



## Ending the Sale of New, Non-Zero Emission Coaches Call for Evidence CONFEDERATION OF PASSENGER TRANSPORT RESPONSE

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### Executive Summary:

- The sector recognises the future of road transport is with zero emission vehicles and is keen to work with government to determine a pathway that is workable and realistic for the industry
- The Zero Emission Coach Taskforce (ZECT) was established to bring together key stakeholders to outline the main barriers for coach operators, the outcomes of the taskforce have informed this response
- Coach already provides a sustainable and environmentally friendly travel option, with a fully loaded coach able to remove up to 50 cars off the road
- The most significant challenge for the sector is the lack of certainty over technology - hydrogen, electric or a combination of both. We will continue to work through these options with the ZECT to build a clearer picture of what the technology needs to deliver
- **Vehicles** – the few zero emission coaches available currently do not deliver sufficient range to cover all services provided by coach
- **Infrastructure** – a reliable network of recharging and refuelling infrastructure is needed to reduce range anxiety and moveable recharging/refueling depot solutions are needed
- **Operational** – drivers and workshop staff may require additional training to drive the new vehicles efficiently and to service and refuel the vehicles safely
- **Manufacturers** – coaches deliver a wide range of services, manufacturers therefore need to develop a solution that is flexible and applicable to a global market
- **Finance** – zero emission coaches cost significantly more than diesel coaches and require investment in supporting infrastructure. Additionally, the unknown residual value makes developing an affordable business case difficult
- The date by which the sale of new, non zero emission coaches can end will greatly depend on the level of support received from government to provide certainty over technology, create a reliable network of infrastructure and reduce the costs.

### 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. 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.

### About the Coach Sector

Coach provides a convenient, accessible and sustainable travel option, helps people to access education, holidays and combats social exclusion. They are capable of transporting huge numbers of passengers and provide a wide multitude of services including rail replacement during engineering works, aviation support, vulnerable group transport including elderly, children and people with disabilities and trips to sporting events and concerts. Coach also transports 600,000 children to school every day.

Coach plays a vital role in supporting the UK's tourism industry; 23 million visits to tourist attractions and locations were made by coach in 2019 which contributed £14 billion to the UK economy<sup>1</sup>.

There are circa 2,500 coach operators in the UK, 81% of which are family or individually owned, often with multiple generations working for the business and deeply embedded in their communities, together these businesses provide 42,000 jobs across the country.

Coach travel is already one of the most sustainable and environmentally friendly ways to travel, with average carbon dioxide emissions per passenger per journey around 1.5 times lower than rail, 5 times lower than air and 6 times lower than car travel<sup>2</sup>. The latest Euro VI coaches emit less NOx per vehicle than the latest diesel cars, with just one coach-load of people able to remove up to 50 cars off the road.

## CPT Response to Ending the Sale of New, Non-Zero Emission Coaches Call for Evidence

### What are the challenges to transitioning to a zero-emission coach fleet?

#### 1. Uncertainty over technology

The most significant barrier which overarches all the challenges outlined in this document is the lack of certainty over which technology solution will be best suited to coach operations. There is currently no clear direction over whether zero emission coaches will be powered by an electric battery,



hydrogen fuel cell, a combination of both technologies, or something else yet to be developed.

The lack of certainty over technology is a huge challenge for vehicle manufacturers who need to develop a vehicle solution that is applicable to as many services as possible and suitable across a global market.

Clarity over technology is also vital for the successful installment of recharging and refuelling infrastructure in strategic locations across the road network.

It is possible that a combination of solutions will be needed, at least in the beginning, with shorter routes being delivered by electric coaches and longer routes delivered by hydrogen. It is therefore essential that the government back both solutions and ensure that both technologies are available.

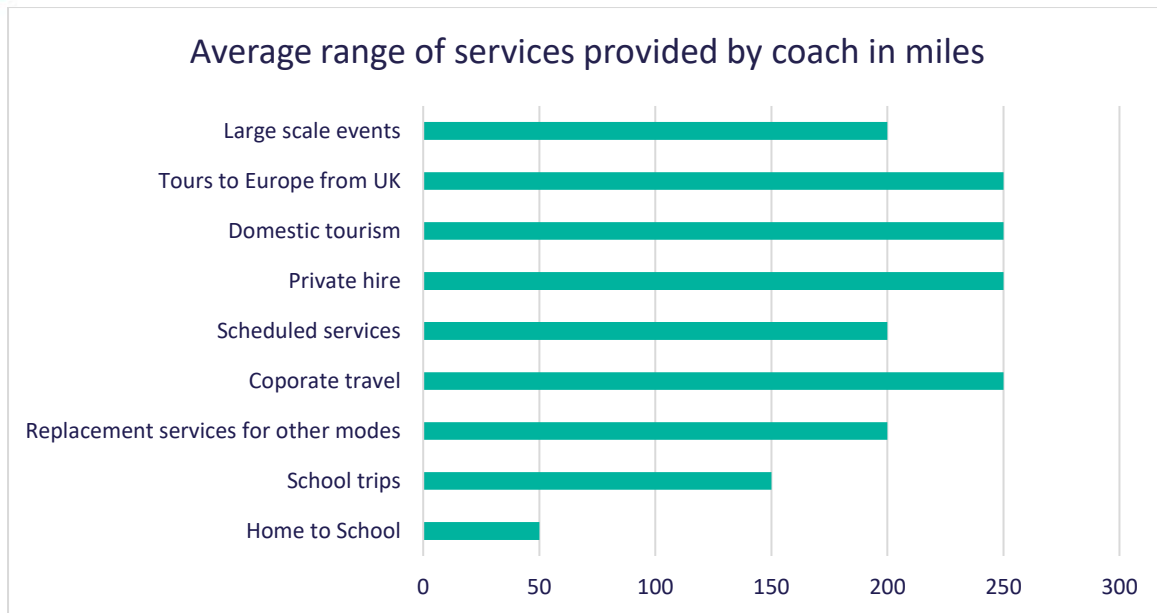
A clear roadmap is needed which sets out how the sector can decarbonise in a realistic and workable timeframe. To help progress this, we will continue to work this through with the Zero Emission Coach Taskforce and our members to provide a specification of what the future coach needs to be able to deliver and ensure vehicle suppliers have the data needed to develop a versatile, zero emission coach.

## 2. Vehicle challenges

### *(a) Range anxiety: insufficient range of battery*

Battery range is one of the most significant barriers facing operators when considering transitioning to zero emission vehicles. Currently there is a reliable diesel refuelling network in place which enables operators to confidently travel anywhere and know they can refuel when required. To deliver the same level of confidence in zero emission coaches and remove range anxiety there needs to be a reliable zero emission refuelling network in place, or vehicles need to have sufficient range to enable operators to continue to deliver their services and be able to return the vehicle to depot before needing to refuel.

Coaches deliver a wide multitude of services of varying distances. The chart below shows the average range covered by coach for each service type they provide<sup>3</sup>.

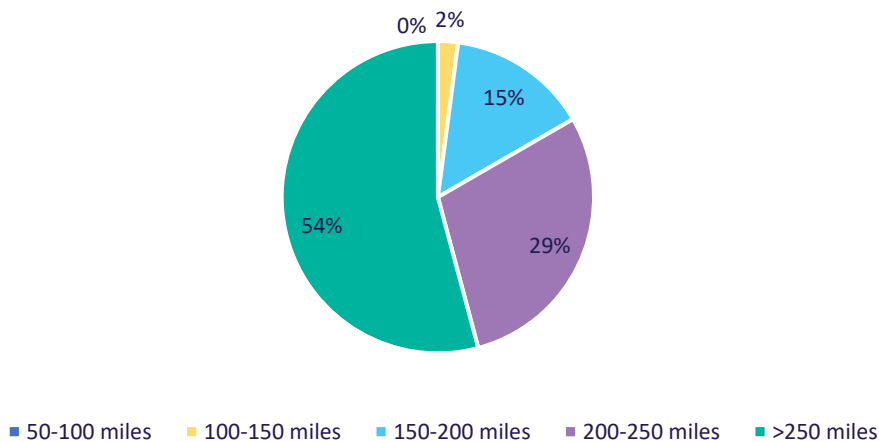


Home to School services and school trips account for just 28%<sup>4</sup> of coach operators' revenue, meaning the rest of their revenue comes from services that cover higher mileages.

The battery electric coaches that are available currently will not deliver the range required for longer distance services, with a single charge currently delivering between 160-200 miles. The off-depot infrastructure required to make longer services viable is not currently in place.

There is an additional concern that the expected range of the battery will be further reduced by on board entertainment, heating and passengers charging their mobile devices. We already know that the weather can have a significant impact on the range achieved, with heating consuming more energy than air conditioning, meaning the range achieved will be less during colder weather. In a CPT survey of coach operators, 54% confirmed that an electric battery would need to deliver a range of over 250 miles to give them the confidence to invest in zero emission vehicles<sup>5</sup>.

### Required battery range that would give operators confidence to invest in zero emission coaches



Hydrogen can deliver the required range, however the high cost of producing hydrogen is making it difficult to offer hydrogen at a price that is cost effective to the operator and is thus preventing the uptake of these vehicles.

#### *(b) Vehicles need to be versatile*

It is possible that the future fleet consists of a mixture of technologies, with shorter distances carried out by electric vehicles and longer distances carried out by hydrogen vehicles. However there is a concern that this will lead to zero emission vehicles being developed that are too operation specific. On average a coach is operated over 5-10 years, but this can be extended to 10-15 years if they are cascaded down through the fleet and used for different types of operations, with the older vehicles doing shorter, more urban services. Zero emission coaches are expensive assets and it is therefore vital that regardless of how they are powered, they are as versatile as possible to extend their lifespan and make them accessible to the secondhand market.

Retrofit could provide an interim solution whilst Zero Emission technology develops and the range is increased. We recommend that their environmental benefits and installation costs are fully explored to understand if they could provide a viable option.

#### *(c) Increased weight of the battery negatively impacts the vehicles payload capacity*

Zero emission coaches will be significantly heavier than standard diesel vehicles due to the increased weight of the powertrain. This has the potential to reduce the vehicles payload capacity which in turn could reduce the number of passengers and luggage the vehicle is able to carry. This will mean more zero emission vehicles would be required to undertake the same journey as one standard diesel vehicle, which not only increases operators



running costs but makes the journey less efficient as it is able to carry less passengers.

#### *(d) Increased space requirements of the battery reduces luggage capacity*

In addition to increased weight, an electric battery also requires additional space and must be fitted underneath the floor of a coach to ensure the weight is equally distributed. A trial of electric coaches carried out by National Express found that the space for luggage was reduced from 10.5m squared to 3.5m squared, a reduction of two thirds. Whilst this was an early generation electric coach and improvements have since been achieved, there is still a way to go before an electric coach has the same capacity as a diesel coach<sup>6</sup>.

#### *(e) PSVAR considerations*

A PSVAR ramp also reduces some of the space capacity allocated for luggage and adds significant weight. Making coaches longer to compensate could mean they lose the ability to access many roads to popular destinations.

Coaches may also struggle to board ferries and park at various sites due to constraints on size<sup>7</sup>.

### 3. Infrastructure Challenges

#### *(a) Range anxiety: lack of infrastructure*

To operate their fleet confidently and efficiently, operators need depot charging solutions and a reliable network of charging infrastructure on the strategic route network. To give confidence to operators to begin investing in these vehicles, the roll out of infrastructure needs to be aligned with the deployment of zero emission vehicles.

There is a need for rapid fast chargers at on route locations such as motorway service stations but also at some end of route destinations. In the event a coach full of passengers needs to recharge on route, the time taken to reach sufficient charge needs to be kept to a minimum. If the time to charge is too long, this risks making the journey unviable as passengers will opt for a quicker transport mode, especially if they are travelling to a time sensitive event such as a sporting event or concert. An extended stop could also have implications for drivers' hours and working time regulations.

Locations that require operators to wait for long periods of time after they have dropped off their passengers and are waiting for the return journey could have slower, less intensive chargers.



### *(b) Universal technology*

It is important that the infrastructure is fitted with universal connectors to ensure all drivers, regardless of vehicle model, will be able to plug in and recharge their vehicle.

### *(c) Depot charging infrastructure*

In addition to refueling and recharging infrastructure on the road network, operators will also require depot solutions.

#### *(i) Depot ownership*

Whilst many coach operators own their depots, there are others who lease their depots and these contracts typically last for 3-5 years, which could make installing recharging and refuelling infrastructure problematic. These operators would need to negotiate their contract with the owner of the land to get permission to install the infrastructure. The infrastructure would also need to be moveable, in the event the coach operator relocated.

#### *(ii) cost of infrastructure*

Installing electric or hydrogen infrastructure is expensive and will significantly increase the upfront cost of transitioning to zero emission vehicles. The costs will vary greatly depending on the location of the depot and the number of vehicles, the existing infrastructure and capacity in the grid. Operators will need to work with their Destination Network Operators to discuss the best solutions available to them and discuss the costs involved. Whilst these are difficult to estimate, we anticipate them to cost millions of pounds.

It may be more likely that hydrogen refuelling stations are developed that allow multiple vehicles to refuel instead of a depot based solution.

#### *(iii) space limitations at smaller depots*

Available space at depots is often limited, which will make it difficult to allocate enough space for multiple vehicles to be charging at the same time whilst also allowing enough space for manoeuvres.

The space required for hydrogen refuelling infrastructure is dependent on the technology; a typical liquid refuelling station requires approximately 25mx25m square for the equipment plus additional space for the dispensers and vehicle maneuvering. A gaseous refuelling station would require 1.5 -2 times more space.

The space needed for electric coaches is unclear but we know that electric buses require around 25% more space at depot than a diesel bus, with additional space allowed for manoeuvres. Our expectation is this would be similar for coach.

#### *(iv) Grid Capacity*



The grid capacity is not equal across all areas in the UK and many operators could be required to pay large sums of money to upgrade their supply to ensure they are receiving sufficient capacity. This is an asset they will not own or be able to take with them in the event they need to relocate.

For operators in rural areas (61% of those in a recent CPT survey<sup>8</sup>), the grid connection challenges are even greater. These depots are located further away from grid connections, in areas that may be already heavily utilised with no spare capacity, meaning operators may require additional power cable to reinforce the energy supply which will result in higher costs.

#### 4. Operational Challenges

##### *(a) Training required for drivers and workshop staff*

There will be a need to train both drivers and workshop staff to operate zero emission vehicles. The range achieved by an electric vehicle is heavily dependent on the driving style, and inspection and refueling practices will be significantly different to diesel vehicles.

##### *(b) Reactive services may be reduced or unviable*

Coach services often need to be reactive, particularly if required to run a rail replacement service when there is a disruption. Recharging requirements could reduce the ability of coaches to respond quickly to such demands.

#### 5. Financial Challenges

##### *(a) Significantly higher upfront purchase prices*

Zero emission coaches are significantly more expensive than ICE vehicles. The unknowns around battery life and residual value of zero emission vehicles will also make investment decisions difficult and can increase the costs of leases.

Electric coaches typically cost over 70% more than diesel coaches and hydrogen coaches are estimated to be 120% more expensive than diesel coaches.

Hydrogen is also significantly higher to run due to current market conditions and the high cost of energy. We are unclear of the exact cost, however we have been told it ranges from between £8-£10 and £15-£20 per kg.

##### *(b) Unknown residual value of the vehicle*

One of the main factors determining the cost of an electric vehicle is the current uncertainty over the residual value of the vehicle. The residual value of a vehicle assists in determining the monthly payments and the price of purchase at the end of the contract should the operator decide to purchase



the vehicle. The uncertainty makes financing options for the vehicles unaffordable to most operators.

#### *(c) SME operators*

Smaller operators will find it even more difficult than larger operators to access the funding to be able to invest in bulk economies of scale and secure affordable lease options.

#### *(d) Lack of grants and funding from government*

The government has so far provided funding support to multiple other transport sectors to enable them to begin transitioning to zero emission alternatives and help cover the significantly higher purchase costs. Cars, vans, motorcycles, taxis and trucks were offered support through plug in grants which offered an amount towards the upfront purchase price of the vehicle. Buses have been able to access support through the ZEBRA scheme which provides support to both the cost of the vehicle and the cost of installing infrastructure, and from April the amount received through the Bus Service Operator Grant has increased if using a green fuel. However, to date no fiscal support has been provided to coach operators.

## 6. Challenges for Manufacturers

#### *(a) Lack of data on the coach sector*

Coach operators deliver a multitude of services which vary greatly in range, passengers and space requirements. Therefore the product must deliver a solution to as many of these services as possible. To develop a product that spans across multiple operations, manufacturers need to understand how a coach runs and what it needs to do. CPT would like to work with members, government and other key stakeholders to assist in gathering the information that manufacturers need to make progress in delivering suitable zero emission coaches.


#### *(b) Need to develop a solution for the global market*

Many manufacturers will produce vehicles for the global market so the end product they develop and produce must meet the needs of different markets and comply with the variety of relevant legislation applicable to those markets.

#### *(c) Research and development*

Research and development into zero emission technology is time consuming and costly. Manufacturers cannot afford to carry out research into both hydrogen and electric solutions and therefore need to decide which technology will provide the best solution for the industry. There is therefore an opportunity here for government to help with research and development costs.

#### *(d) Demand*



There is a huge amount of uncertainty in the market for operators which means the demand for zero emission vehicles is low. Clarity over market direction, funding and provision of reliable infrastructure could help kick-start market demand.

### **What is a realistic date to end the sale of new non-zero-emission coaches?**

We support the ambition of net zero and the coach sector recognises the importance of reducing carbon emissions and improving air quality and stands ready to do its part. However there is still a huge amount of uncertainty over how the sector will achieve this and there are multiple barriers to overcome before we can confidently commit to an end of sale date for new non zero emission coaches.

Nonetheless we know the Transport Decarbonisation Plan sets out a commitment for all new non zero emission road vehicles to be phased out by 2040, and we are in favour of a date that is no sooner than 2040. This will give the sector as much time as possible to allow for the technology to develop and for there to be more certainty over the route to transition.

Whilst coaches transport passengers, operationally they are more akin to heavy goods vehicles (HGVs) than they are to buses. Both coaches and HGVs carry heavy loads over long distances, across a wide range of routes and therefore face similar challenges when it comes to decarbonising.

The end of sale date for new non zero emission HGVs weighing over 26 tonnes is set at 2040. Additionally, last year the government committed to assisting this transition by providing £20 million of funding for Zero Emission Road Freight Trials to help encourage fleet operators to transition to zero emission technologies.

Whilst coaches are under 26 tonnes and the date set for HGVs under 26 tonnes is 2035, we feel that coaches should be aligned with heavier goods vehicles. There has been no support provided for the coach sector to date and it would be incredibly challenging to move towards an end of sale date that was earlier than the 2040 set for heavy goods vehicles over 26 tonnes.

The extent to which any end date can be met is also dependent on the level of support provided from government. The coach sector received minimal financial support during the pandemic and many operators are still recovering from the devastating impact to their businesses, meaning they do not have the finances to be able to invest in zero emission technologies that are still in their infancy. Fiscal support will be required to help cover the significant upfront costs of the vehicles and the required infrastructure. CPT is keen to work with the DfT to find a solution that works for the sector and delivers the government's environmental targets.



## What would need to be true/in place to make the phase out of non zero-emission coaches happen?

### *Certainty over technology*

The main overarching concern facing the sector that is preventing operators from transitioning is the lack of certainty over zero emission technologies.

Both manufacturers and operators are unclear as to which zero emission technology will provide industry with the best solution, that can deliver the required range and will enable industry to continue to provide the variety of services they do currently. Until operators can invest with confidence, the industry will struggle to move beyond this impasse.

A clear roadmap that outlines a realistic and workable pathway to decarbonisation is needed that will give clarity over zero emission technologies, and CPT welcomes the opportunity to work with the DfT to develop this.

### *Financial certainty and confidence to invest*

Zero emission coaches are significantly more expensive than their diesel counterparts, making purchasing them outright difficult for coach operators, particularly SME operators.

The uncertainty over their residual value coupled with their higher purchase cost makes it very difficult to develop a business case to secure funding. The operator is required to demonstrate how the vehicle will deliver twice the profitability to repay back the increased cost. This is problematic considering passengers are unlikely to pay more to travel on an electric coach. This, coupled with the costs of installing infrastructure, makes zero emission coaches currently unaffordable for most coach operators.

### *A reliable network of refuelling and recharging infrastructure*

Coaches provide a wide range of services, transporting passengers across varying distances, over different routes and connecting passengers to locations across the UK. It is therefore essential that a network of recharging and refuelling infrastructure is in place that gives operators the certainty they can continue to operate these services.

In a survey conducted by CPT, coach operators were asked to identify the locations that refuelling infrastructure would be needed to be to give them the confidence they could operate zero emission vehicles. The list of locations included;

- Depots where coaches return to base overnight
- Motorway Services

- End of route locations where passengers are dropped off and the driver is required to wait for them for the return journey such as:
  - Tourist attractions
  - Sports, leisure and arts events
  - Central locations in towns and cities
  - Coach parking areas

## What might Government do to accelerate the transition?

### *Provide certainty over zero emission technologies*

In June 2021 the government committed £20 million of funding to support zero emission vehicle trials for the freight sector and in May 2022 announced £200 million to support the roll out of zero emission HGVs. Funding like this would benefit the coach sector in helping determine which technology is best suited to operations.

There may also be opportunities for the coach sector to join some of the confirmed trials. Cambridge University are involved in a trial which looks to electrify the road using overhead catenaries. There is a potential for collaboration to test out the feasibility of this technology for the coach sector. This is a great example of how different sectors could join up to help each other decarbonise and share infrastructure. The government could explore other ways that the coach sector could collaborate with the freight sector trials.

### *Provide fiscal support*

Zero Emission Coaches are on average about 75% more expensive than their diesel counterparts, depending on their specification. In addition there is also a significant cost to installing the required recharging infrastructure. The costs vary greatly depending on the location of the depot, the number of vehicles and the specification of the technology however we know it is likely to cost millions of pounds and is likely to cost more for operators located in more remote areas.

Coach operators would therefore require a funding solution like that offered to the bus sector through ZEBRA, that would help cover the significant costs of installing infrastructure as well as the higher vehicle purchase costs.

One of the main reasons that electric coaches are currently significantly more expensive than diesel coaches is the uncertainty over their residual value. The government could offer a residual value guarantee to help overcome this.

### *Expand Project Rapid to also support future zero emission coaches*

The government launched Project Rapid in March 2020, providing £500 million to install electric vehicle charging infrastructure across motorways and major A roads to support cars and vans. The scope of this project could be



expanded to ensure that the infrastructure and capacity is in place for when heavier vehicles make the transition to zero emission technologies. Future proofing the infrastructure will reduce the time and costs involved in the installation and will help reduce range anxiety, one of the barriers that is currently preventing operators from investing in zero emission coaches.

### *Enable coach to use HVO whilst the sector is transitioning*

HVO is able to reduce an operators greenhouse gas emissions by 85-95% and would enable the coach sector to significantly reduce the carbon emissions of their current fleet of vehicles whilst they wait for a zero emission solution to become a viable option.

Currently, HVO costs around 20% more than diesel and has a slightly lower energy content which means more fuel is needed to cover the same distance as a diesel. If the government looked to introduce fiscal incentives that would reduce the cost of low carbon fuels to lower than, or in line with, diesel this would help encourage operators to make the switch and would reimburse for the lower energy content of the fuel.

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