



Department
for Transport

Public Sector Equality Duty

Equality analysis for ending the sale of new,
non-zero emission buses

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Contents

| | |
|--|----|
| Introduction | 4 |
| Section 1 | 5 |
| 1.1 Policy | 5 |
| Section 2 | 6 |
| 2.1 Summary of the evidence considered in demonstrating due regard to PSED | 6 |
| 2.2 Assessing the impact | 8 |
| 2.3 Summary of the analysis | 12 |
| Section 3 | 13 |
| 3.1 Decision making | 13 |
| 3.2 Monitoring arrangements | 13 |

Introduction

This document records the analysis undertaken by the Department for Transport to fulfil the requirements of the Public Sector Equality Duty (PSED) as set out in section 149 of the Equality Act 2010. This requires the department to pay due regard to the need to:

eliminate unlawful discrimination, harassment and victimisation and other conduct prohibited by the Act; advance equality of opportunity between people who share a protected characteristic and those who do not; and foster good relations between people who share a protected characteristic and those who do not.

The protected characteristics which should be considered are:

- age
- disability
- sex
- gender reassignment
- marriage or civil partnership
- pregnancy and maternity
- race
- religion or belief
- sexual orientation.

Please note that in relation to the protected characteristic of marriage and civil partnerships the department is required to have due regard only to the first point in the first paragraph above.

Section 1

1.1 Policy

In June 2019, the UK became the first major economy to legislate to end its contribution to climate change by 2050, committing to net zero greenhouse gas (GHG) emissions.

In the National Bus Strategy (NBS), published in March 2021, government committed to achieving an all zero emission bus fleet in the future, and to set a legal end date for the sale of new diesel buses committed to achieving an all zero emission bus fleet in the future, and to set a legal end date for the sale of new diesel buses.

The proposed policy would see the end of sale of new internal combustion engine buses. We are proposing that this would apply to all Class I and II M2 and M3 vehicles, with derogations where appropriate. This would mean that vehicles which have a capacity exceeding 22 passengers, in addition to the driver, including both those constructed with areas for standing passengers, to allow frequent passenger movement, and those constructed principally for the carriage of seated passengers, but also designed to allow the carriage of standing passengers in the gangway and/or in an area which does not exceed the space provided for two double seats, would be captured.

To encourage the decarbonisation of the entire fleet, we need to ensure that all buses transition to climate friendly technologies at scale. As a result, it will be important to set the right incentives for the bus industry if we are to achieve our future emissions reductions commitments under the net-zero 2050 target. The positive environmental benefits will affect all sectors of society.

Section 2

2.1 Summary of the evidence considered in demonstrating due regard to PSED

Throughout policy development, we have considered the potential impacts on protected characteristics. We have also sought to understand the impacts of the proposed policy on the wider community, as opposed to just bus users, drivers and other associated groups.

Initial work was shaped by Verbich and El-Geneidy¹, which sets out the distinctions as to how passengers with differing physical characteristics value different features of bus services compared to other types of riders. This was supplemented by Cakmak, Dales, Rubio and Vidal², who explain that the socially disadvantaged groups appear to be especially susceptible to dying due to higher air pollution, noting concentrations deemed acceptable for the general population would not appear to protect vulnerable subgroups.

Jerrett³ concurs, and also adds that affected groups are not only at greater risk of high exposure but are also more at risk to its deleterious effects. This builds on work from Havard et al⁴, who conducted an advanced dispersion modelling of traffic related air pollution, combined with deprivation analysis and autocorrelation analysis to demonstrate that socially disadvantaged groups bear a higher burden of pollution exposure than other groups. Moreover, Brainard et al⁵ found that high CO(2) and NOx concentrations related strongly to racial/ethnic minority, as well as socioeconomic status.

More widely, Zsamboky, et al.⁶ explain that, in the longer term, the consequences of not mitigating the effects of climate change will intensify risks to those which already suffer

¹ Verbich and El-Geneidy, *Variation in satisfaction with bus transit service among riders with encumbrances and riders with disabilities*, 2015

² Cakmak, Dales, Rubio & Vidal, *The risk of dying on days of higher air pollution among the socially disadvantaged elderly*, 2011

³ Jerrett, *Global Geographies of Injustice in Traffic-Related Air Pollution Exposure*, 2009

⁴ Havard, Deguen, Zmirou-Navier, Schillinger, Bard, *Traffic-related air pollution and socioeconomic status: a spatial autocorrelation study to assess environmental equity on a small-area scale*, 2009

⁵ Brainard, Jones, Bateman, Lovett, Fallon, *Modelling environmental equity: access to air quality in Birmingham, England*, 2002

⁶ Zsamboky, Fernandez-Bilbao, Smith, Knight and Allan, *Impacts of climate change on disadvantaged UK coastal communities*, 2011

from high levels of deprivation. Sevoyan, et al.⁷ provided further evidence as to the effects of climate change being disproportionately borne by vulnerable subpopulations.

Officials have also consulted with counterparts at Transport for London (TfL), as well as with Newport Transport, and The Big Lemon to gain primary evidence on the experience of those with protected characteristics on zero emission buses. Officials at TfL explained that TfL does engage with many users' groups regarding passenger experiences on their network, and has more recently incorporated engagement relating to zero emissions buses in this work. While there are no current specific studies, TfL engage with communities and local groups before transitioning routes to zero emissions, for example by holding open days at garages, but COVID has hindered some of this engagement.

Some areas that have been raised by accessibility groups in TfL's engagement on ZEB's are, for example, the number of accessible and priority seats available at the front of the bus, i.e. they would like to have more, are restricted by the low ceiling at the back of the bus and step-ups to seats in the middle/back of bus. All the internal layouts must, and do, comply with the Public Service Vehicle Accessibility Regulations 2000, and the reasons for changes compared to a diesel layout is primarily due to the configuration of the batteries – which in turn has an impact on the internal layout and weight distribution. These small changes tend to have disproportionately bigger impacts on people with a visual impairment and wheelchair users. As COVID restrictions lift, TfL intend to carry out more engagement with user groups, and officials from DfT will continue to gather further information and ensure policy is designed to enable all people to access transport.

Officials have also engaged with the Disabled Persons Transport Advisory Committee (DPTAC). DPTAC is an expert committee established by the Transport Act 1985, providing advice to the government on the transport needs of disabled people. All DPTAC activities are aligned with its vision statement, that “disabled people should have the same access to transport as everybody else, to be able to go where everyone else goes and to do so easily, confidently and without extra cost”. Engagement with DPTAC has focused on the aforementioned potential for slight changes in layout. Some members believed that, as battery and power electronics technology improve, there may be potential for a smaller raised floor area. This would bring further potential benefits for disabled passengers, by increasing the amount of accessible space. There was also a point raised about ensuring accessibility for drivers, and other members of bus operations staff, which is addressed in section 2.2.

DfT statistics were also used, to illustrate the differences between the number of trips made between those with at least one disability and those with no disability, as well as other considerations to help shape policy development – see section 2.2 for analysis.

Transport Focus carry out direct surveys on passenger's views and thoughts on transport provision. The Transport Focus publication “Disabled passengers during the pandemic” provides an illustration of the effects of the pandemic on transport behaviour, as well as perceptions of its safety. Further Transport Focus research, entitled “Bus passengers with disabilities” investigated preferences and experiences of disabled people on buses, prior to the pandemic. The Motability report “Transport needs for disabled people” explores the extent to which disabled persons' needs are being met by current transport services and

⁷ Sevoyan, Hugo, Fesit, Tan, McDougall, Tan and Spoehr, *Impact of climate change on disadvantaged groups: issues and interventions*, 2013

initiatives, and where there are gaps. This publication illustrated that larger issues of inaccessible infrastructure and poor information provision shape the broader experience, with attitudes and behaviours of other passengers a more marginal variable.

Comprehensive surveys which establish and understand the profile of bus passengers and provide detail of passenger travel behaviour are scarce. Transport for London published a survey in 2014 comprehensively detailing market information on bus passengers' journeys in terms of demographics such as age, gender, ethnicity, employment status, purpose of journey, and ticket used. As these are specific to the London context, it would not be appropriate to use as a corollary to assess on a national basis. We will seek further evidence through the consultation process. Transport Focus' "Bus Passenger Survey – Autumn 2019 report" was key in understanding passengers' reflections on bus journeys, more broadly – providing a useful baseline.

This research was key in understanding the relative importance of various factors, and therefore shaped the development and analysis of how the proposed policy may affect protected groups.

Further work, relating to externalities originating from pollution and their interaction with protected characteristics, was investigated – starting from Banzhaf, Ma and Timmins⁸ who provide a comparative study of socioeconomic relationships relating to exposure to sources of pollution. Mitchell and Dorling⁹ present the implications of the distribution of poor air quality in Britain, in relation to the effect on different population groups. They find that the most deprived communities tend to suffer from the highest levels of air pollution. This is backed up by further research¹⁰ illustrating that racial and ethnic minorities were exposed to significantly higher levels of air pollution, as well as disabled people¹¹.

2.2 Assessing the impact

Of the protected characteristics, under the Equality Act, we do not believe that there will be any negative impact based on sex, gender reassignment, marriage or civil partnership, pregnancy and maternity, race, religion or belief, or sexual orientation. Rather, there will be significant positive benefits across all sectors of society, with some more than proportional gains for some protected groups. For example, as noted above there are significant racial disparities in relation to air quality – Mitchell and Dorling find an inverse relationship between car ownership and air quality. The shift to zero emission buses and the provision of high-quality local bus services will foster greater positive community relations^{12,13} in addition to mitigating the negative effects of air pollution, and environmental degradation as a result of internal combustion engine use.

⁸ Banzhaf, Ma, and Timmins, *Environmental justice: the economics of race, place and pollution*, 2019

⁹ Mitchell, and Dorling, *An environmental justice analysis of British air quality*, 2002

¹⁰ Woo, Kravitz-Wirtz, Sass, Crowder, Teixeira, Takeuchi, *Residential segregation and racial/ethnic disparities in ambient air pollution*, 2018

¹¹ Aldred and Woodcock, *Transport challenging disabled environments*, 2008

¹² Nash, *Bus Riding: Community on Wheels*, 1975

¹³ Sun, Mburu and Wang, *Analysis of community properties and node properties to understand the structure of the bus transport network*, 2015

However, we believe there may be potential for both positive and negative implications, related to age and disability. The following section sets out the scale of those implications, as well as action by government to mitigate.

Government recognises that disabled people rely on bus services more than most and the NBS confirmed government's continuing commitment to supporting an inclusive transport system. One of the strategy's aims is to improve equality of opportunity, particularly for older and disabled people. To benefit from funding, there is a requirement for all local transport authorities (LTA) to produce bus service improvement plans (BSIP). We want, and expect, to see BSIPs drive improvement in accessibility for all. Disabled people should have the confidence to travel when and where they want to, and our plans ensure that bus services play their part in making that possible. This should be implemented through LTAs committing to a Bus Passenger Charter (BPC) that sets out what passengers can expect from bus operators delivering local bus services across their area. BPCs should also include commitments on the accessibility of bus services. Moreover, BSIPs should consider the impact of roadside infrastructure (e.g. bus stops and shelters) on passenger safety, security and accessibility, as well as how a coherent and integrated network should serve schools, health, social care, employment and other services.

Government has taken a holistic approach to the bus sector, with decarbonisation forming one pillar of the broader strategy set out in Bus Back Better. Thus, this proposed policy must be viewed through the lens of the National Bus Strategy. As such, some of the potential impacts of the proposed policy will be mitigated by other commitments in the NBS. The NBS stated that any buses funded by government will need to provide an enhanced level of accessibility. Practically, this means that, as with the Zero Emission Bus Regional Areas (ZEBRA) scheme, funded buses must meet enhanced accessibility standards (see below), which go beyond that required by the Public Service Vehicles Accessibility Regulations 2000 (PSVAR). PSVAR states (in broad terms) that from December 31, 2000, new single and double deck buses that can carry more than 22 passengers need to be accessible to disabled people, including wheelchair users.

In addition to facilities required by PSVAR, we expect vehicles to:

- Incorporate equipment to identify the route, each upcoming stop, and the beginning and end of diversions:
- Visibly, using at least one screen on any deck, with the lower deck screen visible from all priority seats;
- Audibly, with announcements audible on any deck, including in the priority seats and wheelchair space; and
- Using induction loops, in priority seats and the wheelchair space.
- Provide an induction loop to aid direct communication between drivers and passengers who use a hearing aid.
- Provide an additional flexible space in addition to the mandatory wheelchair space, suitable for a second wheelchair user and/or at least two unfolded pushchairs or prams.

The above conditions illustrate the further positive effects that deployment of ZEBs can bring to protected groups.

We intend to use further consultation and engagement to gather greater evidence and information on the potential impacts of the proposed policy. Though, at this time, we do not

anticipate any unlawful discrimination resulting from the proposed policy as we believe any negative implications can be adequately mitigated.

However, there are several areas where greater consideration of those with protected characteristics would produce better outcomes. For example, ensuring that charging, or refuelling infrastructure is designed such that it is easily accessible will enable all staff to carry out their duties. Motability and Ricardo highlighted that charging points deployed in petrol station forecourts typically conform to greater accessibility standards¹⁴, suggesting that such solutions may be deployed in bus garages and depots. Development of inductive charging will be particularly suitable for disabled users, due to its lack of cabling requirements.

Data from the ONS shows that there is a large gender gap, and that disabled people are significantly underrepresented in the bus sector. Utilising the change in technology, and thus working practices, offers an opportunity to ameliorate some of the barriers and ensure that those operating and running bus services better reflect the country at large. The transition to zero emission vehicles can be used as a springboard to improve diversity and inclusion in the bus sector.

As part of this work, DfT has commissioned the British Standards Institution (BSI) to develop accessibility standards for EV chargepoints. These standards will provide industry with guidance and drivers with a new clear definition of 'fully accessible', 'partially accessible' and 'not accessible' for public EV chargepoints – we will look to learn from this and assess its applicability to the bus sector.

We may also consider the broader economic impacts, for example the additional cost burden of zero emission buses, through the lens of PSED as a means to understanding the broader equality effects of the proposed policy. For example, the increased capital cost of zero emission buses, relative to internal combustion engine counterfactuals, means that there is a slight risk that some more marginal bus services may become uneconomical. If this risk comes to fruition, the consequences would be greater dislocation and restriction to economic life for all passengers – with a disproportionate effect on disabled passengers, and on other protected groups.

However, the NBS sets an expectation that partnerships and franchising arrangements must deliver more comprehensive services, including those which are socially or economically necessary. This includes services to smaller and more isolated places, and more services in the evenings and at weekends. In addition, as the policy only proposes to end the sale of new non-zero emission buses, and we understand that the vast majority of vehicles used on such routes tend to be cascaded, there will likely be a proportionally smaller impact on this aspect of the sector.

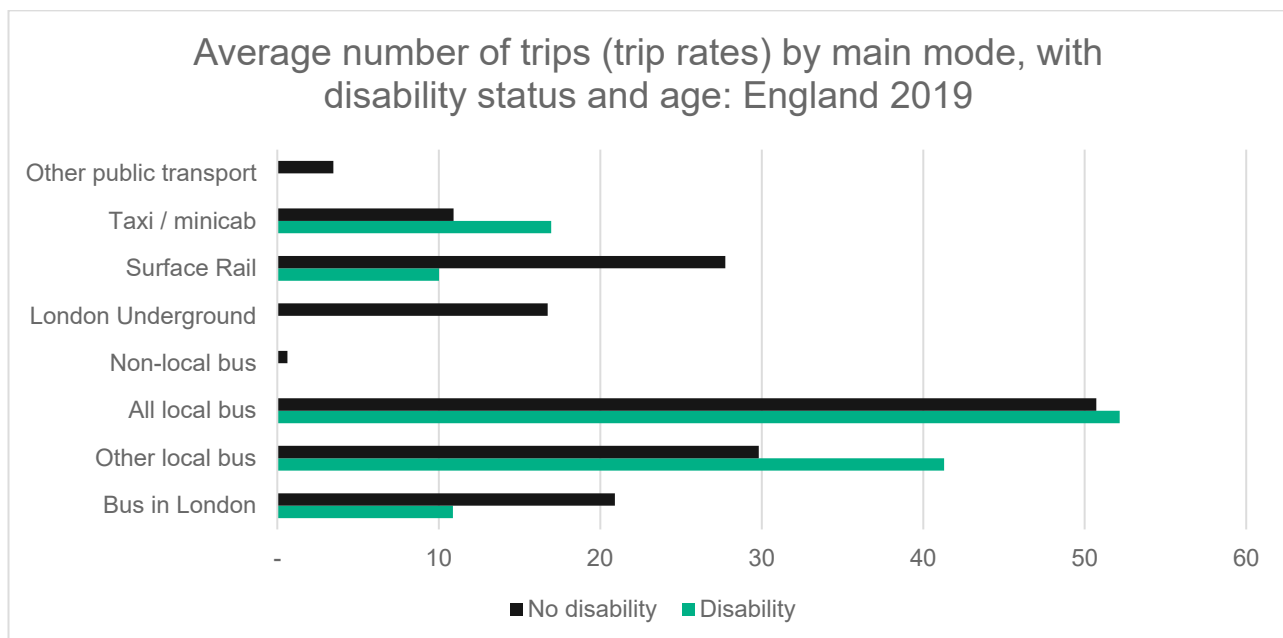
As has been the case with cars and vans, we expect to see a healthy second-hand market for ZEBs to emerge. Indeed, current perceptions of zero emission bus technology tend to pigeonhole it to urban routes with the majority operated by larger companies, implying that rural and SME routes will wait until they are confident that technology can meet their operational requirements.

¹⁴ Motability and Ricardo, *Electric Vehicle charging infrastructure for people living with disabilities*, 2020

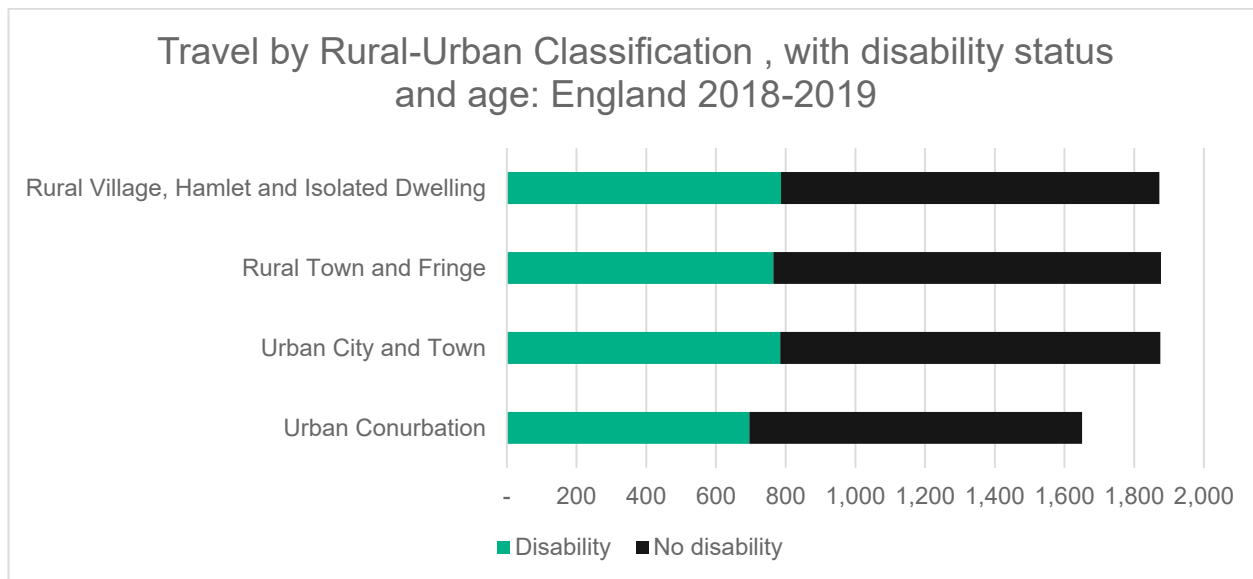
We expect confidence in technology to build over time, as well as costs to decrease. Furthermore, government grant schemes, like ZEBRA, provide an opportunity to mitigate the current high upfront cost differential. We also expect zero emission buses to achieve price parity on a total cost of ownership perspective, with the much lower operating costs potentially meaning that a greater number of routes will become economically viable.

Government has committed to tie future funding only to local transport authorities (LTA) who have established an enhanced partnership (EP) or franchising model. As LTAs should plan to implement their EP or franchising scheme to deliver on the BSIP, and thus BPC, this effectively ties future funding to those who ensure the highest levels of accessibility.

Per section 2.1, DfT statistics were also employed to assess the potential impacts on those with protected characteristics. The below graphs illustrate that any reduction in service as a result of transitioning to zero emission vehicles would have a greater impact on those with disabilities.



*No data available for disabled passengers on non-local bus or London Underground



However, per the broader impact assessment, we do not anticipate that this risk will come to fruition.

As part of the English National Concessionary Travel Scheme, bus passengers aged over 65, or with a disability, have been entitled to travel free of charge on any off-peak local service in England since 2007. DfT stats illustrates that, of the 89 local transport authorities, the majority provide additional discretionary concessionary offers to other groups. We may expect these to rise as enhanced partnerships and franchising become more widespread, per the NBS, with ZEBs playing a crucial role as uptake increases and operating costs decrease.

We do not assess any unlawful discrimination as a result of this policy. In fact, provision of high quality, zero emission, bus services enhance the potential for advancing equality of opportunity for all and fostering good relations across communities.

2.3 Summary of the analysis

We believe the positive environmental benefits that will result from the proposed policy, and the commitments in the NBS relating to accessibility and inclusion will mean that bus services in the future will be equally accessible to all segments of society.

There are potential negative outcomes, but we believe the risks can be mitigated through engagement with industry, and rather than the creation of additional negative burdens for protected groups, would rather represent a continuation of existing issues. Government has committed to tackle these recognised barriers through other commitments in the NBS.

In the very short term, the configuration and layout of zero emission buses may slightly differ from that of conventional buses, and this difference may result in perceptions of lower levels of accessibility – however the buses will remain compliant with PSVAR.

Section 3

3.1 Decision making

Proceed as planned with the proposed policy – Officials have concluded that it should have no disproportionately adverse or negative impacts on people who share a protected characteristic, and government has committed to take further steps to advance equality of opportunity and foster good relations across bus services through the broader framework of the National Bus Strategy.

3.2 Monitoring arrangements

Monitoring will be covered in a separate equality impact assessment for the necessary enforcement legislation.