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 26 - Decarbonisation of the bus network

Recommendation Description

This recommendation seeks to deliver further decarbonisation of the bus fleet, through additional investment to stimulate the commercial roll out of zero emission buses, including those used by the home-to-school, community transport and tourist sectors. Further policy development may be required to ensure a Just Transition to zero emission buses across all operators and any provision of additional funding would need to reflect the expectation that the bus and coach industry will increasingly seek to acquire zero emission vehicles commercially, without the need for Government investment.

Transport continues to be Scotland's biggest emitting sector, accounting for 30.8% of greenhouse gas emissions in 2019[i], with heavy duty trucks and buses making up 15.7% of transport emissions[ii]. The Scottish Government has committed to reaching net zero emissions by 2045[iii], and while a number of measures will be required to meet the 2045 target, the 2021 manifesto[iv] committed to:

- 'Remove the majority of fossil fuel buses from public transport in Scotland by 2023 and invest £120 million in Zero Emission Buses.'

To this end, Transport Scotland launched the first round of the Scottish Zero Emission Bus Challenge Fund (ScotZEB) on 15 July 2021[v]. The funding was available for vehicles used on registered local bus services, including mini-buses, plus associated charging infrastructure (which could be used for other vehicles too) and was aimed at the finance, energy, bus manufacturing and bus operating sectors collectively to encourage innovation and collaboration between all parties. This resulted in the award of £62 million to nine recipients, supporting the acquisition of 276 battery-electric buses and associated charging infrastructure[vi]. The total number of zero emission buses is now just over 600.

Budget beyond the funding announced at the time of the Climate Change Plan Update[vii] may be required to support full decarbonisation of the bus sector at a pace faster than the normal turnover of fleet would achieve, so there is the potential to evaluate whether there is a business case for further Government investment towards decarbonising the remaining vehicles, especially those used as Public Service Vehicles (PSVs), with different approaches to the provision of Government financial support[viii] and different financing solutions and models[ix] set out by the Bus Decarbonisation Taskforce.

1.2. Relevance

Relevant to all of Scotland

Decarbonisation of the bus network is likely to be relevant to all of Scotland. During the consultation for STPR2, the importance of decarbonisation was raised both nationally and by most of the regions, with options discussed relating to increased funding to support purchase of electric and hydrogen buses, plus the need for funding for the associated recharging and refuelling infrastructure.

1.3. Estimated Cost

£51 million – £100 million Capital

As of December 2020, there were approximately 12,515 buses and coaches licensed in Scotland[x], with c3,700 used as PSVs[xi]. The similarities between the vehicles and the charging infrastructure for decarbonising public service buses is largely the same as that required for other types of buses and coaches, and efficiencies of scale could be achieved through encouragement to decarbonise this wider pool. Therefore, there is the potential to evaluate whether there is a business case for further investment towards decarbonising the remaining vehicles used as PSVs, and those used by the home to school, community transport and tourist sectors.

With joint working between the bus industry and the Scottish Government through the Bus Decarbonisation Taskforce[xii], which is expected to lead to increased innovation in financing models and greater confidence in the residual value of life-expired batteries, it is hoped that the remaining £58 million of announced funding will stimulate collaboration that could demonstrate how full decarbonisation of the bus sector could be achieved with little or no Government support.

Indeed, any provision of funding beyond that set out in the Climate Change Plan Update will need to reflect the expectation that the bus and coach industry will increasingly seek to acquire zero emission vehicles commercially, without the need for Government investment. However, it is currently estimated that this recommendation could cost in the range of £51 million - £100 million in addition to the funding already announced.

1.4. Position in Sustainable Investment Hierarchy

Targeted Infrastructure Improvements

Within the Sustainable Investment Hierarchy, this recommendation fits with targeted infrastructure improvements, with recharging and refuelling infrastructure required. However, higher quality vehicles may also deliver mode transfer, contributing towards making better use of existing capacity and reducing the need to travel unsustainably.

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

- Provide fair access to services we need;
- Be easy to use for all;
- Get people and goods to where they need to get to; and
- Be reliable, efficient and high quality.

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	+++	0	+	0	0	+	+++	+	+	0	+	0	0	+	0
High Scenario	+++	0	+	0	0	+	+++	+	+	0	+	0	0	+	0

Investment in decarbonisation of the bus network provides an extremely strong fit with the Scottish Government commitment to net zero emissions. Therefore, it could have a major

positive impact against the STPR2 Transport Planning Objective for net zero target and the STAG climate change criterion, as well as having a very high level of public acceptability. Minor positive impacts are also anticipated against the Transport Planning Objective for place, health, wellbeing, against the STAG health, safety and wellbeing, environment and economy criteria, and against the Strategic Environmental Assessment.

However, any provision of funding beyond that set out in the manifesto commitment would need to stimulate the commercial roll-out of zero emission buses, and further policy development may be required to ensure a Just Transition to zero emission buses across all operators.

Although the value for money of this recommendation is unclear under current appraisal criteria, the strong policy fit, the environmental and health benefits, and the benefits to the economy of fewer days lost due to ill health all support decarbonisation of the bus network.

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) [xiii] in 2018 (National Atmospheric Emissions Inventory 1990-2017)[xiv]. Our transport system needs to minimise the future impacts of transport on our climate. ▪ **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. ▪ **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. ▪ **Changing Travel Behaviour:** changing people's travel behaviour to use more sustainable modes would have a positive impact on the environment, as well as health and wellbeing.

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
▪ Zero emission vehicles and infrastructure transition (28).
Other areas of Scottish Government activity
▪ Climate Change Plan 2018-32 Update[xv]; ▪ Low Emission Zones[xvi]; ▪ Switched on Towns & Cities Challenge Fund[xvii]; ▪ Scottish Bus Emissions Abatement Retrofit Fund[xviii]; and ▪ Scottish Cities Alliance[xix].

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
+++	+++

Decarbonisation of the bus network would reduce greenhouse gas emissions caused by the existing bus fleet, which is crucial for supporting the Government's commitment to net zero by 2045. Although the Scottish Ultra-Low Emission Bus Scheme (SULEBS)[xx] and ScotZEB are anticipated to support the decarbonisation of over 2,100 buses, there are c3,700 buses and coaches used as PSVs[xxi] in Scotland, so there is still considerable scope to reduce emissions, with buses and coaches accounting for 0.4 million tonnes of CO_2 emissions in 2019[xxii], and each zero emission bus potentially reducing CO_2 emissions by 46 tonnes a year[xxiii].

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

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

Low Scenario	High Scenario
0	0

Decarbonisation of the bus network is likely to have a limited impact on the affordability of the public transport network in the immediate term if the cost differential between diesel and zero emission buses continues to be met in part through Government support.

In the longer term, the impact on affordability is unknown, because this would depend on the extent of the reduction in the cost differential relative to reductions in operating costs

due to reduced fuel use, as well as future decisions concerning different approaches to the provision of Government financial support[xxiv] and different financing solutions and models[xxv].

Similarly, impacts on accessibility are likely to be limited in the immediate term, with longer term impacts unknown.

Overall, this recommendation is expected to have a neutral impact on this objective in both Low and High scenarios.

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

Low Scenario	High Scenario
+	+

Decarbonisation of the bus network would improve local air quality, enhancing locations as attractive places to live and improving the health and wellbeing of those living in these locations, with each zero emission bus potentially reducing NO_x emissions by 23 kilograms a year[xxvi].

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

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

Low Scenario	High Scenario
0	0

Decarbonisation of the bus network is likely to have a limited impact on integration of the transport system unless the new vehicles are restricted to the more profitable routes and older diesel vehicles are cascaded to the less profitable routes, which could in time result in the latter routes being withdrawn entirely rather than their vehicles being replaced.

By seeking to target the home to school and community transport sectors through this recommendation, it is hoped that these negative impacts can in part be mitigated, and there are not expected to be material impacts specifically on sustainable inclusive growth so, overall, this recommendation is expected to have a neutral impact on this objective in both Low and High scenarios.

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

Low Scenario	High Scenario
0	0

Decarbonisation of the bus network is likely to have a limited impact on the safety or security of the transport system, except where newer vehicles come equipped with increased onboard safety devices, such as driver aids and CCTV.

While the replacement of older vehicles with new vehicles may improve reliability, the technology underpinning zero emission vehicles is not sufficiently mature for there to be evidence concerning its reliability relative to conventional diesel vehicles.

There is also unlikely to be a material impact on resilience so, overall, this recommendation is expected to have a neutral impact on this objective in both 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 Low and High scenarios.

2. Climate Change

Low Scenario	High Scenario
+++	+++

Decarbonisation of the bus network would reduce greenhouse gas emissions caused by the existing bus fleet, which is crucial for supporting the Government's commitment to net zero by 2045, with each zero emission bus potentially reducing CO_2 emissions by 46 tonnes a year[xxvii].

While the impact on the vulnerability to effects of climate change and the potential to adapt to effects of climate change are expected to be neutral, this recommendation is still expected to have a major positive impact on this criterion in both Low and High scenarios.

3. Health, Safety and Wellbeing

Low Scenario	High Scenario
+	+

Decarbonisation of the bus network would improve local air quality, enhancing locations as attractive places to live and improving the health and wellbeing of those living in these locations, with each zero emission bus potentially reducing NO_x emissions by 23 kilograms a year[xxviii].

However, the recommendation is likely to have a limited impact on accidents or security, except where newer vehicles come equipped with increased onboard safety devices, such as driver aids and CCTV. The impacts on access to health and wellbeing infrastructure and on visual amenity are also expected to be neutral.

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

4. Economy

Low Scenario	High Scenario
+	+

As of 2018, the overall societal costs of air pollution are estimated to be around £22.6 billion per year across the UK[xxix], through sick days, lost working days, treatments and environmental impacts amongst other factors. Decarbonisation of the bus network would help to improve air quality, particularly in towns and cities, reducing the negative impacts associated with poor air quality. Wider economic impacts could also be delivered through the creation of more skilled, sustainable jobs in Scotland, associated with the technological advances required to achieve decarbonisation.

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

5. Equality and Accessibility

Low Scenario	High Scenario
0	0

Decarbonisation of the bus network is likely to have limited impact on equality and accessibility in terms of public transport network coverage or active travel network coverage. It is also likely to have limited impact on affordability and on comparative accessibility, both in terms of the needs of socially excluded groups and by geographic location.

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

This recommendation is therefore expected to have a neutral impact on this criterion in both Low and High scenarios.

3.3. Deliverability

1. Feasibility

While decarbonisation of the bus network is feasible, there is still some uncertainty surrounding whole life costs, especially in terms of maintenance costs and the residual value of batteries[xxx]. Consideration is already being given to these issues through the Bus Decarbonisation Taskforce[xxxi], as is consideration of whether electric charging infrastructure and hydrogen fuelling facilities would be required in public locations for use by all operators, rather than just in operator depots, and whether funding is required towards cross-modal recharging and refuelling infrastructure, particularly non-contestable works where the local network does not have sufficient capacity.

2. Affordability

While the purchase of new vehicles is generally considered to provide a financial return because of the greater attractiveness of these vehicles to passengers, new zero emission vehicles are unlikely to attract higher passenger growth than new conventional diesel vehicles. However, while operators currently require financial support towards the price differential, different approaches to the provision of Government financial support[xxxii] and different financing solutions and models[xxxiii] may help to reduce this differential.

Based on a business case that is mainly dependent on environmental and health benefits, as well as any wider economic benefits associated with the technological advances required to achieve decarbonisation, the value for money of further Government financial support is at best unclear under current appraisal criteria. In addition, at a potential total cost of a further £50 million to £100 million in addition to the funding already announced, it is unclear whether this recommendation would be considered affordable by the Scottish Government.

3. Public Acceptability

Decarbonisation of the bus network is anticipated to be acceptable to the public and wider stakeholders as a result of the consequent improvements in local air quality and contribution to the net zero target.

3.4. Statutory Impact Assessment Criteria

1. Strategic Environmental Assessment (SEA)

Low Scenario	High Scenario
+	+

This recommendation would likely result in positive effects on the SEA objectives related to reducing greenhouse gas emissions (Objective 1) and improving air quality (Objective 3), particularly in relation to the achievement of a reduction in transport related emissions,

as it seeks to reduce emissions from buses through decarbonisation / use of alternative fuels (electric, hydrogen). The recommendation would also have a positive effect on the sustainable use of the transport network (Objective 8) as it promotes a more sustainable use and management of the existing transport network. It would also have a positive effect on quality of life as a result of encouraging sustainable access (Objective 4) and a move away from diesel engines to alternatives such as electric and hydrogen, which could help reduce noise and vibration (Objective 5).

There are possible positive effects on water (Objective 10), biodiversity (Objective 11) and soil (Objective 12) as a result of a reduction in diffuse pollution on key receptors; however, the significance of these effects is uncertain at this strategic stage.

It is considered that there would be negligible effects on the remaining SEA objectives.

Overall, 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
0	0

Decarbonisation of the bus network is likely to have a limited impact specifically on those with protected characteristics, although they would benefit from reduced air pollution along with others in society. In addition, the improved vehicle quality may provide a small beneficial impact for those with reduced mobility.

Overall, this recommendation is expected to have a neutral impact on this criterion in both the Low and High scenarios.

3. Island Communities Impact Assessment (ICIA)

Low Scenario	High Scenario
0	0

Decarbonisation of the bus network is unlikely to have a different impact on Island Communities from its impact on other communities, unless the new vehicles are restricted to the more profitable routes and older diesel vehicles are cascaded to the less profitable routes, which could in time result in the latter routes being withdrawn entirely rather than their vehicles being replaced.

By seeking to target the community transport sector through this recommendation, it is hoped that these negative impacts can in part be mitigated so, overall, this recommendation is expected to have a neutral impact against this criterion in both the Low and High scenarios.

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

Low Scenario	High Scenario
+	+

Decarbonisation of the bus network is likely to have a positive impact specifically on children and young people, due to reduced air pollution along with others in society.

This recommendation is therefore 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
0	0

Decarbonisation of the bus network is likely to have a limited impact in terms of tackling inequality, although the improved vehicle quality may provide a small beneficial impact given that the most deprived households are less likely to own a car, so would be more dependent on bus use.

Overall, this recommendation is expected to have a neutral impact on this criterion in both the Low and High scenarios.

References

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[xiii] Greenhouse gas emissions encompass CO_2 emissions
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