and, as such, the relative cost per metric tons of carbon dioxide equivalent (MtCO2e) avoided is likely to be higher than that of decarbonisation measures for other types of vehicles which do not require the use of new / emerging technologies. Whilst capital construction costs would be high, decarbonisation could support operational cost savings across the CHFS and NIFS ferry networks in the future, with the decarbonisation of the ferry network reducing maintenance burdens associated with existing ferry infrastructure, representing long-term cost savings. However, it is also the case that there could be increased financial burdens associated with measures relating to bunkering and delivery/sourcing depending on the alternative fuel. In the High transport behaviour scenario, more ferry provision may be required to accommodate increased travel demand by autonomous vehicles, which would add to the number of vehicles travelling.

3. Public Acceptability
A ferry network that is more environmentally friendly and meets climate change targets would gain widespread public support provided the vessels can be procured efficiently and effectively and the new vessels at least match the functionality of the existing fleet. Should alternatively powered vessels improve service reliability (which is expected), public support would be high whilst reduced reliability would undermine public support for the new vessels.

3.4. Statutory Impact Assessment Criteria

1. Strategic Environmental Assessment (SEA)

Low Scenario	High Scenario
+	+

This recommendation is likely to result in positive effects on the SEA objectives related to greenhouse gas reduction, improving air quality and the water environment (Objectives 1, 3 and 10 respectively), particularly in relation to the achievement of a reduction in transport-related emissions; as the recommendation seeks to reduce emissions from ferries through decarbonisation / use of alternative fuels (electric, hydrogen). It would also have a positive effect on Objective 8 as it promotes a more sustainable use, and management of, the existing transport network. It would have a positive effect on quality of life and reducing noise and vibration (Objectives 4 and 5) as a result of encouraging sustainable access and a move away from diesel engines to alternatives such as electric / hydrogen which could result in a beneficial effect on air quality and noise and vibration for those living or working near ferry terminals during operation.

There are also possible positive effects on biodiversity (Objective 11) as a result of a reduction in diffuse pollution on key receptors; however, the significance of the effects are uncertain at this stage.

Given the nature of this recommendation, it has no (or negligible) clear link to the achievement of many of the SEA Objectives, including climate adaptation (Objective 2), developing high quality places and improving safety (Objectives 6 and 7) or soil, cultural heritage, and landscape and visual amenity (Objectives 12, 13 and 14).

This recommendation is expected to have a minor positive effect on this criterion in both the Low and High scenarios.

2. Equalities Impact Assessment (EqIA)

Low Scenario	High Scenario
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The procurement of new ferry vessels and infrastructure would deliver equalities benefits through design to higher accessibility standards. This would be of benefit to those with accessibility limitations including older people, disabled people and pregnant women or travellers with pushchairs or young children.

Decarbonisation of ferry vessels could have potential positive impacts on groups who are more vulnerable to the adverse health impacts of transport-related emissions and air pollution. This includes children, older people, disabled people and pregnant women. However, the health benefits of decarbonisation of ferry services are likely to be dispersed and local to ferry ports. As such, the extent to which these benefits would be realised would depend on the impacts on areas with the highest levels of air pollution and those with a high proportion of more vulnerable groups.

A cleaner ferry network, with increased service capacity and improved reliability and resilience, would also improve connectivity to key services such as health and education which could also bring benefits for many groups with protected characteristics. However, it is noted that this recommendation would only provide benefits to those who can currently access the ferry network and there would be no change to the geographical coverage of the ferry network.

This recommendation is expected to have a moderate positive impact on this criterion in both the Low and High scenarios.

3. Island Communities Impact Assessment (ICIA)

Low Scenario	High Scenario
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The investment programme would drive island transport connectivity improvements across the CHFS and NIFS ferry networks. Consequently, there would be a beneficial impact on island communities through improvements in reliability and resilience but also through targeted capacity increases particularly in support of freight.

Further benefits may be realised through the procurement of new ferry vessels and infrastructure which are being designed to higher accessibility standards. This could have a positive impact on island communities, particularly for those with accessibility limitations including older people, disabled people and pregnant women or travellers with pushchairs or young children.

A cleaner ferry network, with increased service capacity and improved reliability and resilience, would also improve connectivity to key services such as health, employment and education which could also bring benefits for island communities. However, it is noted that this recommendation would only provide benefits to those who can currently access the ferry network and there would be no change to the geographical coverage of the ferry network.

This recommendation is expected to have a moderate positive impact on this criterion in both the Low and High scenarios.

4. Children's Rights and Wellbeing Impact Assessment (CRWIA)

Low Scenario	High Scenario
+	+

The renewal and replacement of ferry vessels would support the growth of sustainable and resilient communities to the benefit of all residents including children. Sustainable access to mainland opportunities for example, for education and healthcare would also benefit children.

Decarbonisation of ferry vessels could have positive impacts on groups who are more vulnerable to the adverse health impacts of transport-related emissions and air pollution. This is especially the case with children who are more vulnerable to ill-effects.

However, the health benefits of decarbonisation of ferry services are likely to be dispersed and local to ferry ports. As such, the extent to which these beneficial impacts on children would be realised would depend on the proportion of children and young people living in these areas.

A cleaner ferry network, with increased service capacity and improved reliability and resilience, would also improve connectivity to education which could also bring benefits for children and young people. However, it is noted that this recommendation would only provide benefits to children and young people who can currently access the ferry network and there would be no change to the geographical coverage of the ferry network.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

5. Fairer Scotland Duty Assessment (FSDA)

Low Scenario	High Scenario
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The health benefits of decarbonised ferry services are likely to be dispersed and local to ferry ports. As such, the extent to which these health benefits would be realised would depend on the impact within areas of the highest levels of air pollution and areas with high levels of deprivation.

There could be minor positive impacts on place, health and wellbeing for those living and/or working near ferry terminals who may benefit from less noise associated with ferry vessels arriving, departing and berthing overnight, and improved local air quality (which would have associated health benefits), as a result of encouraging sustainable access and a move away from diesel engines to alternatives such as electric or hydrogen.

A cleaner ferry network, with increased service capacity and improved reliability and resilience, also has the potential to improve connectivity to employment, services and education. However, it is noted that this recommendation would only provide benefits to those who can currently access the ferry network and there would be no change to the geographical coverage of the ferry network.

This recommendation is expected to have a moderate positive impact on this criterion in both the Low and High scenarios.

References

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