

Decarbonisation of transport

July 2020



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Decarbonisation of transport

July 2020



About the Committee

The Committee was established on 28 June 2016. Its remit can be found at: www.senedd.wales/SeneddEIS

Committee Chair:



Russell George MS
Welsh Conservatives

Current Committee membership:



Hefin David MS
Welsh Labour



Vikki Howells MS
Welsh Labour



Helen Mary Jones MS
Plaid Cymru



Joyce Watson MS
Welsh Labour

Mohammad Asghar MS (known as Oscar) was a Member of the Committee during this inquiry and sadly passed away on 16 June 2020.



Mohammad Asghar MS
Welsh Conservatives

The following Member was also a member of the Committee during this inquiry.



Bethan Sayed MS
Plaid Cymru

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Chair's foreword

Although the world has changed beyond imagination since we completed this inquiry, the Minister for Economy, Transport and North Wales told the Committee that Welsh Government is still committed to decarbonisation, and that Covid-19 recovery plans offer an opportunity to drive growth and decarbonisation.

This report reflects evidence received well before the current health and economic crisis, which saw the transport network grind to an almost total halt, and carbon emissions fall significantly. Global daily carbon emissions fell by 17% at the peak of lockdown¹, with almost half of that due to fewer car journeys. The climate emergency hasn't gone away, and the economy must now re-open under new and extremely challenging conditions. In "Leading Wales out of the coronavirus pandemic: a framework for recovery"², Welsh Government recognised the potential opportunities that rapid changes in behaviour could have for decarbonisation:

"It is vital that we seize on the changes which can have a positive impact long into the future, for example, greater use of technology for medical consultations, and to re-evaluate where that technology can enable fewer journeys to be made for work, contributing to our long-term climate targets."

With circumstances changing daily, and in the context of continued social distancing restrictions and people's safety concerns, it's hard to predict how much of the recent changes will stick here in Wales.

As we recover from the pandemic many new and old issues will arise. The hugely reduced capacity on public transport required to achieve social distancing will be a particular problem as active travel is not an option for everybody, and as around 20% of people in the UK do not have access to a car or van³. In urban areas there is a difficult balance to be struck with facilitating more active travel alongside

¹ Source: The Global Carbon Project CO₂ emissions data

² <https://gov.wales/leading-wales-out-coronavirus-pandemic>

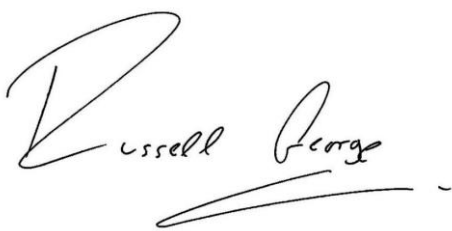
³ www.ethnicity-facts-figures.service.gov.uk/culture-and-community/transport/car-or-van-ownership/latest#main-facts-and-figures

essential private car use. And the work undertaken by the South East Wales Transport Commission to find solutions for congestion on the M4 must also be added into the mix.

On 11 May the Minister for Economy, Transport and North Wales told the Committee: “We’re right on the cusp of being able to develop an integrated transport system in Wales, and I don’t want to see that destroyed because people are not using it, because people are discouraged from using public transport”. The Committee shares those concerns.

Before the pandemic, Wales’s rail network was overcrowded and creaking at the seams; the bus sector had seen falling patronage and route closures, taxi and private hire drivers were struggling financially to survive before their trade dried up, and the future of Cardiff Airport and of Wales’ sea ports were under scrutiny. Freight was already a gap in Welsh Government’s plan, and Covid-19 has had a major impact on the freight sector. On top of this the pandemic has thrown the legislative timetable for the Bus Services (Wales) Bill off course and as the initial peak of the virus recedes, uncertainties over post-Brexit arrangements come back into focus. The next Wales Transport Strategy must tackle all these issues and more.

We hope that this report will help contribute to plans underway to create a low-carbon transport network for the post-corona era. The Committee will continue to scrutinise how Welsh Government works with its partners to capture the positive benefits for decarbonisation.

A handwritten signature in black ink that reads "Russell George". The signature is written in a cursive style with a large initial 'R' and a long horizontal stroke at the end.

Russell George MS

Chair, Economy, Infrastructure and Skills Committee

Recommendations

Recommendation 1. The Welsh Government should outline for the Committee what consideration it is giving to energy and grid capacity issues for running fully electric vehicle fleets in Wales and how is it building that into the Welsh planning system, and to provide assurances about its sustainability plans for managing the procurement and circular recycling of electric batteries. Page 16

Recommendation 2. The Welsh Government should update the Committee on the latest position with its plans for the EV infrastructure network and when it intends to publish its EV strategy. Alongside information on charging infrastructure the Welsh Government should also clearly set out its approach to ensuring taxi / PHV and bus operators themselves adopt EVs by the Government’s target date of 2028. Page 21

Recommendation 3. The Welsh Government should keep the Committee updated on the level and expected impact of its support to local authorities in response to Covid-19 for “pop-up measures” to encourage safe active travel and discourage private car use, and how it will monitor and evaluate success. Page 21

Recommendation 4. Welsh Government should update the Committee on plans for, and progress with, the development of UK-wide specifications, standards and long-term cost modelling for low-emission EV technology to be deployed in Wales. The Committee would also like to be informed about how Welsh Government will share its plans with Welsh transport operators, to build confidence for investment in new technology. Page 22

Recommendation 5. The Welsh Government should outline its latest thinking on the comparative cost effectiveness of retrofitting newer diesel buses to EVs as opposed to replacing all fleet with new electric vehicles by 2028, and whether it will consider retro-fit as part of its decarbonisation plans going forward.Page 26

Recommendation 6. The Welsh Government must undertake detailed consultation with the community transport sector on its decarbonisation agenda and targets, and set out a clear plan for providing appropriate and sustainable support to the sector for vehicles, infrastructure and operations. Page 27

Recommendation 7. The Welsh Government should outline how decarbonisation targets are taken account of as part of its Covid-19 emergency response to support bus operations, and how it will capitalise on any benefits

accruing from the current and future arrangements with operators and partners.
..... Page 30

Recommendation 8. When the Welsh Government is in a position to set out how its legislative priorities for transport will be taken forward now, in light of Covid-19, it should provide the Committee with an analysis of the implications for its decarbonisation agenda, including outlining any non-legislative measures that might be necessary..... Page 30

Recommendation 9. The Welsh Government should provide the Committee with more detail of plans and timescales for reforming the taxi/PHV licensing regime, and how it is working with local government and other partners to ensure the sector remains viable post Covid-19, and to keep decarbonisation plans on track..... Page 33

Recommendation 10. The Welsh Government should tell the Committee what is being done to support Muslim drivers in the Taxi/PHV sector to obtain suitable Sharia-compliant loans for lower emission vehicles, whether via the Development Bank of Wales or other means..... Page 33

Recommendation 11. The Welsh Government should provide more detail to the Committee of how it plans to address freight transport as part of its decarbonisation plans, and how it will fit into the forthcoming Wales Transport Strategy. Page 38

Recommendation 12. The Welsh Government should ensure that its strategy for freight includes consideration of a) pilot projects aimed at creating future-proofed low carbon distribution networks, b) how to identify and influence decision-makers to reduce emissions from cross-border road freight movements and c) how it will seek to influence consumer and e-commerce behaviour..... Page 38

Recommendation 13. The Welsh Government should task Transport for Wales with providing more detail on how the goals and milestones set out in its Sustainable Development Plan and Low Carbon Impact Strategy are being monitored and how often it will be publishing progress reports. Page 44

Recommendation 14. The Welsh Government should set out how Cardiff Airport fits into its plans for a low carbon transport network, how it will be included in the Wales Transport Strategy and the next iteration of the Low Carbon Delivery Plan, and what its expectations are for the decarbonisation of the airport in the short and long-term (including any targets)..... Page 49

Recommendation 15. The Welsh Government should undertake further authoritative analysis of the evidence provided by Cardiff Airport about the relative benefits of flying over rail transport for domestic journeys, and explain how this fits with their plans for supporting and promoting low carbon transport modes.

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1. Overview

Decarbonisation of transport is a huge policy area. The Committee undertook broad consultation with stakeholders before agreeing its focus based on evidence received.

Evidence-gathering

1. The Committee is grateful to all those who contributed to its inquiry. It received 27 written responses to its consultation⁴ from a range of organisations and two individuals. Oral evidence was taken at meetings held on 23 October and 7, 13 and 27 November 2020. Those giving oral evidence are listed at Annex A, and written evidence is listed at Annex B. Meeting transcripts and webcasts can be found on our website⁵

2. The report also takes account of committee scrutiny of the Draft National Development Framework⁶ on 21 November 2019, and Ministerial scrutiny of Welsh Government's Draft Budget 2020-21⁷ on 9 January 2020. On 12 February 2020 the Committee was briefed by Lord Burns on the work of the South East Wales Transport Commission⁸ to tackle congestion on the M4, whose recommendations will also be crucial to the decarbonisation agenda.

Devolution Context

3. The devolution settlement for transport has an impact on the levers available to Welsh Government to deliver its decarbonisation targets. Key areas such as regulating motor vehicle standards and Vehicle Excise Duty remain reserved, with similar limitations for rail. Rail infrastructure planning and funding is the responsibility of the UK Government. While port policy and port development have been devolved for harbours wholly in Wales (with the exception of Milford Haven – defined as a 'reserved trust port' by the Wales Act 2017), shipping remains reserved with standards agreed internationally. And while the Welsh Government owns Cardiff Airport, aviation, air transport and airports and aerodromes remain

⁴ <https://business.senedd.wales/mgConsultationDisplay.aspx?id=357&RPID=1017897845&cp=yes>

⁵ <https://business.senedd.wales/mgIssueHistoryHome.aspx?IId=25649>

⁶ <https://record.assembly.wales/Committee/5716>

⁷ <https://business.senedd.wales/ieListDocuments.aspx?CId=446&MId=5946&Ver=4>

⁸ <https://business.senedd.wales/ieListDocuments.aspx?CId=446&MId=6084&Ver=4>

reserved matters and civil aviation standards are agreed internationally. Finally, 'technical specifications for fuel or other energy sources or processes for use in road, rail, marine, waterway or air transport' remain reserved matters following the 2017 Act. Given these restrictions, UK Government policy in relation to transport decarbonisation will have a significant impact on Welsh transport emissions.

2. Targets

4. The UK Committee on Climate Change (UK CCC) advises the UK Government and devolved administrations on emissions targets and reports to Parliament on progress annually. Its latest report showed surface transport as the largest emitting sector in the UK, accounting for 23% of UK emissions.

5. Overall emissions in Wales fell by 13% in 2017. This included emissions from surface transport falling by 1%, and shipping by 8%. However, between 2012 and 2017, emissions from surface transport had increased by 5%, emissions from aviation went up by 10%, and emissions from shipping decreased by 16%.⁹

6. In May 2019, the UK CCC published advice on long-term targets for greenhouse gas emissions and the UK's transition to a net-zero carbon economy. It recommended a net-zero target for the UK as a whole by 2050, and Scotland by 2045, compared to 1990 levels. However, it recommended that Wales legislate for 'at least a 95% reduction' by 2050, suggesting this was a 'fair contribution' to the UK target reflecting specific Welsh circumstances, including the prevalence of heavy industry and agriculture. Despite this, the Minister for Environment, Energy and Rural Affairs subsequently stated that while the Welsh Government intends to legislate for a 95% reduction, it has an ambition to achieve net zero by 2050.

The Road to Zero - UK Government policy

7. The UK Government's 'Road to Zero' strategy, published in July 2018, aims to put the UK at the forefront of the design and manufacturing of zero emission vehicles, and for all new cars and vans to be zero emission by 2040. Its UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations committed to end the sale of new conventional petrol and diesel cars and vans by 2040.

8. The strategy sets out policies across a range of areas, including reducing vehicle emissions and driving uptake of clean new vehicles with grant support; a 100% ultra-low emission public sector fleet by 2030; measures to reduce HGV and freight emissions and develop an ultra-low emission truck standard; investing in skills for design, manufacture and repair of zero emission vehicles; investment in EV charging infrastructure including local authority support for taxi-charging infrastructure; and a £48m ultra low emission bus scheme.

⁹ www.theccc.org.uk/publication/reducing-uk-emissions-2019-progress-report-to-parliament/

Welsh Government Policy

9. The Welsh Government’s ambition for reducing transport emissions is set out in “Prosperity for All: a low carbon Wales”¹⁰ with a number of policies and proposals aimed at reaching the target of reducing transport sector emissions by 43% from baseline levels by 2030. The policies include increasing active travel and use of public transport, behavioural change measures for modal shift, using planning policy to promote sustainable and less frequent travel, increasing the proportion of electric and ultra-low emission vehicles and investing in EV charging infrastructure.

10. Specific policies aim to reduce the carbon footprint of buses to zero by 2028 (Policy 52); to reduce the carbon footprint of taxis and private hire vehicles to zero by 2028 (Policy 53); and to reduce transport emissions (Policy 54) through a range of actions including a Clean Air Zone Framework, considering the impact of 20 mph speed limits and introducing new rolling stock. There are also proposals to ensure all new cars and light goods vehicles (LGVs) in public sector fleet are ultra-low emission by 2025, and where possible all heavy goods vehicles (HGVs) are ultra-low emission by 2030, and to promote decarbonisation of private sector fleet.

Achievable or too ambitious?

11. There was no clear consensus from written evidence as to whether Welsh Government’s targets are achievable and sufficiently ambitious. Some suggested the targets do not go far enough if Wales is serious about its declaration of a climate emergency and achieving its decarbonisation ambition. Others suggested that, in the (pre-Covid-19) policy context - i.e. taking account of the state of available technology and other factors such as congestion and limited powers over aviation and shipping - the targets were too ambitious, and unlikely to be met without radical action.

12. The Confederation of Passenger Transport (CPT) Wales suggested that the emissions targets for buses were “extremely high” and questioned whether they were at all achievable in the stated timescale without “immediate and considerable investment”.¹¹ It expressed concern over a lack of detail and costings to accompany the policies and proposals”.¹²

¹⁰ <https://gov.wales/prosperity-all-low-carbon-wales>

¹¹ Written evidence

¹² Paragraph 16, Economy, Infrastructure and Skills Committee, 11 November 2019

13. The Low Carbon Vehicle Partnership (LCVP)¹³ highlighted that the targets proposed do not yet deliver the revised UK Climate Change Act target for net zero in 2050 (UK) or 95% in Wales – and achieving the desired reduction by 2030 would require additional actions to those described in the plan: “we’re probably going to have to go faster than is suggested at the moment”.¹⁴ The Welsh Local Government Association (WLGA) said that broadly local authorities have welcomed the Welsh Government’s approach, but echoed concerns about the deliverability of some of the targets and the process to achieve them, saying they were “expressed in aspirational language with little detail on how they will be delivered and, in some cases, how they could be delivered”.¹⁵

14. Green Alliance also pointed to four “critical” gaps in the plan. Chaitanya Kumar of Green Alliance said that a wider and more equitable distribution of the benefits of electric vehicles and electromobility was really important, as half of all private EVs are owned and operated by the wealthiest 20 per cent, whereas the bottom 20 per cent owns about 4 per cent: “you’re effectively subsidising electric vehicles for the benefit of the rich.”¹⁶ He also said there was insufficient policy detail about the implementation of clean air zones; of how to implement the ambitious target for the bus fleet by 2028; and on how to provide the up-front cost support needed for low carbon forms of transport:

“...it’s high capital cost, low operational cost. So, once you actually procure the asset, then running it is far cheaper and easier. So, policies that actually support the reduction of the upfront cost of owning an asset—of purchasing an asset—become very important.”¹⁷

15. Some evidence, including from Living Streets Cymru¹⁸, suggested that the targets do not go far enough to discourage people from using high polluting forms of transport, or set out clear ambition around active travel. The Federation of Small Businesses (FSB)¹⁹ said that achieving these targets will require policies that allow small firms to embrace decarbonisation as an issue and seek to capitalise

¹³ Written evidence

¹⁴ Paragraph 9, Economy, Infrastructure and Skills Committee, 23 October 2019

¹⁵ Written evidence

¹⁶ Paragraph 12, Economy, Infrastructure and Skills Committee, 23 October 2019

¹⁷ Paragraph 15, Economy, Infrastructure and Skills Committee, 23 October 2019

¹⁸ Written evidence

¹⁹ Written evidence

on the environmental and productivity opportunities presented by the green growth agenda.

16. The Institution of Civil Engineers (ICE) Wales²⁰ emphasised that the 2028 target may be considered ambitious for buses and taxis, given the long operating life of the existing fleet. Whilst welcoming the targets, the Community Transport Association (CTA)²¹ suggested that its operators might switch from minibuses to multiple low emission cars/MPVs, as these are cheaper and easier to acquire, but that this increase in vehicles and reduction in communal journeys would mean a negative impact on congestion.²²

17. The Minister for Economy, Transport and North Wales said the targets were “hugely ambitious” but he was confident they were achievable, pointing to the incredible pace at which technology was moving. He said that the UK CCC indicated Welsh Government was on course to meet the targets in its first plan, but that the second plan due in 2021 would contain more detail using a robust evidence base that was being developed. He also pointed to the development of a matrix tool for well-being. The Minister also said that he was pushing more Welsh Government delivery elements across to TfW in order to “create space for more policy considerations”.²³

18. The Minister confirmed that the second 2021 plan would include a costed delivery plan, details of specific actions, funding sources, detailed targets and monitoring arrangements, although noting funding for rail had already been set out, and that an EV charging strategy would come earlier, in 2020.²⁴

19. The Minister said that Government had levers for change via Vehicle Excise Duty, but as this was a regressive tax the UK Government would need to work out soon what to do about the decreasing revenues from this as electric vehicle ownership accelerates. He said Welsh Government was already looking at what further can be done in the devolved arrangements to incentivise the switch to electric.²⁵

²⁰ Written evidence

²¹ Written evidence

²² Written evidence

²³ Paragraph 251, Economy, Infrastructure and Skills Committee, 27 November 2019

²⁴ Paragraph 257, Economy, Infrastructure and Skills Committee, 27 November 2019

²⁵ Paragraph 272, Economy, Infrastructure and Skills Committee, 27 November 2019

Clarity on what decarbonisation means

20. Andy Eastlake of LCVP stressed the importance of differentiating between reducing tail-pipe emissions and decarbonisation as a wider goal. Electric vehicles have zero-tail-pipe emissions and don't generate carbon, but there is also embedded carbon from the production and recycling of vehicles, and decarbonisation of the energy used for transport must also be considered:

“the principles of lifecycle approach, lifecycle assessment, to vehicles and transport, I think, is definitely something that we will need to adopt far more widely as we go forward.”²⁶

Energy Capacity and Sustainability

21. The Committee explored concerns about renewable energy sources and the capacity of the grid to cope with a move to fully electric fleets. Morgan Stevens of CPT Wales asked: “Can the grid cope if, all of a sudden, all the vehicles in Wales were electric?” ...“can the power companies cope with that extra demand at night, when predominantly those electric vehicles will get charged? Will there be any issues on their side?”²⁷ Rhiannon Hardiman of Living Streets also raised concern that electrification of vehicles would not just be displacing carbon.²⁸

22. The Committee also has concerns about the need for sustainable procurement of raw materials for electric vehicle batteries, and the recycling of those batteries for electric vehicles at the end of their life. The Minister recognised these as “really important concerns and considerations” to be dealt with, along with the lifecycle carbon considerations for production of vehicles and fuels.²⁹

Recommendation 1. The Welsh Government should outline for the Committee what consideration it is giving to energy and grid capacity issues for running fully electric vehicle fleets in Wales and how is it building that into the Welsh planning system, and to provide assurances about its sustainability plans for managing the procurement and circular recycling of electric batteries.

²⁶ Paragraph 18, Economy, Infrastructure and Skills Committee, 23 October 2019

²⁷ Paragraph 52, Economy, Infrastructure and Skills Committee, 7 November 2019

²⁸ Paragraph 40, Economy, Infrastructure and Skills Committee, 13 November 2019

²⁹ Paragraph 283, Economy, Infrastructure and Skills Committee, 27 November 2019

What further government support is needed?

23. A key message from evidence, particularly regarding the bus industry, is that financial support is needed from Government to facilitate a shift to sustainable transport. The Future Generations Commissioner's 10 point plan to fund Wales' climate emergency said £240 million should be allocated in the Welsh Government's 2020/21 budget, to:

- Increase investment for active travel – a minimum of 10% of the transport budget (20% of the capital budget) should be allocated for funding walking and cycling infrastructure - £60 million
- Increase funding for public transport – at least 50% of the Welsh Government's transport capital budget should be allocated to improving public transport across Wales - £150 million; and
- Encourage uptake of low emission vehicles – approximately £295 million is required by 2030 (approximately £30 million per annum) which could be met by a mixture of public and private investment.

24. These recommendations are supported by Living Streets Cymru. Sustrans welcomes the ambition set out Welsh Government's plan, but wants further detail on how it is going to fund them. Renewable UK Cymru suggests that transport should be afforded a distinct portfolio within Cabinet, in order to provide greater accountability between Transport for Wales (TfW) and the Welsh Government. The importance of consistent and dedicated application across the whole of the Welsh Government was also highlighted by the Chartered Institute of Logistics and Transport (CILT).

3. Funding models and best practice

25. A range of funding priorities and approaches were suggested, including leasing arrangements and pay-as-you-save schemes where utility companies procure batteries and infrastructure and agree a tariff with the operator to provide the electricity. Green Alliance suggested the Bus Services Support Grant (BSSG) could then be modified to ensure payment of the operational fee for the electricity³⁰ Morgan Stevens of Newport Transport said it was entering into a service level agreement to lease batteries for its electric buses, an arrangement which helped the operator spread the risk attached to degradation of batteries over time.³¹

26. Green Alliance pointed to rebate or subsidy mechanisms for electric vehicles based on income, to address problems with inequity of distribution, and the LCVP also supported “more progressive means testing”.³² Green Alliance also supported recommendations the Committee made in its 2019 report on Electric Vehicle Charging Infrastructure³³ about ensuring adequate funding through both public and private finance, saying public-private partnerships were important,³⁴ and innovative business models to implement technology were as important as the technology itself.³⁵

27. Andy Eastlake of LCVP said that Scotland’s separate bus fund had been “quite successful”, but there were some factors critical to the success of any fund. ‘Stop-start’ funding pots could be a problem - he advocated an ongoing funding strategy with a clear, progressive exit strategy to prevent a “cliff-edge”.³⁶

28. Cardiff Community Energy proposed a low or zero interest revolving loan fund from Welsh Government to support the purchase of electric buses and charging infrastructure for Air Quality Management Areas with repayments structured to equal savings in operating costs. It also said expertise should be made available to help operators apply for electric bus loans.³⁷

³⁰ Paragraph 38, Economy, Infrastructure and Skills Committee, 23 October 2019

³¹ Paragraph 158, Economy, Infrastructure and Skills Committee, 7 November 2019

³² Paragraph 30, Economy, Infrastructure and Skills Committee, 23 October 2019

³³ <https://senedd.wales/laid%20documents/cr-ld12782/cr-ld12782%20-e.pdf>

³⁴ Paragraph 42, Economy, Infrastructure and Skills Committee, 23 October 2019

³⁵ Paragraph 63, Economy, Infrastructure and Skills Committee, 23 October 2019

³⁶ Paragraph 46, Economy, Infrastructure and Skills Committee, 23 October 2019

³⁷ Written evidence

29. The UK Government currently runs an ultra-low emission bus (ULEB) scheme to improve uptake of low and ultra-low emission buses (LEB and ULEB), reduce the need for subsidy, and improve air quality. Successful bidders to the scheme announced in February 2019 included support for 53 ULEB buses to operate in Wales. LCVP said that public support to help move forward on charging infrastructure for buses, as well as taxis and other fleets, was critical: “so that we can sweat those assets very, very aggressively”.³⁸

30. James Price of TfW believed that “Everything is possible, the technology exists”³⁹ but that the biggest challenge was around finance and ensuring incentives for bus operators to invest in the right technology and be able to afford to do that. He said there was a big role for UK Government support for that.

31. The Committee explored sources of funding with local authority representatives. It was acknowledged that the investment needed was significant. Within the existing BSSG there were opportunities to reward operator’s decarbonisation efforts with different levels of subsidy. For charging infrastructure, where the Scottish Government has chosen to invest public funds more heavily, rather than wait for the private sector to intervene, Roger Waters of Cardiff Capital Region (CCR) transport authority said that there were now commercial opportunities to offer public sector land to the private sector as sites for charging infrastructure.⁴⁰ The Minister said that although Welsh Government expected the market to pay first, that “discussions were progressing well” on incentivising deployment of advanced charging points at car parks and railway stations as soon as possible.⁴¹

32. The WLGA also pointed to a role for Welsh Government to provide technical and procurement support to local authorities for public fleet vehicles and infrastructure, perhaps using frameworks⁴² to achieve economies of scale.

Assessing the impact of Welsh Government spending

33. On 9 January 2020 the Committee held a scrutiny session with the Minister and officials on Welsh Government’s Draft Budget for 2020-21 and subsequently

³⁸ Paragraph 55, Economy, Infrastructure and Skills Committee, 23 October 2019

³⁹ Paragraph 198, Economy, Infrastructure and Skills Committee, 27 November 2019

⁴⁰ Paragraph 144, Economy, Infrastructure and Skills Committee, 13 November 2019

⁴¹ Paragraph 274, Economy, Infrastructure and Skills Committee, 27 November 2019

⁴² Paragraph 96, Economy, Infrastructure and Skills Committee, 13 November 2019

recommended⁴³ Welsh Government provide far greater clarity on how its budget allocations support decarbonisation and the policies and proposals set out in its low carbon delivery plan, as well as on cross-departmental work and investment in active travel infrastructure and behavioural change programmes. The Committee also sought more clarity on the rationale behind investment in Cardiff Airport, and the evidence base for the economic benefits that accrue.

34. In its response⁴⁴ Welsh Government said assessing the carbon impacts of individual investments was “not always a straightforward process”, and it would assess the incremental impact when it was “appropriate and meaningful”. It rejected setting out individual budget allocations, pointing to the cross-cutting nature of its decarbonisation actions. It did say it would “endeavour to provide the Committee with clear evidence and examples of how the portfolio expenditure contributes the achievement of the aims in the low carbon plan,” and that the development of the next low carbon delivery plan will “set out the detail of how key policies will allow us to meet our carbon budget, providing clarity and certainty to businesses and individuals”.

35. On 21 May 2020 the Minister for Economy, Transport and North Wales announced Welsh Government ULEV transformation fund grant allocations to local authorities worth £1.9 million for decarbonisation schemes.⁴⁵ The Minister added that officials were working with local authorities to further develop applications valued at over £6 million, which “need to be refined before we can allocate funding support”. The Minister said the grants represented the first investments under the £29 million ULEV transformation fund, and that “further investments to support our ambitions for zero emission buses, taxis and private hire vehicles, and to increase charging points for electric vehicles are being developed”. The Committee looks forward to seeing further announcements as those plans are developed.

36. The Committee welcomes support for a range of infrastructure projects in different parts of Wales from the ULEV transformation fund. However, in light of the likely impact of Covid-19 on taxi and PHV drivers and operators income, and

⁴³ <https://senedd.wales/laid%20documents/cr-ld12987/cr-ld12987%20-e.pdf>

⁴⁴

<https://business.senedd.wales/documents/s99445/Welsh%20Government%20Response%20to%20the%20Recommendations%20from%20the%20Economy%20Infrastructure%20and%20Skills%20Committ.pdf>

⁴⁵ <https://gov.wales/written-statement-local-transport-grants-and-ultra-low-emission-vehicle-transformation-fund>

also that of bus operators, it would welcome further information from the Minister about how targets for procurement of electric taxis/PHVs and buses themselves can now be met.

37. In response to the Covid-19 crisis, on 7 May the Deputy Minister for Economy and Transport opened a two week expressions of interest exercise for local authorities to introduce temporary measures to improve the safety and conditions for sustainable and active travel modes in their area. The call was for “low-cost, high-impact imaginative measures” that could be quickly introduced, as well as interventions to “reduce the impact and reliance on car journeys”. The Committee welcomes this response to the challenges of Covid-19 for the transport network, in light of the need for social distancing, and significantly reduced capacity for, and confidence about use of, public transport. As the Deputy Minister said, “we have a chance to do things differently”.

38. The long term impact of the pandemic on the transport network in Wales, and the extent to which behaviour change and modal shift will be sustained, is still very unclear. Weekly tracking of attitudes to public transport by passenger watchdog Transport Focus⁴⁶ indicates that people are cautious, and many say they will walk, cycle and drive more, so there is a risk that the main modal shift may be back towards private car use. It will be important for Welsh Government funding in response to Covid-19 to align with longer-term decarbonisation targets.

Recommendation 2. The Welsh Government should update the Committee on the latest position with its plans for the EV infrastructure network and when it intends to publish its EV strategy. Alongside information on charging infrastructure the Welsh Government should also clearly set out its approach to ensuring taxi / PHV and bus operators themselves adopt EVs by the Government’s target date of 2028.

Recommendation 3. The Welsh Government should keep the Committee updated on the level and expected impact of its support to local authorities in response to Covid-19 for “pop-up measures” to encourage safe active travel and discourage private car use, and how it will monitor and evaluate success.

⁴⁶ www.transportfocus.org.uk/research-publications/publications/how-do-people-feel-about-returning-to-travel/

4. Technology

39. LCVP called for a UK-wide approach to technology and the specifications - for clean air zones, grants and low emission vehicles - as well as for standards. Defining vehicle standards, against which funding would be predicated, would allow manufacturers some stability and economies of scale.⁴⁷

40. LCVP also said greater clarity was needed from Government about longer-term costs, for example around taxation/duties and road user charging, giving operators confidence about future financial and economic models so that they can make informed choices to buy-in to new technology.⁴⁸

Recommendation 4. Welsh Government should update the Committee on plans for, and progress with, the development of UK-wide specifications, standards and long-term cost modelling for low-emission EV technology to be deployed in Wales. The Committee would also like to be informed about how Welsh Government will share its plans with Welsh transport operators, to build confidence for investment in new technology.

Fully electric vs hybrid vehicles?

41. On whether to go fully electric or move to hybrid car technology first, Andy Eastlake of LCVP said it was a question of pragmatism, and getting as near to the zero emissions goal as quickly as possible by encouraging people to “plug in as much as possible”.⁴⁹ As research shows 98% of car journeys are less than 50 miles and a relatively small battery is needed, he suggested the issue was how to remove barriers to uptake caused by people’s perceptions about charging, range and added charge time for longer journeys.

42. The LCVP also noted that in city centres, using 1kWh of electricity would displace “probably twice or three times as much fuel” as on the motorway, “so encouraging plug-in hybrids with zero emission city centre regimes was the right way forward”.⁵⁰ With regard to the push for all-electric vehicles, Green Alliance also noted that although a lot of people had been incentivised to buy plug-in hybrids in the past, they had not necessarily been running them on the electric motor.

⁴⁷ Paragraph 44, Economy, Infrastructure and Skills Committee, 23 October 2019

⁴⁸ Paragraph 34, Economy, Infrastructure and Skills Committee, 23 October 2019

⁴⁹ Paragraph 73, Economy, Infrastructure and Skills Committee, 23 October 2019

⁵⁰ Paragraph 74-75, Economy, Infrastructure and Skills Committee, 23 October 2019

5. Road-based public transport

Funding the move to electric bus fleets

43. The main barriers to decarbonisation of the bus industry were identified as the cost of vehicles and charging infrastructure. Green Alliance noted that the bus emissions reduction target for Wales sets a stronger indication for electric buses than any UK policy, but said that given the high capital costs for zero emission bus models, it would like to see cost estimates for the transition, and how Welsh Government intends to fund it.⁵¹ Morgan Stevens of CPT Wales said that the 2028 target was achievable “with a lot of funding to assist operators to do that”.⁵²

44. Many respondents from the bus industry and user groups expressed concern about the significant up-front capital costs of upgrading fleets, and the depot charging infrastructure and supply connection required. CPT Wales pointed out that electric vehicles (EVs) are currently priced at around a 100% premium to a standard Euro VI diesel vehicle, and changes to depot layout may be needed to allow simultaneous charging of the whole fleet – at an estimated cost for a 50 vehicle depot of £1.5-2 million. Bus Users UK said:

“The admirable objective of a zero emission fleet being achieved by 2028 is extremely unlikely unless significant Welsh Government funding is provided to meet extra costs this would require.”⁵³

45. Cardiff Community Energy argues that the lifetime costs for zero emission buses and taxis are already close to their diesel equivalents, with the higher capital cost of EVs being offset over their lifetime by lower costs for fuel and maintenance. It recognised however that the high capital cost of EVs and charging infrastructure was a barrier to adoption.⁵⁴

46. Chaitanya Kumar of Green Alliance made the point that cost-effectiveness depended on heavy usage: “you have to really run those assets”, and so bus use would need to see an uplift to maximise cost benefits, whereas the trend in Wales has been falling bus patronage.

⁵¹ Written evidence

⁵² Paragraph 16, Economy, Infrastructure and Skills Committee, 11 November 2019

⁵³ Written evidence

⁵⁴ Written evidence

47. On 9 May 2019 the Minister for Economy, Transport and North Wales told the Committee during general Ministerial scrutiny that almost £10 million had been drawn down by bus companies from the UK ultra-low emission fund, but conceded that “we are going to have to work very closely with the sector and with UK Government to ensure that we meet that target”, and that there was also a very important role for the Development Bank of Wales (DBoW), which had been asked to look at how it could support the transition to zero emitting buses and taxis and private hire vehicles.⁵⁵ CPT Wales told the Committee that any assistance from the DBoW would be greatly welcomed by the industry.⁵⁶

48. CPT Wales referred the Committee to the CPT bus strategy for England, where operators will pledge to purchase only next generation ultra-low or zero emission buses from 2025 (from 2023 in some urban areas). The strategy recognises that to deliver this pledge the industry needs a commitment from Government to support the extra cost of LEV/ULEV vehicles until prices progressively align with comparators and where the range can match that of diesel, to obviate the need for extra vehicles; to provide rapid charging infrastructure at transport hubs; and to acknowledge that with today’s technology, not all bus routes will be able to be converted to EV operation, and some may have to rely on ultra-low emissions diesel, bio-gas or other fuels.

49. CPT Wales said that not all the incentives available in England were available in Wales, e.g. Better Bus Areas and green bus funding, and that more were needed. They noted that in Scotland the equivalent of the BSSG gave operators an extra 1p per kilometre on the grant for an electric, LEV or ULEV vehicle:

“...there needs to be that incentivisation from Government to operate this, to say, ‘We can help you do this, we can help you deal with the capital costs, as an ongoing incentivisation of keeping those vehicles on the road.’⁵⁷

Lifecycle costs of existing fleet

50. CPT UK’s modelling of potential fleet replacement timeframes and costs. shows that delivering on the 2025 pledge will not result in entire fleet replacement by 2028 in England, and suggests the latest Euro VI diesel buses with very low emissions provide the most practical short-term solution for

⁵⁵ <https://record.assembly.wales/Committee/5545>

⁵⁶ Paragraph 158, Economy, Infrastructure and Skills Committee, 7 November 2019

⁵⁷ Paragraph 55, Economy, Infrastructure and Skills Committee, 7 November 2019

meeting clean air strategies and implementing Clean Air Zones. Buses typically have a 15 year life, and CPT Wales suggests it would not make environmental sense to scrap a low emission bus with years of life remaining.

51. Bus Users UK also pointed to the Public Service Vehicle Accessible Regulations, introduced in 2000, when operators successfully argued that the economic life of a bus was 15 years, and that they should be able to use buses until the end of their life. The regulations were amended to reflect this, with exemptions including step entrance vehicles purchased before 2000 which were allowed to operate for a slightly longer period. Bus Users UK said it would expect that operators would seek similar exemptions for existing vehicles, or compensation from the Welsh Government if vehicles must be replaced by 2028 when they still have a number of years of economic life.

Retro-fitting existing diesel fleet

52. The Committee considered retro-fit technology, bearing in mind the long life remaining in existing diesel buses, to convert them to electric operation and allow them to see out their full lifetime. CPT Wales said it could be done, and noted that “a Euro 5 engine vehicle actually produces a lot fewer nitrogen oxides than a Euro 6 car”.⁵⁸ Bus Users UK argued that modern diesel buses, including retrofit of existing vehicles to Euro VI standards, will deliver the reduction in nitrogen oxide and other harmful emissions required, quoting transport expert Professor David Begg.⁵⁹ Professor Begg has warned that if retrofitting diesel buses to Euro VI standards is not supported the impact on bus passengers will be severe, in light of rising operator costs and reducing patronage. He says operators unable to pay the capital costs of replacement vehicles will be “penalised”, and that if retrofit is not supported “the more likely scenario is a combination of fare increases and service cuts”.

53. Green Alliance said that where retrofit had been done in Germany, with the cost subsidised by the German government, according to the company concerned, e-troFit, “the conversion is, on average, 50 per cent cheaper than an electrical brand-new vehicle”.⁶⁰ Green Alliance said the question was how to incentivise and fund that. Cardiff Community Energy suggested that work needs

⁵⁸ Paragraph 59, Economy, Infrastructure and Skills Committee, 7 November 2019

⁵⁹ <https://greenerjourneys.com/wp-content/uploads/2017/04/Improving-Air-Quality-in-Towns-and-Cities-PROF-DAVID-BEGG-Final.pdf>

⁶⁰ Paragraph 51, Economy, Infrastructure and Skills Committee, 23 October 2019

to be done to explore the comparative cost effectiveness of converting newer diesel buses to EVs.

Recommendation 5. The Welsh Government should outline its latest thinking on the comparative cost effectiveness of retrofitting newer diesel buses to EVs as opposed to replacing all fleet with new electric vehicles by 2028, and whether it will consider retro-fit as part of its decarbonisation plans going forward.

Community Transport sector

54. Although CPT Wales said Members had been consulted by Welsh Government on its low-carbon plan, Christine Boston of the CTA said that the community transport sector had not had any formal engagement from Welsh Government,⁶¹ that it was not clear how community transport fitted in, or if the Government's plan applied to Section 22 services.

55. Community transport operators in Wales are often small charities in deprived communities, with limited reserves and few opportunities to fundraise. The amount and types of income that operators can generate is further limited by the regulatory requirement that they cannot make a profit. CTA therefore says support should be available for both installing infrastructure and purchasing electric fleet. It expressed concern that if the costs for upgrading vehicles are unsustainable, community transport operators may have to stop services altogether, leaving those with the greatest need without access to transport and vital services.

56. Many community transport operators use minibuses, and Christine Boston described the cost of electric minibuses as "prohibitive", at 3-4 times more than diesel. The time taken for manufacture, and the demand, were also barriers, as well as the maintenance needs and lack of service centres, Bringing in electric cars was "quicker, easier and cheaper to do,"⁶² although the CTA also recognised the need to focus on encouraging modal shift to group travel.

57. Lack of charging infrastructure and no commercial market in rural areas were also cited as holding back community transport providers and this needs to be addressed, along with the need for access to technical knowledge and practical support. Christine Boston also suggested that retro-fitting might be a solution over trying to go fully electric, and said the sector was being supported to look at the range of ways to reduce carbon.

⁶¹ Paragraphs 30-32, Economy, Infrastructure and Skills Committee, 11 November 2019

⁶² Paragraph 85, Economy, Infrastructure and Skills Committee, 7 November 2019

58. The CTA pointed to the positive development of links between community energy schemes and community transport projects, funded through the Connecting Communities in Wales project. Examples such as Ynni Ogwen in Bethesda and Brechfa windfarm trust and Dolen Teifi were cited, with initiatives ranging from a fleet of electric bikes to wheelchair-accessible community car schemes, car clubs and a ‘dial-a-ride’ pilot. Christine Boston called for “greater exploration of what opportunities there could be and promotion of what’s happening already”.⁶³

59. In terms of a funding model, the CTA referenced the need for the Welsh Government to include the voluntary sector in the development of future schemes, to learn from mistakes elsewhere.⁶⁴

60. The CTA pointed out that not all community organisations were eligible for charitable grants currently available, e.g. community councils, and that there was an opportunity for a public funding stream to support community innovation around transport”.⁶⁵ When the Committee raised the affordability issues for the community transport sector with the Minister he said:

“We recognise that affordability for community transport is an issue. That’s why we’ve got this pilot operating in Pembrokeshire; that will inform whether we can roll it out across Wales. We’d need to carry out an assessment of what the cost of replacing all existing vehicles with electric vehicles would be, or, as an alternative, whether vehicles can be retrofitted with batteries and electric motors, which I certainly wouldn’t rule out.”⁶⁶

Recommendation 6. The Welsh Government must undertake detailed consultation with the community transport sector on its decarbonisation agenda and targets, and set out a clear plan for providing appropriate and sustainable support to the sector for vehicles, infrastructure and operations.

Challenges of topography and terrain

61. Welsh topography and terrain in rural areas present particular challenges for electric vehicles, but LCVP said that there was “plug-in hybrid technology that would enable you to cover the very rural routes, potentially using a low-carbon

⁶³ Paragraph 85, Economy, Infrastructure and Skills Committee, 7 November 2019

⁶⁴ Paragraph 90, Economy, Infrastructure and Skills Committee, 7 November 2019

⁶⁵ Paragraph 150, Economy, Infrastructure and Skills Committee, 7 November 2019

⁶⁶ Paragraph 299, Economy, Infrastructure and Skills Committee, 27 November 2019

fuel so we could decarbonise our bus fleet”.⁶⁷ LCVP also pointed to the emergence of some fully electric coaches “that can cover maybe up to 200 miles”, but noted they had a very large battery and “quite significant charging infrastructure requirements”.⁶⁸

62. Morgan Stevens of CPT Wales also highlighted specific problems in rural areas, where there is significant reliance on very small operators. The nature of the rural operation meant additional ‘positioning mileage’, from depot to the start of the service, “so predominantly rural operators do a lot more mileage” and need technology that can cope with that. There could also be barriers to funding the infrastructure in rural areas to get smaller fleets - maybe 5-6 vehicles - onto low or zero emission technology.⁶⁹

Partnership working, franchising and legislation

63. Partnership working was identified in the evidence as key to the success of decarbonising the bus sector. Prosperity for All: A low carbon Wales refers to the planned proposals to legislate in the Public Transport (Wales) Bill (later introduced as the Bus Services (Wales) Bill), “to improve the effectiveness of bus services including establishing Joint Transport Authorities, Enhance Quality Partnerships, use of franchising, enable local authorities to run their own bus services”.

64. CPT Wales cited a number of examples from across the UK where local authorities and bus operators have worked together to improve bus services and the infrastructure supporting buses. It said these partnership agreements have brought increases in passenger numbers.⁷⁰

65. Issues were raised with the franchising model. The LCVP pointed out the timeframe for route franchises was a problem:

“If those routes are only guaranteed for a few years, getting back your upfront cost over the life of the route can be a challenge. So, maybe longer term franchising on some of these things, where the operating cost-benefits can be realised with confidence over a longer period of time.”⁷¹

⁶⁷ Paragraph 59, Economy, Infrastructure and Skills Committee, 23 October 2019

⁶⁸ Paragraph 59, Economy, Infrastructure and Skills Committee, 23 October 2019

⁶⁹ Paragraph 57, Economy, Infrastructure and Skills Committee, 7 November 2019

⁷⁰ Written evidence

⁷¹ Paragraph 32, Economy, Infrastructure and Skills Committee, 23 October 2019

66. Morgan Stevens of CPT Wales believed that “a partnership approach between national Government, local government and operators can achieve a lot more than maybe franchising can”, explaining:

“Franchising comes at a significant cost to the Government, and also by franchising the bus industry in Wales you don’t remove the problems that operators already have now, including congestion, including funding, including the on-street infrastructure in some areas and things like that.”⁷²

The Role of Legislation

67. In May 2019 the Minister for Economy, Transport and North Wales told the Committee that targets to decarbonise bus, as well as taxis and PHVs, by 2028 would be achievable “provided the reforms that are contained within the White Paper [on Public Transport] are taken forward”. In evidence to this inquiry he reiterated the importance of the reforms, along with funding support, to “take control over emissions” and deliver the step change needed with modal shift:

“...We’ll also be working with the Development Bank of Wales on how innovative funding support can be utilised as soon as possible. We need to discuss with the industry itself the sorts of contracts that are already in place, and how and if they need to be severed or terminated. We need to assess where overall cost of the transition would sit, and how the split in the support would be levelled; to what extent would we get involved; to what extent are costs coming down because technology is advancing at a considerable pace.

But between the legislation, reforms and the money that we already put into the industry, I’m confident that we will have—we will have—significant sway in order to get that transition by 2028.”⁷³

68. The initial White Paper proposals to create Joint Transport Authorities subsequently replaced by proposals for “corporate joint committees” in the Local Government and Elections (Wales) Bill. Following agreement of the general principles of that Bill on 8 April 2020 under emergency Plenary procedures, Stage 2 proceedings began on 9 April, but were then suspended and the deadline extended until 9 October 2020 due to Covid-19. The other measures to expand tools available to local authorities, including introducing Welsh Partnership

⁷² Paragraph 62, Economy, Infrastructure and Skills Committee, 7 November 2019

⁷³ Paragraphs 291-293, Economy, Infrastructure and Skills Committee, 27 November 2019

Schemes and Welsh Franchising Scheme arrangements, were set out in the Bus Services (Wales) Bill introduced on 16 March 2020 but then also paused before Stage 1 scrutiny could begin.

69. James Price of TfW noted that its work around transport modelling was vital to the decarbonisation agenda, but that “pushing the integration agenda” for the transport network was limited by the powers and tools Welsh Government had. He said:

“over time, with some of the powers that the Welsh Government wants to bring through with the Bill it’s taking forward, and some of the other commercial opportunities that we will have, we will be able to influence that...”⁷⁴

70. Alongside uncertainty about the capacity to deliver legislative change in the current circumstances, and the implications of that for decarbonisation, questions also arise about the challenges and opportunities presented by Welsh Government’s decision to step in and provide £29m in support “paid up-front” for bus operators in the face of Covid-19. Does this current new funding arrangement allow Welsh Government greater influence over how services are delivered, in ways that will also contribute to its goals for decarbonisation and an integrated network?

Recommendation 7. The Welsh Government should outline how decarbonisation targets are taken account of as part of its Covid-19 emergency response to support bus operations, and how it will capitalise on any benefits accruing from the current and future arrangements with operators and partners.

Recommendation 8. When the Welsh Government is in a position to set out how its legislative priorities for transport will be taken forward now, in light of Covid-19, it should provide the Committee with an analysis of the implications for its decarbonisation agenda, including outlining any non-legislative measures that might be necessary.

Coaches

71. Evidence from National Express highlighted that low/zero emission technology is not yet available to the coach industry. It says the existing benefits of mass passenger transit, coupled with Euro VI emissions standards, should be fully recognised and maximised. It emphasised the need for Government to

⁷⁴ Paragraph 143-144, Economy, Infrastructure and Skills Committee, 27 November 2019

understand the transport industry and the associated planning and investment required for fleet renewal and replacement to ensure achievable targets and timescales. The need for significant financial support from the Welsh Government was also outlined by Stagecoach, which referred to SMEs operating older fleet vehicles for school journeys and local services.

Taxis and Private Hire Vehicles

72. Although no written evidence was received from the taxi and PHV sector, the Committee took oral evidence from Cardiff Hackney Alliance. Its Chair, Mohammed Abdul Hie, presented a stark view of the challenges of poverty facing the taxi sector that were preventing drivers from switching to zero emission vehicles:

“the income of drivers who are working in Cardiff has gone down by as much as 60%, so some of them are on income support, relying on foodbanks. So we are at a crisis point at the moment.”⁷⁵

73. The Committee heard about progressive moves in cities like London and Nottingham, but also rural areas like Cornwall, to bring in zero tailpipe-emission fleets. Green Alliance point out that higher mileage means the long-term cost benefit of running an electric vehicle is more favourable for a taxi driver than for a private consumer. Andy Eastlake of the LCVP said it was a case of ‘sticks and carrots’ - with grants provided but also a role for the licensing regime to drive change. The LCVP was asked whether Welsh Government removing taxi and PHV licensing reform from its legislative proposals would prevent taxis being part of the wider decarbonisation agenda, but it suggested legislation was not essential: “Typically, we want to be moving faster than legislation is able to move”.⁷⁶

74. The Committee heard that, although drivers were overwhelmingly supportive of reforming outdated legislation to bring in national standards, enforcement and a common database, licensing reform and resolving cross-border issues was necessary before drivers could switch to zero emission vehicles. Cardiff Hackney Alliance wanted to see the recommendations from a UK Government Task and Finish Group⁷⁷ chaired by Professor Mohammed Abdel-Haq implemented first,⁷⁸

⁷⁵ Paragraph 19, Economy, Infrastructure and Skills Committee, 7 November 2019

⁷⁶ Paragraph 82, Economy, Infrastructure and Skills Committee, 23 October 2019

⁷⁷

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/745516/taxi-and-phv-working-group-report.pdf

⁷⁸ Paragraph 22, Economy, Infrastructure and Skills Committee, 7 November 2019

saying if that was done then the 2028 target would be achievable.⁷⁹ The Chair of Cardiff Hackney Alliance said that the industry was already struggling to meet the target to introduce Euro 6 vehicles by 2021, and had been pushing back on that target:

“At the moment we’re struggling to make ends meet, and I think this is what the Government needs to understand. We’re at breaking point at the moment with these things.”⁸⁰

75. The Committee had represented the views of the taxi and PHV sector to Welsh Government in its response to the White Paper on Public Transport, and challenged the Minister for Economy, Transport and North Wales on why the sector had not been included in the Bus Services (Wales) Bill. He explained that it would have been a “monumental challenge” within the time available to legislation, but that Welsh Government was working with the WLGA on “proposals to improve safety, the environment, accessibility, customer experience” as well as look at cross-border working. Dewi Rowlands of Welsh Government said it was looking to work with the industry to achieve “quick wins”.⁸¹ The Minister subsequently wrote to the Committee about the plans for a new regime to address issues including “the impact of licensed vehicles on the environment”.⁸²

76. Roger Waters of Cardiff Capital Region’s transport authority said the typical age of the approximately 6,500 vehicles affected in South Wales was up to about seven years, so if the funding was made available the upgrade could be supported over a fairly short cycle,⁸³ and that could be replicated across Wales.

77. The Minister said that Welsh Government was considering whether additional incentives needed to be offered above the £7,500 grant offered by the Department for Transport, but also pointed out that the lifetime cost of ownership between electric and diesel vehicles was almost at parity, and with new products coming onto the market, stringent EU regulations driving change, and ‘cascading’ of used vehicles, more electric or electric hybrid vehicles would be available.

78. Mohammed Abdul Hie told the Committee that the grants offered to the industry to switch to electric vehicles must be more realistic to act as an incentive,

⁷⁹ Paragraph 188, Economy, Infrastructure and Skills Committee, 7 November 2019

⁸⁰ Paragraph 22, Economy, Infrastructure and Skills Committee, 7 November 2019

⁸¹ Paragraph 313, Economy, Infrastructure and Skills Committee, 27 November 2019

⁸² <https://business.senedd.wales/documents/s96882/EIS5-01-20P1%20Letter%20from%20the%20Minister%20for%20Economy%20and%20Transport.pdf>

⁸³ Paragraph 90, Economy, Infrastructure and Skills Committee, 13 November 2019

and for many a bank loan was not a viable option.⁸⁴ It was also important to recognise that as many drivers are Muslim, interest-based loans would be a hindrance to switching to owning electric vehicles: loans need to be available on a Sharia-compliant basis.

Recommendation 9. The Welsh Government should provide the Committee with more detail of plans and timescales for reforming the taxi/PHV licensing regime, and how it is working with local government and other partners to ensure the sector remains viable post Covid-19, and to keep decarbonisation plans on track.

Recommendation 10. The Welsh Government should tell the Committee what is being done to support Muslim drivers in the Taxi/PHV sector to obtain suitable Sharia-compliant loans for lower emission vehicles, whether via the Development Bank of Wales or other means.

⁸⁴ Paragraph 130, Economy, Infrastructure and Skills Committee, 11 November 2019

6. Freight

79. Cardiff Business School (CBS) and the LCVP said that the freight sector was one of the hardest to decarbonise. Although Euro 6 emissions standards for heavy vehicles were delivering good air quality performance, LCVP said decarbonising the HGV sector was “proving very challenging”.⁸⁵ There were no clear answers yet on the best approach - all of the options would require “significant infrastructure” investment, but in the meantime investing in moving the current fleet to a very low carbon fuel was the best way forward (e.g. methane or biomethane). Sally Gilson of the Freight Transport Association (FTA) pointed out that many hauliers were relatively small businesses and the cost of procuring less polluting vehicles represented a significant investment for them. She said some kind of scrappage incentive would be helpful, although it was noted that for a move to electric vans the infrastructure needed to be in place too.⁸⁶

80. CBS and the Chartered Institute for Logistics and Transport (CILT) both expressed concern that Prosperity for All: A low carbon Wales contains little mention of freight transport in its proposed policy interventions. CBS said the aim should be to decarbonise logistics, not just freight transport, in any strategies that are developed. It suggested steps should be taken to reduce the amount of goods consumed and the length of supply chains, and transport planning must take account of the trade-offs between different decarbonisation measures, e.g. emission zones in urban areas may deter shopping trips, but increase freight transport to deliver products to more locations.

81. Introducing emission zones not suited to HGVs may also necessitate multiple deliveries using LGVs and increase congestion. Sally Gilson of the FTA said: “instead of let’s just say a medium-sized lorry that can carry about 10,000 kg, the equivalent of that would be 10 vans. Well, that’s not the impact that you want to have”.⁸⁷

82. Professor Robert Mason pointed out that long-haul transport accounted for the biggest share of emissions in the road freight sector, where action is needed at UK and EU level, and Professor Andrew Potter said that for cross-border

⁸⁵ Paragraph 86, Economy, Infrastructure and Skills Committee, 23 October 2019

⁸⁶ Paragraph 275, Economy, Infrastructure and Skills Committee, 7 November 2019

⁸⁷ Paragraph 230, Economy, Infrastructure and Skills Committee, 7 November 2019

movements the challenge was for Welsh Government to identify the decision-maker in the supply chain to influence, which was often not the logistics provider.

Home delivery and local distribution networks

83. Professor Robert Mason said a forward-thinking strategy was needed that recognised the competitive and changing nature of e-commerce, and that there was scope to “de-couple” the supply chain to use lower emission vehicles locally for “last-mile” journeys. The LCVP said electrification of city centre operations was vital, and although there were some good examples of electric fleets for urban distribution, many companies used un-regulated third party agents.

84. A more “constructed and planned approach” was needed to regulate the home delivery distribution network, and both the LCVP and Cardiff Business School said consumers must also be encouraged to change behaviour. LCVP said the impact of increasing home deliveries has not been costed particularly effectively. This is now an even more significant issue as a result of societal changes brought about by Covid-19.

85. The LCVP saw an opportunity at Government level to pilot solutions such as consolidation centres like those used in the Netherlands, and to “demonstrate what model will work, going forward”.⁸⁸ Sally Gilson of the FTA noted that although consolidation centres had not worked particularly well in other parts of the UK, the possibility was being considered as one of the measures to tackle congestion on the M4 corridor.⁸⁹

86. Professor Andrew Potter pointed out that some light goods vehicle movements were under local authority control, and so Welsh Government could have a role to encourage the purchase of electric vehicles by local government, “and maybe help them get the infrastructure in place to support other operators too”.⁹⁰

87. CBS also suggested introducing traffic restrictions and revised taxation targeted at easing congestion at rush hours. Joint planning and operating of public and freight transport, with the public and private sectors working more closely together, should also be considered, .e.g. using spare capacity in private and/or public passenger transport journeys to move parcels ordered through home delivery or click-and-collect distribution channels. There might be particular

⁸⁸ Paragraph 90, Economy, Infrastructure and Skills Committee, 23 October 2019

⁸⁹ Paragraph 244, Economy, Infrastructure and Skills Committee, 7 November 2019

⁹⁰ Paragraph 214, Economy, Infrastructure and Skills Committee, 7 November 2019

scope for this in rural parts of Wales where it would have less impact on timetabling, if the infrastructure and resources could be put in place around it. As well as past precedent for this, it was noted that the rail route from Cornwall to London is currently used to transport fresh produce.⁹¹

88. CBS suggested that the Welsh Government’s vision for the decarbonisation of transport was not sufficiently innovative (particularly in freight and logistics), and that there was a greater need for imaginative solutions:

“We believe the traditional segmentation of considering passenger and freight transport as completely separate entities could be challenged, as there will be increasing opportunities for these two networks to operate synergistically together with an improved sustainability outcome.”⁹²

89. CBS offered a number of suggestions for reducing emissions from road freight, including: enhancing driving standards and styles; increased use of routing software and telematics to increase efficiency of ‘just-in-time’ supply chains by having fuller vehicles; using buses instead of trucks for low volume movements; use of hybrid passenger/freight vehicles; and use of alternative fuels, with consideration to corresponding infrastructure requirements. Professor Andrew Potter said that other economic aspects of logistics, such as warehouse development, should also be included in Welsh Government’s strategy.⁹³

90. As far as other technological advances for freight, Professor Potter identified potential problems with electric trucks due to battery size, and safety issues with use of overhead wires. Fully autonomous vehicles were further in the future, but he saw “platooning” of trucks, like ‘road trains’, so that some vehicles in the platoon could travel autonomously using less carbon, as more of a possibility in the next 15-20 years.⁹⁴ Sally Gilson of FTA was sceptical about platooning being possible on the M4 any time soon, but did highlight the immediate cost-benefits to telematics software for affecting driver behaviour and reducing fuel consumption, with businesses then able to divert those savings into vehicle improvements.⁹⁵

⁹¹ Paragraphs 300-312, Economy, Infrastructure and Skills Committee, 7 November 2019

⁹² Written evidence

⁹³ Paragraph 223, Economy, Infrastructure and Skills, 7 November 2019

⁹⁴ Paragraph 288, Economy, Infrastructure and Skills, 7 November 2019

⁹⁵ Paragraph 291, Economy, Infrastructure and Skills, 7 November 2019

91. The Green Alliance called for more clarity on what type of technology is likely to cover HGVs, as the UK wide debate on zero carbon HGVs covers battery electric, hydrogen and direct electric alternatives. It says that as there is a lack of strategy on HGVs in the UK as a whole, ambitious deployment by Wales could influence the national debate and give Wales a competitive lead, bringing economic opportunities with the new technology. The Mineral Products Association (MPA) Wales suggested that it is too early to say with certainty when zero emission HGVs will be available and become the market norm, suggesting this target should be revisited in future years as vehicles develop and the market evolves.

92. The MPA also suggested there should be sufficient time for an investment cycle between ultra-low emission HGVs coming onto the market and becoming the only models allowed. It said incentivising businesses to switch earlier than they otherwise would is probably where Government can have its greatest impact.

93. The FTA also pointed out that with Brexit negotiations still underway, the possibility of future tariffs, of around 16% for vans and 22% for HGVs, would “drive a coach and horses” through plans for take-up of Euro 6 vehicles.⁹⁶

94. Professor Potter said that if the future relationship with the EU led to congestion at Holyhead and less HGV traffic going through North Wales, the negative economic impacts of that would also have a perverse positive impact on carbon levels. It was noted that if Brexit led to changes to freight routes from Ireland, with as small as a 5% change in freight traffic, that might also make a rail link from Holyhead more viable in the future.⁹⁷

Road vs rail for freight?

95. Professors Mason and Potter said that whereas in other parts of Europe 80% of rail freight travelled on fully electrified rail, decisions on modal shift from road to rail in the UK were affected by the cost of full electrification, and had to be weighed up against the time it might take to move to electric trucks.

96. Andrew Kluth of the RSSB said that currently diesel was the only alternative to electrification to run freight across the rail network, and that was likely to be the case for some time, but he pointed to the National Infrastructure Commission’s recommendation to electrify key rail freight routes as part of an integrated freight network, “because that was, in their view, the most effective way

⁹⁶ Paragraph 323-326, Economy, Infrastructure and Skills Committee, 7 November 2019

⁹⁷ Paragraph 330, Economy, Infrastructure and Skills Committee, 7 November 2019

of moving certain types of freight.⁹⁸ He also said the Advanced Propulsion Centre, a research and development group looking at automotive technology, and the Rail Industry Association, have been engaging on ideas for improvements to heavy-duty rail freight and heavy-duty HGV freight transmission. The Minister told the Committee:

“we will look at stretching all opportunities available for moving freight by the most sustainable method before we accept that it must be moved by heavy goods vehicles on our roads.”⁹⁹

97. The Committee received evidence about many important steps that could be taken to decarbonise freight transport. It recognises that many policy levers are not devolved, and moving freight from road to rail in Wales is hampered by lack of powers over infrastructure. However, the fact that the Welsh Government’s delivery plan does not currently cover freight at all, along with the fact that the “current” Wales Freight Strategy¹⁰⁰ is now more than 12 years old, is a fundamental problem. There is no vision or plan for how Welsh Government could lead the way in trialling solutions, or even a clear indication of what its priorities might be in working in partnership at UK level.

Recommendation 11. The Welsh Government should provide more detail to the Committee of how it plans to address freight transport as part of its decarbonisation plans, and how it will fit into the forthcoming Wales Transport Strategy.

Recommendation 12. The Welsh Government should ensure that its strategy for freight includes consideration of a) pilot projects aimed at creating future-proofed low carbon distribution networks, b) how to identify and influence decision-makers to reduce emissions from cross-border road freight movements and c) how it will seek to influence consumer and e-commerce behaviour.

⁹⁸ Paragraph 235-246, Economy, Infrastructure and Skills Committee, 13 November 2019

⁹⁹ Paragraph 336, Economy, Infrastructure and Skills Committee, 27 November 2019

¹⁰⁰ <https://gov.wales/wales-freight-strategy>

7. Rail

98. Green Alliance suggested that a target for electrifying rail would ensure emissions reduction from existing trains, and reviewing where new lines could go would incentivise greater connectivity¹⁰¹. It also suggested there should be developments in the rail network to connect more isolated areas, particularly in the south west of Wales.

99. ICE Wales supported the Welsh Government’s ambition to increase travel by rail. It suggested that the renewal of aged rolling stock, improved passenger information and ticketing and service improvements (journey time and frequency) will help to achieve this ambition, providing fares do not rise excessively.

The technology

100. In its 2017 report, *On the right track? The Rail Franchise and South Wales Metro*, the Committee explored the potential of alternative fuels (such as hydrogen), rolling stock and electrification. Trials of hydrogen fuel cell trains for passenger operation have taken place in Germany, but are not yet underway in the UK.

101. Angel Trains explained that despite the potential of hydrogen there are significant barriers to commercial roll out: its energy density means it cannot currently be used to power fast intercity type trains or heavy vehicles, including freight. Use of hydrogen is also constrained by current regulations that restrict gas powered trains from passing through a tunnel longer than 1km, limiting use across the rail network, and the volume of fuel storage required on board to keep a train in service for one day without refuelling is a challenge.¹⁰²

102. In evidence to this inquiry, Green Alliance noted the high cost element of electrification, but that on the busiest lines it was the most cost-effective option. The added challenge for reaching net zero by 2040 or 2050 is the average life span of a train, of 30-35 years: “we haven’t got a lot of time to make that transition in rail either”.¹⁰³

103. Angel Trains say a wide range of rolling stock solutions will be needed to accelerate decarbonisation across the UK’s rail network. At this stage, battery-only

¹⁰¹ Written evidence

¹⁰² Written evidence

¹⁰³ Paragraph 92-93, Economy, Infrastructure and Skills Committee, 23 October 2019

trains are not a viable replacement for diesel or electric trains. However, with hybrid technology, batteries can enable trains powered by electricity, a diesel engine or a hydrogen fuel cell to make short journeys without another power source. Angel Trains is involved in a project to deliver the industry's first hybrid technology with the conversion of a Diesel Multiple Unit (DMU) to battery hybrid drive. The key environmental and passenger benefits include a reduction in diesel engine exhaust emissions, switching off engines in stations and other sensitive areas, and significant improvements in fuel economy. An additional benefit of upgrading existing vehicles is the avoidance of the embedded carbon used in constructing new vehicles. Angel Trains said:

“We believe the hybrid approach has a crucial role to play as a bridging technology that reduces the emissions from today's trains, with no infrastructure requirements, and without the carbon and energy cost of renewing a fleet before it is life expired.”

Developments in Wales

104. Angel Trains said that rail is one of the lowest carbon transport modes in Wales, and suggested there is a clear economic opportunity for the sector to become a world leader in developing and delivering low carbon rail solutions, as well as passenger benefits.¹⁰⁴ Matthew Prosser of Angel Trains said that investments in technology would have a significant impact on modal shift.¹⁰⁵

105. Transport for Wales (TfW) plans to electrify the Valleys lines will result in lines powered with 100% renewable energy. Together with new rolling stock, it suggests this will result in a 25% reduction in carbon emissions across the rail network.¹⁰⁶ TfW said that the new DMUs being introduced on the network will have the capability for the diesel engine to be replaced with a hybrid power system, or other innovative systems. TfW Rail Services will establish a dedicated innovation centre to ensure developments will be monitored as technologies mature.

106. James Price set out TfW's high-level decarbonisation targets for rail, of 100 per cent carbon free for traction and other power on the Metro, 50 per cent of which coming from Wales, and a 30 per cent reduction target for the rest of the network when the new fleet comes in. He explained it was only 30 per cent

¹⁰⁴ Written evidence

¹⁰⁵ Paragraph 228, Economy, Infrastructure and Skills Committee, 13 November 2019

¹⁰⁶ Written evidence

because of the non-electrification of the remaining Network Rail asset, which meant a diesel fleet, but outlined how TfW Rail Services had “tried to keep all options open for the future, depending on where hydrogen technology goes, depending on where battery technology goes, and depending on where overhead electrification goes”.¹⁰⁷ New units had been procured with the requirement that it would be possible in future to convert them to new, lower carbon technologies.

Policy development and funding

107. Angel Trains said that to finance, deliver and enhance trains that are fit for the future there needed to be a long-term policy and funding framework, agreed by government and industry, that provided clarity of vision and deliverable timescales. Policy and regulatory certainty, increased research and development funding, and targeted government support and incentives will be required to take rolling stock solutions from trial to commercial production, and to accelerate the UK’s transition to a low carbon railway.¹⁰⁸

108. The Committee discussed the July 2019 report¹⁰⁹ published by the UK Government’s Rail Industry Decarbonisation Taskforce (RIDT) with Matthew Prosser of Angel Trains and Andrew Kluth from the Rail Safety and Standards Board (RSSB), which led the taskforce’s work. The RIDT was tasked with proposing how to remove diesel only trains from the network by 2040 and to develop a vision as to how the rail industry could decarbonise across traction, property and infrastructure.

109. The RIDT report says the rail industry has made incremental improvements but that the rate of change is “not anywhere near fast enough”. Traction is the single biggest source of carbon and where the greatest change is possible within the 2040 target date. The report makes five strategic recommendations “to provide a clear goal, robust and consistent leadership and a framework for innovation”. They include committing the railway to operational targets that move it “well beyond business as usual”; for Government to set out a clear policy position that defines the expectation of rail to deliver net zero carbon through a suitable mix of traction technologies, and outline how this will be delivered through public procurement and specifications. The report also makes recommendations for

¹⁰⁷ Paragraphs 155-160, Economy, Infrastructure and Skills Committee, 27 November 2019

¹⁰⁸ Written evidence

¹⁰⁹ www.rssb.co.uk/en/Research-and-Technology/Sustainability/Decarbonisation/Decarbonisation-our-final-report-to-the-Rail-Minister

different industry elements to all set out their plans and to have a clear research plan.

110. Andrew Kluth said that “if we’re going to produce the most effective solution across the UK...it’s going to take a great deal of co-operation between all of the regions of the UK, both in policy terms but more so in technical implementation terms”.¹¹⁰ He said the RSSB had good engagement with TfW, and there was “increasing awareness of the need to manage...the local and national priorities in a sensible manner”. Working at pace to support that process would help realise the long-term ambitions for decarbonisation.¹¹¹

111. The RIDT report recommends that the Williams Rail Review, still to report, should ensure that any future industry structure enables and incentivises the move towards zero carbon. This should clarify where the responsibilities lie for target setting, R&D, monitoring and regulation. Andrew Kluth said there was an opportunity for Welsh Government to “give policy support and guidance” to support innovation, like the deployment of community-generated renewables in Wales, citing the Green Valley Lines research project, which was putting Wales at “the cutting edge”.¹¹²

112. The Minister for Economy, Transport and North Wales said he expected to be part of the UK Government’s work to develop a plan in response to the RIDT report, but the outcome of the Williams Review in terms of the extent of devolution of powers and funding is crucial:

“If we did have the full devolution that we ask for, including the funding, then we could go much further in terms of decarbonisation of the rail network....we could improve infrastructure, and we could develop new railway lines, we could open existing, or redundant, railway lines, we could open new stations. We could resolve some of the issues on the existing rail network that are curtailing the ability to be able to carry freight on the rail network—for example, the heights of bridges and the gauging challenges that are preventing us from carrying high loads on trains. We’d be able to look at how we could get into the mix freight with passenger transport as well.”¹¹³

¹¹⁰ Paragraph 272, Economy, Infrastructure and Skills Committee, 13 November 2019

¹¹¹ Paragraph 273, Economy, Infrastructure and Skills Committee, 13 November 2019

¹¹² Paragraph 227, Economy, Infrastructure and Skills Committee, 13 November 2019

¹¹³ Paragraph 315, Economy, Infrastructure and Skills Committee, 27 November 2019

113. Simon Jones of Welsh Government went on to explain the importance of having flexibility and choice over further electrification, and to do things that would “potentially broaden the reach of the railway” to encourage further modal shift.¹¹⁴ Welsh Government’s Dewi Rowlands added that without control over infrastructure there was a big risk of Wales being “left behind with this transformation”.¹¹⁵

Decarbonisation of rail property and infrastructure

114. The longer lifecycle of rail property, depots and station infrastructure is a challenge but Andrew Kluth highlighted “great opportunities” through renewal programmes, in particular replacing heating and lighting energy requirements with locally generated renewables, e.g. solar panels, air source heat pumps, better insulation and battery storage: “in principle, that should be something you’d be able to do across a lot of your stations throughout Wales”. Other areas to look at included ticket machines, ticket offices, concessions and IT server equipment. Techniques such as BREEAM (the Building Research Establishment environmental assessment method) should be applied not just to the capital build, but also in tracking operations. The RIDT report recommends mandating this in future for projects above a certain size.

115. James Price of TfW said work on stations included microgeneration, storage of locally generated electric in batteries for use later on, rainwater harvesting, photovoltaic panels, green walls and other initiatives. The Green Dragon carbon footprint assessment tool is applied to all stations: Gareth Morgan of TfW said all stations would be Green Dragon level 3, and depots Green Dragon level 5. New stations would be constructed to the CEEQUAL environmental standard measuring carbon and waste, and travel planning for depot staff was also being conducted.

116. James Price thought the biggest carbon impact would not be from stations but from driving modal shift to a public transport network that people wanted to use. On some parts of the network there was huge pent-up demand, but in other quieter parts, e.g. the Welsh Marches, work would need to be done to encourage behaviour change.

117. The Committee welcomes Transport for Wales’ plans to decarbonise the rail network, and the fact that it has published a Sustainable Development Plan

¹¹⁴ Paragraph 318, Economy, Infrastructure and Skills Committee, 27 November 2019

¹¹⁵ Paragraph 325, Economy, Infrastructure and Skills Committee, 27 November 2019

setting out some clear principles of operation, a Low Carbon Impact Strategy 2019/20¹¹⁶, and intentions regarding active travel. The Committee would welcome being kept updated on how the goals and milestones set out in both the plan and the Low Carbon Impact Strategy are being monitored and how often it will be publishing progress reports.

118. James Price of TfW said it was moving as fast as it could (as a new organisation) to meet the decarbonisation targets, but that organisational capacity was an issue and it was fair to challenge its ability to act with pace. He said outcome-based Key Performance Indicators (KPIs) would be set against strategic objectives for modal shift and carbon reduction, and the first iteration of those was likely to be seen as part of the Wales Transport Strategy.¹¹⁷ The Committee also welcomes the existence of break points in the rail franchise agreement, in years 5 and 10, giving Welsh Government the opportunity to increase TfW's decarbonisation targets to reflect changing circumstances.¹¹⁸

Recommendation 13. The Welsh Government should task Transport for Wales with providing more detail on how the goals and milestones set out in its Sustainable Development Plan and Low Carbon Impact Strategy are being monitored and how often it will be publishing progress reports.

¹¹⁶ <https://trc.cymru/sites/default/files/inline-files/Low%20impact%20carbon4%20english.pdf>

¹¹⁷ Paragraph 149, Economy, Infrastructure and Skills Committee, 27 November 2019

¹¹⁸ Paragraphs 327-331, Economy, Infrastructure and Skills Committee, 27 November 2019

8. Aviation and Shipping

119. The Committee received little written evidence on decarbonising the aviation and shipping sectors, and it is an area with fewer levers for Welsh Government, but Green Alliance noted hydrogen was emerging as “one of the top solutions for decarbonising the shipping sector”.

Shipping

120. Cardiff Business School (CBS) noted that the International Maritime Organisation was bringing in stricter regulation of vessel emissions in 2020, which shipping companies were struggling to meet but which should have an effect in the longer term. CBS said that carbon is not the only issue with shipping, given the fuel type used, and that wider air quality issues need to be considered.

121. CBS said all Welsh ports should be equipped with shore-to-ship power supply so that docked vessels can run on shore supplied electricity rather than running their engines in port. It also suggested the potential for promoting the take up of wind-assisted propulsion by Welsh based or owned shipping should be investigated.

122. The Minister noted the importance of ‘perfectly aligning’ investment in Welsh ports with global standards and developments such as the type of fuels being used.¹¹⁹ He described constructive engagement with UK Government and the Department for Business Energy and Industrial Strategy on its clean maritime plan for zero emissions shipping.¹²⁰

Cardiff Airport

123. Like freight, aviation is also missing from Welsh Government’s low carbon delivery plan. Cardiff Business School said that very limited freight is transported directly from Cardiff Airport, and generally goes in the hold of passenger aircraft, therefore improving passenger transport emissions would have a benefit for air freight emissions. The Committee took evidence from Cardiff Airport on its decarbonisation plans. Deb Bowen Rees, Cardiff Airport’s CEO, said that after

¹¹⁹ Paragraph 344, Economy, Infrastructure and Skills Committee, 27 November 2019

¹²⁰ www.gov.uk/government/publications/clean-maritime-plan-maritime-2050-environment-route-map

safety and security, sustainability was at the top of the aviation sector's agenda and there was a strong commitment to decarbonisation.¹²¹

124. Deb Bowen Rees said the UK and all airlines are signed up to an International Civil Aviation Organization (ICAO) initiative called CORSIA - the "carbon offsetting and reduction scheme for international aviation", which she said set "really stringent" targets. She said that Sustainable Aviation's findings¹²² were that carbon efficiency could be doubled by 2050 relative to 2010, and "By 2050, carbon dioxide emissions are expected to be close to the 2005 levels recommended by the Committee on Climate Change", with the halving of net carbon dioxide emissions by 2050 managed by the CORSIA scheme. The Committee asked if Cardiff Airport could make its emissions data publicly available on its website and was told it would be done, along with a planned 'dashboard' of environmental measures.

125. Evidence from Cardiff Community Energy suggested that short haul electric light aircraft are very close to availability, and Welsh Government should explore the possibility of making the Cardiff to Anglesey air link an electric service (although the service is currently suspended due to Covid-19). Commercial confidentiality about testing prevented witnesses from Cardiff Airport from giving estimated timescale, although along with solar powered aircraft, they said development is "quite advanced". The Minister pointed to the importance of the new Airbus testing facility for new technologies at the Advanced Manufacturing Research Centre in Broughton - he was confident of a rapid transition and wanted to see maximum economic benefit to Wales from that.¹²³

126. The UK Government's long-term Aviation Strategy 2050 will be hugely important to the airport and the Airport had fed into the Green Paper both individually and through its membership of the Regional and Business Airports Group (RABA), but an Aviation White Paper was still awaited at the time of this inquiry, before the massive impact of Covid-19 on the industry.

127. Cardiff Airport's master plan to 2040 encompasses its work with the nearby Enterprise Zone, Vale of Glamorgan council, landowners and other stakeholders to develop sustainably, with sustainable energy, supply, charging infrastructure and a sustainable transport hub.

¹²¹ Paragraph 10, Economy, Infrastructure and Skills Committee, 27 November 2019

¹²² www.sustainableaviation.co.uk/

¹²³ Paragraph 347, Economy, Infrastructure and Skills Committee, 27 November 2019

128. The airports ‘environmental flight path’, a live document to be published on a 3-6 month rolling basis, outlines short, medium and long-term measures to reduce emissions. Mark Bailey said the airport had reduced emissions by 53% in 8 years, and was ahead of others. He pointed to a new electricity contract of 100 per cent green energy, commitment to a healthy travel charter, installing EV chargers into public areas and air side, and using EV vehicles on the airfield. A planned 2 MW on-site solar farm project with Cenin Renewables will generate electricity for the airport, with excess energy either reverting to the grid or stored as technology allows, and incorporating a biodiversity plan to support pollinators. Food waste is also composted on site and recycled locally, and the airport had engaged environmental consultants to look at further climate adaptation measures.

129. Bristol Airport has set a carbon neutral target date of 2025, however Cardiff Airport’s CEO said that Bristol’s plan lacks tangible actions to reach that target, whereas Cardiff has specific projects with targets against them. She hoped its consultants would help to identify a realistic overall target, to be announced between mid-summer and the end of 2020. Deb Bowen Rees also agreed that as the airport was an integral part of the transport network, specific objectives for it should be included in Welsh Government’s low carbon plan.

130. Deb Bowen Rees did not think that the airport’s size or reliance on government support affected its ability to attract and negotiate with operators willing to work in a more sustainable way. She noted that its key airlines had modern fleets, including one that had come out as the most sustainable airline (KLM). It was a factor to take into account when negotiating for routes, but had to be balanced against customer needs.¹²⁴

131. The Airport’s CEO welcomed cross-party support for the devolution of Air Passenger Duty (APD), noting that:

“APD with an environmental tag attached to it would give us a massively powerful lever in terms of attracting the most environmentally efficient airlines to Cardiff and to Wales.... Some people say, ‘How can you square giving APD to Wales if the Welsh Government have declared a climate emergency?’ For me, it makes the argument even stronger, because it enables the Welsh Government to actually do with it what it feels is appropriate in terms of the Welsh context.”¹²⁵

¹²⁴ Paragraph 104-105, Economy, Infrastructure and Skills Committee, 27 November 2019

¹²⁵ Paragraph 111, Economy, Infrastructure and Skills Committee, 27 November 2019

132. The Welsh Government has also been seeking to impose a number of Public Service Obligation aviation routes (PSOs) within the UK, where an operator secures benefits including exclusivity for a period of time and exemption from APD. In May 2018 the then Cabinet Secretary for Economy and Transport indicated that officials were investigating 9 routes – including services to Manchester, Norwich, London and Newquay, and a statement by the Minister in June 2019¹²⁶ indicated Welsh Government frustration at a lack of progress by UK Government on these PSOs.

133. When the ‘elephant in the room’ was raised - whether people should be flying at all - Deb Bowen Rees said the airport needed to grow to provide economic benefit of Wales but in an environmentally sustainable way, pointing to “something like the 2050 forecast growths based on the 2008 carbon forecasts”, i.e. a picture of economic growth without increasing emissions. She said that it was important to look at the issue “holistically”. This led to a surprising assertion that a carbon mode analysis study by the Regional and Business Airports Group (RABA) demonstrated that, in the absence of rail electrification, air travel could, for the Cardiff-Manchester route, be more environmentally friendly than by road or rail.¹²⁷

134. This claim drew significant public interest, and the Committee Chair subsequently wrote to the airport on 31 January 2020¹²⁸ to request the RABA study be put into the public domain. A version of the report was subsequently provided, and published by the Committee on 27 February 2020¹²⁹ alongside an analysis by Transport for Wales.¹³⁰ The letter from TFW’s Chief Executive set out why it was difficult to make comparisons between the different modes of transport, given the assumptions made in the report about load factors, passenger numbers, journey duration and hypothetical route options.

135. Between the conclusion of this inquiry and the onset of the Covid-19 pandemic, the picture for aviation in general, and regional air connectivity in particular, has changed significantly. In response to Covid-19, on 7 April the

¹²⁶ <https://gov.wales/written-statement-welsh-government-response-aviation-2050-green-paper-consultation-public-service>

¹²⁷ Paragraph 100, Economy, Infrastructure and Skills Committee, 27 November 2019

¹²⁸ <https://business.senedd.wales/documents/s98506/EIS5-06-20P1%20Letter%20to%20Chief%20Executive%20Cardiff%20Airport.pdf>

¹²⁹ <https://business.senedd.wales/ielistDocuments.aspx?CId=446&MId=5949&Ver=4>

¹³⁰ <https://business.senedd.wales/documents/s99052/EIS5-07-20P3%20Letter%20from%20Chief%20Executive%20Transport%20for%20Wales%20re%20RABA.pdf>

Minister for Economy, Transport and North Wales announced¹³¹ short term support to help Cardiff Airport, including rescheduling of loan repayments, but stated that “The UK Government has the key lead in supporting the aviation industry and must change its policy towards further financial help for regional airports”.

Recommendation 14. The Welsh Government should set out how Cardiff Airport fits into its plans for a low carbon transport network, how it will be included in the Wales Transport Strategy and the next iteration of the Low Carbon Delivery Plan, and what its expectations are for the decarbonisation of the airport in the short and long-term (including any targets).

Recommendation 15. The Welsh Government should undertake further authoritative analysis of the evidence provided by Cardiff Airport about the relative benefits of flying over rail transport for domestic journeys, and explain how this fits with their plans for supporting and promoting low carbon transport modes.

¹³¹ <https://gov.wales/welsh-government-steps-short-term-funding-support-cardiff-airport-and-calls-change-approach>

9. Modal Shift (planning and local government)

136. When the Committee took oral evidence last November, witnesses were asked about behaviour change away from car use: “is it really realistic to expect people to engage in such a massive cultural change in a short period of time?”¹³² Six months on the possibilities for modal shift are being viewed through a very different lens.

137. Andy Eastlake of the LCVP had welcomed Welsh Government’s clear objectives on modal shift but said there was a need to be “more aggressive”.¹³³ about moving people out of their private vehicles, particularly in city centres. Bus Users UK also suggested Welsh Government should adopt more stringent measures to force change:

“The car is currently king and unless tough political decisions are made to introduce congestion charging and chargeable workplace parking then little will change.”¹³⁴

138. Christine Boston of the CTA agreed people needed to understand that switching to an electric car wasn’t enough: “we need a different sort of campaign that encourages individuals to travel by public transport,”¹³⁵ along with greater focus on segregated cycle lanes and bus rapid transit routes to make it quicker than the car, and greater capacity on public transport.

139. Rhiannon Hardiman of Living Streets commended the ambition in Welsh Government’s plan for modal shift but said there wasn’t any kind of strategy or substance of how it was going to move to that position - she said the Wales Transport Strategy was an opportunity to “really open up the debate” about target setting for active travel that had been missing from earlier plans: “We’re monitoring it, so let’s set some targets against it”.¹³⁶

140. Sustrans¹³⁷ suggested that without the minimum investment of £20 per person per year, Wales will not see the step change needed, and that the current level of funding for behaviour change programmes is insufficient. Public Health

¹³² Paragraph 121, Economy, Infrastructure and Skills Committee, 7 November 2019

¹³³ Paragraph 23, Economy, Infrastructure and Skills Committee, 23 October 2019

¹³⁴ Written evidence

¹³⁵ Paragraph 119, Economy, Infrastructure and Skills Committee, 7 November 2019

¹³⁶ Paragraph 23, Economy, Infrastructure and Skills Committee, 13 November 2019

¹³⁷ Written evidence

Wales (PHW)¹³⁸ said that mass modal shift needs a co-ordinated system that crosses geopolitical boundaries which are often of little relevance to the ways people live, work and play, and also called for greater links between transport and health policy.

141. The WLGA said significant investment in areas such as active travel and the development of the place-making agenda within Planning Policy Wales 10 (PPW 10) have been vital in signalling a change in direction across transport policy, but that some changes will take time to have effect. Greater thought needed to be given to reducing the demand for movement and enabling the societal change required. It emphasised that it is important to know the cost implications of decarbonisation actions for local government and not simply assume the resources can be found, and careful cost benefit analysis is needed to determine if limited resources are better invested in the short term in promoting and delivering modal shift rather than significant investment in hard infrastructure technology which may prove redundant or actually exacerbate the issues.¹³⁹

142. Roger Waters of the CCR's transport authority set out the scale of the problem using Office of National Statistics data on commuting in Wales by car (82%) as opposed to cycling at 2%:

“you’ve really got to accelerate the growth in cycles to something that’s I think beyond our comprehension perhaps at the moment just to match that natural growth in cars.”¹⁴⁰

143. He subsequently provided data and evidence of the link between economic growth and travel demand, arguing that it illustrates the need to better link land use and strategic development planning if decarbonisation objectives are to be met. His evidence illustrated how, in his words, “one year car growth equates to 8.59 years cycle growth” in terms of extra miles travelled. He concluded that “doubling cycle journeys as the main mode of commute would be an exceptional achievement and probably exceeds any credible target, even if all cycling growth transferred from car (unlikely)...[however]...It would only equate to 2.4% reduction in car use – a couple of years traffic growth. Bus and rail each account for 4%”.

144. The issue here is not to understate the importance of cycling in decarbonisation, but to illustrate the scale of the change in travel behaviour and

¹³⁸ Written evidence

¹³⁹ Written evidence

¹⁴⁰ Paragraph 27, Economy, Infrastructure and Skills Committee, 13 November 2019

modal shift required to have a meaningful impact. James Price of TfW also told the Committee that the scale of modal shift needed was much greater than people had thought about in the past.¹⁴¹

145. The Committee believes this would require greater ambition from the Welsh Government at any time, but the challenge is greater still in the light of the potential impact of Covid-19 on public perceptions of public transport. It is too early to know the extent to which cycle commuting will increase as a proportion of total commuter journeys, and how sustained any change will be. The biggest concern, and risk to the public transport sector, borne out by attitude surveys by Transport Focus¹⁴², is that people will start commuting by car again rather than public transport and this will become a long-term habit.

146. Community transport already offers flexible, demand-responsive transport solutions, which CTA suggest offer lessons for the future:

“we need to think about what people want, where they want to go, how they need to get there, and really do something to encourage modal shift, because we talk about it a lot, but I’m not sure the actions have really been taken to make it happen.”¹⁴³

147. Morgan Stevens of CPT Wales agreed that public transport needs to be incentivised, with more efforts to identify “pinch points” on routes and take steps to re-assign road space¹⁴⁴, to improve journey times, and build public transport routes into planning for residential developments from the start, so that people would not default to car use. He felt that there was still more for Welsh Government to do to implement changes following the Committee’s 2017 “Taming the Traffic” report.¹⁴⁵

148. Written evidence from Stagecoach also said there was still not sufficient emphasis on bus priority measures: “The 1985 Act is not to blame for a lack of Welsh Government investment and focus in the area of bus priority”.¹⁴⁶ Roger Waters of CCR’s transport authority said that where bus priority was being done to good effect by local authorities it was having a benefit.¹⁴⁷ He said the biggest

¹⁴¹ Paragraph 232, Economy, Infrastructure and Skills Committee, 27 November 2019

¹⁴² www.transportfocus.org.uk/

¹⁴³ Paragraph 120, Economy, Infrastructure and Skills Committee, 7 November 2019

¹⁴⁴ Paragraph 145, Economy, Infrastructure and Skills Committee, 7 November 2019

¹⁴⁵ <https://senedd.wales/laid%20documents/cr-ld11145/cr-ld11145-e.pdf>

¹⁴⁶ Written evidence

¹⁴⁷ Paragraph 45, Economy, Infrastructure and Skills Committee, 13 November 2019

enemy of bus in urban areas was congestion, as highlighted in the Committee's 2017 report.

149. In considering how to disincentivise private car use and incentivise public transport in the future, Christine Boston's view has particular resonance in today's world of enforced home-working:

“Some people need to use their car, but perhaps we could have, let's say, 30 per cent of people not travelling because actually they don't need to on that day—thinking about how people are working, and maybe they could work differently. We could perhaps have 30 per cent of people who are encouraged and incentivised to use public transport, because we've got a really good system and service that's affordable, accessible and efficient and makes sense for people to use, and then those people who need to drive—there's space on the roads for them to do that.”¹⁴⁸

150. Rhiannon Hardiman of Living Streets welcomed the investment in active travel infrastructure, but said more needed to be done through revenue programmes to encourage and support behaviour change - by taking a whole-community approach to engage and work with communities to address the barriers for people, such as fast-moving 'rat-run' traffic in residential areas and near schools, introducing school parking exclusion zones, tackling dangerous driving and pavement parking, and improved pavement condition for pedestrians.¹⁴⁹ She also stressed that planning for charging point locations must ensure they do not impede pedestrians.

Planning Policy Wales 10 and Land Use Planning

151. Living Streets said the incorporation of active travel and place-making into Planning Policy Wales 10 (PPW10) was a positive move to support the cross-cutting agenda, but that there had been problems in education with the first tranche of the 21st Century Schools programme which had led to children who had walked and cycled to primary school being unable to do so due to longer travel distances.¹⁵⁰ The Committee welcomed the Minister's subsequent commitment, in response to scrutiny of the Draft Budget 2020-21, to update the Committee on work with health and social services to develop joint communication and

¹⁴⁸ Paragraph 140, Economy, Infrastructure and Skills Committee, 7 November 2019

¹⁴⁹ Paragraphs 62-68, Economy, Infrastructure and Skills Committee, 13 November 2019

¹⁵⁰ Paragraph 72-73, Economy, Infrastructure and Skills Committee, 13 November 2019

awareness raising activities, and that 21st Century Schools guidance had been updated “to reflect consideration of active travel access to schools” and a checklist for local authorities was being developed to support that.

152. Craig Mitchell of the WLGA said the changes that PPW10 would lead to in local development plans would be “incremental”, and so initiatives such as that in the Cardiff and Vale Public Service Board by Dr Tom Porter, to look at how employees travel to work, was welcome in trying to reduce the need for transport, e.g. by increased remote working. Roger Waters of CCR transport authority said PPW10 was a step in the right direction, and that strategic development plans and using the transport modelling developed by TfW and Welsh Government: would be helpful across south-east Wales to identify transport impacts and “perhaps, be more selective in allowing which sites come forward to minimise that travel demand”.¹⁵¹

153. James Price of TfW said the modelling had a crucial role to aid land use and transport planning, and that it was developing alternatives to out-dated traditional modelling based on carbon-intensive road-building methodology, which focused on time saved and traffic mortality figures rather than transport interventions to “save the planet and generate economic activity”. Craig Mitchell of WLGA said that there was scope for more ‘front-loading’ of public transport in advance of major developments going in, although noting the cost involved.¹⁵²

154. The Committee raised concerns with the Minister about the time lag before the Strategic Development Plans proposed in the Draft National Development Framework (NDF) would come into effect, and how much collaborative working between local authorities would happen in the meantime. The Minister pointed to the importance of the Corporate Joint Committees proposed in the Local Government and Elections (Wales) Bill to make that regional planning happen.¹⁵³

155. Roger Waters also pointed to the work being done in the South Wales region on “transit-oriented development”, focusing high-density and high-transport-demand around transport hubs, and the promotion via the CCR City Deal of “poly-centric development” of centres outside the capital city, in places like Pontypridd,

¹⁵¹ Paragraph 79, Economy, Infrastructure and Skills Committee, 13 November 2019

¹⁵² Paragraph 55-56, Economy, Infrastructure and Skills Committee, 13 November 2019

¹⁵³ Paragraph 388-389, Economy, Infrastructure and Skills Committee, 27 November 2019

Caerphilly, Cwmbran and Bridgend, to reverse the current trend of everyone travelling into Cardiff and back.¹⁵⁴

156. The Committee noted Welsh Government's work on integrated transport pilots,¹⁵⁵ but asked the WLGA whether there was a need to be even more radical. WLGA said it was still early days for the pilots, and James Price of TFW sounded a note of caution that similar demand responsive pilots elsewhere had failed. He said congestion was still a problem for the system in towns, and integrating it with other modes of transport was difficult. He said this kind of transport solution would need public subsidy, and it was too early to know if the pilots in different parts of Wales would be scale-able.

157. The Minister told the Committee that introducing disincentives to private car use, such as workplace levies, congestion charging, must be accompanied by the provision and the capacity of alternative forms of transport. He said the UK Government needed to look at how it can use the taxation system to tax those journeys that are not absolutely necessary rather than having a blanket tax on all journeys.¹⁵⁶

¹⁵⁴ Paragraph 81, Economy, Infrastructure and Skills Committee, 13 November 2019

¹⁵⁵ <https://gov.wales/minister-announces-responsive-bus-trials>

¹⁵⁶ Paragraph 375, Economy, Infrastructure and Skills Committee, 27 November 2019

10. The Wales Transport Strategy - other considerations

158. The Minister told the Committee that the Wales Transport Strategy (WTS) was due to be published in 2020 but with no indication of a date. In addition to the recommendations already made, the inquiry highlighted some further considerations for the new WTS.

159. The WLGA and the CTA said the new strategy must make a very clear statement that the declaration of a climate emergency and a focus on carbon reduction are fundamental considerations that have shaped it. It must also be developed in the light of the Well-being of Future Generations (Wales) Act 2015 (WFG Act) and the Environment (Wales) Act 2016. When asked about this, in evidence to the Committee in May 2019, the Minister for Economy, Transport and North Wales said: “...the declaration of a climate emergency right at this point couldn’t have been more timely, because it will enable us to ensure that the Welsh transport strategy fully responds to that emergency”.

160. Emphasising the need for cross-Government action, the CILT said the WTS should contain specific wording to ensure that all departments will implement the relevant policies. The WLGA said that any aspect of policy that requires the movement of people or goods should consider the transport and carbon implications of any policy changes, and seek to maximise the emissions reduction. ICE Wales suggested the government needs to adopt a Welsh-led system for rating infrastructure projects based on their overall contribution to the economic, environmental and social aspects of decarbonising Welsh transport infrastructure.

161. A number of written responses, including the WLGA and Green Alliance, highlighted the need for the strategy to go into far more detail than Prosperity for All: A low carbon Wales about the costs, delivery mechanisms, implementation and roles and responsibilities for transport decarbonisation policies and proposals. The CTA emphasised the importance of Welsh Government coordinating with community groups to ensure that those who are left behind by the current transport network have a voice in shaping future transport provision.

162. A key message was that the strategy must focus on the integration of different modes of transport. Public Health Wales emphasised the importance of integrating bus and rail services, Sustrans agreed and said that bus interchanges must also be easily accessible by foot and bike. The CTA said that transport needs to be planned and implemented in a more joined up way, so people are able to

travel seamlessly across different modes of transport. The central role of integrated ticketing was also emphasised.

163. The RTPI supported the continued preparation of local transport plans by local authorities, and suggested this should continue under the new WTS. ICE Wales said the strategy must focus on facilitating modal shift, and Living Streets Cymru said that alternatives to car travel must be realistic, attractive and sustainable.

164. Bus Users UK called for proactive legislative change to support modal shift, suggesting this should include congestion charging and reducing the demand for travel. Renewable UK Cymru suggested that a demand mapping exercise should be a priority for the WTS to inform projections of potential uplifts in power capacity under a variety of scenarios.

165. Angel Trains said the WTS should reflect the significant passenger benefits that alternative fuel rolling stock provide. These include reduced noise and vibration, less air pollution, shorter journey times achieved by increased acceleration, and reduced operating cost resulting from improved fuel economy.

Annex A: List of oral evidence sessions.

The following witnesses provided oral evidence to the committee on the dates noted below. Transcripts of all oral evidence sessions can be viewed on the Committee's website.

Date	Name and Organisation
23 October 2019	<p>Andy Eastlake, Managing Director, Low Carbon Vehicle Partnership</p> <p>Chaitanya Kumar, Senior Policy Adviser, Green Alliance</p>
7 November 2019	<p>Christine Boston, Director for Wales & UK Research and Policy Campaigns, Community Transport Association</p> <p>Mohammed Abdul Hie, Chair, Cardiff Hackney Alliance</p> <p>Morgan Stevens, Confederation of Passenger Transport Wales</p> <p>Professor Andrew Potter, Chair in Logistics and Transport, Deputy Head of Logistics and Operations Management Section (Learning and Teaching), Cardiff Business School</p> <p>Professor Robert Mason, Chair in Logistics, Head of Logistics and Operations Management Section, Cardiff Business School</p> <p>Sally Gilson, Head of Skills, Freight Transport Association</p>
13 November 2019	<p>Andrew Kluth, Lead Carbon Specialist, Rail Standards and Safety Board</p> <p>Craig Mitchell, Head of Waste Support, Welsh Local Government Association</p> <p>Matthew Prosser, Technical Director, Angel Trains</p> <p>Rhiannon Hardiman, Wales Manager, Living Streets Cymru</p> <p>Roger Waters, Service Director Frontline Services, Rhondda Cynon Taf Council</p>
27 November 2019	<p>Deb Bowen Rees, Chief Executive Officer, Cardiff Airport</p>

	<p>Mark Bailey, Director of Airport Planning and Development, Cardiff Airport</p> <p>James Price, Chief Executive Officer, Transport for Wales</p> <p>Gareth Morgan, Safety and Sustainability Director, Transport for Wales</p> <p>Ken Skates AM, Minister for Economy, Transport and North Wales</p> <p>Simon Jones, Director Economic Infrastructure, Welsh Government</p> <p>Dewi Rowlands, Deputy Director, Transport Policy and Strategy, Welsh Government</p>
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Annex B: List of written evidence

The following people and organisations provided written evidence to the Committee. All Consultation responses and additional written information can be viewed on the Committee's website.

Reference	Organisation
01	Confederation of Passenger Transport
02	WLGA
03	Cardiff Business School
04	Angel Trains
05	FSB
06	Transport for Wales
07	RTPI
08	Community Transport Association
09	Renewable UK Cymru
10	National Express Limited
11	Future Generations Commissioner
12	Stagecoach in South Wales
13	Western Power Distribution
14	Individual Response A
15	Institution of Civil Engineers Cymru
16	Living Streets
17	Cardiff Community Energy
18	Individual Response B
19	Public Health Wales
20	Green Alliance
21	Mineral Products Association
22	Bus Users UK
23	Newport Transport Limited
24	Enterprise Holdings

25	Sustrans
26	Chartered Institute of Logistics and Transport
27	Cardiff School of Engineering

Additional Information

Title	Date
EIS(5)27-19(P5) Evidence Low Carbon Vehicle Partnership	23 October 2019
Roger Waters: Action arising from 27 November 2019 meeting	14 November 2019
Craig Mitchell, WLGA: Achieving Net Zero in the City of Edinburgh	13 November 2019
Regional and Business Airports Group Report re Modal Comparison Carbon Footprint Model - EIS(5)-07-20(P2)	27 February 2020
Letter from Chief Executive Transport for Wales to Chair re RABA - EIS(5)-07-20(P3)	27 February 2020