Ending the Sale of New Non Zero Emission Buses

CONFEDERATION OF PASSENGER TRANSPORT

Date of Issue: May 2022

Executive Summary:

- The industry recognises the future of road transport is with zero emission vehicles and remains committed to transitioning to zero emission buses, with the correct government support
- Most large bus operators already have their own zero emission targets in place meaning that from 2025 over two thirds of all new bus purchases in England will be zero emission
- The end of sale date for diesel buses set by government will therefore have the biggest impact on smaller bus operators, especially those who operate marginal and rural services
- Any end date therefore needs to give time for appropriate and affordable solutions for those operators and services to come forward
- Future funding for zero emission buses should be long term and predictable and transition away from bidding rounds to give certainty to operators
- The process for reinforcing the electricity supply for a depot remains overly complex, with significant delays in applications and inconsistencies when engaging with local DNOs
- The impact assessment needs to consider the potential increases in energy and raw material prices as demand increases
- It is not yet clear if the price of zero emission buses will reduce, there is a potential the savings could be reinvested in range improvements instead of being passed on to operators purchasing the vehicles
- Buses and coaches are only responsible for 3% of transport emissions. Whilst zero emission buses will play a role in reducing transport emissions, encouraging people out of cars and onto the bus/coach will deliver significant carbon reductions and will improve the business case to enable operators to invest

About CPT:

We help a dynamic bus and coach industry to provide better journeys for all, creating greener communities and delivering economic growth.

We do this by representing around 900 members from across the industry be they large or small, bus or coach, operator or supplier. We use our influence to campaign for a supportive policy environment, give our members practical advice and support to run their businesses safely, compliantly and efficiently and bring the industry together to share ideas and best practice.

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We are ambitious to make things better for passengers, inclusive in seeking out different perspectives and we are always there when our members need us.

CPT Response

1. What are your views on the approach to end the sale of new non zero emission buses no later than 2032?

The sector recognises that the future of road transport lies with zero emission vehicles and operators are committed to transitioning their vehicle fleets. In our bus strategy *Moving Forward Together* published in September 2019, the industry committed to only buying zero emission or ultra-low emission buses from 2025, provided the right fiscal support was delivered by Government to help cover the higher upfront purchase costs and the required supporting infrastructure. The sector is supportive of the Zero Emission Bus Regional Areas Scheme (ZEBRA) which has provided support to many operators already and enabled them to begin transitioning their fleet to zero emission and operators remain committed to transitioning towards an ultra-low and zero emission fleet.

Large bus operators have voluntarily put in place their own targets for transitioning their fleets to zero emissions;

First Bus have committed to not purchasing any new diesel buses beyond December 2022 and are committed to operating a zero emission bus fleet by 2035. **National Express** have committed to operating a zero emission buses only by 2030, and **Go Ahead** and **Stagecoach** have committed to zero emission bus only fleets by 2035.

We therefore predict that by 2025, over two-thirds of all new bus purchases in England will be zero emission, provided sufficient government funding continues to be available, without the need to set a date.

Any end of sale date will therefore have the biggest impact on smaller bus operators and the rural and marginal services they provide. SME operators cannot afford to purchase zero emission buses and have had limited or no access to the zero emission bus funding that has been provided to date.

Additionally the battery range of fully electric vehicles is not currently adequate for some longer, more rural routes, resulting in the need for additional electric buses to cover the same mileage as their equivalent ultra-low vehicles, which only adds to the financial pressure.

We know that hydrogen vehicles deliver a greater mileage, however for these to be deployed by rural and SME operators, more time is needed to resolve the challenges around the required infrastructure and higher upfront vehicle costs.

Installing the supporting infrastructure at smaller depots and outstations also poses additional challenges. There are not only constraints on available space but also on grid capacity and connection due to being located further away from urban areas. The costs per bus to install infrastructure for rural depots is also higher than for urban depots. If an operator runs 140 buses across 7 depots, the cost to electrify those 7 depots will be considerably more than an operator who operates 140 buses from one urban depot.

It is therefore vital that any government-set end date gives time for appropriate and affordable solutions for rural services to be developed. This will reduce the risk of these services needing to be cut which would leave large numbers of people stranded and goes against the ambitions set out in the National Bus Strategy. Larger operators who, together, are responsible for a large proportion of the country's bus fleet, are already transitioning to zero emission vehicles.

2. What are your views on the proposal to use an approach based on type approval categories?

We agree in principle that using the existing type approval regulation to determine which vehicles would be subject to the end of sale date is appropriate. However, there is a concern that the market for single deck buses is more developed than that for double deck buses.

There are greater range concerns for electric double decker buses due to their increased weight, a typical range for these buses is 150 miles between recharging, and issues around the maximum speed they can achieve. Solutions for these vehicles are therefore likely to take longer.

There is a concern that the introduction of a Zero Emission Vehicle mandate places all the onus onto the manufacturer to sell a proportion of zero emission vehicles. If operators are unable to afford zero emission buses, the manufacturer receives a penalty for failing to sell the specified amount. We appreciate manufacturers could reduce the price to try and incentivise more operators to purchase them, but we are concerned in principle with a model that punishes the vehicle manufacturer in the event the sector has no funds to invest.

3. We welcome further views on the challenges arising from charging and refuelling infrastructure in ending the sale of new non zero emission buses and what more might be needed to address these challenges?

We recognise the government has taken steps to address some of the challenges relating to recharging and refuelling infrastructure. However there are still multiple barriers that exist which are making it difficult for operators to invest in zero emission buses.

Depot Charging Infrastructure Challenges

Zero emission buses have greater space requirements than their diesel counterparts, on average around 25% more depot space is needed per vehicle. The expectation that operators would also need to increase their fleet size to deliver the same level of service due to the limited range of electric buses will only exacerbate the issue.

Bus operators already utilise their available space as efficiently as possible with little to spare. Transitioning their fleet to zero emission could force them to relocate or need to develop new depots which would have huge time and cost implications. Additionally, if this search for more space forces bus operators further outside of the city centre, their dead mileage will increase which in turn reduces their operational range.

Grid Capacity Challenges

As well as increased space, recharging infrastructure requires there to be sufficient capacity in the local electricity grid. A depot of 150 buses will need an electricity connection with at least 11MW capacity, this is the same as powering 1,500 homes.

Operators that are already running zero emission buses who have worked with their local Distribution Network Operators (DNOs) to ensure their depots receive sufficient capacity have found the process to be inconsistent across the UK. This has been identified as one of the primary barriers to introducing zero emission buses into operators' fleets.

The specific challenges with these processes include

- Bus depot requests are not always prioritised which means the response is often slow and without forward planning
- The work is often carried out by many subcontractors which increases the complexity of the process
- The DNOs planning processes do not allow for future planning, which means any capacity is not future proofed for additional zero emission buses purchased later
- The cost estimates given are only valid for limited period, however the planning and development process for introducing zero emission buses is complex and can take anywhere between

12-18 months to make an investment commitment. Often the estimates have expired by this time and operators are required to request a new estimate. There have also been reports of capacity that has previously been allocated to bus depots being allocated to a different party during this time.

The government and Ofgem should review the existing process and introduce a new statutory duty on DNOs that would prioritise grid infrastructure upgrades that will deliver significant social and community benefits. This will ensure that bus depots are moved higher up the priority list and will help to reduce the application process.

Government could provide guidance and encourage local authorities to proactively engage with bus operators through their Enhanced Partnerships to determine the viability of existing depot arrangements and provide support where required – for example ensuring that planning permission is fast tracked if additional space is required.

The government could help rural operators by setting up a taskforce which would bring together key stakeholders to work collaboratively to overcome the challenges to decarbonising rural operations and share best practice.

Streamlining this process will help encourage more operators to invest in zero emission buses and the ability to future proof bus depots and ensure that the future fleet can be supported will significantly reduce the costs and time involved.

Visibility over future government funding streams would help align the process for infrastructure planning and development.

4. What are the challenges to transitioning to a zero-emission minibus fleet?

Minibuses are predominantly used by education establishments, local authorities. to provide community transport but they are also operated by some bus and coach operators. However, they are particularly important to a number of small-group tour operators, some of whom have substantial fleets up to 60 vehicles purely comprising of minibuses. These companies operate minibuses as if they are coaches on scheduled tour itineraries on 1-10 day itineraries. The challenges these companies face in transitioning to ZEVs mirror the same challenges as Coach operators in terms of infrastructure requirements whilst out on tour and lack of commercially available alternatives to diesel variants.

There are currently no options commercially available for this use-case. Given the similarities of issues for these Minibus operators to Coach operators we would propose to match the end sale deadline for new diesel minibuses to that of coaches in 2040.

Impact Assessment Questions-

5. **Do you consider the estimated impacts presented in the Impact Assessment to be reasonable? If not, please specify the changes you would make, noting which assumptions and uncertainties you believe to be incorrect.**

No, we do not believe the modelling in the impact assessment to be a reasonable or realistic, we have provided further information in the points below.

Future of energy prices – previous months have shown just how volatile fuel prices can be, it is therefore important that consideration is given to future fluctuations as much as possible and potential significant increases in fuel costs.

Hydrogen could potentially be used in the future for heating in homes, Heavy Duty Vehicles and aviation. Operators are concerned that this increase in demand for hydrogen could cause the cost of hydrogen to increase due to limited supply and increased competition. However we are aware that offtake agreements have the potential to reduce the cost significantly due to volume confirmation, it is important that the fluctuations in prices are factored into the impact assessment.

The market could see the price of diesel reduce significantly and a potential surplus of diesel created as more vehicles transition away from it. This will increase the business case for diesel and make the case for zero emission buses harder to justify, particularly for smaller operators.

Overall capacity and resilience of the grid – buses aren't the only sector that are transitioning to zero emission vehicles - the ambition calls for the sale of all new non-zero emission road transport to end. In addition buildings such as schools, hospitals, homes and factories will all need to transition to zero emission alternatives. This will have a huge impact on hydrogen supply and electricity capacity, the impact assessment needs to consider the competition for this supply and contingencies in the event there isn't sufficient supply to power buses.

Uncertainty over the future of battery prices – lithium is a vital component of electric batteries and due to the increased demand, its price is increasing. The impact assessment needs to allow for the cost of raw materials required to make batteries to significantly increase over the coming years as demand increases and consider how this will impact the purchase price and midlife costs of an electric bus.

Cost of zero emission buses will fall as demand increases – operators are not convinced that the cost of electric buses will reduce significantly as demand increases. It may be that any savings are reinvested into battery development to increase range, as the car industry has seen.

It was assumed that the price of early hybrid buses would reduce as more operators purchased them, however this was not the case and purchase prices remain high. There is a concern this will be the same for electric and hydrogen buses.

Huge levels of uncertainty remain – there is still a lot of uncertainty over multiple factors, with much of the industry still focused on short term survival following the impacts of the pandemic. We are only just starting to see the Bus Service Improvement Plan funding coming through and are in the early stages of the ZEBRA projects. There is also uncertainty over concessionary fare reimbursement rates and the BSOG review has not yet been launched. The impact assessment needs to factor these in and consider any new data that emerges from these bigger zero emission bus rollouts.

Tendered services – a lot of school buses are funded by local authorities, the capital and running costs of zero emission buses for these services is going to be considerably more than diesel. The impact assessment needs to consider the impact on these services - these services are more likely to be cut if the local authorities can no longer afford them.

6. **How do you expect the upfront cost of:**

    a. **Battery electric buses**
    b. **Hydrogen fuel-cell buses**
    c. **Battery replacements**
    d. **Fuel-cell replacements**
    e. **Electric powertrains to change over the period 2025 to 2032?**

Please provide, or cite, any evidence you may have, or which informed your understanding.

Zero emission buses are significantly more expensive than their diesel counterparts. There is an expectation that increased supplier competition and mass production could potentially reduce the purchase price however experience from the electric car market suggests that this may not be the case. However, volume discounts on key components for both electric and hydrogen fuel cell vehicles can be applied which could bring down the purchase price per vehicle.

Battery replacement – the cost of the battery is the key differential and this cost has not changed.

7. **In the absence of any policy/regulation, what would you expect the uptake of zero emission buses to be over the period 2025 to 2032?**

The bus sector is committed to transitioning towards zero emission, and many operators have company policies that drive the transition to zero emission buses. However, there currently is not a business case for electric buses and this transition is going to be financially and logistically challenging for all operators without continued support.

There is still a lot of uncertainty over the new zero emission technology which means industry are still being cautious. Government needs to lead the industry by setting out a clear pathway that gives certainty over future support and brings together all stakeholders. Manufacturers need the certainty to know they can sell their buses, infrastructure providers need to know where infrastructure and capacity upgrades are needed and bus operators need the certainty that they can continue to deliver their services efficiently.

8. **Do you believe that changes proposed through *Ofgem's Access and Forward Looking Charges Significant Code Review: Consultation* will contribute to reducing the cost of obtaining sufficiently large electrical connections at bus depots?**

Yes, we do believe the proposed changes in Ofgem's report will go some way to improving the process and reducing the significant costs involved for operators needing to increase the electric supply to their depots.

The proposal to spread the costs of network reinforcement between all users will reduce the uncertainty of the costs involved to reinforce the

network and will enable operators to plan their investment more efficiently.

Currently bus operators pay for their connection capacity across a 24-hour period, however zero emission buses typically require significant capacity for recharging between 11pm-5am. Enabling time profiled access choices could reduce operators' connections costs, enabling them to only pay for the increased capacity when required.

The costs of reinforcing the local distribution network are significant and unpredictable, we therefore support the proposal to reduce the overall connection charge for those connecting to the distribution network and offer a standardised option for larger network users.

9. **Do you have any evidence to indicate that additional zero emission buses might be needed on routes, given current and expected technological developments, and if so to what extent?**

Currently, bus operators allocate each bus in their fleet a set of routes to be delivered each day, with buses returning to depot overnight to refuel ready for the next day. This enables them to deliver their services as efficiently as possible with little scope for buses to be out of action for long periods of time.

The battery range of fully electric buses that are currently available do not provide sufficient range for bus operators to continue delivering their routes in this way and would require buses to recharge during the day. It takes 6 hours to recharge an electric bus which is significantly longer than the time needed to refuel a diesel bus, typically under 10 minutes.

The range delivered is also affected by other external factors; driving in stop start traffic and colder temperatures can reduce the level of range achieved.

Operators would therefore require additional buses to enable them to continue to operate the same level of services whilst some vehicles returned to depot to recharge. We estimate that between 5-15% of charging spares would be required but this will vary between urban, interurban and rural routes.

Whilst we anticipate there will be improvements in battery technology over the next 5 years which will yield some increase in range, this is only expected to be incremental. We anticipate the sector is 10 years away from significant improvements in technology that will deliver a substantial improvement capable of delivering the same 350 miles range as a diesel bus.

10. Do you have views/evidence on any potential impact that investment in zero emission buses over the period 2025-2032 might have on patronage and fares?

Research carried out by Stagecoach[1] found that the transition to zero emission buses could significantly increase patronage. If fare prices, frequency and reliability of services remained the same, between 1.03m and 1.7m non bus users said they would be more likely to travel by bus if their usual diesel bus was replaced by a zero emission bus.

11. Providing any evidence, how would you expect zero emission and conventional powertrain purchases to vary in the years prior to the implementation of the end of sales date?

Operators will continue to purchase zero emission buses where possible. Whilst they are more expensive, they recognise that it is the right thing to do and remain committed to transitioning their fleet to newer, greener vehicles. There may be some niche services that would still require a diesel vehicle however most larger operators will be able to manage with their existing fleet where required and do not anticipate needing to purchase a new diesel bus. There may be some contracts where this will not be possible due to fleet age requirements specified in the contract, but operators anticipate being able to purchase a secondhand diesel bus where required for these services.

However, for SME and rural operators where the economics of buying a new zero emission bus do not stack up, continuing to purchase diesel buses may be their only option. We therefore anticipate these operators will continue purchasing diesel buses until they are no longer able to, and for there to be a period directly afterwards where no new buses are purchased. Operators will continue to operate their existing vehicles until the price of zero emission buses reduces and becomes more affordable. There could also be purchases of secondhand hybrid

[1] Road Map to Zero, Stagecoach March 2022

buses until the required refuelling and recharging infrastructure to support zero emission buses is in place in more rural, remote areas.

There are four things that need to be in place prior to the end of sale date for diesel buses for there to be a sound business case for operators to purchase zero emission buses.

- **Green BSOG** needs to continue and the rate increased to at least 26p per km. Whilst the recent increase is welcome and a step in the right direction, 22p per km is not sufficient with the 75% funding provided via ZEBRA for operators to break even due to the significant increases in the costs of electricity, materials and labour. This rate should also be reviewed regularly to ensure it considers any increases in hydrogen and electricity costs as the demand increases
- The ZEBRA funding has been well received by operators and should continue to support the uptake of zero emission buses and the installation of recharging infrastructure. However, a more **predictable, longer term funding solution** is needed to transition away from the need to bid for funding and provide certainty over the amount of funding available and how it will be allocated.
- There needs to be a process in place for **encouraging more passengers on board** and to continue growing passenger numbers to develop a sustainable business model

If a legally binding end of sale date is too early it risks operators backloading the deployment of zero emission buses, with operators all trying to purchase zero emission buses and install infrastructure at the same time and causing capacity challenges for manufacturers and Destination Network Operators. This will not develop the sustainable supply chain required for the successful roll out of zero emission buses.

12. How might you expect the end of sales to effect bus sector and related exports?

We have a flourishing diesel export market but this is based on a strong domestic order book. If this is removed too quickly, it could diminish out ability to export buses.

Assurances would need to be given to British Manufacturers who still produce diesel buses for the international market. Many developing countries are working towards a Euro VI fleet, and there is currently no

Zero Emission market. It is important that these opportunities are protected[2].

13. Providing evidence, if possible, what do you understand the operating lifespan of the following types of vehicles to be?

a. **Diesel buses**
b. **Battery electric buses**
c. **Hydrogen fuel cell buses**

Diesel buses are typically operated between 12-15 years, before they are cascaded down through the fleet to carry out shorter, more urban routes like home to school or are sold on to smaller operators. These buses are then operated for an additional 5-10 years, making the total life of a diesel bus anywhere between 20-25 years.

Battery electric buses are expected to operate for 7-8 years before the battery needs to be replaced and then can continue to operate for an additional 7-8 years, meaning an electric vehicle with the midlife battery change can achieve a similar life to that of a diesel bus.

However, once the second battery is degraded at the end of the 16 years, the body work of the vehicle will be coming to the end of its life and the vehicle would need to be withdrawn from service. We do not expect electric buses to cascade through the fleet in the same way as diesel buses, as it would be difficult for a smaller bus operator to justify. Currently, it does not make economic sense to purchase a second-hand electric bus, invest in a replacement battery and the required recharging infrastructure for a bus that will only be used to run school services.

Hydrogen manufacturers have confirmed these vehicles should deliver an operational life of 21 years, with some finance providers offering a 15 year warranty to operators who want to lease the vehicles, however there is a concern from operators that the life of these vehicles will be closer to 12. There is a significant risk of obsolescence due to the increase in demand for hydrogen from other sectors looking to decarbonise driving the up price of hydrogen fuel to the point where vehicles are no longer sustainable to run. We are aware that fuel cell technology is continuing to develop and the performance of these new buses may be significantly improved in 5 years' time, which has

[2] Alexander Dennis Limited

the potential to further increase the risk of obsolescence, which would leave operators with stranded, expensive assets that are no longer fit for purpose.

Retrofitting may be an option for many operators who find themselves with stranded assets and could provide an option for operators who are unable to invest in newer buses to reduce the emissions of their existing fleet.

14. Please explain your understanding, providing evidence where appropriate, of the costs and barriers relating to the provision of infrastructure for zero emission buses (both hydrogen and battery electric).

The cost of installing electric refuelling infrastructure at a depot is estimated at around £29,000 per bus, this will be dependent on the number of electric vehicles and the location of the depot.
We cover the existing barriers to installing the required electric recharging in our response to question 5.

The cost of installing a hydrogen refuelling station is not a fixed cost and is dependent on the size and technology required- gaseous or liquid. We are also aware that there are other changes that are required at depot, including installation of trickle power points for the fuel cell heaters, ventilation systems to the work bay, hydrogen detection system, emergency hose connections and changes to sockets and lights in the work bay to ensure they are ATEX compliant. These modifications including fees, reviews and updating the DSEAR Risk Assessment total circa £432,000.

15. What impact might the proposed policy have on different population demographics and social groups, particularly those with defined protected characteristics under the Equality Act 2010?

The policy will have the most detrimental impact on services provided to passengers living in rural, more remote areas as these routes are significantly more difficult to electrify which could place services at risk if legal vehicle requirements cannot be met in future.

Rural buses travel longer distances, travel across hilly terrain and their depots are in more remote areas which poses additional challenges for grid connections and infrastructure. This coupled with the constraints of battery range will mean that many services may no longer be feasible.

We are aware that a greater mileage can be achieved with hydrogen buses, however before these are a viable solution for rural operations more time is needed to resolve the challenges around the required infrastructure and the higher upfront vehicle costs.

16. **Please outline your understanding, providing evidence, if possible, of the future apportioning of the bus fleet between hydrogen fuel cell and battery electric buses.**

We anticipate that there will be a mixture of solutions, but most bus operators will opt for electric over hydrogen. Hydrogen is less energy efficient than electric and fuelling a hydrogen bus is currently 20% more expensive than electric. There is the additional concern over how hydrogen is generated and it is not always easy to determine. Hydrogen can be, and often is, generated from fossil fuels and transported on tankers. For hydrogen to be a sustainable option, we need to achieve a green generation and a direct connection into the refuel network.

It is unlikely than an operator will operate both hydrogen and electric vehicles from the same garage due to the high cost of installing infrastructure and space limitations. However, there may be some operators who make the decision across the company to opt for hydrogen for their more rural, remote services as hydrogen delivers a higher range and could lend itself to the routes that will be harder to electrify.

17. **Do you believe that ending the sale of new, non-zero emission buses might cause operators to stretch the operational life of existing non-zero emission buses? If yes, please outline the extent to which you believe this might occur.**

For some operators, stretching out the operational life of their existing non-zero emission buses may be the only option available to them whilst they wait for a zero emission solution that is viable for their operations.

The range achieved by an electric bus is currently not sufficient for rural and interurban bus services which typically travel longer distances than urban services. There are additional challenges for bus depots located in more remote areas in receiving sufficient grid capacity.

For these services, we would expect operators to continue to run their diesel buses for as long as they could to ensure they can continue to deliver services to their passengers.

Additionally, an end of sale date could affect the resale value of a diesel bus, if an operator purchased a vehicle in 2025, and the end of sale date was set at 2030, when the operator comes to replace their vehicle the outgoing diesels value would have significantly reduced. This could mean that operators stick with their diesel vehicles, which would increase the average age of the fleet, or are forced to right off a significant amount of money and a vehicle, which many will not be able to afford to do.

18. In relation to powertrains, how do you expect purchasing decisions to vary in the period preceding any end of sales?

Please refer to our response to question 10.

19. Please outline your understanding of the need, and costs relating to mid-life component replacements for battery electric and hydrogen fuel cell buses.

Electric vehicles are expected to run for between 7-8 years before the battery will need to be replaced. The cost of the replacement is around £100,000 - £150,000 depending on whether the vehicle is single or double deck.

Additionally, there may be strict warranty conditions within the contract which can significantly increase the cost of ownership. In the fourth and twelfth years of operation, the vehicle battery must undergo a comprehensive maintenance check.

The components of an electric vehicle are also significantly more expensive than diesel parts which further increases the maintenance costs.

Hydrogen is more difficult to estimate the mid-life costs as it is a less proven technology, and still very new. However hydrogen vehicles do have a battery and our expectation is that this also would need to be replaced midlife. We are aware that extended warranties on the batteries and fuel cells can offer some certainty to operators where they are provided.

It is worth mentioning that both are new technologies and are still in their infancy. No operator has long term experience with running these vehicles so it is unclear as to when each component will need replacing and how much this is likely to cost.

20. Based on the Impact Assessment, what payback time, in years, would be economical for battery electric technology to be utilised in a given bus fleet?

Currently, battery electric vehicles do not payback over their anticipated life of 15-16 years. For them to pay back, operators would need to continue to operate battery electric vehicles beyond their usual life, provided the battery was still functioning. This is why government support is vital to the business case, the support makes the payback deliverable.

21. Based on the Impact Assessment, what payback time, in years, would be economical for hydrogen fuel cell electric technology to be utilised in a given bus fleet?

Like electric buses, operators do not expect hydrogen buses to payback over their anticipated life of 12 years, the vehicles are expensive and operators are concerned over the significant cost of hydrogen fuel.

22. Any other comments?

Infrastructure and grid connectivity – It is essential that the end of sale date allows enough time for bus operators to ensure they have the required recharging infrastructure installed and a connection that delivers sufficient electricity.

Operators are reporting significant delays in their requests for increased supply due to Distribution Network Operators connecting other businesses and organisations that are perceived as a higher priority. It is vital that bus operators are recognised as a high priority group, especially if the end of sale date is nearer to 2025, and that these decisions are being made strategically.

Depot Ownership – Some operators park their buses in small yards and outstandings overnight which they do not own and would therefore be unable to install the required recharging infrastructure. The need to

own a depot will increase the cost of transitioning to zero emission vehicles.

Some operators run jointly owned services, with buses parked over night at a different location to where they started, this poses a potential problem if there is no recharging infrastructure for these buses.

Vehicle Warranty Requirements – Finance deals have conditions applied to how the batteries are operated. Operators are required to retain between 20-30% of their battery charge to ensure that the life of the battery and its performance is protected.

Additionally, operators are required to equalise the charge across their fleet to protect the life of the batteries. If an electric bus was placed on a high mileage route one day, operators would need to place the vehicle on a low mileage route the next day. A charge cycle that means the battery is repeatedly charged and dispensed intensely every day will degrade the battery. Manufacturers are therefore requiring operators to ensure their vehicles are rotated regularly across their services. This further adds to the complexity of scheduling their routes.

Timing of the consultation – Many of the questions included in the consultation required technical knowledge and additional time to ensure all factors outlined in the impact assessment were fully considered and understood. It is vital that the impact assessment is accurate to ensure that any proposed date is workable and achievable for the industry. We were disappointed to learn that the consultation only allowed 8 weeks and not the standard 12 weeks and included multiple bank holiday that further restricted the available time for the sector to respond.

Modal Shift will play a key role in reducing emissions – bus and coach only contribute 3% of total transport emissions. Whilst transitioning to zero emission buses is the ultimate end destination, it is vital to remember that we can significantly reduce transport emissions by encouraging more modal shift. An increase in passenger numbers will help deliver a sustainable business model and enable more operators to invest in zero emission buses.

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