

# Unite Response to the Department for Transport Decarbonisation Plan: Call for Ideas



## 1. Introduction

- 1.1. Unite is the UK and Ireland's largest trade union with over 1 million members across all sectors of the economy including manufacturing, financial services, transport, food and agriculture, construction, energy and utilities, retail, information technology, service industries, health, local government and the not for profit sector. Unite also organises in the community, enabling those who are not in employment to be part of our union. Of particular importance Unite represents a quarter of a million members using every form of transport and also encompassing hundreds of thousands more in the construction and business use of vehicles, the manufacture and supply chains all the way through to the production of the raw materials and electricity, fuels and water needed to produce and use these forms of transport.
- 1.2. Transport is affected by the speed and nature of technological change and the challenges associated with automation and the 'fourth industrial revolution'. Unite argues that, as part of a meaningful industrial strategy, technology should be implemented in a way that is beneficial for all, with work as the central pillar of society.<sup>1</sup> A transport policy based on solely on market forces cannot meet the national interest.
- 1.3. Transport is critical to the economy. The transportation and storage sector contributes £107bn towards the UK's turnover. Gross value added (GVA) for the sector is £81.2bn (15%) of the UK total for non-financial services<sup>2</sup>. The sector employs 4.8% of the UK's employees<sup>3</sup> or 1.52 million people<sup>4</sup>.
- 1.4. However, the transport sector should not just be valued on its considerable direct contribution to output and employment. It supports national and local economies in many other ways. Effective transport systems provide access to goods, services and jobs.
- 1.5. Transport is essential to helping city regions to thrive, securing private sector growth across the country and improving exports to international markets.<sup>5</sup> Transport is also essential to the development of rural economies.

---

<sup>1</sup> *Industrial Strategy: building an economy that works for all* – Unite submission to Industrial Strategy Green paper (2017) -

<http://www.unitetheunion.org/uploaded/documents/Unite%20submission%20to%20Industrial%20Strategy%20Green%20Paper%20April%20201711-31067.pdf>

<sup>2</sup> Non-financial business economy, UK (Annual Business Survey): 2017 provisional results (most recent information available)

<https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/bulletins/uknonfinancialbusinesseseconomy/2017provisionalresults>

<sup>3</sup> Office for National Statistics – Business Register and Employment Survey 2018

<https://www.ons.gov.uk/generator?uri=/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/businessregisterandemploymentsurveybrestable2018/dd46d275&format=xls>

<sup>4</sup> Office for National Statistics – Business Register and Employment Survey: Table 2 2018 provisional figures <https://www.ons.gov.uk/file?uri=%2femploymentandlabourmarket%2fpeopleinwork%2femploymentandemployeetypes%2fdatasets%2findustry235digitsicbusinessregisterandemploymentsurveybrestable2%2f2018provisional/table22018p.xlsx>

<sup>5</sup> See *Delivering Change: Making transport work for cities*, Centre for Cities (2014)

<http://www.centreforcities.org/publication/delivering-change-making-transport-work-for-cities/> and

- 1.6. The influential Eddington Transport Study was clear about the long-term links between transport and the UK's economic productivity, growth and stability.<sup>6</sup> It found that transport schemes can deliver overall benefits averaging £4 per £1 of government expenditure and cited a potential cost of £22 billion a year in increased congestion by 2025 if the transport network does not keep up with demand.
- 1.7. Transport is in desperate need of investment. UK public spending on transport as a percentage of GDP increased from 1.2% to 1.5% in 2015-16 dipped to 1.4% in 2016-17 then returned to 15% in 2017-18 and remained at that level in 2018-19<sup>7</sup>, This percentage is low by international standards.
- 1.8. Figures from the OECD's International Transport Forum find that UK investment in inland transport infrastructure as a percentage of GDP was 0.9% in 2018. This compares to 5.6% in China, 2.4% in Greece, 1.6% in Australia and 1.4% in Norway.<sup>8</sup>
- 1.9. There is a lack of investment in the UK's infrastructure, including transport, and government has a key role to play. Some have argued that government should set a higher minimum ratio - perhaps 2% of GDP by 2020/21 – for infrastructure investment in key areas like transport and energy.<sup>9</sup>
- 1.10. Transport users are experiencing overcrowding<sup>10</sup> and reporting poor satisfaction levels<sup>11</sup>. Traffic congestion has direct and indirect costs to the economy with one study finding that between 2013 and 2030, the total cumulative cost of congestion to the UK economy is estimated to be over £300 billion, with the annual cost of congestion set to rise by 63% to £21.4 billion over the same period.<sup>12</sup>
- 1.11. Professor Philip Alston, United Nations Special Rapporteur on extreme poverty and human rights, in his statement on his visit to the UK in November 2018 said:  
  
*“Transport, especially in rural areas, should be considered an essential service, equivalent to water and electricity, and the government should regulate the sector to the extent necessary to ensure that people living in rural areas are adequately served. Abandoning people to the private market in relation to a service that affects every dimension of their basic well-being is incompatible with human rights requirements”<sup>13</sup>.*
- 1.12. More than ever, there is a case for long-term planning in transport and transport infrastructure, which will produce a modern integrated and sustainable transport system for all – a strategy

---

Poor transport connections hold exporters back, says BCC <http://www.britishchambers.org.uk/press-office/press-releases/poor-transport-connections-hold-exporters-back,-says-bcc.html>

<sup>6</sup> The Eddington Transport Study (2006)

<sup>7</sup> Table 4.4, *Public Expenditure Statistical Analysis 2019* (HMT 2019) -

<https://www.gov.uk/government/statistics/public-expenditure-statistical-analyses-2019>

<sup>8</sup> [http://stats.oecd.org/Index.aspx?themetreeid=24&datasetcode=ITF\\_INV-MTN\\_DATA#](http://stats.oecd.org/Index.aspx?themetreeid=24&datasetcode=ITF_INV-MTN_DATA#)

<sup>9</sup> *Setting the Fiscal Rules*, IPPR (IPPR, 2015): [http://www.ippr.org/files/publications/pdf/setting-fiscal-rules\\_Dec2014.pdf?noredirect=1](http://www.ippr.org/files/publications/pdf/setting-fiscal-rules_Dec2014.pdf?noredirect=1)

<sup>10</sup> <https://www.theguardian.com/uk-news/2019/jan/03/uk-train-overcrowding-highest-level-in-years-labour>

<sup>11</sup> <https://www.globalrailwayreview.com/news/77204/passenger-satisfaction-rail-services-uk/>

<sup>12</sup> <http://inrix.com/press/traffic-congestion-to-cost-the-uk-economy-more-than-300-billion-over-the-next-16-years/>

<sup>13</sup> Statement on Visit to the United Kingdom, by Professor Philip Alston, United Nations Special Rapporteur on extreme poverty and human rights -

<https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=23881&LangID=E>

that recognises the importance of transport to society, the economy and the environment, as well as the key role played by transport workers. **Unite is calling for a transport strategy that includes:**

- **a commitment to investment;**
- **accessible, affordable, integrated and accountable public transport;**
- **a fundamental shift away from further privatisation and deregulation;**
- **safe and healthy transport with decent employment standards, equality and protection from violence for transport workers;**

**and importantly with respect to this consultation**

- **a sustainable transport system and a ‘just transition’ for transport workers to ensure nobody is left behind.**

**1.13. Unite believes that to truly tackle emissions from transport the DfT will need to examine a plethora of other topics and how changes in these will impact transport decisions and vice versa.** To examine transport in isolation is like focusing on one corner when you need to pull back and examine the whole economy. Unite is also clear that government support for industry in terms of the impact of Covid-19 provides a major opportunity to require action on decarbonisation and to rebuild more sustainably.

## 2. Consultation Questions

### **What do you think government should be doing to reduce the greenhouse gases that are produced from:**

#### **Cars?**

- 2.1. Unite is the trade union for over 100,000 workers in the automotive industries, including each major OEM and throughout supply chains. Unite is fully aware of the automotive industry's environmental responsibility and is demanding a just transition towards electrification and alternatively fuelled vehicles. Unite has published extensive material on this issue which is available on request.
- 2.2. **Unite does not support a unilateral ban date on the sale of petrol and diesel vehicles or for that date to be brought forward in the wake of Covid 19. Unite also calls for hybrids to be excluded from any ban. Unite fully supports the transition to full electric and other alternative fuels<sup>14</sup>, but this must be part of a considered industrial strategy which defends and extends high quality employment.** Unite is fully prepared to engage with the government and employers on such a strategy to ensure the automotive industry can meet its environmental obligations as quickly as the planet demands.
- 2.3. Whilst the supporting policy paper<sup>15</sup> highlights that personal cars are the source of 55% of all UK domestic transport emissions, if you include bunkers for international aviation and shipping this figure drops to 40%. Whilst this is currently the lion's share of the emissions the industry is moving forward with various ways to this problem.
- 2.4. Having a car provides the individual with the sense of freedom enabling them to get up and go to whatever destination domestically (or internationally via ferries and the Channel Tunnel) whenever they wish. This freedom, removes the need to wait for the next bus or train, it protects you from the weather and the worry that you will not be able to get home as you've missed the last connection. Encouraging a greater use of public transport, is an uphill battle especially, if it comes at an additional financial burden.
- 2.5. Whilst old cars can become lucrative investments, if they are over 40 years old and in limited numbers, especially as they would then be exempt from M.O.T's and road tax<sup>16</sup>, they can be the source of higher maintenance costs and emissions. In general after housing costs, a car is probably one of the most expensive things a young adult will purchase but unlike housing cars normally depreciate in value very quickly<sup>17</sup>. For many retaining their car, even if it is old and only just scrapes past its M.O.T. is all they can afford as they do not earn enough to upgrade to a cleaner less polluting alternative.
- 2.6. If it is difficult to park, as there are very few places or if the roads are congested or off limits to private cars, passengers will opt for park and rides. There need to be exceptions, however, to provide for those with mobility issues to ensure they can enjoy the same access to shops and other business without struggling with a walking frame or wheelchair over obstacles in their way.

<sup>14</sup> <https://unitetheunion.org/media/1225/a-manufacturing-strategy-from-the-unite-automotive-sector.pdf>

<sup>15</sup> Decarbonising transport: setting the challenge  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/878642/decarbonising-transport-setting-the-challenge.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/878642/decarbonising-transport-setting-the-challenge.pdf)

<sup>16</sup> <https://www.gov.uk/historic-vehicles>

<sup>17</sup> <https://www.moneyadvice.service.org.uk/en/articles/how-to-find-the-right-car-for-your-budget>

- 2.7. Whilst there are alternative ways to enjoy the use of a car these come with catches. Shared ownership through a range of car clubs, can provide an alternative to car rentals. The problem can be booking and arranging for the use of the shared car, when it is needed, removing the spontaneity of being able to escape from the four walls onto the open road when needed. Additionally in today's climate of heightened awareness of the Covid-19 pandemic there is the fear that the previous user may have been suffering from the pandemic and had not cleaned the vehicle properly when finished. There are websites that help individuals book rides in the passenger seats of cars heading in the same direction<sup>18</sup>. The issue here is that you do not know the individual with whom you are getting in the car with, they are rarely vetted and could be carrying the virus or some other communicable medical issue. Unite therefore believes that any passenger using such a services will be taking a risk with their personal safety.
- 2.8. **Unite believes that individuals and families should not be priced out of their private cars. The ownership and operation of a car should not be the preserve of the rich. Unite would instead encourage journeys by car to be more transparent with respect given to the carbon footprint of the journey.** There are calls for all employers to include all emissions from transport in their annual reports to shareholders. This report should include the amount of emissions produced by the employees commute to and from work<sup>19</sup>. Unite believes that this may then make employers more receptive to the concept of assisting employees to choose a better, more sustainable journey to work than simply jumping in an older vehicle to make the commute. Employers should not be allowed to impose change (removing car parking spaces for example) but instead incentivise change to a newer, less polluting or more sustainable option using more of a carrot than a stick approach.
- 2.9. If the government cannot encourage the general public and employers to help the public to give up the car then the next best option is to build a better car or design a better fuel. Sadly, just 0.5% of all vehicles licensed in the UK in 2018 were ultra-low emission vehicles<sup>20</sup>. Transport for Quality of Life have suggested that the level of traffic reduction needed by 2030 could be anywhere between 20% and 60%, depending on factors including the speed of the switch to electric vehicles and how fast the electricity powering them is decarbonised<sup>21</sup>. There is a range of drop in alternative fuel solutions ranging from synthetic petrol and diesel derived from sustainable sources like household waste, old chip shop oil and even captured CO<sub>2</sub>. Vehicles can also be adapted to run on any volatile liquid or gas provided it can combust with enough force to move a vehicle without destroying the engine. There are other methods of moving a vehicle including the use of electricity, via battery technology or on board power generation from hydrogen or, in the case of small personal vehicles, solar panels. **Unite believes that not enough is being done to increase the volume of synthetic fuel that is purchased under the Renewable Transport Fuel Obligation (RTFO) and increase the minimum price suppliers need to pay to buy themselves out of their obligations.**
- 2.10. Whilst hydrogen may prove to be an option it is not without its issues, which is why Unite Automotive section is not wedded to the idea. Hydrogen gas can be used not just to provide power through fuel cells but through and internal combustion engine (ICE) but doing so does not overcome the issues associated with the production of Nitrogen Oxides (NOx) as such an engine will still be hot enough to convert nitrogen and oxygen in the air into these harmful gasses. For this reason Unite would not recommend hydrogen ICE in cars as such conversions should be reserved for other transport modes where conversion from fossil fuels

<sup>18</sup> Here is just one example <https://liftshare.com/uk>

<sup>19</sup> See section 7 [https://ghgprotocol.org/sites/default/files/standards/Scope3\\_Calculation\\_Guidance\\_0.pdf](https://ghgprotocol.org/sites/default/files/standards/Scope3_Calculation_Guidance_0.pdf)  
<sup>20</sup> <https://www.ons.gov.uk/economy/environmentalaccounts/articles/roadtransportandairmissions/2019-09-16>

<sup>21</sup> <https://policy.friendsoftheearth.uk/insight/more-electric-cars>

and batteries is not a realistic proposition. If there to be a wholesale buy in from the general public to convert them from a fossil fuel powered vehicle to a hydrogen fuelled one, it will require the creation of a much more comprehensive network of filling stations that provide hydrogen. Currently there are just 17 hydrogen pump equipped filling stations covering the entire country, most in the South East and none in Northern Ireland<sup>22</sup>.

- 2.11. According to Wan Gang, a former vice chairman of China's national advisory body for policy, "it's hydrogens turn"<sup>23</sup> predicting a substantial surge in the fuel cell market demand to at over 5 million units by 2032. This has ultimately led China to cut funding to battery technology in half with the savings used to grow the hydrogen market share. Early in March this year Japan announced plans to have 80 new hydrogen refuelling stations by 2021<sup>24</sup> The Hydrogen 4 Climate Action conference in Brussels in mid-October 2019 led to investment pledges by European governments of more than €50bn (£43bn) in hydrogen research and infrastructure<sup>25</sup>. In 2017, Shell published a study on the future of hydrogen in the transport sector, jointly produced with the Wuppertal Institute for Climate, Environment and Energy<sup>26</sup>. The study concluded that in 2050, 113 million fuel cell electric vehicles (FCEVs) could save up to 68 million tonnes of fuel and almost 200 million tonnes of carbon emissions, making a significant contribution to reducing energy consumption and greenhouse gas emissions in the transport sector.
- 2.12. Once moving a vehicle has to stop and this loss of momentum is often just converted into heat in the brake drums, disks and pads. A Kinetic Energy Recovery System (KERS) slows vehicles by using electric motors in reverse to generate electricity. KERS then uses the stored energy to help the engine get up to speed. In a larger vehicle a flywheel performs a similar function by using the braking to speed up a heavy flywheel. This flywheel then feeds the energy to help speed up the vehicle. The advantage of KERS over a flywheel is that to be effective a fly wheel needs to be heavy. Neither KERS or a flywheel will totally arrest the vehicle so some braking is still required, nonetheless on a congested road or if there are multiple periods when the vehicle needs to stop and accelerate, these systems can save a considerable amount of energy and reduce emissions from any wheeled vehicle. The KERS systems are now very common in electric and hybrid cars but more needs to be done to see them as standard on all vehicles.
- 2.13. Hybrid cars are capable of reducing emissions, but only if the driver switches over to battery power. If not the small petrol or diesel engine will be working harder, as it needs to move not just itself and its drive system but also the dead weight of the batteries and electric motors. Driver education is therefore critical, so that the driver learns to reduce the amount of fuel burnt during their journey.
- 2.14. **Unite believe initiatives to reduce emissions must also have proper regard for professional drivers who will be financially affected by the proposed initiatives. Unite opposes any undue and unfair pressure on the taxi industry to change.** Applying penalties to taxis is an inadequate way of dealing with the issue and can have an adverse

---

<sup>22</sup> <https://www.drivingelectric.com/your-questions-answered/1363/where-can-i-buy-hydrogen-and-where-my-nearest-hydrogen-filling-station>

<sup>23</sup> <https://www.cbtnews.com/former-chinese-minister-wan-gang-on-evs-its-hydrogens-turn/>

<sup>24</sup> <https://asia.nikkei.com/Business/Business-trends/Fuel-cell-cars-in-for-a-lift-as-Japan-looks-to-expand-infrastructure>

<sup>25</sup> <https://www.bbc.co.uk/news/business-50212037>

<sup>26</sup> [https://www.shell.com/energy-and-innovation/new-energies/hydrogen/\\_jcr\\_content/par/keybenefits\\_150847174/link.stream/1496312627865/6a3564d61b9aff43e087972db5212be68d1fb2e8/shell-h2-study-new.pdf](https://www.shell.com/energy-and-innovation/new-energies/hydrogen/_jcr_content/par/keybenefits_150847174/link.stream/1496312627865/6a3564d61b9aff43e087972db5212be68d1fb2e8/shell-h2-study-new.pdf)

effect as taxis actually reduce private car usage and provide an affordable and reliable form of public transport. Unite supports effective regulation of taxis as part of reducing emissions.

- 2.15. The greatest barrier to changing up to a more sustainable option is cost. Scrappage schemes work best if the vehicle is swapped and the old car is sold on in a part exchange to someone less fortunate, thus taking the worst polluting car off the road in each scrappage arrangement.
- 2.16. Removing old polluting vehicles from the road has substantial long term health benefits too. Diesel Engine Exhaust Emissions (DEEE) are recognised by the World Health Organisation (WHO) as a cause of cancer in humans placing it in the same category as smoking, Mustard Gas and excessive exposure to the ultraviolet (UV) part of sunlight<sup>27</sup>. A study by London's Kings College highlighted how drivers especially black cab drivers in London are receiving a high dose of such DEEE and black carbon from the traffic around them, many times the levels of pedestrians or cycle couriers, simply due to the proximity of the air intake for the cab and the exhaust of the vehicle in front.<sup>28</sup>
- 2.17. Scrapping a vehicle that still has life in it which produces less emissions than an older model minimises the potential environmental benefits. If these 'scrap' vehicles are not sold on, through the displacement of older vehicles to existing black cab drivers away from the capital, however, then the older cabs are retained as the supply of newer cabs dries up. The operation of a improperly managed scrappage scheme can therefore result in a higher level of emissions elsewhere in the country. A black cab is designed to last at least 25 years and sold at a price which reflects this longevity. Consequently when a black cab driver invests in a used black cab they are investing in something that has a shelf life of up to 24 years depending on the age of the vehicle when purchased from its previous owner. Not all cabbies can afford to buy the latest model and hence will buy as new a cab as they can afford. This results in a market where older more polluting cabs eventually end up in the most deprived areas where affording a new cab is way beyond their reach. Consequently, it should be in these areas where a scrappage scheme is most effective as it will remove the highest level of emissions and create a higher demand for newer taxi's and incentivise the ownership chain to upgrade.
- 2.18. Reducing harmful emissions from transport will be a major part in meeting the UK's commitment to reducing greenhouse gas emissions by 80% by 2050. This will not only require action to 'decarbonise' transport and develop emission reducing technologies, but will also depend on persuading people to make travel choices that are less environmentally damaging.
- 2.19. With recent cuts to bus routes in central London, taxis play a vital role in providing a safe and reliable public transport service which is designed around passenger accessibility. Unite calls on more funds directed towards grants for buying new compliant taxis.
- 2.20. Unite's transport strategy supports technology which minimises the polluting effects of transport and endorses cleaner fuels and electric cars. Unite has been working with our members in the taxi sector to identify sustainable, affordable and cleaner taxis. In 2018 Unite held a taxi conference which included a visit to the LEVC taxi factory and engaged with leading academics and businesses who promote electric and cleaner vehicles.
- 2.21. Our members were disappointed to learn that the £7,500 electric vehicle government grant to be awarded to taxi drivers buying the new electric Taxis will be limited to the first 9,000 applicants. In London alone there are 24,000. The new TX electric taxi costs £63,100 without

<sup>27</sup> [https://www.who.int/ipcs/assessment/public\\_health/IARC\\_mono105.pdf?ua=1](https://www.who.int/ipcs/assessment/public_health/IARC_mono105.pdf?ua=1)

<sup>28</sup> <https://www.kcl.ac.uk/news/taxi-drivers-face-highest-level-of-black-carbon-exposure>

the Government grant, most of our members are not able to afford this cost, especially now that the economy has shrunk by 20.4% and the UK enters it's worst recession in 300 years , A recent Unite survey of taxi drivers recorded 69% of drivers would not be able to afford to buy a new hackney cab as a result of reduced equity on their existing cab, and 70% would be less likely to buy a new cab as a result of lowering of the age limit of taxis, this is largely linked to feelings of uncertainty influenced by the fact that taxi drivers were originally 'promised' a 15 year age limit. Unite support the proposal for Euro 6 taxis to be subject to the 15 year age limit, but we see no reason to reduce LPGs, which currently have a 20 year age limit, or ZEC vehicles which are accepted in the new scheme, to the 15 year limit.

2.22. Additionally Unite is concerned by the lack of charging infrastructure with a serious shortage of rapid charge points for taxis, in London there are 56 rapid charge points designated for taxis . Added to that the current range of the batteries stands at 64 miles on a single charge in real world driving conditions<sup>29</sup>, our members usually do approximately 120 miles per day. The shortage of accessible charging points will significantly impact on drivers ability to work and Unite anticipate this will lead to significant financial losses for taxi drivers.

2.23. Understandably our members are apprehensive about the 'benefits' of owning the new electric taxi. Unrevised the current environmental measures are making taxis unaffordable for drivers and passengers. Taxis need more help from local and central government to enable taxi drivers to engage in the new cleaner technology. **Unite calls for better grants, wider vehicle choice and a comprehensive charging infrastructure.** Our members fully endorse a sustainable transport system that is better for the environment and need support to transition to cleaner vehicles. Unite's taxi sector understand the need to shift to low- and zero-emissions vehicles and we call for a national vehicle scrappage fund backed by government.

2.24. Unite's members in the taxi sector have raised the following concerns related to decarbonising taxis;

- The potential of passing on additional charges to customers;
- The displacement of older vehicles;
- Urgent support for conversion to alternative fuels and some support for only electric taxis being allowed into Clean Air Zones.

Furthermore our members in the taxi sector believe charging zones are a blunt instrument. While deterring some of the most polluting vehicles from entering certain areas, they penalise a small group of drivers that enter them. At the same time, the set daily ULEZ and congestion charge will incentivises drivers who have paid it to get value for money by making their journeys longer, while also encouraging other drivers to avoid paying by skirting around the edges of the zone. To make a lasting impact on air quality, we need not only cleaner vehicles, but fewer vehicles on our roads overall. Clean air charges will be picked up by customers with increased tariffs, this could well lead to an increase in the use of private vehicles as taxis and PHVs become unaffordable and inaccessible.

2.25. Designing the flow of traffic through any town or city is a fine art, likened to the flow of a liquid. Stopping the flow of traffic down one path too infrequently will cause the traffic to build up, causing increased emissions from the idling vehicles. Ensuring the flow of traffic from one set of lights to the next is a fine art easily upset by the provision of a zebra crossing or one which gives an increasing priority to pedestrians, cyclists or animals. The need for such crossings is always in doubt especially when there are alternatives such as an underpass or bridge. Similarly the interruption of traffic flow down one path, can be interrupted by the introduction of additional traffic over a level crossing. Finally removing an obstacle may convert a busy road into a rat run to avoid a greater level of disruption of an adjoining

---

<sup>29</sup> <https://www.levc.com/tx-cost-comparison/>



parallel path. **Unite therefore calls for a greater focus on the placement of crossings and a greater focus on traffic flows in order to reduce congestion and emissions.**

### **Buses and Coaches?**

- 2.26. The UK has a world leading low emission bus and coach building industry which must be defended. Unite is the trade union for workers at Wrightbus, Optare and Alexander Dennis. **Unite is calling for the order of 4,000 low emissions buses, announced by the Prime Minister in February 2020, to be brought forward in order to support the industry through the Covid 19 crisis and the aftermath.**
- 2.27. **Unite is calling on Government support for bus and coach manufacturing to be conditional on retaining jobs and production within the UK.** On July 27<sup>th</sup> Alexander Dennis announced 650 job cuts across all three UK sites and the planned closure of the Guildford site. Unite has uncovered that this is part of a corporate restructure strategy planned by the parent company, the NFI Group, prior to Covid. As part of this strategy ADL plan to outsource a significant order of 198 buses for BVG Berlin to a third party in Turkey despite citing a decline in orders to try and justify cutting jobs. All this is despite receiving support from the Scottish and UK Governments.
- 2.28. Conservative Government policies of privatisation, marketisation and underfunding has meant inadequate and expensive public transport and have created hostile walking and cycling environments. The Bus Service Operators Grant (BSOG), a subsidy paid by the Department for Transport to operators in England of eligible local bus services and community transport organisations, helps to lower the cost of providing services, resulting in lower fares, a more comprehensive network of services, less congestion on our roads and a better and healthier living environment in our communities. BSOG generates between £2.70 and £3.70 in benefits for every £1 of public money spent<sup>30</sup>. In 2010, the Coalition Government announced a 20% reduction in BSOG from 2012/13 onwards, with further reductions in local authority budgets leading to a 25-30% reduction in the budget for tendered bus services. Over the past five years the Conservative Government has been pledging it will reform BSOG, but little has happened.
- 2.29. Bus service provision has reached a point where it is rarely an alternative to car ownership. Central government cuts have meant reductions in bus services and routes; cuts to the Bus Services Operators Grant and less money for carrying concessionary bus pass holders. This has meant forcing millions of people to choose between debt and social exclusion. It has to be a priority to tackle transport poverty to ensure a fair public transport system must be affordable to all.
- 2.30. According to the latest National Travel Survey report bus use in rural and urban areas is in decline. The report attributes the decline to a shift to car ownership in these areas but also cites income and quality and cost of bus services as additional factors. Bus services supported by local authorities are often the only form of non-car transport in rural areas and are essential for vulnerable groups who would otherwise be isolated. However there have been significant cuts to local authority budgets since 2010 which have resulted in 30 million miles of bus journeys have been lost as supported mileage has fallen to 13.4% in year ending 2017 .
- 2.31. In a Commission for Rural Communities survey public transport was mentioned by 28% of respondents as one of the main things rural people would like to see done to improve the

---

<sup>30</sup> Costs and Benefits of the Bus Service Operators Grant, Greener Journeys (2017):  
<https://greenerjourneys.com/wp-content/uploads/2014/10/BSOG-June-2017.pdf>

quality of life. Indeed the Government's own Social Mobility Commission highlighted the lack of transport as a major contributor to poor social mobility in the most remote rural and coastal areas. The lack of bus services in such areas increases problems of road congestion and pollution as more people are driven into car use and dependence on car travel. Rural bus users experience a skeletal service or, in some places, no service at all. Resultantly people who cannot drive, mainly the elderly, young people and people on low incomes are being cut off.

- 2.32. The Paulley v FirstGroup plc Supreme Court judgement<sup>31</sup> has increased pressure on drivers to enforce wheelchair users' legal right to a designated space on public transport. However, accessibility remains a barrier as wheelchair space on buses is limited to a maximum of two chairs. With other passengers such as those with pushchairs competing for shared access this creates an impossible conflict for bus drivers as well as for the passengers. Recently a driver attempting to enforce the rules, in this case the requirement to wear mask, have being assaulted<sup>32</sup> echoing the dangers faced by transport workers all over the world. In France one driver, Philippe Monguillot, died following a similar altercation with a passenger over their refusal to wear a mask. In a Unite survey, bus drivers reported increased levels of stress resulting from confrontations between drivers and passengers as they attempt to enforce priority spaces for wheelchairs. **Unite supports the Supreme Court ruling but more needs to be done by bus companies to design buses with better accessibility for wheelchair users and signage to make it clear who has priority over spaces on tickets.**
- 2.33. Our transport planning system penalises people who cannot afford a car, who struggle to cover rising public transport fares and who lack access to public or private transport because of age, disability or where they live. Yet so far there has been the opposite approach with recent emergency funding for TfL from central government tied to increasing fares.
- 2.34. **Unite believes that fares on public transport need to be affordable with no cuts to concessionary fares for young, older and disabled people. Nor should there be further cuts to the Bus Service Operators Grant (BSOG), as the cuts have had damaging and wide ranging consequences for local communities, public transport services, low income groups, the UK economy and the environment. Unite believes the government must set out a long term policy framework supporting investment for buses and link buses into other government policies beyond a transport.**
- 2.35. Unite is committed to a policy of full public ownership of buses and we see this as the best way for the bus system to operate in the interests of passengers, communities, the environment and the wider economy. Unite sees little benefit to bus users, communities or workers in private companies cherry picking routes to provide profits to pay to shareholders while fares rise, bus routes are withdrawn and the terms and conditions of workers in the industry are being eroded. Public ownership of our buses would create a more integrated network of properly regulated bus services which would be run for the benefit of passengers rather than to provide excess profits for operating companies. It would lead to greater accountability, improved reliability, better value for money and better for the environment.
- 2.36. A modern diesel bus produces fewer NOx emissions overall than a modern diesel car despite being able to carry 20 times more passengers. A double decker can carry enough passengers to reduce the need for 75 fewer cars journeys<sup>33</sup>.

---

<sup>31</sup> [2017] UKSC 4

<sup>32</sup> <https://www.bournemouthcho.co.uk/news/18602680.bournemouth-bus-driver-assaulted-man-not-wearing-face-mask/>

<sup>12</sup> [https://www.transporttimes.co.uk/news.php/Accelerating-modal-shift-to-public-and-active-transport-528/?utm\\_source=Transport+Times&utm\\_campaign=ff4435b592-](https://www.transporttimes.co.uk/news.php/Accelerating-modal-shift-to-public-and-active-transport-528/?utm_source=Transport+Times&utm_campaign=ff4435b592-)

- 2.37. **Whilst the emissions from buses and coaches has fallen significantly in recent years, Unite would argue that the reduction in emissions has predominantly been as a result of the loss of over a quarter of all previously operated bus routes.** This is also why a reason why the levels of emissions from cars and vans have increased - the loss of a convenient cheaper alternative. Bus services must provide a rapid, reliable and stress free service to the destination or interchange with another mode of transport. Equally there needs to be the provision of a service, late enough to greet the returning passenger and convey them home at an affordable price. Key to reducing emissions must therefore be the provision of more services.
- 2.38. A bus is not too large to fully benefit from battery electric conversion and the Dft has funded a £50m scheme to help local authorities change to electric busses.<sup>34</sup> London already uses electric buses as part of its 9,000-strong fleet and one North London garage has started a trial to see if the batteries in the busses it is not using can help balance the gap between demand and supply within the National Grid network<sup>35</sup>. Unite members at Alexander Dennis Limited and BYD Europe (the UK's leading electric bus producer), have just supplied the first of 29 Enviro 400 EV double decker busses to National Express West Midlands<sup>36</sup>, where they are charged entirely by renewable energy and utilise a stationary battery system to balance the load on the electricity grid in a similar trial to that already employed at a North London garage<sup>37</sup>
- 2.39. Busses are also being converted to run on Liquid Petroleum Gas (LPG), hydrogen ICE or an alternative sustainable fuel. Whilst hydrogen combustion does remove the direct CO<sub>2</sub> and other greenhouse gas emissions it may not stop creation and release of Nitrous Oxides (NO<sub>x</sub>). As with cars a bus can benefit from a flywheel or KERS system to maintain the kinetic energy especially as its journey through a town or city involves numerous periods of acceleration and braking.
- 2.40. A hydrogen fuel cell bus is the ideal solution as it can be topped up quickly to keep the vehicle in service and produces only water vapour as its emissions. Sadly even though this water could be converted back into hydrogen through electrolysis, it is simply left to escape, meaning that more hydrogen needs to be purchased each time from the limited number of suppliers. The other advantage of a hydrogen fuel cell is that it also releases deoxygenated air as a waste material which is very useful as a non-toxic fire retarding gas.

## **Vans and Lorries?**

- 2.41. Unite has over 80,000 members driving vans and lorries around on UK roads and supports the call for further support for workers in the commercial vehicle industry in the transition to electrification. Unite members also work in the manufacturing of the LEVC electric small van,

---

[EMAIL\\_CAMPAIGN\\_2018\\_10\\_30\\_11\\_03\\_COPY\\_01&utm\\_medium=email&utm\\_term=0\\_c0cfa3f39-ff4435b592-250768089](mailto:EMAIL_CAMPAIGN_2018_10_30_11_03_COPY_01&utm_medium=email&utm_term=0_c0cfa3f39-ff4435b592-250768089)

<sup>34</sup> <https://www.bbc.co.uk/news/business-51391764#:~:text=England's%20first%20town%20to%20have,play%20in%20bringing%20down%20emissions%22.>

<sup>35</sup> <https://eandt.theiet.org/content/articles/2020/08/electric-buses-stored-in-london-garage-to-become-virtual-power-station/#:~:text=A%20bus%20garage%20in%20North,1MW%20energy%20to%20the%20grid.>

<sup>36</sup> <https://www.alexander-dennis.com/media/news/2020/july/29-byd-adl-enviro400ev-electric-double-deckers-are-first-step-towards-zero-emission-national-express-fleet/>

<sup>37</sup> <https://eandt.theiet.org/content/articles/2020/08/electric-buses-stored-in-london-garage-to-become-virtual-power-station/#:~:text=A%20bus%20garage%20in%20North,1MW%20energy%20to%20the%20grid.>

Vauxhall – Vivaro large vans, Ford – Engines for transit vans. (Most sold vehicle across all categories in the wake of Covid 19) and Leyland DAF trucks, so understandably argues that there needs to be a just transition strategy in place to retain and retrain the workforce if the internal combustion engine is to be phased out of production and vehicles like the new Renault Kangoo ZE hydrogen and Master ZE Hydrogen<sup>38</sup> possibly take their place.

- 2.42. Whilst passengers can choose the route they travel, and hence may choose a less sustainable option for convenience, a package or consignment from a hub to the destination has its travel plans decided for them and do not mind being locked away for long periods of time. The parcel cares not what it travels with nor the route or vehicle taken. The enemy of the environment in this situation is the lack of warehousing and the use of “Just-in-time delivery” as the speed a consignment travels to its destination. Whilst the van and lorry provide the final link in the chain to the door and the first link from the manufacturer to a transport hub there is no logical reason why the van or lorry should always be the vehicle of choice to deliver consignments from source to the door. The redeployment of lorries and vans to just shorter elements of a journey and the rationalisation of loads to reduce the amount of empty running could save on the logistics company fuel and hence emissions.
- 2.43. As stated earlier how the vehicle is driven can make a substantial difference to the volume of emissions released, consequently, driver training is critical. Whilst a battery van may be a workable solution a battery powered heavy goods vehicle (HGV) only has a 15 tonne payload per 40 tonne articulated vehicle due to the weight of the tractor unit and trailer. Batteries currently weigh too much to make a viable battery HGV solution. HGV tractor units are already being converted to run on hydrogen ICE<sup>39</sup> and there is no reason why they could not equally operate on hydrogen fuel cells. Similarly Unite members help produce the new LEVC – new electric small van<sup>40</sup> which is based around the near bullet proof engine in the new electric black cabs.
- 2.44. **Unite opposes the ‘race to the bottom’ in this sector, and supports environmental concerns alongside wider minimum standards as set out in Unite’s charter.** Unite opposes the increasing size or volume of lorries and the use of platooning. Platooning is reliant on the trailing vehicles travelling at far closer distances than would normally be possible without a physical linkage to engage brakes and steering inputs at exactly the same moment. The UK road network has too many low bridges, junctions and roundabouts for platooning to work on anything other than major motorways. Even here, every care should be taken to ensure the vehicles in the platoon are all in top condition. At the speeds platoons travel at and given the distances, all it needs is a tyre to explode or a brake to fail and the whole platoon could become involved in the accident. A 40 tonne lorry can be difficult to stop in a collision and the thought of a string of lorries impacting another vehicle or chain of vehicles does not bear thinking about. Taller lorries are more prone to topple over in high winds especially if the load that is being carried is light in weight<sup>41</sup>.
- 2.45. Vans are also used as everything from a mobile storeroom, engineering department to a shop, library, bank or hairdressers which can service remote communities. Consequently in these cases the solution has to be a more sustainable vehicle or fuel.

---

<sup>38</sup> <https://www.autocar.co.uk/car-news/new-cars/renault-launches-hydrogen-range-extender-electric-kangoo-and-master-vans>

<sup>39</sup> The conversion from diesel or petrol to hydrogen ICE in theory only requires a change in gasket materials due to the change in fuel composition, indeed companies like [UlemCo](#) are already converting vehicles and setting up the supply chain for fleet changes to hydrogen using the existing engines in company cars.

<sup>40</sup> <https://www.levc.com/vn5-electric-lcv-van/>

<sup>41</sup> According to a government funded investigation into the need to change the dimensions of lorries the trend is for ever lighter consignments but this does not mean a reduction in volume hence the trials of taller lorries - <http://data.parliament.uk/DepositedPapers/Files/DEP2008-1410/DEP2008-1410.pdf>

## Passenger Rail?

- 2.46. **Unite believes that to improve the carbon footprint of passenger transport the key is to entice those passengers out of their cars and into mass transport.** To do so on the rail network will require a culture change, the provision of better information and every effort put into improving reliability.
- 2.47. **Unite believes that a CCTV is no deterrent to criminal behaviour and in many cases it is not a tool to catch the guilty either, due to their poor state of repair.** An unstaffed train or bus station, late at night is a very frightening place, especially if the only other passengers around are a group of drunken lads, buoyed by peer pressure and alcohol into making lude comments to attractive female passengers travelling alone. Unite believes that the retention of a member of staff to assist passengers can provide a visual deterrent and place of refuge. At a bus station there is always the potential for passing motorists to see what is going on and report it but not so on a train station which may be underground or enclosed in a building where the only witnesses are passing train drivers whose focus should be on the signalling and the line ahead. **If the government is to encourage passengers back onto the train services, Unite believes that there can be no replacement for the personal service provided by a member of staff.**
- 2.48. Hindsight is a wonderful thing as it can provide a new way to address an old problem. A rail network will always lose money on its own as it does not produce anything other than the relocation of assets but costs money to achieve that goal. Initially rail networks were set up to move freight to market and the idea of providing access to paying passengers was very much an afterthought. For a rail network to make money it needs either a manufacturing business to produce some large volume quantity of freight which then needs to be moved to market to produce the money. In the past this was coal and metals that provided the backbone funding which would subsidise the cost of a passenger ticket.
- 2.49. As a result the priority access to the tracks had to be freight before passengers as it was freight that paid the bills. The removal of the British steel industry from the body that formed the larger British Rail removed that income and the growing focus on road transport and the removal of 5,000 miles of track, and 2,363 stations often in remote communities during the Dr Beeching era has left many areas without access to rail travel. The conclusion of Dr Beeching's report<sup>42</sup> has now been widely criticised and in places reversed. **Unite believes that should the network be expanded into more rural locations and back into industrial estates for freight, that car journeys can be reduced further.**
- 2.50. There have, been two occasions in the history of UK standalone passenger rail travel when the cost of a passenger's ticket was enough to cover the costs of the network operation. The first occasion was just prior to the privatisation of British Rail when it was being operated with minimal funding, was using aging equipment and was in serious need of a cash injection. The other example was under state ownership on the East Coast line from London to Edinburgh that was instigated between the collapse of the Stagecoach and the collapse of the Virgin franchises. During this time East Coast paid back £225 million to the Treasury just prior to the sell off.
- 2.51. The history of rail franchising on the East Coast route has repeatedly highlighted why rail franchising only works as a method to funnel taxpayers and fare paying customer revenue streams into the pockets of other European state networks and the pockets of investors rather than back into the network.

---

<sup>42</sup> [http://www.railwaysarchive.co.uk/documents/BTC\\_Mod001.pdf](http://www.railwaysarchive.co.uk/documents/BTC_Mod001.pdf)

- In December 2006 Sea Containers was stripped of the Great North Eastern Railway (GNER) franchise due to financial difficulties.
  - It's eventual replacement National Express East Coast (NEXC) was stripped of the franchise due to financial difficulties in July 2009.
  - November 2017 Stagecoach/Virgin operating as Virgin Trains East Coast (VTEC) again announces that it is facing financial difficulties and once the government replaces the operator of last resort the franchise in June 2018 is renationalised yet again.
- 2.52. Each time this happened the taxpayer lost millions due to the way franchises are financially structured. As it costs money to buy new uniforms and paint everything in the new company colours, the Government does not charge the franchise holders with a flat annual fee for the licence to operate that route. Instead the government weights franchises so that the operator only has to pay a third of the average annual cost of a licence to operate that franchise in the first half of the franchise and in the last third they pay back the balance on a sliding scale. Whilst this may help the new franchise holder initially invest in new technology and training, this does not last.
- 2.53. During the latter half of the franchise, the holder is less likely to invest in upgrades or training and is more likely to claim financial difficulties. This leaves the government with the task of picking up the pieces whilst the franchise holder pockets the outstanding balance. In the case of the East Coast line, each of the operators pulled the plug but was allowed to continue to operate other franchises on other parts of the network. At no time were these franchise holders charged for the difference between the average and actual franchise licence fee. **Unite believes that if the network is to continue to be privatised the franchise operator should be charged a flat fee.** Had this been the case on the East Coast route these lost mission millions could have made a significant difference in reducing fares, increasing ridership and hence reducing emissions.
- 2.54. **Unite is against the franchise operator who rips off the tax payer and travelling public to make payments of public funds into the pockets of shareholders under cover of them being called “profits”.** This has happened all too often in the past. If the rail industry is to attract customers out of their cars the fares need to be cheap and easier than the alternatives. The Centre for Research on Socio-Cultural Change (CRESC) public interest report<sup>43</sup> into rail privatisation and its aftermath clearly illustrates how the private sector has milked the industry and sadly not that much has changed since its publication.
- 2.55. The public sector would have you believe that ridership on the UK rail network has increased under their management, which it has, but Unite would argue that ridership figures would have increased anyway but at a far faster pace had it not been for the overpricing of tickets. Prices rose quickly in this period, rising 108% in real terms from 1979 to 1994, as prices rose by 262% but RPI only increased by 154% in the same time<sup>44</sup>. The problem is that the ticket prices have now increased to a level where passengers cannot afford to commute by rail and are returning to their cars<sup>45</sup> as they get priced out of using the train<sup>46</sup>

---

<sup>43</sup> The CRESC study can still be found here  
<http://hummedia.manchester.ac.uk/institutes/cresc/sites/default/files/GTR%20Report%20final%205%20June%202013.pdf>

<sup>44</sup> Gourvish, Terry. *British Rail 1974–1997: From Integration to Privatisation*. p. 277

<sup>45</sup> <https://dataportal.orr.gov.uk/media/1740/passenger-rail-usage-2019-20-g4.pdf>

<sup>46</sup> <https://www.theguardian.com/money/2019/aug/14/rail-fares-to-rise-in-january>

- 2.56. Whilst journeys have increased from 255 billion miles travelled in 1990 to 328 billion miles in 2018, an increase of 29%<sup>47</sup> franchise operators have for years claimed that it is thanks to their efforts. Recent passenger number statistics suggest that that bubble has burst.
- 2.57. The same mistake was made in the late 1950's and 1960's when the UK embraced the motor car and began constructing its first motorways for the masses who could now afford a car, which in turn caused rail ridership to plummet. The industry experts at the time believed that rail travel was dead and had been replaced by the car. The latest ORR report highlights at the bottom of page 2 a graph of rail ridership figures from 1950, which illustrates that throughout the era when major government investment was going into the UK Motorway network, there was a downturn in rail journeys. Throughout the Thatcher era and economic crisis and run up to privatisation, the network received very little funding. This graph illustrates that once the government started ploughing billions into the now privatised rail industry, once roads started to become more congested, the cost of running a car increased and the nation's population grew passenger numbers increased. Passenger rail ridership figures have now begun to decline as passengers sort more local employment and avoid using rail. **Unite believes that this reduction in rail passenger numbers has been as a result of rail fares outstripping income and now that companies have learnt that they can save on office space by getting office workers to work from home, Unite believes that this decline will continue.**
- 2.58. Today we are seeing an economy where many low paid jobs in the capital are left unfilled as fares are now making it far too expensive to commute for a low paid job, by rail. The ORR report highlights that bus use has also declined since the 1950's simply because of the access to the family car, and due to a reduction in bus services since privatisation and rising fares bus passenger usage outside London have continued to decline. Bus fares have more than tripled since deregulation in 1986.<sup>48</sup> Year on year we are seeing bus fares increase in all regions of the UK, bar London, where a more moderate system of local authority controls has been established by TfL which has control of public transport provision. The latest report from the Department for Transport stated a 3.3% increase in bus fares in the year to March 2019, which is greater than all other items in the Consumer Prices Index rate of inflation.<sup>49</sup>
- 2.59. **Unite also believes that the lack of a guiding mind and level of fragmentation creates a blame culture where the operator is never responsible.** This fragmentation has been recognised as a major reason for the additional costs associated in operating a rail network in government report after government report. In these reports despite highlighting the problem, the solution is never unification but further fragmentation. Once broken re-establishing an alternative to the car will be far more expensive.
- 2.60. **Unite would therefore argue that if the aim is to drive down emissions from transport then the goal should be to make the service pay for itself and charge passengers enough to still attract them out of their cars.** This pricing balancing act is hard to achieve as it means enough needs to be fed into the network to cover both existing operations and maintenance but also track improvements and upgrades. Such proposals leave very little if any room for profits. Nonetheless the history of the privatised rail network is covered in a catalogue of failures which have cost lives and built a debt mountain which exceeded £27

---

<sup>47</sup> <https://www.ons.gov.uk/economy/environmentalaccounts/articles/roadtransportandairmissions/2019-09-16>

<sup>48</sup> Davis et al., 2012 A minimum income standard for the UK in 2012: Keeping up in hard time

<sup>49</sup> DfT Quarterly Bus Statistics: England Q1 (January to March) 2019 - [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/810251/quarterly-bus-statistics-januaryto-march-2019.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810251/quarterly-bus-statistics-januaryto-march-2019.pdf)

billion causing the EU<sup>50</sup> and finally the Office for Budget Responsibility to reclassify Network Rail as publically owned to comply with the 2010 pan-European System of Accounts. **Unite would stress therefore, that the privatisation of the rail network should never have happened and a return to public ownership should be the way forward.**

- 2.61. The decarbonisation of rail cannot come soon enough for some engineers who have suffered from a high percentage incidents of throat cancers and other breathing problems. **Unite does not however wish to see a repeat of the situation at Gemini Trains in Springburn, Scotland, last year**, where Scot Rail closed a site that could easily have been converted to take electrified trains. The engine sheds are a matter of yards from the main line and it would have needed minimal investment to repurpose the sheds instead of the current situation where trains need to travel hundreds of miles to be serviced. Similarly as old rolling stock is replaced the highly skilled and qualified train engineers can learn new skills to maintain the replacement trains rather than being dumped by the wayside. Unite has witnessed situations where, because the manufacturer retains ownership that they also maintain the trains leaving the engineers who previously worked on the old rolling stock out of work. **Unite believes in a just transition and this should include the retraining of engineers to work on new equipment as more polluting trains are retired.**
- 2.62. Thankfully the UK Government has announced that diesel-only trains will be phased out by 2040<sup>51</sup> but what it didn't say was anything about the just transition of engineering jobs from the maintenance of diesels to electrically powered trains. **Unite calls on the government to ensure that wherever possible maintenance facilities are retained and adapted to enable engineers to retain their jobs.** Sadly this was not the experience those engineers who worked in Scotland's Gemini Rail, Springburn depot who in 2019 lost their fight to keep the depot open in order to maintain ScotRail's new electrified fleet. Unite welcomed the pledge by the Cabinet Secretary to accelerate a commission by Transport Scotland on the electrification of the depot to connect it to the Glasgow to Edinburgh rail line, and to explore repurposing options, including the creation of a national transport hub<sup>52</sup> but despite our efforts the depot closed.
- 2.63. The condition of the network with its low, often masonry, bridges and tunnels, present technical challenges when it comes to the challenge of reducing emissions from the network. Before the cables can be laid, piling needs to be driven into the sides of the track to strengthen and stabilise the ground but also to enable the provision of overhead gantries from which the cables can be hung. When the work begun on the Great Western line from Paddington to Cardiff it was soon realised that all the usual cabling had been buried under the tracks. This therefore required far more engineering to lift the track, unearth the cabling and position it correctly before replacing the track and begin driving in the piling.
- 2.64. The task of electrification is a long and heavily manpower intensive one. A mile of overhead electrical cabling can be laid in each shift<sup>53</sup>, on the railway highlighting how much work needs to be done just to electrify a mile of track. This does not take into account the preparatory work and the surprises in the way or the disruption to existing rail services, disruptions that if not properly managed, discourage passengers from using trains.

---

<sup>50</sup> <https://ec.europa.eu/eurostat/documents/1015035/3991223/Final-findings-EDP-dial-visit-UK-Jan-2013.pdf>

<sup>51</sup> <https://www.railway-technology.com/features/goodbye-diesel-phase-mean-uk-rail-innovation/>  
<sup>52</sup> <https://unitetheunion.org/news-events/news/2019/january/unite-accuses-gemini-rail-of-being-committed-to-industrial-vandalism/>

<sup>53</sup> <https://www.networkrail.co.uk/communities/living-by-the-railway/electrification/overhead-line-equipment/>



- 2.65. On most of the network there are no accurate up to date maps showing where every communication cable is lying nor the location of the track switches and even in some cases if a set of points is still part of the network or if it has been removed. This lack of information and even signage at track access points has left many an engineer to walk the wrong way down a length of track or to get to a location to affect repairs only to discover that the infrastructure in question no longer exists. What complicates the situation further is the lack of a single map of the area from which planners and engineers can work. Instead there are a plethora but none unified into a single live resource. As a consequence a section of track can be removed from the useable network on the basis that maintenance work is to be carried out only to discover that the work was unnecessary as the planners map showed a section in need of repair when the work had already been done or in at least one case repairs scheduled to repair a set of points that had already been removed.
- 2.66. **Unite would therefore suggest that the existing maps of the network should be combined into a single on-line map which contains up to the minute information on what assets are located where, when they were last maintained and when they were installed.** Such a model will allow maintenance and upgrading teams the ability to minimise the disruption to the passenger journey.
- 2.67. As highlighted earlier, before any work can be carried out, engineering teams need to put line blocks in place to prevent trains using tracks whilst engineers are onsite effecting repairs. The use of live lane operations which rely on look outs to get these engineers off the tracks if a train is approaching is dangerous and has cost lives with numerous near miss's recorded. There is far too much of a macho, "we don't need no health and safety culture" that prevails on the network.
- 2.68. **Unite is not advocating any increase in live lane running in order to minimise disruption and therefore save on emissions, quite the reverse. Safety will always trump inconvenience, every time.** It is always appalling when there is a work related death or any death or injury on the rail network, but given the number of near misses, it's a wonder why there aren't more involving track workers. Any measure to reduce the number of such incidents including the reinstatement of the yellow front end livery requirement, to make trains more visible would help them stand out more to lookouts.
- 2.69. Trains that are tasked with passenger operations on lines that are not electrified via an overhead cable or a third rail can reduce emissions to zero if they utilise green hydrogen<sup>54</sup> and fuel cells to provide the power to converted trains. Whilst diesel trains can also be converted to burn hydrogen ICE can create NO<sub>x</sub> as highlighted earlier. Waste household products and biological waste from plants and animals can all be used to produce an alternative sustainable fuels but the need for these drop-in fuel alternatives is greatest in the battle to decarbonise aviation.
- 2.70. **Unite welcomes work carried out by Alstom to convert Class 321 trains into hydrogen Class 600's as it will allow large areas of the rail network to be accessed by electric trains without the need for heavy batteries, cables or a third rail.** Despite this Unite feels that the £1 million Eversholt Rail / Alstom project is just a drop in the ocean and more should be done to remove the networks dependency on fossil fuels.

## Aviation?

- 2.71. The aviation industry has been hit hard by the global pandemic and it is unlikely to attract back some passengers for several years. As highlighted earlier the type of flying provided by Flybe before it was allowed to fail by the government provided lifeline and feeder services

---

<sup>54</sup> See para 2.176 below to find out the difference between green and blue Hydrogen

that cannot be replaced easily. The loss of this airline and Thomas Cook and Monarch before it, has highlighted just how financially precarious some parts of the industry are.

- 2.72. Whilst it is true that on some activities the level of emissions have been less than optimal, it should be recognised that the aviation industry is active and vocal in attempting to clean up its act in the UK and has managed to divorce growth in passenger numbers with growth in emissions. The UK aerospace industry was the first to accept that the aviation sector could reach net zero by 2050 unlike the rest of the world who has been continuing to claim that aviation can only reach 2005 levels of emissions by 2050 against a considerable amount of opposition.
- 2.73. Whilst innovation in the industry could help it achieve net zero a lot depends on funding and government support. Had this support been forthcoming London's waste would now be fuelling flights and this waste would be providing electricity and regional heating eliminating 500,000 tonnes of landfill per annum. Instead this like other innovations is now being demonstrated in another country. **Unite asks for the government to be generous in helping what is widely perceived as the worst polluting part of the transport industry if it intends to achieve net zero by 2050.** The aviation sector supports not only the few hundred thousand jobs employed directly and indirectly in moving passengers and freight using aircraft, but supports the existence of many other industries that need to provide fast connectivity with the rest of the world. Sometimes there cannot be the same interaction with clients to keep deals alive if they are not carried out in person. And that deal may be the difference between keeping a production facility open or it closing.
- 2.74. The UK aerospace sector is a vital export earner with around 90% of its jobs located outside London and the South East thus commercial aerospace sector are central to the success of our nation's economy, with over 110,000 people directly employed in the sector and about four times this number supported indirectly.
- 2.75. It's the second largest commercial aerospace industry in the world and it's been built through the highly skilled workers and high value jobs (average annual earnings of £43,000 being 45% higher than the UK average) we have in the UK. It's a sector we should be very proud of. However, it's a sector that's coming under great strain as a result of the current COVID-19 pandemic massively curtailing global flying activities and thus the revenue streams of their customers. the airlines, who are in turn attempting to cancel or postpone existing aircraft orders.
- 2.76. With our aircraft manufacturing and servicing base thus under great threat, we must do all we can to secure and strengthen this vital sector, whilst also insuring its green credentials are continually enhanced. In other countries such as France and the US their governments are significantly more supportive of their commercial aerospace industry. Opportunities exemplified by the positive picture portrayed by the figures set out in ADS's Outlook Report 'show the benefits achieved in recent years by a strong partnership between the industry and Government, with £3.9 billion of joint funding in the Aerospace Technology Institute (ATI) supporting cutting edge technological innovation that keeps the UK aerospace sector a global leader in its field'.<sup>55</sup>
- 2.77. Sector analysis shows the UK aerospace sector (approximately 75% civil and 25% defence) has an annual turnover of £35.9 billion which has grown by 45% since 2010 and generates £9.9 billion (2018) in value added and £34.2 billion in exports, being 95% of the goods it produces.<sup>56</sup> There are around 3000 aerospace companies across the UK<sup>57</sup> delivering high

<sup>55</sup> <https://www.adsgroup.org.uk/blog/adsfacts/uk-aerospace-outlook-2019/>

<sup>56</sup> Ibid

<sup>57</sup> <https://www.great.gov.uk/international/content/industries/aerospace/>

value jobs for a highly skilled workforce, supporting around 3,800 apprentices. Additionally, the sector provides 31,000 jobs in design and engineering.<sup>58</sup>

- 2.78. Prior to the pandemic it was forecast that demand for new commercial aircraft was strong and that approximately 36,800 jets would be delivered globally over the 2017–2036 period.<sup>59</sup> Such demand at the UK level has seen substantial sums spent on research and development with £1.5 billion being spent in 2017 alone; with 67% of this funding coming from businesses own funds. In the same year the UK industry attracted £2.7 billion in private sector investment.<sup>60</sup> It is also noteworthy that on 20th of July 2020 it was announced that the 'UK aerospace sector is to benefit from £400 million funding to go green'.<sup>61</sup>
- 2.79. The strategic players in the sector, Airbus, Rolls-Royce, Bombardier, GKN, Collins Aerospace, GE and Leonardo have significant roles to play in designing, building and maintaining the products that make the UK commercial aerospace sector the envy of the world. June 2019 saw the Bi annual Air Show land in Paris<sup>62</sup> with the industry's biggest names gathering to showcase their products - all in all there were 2,453 exhibitors from 49 countries (including 103 from the UK) - covering the whole spectrum of aviation from airframes to airport equipment, engines to education and material's to maintenance<sup>63</sup>, with the shows underlying theme being one of sustainability.
- 2.80. Given the aviation industry accounts for 2% of manmade CO<sub>2</sub>, it is hardly surprising that tackling the challenges of tomorrow, such as climate change, have risen to the top of the sectors agenda, evidenced by the signing of a decarbonisation declaration by some of the industry's biggest and most influential players.<sup>64</sup>
- 2.81. Whilst the emissions from aviation are growing at an alarming rate the demonization of domestic aviation is misplaced. A typical diesel train produces more greenhouse gasses than a turbo prop aircraft flying the same route around the UK yet the statistics produced which are used by those passengers to plan their trip use average emission figures for all aviation and all trains. This has the perverse effect of causing passengers to choose diesel rail services over turboprop aircraft causing more emissions to be released. What the environmentally conscious traveller sees is aviation bad and trains good without looking deeper into the facts. Passengers need to be able to make a real informed choice.
- 2.82. The report and other government publications have added to the emissions from aviation a band to take account of non-CO<sub>2</sub> impacts on the climate from secondary emissions. These secondary emissions generally centre on the creation of condensation trails behind the aircraft. The science actually suggests that condensation trails are a major problem when they are caused at night as the additional cloud coverage retains heat whilst during the day the additional cloud coverage actively reduces the warming of the planet, when taken in isolation. Condensation trails are caused by the addition of particulates from the engines in the main but also from disturbed air caused by the wake of the aircraft passing through it<sup>65</sup>. It

---

<sup>58</sup> <https://www.adsgroup.org.uk/blog/adsfacts/uk-aerospace-outlook-2019/>

<sup>59</sup> <https://www2.deloitte.com/content/dam/Deloitte/global/Images/infographics/gx-eri-global-a-d-industry-financial-performance-study-2018.pdf>

<sup>60</sup> <https://www.adsgroup.org.uk/blog/adsfacts/uk-aerospace-outlook-2019/>

<sup>61</sup> <https://www.gov.uk/government/news/uk-aerospace-sector-to-benefit-from-400-million-funding-to-go-green>

<sup>62</sup> <https://www.siae.fr/en/>

<sup>63</sup> [https://www.siae.fr/en/exhibitors\\_list.htm](https://www.siae.fr/en/exhibitors_list.htm)

<sup>64</sup> <http://www.asdnews.com/news/aerospace/2019/06/19/aviation-industry-declares-commitment-future-clean-aviation-partnership>

<sup>65</sup> <https://www.scientificamerican.com/article/why-do-jets-leave-a-white/>

is not as some environmentalists would have you believe simply exhaust fumes produced by dirty engines.

- 2.83. Measurements of particulates created by aircraft on the ground also highlighted just how small these particulates can be potentially causing health issues for all aviation workers at airports. It is thought that the principle component of these particulates are aerosolised sulphur compounds from the impurities in the conventional aviation fuel. As synthetic aviation fuel contains little if any sulphur **Unite believes a move to synthetic aviation fuel and eventually hydrogen could to a very large degree eliminate, or at least substantially reduce, both ground based pollution and the volume of condensation trails**<sup>66</sup>
- 2.84. As the majority of domestic and short haul flights are during the hours of daylight the release of NOx will also trigger a chemical reaction that removes methane from the atmosphere<sup>67</sup> in such quantities that rather than doubling the impact of domestic aviation emissions, the secondary reactions have however been investigated and will according to a study examining the effects of aviation NOx emissions as a short-lived climate-forcer determined that the secondary impacts would amount to only an additional 2%<sup>68</sup> and could result in a negative impact, thereby actively reducing the impact of flights if it were not for a subsequent increase in fuel burn and therefore CO<sub>2</sub>. Obviously if the fuel burnt was hydrogen then the CO<sub>2</sub> element of the emissions would be removed but through combustion NOx may still be present.
- 2.85. As the industry moves forward the importance of digital should not be underestimated. The broad title digital, also known as the '4th Industrial Revolution', covers a broad spectrum of activities, from artificial intelligence to automation, machine learning, data analytics and electrification.
- 2.86. There will undoubtedly be many challenges, not just for unions and employment but for society as a whole, posed by the technological advances that digitisation will bring. However, if we are to reduce the impact on our planet from the aviation sector, then there is little alternative than to embrace the technology whilst continuing to ensure regulatory protections are in place, not just for the environment but also for the safety of all those concerned.
- 2.87. Since 2005 the UK aviation industry has invested over £22 billion in green technologies and reduced its emissions by 3.5%, however, with passenger numbers increasing year on year more investment and green technology is needed to provide even greater fuel efficiencies.
- 2.88. The first jet aircraft, the Havilland Comet, entered service in 1952 and although aircraft missions were not on anyone's agenda, aircraft technology quickly evolved and between 1960 and 1990 fuel burn per passenger kilometre was reduced by almost 50%.
- 2.89. One area that has seen ongoing research since it first emerged within the aviation sector is biofuels. Although biofuels have been around for over a decade they are still very much considered a work in progress in terms of research, as opposed to a viable option in the short term. This is for a number of reasons, but the primary one being that currently the conversion process of biomass to kerosene is very intensive and therefore not commercially viable. Additionally, depending on the type of biomass used, the actual overall emissions may in fact increase. Sustainable Aviation published a report on this subject area in February 2020.

---

<sup>66</sup> <https://www.sciencemag.org/news/2019/06/aviation-s-dirty-secret-airplane-contraails-are-surprisingly-potent-cause-global-warming>

<sup>67</sup> <https://cordis.europa.eu/project/id/EV5V0044>

<sup>68</sup> [https://e-space.mmu.ac.uk/618313/1/thesis\\_corrected.pdf](https://e-space.mmu.ac.uk/618313/1/thesis_corrected.pdf)

- 2.90. Another area that is currently the focus of intense research is electrification, which is currently transforming the automotive industry. However, whilst undoubtedly electrification will provide opportunities, the characteristics of flight also present significant challenges that need to be addressed before mass movement of people by air becomes a reality.
- 2.91. Electric flight, as touched on earlier, is not a new idea, with the first all-electric flight occurring in 1973. However, whilst it's true that some of the large modern aircraft taking to the skies today are more electric than they have ever been, we're still some twenty plus years away from a large wide body civil aircraft being able to complete a long haul flight via total battery electric propulsion. The key challenge is the weight of the batteries. Whilst a conventional aircraft takes off with full tanks and burns through its fuel during the flight, until it reaches a weight which the landing gear and frame of the aircraft can take on landing. A battery electric aircraft does not have this declining weight, and hence the frame and landing gear need to be reinforced, which means additional weight which therefore the requirement for more power to get the aircraft airborne.
- 2.92. A more realistic prospect in the mid-term is a hybrid solution, with increased use of electric generators and motors combined with an energy storage system such as battery power, used during flight and for different phases of flight, driven by a conventional jet engine, to provide some electrical propulsion.
- 2.93. In terms of electrification and in keeping up with the demands of more electric aircraft, it's interesting to note that companies such as GE have in the past decade set up Electrical Power Integration Centre's (EPIC) in Cheltenham, UK and near Dayton, Ohio USA. They outline that "Electrical power engineers and technicians at the centre's will develop some of the latest end-to-end power generation, distribution, load and avionic control technologies"
- 2.94. They also outline that 'GE's electrical power technology path supports coming generations of commercial air transports, business and regional jets'. Not only does electrification present great opportunities to reduce CO<sub>2</sub> emissions, but also its potential to reduce noise shouldn't be underestimated / undervalued.
- 2.95. Hydrogen is widely seen as a realistic option as it can be used in two ways to power an aircraft. Firstly as a drop in alternative to kerosene, by burning the gas or by passing it through a bank of hydrogen fuel cells to generate electricity which can then turn a turbine or propeller using an electric engine. The problem is the lead time as it is improbable that such an engine can be designed, installed in an aircraft and that aircraft to be certified to carry passengers, in the next ten years without major investment. Rolls Royce are none the less looking into both possible uses for hydrogen as a fuel source. Given the different ways in which hydrogen can be commercially produced, the trace elements in the hydrogen can create problems in engine design but it has already been determined that hydrogen has the potential to provide a better return if used in combustion than conventional aviation fuel over short to medium haul distances.
- 2.96. It is recognised that jet aviation is far from environmentally sustainable, so until hydrogen or electric aircraft become the norm, an alternative fuel solution is needed. There are sustainably produced drop in alternative fuels available but currently only enough produced a year globally to power the worlds fleet of aircraft for just 10 minutes of flight<sup>69</sup>.
- 2.97. To reduce emissions from aviation (including international bunkers) major government investment is needed to support the creation of projects like the production of synthetic fuel

---

<sup>69</sup> See the sustainable fuels element of the Sustainable Aviation road map.  
<https://www.sustainableaviation.co.uk/>

industry from waste. Currently any synthetic fuel is blended with normal aviation fuel due to the lack of synthetic fuels and engines certified to burn synthetic fuels on their own. The idea of synthetic fuels from household waste is nothing new and a project to convert 500,000 tonnes of London's household waste into aviation fuel has been mothballed since 2007 through lack of government support. Had that support been forthcoming in 2007, the UK would have become world leaders in this technology and they could have supplied enough fuel from this waste to not just fuel the British Airways fleet at London City Airport twice over per year, but also create a station that could produce 20GW of electricity, heat for the local community, a range of products normally only derived from oil, including synthetic diesel and importantly no waste ash or residues to add to the mountain of household and industrial waste that is buried underground each year. This mountain of waste rots and creates methane gas, a product 27 times as powerful as CO<sub>2</sub> over its lifespan in the atmosphere and is using up an ever reducing amount of free capacity in the UK landscape from an ever growing populous. There currently plans for a new synthetic fuels from household waste production facility on the Humber which needs government support which Unite is supporting as it has the potential to help the UK build back better in its recovery from the Covid-19 induced recession. **Unite therefore calls on the government to provide this project with all the support it needs to demonstrate to other cosmopolitan areas the potential such a project can provide.**

2.98. There are several projects that are being pursued by the UK aviation industry for drop in sustainable fuels. None of these sourced from crops grown on land that could be used to grow food or land which was originally part of a jungle is seen as a sustainable alternative which leaves other biological waste and carbon sources.

- Aviation fuel from domestic household waste was proved possible by, British Airways (BA) and its partners in 2007 as highlighted earlier. It approached the Government for support to guarantee their crude oil equivalent break-even point of \$60 an barrel but was turned down. Since then the project has been mothballed in the UK and BP Air has bought in on the scheme and started working with Brazilian airline LATAM in 2010 and started producing the fuel in California in 2016 and in Scandinavia in 2017. A project using an old oil refinery on the banks of the Humber<sup>70</sup> could this prove to work as a proof of concept in the UK and go a long way to reduce the volume of landfill waste and reduce emissions from transport at the same time.
- Virgin Atlantic has a scheme that would turn the fumes from factories and steel plants into ethanol which can be blended with aviation fuel. This blend has been tested at various concentrations and Rolls Royce are looking positively on the prospect of using a far higher percentage of synthetic fuel. Again these tests and proofs of concept require funds to turn the idea into a reality.
- There is also a proposal from various sources to use the same CO<sub>2</sub> scrubbing technology used in submarines during the Second World War, as part of a Direct Air Capture (DAC) to sustainable aviation fuels facility. DAC works by drawing in large quantities of air over a CO<sub>2</sub> capturing medium<sup>71</sup>. Once that medium is fully loaded, the capture medium is heated to 100°C to cause the release of the CO<sub>2</sub> which is then collected in a conventional pipe compressed and then converted from CO<sub>2</sub> to synthetic kerosene. This latter scheme has very high electrical energy demands to make it work, however, resulting in it being criticised as being a red herring<sup>72</sup>. If a DAC project was married with a scheme like that of the British Lithium mine in

<sup>70</sup> <https://www.theengineer.co.uk/waste-jet-fuel-humber/>

<sup>71</sup> <https://carbonengineering.com/>

<sup>72</sup> <https://www.vox.com/energy-and-environment/2018/6/14/17445622/direct-air-capture-air-to-fuels-carbon-dioxide-engineering>

Cornwall<sup>73</sup> which uses geothermal heat, the heating of the capturing materials (to cause the release of the CO<sub>2</sub>) then turns such a project becomes a far more credible option.

- 2.99. **Unite is heavily concerned about the volume of renewable fuel that is available to the worlds fleet of aircraft and believes more needs to be done to create a sustainable aviation fuel in the quantities needed.** Once a demonstration plant of whatever type is up and running it will potentially provide the solution to end the practice of sending non-recycled waste to landfill whilst producing a fuel which provides better fuel economy than kerosene, for example.
- 2.100. If carbon offsetting is to be used to deal with the difference between net zero by 2050 and actual emissions, which is likley, then there are number of factors to consider when making a true informed choice to calculate the real emissions per passenger km on each flight. These include:
- The fuel used to power the aircraft.
  - The number of passengers on board (load factor)
  - The weight of the aircraft (including the volume of spare fuel in the tanks) on landing.
  - The route taken (does it include diversions, a transit through an airport en-route)
  - The vertical path the aircraft took (did they climb rapidly and then descend slowly in a steady path, before they landed?)
  - The wind direction and other atmospheric conditions to enable an accurate estimate of the secondary climate impacts from things like condensation trails.
  - But most importantly the aircraft design (is it a rotary engine, turbo prop or jet powered aircraft with one two or more engines?)
- 2.101. The science actually suggests that condensation trails are a major problem when they are caused at night as the additional cloud coverage retains heat whilst during the day the additional cloud coverage actively reduces the warming of the planet, when taken in isolation. Condensation trails are caused by the addition of particulates from the engines in the main but also from disturbed air caused by the wake of the aircraft passing through it<sup>74</sup>. It is not as some environmentalists would have you believe simply exhaust fumes produced by dirty engines.
- 2.102. Measurements of particulates created by aircraft on the ground also highlighted just how small these particulates can be potentially causing health issues for all aviation workers at airports. It is thought that the principle component of these particulates are aerosolised sulphur compounds from the impurities in the conventional aviation fuel. As synthetic aviation fuel contains little if any sulphur **Unite believes a move to synthetic aviation fuel and eventually hydrogen could eliminate or at least substantially reduce both ground based pollution and the volume of condensation trails**<sup>75</sup>.
- 2.103. Aircraft designers are coming up with ever lighter aircraft and to reduce drag which should in turn reduce noise and the amount of fuel burnt per flight. The key problem is designing an aircraft which will fill the needs of airlines and airports. The Airbus A380 was designed specifically to cope with the ever increasing demand for flights from airports who could not

---

<sup>73</sup> British Lithium mine uses geothermal energy to mine for this very valuable resource  
[https://britishlithium.co.uk/?gclid=Cj0KCCQjw7Nj5BRCZARIsABwxDKlvI9UhpLevwWWOnbj2PVtUi4IDsOx6pBk2nL2aq9fVC1KgRM1F1QkaAiV2EALw\\_wcB](https://britishlithium.co.uk/?gclid=Cj0KCCQjw7Nj5BRCZARIsABwxDKlvI9UhpLevwWWOnbj2PVtUi4IDsOx6pBk2nL2aq9fVC1KgRM1F1QkaAiV2EALw_wcB)

<sup>74</sup> <https://www.scientificamerican.com/article/why-do-jets-leave-a-white/>

<sup>75</sup> <https://www.sciencemag.org/news/2019/06/aviation-s-dirty-secret-airplane-contrails-are-surprisingly-potent-cause-global-warming>

expand due to local protests, specifically at Heathrow. The inter party point scoring over the decision to block or allow expansion plans for the airport meant that the airport has had to develop new operational procedures to squeeze more flights on to the airports two runways. The idea was therefore to try and replace two to three smaller flights on busy routes with one, requiring a larger aircraft. The use of larger aircraft was found to reduce flexibility, increase the delay between flight arrivals and the onward flight connection and due to its noise cancelling design, increased fuel burnt on the route. As a result the production run of this aircraft has been massively reduced since it entered service with the last ones due to roll off the production line in 2021 despite it only being 15 years old<sup>76</sup>.

- 2.104. Airlines attempt to achieve the goal of getting passengers to any airport on earth from any other with just three flights. The reason they do this is because airports do not have the capacity to fly direct to every destination direct and even if they did the economics of providing direct connectivity is one where an airline would swiftly go bankrupt flying empty aircraft. Consequently the airlines fly to hub airports like Heathrow, Amsterdam Schiphol, Paris Charles De Gaul or Brussels main to connect with other flights which will hopefully connect with the destination but if not they may be able to link to a hub closer to the destination and connect from there. The problem with this is that to encourage passengers onto a flight airlines will cut the cost of connecting flights. This may mean a journey of several times the distance of a direct flight.
- 2.105. A flight from Exeter to Cairo would be just 2,286.79 miles (3,680.24 km) but if a passenger try's to book such a flight the cheapest option sends them on a route which is 11,656.72 miles (18,759.67 km) to get there and a further 10,593.15 miles (17,048.02 km) back. Given the circumference of the earth is roughly 24,850 miles<sup>77</sup> (40,000 km) it seems absurd that a passenger should be offered a flight of such a distance just to travel from Exeter to Cairo<sup>78</sup>. Due to capacity restraints and the volume of flights going between New York and Heathrow, which allow business customers multiple timing options, Heathrow has had to sever routes to UK airports and although there are flights that go direct between the Egyptian capital and Heathrow anyone wishing to go to see the pyramids from the West Country will need to drive or catch a train to Heathrow rather than flying. As a result of these circuitous routes, passengers are flying many thousands of miles often in the wrong direction to arrive at their destination. This is not just an environmental disaster but also a financial one given business is funnelling into foreign airlines with the tax revenue filling that host nations coffers. It also means that many thousands of jobs are being exported to other nations.
- 2.106. **Unite believe that a solution to the level of emissions caused by aviation is to radically redesign airspace control and increase capacity on the ground including expansion of Heathrow.** Under the current design of airspace over major airports aircraft are required to circle before they can enter the queue to land. This not only wastes fuel, increasing emissions but also increases the volume of noise pollution. Equally on the ground when a jet engine is operating at its least efficient, aircraft are forced to queue with all engines running going nowhere but a few feet forward whilst obtaining a departure slot.
- 2.107. **Unite believes in the provision of enough runway capacity at airports to allow all aircraft to come straight in to land, provide flexible runway operations which allow runways to be maintained during the day and a swift, on-time departure, reducing the potential of weather and other airport related reliability issues.** In other nations around the globe airports do not operate at anywhere near the tolerances placed on the arrival and

<sup>76</sup> <https://www.cnet.com/news/on-its-15th-birthday-the-airbus-a380-is-facing-retirement/#:~:text=The%20coronavirus%20pandemic%20has%20now,the%20last%20aircraft%20by%202021.>

<sup>77</sup> <https://www.scientificamerican.com/article/measure-earths-circumference-with-a-shadow/>

<sup>78</sup> Examples of this can be found in Appendix 2



departure of aircraft. In those nations the airport flight numbers are kept below set limits not by the physical capabilities of the runway but the legal limits placed on the airport by the government. Unite believe that doing so at Heathrow by allowing the third runway and other airport expansion plans to obtain approval (even if it comes with an additional legal barrier to growth), could end fears of London and the UK becoming a backwater as European hub traffic switches to Madrid or Paris.

- 2.108. Whilst Air Passenger Duty is not an environmental tax it is argued that it does discourage passengers from flying. Whilst this might be true, the tax is now that high<sup>79</sup> that it pays for a family to book separate tickets from London to Amsterdam Schipol if they intend a to catch a flight of over 2000 miles, due to the cost of the APD<sup>80</sup>. If the family is not living in London the savings by using flights to Amsterdam Paris or Brussels may be more expensive but would save on the cost of rail fare to London and higher airfare costs from the local airport. Equally residents in London could save a fortune by using the high speed rail services or coaches from Paddington to fly from Charles De Gaul or Brussels International. Unite believes that rather than reducing the emissions from flying APD may increase the volume of emissions and financially incentivise passengers to catch a bus, train or flight out of the UK to a rival European hub airport.
- 2.109. The inclusion of aviation in a non-global trading emissions scheme will create the potential the environment for more emissions to be released as flights are directed to hub airport outside the scheme. For example if a flight from the United States wishes to fly to Frankfurt<sup>81</sup>, landing there will mean that the airline needs to pay for the entire flights emissions from the point of departure to Frankfurt. If on the other hand the flight was diverted to Istanbul<sup>82</sup> which is not in the EUETS and then flies to Frankfurt from there<sup>83</sup>, the airline will only be charged for the emissions from Istanbul but the passengers or freight would have travelled an additional 2,316.05 miles (3,727.36 km) or 1.6 times to direct connection distance. For years the UN has been attempting to obtain global agreement to a Global scheme called CORSAR but due to objections from the Chinese and Russians amongst others this has yet to be agreed even in principle. **Unite supports the inclusion in the EUETS but feels that every diplomatic effort should be brought to encourage the inclusion of all nations in a global scheme as soon as possible to prevent such anomalies.**
- 2.110. Covid-19 has caused the price of oil and thus oil to drop just at the time when airlines are struggling to attract passengers. (hence the array of low cost flight options) This lack of income has caused in turn airlines to cancel orders for new more fuel efficient aircraft. Unite is therefore battling in the unenviable position to try and retain jobs across both aviation and aerospace suppliers. It is very unlikely that the airline and aerospace industry that emerges from this crisis will be anything like the one last scene in January 2020. Airlines are shedding pilots, cabin crew, engineers and office based staff while the shape of ground support industries are in disarray, not knowing if they have the capacity to ride out the oncoming storm. The UK produces 25% of the worlds aircraft components, most notable being Rolls Royce. **Unite therefore believes if the UK is to emerge from this crisis it will continue to need government help not just to retain staff but also invest in new more fuel efficient aircraft.**

freight?

---

<sup>79</sup> <https://www.telegraph.co.uk/travel/news/air-passenger-duty-increase/>

<sup>80</sup> See Appendix 2 for potential savings on flights from London

<sup>81</sup> If flown direct from New York JFK to Frankfurt =3,846.67 miles / 6,190.62 km

<sup>82</sup> If flown direct from New York JFK to Istanbul Ataturk Airport =5,004.67 miles / 8,054.24 km

<sup>83</sup> If flown direct from Istanbul Ataturk Airport to Frankfurt =1,158.05 miles / 1,863.71 km

- 2.111. Currently waterborne transport has the least friction and hence the least emissions per tonne km. This is why the government should support the short sea transport of goods to regional distribution nodes based at the major ports. The inland canal and waterway network was the first form of mass freight transport around the UK but today it is largely just used for leisure pursuits. Canals and waterways can still serve an industrial purpose by removing waste and goods that are not so critical to the just in time delivery model.
- 2.112. The second best environmentally, is currently by rail but the emissions from rail depend on the source of the fuel used. Diesel hauled freight is still used even where there are alternative power supplies available simply because of the number of gaps in the electrified networks. It is clearly impossible for a crane to lift a container from a ship onto a train if there are overhead cables in the way, so propulsion in and around ports and shunting yards can realistically only be achieved by a train which has its own on board fuel supply.
- 2.113. Not all factories or warehouses have a wharf, runway or rail head, so it is necessary to ensure the distribution of goods by road. The support for a dynamic road haulage sector is critical to the UK economy. That is not to say that there is not a role for long distance road haulage but a far better model is the use of regional hubs to coordinate the delivery of goods of multiple types onto a single vehicle.
- 2.114. Distribution by air does happen especially where the destination is on a remote island or a rig in the sea. It is therefore only the very high value or time critical cargos that fly between airports within the UK. There are numerous “flights” between UK airports that don’t leave the ground and are actually performed by lorry. The reason for this is the lack of capacity at London airports but an equal lack of specialist customs facilities to handle that type of cargo (Exotic animals, for example). A solution to this would be to invest in more local specialist customs facilities.
- 2.115. In the run up to the 2012 London Olympics the suppliers of every item to be delivered to Stratford were challenged to use the least polluting method of transport available. To achieve this the then government built a new canal lock in Stratford which would be capable of lifting virtually any size barge up a canal from the Thames. Such a transport option would mean all rubble could be removed from the Olympic park and all building materials could arrive to the construction site without any disruption to the surrounding road network. The trouble was that nobody thought to dredge the canal from the lock to the Thames and as a result the lock was never used as the depth of the canal was too shallow from years of non use. The Olympic park is built next to rail freight site so those supplying the site could bring freight by rail to the park. But as there was no central coordination, customers were left in the position of asking a rail freight company how much it would cost to hire an entire rail freight train to move only enough freight to fill up one freight car per week. If there had been some coordination the rail freight option could have worked.
- 2.116. All that is needed is the provision of regional rail freight parks where goods to be transited can be brought from the manufacturers and taken to their final destination. From the hubs goods can be transferred to the next regional hub and then the next. Doing so would mean that deliveries would only travel by road from the hubs to the shops or local distribution centres.
- 2.117. The benefit of this would be less traffic, less pollution and the possible end to the sight of lorries parked overnight in laybys so that drivers can grab some sleep. Facilities could be made at the regional distribution nodes or drivers could end up sleeping in their own beds at night in an atmosphere free from the roadside pollutants.
- 2.118. There is a growing shortage in articulated lorry drivers in the UK and such changes in distribution methods may help resolve that problem as well as reduce total emissions.



such a link between HS1 and HS2 in allowing not just freight to transit between Europe and the North of England but also passengers who would not have to endure the 15 minute walk between Euston and Paddington.

- 2.124. UK's inland waterways are also overlooked as a possible means of moving large volumes of freight. Whilst originally built for land drainage these navigable corridors can still carry non time sensitive and cargos which would be disruptive to the normal road or rail alternatives. It is often said that there are more canals in Birmingham than in Venice but none of them are frequently used to move freight into the city. In London the Thames has remained an active freight corridor moving amongst other things, large volumes of domestic waste. Due to the lack of frequent traffic and maintenance designed to just cater for the leisure market some canals have been allowed to silt up so that they have a very limited carrying capacity, being less than a metre deep in places<sup>88</sup>. Whilst some waterways have been abandoned by the likes of the Canal and Rivers Trust and Scottish Canals due to the lack of funding and volunteers it is possible to cross the UK by boat in several places.
- 2.125. Using waterborne freight transport is the most sustainable option available, principally due to the reduced friction and relative speeds involved. A journey from London to Birmingham may take five days for example. If the network was configured to carry freight to city centres from out of town wharfs the journey may be a matter of minutes and could reduce congestion, providing a guaranteed rather than an expected time of arrival.
- 2.126. As stated these canals were originally designed to provide drainage and are therefore a vital weapon to combat flooding. With climate change likley to increase the severity of weather events including rainfall, maintaining these canals not just for their leisure potential can also help all forms of road and rail transport get through rain affected areas quicker.

#### maritime?

- 2.127. As highlighted the most sustainable method of transiting freight is by water. The UK is incredibly fortunate as nowhere is more than 113 km from the sea<sup>89</sup>. Short sea and coastal shipping between UK ports therefore provide the opportunity to reduce the length of rail or road journeys in a more structured multimodal approach to freight transport. If the UK is going to reach net zero by 2050 or earlier, it will need to think more strategically rewarding businesses which reduce the amount of diesel hauled road or rail journeys. **It is Unite policy to support such a multimodal approach to not just freight but all transport decision making.** By utilising smaller shipping from larger ports to trans ship cargos, such a policy allows many of the smaller ports to survive the trend towards ever larger ships and the ports to handle them.
- 2.128. **Unite feels it is vital to maintain a cabotage agreement to enable UK flagged short sea shipping to move freight between EU ports, post Brexit.** These vital links to European trade require adequate investment and should not be put in the hands of those who might strip and sweat long term assets at the expense of the travelling public and British commerce.
- 2.129. The potential loss of cabotage for short sea shippers could result in a change to a flag of convenience for UK ships or the loss of this vital service. Without the rights to move goods between EU ports it is unlikely any short sea shipping line will survive.

---

<sup>88</sup> This link provides details of each waterway  
[https://www.waterways.org.uk/waterways/individual\\_waterways](https://www.waterways.org.uk/waterways/individual_waterways)

<sup>89</sup> <http://news.bbc.co.uk/1/hi/england/derbyshire/3090539.stm>

- 2.130. The move to ever larger ship sizes by shipping lines is focussing demand for more tugs whilst at the same time reducing the number of times they have work in any period. Together with increased competition from new tug operators, margins are being squeezed to the detriment of crew. Smaller ports are also losing traffic to the larger ports that are able to cope with the deep draft clearance of these ships leaving them dependant on short sea services. The plight of smaller container ports is made worse by the numerous additional large port projects that are opening which has created significant overcapacity and competition between ports for the shipping lines. **At the present time, Unite therefore opposes any new deep sea port developments.**
- 2.131. Ferry connectivity to the numerous island communities provide these groups with the ability to receive mail, parcels and remain a connected part of the UK. The majority of these islands do not have any other way of getting to and from these islands making it difficult for these communities to do a simple school run once children grow beyond primary education. The provision of a reliable ferry connection is very difficult to achieve as they need to fit around the tide and prevailing weather. During periods of sustained poor weather it is possible for island communities to be totally cut off from the rest of the UK for days<sup>90</sup>. Ferry operations can face extreme pressure to resume which can place lives at risk. **Unite calls on the government to look into ways to supply these communities with lifeline services so that power and food can be provided in times of poor weather.**
- 2.132. Since the 1<sup>st</sup> January 2020 all international shipping is required to use a fuel which has a sulphur content of no more than 0.50% m/m (mass by mass) under IMO legislation<sup>91</sup> down from 3.50% in international waters and since January 2015 in designated emission control areas this limit is just 0.10% m/m. These limits have forced shipping lines to either purchase more expensive reduced sulphur fuel oil, invest in scrubbing devices to extract the sulphur from the smoke stacks or the use of other fuels such as Liquefied Natural Gas (LNG).
- 2.133. The desulphurization of the crude oil refining residues which are used as fuel oil in shipping requires considerable amounts of hydrogen, typically obtained from natural gas. If the CO<sub>2</sub> from this process is not captured as in the creation of blue Hydrogen this change to lower sulphur fuel oils can mean an increase in CO<sub>2</sub>.<sup>92</sup> **Unite believes that should the carbon price for the release of CO<sub>2</sub> increase it will eventually lead to the creation of a CCUS network especially if the government is to allow the use of blue hydrogen as a way of reducing greenhouse gasses from the energy and transport sectors.** It is no use reducing emissions from transport and energy if the emissions from the chemical industry go up by the same amount as the other two sectors decline.
- 2.134. The adaptation of existing shipping by adding a funnel scrubbing devices may reduce sulphur levels in the air but unless the sulphur is retained in the ship for proper chemical disposal, the discharge could damage the natural environment, increase sea acidification and ultimately increase the amount of CO<sub>2</sub> in our atmosphere due to the release of CO<sub>2</sub> from decomposing coral skeletons. Worse still these scrubbing devices can increase a ship's fuel consumption by about 2% adding to fuel burnt for each journey. In an article in the Independent late last year it reported that of 3756 ships only 65 were fitted with closed loop scrubbing devices, 677 with the capability to retain the pollutants or dump the toxic residue and the rest were configured without the retaining capability dumping all the collected

<sup>90</sup> <https://www.pressandjournal.co.uk/fp/news/highlands/1909611/wintry-weather-conditions-force-school-closures-power-cuts-and-ferry-cancellations/>

<sup>91</sup> IMO Sulphur in fuel rules  
<http://www.imo.org/en/MediaCentre/HotTopics/GHG/Documents/2020%20sulphur%20limit%20FAQ%202019.pdf>

<sup>92</sup> <https://www.egcsa.com/wp-content/uploads/CO2-and-sulphur-emissions-from-the-shipping-industry.pdf>

sulphur waste overboard. **Unite wishes to see an end to the dumping of the waste captured from scrubbers and wishes to see a ban on such shipping fitted with open loop scrubbers in UK waters.**

- 2.135. Should the worlds shipping fleets suddenly decide to switch to LNG there would be a shortage of the gas pushing up prices undoing the cost savings made by switching from fuel oil to this fuel. Consequently it is a wise investor in shipping who constructs his ships with the ability to run on both low sulphur fuel oil and LNG. LNG is however a colourless, odourless, highly explosive gas which is heavier than air that can crack deck plates should it be spilled on the surface of a ship, due to the temperatures at which it is stored<sup>93</sup>. Unite has major health and safety concerns about ships safety but these .
- 2.136. Shipping manufacturers are redesigning ships literally from top to bottom in order to cut the cost of fuel and thereby reduce CO<sub>2</sub> and other greenhouse gas emissions. Designs from hulls that minimise contact with the water though the use of specialist materials and hull ridges which can be used to create a very small bubble layer between the hull and the water<sup>94</sup>. At lower speeds, frictional resistance comprises more than 75% of the total picture, with wave making and eddy resistance comprising most of the remainder so any technology that can reduce the drag from a ship's hull can reduce the energy needed to move the vessel from A to B and in turn reducing fuel burn.
- 2.137. Other measures that shipping has taken to improve economy has been the introduction of slower sailing. Whilst this has added to global delivery times it has extensively reduced fuel consumption across the world's fleets<sup>95</sup>. What it has done, however, is extend the length of time between crew changes. **Unite believes that due to these longer sailings crews are not in a fit state to safely perform the roles of Stevedores in releasing and securing lashings on ships. Unite believes that no ship should secure itself to the quayside with the cargo already unsecured, and nor should a ship leave the quay with cargo free to move.** Shipping lines feel, however, that by cutting these corners the ship can spend as little time as possible in a port where it is not making money. And Unite is not the only trade union around the world to believe that the lashings should be released and secured by trained Stevedores, not the crew.<sup>96 97 98</sup> Should the unthinkable occur and cargo moves and topples over whilst entering or departing from a port, as some crew member has released the wrong part of the lashings, or failed to secure it, their actions could result in the closure of the port and millions of pounds of financial costs to the port operator possibly adding hundreds of miles of additional sailing and cargo rerouting not forgetting the cost to the environment until the problem is solved.

#### other transport?

- 2.138. The government recently announced a £2 billion package to create a new era for walking and cycling<sup>99</sup> which can not only cut greenhouse gas emissions, it could also help tackle the

---

<sup>93</sup> [http://www.adaptive-research.com/newsletters/q4\\_2013/LNG%20VESSEL%20CASCADING%20DAMAGE%20STRUCTURAL%20AND%20THERMAL%20ANALYSES.pdf](http://www.adaptive-research.com/newsletters/q4_2013/LNG%20VESSEL%20CASCADING%20DAMAGE%20STRUCTURAL%20AND%20THERMAL%20ANALYSES.pdf)

<sup>94</sup> A Review on the Drag Reduction Methods of the Ship Hulls for Improving the Hydrodynamic Performance  
Mohammad Ahmadzadehtalatapeh, Majid Mousavi <http://ijmt.ir/article-1-428-en.pdf>

<sup>95</sup> <https://www.theguardian.com/environment/2010/jul/25/slow-ships-cut-greenhouse-emissions>

<sup>96</sup> <https://www.etf-europe.org/campaign/lashing-campaign/>

<sup>97</sup> <https://www.nautilusint.org/en/news-insight/telegraph/lashings-of-despair-unions-raise-concerns-about-implementation-of-itf-dockers-clause/>

<sup>98</sup> <http://www.idcdockworkers.org/en/news/media-corner/246-lashing-statement>

<sup>99</sup> <https://www.gov.uk/government/news/2-billion-package-to-create-new-era-for-cycling-and-walking>

obesity epidemic that has struck especially since the pandemic<sup>100</sup> and provide an alternative to over crowded buses and inner city rail services. **Unite strongly welcomes this investment as part of an integrated transport system. Unite calls for designated walking and cycling paths as the safest way of protecting both pedestrians and cyclists, while also ensuring appropriate safeguards where there is shared usage.**

2.139. Any such cycle lane should not just be the preserve of those on two pedal powered wheels, as electric bicycle conversions and other forms of electric transport should be allowed to use them. Electrically powered personal transport can make it possible for a business person to travel between offices and meetings away from heavy and dangerous vehicles, arriving in a condition where they do not need to take a shower first. Such electric vehicles can make it possible for the average cyclist to travel up to 40 miles a time without breaking a sweat. If these vehicles are to be encouraged, however, Unite believes they need to be in a roadworthy condition and the riders need to be wearing the correct safety equipment.

### Local journeys

**What, if any, changes to reduce the greenhouse gases produced by your local transport, would you like to see made?**

2.140. **Unite welcomes the news that electric scooters, similar to those which are used by young children, can now be ridden by standing riders, legally on the UK's road network<sup>101</sup>.** Unite also welcomes the ban on their use on pavements where they can become a menace to those walking, riding in a wheelchair or being pushed in a buggy or pram. These vehicles provide arguably, a greater level of vision due to the standing riding position over cyclists and are more visible. Unite would argue, however, that given this riding position, accidents, could, more readily, propel the rider forward at speed. For that reason **Unite would argue for safety equipment to become mandatory on electric vehicles including the need for a helmet and joint padding.**

2.141. As stated previously **Unite would welcome a greater level of investment into additional public transport services, reversing the decline of available services to rural areas in particular.**

### Longer journeys

**What changes would you like to see that will help to reduce the greenhouse gases produced from longer journeys?**

2.142. **Unite would welcome a reduction in the price of train tickets and a greater level of investment into long distance passenger services.** As stated Unite believes that rail services are better served in public hands and would welcome a return to public ownership.

2.143. Air services to other parts of the world from the regions suffer greatly from the lack of a direct connection or at the very least one which can be achieved with just one change of aircraft. The loss of Flybe has highlighted the need for a domestic air carrier who can link the capital, with its range of long distance connections, to the regions. Without this it is difficult for these regions to attract international investment into manufacturing opportunities, further expanding the divide between the South East and the rest of the UK. While such services will attract criticism about supporting domestic aviation "over less polluting rail services", the reductions in real world emissions could be far greater.

<sup>100</sup> <https://www.nature.com/articles/s41574-020-0387-z>

<sup>101</sup> <https://www.express.co.uk/life-style/science-technology/1305166/Electric-Scooters-Legal-UK-Rent-Own-EScooters>

## Purchasing goods

What action do you think government should take to reduce the greenhouse gases produced from the: distribution of goods across the country?

- 2.144. Unite supports the battle against food mileage and the increasing distances that component parts need to travel before they are incorporated into the final product. It is appalling that manufacturers will ship components hundreds of miles in order to exploit workers and obtain cheap labour. International corporations will think nothing of using their considerable financial powers to sway governments, with the threat of factory closures if they don't get their way. **Unite believes that the only way to tackle this is internationally working in tandem with other nations to tax component mileage.**
- 2.145. Why do pot noodle send cartons with the noodles to Germany just to have a flavour sachet added before it is returned for final labelling and packaging in the UK from where it is distributed around the UK and rest of the world, including to the region where the German factory resides. In vehicle manufacturing why is it necessary for one component to travel around the world several times including multiple visits to the UK while it is put together prior to it being finally assembled. In short the production and supply lines of many goods in the UK have supply chains scattered far and wide based not on the availability of the materials from the region but on the level of skill and production costs i.e. the cost of labour. This model is inefficient and costing the environment dear. There are numerous examples of goods travelling hundreds of miles to complete a journey of to customers of only a few.
- 2.146. The government should therefore be looking into the provision of skills needed to produce goods locally. This idea is nothing new and stems from the origins of textile production. Instead of having crofters scattered all over the country performing a single task in the production line these roles need to be reviewed and wherever possible centralised. In the case of pot noodle for example why can't enough sachets be sent to the UK to meet the demands of the UK and exports to areas around Western Europe and the rest of the world while enough pot noodles are sent to Germany for them to add their sachets and distribute to Germany and its Eastern and Southern neighbours. Such rationalisation will require major investment but could reduce emissions dramatically.
- 2.147. Unite therefore looks to the government to seek agreement with international partners to endeavour to localise and replicate production facilities to carry out such simple tasks as labelling, packaging and dispatch. There should not be an economic advantage to send fish caught in UK waters to China for processing prior to being sold in the UK. If the skills are not available in the UK then for the sake of the planet customers need to be aware of the total mileage each component part has travelled prior to sale. Such labelling would at the very least highlight to consumers the damage that items production has done to the UK economy due to the export of jobs from the UK and to the climate from such international operations
- 2.148. **Unite supports the use of a multi modal approach to the distribution of goods utilising the most appropriate form of transport for the job in question.** Environmentally the most sustainable form of transport per tonne km will depend heavily on the speed the consignment travels at and on what transport mediums are available between the point of departure and arrival. Whilst this could mean a longer journey it may be more sustainable.
- 2.149. **Unite believe that when it comes to public sector procurement, the automotive industry is indicative of the number of missed opportunities to combat emissions.** From electric cars at Sunderland to vans built at Luton and the hydrogen-hybrid buses made in Falkirk, Scarborough, Guildford and Ballymena, the UK automotive sector can provide



vehicles suitable for all UK public bodies. Yet, data collected by Unite reveals that 74 per cent of vehicles procured by public bodies in the UK are not produced in the UK.

## The delivery of goods to shops or residences?

- 2.150. A major issue in the delivery of goods to town and city centre shops is getting through the road traffic. Deliveries in the middle of the night mean that someone has to be there to dispatch and receive these goods but the noise from such activities will not be popular with neighbours. There are many alternative options to solve this issue, which could help reduce the congestion of large towns and cities.
- 2.151. Where there are canals and waterways that flow through city centres, these could be used to move goods downstream to waiting businesses leaving just the issue of moving the goods from the quay to the individual shops. Provided the consignment is small enough this could be achieved by people power and cycle couriers to customers doors. Waste and other less time sensitive goods can equally be moved out of the centre down stream to waiting transport options.
- 2.152. Another alternative would be for each store to have just a display item with the stock distributed from a centralised distribution hub. This would mean that consumers could do their Christmas shop without the back breaking task of hauling bags around city centres or shopping centres burning the fuel to get that item home themselves (not to mention the parking) when they could more easily catch a bus. In such cases the orders could be replicated from a central warehouse for domestic delivery, thus allowing the traditional shop to continue, with a technological solution for transportation reducing travelled miles and the congestion of the road network.
- 2.153. A solution employed by the Victorians to ensure the swift delivery of post was a dedicated underground railway to depots scattered across London. A similar network of centralised delivery by electrified rail could be a solution if there was the money to support such an endeavour.
- 2.154. Another option is the creation of a pneumatic tube system for smaller items via containers which can whisk goods from across a city in a secure manner and in a matter of seconds in a similar way to the systems employed in many NHS hospitals. Such systems can operate using a 160 mm carrier system with automatic unloading.<sup>102</sup>
- 2.155. A typical shopping street or centre will often contain shops carrying items that require similar shipping requirements. i.e. refrigeration. Where this is the case it would make perfect sense to use a single vehicle to make the delivery as opposed to multiple smaller lorries. If the delivery is small enough to fit in a small lorry or van, it should be held at a distribution hub until a load of similar transport requirements or local destination needs is available. Doing so could provide multiple financial and environmental savings.
- 2.156. The growth of car use has led to the appearance of large out of town shopping centres. These centres are often poorly connected to public transport options.
- 2.157. Given the limited range of electric battery technology and charge time constraints not to mention the environmental damage caused by current batteries, the role of all electric and hybrids could reduce the impact on final mile transits. Such battery driven freight movement will enable a range of local deliveries.

---

<sup>102</sup> <https://www.quirepace.co.uk/products/pneumatic-tube-systems/case-studies/automatic-carrier-unloading/>

## Travel choices

### Do you find it:-

- easy to make informed travel choices in relation to the emissions produced?**
- difficult to make informed travel choices in relation to the emissions produced?**

- 2.158. Unite proposes a simple labelling scheme which contains details of how many miles goods have travelled. This will provide a better understanding of the impact of each product on the shelves.
- 2.159. The calculation of rail mileage needs to be split into electrified rail and non as in the accompanying consultation document (published in March 2020). This will provide better guidance on the travel methods employed to reach destinations. Whilst it is relatively simple to go on a website and determine how much CO<sub>2</sub> has been released as a result of a journey on a plane or train there is no display in a car or van to produce this figure despite the technology being readily available from the on the on-board computer. This figure would be far more accurate as it would also take account of the driver's style and type of driving.
- 2.160. Similarly when calculating air mileage the calculation does not take account of the aircraft used. A Dash 8 Turbo prop aircraft for example will produce around two thirds of the emissions of a jet and far less emissions than a family car over the same distance.<sup>103</sup>

## Information to inform travel choices

### What information would you find helpful in making those choices?

- 2.161. The vast majority of passenger rail lines are operated using diesel trains, some of these trains are over 40 years old operating on lines that were originally laid by the early Victorians<sup>104</sup>. Around five million homes either backing onto or facing the railway in Britain<sup>105</sup> and are therefore affected adversely by the DEEE for passing diesel trains. In addition diesel train pass within meters of schools, nurseries, offices and hospitals. The fumes are worse on enclosed station platforms, such as in Birmingham New Street where members of the travelling public and staff are subjected to the fumes from idling diesel trains. In maintenance depots around the UK inefficient extraction frequently leaves engineers choking in a fog of fumes, resulting in a very high frequency of near miss reports into the accident books and entries on to the Unite Diesel Fume register which was set up to capture details of DEEE exposure.
- 2.162. Whilst the UK power grid has significantly lowered the carbon footprint of the electrical supply the challenge of upgrading the network to enable the running of electrified alternatives to diesel trains are numerous. Although the technology to burn diesel more efficiently exists in more modern fleets the replacement or ex British Rail rolling stock takes time, more so following the devastation that has happened to the rail manufacturing industry since privatisation. The lack of a flow of orders has led to the demise of many facilities over the years, brought about by the failure of successive UK governments to understand the industry and provide it with the support it needed.

---

<sup>103</sup> See Appendix

<sup>104</sup> A map of the Network in CP5 can be found here.

[https://www.whatdotheyknow.com/request/498683/response/1209099/attach/4/FOI201800959%20CP5%20Electrification%20map.pdf?cookie\\_passthrough=1](https://www.whatdotheyknow.com/request/498683/response/1209099/attach/4/FOI201800959%20CP5%20Electrification%20map.pdf?cookie_passthrough=1)

<sup>105</sup> <https://www.networkrail.co.uk/communities/living-by-the-railway/electrification/overhead-line-equipment/>

- 2.163. Statistics from the ORR data portal highlight that in 2018/19 the rail Passenger journeys consumed 3,976 million kWh of electricity (up 9.1% from 2017/18) and 469 million litres of diesel (down 5.3% from 2017/18). The ORR portal then calculates the total emissions as 2,465 KTonnes of CO<sub>2</sub>e (down 10.8% from 2017/18) and divides the figure by the number of passengers to achieve the figure of 36.6g CO<sub>2</sub>e per passenger km. As you obtain 2.69 kg's of CO<sub>2</sub>e per litre of diesel<sup>106</sup> and as the grid was producing 0.2556 kg's of CO<sub>2</sub>e per kWh<sup>107</sup> this calculates out as 1.26 million Tonnes of CO<sub>2</sub>e from its diesel fleet 1.02 million Tonnes of CO<sub>2</sub>e produced by the national grid to generate the electricity to power the electric fleet of trains. According to the ORR data portal<sup>108</sup>, the volume of passenger train kilometres in 2018-19 was 67.6 billion passenger kms = 36.7g CO<sub>2</sub>e per passenger km. If you examine the routes that have been electrified and the distances travelled by the trains<sup>109</sup> you discover that passenger trains covered 530.3 million kms of which around 175 million kms were powered by electricity and the other 355 million kms were on routes under diesel locomotion. Using these figures it is possible to calculate that a diesel train produced around 1.5 times the emissions per km than an electrified train highlighting the need to change over to electrified services and as the decarbonising programme of the energy sector improves, so will this gap widen.
- 2.164. Equally if there were better management of passenger services to reduce the amount of empty running it would mean that there would be a reduction in emissions of the same order. Using the ORR figures<sup>110</sup> it means that electrified train operations were only functioning at 18% efficiency whilst a diesel operations was performing at 44% efficiency. Whilst some of this empty running is due to the need to position trains and operate more commuter services than are needed during the day.
- 2.165. Unite would recommend that passengers and businesses are provided with a realistic estimate of the environmental savings that they can and are making.** This could be achieved by advertising the carbon footprint of choosing to travel by rail on that type of train and not the average emissions of the rail industry. The rail industry, in the UK, currently advertises the average figure for all rail journeys as opposed to two figures, one for diesel rail and another for electrified rail. If this figure is incorporated into the company's annual reports of their carbon footprint it is very unlikely that passengers will find out, whilst an obligation to display the running total per mile on that service on the digital signs in the carriages of a train, bus or the screens on flights when not in use displaying the position on their journey may more readily raise customer awareness of the emissions from transport which may encourage transport companies to be more inclined to invest in new alternatives to fossil fuels.

### **The approximate measurement of greenhouse gases emitted as a result of your journey A comparison of the greenhouse gases emitted as a result of your journey relative to other forms of transport**

---

<sup>106</sup> Greenhouse gas reporting: conversion factors 2019  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/904213/conversion-factors-2019-full-set-v01-02.xls](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904213/conversion-factors-2019-full-set-v01-02.xls)

<sup>107</sup> UK Electricity figures tab  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/904213/conversion-factors-2019-full-set-v01-02.xls](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904213/conversion-factors-2019-full-set-v01-02.xls)

<sup>108</sup> See Table 12.3 <https://dataportal.orr.gov.uk/statistics/usage/passenger-rail-usage/passenger-kilometres-by-sector-table-123/>

<sup>109</sup> <https://dataportal.orr.gov.uk/statistics/usage/passenger-rail-usage/passenger-train-kilometres-by-operator-table-1213/>

<sup>110</sup> See ORR tables 12.12 & 12.13

**A comparison of the greenhouse gases emitted as a result of your journey relative to other lifestyle choices**

- 2.166. **Unite believes that there are so many variables to consider when make a simple comparison.** These include the vehicle design, age, how well it has been maintained, fuel type, number of passengers on-board, route taken and even the weather that to give an accurate picture of comparative emissions would need to be more specific than simply a bus verses a car. The emissions from diesel double decker bus per mile with just one passenger on board is going to be many times more polluting than a Dash 8 aircraft per mile especially if it was filled to capacity and the measurement per mile was taken whilst the aircraft was on its approach to the airport for example.
- 2.167. To get a message across to the traveling public and shippers the message needs to be as simple and catchy as possible. This is why Unite suggests an 'A to G' rating system similar to that found on electrical goods when booking tickets. A Green Hydrogen powered bus would rank an AAA+ for example whilst one run on Blue hydrogen may only obtain a C or D ranking simply because of the possibility that the CO<sub>2</sub> that is created when Natural Gas is split, might simple be released into the atmosphere at the chemical plant where the hydrogen is created as is the case currently. Similarly as passengers board the bus or aircraft the ranking could improve with the ranking announced on the in journey displays.
- 2.168. A cardboard box does not care which route it takes to its destination and hence it may be placed on a series of transshipping services to enable the box to get to where it needs to go not necessarily the shortest route but possibly the most fuel and hence carbon efficient manner. As stated earlier **Unite supports a multimodal approach to transport and hence believes that the mode with the lowest emissions should be given priority.** Such an approach may mean that a package is transferred between each transport modes several times so that the least emitting mode is used in each situation.
- 2.169. Unite believes that comparing transport emissions to other activities would be a good proposal but again such an exercise would need to be a wild simplification of the facts which could have the potential to damage one part of the transport industry or another.

**Other:**

- 2.170. Emissions from all of the above depend on the fuels used to power the vehicles. Diesel derived from crude oil has had its day, just like coal before it and it is time to explore the use of hydrogen and diesel derived from more sustainable sources. By sustainable sources this does not include diesel from crops grown on land that could be used to grow food.
- 2.171. Every year millions of tonnes of domestic waste ends up in landfill sites and warehouses which are becoming full of plastic waste destined to be eventually recycled in facilities which don't have the capacity to cope with demand. This material offers the potential for more than greenhouse gas production as is degrades but can be turned into fuels. For the next 10 to 15 years at least the aviation sector will still require kerosene as it will take time to develop the propulsion plants to run on hydrogen, electricity or some other as yet to be discovered alternative to aviation fuel. It is therefore critical that as much of this waste is turned into Sustainable Aviation Fuels (SAF) or rather what the industry is calling Waste to Aviation Fuels (WAF). There is at least one project ready to go and two more which could demonstrate the technology which could end the need to bury so much waste.
- 2.172. Electrification of transport such as the expansion of electrified rail lines will reduce emissions and improve the lives of all that reside or work by a non electrified rail line. Diesel trains on journeys to and from Scotland produce around as much pollution per passenger as a turbo prop flight between the same two cities. Whilst this is less than that produced by a family car

on the same journey, it does not stop the increases in particulates, nitrogen oxides, CO<sub>2</sub> and unburnt fossil fuels released by the use of diesel trains. In Engine sheds up and down the UK train engineers are exposed to these gasses yet very little is done to improve the air quality of these workers.

- 2.173. Where electrification is not possible hydrogen fuel cells can provide more than enough power to trains to enable them to haul train loads of freight and people. Hydrogen can and is being used as a fuel replacement for diesel and petrol vehicles through hydrogen combustion.
- 2.174. There are three main ways to generate hydrogen industrially. So called “Blue Hydrogen” derived by splitting Natural Gas into Hydrogen and CO<sub>2</sub>. The CO<sub>2</sub> could then be captured and put into a Carbon Capture Utilisation and Storage facility (CCUS). It is technically possible to also use the CO<sub>2</sub> to produce synthetic fuels such as synthetic aviation kerosene or diesel although no company to date has started to do this to our knowledge.
- 2.175. The second option would derive hydrogen from ammonia by chemically splitting the ammonia into Hydrogen and Nitrogen gas. Ammonia is a gas at normal temperature and atmospheric pressure. But it becomes liquid under ~10 bars at 24°C temperature (or -33°C at atmospheric pressure). Since liquid ammonia has more energy density than in its gaseous form, it can be stored in liquid form and re-gasified when in use. Ammonia can be used as a hydrogen storage (hydrogen carrier) for fuel cells. Ammonia has a higher volumetric hydrogen density (10.7 kg H<sub>2</sub> /100L) 1.5 to 2.5 times that of liquid hydrogen<sup>111</sup> itself so, for example, a litre of liquid ammonia contains ~50% more hydrogen than the same volume of liquid hydrogen. Ammonia would need to be split via on-board reformers before the released hydrogen can be supplied to fuel cells. However, several technological challenges for on-board reforming of ammonia remain<sup>112</sup>. Splitting ammonia in this way could be utilised as a safer way to transfer Hydrogen as a fuel without using heavy armoured storage tanks.
- 2.176. The final method is called “Green Hydrogen” generating a purer form of hydrogen by splitting water into Hydrogen and Oxygen, by passing an electrical current through almost pure water. Producing hydrogen in this way could also help balance the production of electricity fed into the national grid by creating hydrogen when the wind is blowing and producing excess power for example. This stored hydrogen can then be used to generate electricity, via a bank of hydrogen fuel cells (recovering the water in the process) when there is additional generation required. When there is more Hydrogen generated than is needed to balance the grid the additional hydrogen can be used as a carbon free non-polluting alternative to fossil fuels.
- 2.177. It should also be noted that some research points to the possibility of ammonia being used directly in an alkaline fuel cell (FC) without the necessity of the prior splitting of ammonia into hydrogen and nitrogen<sup>113</sup>. It is important to note that ammonia is a toxic substance and its spill would be hazardous to the environment. These aspects of ammonia need to be seriously investigated and strict safety rules would need to be put in place before ammonia can be used as a fuel source. Ammonia has a very high resistance to auto-ignition (651°C -

---

<sup>111</sup> <https://nh3fuelassociation.org/2014/09/06/liquid-ammonia-for-hydrogen-storage/>

<sup>112</sup> On the ground in controlled circumstances ammonia could be split using electrolysis in a similar way to the way hydrogen can be liberated from water. As ammonia is flammable, however, an alternative method is needed.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/880826/HS420 - Ecuity - Ammonia to Green Hydrogen.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/880826/HS420_-_Ecuity_-_Ammonia_to_Green_Hydrogen.pdf)

<sup>113</sup> Rong Lan and Shanwen Tao (2010), Direct Ammonia Alkaline Anion-Exchange Membrane Fuel Cells, *Electrochemical and SolidState Letters*, 13 8, B83-B86

ammonia vs. 210/225°C diesel vs. 246/280°C gasoline<sup>114</sup>) and narrow flammability limits (16-25% by volume in air). Therefore, ammonia does not compression ignite and requires blending with a certain amount of another (high-cetane) fuel such as hydrogen. Ammonia engines were used experimentally in the 19th century by Goldsworthy Gurney in the UK<sup>115</sup> and the St. Charles Avenue Streetcar line in New Orleans in the 1870s and 1880s<sup>116</sup> and during World War II ammonia was used to power buses in Belgium<sup>117</sup>.

2.178. The road haulage industry provides that vital link between the customer and the manufacturer but it is often considered to be one of the most polluting on the roads, made worse by the volume of empty running and re positioning journeys. Unite believes that more can be done to reduce the number of these journeys by creation of regional (out of town) distribution hubs from where goods can be transported that final mile to shops and homes using unified loads from multiple suppliers as opposed to one logistics team and warehouse per product line. Modal transport hubs like Heathrow, and the ports of Felixstowe, Southampton, the Humber, Forth and Liverpool provide such a hubs for goods arriving and departing from the UK but there are only a few such rail / road hubs.

2.179. One of the greatest challenges to the road haulage and long distance road passenger services is the capacity of the human bladder and the need for the driver to rest. Currently once the driver reaches his maximum number of driving hours there are only a limited number of facilities for drivers to rest, secure in the knowledge that his load is monitored by 24/7 security and where they do not have traffic only a few metres away, thundering past their windows. More truck stops, not just associated with transport hubs need to be established if we are to expect drivers to continue to drive long distances. In the 2008 MTRU report on HGVs, attention was drawn to UK data for 2007 showing that heavy goods vehicles are much more likely to be involved in fatal accidents per mile travelled than other vehicles. This exercise has been repeated annually and it has shown that whilst the number of accidents on motorways and major roads is still around the same levels, as they reach capacity, the number of accidents on minor roads has increased dramatically<sup>118</sup>. Each of these incidents has caused major disruption, congestion and hence additional emissions from vehicles going nowhere fast. This is migration onto minor roads is partly due the increase in HGV numbers but also driver fatigue. Unite therefore believes that to help improve the health of drivers and reduce congestion from lorry involved road accidents the government needs to support a programme of truck stop construction around the UK.

### 3. Final comments

#### What other views do you have on how to decarbonise the UK transport network?

3.1. The biggest weapon in the arsenal to decarbonise is the workforce. Unite has been calling on the government to recognise the work of environmental reps, who can encourage colleagues to carry out simple measures like switching off their computers and office lights at the end of the day to the use of a suggestion box to gather ideas relating to better ways of

<sup>114</sup> Fuels and Chemicals - Auto Ignition Temperatures [https://www.engineeringtoolbox.com/fuels-ignition-temperatures-d\\_171.html](https://www.engineeringtoolbox.com/fuels-ignition-temperatures-d_171.html)

<sup>115</sup> [http://www.laurencebarber.ca/Kenny/Aaron's/People/Gunn/Meisner/Gurney/goldsworthy\\_g.html](http://www.laurencebarber.ca/Kenny/Aaron's/People/Gunn/Meisner/Gurney/goldsworthy_g.html)

<sup>116</sup> The ammonia engine used in these cases was similar to a steam engine, except that a solution of water and ammonia provided the motive power. <https://www.asme.org/wwwasmeorg/media/resourcefiles/aboutasme/who%20we%20are/engineering%20history/landmarks/101-st-charles-avenue-streetcar-line-1835.pdf>

<sup>117</sup> [http://claverton-energy.com/cms4/wp-content/files/NH3\\_bus\\_1945\\_JInstPetrol31\\_Pg213.pdf](http://claverton-energy.com/cms4/wp-content/files/NH3_bus_1945_JInstPetrol31_Pg213.pdf)

<sup>118</sup>

<https://bettertransport.org.uk/sites/default/files/pdfs/26.11.17%20Fatal%20HGV%20collision%20rates%20ten%20year%20tables.pdf>

working etc. Technology is developing every day aimed at reducing emissions. The trick is to find that solution that works in that workplace. Consequently who better to ask but those who work at that company.

3.2. Unite members in the Taxi sector believe there are other ways to reduce NOx emissions from taxis. These include;

- Increasing capital allowances and access to affordable credit for taxi drivers to switch to cleaner vehicles. Unite's cab section is calling for more government investment in the Plug-in Taxi Grant and for the grant to be made available to every taxi driver that wishes to switch vehicles as opposed to the current system for the first 9,000 drivers. Unite call for a national diesel scrappage scheme.
- More affordable vehicle options. Our members have expressed concerns over the lack of choice in vehicle currently available on the market. They have found the current options unaffordable even where the Government are applied, with many drivers expressing that they 'are having to pay to work'. We cannot have a situation where standards are made so severe that taxi drivers cannot afford to stay in the trade.
- Proper government investment in research and development of new sustainable technology.
- Unite encourage the Government to continue to develop its proposals to reduce harmful emissions in partnership with Unite and our members in the taxi sector;
- Taxi drivers require a comprehensive charging infrastructure which isn't yet available to them. Unite believe the provision of a charging infrastructure network must be government lead. Norway has the largest per capita number of electric vehicles in the world<sup>119</sup>, yet the Norwegian government has been able to provide investment for 12,000 charging points nationwide<sup>120</sup> as well as providing a substantial package of incentives developed to promote zero emission vehicles into the market<sup>121</sup>. Unite believe that it is only through national government intervention, such as we have seen in Norway that we will fully and successfully support taxi drivers to transition to electric vehicles with confidence that this will be affordable and sustainable.

3.3. Unite Member at airports believe that there are a range of measures that can be employed at airports to reduce emissions. These include:-

- The electrification of all vehicles at the airport. Every vehicle at an airport is not encumbered by the need to have an extensive range as it only needs to travel short distances between the gates where the aircraft are parked and the companies base.
- Electric engines can produce a surprising torque for their size and are therefore ideally suited for pulling heavy loads like aircraft, baggage and fuel.
- This electricity could be generated from hydrogen or battery technology. Given the size and location of airports, they are ideally suited to gather electricity from solar and wind turbines. Large wind turbines at an airport will interfere with radar and the blades could become a major obstacle to aviation safety but an array of smaller turbines or solar panels could easily provide enough power to light runways<sup>122</sup>, especially given their exposure to the jet or propeller wash which pushes the aircraft airborne.<sup>123</sup>
- It is technically possible to make the paint on a runway to light up using an electroluminescent coating system<sup>124</sup> enabling all runway and taxiway markings to not

---

<sup>119</sup> <https://www.centreforpublicimpact.org/case-study/electric-cars-norway/>

<sup>120</sup> <https://www.independent.ie/life/motoring/car-news/electric-vehicle-wakeup-call-norway-has-12000-charging-points-and-still-there-are-queues-37929758.html>

<sup>121</sup> <https://elbil.no/english/norwegian-ev-policy/>

<sup>122</sup> <https://www.airsideint.com/issue-article/bright-sparks-in-airfield-lighting/>

<sup>123</sup> <https://transair.co.uk/aircraft-and-airfield/aircraft-maintenance/runway-lighting-kits/runway-lights/runway-lights-customized-6-pack>

<sup>124</sup> <https://www.coating.co.uk/electroluminescent-paint/>



just reflect the runway lights but literally glow in the dark adding to runway safety. This is achieved by passing an alternating current through the special coating. Again this could be powered by solar or small ground hugging turbines.

- A number of UK airlines are not far from a water course and if they have the electrical generational capacity or supply, could provide hydrogen generation within the perimeter fence, through electrolysis (once the water is purified). This would need to be within the permitted water extraction limits of that water course. This hydrogen could go towards the fuel for all hydrogen fuel cell and hydrogen ICE powered vehicles, including the aircraft. Any hydrogen produced could also store energy from any solar or wind generation so that the supply to terminals and other buildings is not interrupted due to a cloudy or still day.

3.4. Investment in transport isn't just about infrastructure. Public transport plays a vital role in reducing inequality and providing mobility for many people, particularly those on low incomes, enabling them to better participate in society. A review of family spending by the ONS highlighted that transport accounts for the highest average weekly spend (£80.80), equivalent to 14% of households' average total weekly expenditure<sup>125</sup>. The Government's own Future of Mobility: Urban Strategy acknowledges that "access to transport is vital to individual freedom and wellbeing, social cohesion and a productive economy"<sup>126</sup>. A House of Commons Select Committee report found that problems with transport provision and the location of services can reinforce social exclusion and that accessibility worsened with tight budgets in central and local government.<sup>127</sup> It recommended that the social value of transport needs to be explicitly considered in policy-making and in the planning system. More recently, others have argued that a new appraisal methodology should be developed for transport that includes social and environmental outcomes<sup>128</sup>.

3.5. The Equality Trust has also highlighted how our transport system can be a driver of inequality, finding that the richest 10% of households receive almost double the transport subsidy of the poorest 10%.<sup>129</sup> It recommends that the Department for Transport, and all other government departments, should review the net effect of their existing policies on inequality. Unite also recognises the importance of Community Transport Services and the role they play in delivering a more accessible and inclusive transport system. Concessionary travel is an important part of ensuring equality of access to transport and concessionary travel policy should ensure that anybody unable to make use of their concession on existing eligible transport services should be permitted to use it on other transport services. This fair level of service for excluded individuals must not adversely affect the level, quality, or financial viability of community transport services enjoyed by passengers.<sup>130</sup> Government needs to ensure that public transport fulfils its important social function by being accessible, affordable, integrated and accountable.

---

<sup>125</sup> Family spending in the UK: April 2017 to March 2018, ONS: <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/bulletins/familyspendingintheuk/financialyearending2018>

<sup>126</sup> Future of Mobility: Urban Strategy, Department for Transport (2019): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/786654/future-of-mobility-strategy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/786654/future-of-mobility-strategy.pdf)

<sup>127</sup> Transport and accessibility to public services, House of Commons Environmental Audit Committee (2013) - <http://www.publications.parliament.uk/pa/cm201314/cmselect/cmenvaud/201/201.pdf>

<sup>128</sup> Quick Wins for the North's Transport Network, IPPR North (2019): <https://www.ippr.org/files/2019-03/quick-wins-for-north-transport-networkmarch2019.pdf>

<sup>129</sup> Taken for a Ride, Equality Trust (2015) - <https://www.equalitytrust.org.uk/taken-ride-how-uk-public-transport-subsidies-entrench-inequality>

<sup>130</sup> <https://ctauk.org/policies-legislation/concessionary-travel.aspx>

- 3.6. Accessible Public transport has an important part to play across a range of key areas, such as health, social care and employment; for example, connecting people to sport and leisure facilities, ensuring people without access to a car are able to reach health facilities, enabling older and disabled people to retain their independence, and widening employment opportunities for unemployed people.<sup>131</sup> It also matters to young people to tackle isolation from friends, education, and work.<sup>132</sup> Rural transport and subsidised travel to remote areas and islands also need to be protected. As highlighted previously bus services have been reduced dramatically over recent years to a stage where the equivalent of 1.3 million people need to travel at least 2 km before they can reach a bus stop which has a service calling four times a day.<sup>133</sup>
- 3.7. Women are less likely to have access to a car, and are more likely to travel by bus, on foot, community transport or taxi than are men<sup>134</sup>, and poor quality, unreliable and expensive public transport has a far bigger impact on women's lives than it does on the lives of men.<sup>135</sup> Women are also more likely than men to be responsible for childcare. Passengers carrying children in pushchairs or shopping (most usually women) need adequate storage space. Vehicles must be designed to prioritise safety, accessibility and protection of the environment. But accessibility is not only about vehicle design. It is about bus drivers having the time to pull up close to the kerb at bus stops, and to wait until passengers sit down before they move off. But when buses are scheduled for maximum profits these needs are ignored. **Unite believes that putting people before profits has the potential to increase ridership and reduce the dependence on the car if public transport was run for the public with assistance provided whenever needed.** This frequently not possible on the rail as train carriages and stations are unmanned and it is only through the good will of bus drivers that assistance is possible.
- 3.8. People not only want to feel safe, they want to feel secure while they travel especially during the recent pandemic. The removal of guards from rail, underground services and stations has left passengers feeling more anxious about personal security. Fears over staffing cuts as suggested in the McNulty Review into Rail<sup>136</sup> and other reviews, promote and justify Government endorsed rail companies 'savings', have only served to increase passenger anxiety.<sup>137</sup>
- 3.9. The changes brought in following the Conservative Party review into railways saw some changes to the industry but none that would improve passenger personal security.<sup>138</sup> The current awarding of franchises needs a significant review which must include cross-ticketing and standard costings across the network. In addition, to help passengers with sight

---

<sup>131</sup> See, for example, Tackling unemployment among disadvantaged young people (IES, 2016) - <https://www.employmentstudies.co.uk/system/files/resources/files/cpt0316.pdf> and Total Transport: working across sectors to achieve better outcomes (pteg, 2011) - <http://www.urbantransportgroup.org/system/files/20110627ptegTotalTransportforWebFINAL.pdf>

<sup>132</sup> Access to public transport remains an issue for young people, British Youth Council <https://www.byc.org.uk/blog/2019/access-to-public-transport-remains-an-issue-for-young-people>

<sup>133</sup> <https://www.bbc.co.uk/news/uk-england-51815726>

<sup>134</sup> Valuing the Social Impacts of Public Transport, DfT (2013) - [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/226802/final-report.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/226802/final-report.pdf)

<sup>135</sup> Public Transport and Gender (Women's Budget Group, 2018) - <https://wbg.org.uk/wp-content/uploads/2018/10/Transport-October-2018-w-cover.pdf>

<sup>136</sup> <https://www.gov.uk/government/publications/realising-the-potential-of-gb-rail>

<sup>137</sup> <http://www.independent.co.uk/news/uk/crime/rail-staffing-cuts-blamed-for-shocking-increase-in-passengers-being-attacked-on-britains-trains10416174.html>

<sup>138</sup> Conservative Rail Review: Getting the best for passengers <http://www.conservatives.com/~media/files/downloadable%20files/railreview.ashx>

difficulties, there must be common standardisation of fixtures and fittings on all rolling stock, and braille signage must be fit for purpose. We need to plan and run public transport in a way which makes it positively accessible to everyone. This can only happen if transport policy makers properly consult with passenger groups, disabled peoples' and user organisations as well as transport unions. **Unite believes that Research needs to be commissioned into the adequacy of safe accessible public transport for disabled people and their experience of using these services.**

#### 4. Conclusion

- 4.1. **Unite will support efforts to reduce emissions from transport and believes this is best achieved through a multimodal approach.** No form of transport should be left behind as all serve a specific need in providing the spectrum of options.
- 4.2. Equally policies well beyond transport sectors have a major influence on transport decisions. If all road haulage was conducted by hydrogen powered vehicles then these would be far more sustainable than waterborne freight transport, if that remained powered by traditional fuel oil. But if the hydrogen was sourced from natural gas and the waste CO<sub>2</sub> was vented as opposed to piped into a CCUS network, then the reverse would be true. For this reason Unite believes that all sustainable transport policies need to be alive to the wider industrial surroundings, to maximise the reduction in environmental damage.

Diana Holland  
**Assistant General Secretary  
for Transport, Food and Equalities,**  
Unite the Union,  
128 Theobalds Road,  
Holborn, London,  
WC1X 8TN

For further information please contact Colin Potter, Research Officer in the Unite the union Research Department on 020 7611 2591, [colin.potter@unitetheunion.org](mailto:colin.potter@unitetheunion.org)

## Appendix 1

- A typical return flight from Gatwick to Newquay on a Dash 8 Q400 would release about **89 kg CO<sub>2</sub>** per passenger
- The same journey on an Airbus 320 would release **126 kg CO<sub>2</sub>** per passenger
- Or on a Boeing 717-200 would release **146 kg CO<sub>2</sub>** per passenger
- And it is these aircraft that are typically used on Public Service Order flights which Flybe performed on routes that give remote communities access to the rest of the UK enabling the supply of mail and other vital supplies.
- Embraer-195 are larger jet aircraft that are used to fly longer haul routes as they can fly up to 2,300 nm. A typical Flybe route was Aberdeen to Milan = **658 kg CO<sub>2</sub>**
- An Airbus A318 aircraft flying that route creates **711 kg CO<sub>2</sub>**
- A Boeing 737-300 aircraft flying that route creates **668 kg CO<sub>2</sub>**

All the above statistics are based on <https://www.atmosfair.de/en/offset/flight/>

## Appendix 2

Air Passenger Duty is charged depending on where the passenger is flying to regardless of the number of connecting flights.

APD Band A rate £13.00 <under 2000 miles from London

APD Band B rate £80.00 >2000 miles from London

**Difference £67.00**

Band A destinations are:

all countries in the EU and EEA including Corsica, Gibraltar, Madeira, Sicily, Svalbard, The Azores, The Balearic Islands, The Canary Islands and Western Sahara

non-EU countries – Morocco, Libya, Algeria, Tunisia

independent regions – the Channel Islands, Isle of Man

non-EU countries – Albania, Andorra, Switzerland, North Macedonia, Turkey, Ukraine, Russian Federation (west of the Urals only), Greenland, Faroe Islands, San Marino, Serbia, Republic of Moldova, Monaco, Montenegro, Bosnia and Herzegovina, Belarus, Kosovo

Band B destinations are all not listed in Band A

APD is charged regardless of route taken from the UK to the final destination regardless of any connections at other airports en-route. Therefore any flight which can get you to Paris Charles De Gaulle or any other major hub airport, would have to be on a non connecting flight ticket. This means that you need to arrive in Charles De Gaulle or the other hub with enough time before the flight to the final destination, to allow you to collect your luggage, and check in again for your next flight could save you money.

On the Skyscanner website<sup>139</sup> flight options

Easyjet	LTN to CDG	– CDG to LGW	= £ <b>52.00</b>	428.94 miles / 690.32 km
Easyjet	LGW to AMS	– AMS to LGW	= £ <b>48.00</b>	452.34 miles / 727.98 km
Brussels Airlines	LHR to BRU	– BRU to LHR	= £ <b>65.00</b>	435.64 miles / 701.08 km

<sup>139</sup> All of the below flights are based on journeys booked on 24/08/2020 for travel on 30/10/2020 returning 16/11/2020

The above demonstrates the poor connectivity and circuitous routes that the airlines advertise in order to connect one airport with another. Some of these journeys involve a journey of over 28 hours due to the poor connectivity at the connecting airport. To fly from Exeter to Brussels for example as there is no direct flight means that passengers are expected to fly more than 3.7 times the distance between the two airports or catch a flight from another airport.

Alternatively

Residents in London or those with annual season tickets to London. Or those who are residents in the capital, can save money on their APD ticket costs by catching a train or bus to Charles De Gaulle or Amsterdam Schiphol.

When you factor in the cost of a cab or train to Heathrow, Gatwick or Stansted in to the mix which could cost between £55.00 each way<sup>140</sup> or more depending on the time.

£67.00 + £55.00 = £122.00 if 2 people are travelling together OR  
£67.00 + £110.00 = £177.00 if traveling alone.

Cab sizes increase the cost but if shared the relative saving can add up an 8 seater van can carry 8 people with 8 cases on the same journey if they restrict themselves to 8 cases this will only be £74.00 to £98.00 each way  $\approx$  £ 148 /8 = £18.50 to £24.50 per person

£67.00 + £18.50 = £85.50  
£67.00 + £24.50 = £91.50

On the Trainline website<sup>141</sup> you can book<sup>142</sup>:

- A Eurostar to Charles De Gaulle from **£145.68** return via St Pancras.
- A BlaBlaBus/TGV Return ticket for **£28.26** to Charles De Gaulle via Victoria Coach Station
  
- A Eurostar train to Amsterdam Schiphol from **£150.42** via St Pancras.
- A BlaBlaBus/TGV Return ticket for **£100.26** return to Amsterdam Schiphol via Victoria Coach Station change at Brussels Midi.
  
- A Eurostar to Brussels from **£118.25** via St Pancras
- A BlaBlaBus to Brussels Midi from **£52.02** via Victoria Coach Station.

### Cheapest flights

Airlines will try and absorb as much of the cost of taxes as possible to provide potential passengers on a route with high demand with a competitive ticket price. With APD at £80, however, it is impossible to compete on some routes.

So even if you can get to Paris Amsterdam or Brussels cheaply you still need to book the onward flight.

The flight prices from around the UK are to a large degree considerably higher to the below sample destinations. Cardiff to Cairo for example is £1,645 and involves a stop in Amsterdam in both directions!

---

<sup>140</sup> <https://www.airport-pickups-london.com/ResultsNew.asp>

<sup>141</sup> <https://www.thetrainline.com/>

<sup>142</sup> All of the above are based on journeys booked on 24/08/2020 for travel on 30/10/2020 returning 16/11/2020

There are exceptions Edinburgh to Tokyo is £589.00 but involves a stop over for several hours in Amsterdam on the way out and in Charles De Gaulle on the way back.

### Flights from London<sup>143</sup>

Out	From Airport	Back	To Airport	Price	
<u>Cairo</u> <u>(Egypt)</u>					
British Airways	LHR	British Airways	LHR	£393	-
<u>Toronto</u> <u>(Canada)</u>					
WestJet	LGW	Transat	LGW	£358	-
<u>Brasilia</u> <u>(Brasil)</u>					
Air Portugal via Lisbon	LGW	Air Portugal via Lisbon	LGW	£564	-
<u>Tokyo</u>					
British Airways	LHR	British Airways	LHR	£706	-

### From Charles De Gaulle (CDG)

Out	From Airport	Back	To Airport	Price	Flight Saving	Cheapest Way to CDG BlaBlaBus	Total saving per passenger
<u>Cairo</u> <u>(Egypt)</u>							
Ukraine International	CDG	Ukraine International	CDG	£232	£161	£28.26	£132.74
<u>Toronto</u> <u>(Canada)</u>							
Air Canada	CDG	Lufthansa	CDG	£235	£123	£28.26	£ 94.74
<u>Brasilia</u> <u>(Brasil)</u>							
Air France + GOL via Sao Paulo Guarulhos	CDG	Air France via Fortaleza	CDG	£616	-£ 52	£28.26	-£ 80.26
<u>Tokyo</u>							
Qatar	CDG	Qatar	CDG	£502	£204	£28.26	£175.74

<sup>143</sup> LHR = Heatrow, LGW- Gatwick, STN = Stansted LTN = Luton

**From Amsterdam Schiphol (AMS)**

Out	From Airport	Back	To Airport	Price	Flight Saving	Cheapest Way to AMS EasyJet	Total saving per passenger
<u>Cairo</u> <u>(Egypt)</u> Turkish Airlines	AMS	Turkish Airlines	<u>AMS</u>	£218.00	£175.00	£ 48.00	£127.00
<u>Toronto</u> <u>(Canada)</u> Iceland Air AMS	AMS	Iceland Air AMS	AMS	£341.00	£ 17.00	£ 48.00	-£ 31.00
<u>Brasilia</u> <u>(Brasil)</u> Air Portugal via Lisbon	AMS	Air Portugal via Lisbon	AMS	£539.00	£ 25.00	£ 48.00	-£ 23.00
<u>Tokyo</u> KLM	AMS	<u>KLM</u>	AMS	£689.00	£ 17.00	£ 48.00	-£ 31.00

**From Brussels International (BRU)**

Out	From Airport	Back	To Airport	Price	Flight Saving	Cheapest Way to BRU BlaBlaBus	Total saving per passenger
<u>Cairo</u> <u>(Egypt)</u> Lufthansa	BRU	Austrian	BRU	£255.00	£138.00	£52.02	£ 85.98
<u>Toronto</u> <u>(Canada)</u> KLM	BRU	KLM	BRU	£270.00	£ 88.00	£52.02	£ 35.98
<u>Brasilia</u> <u>(Brasil)</u> Air Portugal via Lisbon	BRU	Air Portugal via Lisbon	BRU	£486.00	£ 78.00	£52.02	£ 25.98
<u>Tokyo</u> ANA	BRU	<u>ANA</u>	BRU	£620.00	£ 86.00	£52.02	£ 33.98

With margins that tight whilst it may be possible to make a saving particularly nearer the date of departure when flight prices are considerable higher the question is whether a passenger would endure a day on a coach to Charles De Gaulle to save £175.74 if their ultimate destination is Tokyo?

Capacity restraints = additional flight distances and connections

The below examines the sort of additional distances that a passenger may need to fly in order to obtain the cheapest fare, to the alternative hub airports or from the regions to the above four example international destinations.

Airlines	From	To Airport	Cost	Return flight miles (km)
Lufthansa	<b>Birmingham</b>	<b>to CDG return</b>	= £112.00	608.24 miles / 978.86 km
KLM	<b>Birmingham</b>	<b>to AMS return</b>	= £ 95.00	550.54 miles / 886.00 km
Brussels Airlines	<b>Birmingham</b>	<b>to BRU return</b>	= £ 81.00	575.46 miles / 926.12 km
	<b>Birmingham</b>	<b>Cairo (Egypt)</b>	No Direct	4,555.80 miles / 7,331.85 km
Lufthansa		via Munich	= £288.00	4,580.18 miles / 7,371.09 km
	<b>Birmingham</b>	<b>Toronto (Canada)</b>	No Direct	6,925.68 miles / 11,145.80 km
KLM		via Amsterdam	=£345.00	7,983.88 miles / 12,848.81 km
	<b>Birmingham</b>	<b>Brasilia (Brasil)</b>	No Direct	10,933.84 miles / 17,596.31 km
KLM			No 1 stop	
GOL Linhas Aéreas + KLM		via Amsterdam and Fortaleza Brazil	£529.00	11,905.86 miles / 19,160.62 km
	<b>Birmingham</b>	<b>Tokyo</b>	No Direct	11,863.90 miles / 19,093.13 km
KLM		via Amsterdam out and Charles De Gaul back	£543.00	12,403.72 miles / 19,961.85 km
Air France				
easyJet	<b>Manchester</b>	<b>to CDG return</b>	= £ 52.00	733.02 miles / 1,179.68 km
easyJet	<b>Manchester</b>	<b>to AMS return</b>	= £ 59.00	550.54 miles / 886.00 km
Brussels Airlines	<b>Manchester</b>	<b>to BRU return</b>	= £ 81.00	605.82 miles / 974.98 km
	<b>Manchester</b>	<b>Cairo (Egypt)</b>	No Direct	4,655.8 miles / 7,492.78 km
Lufthansa		via Munich	£294	4,667.46 miles / 7,511.55 km
	<b>Manchester</b>	<b>Toronto (Canada)</b>	No Direct	6,837.78 miles / 11,004.34 km
Air Portugal		via Lisbon	£318	9,235.84 miles / 14,863.64 km
	<b>Manchester</b>	<b>Brasilia (Brasil)</b>	No Direct	10,991.40 miles / 17,688.94 km
Air Portugal		via Lisbon	=£566	11,184.12 miles / 17,999.10 km
	<b>Manchester</b>	<b>Tokyo</b>	No Direct	11,778.72 miles / 18,956.01 km
Qatar		via Doha	=£492	16,989.78 miles / 27,342.40 km



Airlines	From	To Airport	Cost	Return flight miles (km)
	<b>East Midlands</b>	<b>to CDG return</b>	No Direct	628.54 miles / 1,011.54 km
Ryanair +Aer Lingus Aer Lingus + Ryanair		Out via Dublin Back via Dublin	=£129.00	395.92 miles / 2,246.52 km
	<b>East Midlands</b>	<b>to AMS return</b>	No Direct	517.56 miles / 832.94 km
Ryanair		Out via Dublin & Back via Berlin	= £73.00	1,655.77 miles / 2,328.48 km
easyjet + Ryanair	<b>East Midlands</b>	<b>to BRU return</b>	No Direct	563.06 miles / 906.16 km
Ryanair		Out via Malaga! & Back via Dublin	=£113.00	2,902.13 miles / 4,670.54 km
Ryanair	<b>East Midlands</b>	<b>Cairo (Egypt)</b>	No Direct No 1 Stop	4,551.46 miles / 7,324.86 km
Ryanair + Aegean Airlines Aegean Airlines + Ryanair		via Malta and Athens out via Athens and Berlin back	=£314.00	24,547.32 miles / 39,505.08 km
	<b>East Midlands</b>	<b>Toronto (Canada)</b>	No Direct No 1 stop	6,937.92 miles / 11,165.50 km
Ryanair + TAP Air Portugal + Portugalia Airlines		via Dublin & Lisbon out	£364.00	8,860.63 miles / 14,259.80 km
Air Transat + Ryanair		via Gatwick & Dublin back		
	<b>East Midlands</b>	<b>Brasilia (Brasil)</b>	No Direct No 1 stop No 2 stops	10,995.58 miles / 17,695.67 km
Ryanair + Azul Airlines		via Fairo, Lisborn & Sao Paulo out	=£526.00	13,431.92 miles / 21,616.58 km
Azul Airlines + Ryanair		via Sao Paulo, Lisborn & Dublin back		
	<b>East Midlands</b>	<b>Tokyo</b>	No Direct No 1 Stop	11,801.10 miles / 18,992.03 km
Ryanair + Aeroflot		via Budapest & Moscow out	=£846.00	13,368.61 miles / 21,514.69 km
Aeroflot + Ryaniar		via Mosco and Milan back		

Airlines	From	To Airport	Cost	Return flight miles (km)
Air France	<b>Newcastle</b>	<b>to CDG return</b>	= £140.00	905.60 miles / 1,463.86 km
KLM	<b>Newcastle</b>	<b>to AMS return</b>	= £ 99.00	650.62 miles / 1,047.08 km
	<b>Newcastle</b>	<b>to BRU return</b>	No Direct	769.32 miles / 1,238.10 km
KLM		via Amsterdam	=£128.00	847.22 miles / 1,363.48 km
	<b>Newcastle</b>	<b>Cairo (Egypt)</b>	No Direct	4,738.50 miles / 7,625.88 km
British Airways		via Heathrow	=£408.00	4,897.00 miles / 7,880.96 km
	<b>Newcastle</b>	<b>Toronto (Canada)</b>	No Direct	11,801.10 miles / 18,992.03 km
KLM		via Amsterdam	=£345.00	8,083.96 miles / 13,009.87 km
	<b>Newcastle</b>	<b>Brasilia (Brasil)</b>	No Direct No 1 stop	11,189.38 miles / 18,007.56 km
Air France + GOL Linhas Aéreas		via Charles De Gaule & Fortaleza	=£524.00	11,951.94 miles / 19,234.78 km
GOL Linhas Aéreas + KLM		via Fortaleza & Amsterdam		
	<b>Newcastle</b>	<b>Tokyo</b>	No Direct	11,554.84 miles / 18,595.71 km
KLM		via Amsterdam out	=£572.00	12,604.44 miles / 20,284.88 km
Air France		via Charles De Gaulle back		
	<b>Exeter</b>	<b>to CDG return</b>	No Direct	584.20 miles / 940.16 km
Blue Islands + easyJet		via Manchester	=£200.00	1,107.8 miles / 1,782.82 km
	<b>Exeter</b>	<b>to AMS return</b>	No Direct	736.82 miles / 1,185.80 km
Blue Islands + easyJet		via Manchester	=£209.00	980.60 miles / 1,578.12 km
	<b>Exeter</b>	<b>to BRU return</b>	No Direct	689.84 miles / 1,110.19 km
Ryanair		Out via Alicante Spain	= £163.00	2,570.95 miles / 4,137.50 km
Ryanair+ Blue Islands		Back via Manchester		

Airlines	From	To Airport	Cost	Return flight miles (km)
	<b>Exeter</b>	<b>Cairo (Egypt)</b>	No Direct No 1 stop	2,286.79 miles / 3,680.24 km
Blue Islands + easyJet + Aegean Airlines		via Manchester, Geneva & Athens out	=£463	22,249.87 miles / 35,807.69 km
Aegean Airlines + British Airways + Blue Islands		via Athens, Heathrow & Manchester back		
	<b>Exeter</b>	<b>Toronto (Canada)</b>	No Direct No 1 stop	6,886.92 miles / 11,083.42 km
Blue Islands + TAP Air Portugal		via Manchester and Lisborn	=£532.00	9,610.62 miles / 15,466.79 km
	<b>Exeter</b>	<b>Brasilia (Brasil)</b>	No Direct No 1 Stop	10,663.90 miles / 17,161.88 km
Blue Islands + easyJet + TAP Air Portugal		via Manchester Prague & Lisborn out	No 2 Stop =£632.00	13,556.37 miles / 21,816.86 km
Azul Airlines + Ryanair + Blue Islands		via Sao Paulo, Lisborn and Manchester back		
	<b>Exeter</b>	<b>Tokyo</b>	No Direct No 1 stop	12,141.26 miles / 19,539.46 km
Blue Islands + Qatar		via Manchester and Doha	=£667	17,364.56 miles / 27,945.55 km
easyJet	<b>Edinburgh</b>	<b>to CDG return</b>	= £75.00	1,081.28 miles / 1,740.14 km
easyJet	<b>Edinburgh</b>	<b>to AMS return</b>	= £49.00	818.16 miles / 1,332.78 km
Ryanair	<b>Edinburgh</b>	<b>to BRU return</b>	= £32.00	950.00 miles / 1,528.88 km
	<b>Edinburgh</b>	<b>Cairo (Egypt)</b>	No Direct	4,915.42 / 7,910.60 km miles
Lufthansa		via Frankfurt	+£365.00	/ 7,913.31 km 4,917.10 miles
	<b>Edinburgh</b>	<b>Toronto (Canada)</b>	No Direct	6,631.04 miles / 10,671.62 km
KLM		via Amsterdam	=£347.00	8,251.50 miles / 13,279.50 km
	<b>Edinburgh</b>	<b>Brasilia (Brasil)</b>	No Direct No 1 Stop	11,190.18 miles / 18,008.85 km
easyJet + TAP Air Portugal		via Milan & Lisborn out	£394.00	13,123.45 miles / 19,407.92 km
Azul Airlines +				

Airlines	From	To Airport	Cost	Return flight miles (km)
easyJet	<b>Edinburgh</b>	<b>To Airport</b> via Sao Paulo & Lisborn <b>Tokyo</b>	No Direct	11,510.78 miles / 18,524.80 km
KLM		via Amsterdam out & via Charles De Gaulle back	=£588	12,774.05 miles / 20,557.84 km
Air France				
Easyjet	<b>Glasgow</b>	<b>to CDG return</b>	= £54.00	1,115.76 miles / 1,795.62 km
	<b>Glasgow</b>	<b>to AMS return</b>	= £54.00	892.42 miles / 1,436.22 km
Ryanair		Out via Dublin		1,096.98 miles / 1,765.42 km
easyJet	<b>Glasgow</b>	Direct back <b>to BRU return</b>	No Direct	1,004.14 miles / 1,616.00 km
easyJet + Ryanair		Out via Venice	= £103.00	2,211.63 miles / 3,559.27 km
Ryanair	<b>Glasgow</b>	Back via Dublin <b>Cairo (Egypt)</b>	No Direct	4,980.14 miles / 8,014.76 km
Lufthansa		via Frankfurt	£313.00	4,980.28 miles / 8,014.98 km
	<b>Glasgow</b>	<b>Toronto (Canada)</b>	No Direct	6,556.38 miles / 10,551.47 km
KLM		via Amsterdam	=£346.00	8,325.76 miles / 13,399.01 km
	<b>Glasgow</b>	<b>Brasilia (Brasil)</b>	No Direct No 1 stop	9,102.24 miles / 14,648.64 km
KLM + GOL Linhas Aéreas		via Amsterdam & Fortaleza	=£539.00	12,247.74 miles / 19,710.83 km
	<b>Glasgow</b>	<b>Tokyo</b>	No Direct	11,560.96 miles / 18,605.56 km
KLM		via Amsterdam	=£601.00	12,473.62 miles / 20,074.35 km
easyJet	<b>Belfast</b>	<b>to CDG return</b>	= £58.00	1,082.52 miles / 1,742.16 km
easyJet	<b>Belfast</b>	<b>to AMS return</b>	= £45.00	959.46 miles / 1,544.10 km
	<b>Belfast</b>	<b>to BRU return</b>	No Direct	1,033.24 miles / 1,662.84 km
easyJet + Ryanair		Out via Edinburgh	=£126.00	1,144.46 miles / 1,841.83 km
Brussels Airways + easyJet		Back via Birmingham		
	<b>Belfast</b>	<b>Cairo (Egypt)</b>	No Direct	5,023.46 miles / 8,084.48 km
easyJet + Egypt Air		via Amsterdam	=£507.00	5,047.34 miles / 8,122.91 km

Airlines	From	To Airport	Cost	Return flight miles (km)
	<b>Belfast</b>	<b>Toronto (Canada)</b>	No Direct	6,475.02 miles / 10,420.53 km
easyJet + WestJet		via Gatwick	=£361.00	7,820.14 miles / 12,585.30 km
	<b>Belfast</b>	<b>Brasilia (Brasil)</b>	No Direct No 1 Stop No 2 Stops	10,908.00 miles / 17,554.72 km
Ryanair + Azul Airlines out		via Stansted, Lisborn & Sao Paulo	=£575.00	13,609.76 miles / 21,902.79 km
Azul Airlines + Ryanair + easyJet back	<b>Belfast</b>	<b>Tokyo</b>	No Direct No 1 Stop	11,773.68 miles / 18,947.90 km
easyJet + Turkish Airlines		via Amsterdam & Istanbul	=£592.00	14,861.86 miles / 23,917.85 km
	<b>Cardiff</b>	<b>to CDG return</b>	No Direct	618.78 miles / 995.84 km
KLM		via Amsterdam	=£149.00	1,200.54 miles / 1,932.08 km
KLM	<b>Cardiff</b>	<b>to AMS return</b>	£109.00	704.20 miles / 1,333.32 km
	<b>Cardiff</b>	<b>to BRU return</b>	No Direct	681.86 miles / 1,097.36 km
KLM		via Amsterdam	£155.00	900.80 miles / 1,449.70 km
	<b>Cardiff</b>	<b>Cairo (Egypt)</b>	No Direct	4,607.72 miles / 7,415.41 km
KLM + Egypt Air		via Amsterdam	=£1,645.00	4,792.08 miles / 7,712.11 km
	<b>Cardiff</b>	<b>Toronto (Canada)</b>	No Direct	6,856.84 miles / 11,035.01 km
KLM		via Amsterdam	=£405.00	8,137.54 miles / 13,096.10 km
	<b>Cardiff</b>	<b>Brasilia (Brasil)</b>	No Direct No 1 Stop	10,734.28 miles / 17,275.15 km
KLM		via Amsterdam & Fortaleza	=£574.00	12,059.52 miles / 19,407.92 km
GOL Linhas Aéreas + KLM	<b>Cardiff</b>	<b>Tokyo</b>	No Direct	12,058.36 miles / 19,406.05 km
KLM		via Amsterdam	=£639.00	12,285.40 miles / 19,771.43 km