pcs

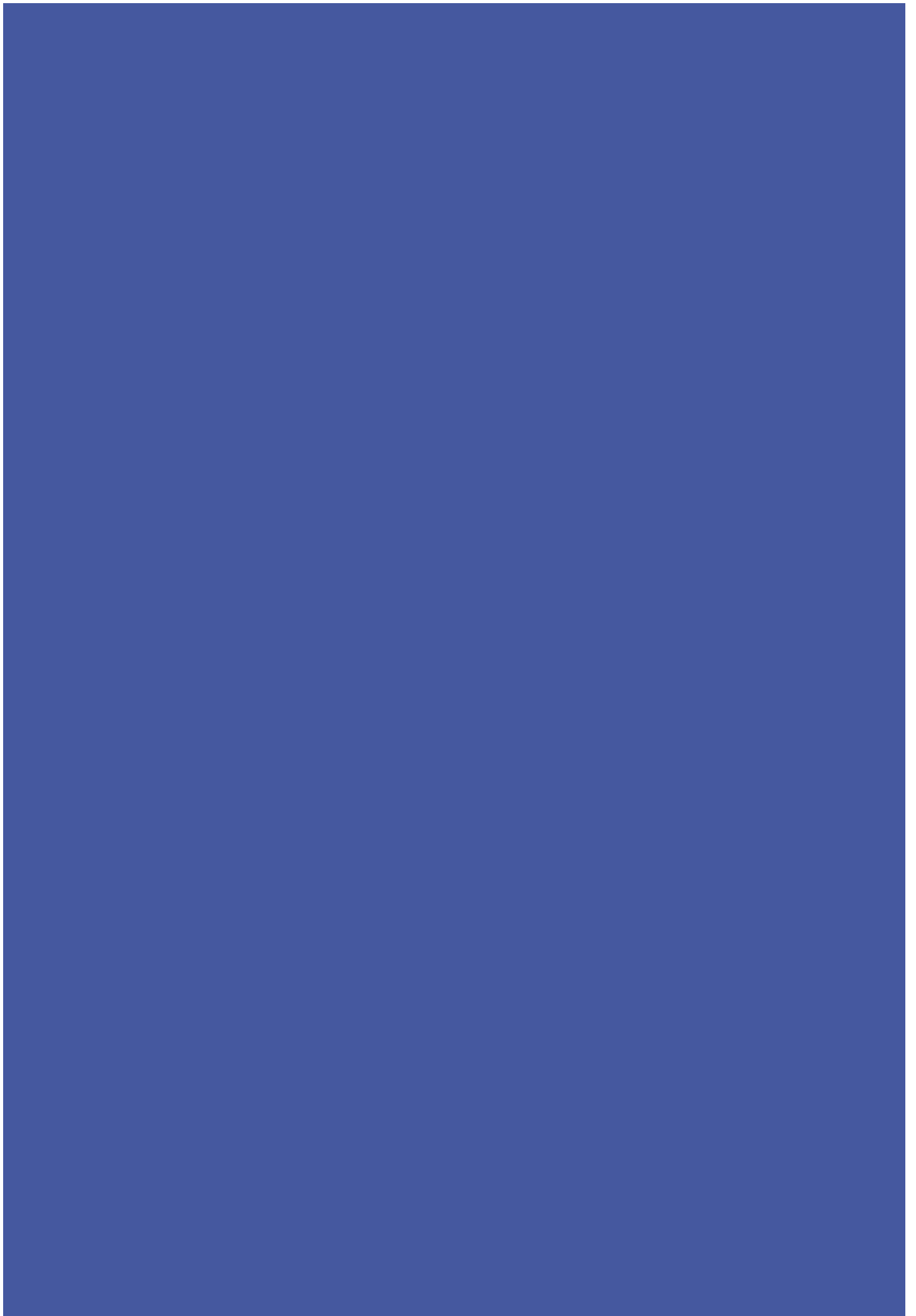# AVIATION DEMOCRACY

The case for public ownership
of the aviation sector to protect
jobs and protect the planet

Public and Commercial Services Union | pcs.org.uk

Contents

1. Introduction

Tahir Latif, aviation group president

PCS has always argued that protecting the long term job security of our members in aviation means recognising the impact of flying on the environment, and vice versa.

Technical fixes – new fuels, better engines, more efficient aircraft – will help but not solve the challenge of climate change. To meet the UK's climate targets will involve managing down .

As a trade union we want to ensure a reduction in flying does not lead to an accompanying loss of jobs but to a planned transition of workers to the jobs required in a greener aviation industry that is part of a broader integrated transport system, owned by and run for the public, and that meets its climate commitments.

Writing in the midst of the 2020 Covid-19 pandemic the aviation industry has been among the worst hit, with flying coming to a virtual halt for several months, placing at severe risk the privatised airlines, airports and air traffic providers and their employees including PCS members.

The pandemic has also had two direct effects in relation to climate change.

First, the collapse in aviation as a result of the coronavirus is a dress rehearsal for the climate crisis. In days and weeks we have seen developments that would happen over months and years if the industry pressed ahead with its expansion plans without regard for the environmental impacts. The issues associated with protecting jobs are exactly those we would be confronting in years to come when climate change forces more drastic action than the industry is currently willing to countenance.

Second, the lull in air travel during the pandemic has sharpened the public perception of the impact of flying (be it carbon emissions, air quality or noise) such that re-making aviation in a more benign, less greedily expansionist, mode could garner popular support. And that support would undoubtedly extend to a Just Transition of workers to jobs that would protect the planet not destroy it, and to public ownership of the transport sector to oversee and ensure these transformational developments.

This pamphlet tells the story of PCS's historic position in relation to aviation, jobs and climate. The policies elaborated here are based on that position, one we feel has been completely vindicated by the consequences of subjecting aviation to free market ideology, and the uphill struggle to protect our members jobs when their skills, expertise and experience have been most needed.

This Aviation Democracy pamphlet represents PCS's contribution to one of the most important debates of our time at this crucial moment of history, to defend jobs, promote public services, and protect the planet.

2. The aviation sector: what is it?

2.1 Overview

Prior to the Covid-19 pandemic grounding the aviation industry, the UK had the largest aviation network in Europe, and the third largest in the world after the USA and China. Its contribution to the UK economy varies from around £22 billion and providing 230,000 jobs according to the UK government[1], and £66 billion and supporting 1.1 million jobs according to the Airports Operators Association (AOA).[2] Like any sector, the difficultly in understanding the economic contribution and related jobs depends on what's counted in the figures. Where there is no misunderstanding, is the aim for the UK government, supported by the industry globally, to see the sector grow. Covid-19 drastically halted this agenda, but there is no doubt that the "restart and recovery"[3] strategy is designed to return the industry not just to its former position, but also to resume its expansionist activities.

In 2018/2019, the UK Government undertook a consultation on its aviation 2050 strategy. Predicated on supporting "aviation industry growth",[4] it was structured around seven strategic themes[5] to:

i)   Build a global and connected Britain
ii) Ensure sustainable growth
iii) Support regional growth and connectivity
iv) Enhance the passenger experience
v)   Ensure a secure and safe way to travel
vi) Support general aviation (non-civil aviation)
vii) Encourage innovation and new technology

In response to the consultation, PCS said:

"…we need to see aviation as a public service as part of a wider integrated transport policy that should be looking for ways to reduce demand for the benefit of the environment. Not increase it for the benefit of profits and increase the risk of catastrophic climate change."[6]

Breaking the sector down into its interrelated component parts, enables us to better understand the impacts of climate change and automation/digitalisation and how it interacts with other parts of the economy. In turn, recognising these inter-relationships helps to explain why PCS is calling for public ownership of the entire sector, not just parts of it, and for aviation to be part of a new integrated public transport system.

2.2 What is the aviation sector?

The industry is structured around airlines which facilitate worldwide travel, and which generate activities across the economy such as in the energy, food, or automotive sectors. Infrastructure includes the airports and its direct functions (ground staff operations) as well as associated ancillary services - hospitality, retail and food

services, and passenger services in and around airports. The sector is also closely aligned to maintenance, production and distribution facilities as well as non-civilian use such as military flying and manufacturing. All of this is supported across a vast supply chain. Finally, there are the bodies which support the regulation, governance and policy.

To some, aviation is the "Real World Wide Web".[7]

2.2.1 Airlines

Airlines UK[8] is the trade body for UK airlines registered with the Civil Aviation Authority (CAA). They seek to promote long-term and sustainable growth in the sector. Members include well known carriers such as British Airways, Easy Jet, Norwegian, Ryan Air and Virgin Atlantic, and organisations and suppliers connected to the industry including manufacturers (Boeing), universities (Coventry, Sheffield Hallam) and consultants.

The disappearance of airlines from our skies was one of the most visible impacts of the global Covid-19 pandemic. The International Air Transport Association (IATA) has called this aviation's "darkest hour" with airlines being "hit by a sledgehammer" as borders closed in an attempt to halt the spread of the virus.[9] In the UK, 90% of flights were grounded as the country went into lockdown in late March.[10]

The airline industry in the UK is split between domestic and international routes. Domestic air services are defined as originating and terminating entirely within the territorial limits of the UK including the Channel Islands and the Isle of Man. The number of passengers uplifted in April 2020 was 58,395. This compares with 11,670, 380 in April 2019.[11] Domestic airlines include international carriers such as British Airways or Virgin Atlantic, and regional airlines such as Flybe.

The volatility of airlines was apparent before the Covid-19 pandemic hit – notably Flybe and Thomas Cook. Both servicing different routes, types of passengers but both illustrative of the precarious business model of the airline industry, and its predatory practices slowly consolidating into a handful of large corporations. And despite commitments to the free market model, how far the UK government is prepared to go in supporting political winners.

A tale of two bailouts
Flybe, which went into administration in March 2020[12] was by far the biggest domestic provider with 40% of the home market. Operating out of Exeter in the South West, it had routes across the UK as well as to mainland Europe. The airline was however owned by Connect Airways, a consortium of Virgin Atlantic, Stobart Air and the hedge fund Cyrus Capital which had acquired it just one year before when it was struggling with losses of around £20 million a year.

The government had already agreed a 'rescue package' for Flybe in January 2020 based on a potential loan of £100million, possible short-term deferral of £106m air passenger duty (APD) bill and pledges to review taxes on domestic flights ahead of the March budget. The extraordinary efforts of the UK government intervention to save Flybe, compared to the popular holiday company Thomas Cook which went into administration in the autumn of 2019 at the expense of the companies 21,000 workforce worldwide, raised many questions.[13] Answers to which are pertinent to our arguments.

Coming out of the December 2019 election with the promise to 'level-up' the economy across the country, political expediency was a strong driver in the decision rather than concern for their 2,400 staff. Therefore by preserving so called "vital regional connections" across the country, Prime Minister Johnson was seen to be repaying the votes that got him to the seat of power. South Western Railway stepped in to help move stranded passengers and staff for free across their routes, whilst also encouraging former Flybe employees to apply for jobs within their company.[14]

Unfortunately there was not the same "levelling up" incentive to drive a government bailout for Thomas Cook, although that is not to say the collapse of Thomas Cook had no impact on the public purse. According to the National Audit Office, the government was expected to pay out at least £481 million from the Air Travel Trust Fund.[15]

Whilst PCS does not oppose all UK internal domestic travel, clearly the need to fly people across well serviced rail routes makes no sense. Even if this is posited as a connectivity issue to other UK hub airports such as Heathrow. Equally from a climate change perspective, the environmental cost is high. The effect of CO_2 emissions released at high altitudes has a fuel burn of, kilo for kilo, 1.5 to two times more impact when compared to the ground based motor vehicle. However, if compared to a car, the best means of transports for domestic travel is the train.[16]

Investment in the rail routes including their electrification, and looking at options for high speed rail, should provide viable alternatives. Equally, with rail under public ownership, fares can be brought down to a level that they are no longer put in unnecessary competition with airlines who may provide cheaper services but ultimately at greater environmental cost.

International routes
Replacing international travel with land surface is harder of course and long journeys by sea are not viable for most. The table below shows the breakdown of outbound travel from UK airports in 2018.

Outbound visit from the UK by reason for visit 2018		
	Millions	**% of total**
Holiday	47.00	66%
Friends/relatives	16.7	23%
Business	6.6	9%
Miscellaneous	1.4	•2%
Total		**71.1**

Source: House of Commons briefing paper No. 06022 Tourism: statistics and policy

Significantly, UK travel is mainly for leisure and to Europe. The top three countries visited in 2018 (in order) are Spain, France and Italy, with the US at 5% being the most visited outside of Europe. With liberalisation, the European airline market is seen as highly saturated and on the back of Thomas Cook's failure, other airlines are homing in to pick over their airport slots for the holiday industry. Of course those who don't profit at all from these spoils of competition are workers.

One slight irony is seeing airlines like the German Lufthansa group calling for market stability in Europe in the face of increased competition, and what it has called "sustained overcapacities caused by carriers willing to accept significant losses to expand their market share".[17]

In a globally competitive market, airlines are constantly looking to find savings to remain market leaders. This has meant looking to their core business processes.[18] One of their biggest cost areas is the maintenance side of airline operations where outsourcing has become an increasingly prevalent business model, and enabled the expansion of airline fleets.

According to one analyst, 2018 was the "heyday" for aviation where everything was – quite literally – on the up. Airline carriers were confident, with lower oil prices, and operational efficiencies they were making profits. This was also coupled with investment in the maintenance, repair and overhaul (MRO) sector prolonging the life of planes that otherwise would have been retired and enabling the sector to meet the rising demand for air travel - keeping production lines at aircraft, engine, and component manufacturers busy and setting records.[19]

Ownership of airlines, even in the liberalised model of aviation economics, has a mix of public and privately owned national carriers. For example, Air India and Air Emirates have government support. In light of the Covid-19 pandemic and call for bail-outs there has been a growing call for governments, if not to fully nationalise, to at least take an equity stake in airlines, which has additional challenges within the EU single market model designed to promote competition.[20]

The perception of the public is that this is a high profit industry, and in light of Covid-19, bailout discussions have opened up a new debate on airlines in the UK. A bailout for Virgin Atlantic UK was widely unpopular for a company seen not to pay their taxes, and for an anti-trade union owner living on a privately owned island, the population of which, he was prepared to put up their livelihoods as collateral for any bailout.[21] After a decade of austerity and the bankers' bailouts, this is perhaps a turning point in the UK public acceptance on issues of ownership.

With around 2.7million jobs dependent on airlines globally, clearly there needs to be alternative strategies to protect workers through a revision of the industry. However there is hardly much glamour left in working for an airline even with the lure of international travel. As detailed in section 6 below, the rise of a-typical working such as agency working and insecure contracts, and increasing

concerns around the health, safety and welfare of workers in the sector has led to more militant action from airline pilots to flight crews.[22] This is another reason why we need to take this opportunity to recover aviation as part of an integrated transport system, with related public service jobs that centres transport for people's and workers needs not the profits of corporations.

As detailed below, the business of airlines is closely tied to the expansion plans of airports, and related impacts for PCS members. Therefore revisioning the sector, has to take account of this including freight services, and alternatives ways to provide trade and manufacturing as part of the global supply chain that currently relies on the airline industry.

2.2.2 Airports

The British Airports Authority (BAA) was established in 1965 to take ownership of four key state-owned airports (Heathrow, Gatwick, Prestwick, Stansted) from the Ministry of Aviation, and subsequently took ownership of a number of other UK airports. In 1986, BAA became a part of the government's privatisation programme and became BAA plc.

In 2006 BAA was taken over by a consortium led by Ferrovial, and in 2008-09 was instructed by the UK Competition Commission to sell off several of its airports, resulting in Gatwick and Edinburgh airports being owned by Global Infrastructure Partners. BAA divested itself of any ties to its former state owned incarnation by renaming itself Heathrow Airport Holdings Ltd (HAL) in 2012.

As the distribution of airport ownership implies, and was intended to do, UK airports are put in competition with each other – most notably between the two locations where most PCS members in the airport operators section work, Gatwick (GAL) and Heathrow (HAL). This competitive model, and associated emphasis on company profits, shareholder dividends etc. operates in tension with the government's often stated stress on the importance of aviation to UK plc. Setting airports in competition with each other, intended to bring down ticket prices for travellers, mitigates against any strategic approach to the aviation sector in the public interest, as each airport seeks to become the preferred location for reaching the most sought after and profitable destinations.

There is also an economic pressure on airports to continuously increase flight and passenger numbers to remain economically viable, both in their own terms and on behalf of the airlines they service. Expansion means increasing the capacity of both UK airspace (see the next section on Air Traffic Management) and on runways at airports – both are needed to accommodate the anticipated levels of traffic to which the industry aspires. And it is not just runways, expansion entails new terminal buildings, retail outlets, hotels, car parking and associated infrastructure (the 'aerotropolis' concept of what an airport is) and has significant impacts on local communities – both positive, additional employment opportunities, and negative as in noise disturbance and poor local air quality, both bringing detrimental health impacts to local people.
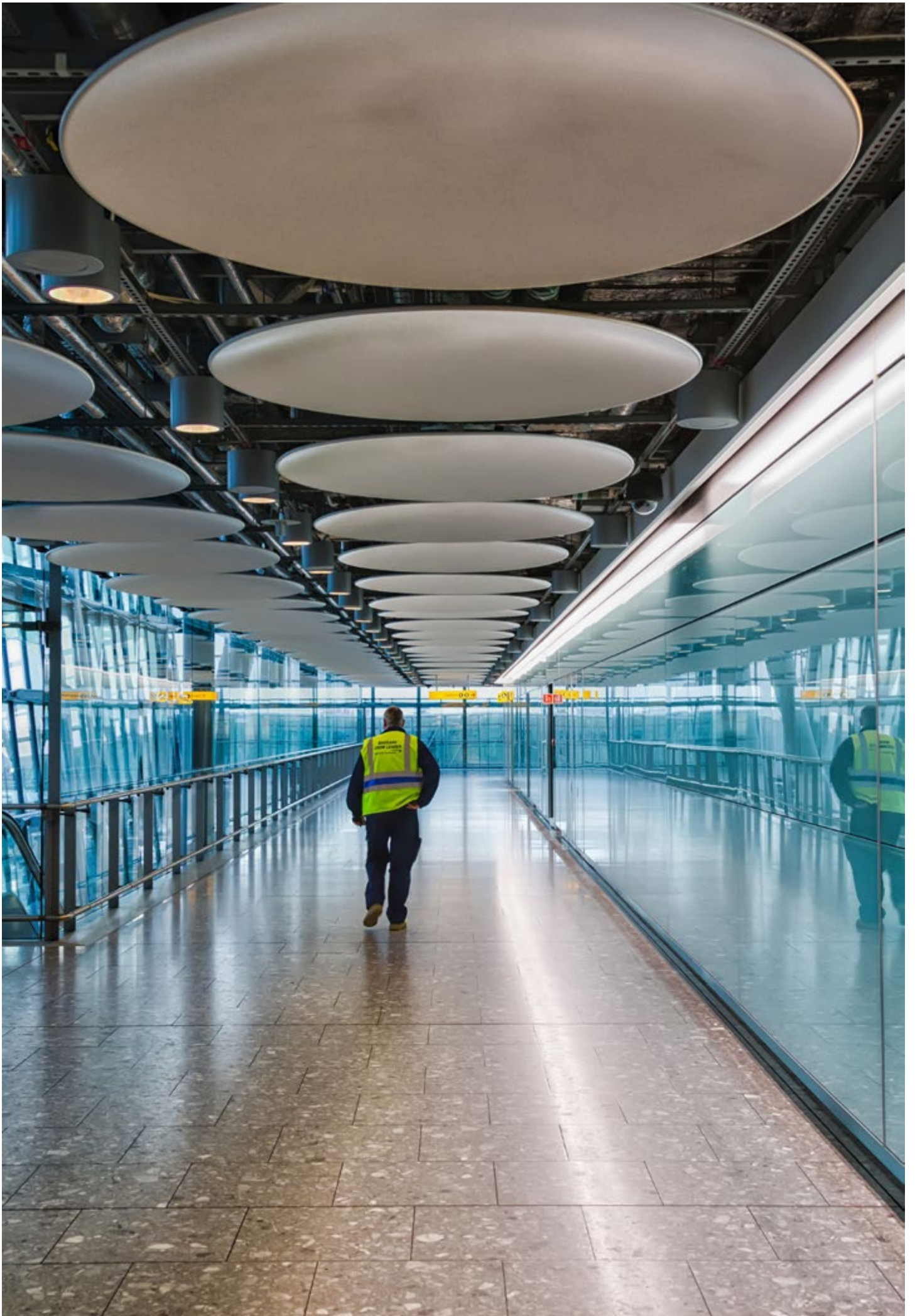
Air traffic is largely concentrated in the South East, servicing frequent flying by a relatively small percentage of the population. While this reinforces a social divide between the South East and the rest of the UK, it also means that expansion efforts in recent years have primarily focused on a third runway at Heathrow or, alternatively, a second runway at Gatwick. Regional airports do, however, have expansion plans of their own, fuelling both the competition for passengers and a drive to increase the capacity of all elements of the system.

PCS members in the airports section, unlike at the regulator or in air traffic, tend to be in the managerial and supervisory positions. For example, in an airport's security operations, PCS represents Security Team Leads (STLs) while Unite represents the security guards themselves. Key figures for Gatwick and Heathrow are as follows:

Airport owner	Staff numbers	PCS members (approx.)	Passengers in 2019	ATMs in 2019
GAL	3,500	200	46.5M	283k
HAL	6,500	400	80.8M	476k

As with other parts of the aviation infrastructure, airports are also under constant pressure to reduce internal costs, ostensibly to reduce consumer prices, though in practice a reduction in landing fees, ground handling charges, security costs and so on, also provides a boost to airline profit margins. And while industrial relations between the trade unions and the airport owners have differing characters at HAL and GAL, the broad themes tend to be common: reduced staffing levels, introduction of automated processes, parallel grading structures, union recognition issues.

These developments necessitate an ongoing process of negotiation by PCS reps at both branches to safeguard job security, seek redeployment assurances or, at worst, ensuring that any job losses are on a voluntary basis. Automation has been most visibly introduced at security gates, with passports now routinely checked via an electronic system. In terms of grading, Heathrow in particular has been pursuing a systematic programme of down-grading via the introduction of parallel grade structures on lesser pay and terms and conditions. With the advent of the Covid-19 pandemic the major employers are seeking to use the crisis as a means of reducing the workforce, even while using public money to furlough staff.

In terms of the aviation/climate debate, these ongoing issues provide a backdrop to the fundamental dilemma of union members employed at airports:

- to seek to enjoy short term job security by supporting the expansion plans of the employer, even while that employer is attacking jobs and terms and conditions, or

- to back a climate plan that, while demonstrably necessary and likely to produce many jobs, relies on a political commitment to climate targets that does not currently exist in government.

When the ten year long austerity programme of the government is factored in, with its achievement of establishing the 'gig' economy as the most likely alternative to unemployment, then it is not surprising that many airport members choose their immediate livelihood over climate goals perceived as nebulous and distant.

Consequently, all other unions at the airports (GMB, Prospect, Unite) support expansion as a route to job security; PCS, whose overall membership composition is different (only 1% work in aviation) has policy against expansion on environmental grounds. The other unions will tend to point to the efforts of the employers to 'green' the airport (electric surface vehicles, improved recycling facilities, more efficient handling processes) and to the advent of technical fixes that are claimed to reduce the environmental footprint (alternative fuels, more efficient engines, larger aircraft, carbon offsets, electrification). But there are plenty of arguments, given later in this pamphlet, as to why these fixes are either fallacious, and produce problems of their own, or insufficient when set against the anticipated increase in flight numbers.

In terms of jobs PCS has, over a number of years, worked with other organisations to dispel the myth that more planes = more jobs, and that less planes = fewer jobs. Our argument has been that climate change will force a transformation on the industry such that planned expansions will not happen, or will happen with increasing rarity. As a consequence, clinging to such plans will not lead to expanded job opportunities and, as unions, we need to look now to identify, shape and influence what the jobs of the future – climate jobs – will actually look like.

This is not an easy sell to airport workers, including PCS members at Heathrow and Gatwick. Unlike ATM, where technological development is reaching the point where more aircraft can be controlled with less people, for airport workers expansion is perceived as best way of protecting jobs. Even with, or perhaps because of, the automation of some crucial functions, a bigger airport geographically means more people required than would otherwise be the case. Hence the pro-expansion positions of Unite, GMB and Prospect.

But the prevailing political, economic and environmental winds are gradually shifting in the right direction. Increasingly local authorities, courts, even the government, are ruling against planned expansions, having previously declared climate emergencies and therefore obliged to back up words with actions. Important movements such as the school strikes and the emergence of Extinction Rebellion, have moved public opinion significantly. And the clear environmental benefits of the hiatus in flying enforced by the coronavirus restrictions has brought into question the value of returning to previous levels of flying.

As a consequence of the downturn in traffic brought about by the pandemic, aviation unions are beginning to contemplate the need for retraining and reskilling of members, for redeployment to decarbonisation projects, and even for a level of public ownership

to facilitate those developments. The covid crisis, and no flights, threatens the finances of airport owners – some of whom are local authorities[23] - and may yet trigger panic sales. As essential transport infrastructure, the government can step in to maintain the airports, but the current situation again demonstrates the fallacy of privatisation of these key assets. If the climate challenge can only be met through the integration of aviation with the rest of transport sector, that level of coordination is not achievable in current ownership structure.

2.2.3 Air Traffic Management

Air Traffic Management (ATM) is what is popularly known as air traffic control, and comprises the staff, tools and organisation on the ground to ensure that the arrival, departure and 'en route' flying of aircraft is carried out in accordance with strict safety standards. Organisations, whether state owned or private companies, which provide ATM are known as Air Navigation Service Providers (ANSPs).

Traditionally, the ATM function was, as with 'flag carrier' airlines, a component of the state-owned infrastructure to enable travel by air to take place. Until 2001, the industry regulator, the Civil Aviation Authority, included the National Air Traffic Services (NATS) division, which carried out ATM for the whole of UK airspace.

In terms of staffing, four distinct categories can be identified, two represented by Prospect (Air Traffic Controllers [ATCOs], Engineering and Scientific grades) and two by PCS (Air Traffic Services Assistants [ATSAs], all other executive, administrative and support functions).

There is a distinct hierarchy at work, with ATCOs at the top in terms of job prestige and treatment, to the extent that Prospect considers its two areas of representation as two completely distinct branches. By contrast, while ATSAs are much stronger than office grades in terms of both membership density and industrial strength, PCS has always operated on the basis of a single NATS membership group.

The approaches to industrial relations have tended to reflect the differing conceptions of what a union is. There is a line of argument that identifies the very militant activity of the ATSA community in the late 1970s as the primary source of the high level of pay, pension, and other terms and conditions from which all grades have benefitted since.

Over the last 20 years, management have conducted an ongoing attack on these conditions of employment. In the face of declining union militancy, mirroring that in society generally, and the threat of automation, the trade union response has largely been damage limitation and preservation of terms and conditions which are decent relative to many other workers, but nevertheless a gradual erosion of what had been achieved previously.

The Conservative government in the 1990s, as part of its privatisation ethos had identified ATM as an activity that could

'naturally' reside within the private sector, subject to competition and producing a reduction in the charge made to airlines for the ATM service which, the theory states, should be passed on to the passenger in the form of cheaper tickets (or alternatively, enables increased profits for airlines). Although unspoken, this process would also serve to divide and undermine the workforce.

With these objectives in mind, in 1996 NATS was deemed a 'semi-autonomous' body as a first step towards the private sector, and in 2001 National Air Traffic Services Ltd was set up as a 'public private partnership'. The ownership structure was set up as follows (to the nearest 1%):

- **46%** private investors
- **49%** retained by government
- **5%** shared among employees

A tender process to assess potential private investors took place, with the successful bid being that of the Airline Group, a conglomerate of seven airlines (British Airways, Virgin Atlantic, Air 2000, Brittania, Flying Colours, Easy Jet, Monarch). The Trade Union Side, while opposed to the part privatisation, could not prevent the process from taking place and agreed that the Airline Group was the 'least worst' choice of the potential investors. The 'logic' underpinning this position was that the Group was at least part of the industry and would therefore have first-hand understanding of how the ATM environment operated.

In the two decades since, both the composition of the Airline Group and of the private equity has shifted; as at summer 2020, the 46% is composed of the following:

- **42%** Airline Group - 49.9% of which is now held by the Universities Superannuation Scheme, USS, while mergers and take overs have changed the airline composition, including a stake held by Lufthansa
- **4%** Heathrow Airport Limited

Crucially, the privatisation of NATS also segmented the ATM function into two distinct components:

1 The 'en route' service, providing ATM throughout UK airspace not within the jurisdiction of an individual airport (but including the London Terminal Manouevring area). NATS would hold the government licence and mandate to provide the service, subject to periodic review. While the potential to lose the licence exists, en route ATM is a monopoly service and not subject to market competition per se.

2 The 'airports' service, providing ATM for departures and arrivals at individual airports and the surrounding airspace, handing flights over to, or receiving from, the en route service. Airports were defined as a competitive market for provision of the ATM service, resulting in NATS losing a number of bids, most notably the contract at Gatwick airport to Air Navigation Services (ANS) which also provides ATM at Edinburgh airport. Distribution of contracts to different ANSPs is seen as a way of driving costs
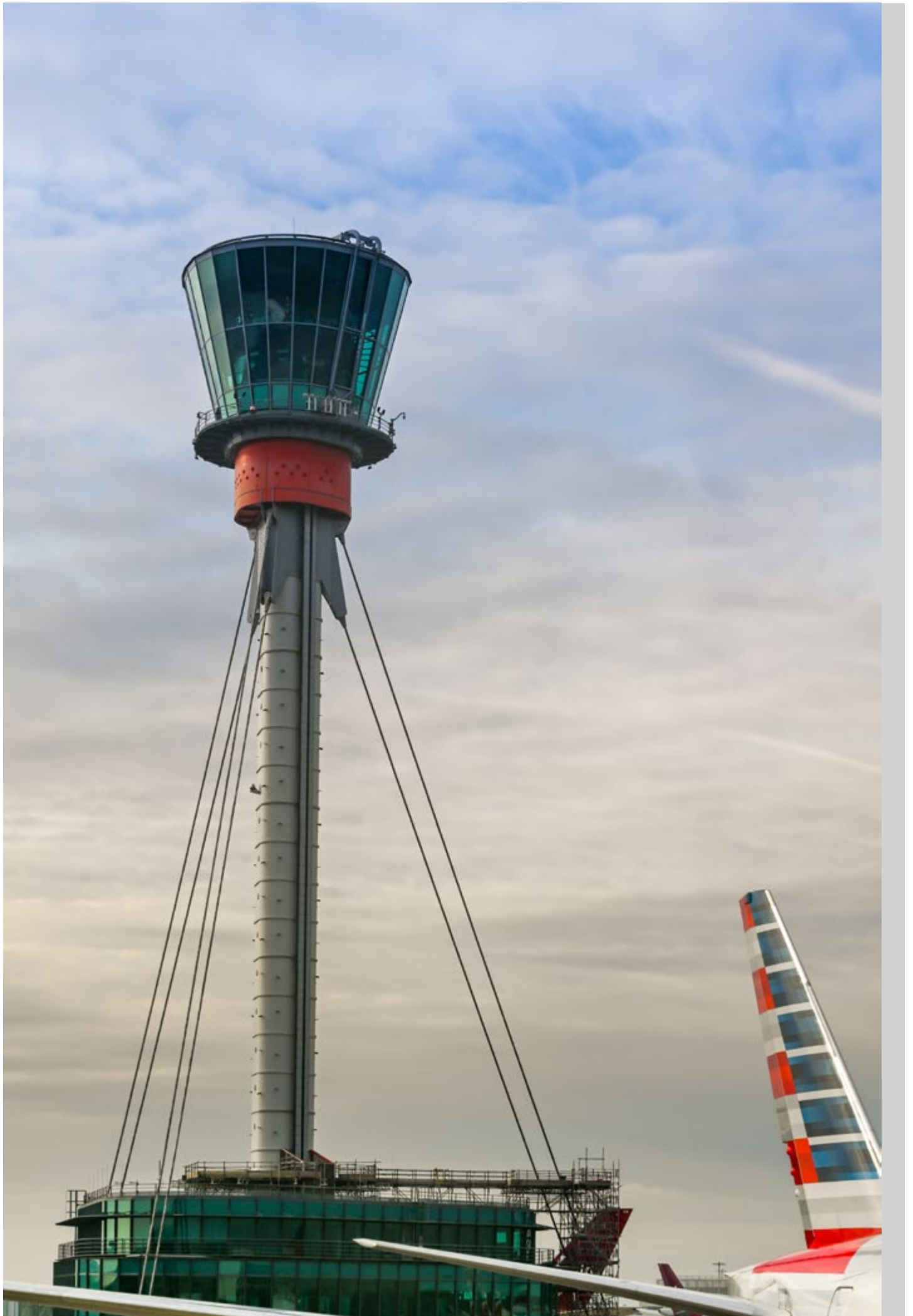
down (i.e. undercutting the salaries of skilled staff).

Privatisation also brought an emphasis on 'service' to the direct customer, the airlines, which translates as an obligation to provide as much airspace and airport capacity as the airlines could fill, and to do so as cheaply as possible. Passenger demand would soon follow, growing to fill the capacity delivered but nevertheless used as the justification for continuous rounds of expansion (growing supply to fulfil demand etc.)

This new ethos of obligation to the airlines was concretised in the terms of privatisation by making NATS (and other ANSPs at airports) financially dependent on the amount of air traffic handled – the more flights in UK airspace and at airports, the more revenue generated for the ANSPs dealing with those flights. Privatised ATM became a matter of accommodation rather than public safety. There are both safety and environmental performance targets to be met, but the continued financial success (manifested in the usual executive pay levels and shareholder dividends) of an ANSP is based entirely on its ability to handle more and more traffic. As a consequence, workers would also come to identify job security and improved remuneration with increases in traffic, thus tying them into the system.

The incongruity of this situation has been demonstrated on two other occasions prior to the advent of the covid-19 crisis. The 2008 financial crash saw a huge downturn in air traffic movements and therefore revenue, which took several years to restore. And in 2010 the Icelandic 'ash cloud' resulted in NATS, for very good safety reasons, clearing UK airspace and keeping it that way for several days. In this latter case, NATS not only endured severe criticism for daring to put public safety first, but the Chief Executive at the time said, revealingly, that another ash cloud incident would 'bring NATS to its knees financially', inadvertently pointing up the contradiction of a public service in the private sector.

In 2020, the covid-19 crisis has challenged this paradoxical situation like never before. With some 95% of flights not materialising for several months in a row, NATS has little or no revenue, and has had to rely on the government's job retention scheme to retain its skilled workforce. Yet NATS has also spent the last few years with staffing levels on a knife edge and unable to spare individuals to support major projects to the extent that would be ideal. If it was a public sector organisation, the hiatus could be used to deploy those skilled staff to get ahead on the required projects.

In terms of aviation's impact on climate change, NATS is probably ahead of most employers in the industry in 'doing it's bit' to reduce carbon emissions, and has many dedicated staff working to bring carbon reduction projects to fruition. However, whether the management of NATS is concerned with environmental impacts or not, the organisation is – as noted above – institutionally obligated to provide airspace capacity to match the expansion plans of airlines and airports (and, notionally,

passengers) while also keeping costs down for the benefit of those same customers.
This automatically puts a strict limit on what a privately owned ATM provider, whose revenue is linked to the amount of traffic, can do in terms of carbon emissions.

Profitability, the interests of shareholders, cannot be compromised under the existing business model. In practice this limits NATS to reductions in flying time and miles through improved flight paths, reducing carbon emissions on a 'per flight' basis.

In essence, NATS responsibility begins and ends with that per flight reduction. If the market determines that the percentage growth in flights far outweighs the percentage reduction in CO_2 per flight that is a matter outside NATS' jurisdiction. This is held to be true even though much of NATS' effort, and staff expertise, is also spent on providing the capacity, under its licence obligation, to enable the desired growth to take place.

The mutually reinforcing nature of the components in the aviation sector is clear, and shows why discussion of demand management, reducing CO_2 by limiting flying, is outside the remit of any of the individual participants. Segmenting the industry in this way makes it difficult, in the current circumstances, to produce a coherent action plan for dealing with the impact of flying on climate change. A cap on flying, the consequent protection and redirection of skilled resource currently deployed on expansion to solving environmental issues, and the building of alternative and integrated transport systems to accommodate the public, are decisions that cannot be made by airlines, NATS, or any of the airports, but are matters of government policy.

This is why PCS members' job security is such a contentious issue. In the industry as currently constituted, everyone benefits financially from more flying, including employees. Conversely, raising the issue of carbon emissions feels like an attack on those benefits, and would – as the current handling of the covid-19 crisis indicates – have employers reaching for job cuts to survive. Only planning and coordination – the benefits of which have been amply demonstrated by the covid-19 response - of how the industry operates and interacts with other sectors can provide the job protection, and the retraining and redeployment, needed to combat the climate crisis.

2.2.4 Governance, regulation and policy

The Department for Transport (DfT) controls the overall direction of programmes such as rail expansion, road development, ports and sea travel, emissions levels, airspace use and airport capacity. The different parts of the transport sector, under the DfT's over-arching authority, are directly regulated by a number of 'arms-length' agencies Highways England, the Driver and Vehicle Licensing Agency, and in the case of aviation, the Civil Aviation Authority (CAA).

The CAA is a statutory independent regulator. It is a public corporation of the DfT responsible for the regulation of aviation

safety in the UK, determining policy for the use of airspace, the economic regulation of Heathrow, Gatwick and Stansted airports, the licensing and financial fitness of airlines.

It also oversees the national ATOL protection scheme for customers abroad in the event of a travel company failure. As a public corporation, however, the UK government requires that the CAA's costs are met entirely from its charges on those whom it regulates and there is no direct government funding. The statutory duties of the CAA are established in primary legislation (the Civil Aviation Act 1982, the Airports Act 1986, the Transport Act 2000 and the Civil Aviation Act 2012) and secondary legislation (principally the Air Navigation Order 2009).

The CAA's primary functions can be summarised as:

1 Regulating all UK airlines to ensure they comply with relevant international safety standards.

2 Regulating all UK airports, ensuring they comply with relevant international and UK safety standards. In addition, there is a role, applicable to Heathrow and Gatwick, to monitor the rate charged to airlines by airports that have significant market power.

3 It considers and decides on airspace change proposals, taking into account safety, efficiency and noise impact on local communities.

4 In terms of aviation capacity, the authority, while arguing for additional capacity in the UK, is also responsible for promoting the efficient use of airspace so that the environmental impact of aviation on local communities is effectively managed and CO_2 emissions are reduced (although the push for more growth tends to outweigh climate concerns).

While the CAA is well established as a commercial operation, reflected in the tone and tenor of its Annual Reports and 5-year Business Plan[24], a number of tensions emerge from its current operation. There is a considerable emphasis on moving from a compliance-based approach to risk-based regulation with the emphasis: "target regulation where risk is highest and be adaptable to the ever-changing risk picture. We will act to develop confidence that members of the aviation community are managing their own risks effectively".

Two concerns emerge from this: the potential to move eventually to less regulation or self-regulation of parts of the aviation sector where risk is deemed not to be highest; and the lack of appropriate training and employment of staff to address this move to regulation.

The CAA is in pursuit of further efficiency savings against a budget reduction of 35% since 2005

The CAA employs 927 FTE staff and is divided into a number of divisions to achieve these regulatory roles:

- The Safety and Airspace division employs around 498 staff - it deals with airspace, airlines and airports, and strategy and is based primarily at Gatwick;

- The Operations division which provides administration, internal support and shared services employs around 250 staff and is primarily based in London;

- The consumers and markets section which deals with ATOL, consumer enforcement and licensing, employing 73 staff;

- A security section employing 83 staff.

Union representation is split between Prospect (technical staff) and PCS (administrative and executive grades). PCS has around 120 members, constituting a 'national branch' regardless of location, and a relatively low membership density relative to the other sections of the aviation group. This is a legacy of the 2001 hiving off of NATS into the private sector – when NATS was a part of the CAA, the higher membership density, especially among the ATSA grades (see 2.2.3) benefitted all PCS-represented grades. With the removal of the strongest areas of union representation, it has been an ongoing challenge for CAA reps to organise their membership effectively.

These difficulties have been exacerbated by a management style that has tended to mimic, almost parody, that of the private sector, with unions being side-lined wherever possible, management dictats issued with little or no consultation, and the establishment of an 'employees forum' supposedly to give staff a voice but in actuality lacking the effectiveness of a well organised union branch.

Additionally staff locations have been subject to constant change, with the two main centres being at Aviation House, Gatwick and CAA House, London, and the latter then being moved to Westferry Circus in East London, as well as many distributed staff at locations across the UK including permanent home workers even before the pandemic (the latter not necessarily unwelcome but mitigates against effective organisation).

There have been significant reductions in staffing, with redundancies 'across the board', a new pay and grading system and the shift to a lower value defined contribution pension scheme. Entry-level pay for new starters had declined for staff, the majority of whom live in London or the South East, and progression pay had been stopped. Additionally, greater functional flexibility was built into contracts over transferring staff within and between divisions. While such flexibility was not opposed per se by the union, the consequence had been a significant dilution of specialist requirements, exacerbating the knowledge lost to the organisation through prior redundancies and severance schemes, while the lack of specialist training and progression opportunities was creating significant high dysfunctional turnover, addressed by high levels of overtime and extending the use of call centre operations.

The future has been complicated somewhat by the likely impact

of Brexit on the UK's aviation regulation regime. As with many regulatory functions, Brexit constitutes a double-edged sword – on the one hand, returning regulatory functions to the UK could in theory involve the restoration of jobs lost to European centralisation; on the other, the determinedly privatised ethos that the CAA tends to affect means that those jobs are highly likely to be put out to private contractors, probably attracting the usual suspects, and employing staff on inferior pay and terms and conditions with little scope for union representation. There is also the danger that, under the current government, the opportunity will be taken to reduce the regulatory regime still further in a bid to attract airlines and further liberalise the UK aviation market.

In terms of climate change, the regulator largely follows the airlines, airports and air traffic providers and indeed is committed to overseeing the provision of airport and airspace capacity to meet the industry's expansion plans, intervening only where conflict or serious contravention of climate aims might be involved. This is in line with the ideological ethos of both government and industry, to provide only 'light touch' regulation and promote a self-regulating market wherever possible.

When actively providing guidance on environmental issues, it tends to be noise regulation. As a public body, charged with responding to public concerns, it is the more direct impact of noise disturbance that produces the greatest amount of public feedback from those affected. The designation of noise preferential routes (NPRs) is a source of some expertise and skilled jobs in the CAA. By contrast, the more diffuse, non-geographically specific impact of climate change tends to be more about lobbying by environmental and activist groups. In general the position of the regulator on climate change accords with that of the major industry players, i.e. what measures can be taken without overly disturbing the model of a profitable, expanding and economically viable industry.

2.2.5 Other aviation related

Many other economic activities are dependent on the aviation sector and which need to be considered when looking at the future of the industry. It is not the aim of this pamphlet to look at these in detail but two areas are highlighted in brief to give an indication of other employment and environmental related impacts which need to be considered in any transition discussions, including protections for workers.

a) Airport Cities/Aerotropolis

Non-aeronautical airport activities such as retail, and food and beverages services are an increasingly important revenue stream for airports, alongside parking charges, land rental and airlines rents. Even smaller international airports such as Stansted in London are an emporium of duty-free stores and other retail outlets. Whilst there is much to say about this model of consumerism which replicates itself in airports across the world, the more worrying trend is towards the development of airport cities and an aerotropolis business model.

This model mixes the development of services within airports – the airport city – to transportation corridors outside of airports to create an aerotropolis which essentially is about organising cities around air transportation. Whilst not so prevalent in the UK when considered against the scale of Dubai or the new airport in Istanbul, indicators of it can be seen in the aligning of business to airports such as hotel and conferencing facilities located on land around airports.

At Gatwick airport, the so called Gatwick Diamond is also an example of how the airport sees itself as central to economic strategy. The diamond comprises a cluster of towns in East Surrey and West Sussex surrounding the airport, and seen as part of a "symbiotic economic relationship between the airport and the local area". Gatwick is at the heart of the Coast2Capital economic strategy. Whilst economic activity around transport hubs is common – airports or otherwise and particularly for freight - centring the airport to investment puts the wider local economy at risk as the Covid crisis has clearly exposed. Airports can lead to the erosion of local economic diversity as happened with Heathrow making local communities and workers highly reliant and therefore supportive of aviation growth as illustrated in 2.2.2 above.

Manchester airport, self-defined as the "global gateway to the North of England" is also investing to become an airport city with a £650million 'Airport City' project as part of the Manchester Airport Enterprise Zone aimed at delivering five-million square feet of new business accommodation.

b) Aerospace industry

Aerospace refers to "the design, manufacture and assembly of aircraft products". This includes commercial, defence and global services. According to the UK Government's Aerospace Sector Deal, it provides 120,000 "highly skilled jobs" that pay 40% above the national average, and has an annual turnover of £35billion mostly from exports.

The commercial airline industry is dominated by large companies such as Boeing and Airbus (more than 90% and account for the majority of civil aircraft design and manufacture) with a "long tail" of small and medium sized enterprises (SMEs) and micro entities. Some also cross-over into other sectors such as the automotive sector.[29]

On the business side, the industry is more fragmented but Bombardier is a key player in private/business jets, particularly in Northern Ireland. Leonardo and Airbus helicopters have UK operations with civil and military content. Airbus has a maintenance, repair and overhaul (MRO) facility in Scotland which services the oil and gas industry.

MRO and logistic is a key part of the aerospace industry and forms a significant part of total aircraft costs of ownership over their lifetime – which can range up to thirty years – and is estimated to be around 80 percent of total aircraft life cycle cost.[30]

With a decrease in need for aircraft maintenance, opportunities will exist for workers to transfer their skills into other forms of transport maintenance. And in an industry increasingly looking to outsourcing to cut costs, with public sector, secure and decent jobs.

3. Who owns the skies?

"History suggests that change is as much a matter of recycling the old as introducing the new. The past thus remains an important resource for transport alternatives in the future."[31]

The historical development of the UK aviation sector shows that PCS's proposals reflect a) a model that has largely been dependent on the state in various forms, and b) why there is a need to revisit the industry in the era of the Covid-19 pandemic, climate change, and automation/digitalisation.

It's over 100 years since the first commercial flight in the UK by the British company Air Transport and Travel Ltd in 1919 on a plane powered by Rolls-Royce engines.[32] Flying from London to Paris with two passengers on board, it's a far cry from the global aviation network of today.

Pre-world war two, the aptly named Civil Air Transport Subsidies Committee set up to review civil air policy, supported the consolidation of four airlines into Imperial Airways Ltd – the predecessor to British Airways - as part of a ten year plan to privatisation. Subsidised in formation, it was nationalised in 1939 and split into two government owned companies in 1946 – the British Overseas Airways Corporation and British European Airways – which then merged to become British Airways in 1974, and privatised in 1986.[33] According to one source, "by February 1921, all British air commercial services had ended due to a financial crisis"[34] with a 'bailout' coming from the UK government. Sounds familiar.

The equally aptly named Imperial Airways was geared to support the UK's outposts of empire in India, Africa and the Middle East, particularly for airmail. France and the Netherlands also pioneered early transport services linked to their former colonies. Germany on the other hand, was developing services across Europe and by the mid 1930's, was said to have the largest commercial airline network in Europe. In the US, the early phases of aviation concentrated on the internal air mail planes, helping to speed up business and financial transactions.

If the Americans were more concerned with speed and time savings, the Europeans tended towards short-haul services and luxury where state subsidies were invested over concern for technical innovations in aircraft design. But technological changes were advancing air travel in the US as innovations like the pressurised cabin and tricycle landing gear meant flying at higher altitude with resultant better performance from friction and in turn greater fuel efficiency.

Development of the sector was facilitated by the parallel evolution of aeronautical infrastructure and global governance architecture. The Convention on International Civil Aviation (Chicago Convention) in 1944 established the International Civil Aviation Organization (ICAO) as a specialized agency of the United Nations.[35] Its role is to work with signatories to the convention (member States) and industry groups to agree international civil aviation Standards and Recommended Practices (SARPs) to "support a safe, efficient, secure, economically sustainable and environmentally responsible civil aviation sector".

3.1 From state to private - civil aviation emerges from the war

Discussion was well underway during WWII of the importance of developing a civil aviation sector post war with Britain becoming the largest aircraft producer in the world by 1940. Whilst driven by the military imperatives of the war, civil aviation infrastructure remained relatively underdeveloped. Imperial Airways operated from Croydon Aerodrome whilst Manchester airport for example was constructed under municipal ownership in the 1930s. From the 1950's, the arrival of the passenger jet and package holidays saw the transformation of air travel in the UK. Passenger numbers increased from around one to six million over a decade accompanied by the development of Heathrow in 1946 and Gatwick 1958 and expansion of Manchester (1958) and Prestwick (1964).

Whilst privatisation of the aviation industry is assigned to the Thatcher era, the foundations were laid before this for airports through the Airports Authority Act 1965. This allowed the transfer of the four main international airports – Heathrow, Prestwick, Gatwick and Stansted – to a newly formed public statutory body, the British Airports Authority (BAA). Lord Beswick in moving the second reading of the Bill in the Lords, said this "piece of practical and applied socialism" is a more appropriate form of ownership and control.[36]

Interestingly, air traffic control and noise were seen as reserved for the state for reasons of safety and the economy. Other points of note relevant to this story, is the need for the BAA to be sustainable through revenue generating activities such as from landing fees, rents and services, and trading concessions. Security arrangements were drawn from the local constabulary. Whilst previously under control of the Ministry of Aviation, as a public body staff at the airports lost their status as civil servants.

The BAA survived until 1986 when the Thatcher government introduced the Airports Act. This dissolved the authority and saw its assets transferred to a new BAA company. British Airways was also privatised the same year.

3.2 Deregulation

The UK led on deregulation of air transport in the mid 1980's, which along with the European Union from the early 1990's,

facilitated the spread of Low Cost Carriers (LCCs), giving rise to Easyjet and Ryanair. LCC's are credited with a process of democratisation of air travel by providing services within the economic reach of many more people. Until this time, UK air traffic movements (ATM) were increasingly slowly and steadily, and with no real competition between national carriers. A web of bilateral air service agreements between states shaped the industry, with specified routes and airports, agreed aircraft types, fares and frequencies, and designated carriers. In effect, capacity on the majority of routes was restricted, fares were high as a result, and entry into markets by non-flag carrier airlines was virtually impossible.

The United Kingdom is now the most developed market for low fares services, with several low fares airlines having established operational bases here. This has forced the traditional flag carrier airlines to respond with lower air fares and more services, and created an increased demand for air transport, especially low fare travel. The vast majority of low fares passengers initially were new passengers, who either would not have previously travelled at all, or might have taken another mode of transport. The LCCs tend to operate on a point-to-point business model, rather than the hub and spoke business model operated by the flag carrier airlines.

Advocates of increased Low Cost Carriers such as the European Low Fares Airline Association13 (ELFAA) argued that increased connection between European cities has led to increased inward investment, tourism and related employment, as well as facilitating the movement of labour within the EU, from the accession countries in Eastern Europe. An issue which of course will be less relevant with the UK's exit from the EU.

Privatisation compared to public ownership (or state owned enterprises) is guided by a belief in the free market, competition and "emphasises that a business enterprise has no right to long-term existence unless the business operates profitably."[37] However, the mechanisms by which deregulation and privatisation put theory into practice hinge around cost reduction, portrayed by its adherents as stripping out 'excess fat' and 'gold plating', but in reality comprising a reduction in the quality of service and overseeing worsening pay and conditions in the sector.

If aviation is just the profits then it has no right to exist in the age of climate realism. But it does have to recognise its colonial past on which the wealth of the country was built – even if it wasn't distributed – and for people in a multicultural society to have the ability to travel to their ancestors home countries. In which case, the need to operate an aviation public transport service within the confines of the UKs carbon budgets and prioritising aviation for those that really need it.

Restoring aviation to the public sector as part of an integrated transport strategy will both help to manage reduction in the sector under regulated conditions, whilst establishing good, new, transport worker jobs. In terms of pricing, for the consumer

then alternative transport modes particularly for domestic or short haul equivalent trips to mainland Europe can be developed under new, overall affordability pricing models. This will require government subsidy, but if we view all transport as a public service and the fact that the aviation industry is already enjoying hidden government subsidies,[38] then this is not as economically unviable as it may at first appear.

4. Aviation and climate change

"*One of the most visible impacts of the COVID-19 crisis is the fall in both domestic and international travel, reducing emissions in the short-term, and improving local air quality in cities around the world*."[39]

With a few notable exceptions such as Donald Trump, there is no dispute that climate change is here and we're running out of time to allay its worst impacts. The Paris Agreement 2015[40] was ground breaking in establishing the aim to keep global temperature increase to well below 2 degrees Celsius above pre-industrial levels and "to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius."

The subsequent United Nations Intergovernmental Panel on Climate Change (IPCC) report in 2018 on "understanding the impacts of 1.5°C global warming above pre-industrial levels"[41] was starkly illustrative of what the Paris agreement means in practice. Arguably this unleashed the new climate movement of Greta Thunberg climate strikers and Extinction Rebellion as it set out in the starkest terms the action needed by 2030 and how to achieve this – "rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial"

Whilst these illustrate the size of the challenge, they do not however include aviation (or shipping) which is 'governed' by a mechanism set by the industry and the International Civil Aviation Organisation (ICAO – a UN agency) known as CORSIA – Carbon Offsetting and Reduction Scheme for International Aviation.

The UK however has set a target of net zero by 2050 which includes international aviation emissions. According to the UK Committee on Climate Change, aviation is "likely to be the largest emitting sector in the UK by 2050, even with strong progress on technology and limiting demand." This is exactly why the current growth objective is not only unsustainable but destructive of other parts of the economy which will have to compensate for aviation.

4.1 Highest and fastest growing emissions

Where the world has made efforts to reduce emissions in sectors such as power, transport – including aviation – remains a significant and growing contributor.

In 2018, the total global CO_2 emissions produced by aviation was 2.4 percent. A seemingly low number but, when related in

country terms, this would put commercial aviation number six in the world of energy consumption CO_2 emitters between Japan and Germany.[42]

Global annual international aviation emissions are already 70% higher in 2020 than in 2005, and are forecast by ICAO to grow by over 300% by 2050 if additional measures are not put in place to curb these.[43] Such measures include operational efficiencies, technological improvements, and use of sustainable aviation fuels. See further below.

Aviation also produces other non-CO_2 pollutants that have warming effects through radiative forcing that are much harder to calculate. These include nitrogen oxides, black carbon and aviation induced cloudiness which impact "the overall energy balance of the planet".[44]

Whilst non CO_2 emissions are short lived (e.g. one hour and localised impact) being produced in the flight itself, and unlike CO_2 it does not create a cumulative impact in the atmosphere adding to "historic emissions" associated with flying, they can have more immediate damaging effects. These are also linked to atmospheric conditions, time of day and season. For example, contrail effects occur more with night and winter flights where there are less possibilities for infrared effects to reflect back into space.

Non CO_2 emissions can potentially be limited via operational changes such as timing and routes of flights. However, with more airspace capacity required by governments there is very little option in practice to effect such changes.

Combined with these other pollutants the total combined aviation contribution to global warming is around 5 percent.[45]

The Committee on Climate Change 2020 report to Parliament noted that aviation contributed 8% of 2019 UK emissions.[46] It recommends that a policy framework is needed to achieve net-zero emissions of UK international aviation by 2050, and UK domestic to aim for earlier than 2050 and include:

- demand-side measures
- efficiency
- low-carbon fuels, with residual emissions offset by greenhouse gas removals
- Review of the UK's airport capacity strategy
- Action on non-CO_2 warming effects from aviation.
- Working with ICAO to set a long-term goal for aviation consistent with the Paris Agreement, and to strengthen the CORSIA scheme

According to the Committee on Climate Change, zero-carbon aviation is "highly unlikely to be feasible by 2050".[47] However, the CCC go on to note that emissions could be reduced by around 20% from 'today' to 2050 by making improvements to fuel efficiency, use of sustainable biofuels, and "limiting demand growth to at most 25% above current levels." They have also

stated that aviation will require greenhouse gas removals (GGRs) to remove CO_2 from the atmosphere in a strange combination of offsets and GGRs. The mechanism would be through the internationally agreed framework e.g. CORSIA with supporting UK policies.

4.2 CORSIA and EU Emissions Trading System

These are the two international standards for reducing GHGs emissions globally and in the EU.

CORSIA is a global market-based measure (GMBM) and was formally adopted in 2016[48] as part of a basket of measures to address CO_2 emissions from international aviation, aiming for carbon neutral by 2050. The other measures include:

- aircraft technologies
- operational improvements
- sustainable aviation fuels

Rolled out in phases, it is voluntary from 2021 until 2027 when it becomes mandatory for all but a few countries such as Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Landlocked Developed Countries (LDCs) will remain exempt.

Corsia is to be reviewed from 2022 every three years, and is heavily predicated on avoiding "market distortion" and being the only global market-base measure applying to CO_2 emissions from international aviation to ensure aviation emissions are only counted for once.

However in plain speak, GMBM is an off-setting measure which is rightfully described as "a licence to pollute".[49] It only covers CO_2 emissions and even then, estimated to be only 6% of those up to 20[50].50 The main criticism of Corsia is that it is able to off-set its emissions by paying for an equivalent reduction in emissions elsewhere through 'investment' in another project which reduces CO_2 emissions. In reality, this is not about reducing emissions but aviation being seen to be contributing to a perceived reduction in emissions. And just to emphasise the 'sleight of hand' world of carbon emissions reduction, the ICAO has agreed to put back the baseline emissions reduction year to 2019 due to the Covid-19 pandemic.[51] The rationale was given to save the industry from economic burden and to respect the objectives of the ICAO's 2016 agreement. This probably says as much as we need to know about the fact there is little serious objective to decarbonise the aviation sector.

The European Union emissions trading scheme[52] is equally a market approach based on carbon offsetting. Since 2012, CO_2 emissions from aviation have been included in the EU Emissions trading system (EU ETS). This requires all airlines operating in Europe (regardless of national registration) to "monitor, report and verify" their emissions. This is part of a wider EU "cap and trade" system.

This entails the EU setting an allowed emissions cap on a sector which can be traded across the EU to enable lower emitters to

trade their allowances with higher emitters. A total emissions reduction target is set in phased periods in line with EU-wide climate targets.

With 38 million allowances being issued to the aviation sector annually since 2013, verified CO_2 emissions from European Economic Area flights have increased from [53].5 million tonnes of CO_2 in 2013 to 67 million tonnes in 2018.[53]

The EU is continuing with its current approach until 2021 when it will look at how it integrates with the ICAO GMBM.[54]

How does the EU ETS work?

Each year, polluters have to surrender a number of permits equivalent to the amount of CO_2 they emitted in the preceding year. Polluters acquire permits through an annual allocation system and some are issued by member states for free. If polluters don't have enough allowances to acquit their previous year's emissions, they can buy additional permits at auction or from other companies having a surplus. The EU puts a maximum cap on the CO_2 emissions that can be emitted by restricting the number of permits available on the market. As issued permits become scarcer due to progressive reductions in the cap, the permit price goes up, providing emitters with an incentive to reduce their emissions where that is cheaper than buying permits.

https://www.transportenvironment.org/what-we-do/ flying-and-climate-change/aviation-ets

Of course these mechanisms sit within the wider 'market mechanisms' of the global COP climate talks that failed in Madrid in 2019 to agree a global carbon market system. This is covered in article 6 of the Paris climate agreement and again, like the system above, is in reality a system to offset rather than seriously reduce carbon emissions.[55]

4.3 From offsets to bio and e-fuels

It is clear too that proposals under current arrangements to decrease aviation emissions are not the means to achieve these when it comes to aviation, particularly when considering the impacts these policy solutions have on other parts of the economy.

Outside reducing aviation rather than expanding, there are three path ways to decarbonising the industry:

i) operational efficiencies
ii) Aircraft design including electric and solar planes
iii) Sustainable aviation fuel or biofuels

The International Renewable Energy Agency (IRENA) note that annual emissions can be reduced by 1.5% annually through efficiency gains such as new aircraft and modifications to aircraft, at airports and optimising navigational systems.[56] However this would make little long-term impact to the decarbonisation needed.

Equally electric and solar planes are a long way off. Despite upbeat exaltations from the industry about the advancement of technology and ambition that flights of less than 1,000 miles will be completely electric by 2035[57] there are many barriers to the commercialisation of non-jet fuelled planes. For one is the heaviness of the batteries in an industry where weight and costs are important to efficiency of flight and consumer ticket pricing.

If we consider that conquering the technical challenges of flight date back long before the first commercial flight was taken in 1919, it's very likely that in time these engineering feats will be mastered. But time is not what we have right now in terms of making a serious contribution to decarbonisation. Therefore other, 'quick fixes', are being looked at such as cleaner-burning biofuels, blended with petroleum products.

Biofuels, or so called Sustainable Aviation Fuel, has been sold as the panacea to decarbonising aviation. Jet fuel (liquid hydrocarbons fuel) is currently the only means of powering commercial aviation and according to the International Energy Agency, accounts for around 15% of oil demand growth up to 2030.[58] Yet again there are many reasons to be sceptical as a real decarbonisation alternative.

The first is that they are only targeted to meet around 10% of aviation fuel demand by 2030 and 20% by 2040. Even at that low level, there are serious doubts that there is sufficient feedstock – waste household oils – to scale up production to realise commercial levels. To do so would be to put them in competition with the food system, and bring with it their own environmental impacts such as is already being witnessed in the production of palm oil for example[59].

The other option is **synthetic fuels**[60] which are described as liquid fuels manufactured, via chemical conversion processes, from a carbon source such as coal, carbon dioxide, natural gas, biogas or biomass. These break down into two types:

i) Electrofuels (efuels) – synthetic fuels manufactured using captured carbon dioxide or carbon monoxide together with low-carbon hydrogen. They are termed electro- or efuels because the hydrogen is obtained from sustainable electricity sources e.g. wind, solar and nuclear power.
ii) Synthetic biofuels - fuels synthesised from biomass or waste or biofuels using chemical or thermal processes.

The advantages of synthetic fuels are listed as:

- They can be used as 'drop in' replacements for fossil jet fuel.
- The volume and energy density of synthetic fuels are similar to existing fuels
- They can be designed to burn cleanly, reducing other pollutants associated with fossil fuel use, such as particulates and nitrogen oxides
- Existing infrastructure can be utilised for distribution, storage and delivery,

On the other side, the disadvantages are listed as:

- Cost compared to fossil fuels. For example, around €4.50/litre for diesel equivalent efuel and around €1/litre petrol equivalent biofuel.
- High energy losses from manufacturing and using synthetic fuels due to the many processes involved.

Whilst there may be high levels of confidence in these solutions, they are still in development at the level of theory rather than practical application. They do not address the challenges of the immediate and therefore we need to look at how we manage a decline in aviation whilst developing a smaller but sustainable industry in the longer term.

One immediate solution is preventing pollution from airlines in the first place. For example, energy efficiency measures that end the practice of airlines carrying additional fuel to avoid higher costs in different countries; carrying more passengers by eliminating first class seats; an enforceable emissions reduction regime.

As we argue throughout this report, the only way to do that is to start by changing the business model of aviation, how we see its purpose, and plan for it as part of wider integrated transport system.

We can begin to reconfigure our transport system nationally and globally into one that considers aviation as part of a public transport service under public ownership and forms of democratic control. This would enable it to be run as a transport service that is both integrated as a public service without fear of competition and based on providing the service that meets the optimum in terms of environmental and climate challenges, affordability, accessibility and universality.

5. Aviation 4.0 – AI and automation

Aviation like all sectors is being reshaped by digitalisation and automation as part of the so called Fourth Industrial Revolution (IR4) although it has long had a presence in the aerospace manufacturing side with use of digital design tools such as Computer Aided Design (CAD). As a 2019 UK Government policy paper outlined, IR4 is happening at unprecedented scale, pace and complexity.[61] Along with climate change, this is another global economic disruptor which will have a massive impact on how, in what form, and where we interact with transport services. And needless to say, employment.

As mentioned in section 2, anyone travelling by plane in the past few years will have noticed the change in our experience with airlines and airports. For example, we might use an online platform to book our plane journey, print our boarding cards at

home or save them on our phones to independently scan them at the airport. On board the plane we can order food and drink paying directly with digital money. Biometric passports enable us to enter our new destination without need to interact with Border Force staff which are PCS members. We can also pre-book taxis and other local transport services online to complete the final part of our journey.

Aviation has been quick to adopt digitalisation practices particularly in relation to operational efficiency, cost effectiveness through the Internet of Things (IoT), predictive analytics, and digital twin technologies.[62] On one level, this makes sense for an industry that relies on vast sets of data or information logistics to run safely and efficiently (cost) – weather forecasting, GIS data, operational performance of planes. Equally, for a future generation of low or zero-carbon planes, this will no doubt be key from a research and development (R&D) perspective. However this does of course have other impacts such as displacing jobs – ticketing, sales, ground services to name some areas.

The operation of 'twin technology' enables speeding up of maintenance operations. For example, electronics systems data can be monitored whilst an aircraft is in flight saving time on the ground. This partnering of the aerospace operations with data companies such as Airbus and IBM Watson (designed to takeover cockpit cognitive functions of pilots[63]), or Rolls Royce and Microsoft, enables the companies to perform aircraft maintenance before human mechanics are involved.[64]

In the information age, data is key in all sectors and none less so than in aviation. As noted in the Cambridge report on Challenges to Digitalisation in aviation and Aerospace[65], there is a complex data ownership in operation across the sector and given the nature of the industry – despite its high level of competitiveness – reliance on information sharing. This distinguishes between airlines ground operations and operations once airborne where control falls to airspace operators and data generated is shared with regulatory authorities i.e the Air Navigation Services Providers. It also requires a new physical infrastructure for data including sensors, servers and communications technology as well as regulatory policy and standards. The latter the UK Government argues should come from within the market.

The erection of digital towers is pointing the way to one of the major impacts of digitalisation on aviation in air traffic management and airspace capacity. Initially linked to 'project Chatham'[66] which is aimed at the management of drone technology, as the Governments aviation strategy 2050 consultation document says, ultimately this is the first pillar of a "future unmanned traffic management system in the UK."[67]

Whilst not a primary concern of this pamphlet, drones are increasingly having an impact on aviation and UK airspace. Drones fall into three types of categorisation. Those used for recreation (and sometimes disrupting airport operations[68] and airlines) at 20kg or less referred to as Small Unmanned Aircraft

(SUA); unmanned aircraft at 20 –150kg – Light Unmanned Aircraft (LUA); unmanned aircraft over 150kg which are subject to the same regulatory agreements as manned aircraft.

In a report of the House of Commons Science and Technology Committee on Commercial and Recreational drone use in the UK[69] published in October 2019, it noted the lack of an independent assessment by the Government of the potential economic benefits and opportunities of a growing drone industry. These include in the public sector, particularly in the emergency services, the oil and gas industry, and in the construction, inspection and maintenance of transport infrastructure. Certainly, PwC see drones as a transformative technology for the UK economy with the potential to add £42bn to GDP and save the public purse £16bn by 2030.[70]

PwC envisage drones as a technology that will integrate with artificial intelligence and autonomous vehicles, eliminating any form of human intervention in operational processes such as logistics for example. They also see the drone economy adding 628,000 people, needed in areas to think about their development and application (data scientists and robotic engineers), maintenance and operation, and regulatory roles.

As ever with such studies, jobs numbers' and guarantees have to be treated with high levels of scepticism, not least when they are designed to eradicate human labour, but this is not a far-fetched future. In the US, 'urban air mobility' (UAM) or 'flying cars' is seen as a new Aviation 4.0 age of aerial mobility democratisation just as deregulation and low cost carriers were to the growth of aviation in the 1980's and 1990's.[71] A concept being developed through the Uber-Elevate initiative to transform it from a ground ride hailing company to one that provides Mobility as a Service (MaaS) as part of an inter-modal provider. This new electrical vertical take-off and landing (eVTOL) aircraft is certainly being seriously discussed as a way to challenge the model of urban land surface transport.[72]

The "integration" of drones or unmanned aircraft into UK airspace is being taken forward by the government as part of its Air Traffic Modernisation Programme and the Future of Mobility Grand Challenge (one of four Grand Challenges set out in the Industrial Strategy 2019). ATM is part of a strategy to which the UK government has tasked the CAA to prepare and maintain a coordinated strategy and plan for UK airspace up to 2040. This is both to handle an increase of flights at UK airports and deal with other airspace users such as drones. Airspace is seen as a key but invisible part of the UKs national transport infrastructure.

The governance of this programme has been set by CAA, Department of Transport and NATS, and the Infrastructure Projects Authority. A National Audit Office report in 2018 "NATS Feasibility Report into Airspace Modernisation in the South of the UK and the CAA Assurance into the NATS Feasibility Report"[73] recognised the need for "close collaboration and compromise" between airports to develop airspace change proposals. As part of the review NATS made clear that airspace capacity should not be a constraint on aviation growth over constraints from number of runways, use of runways as decided by local or national government.[74]

Findings of this report included the "innovative data and computer modelling" in the design of airspace, and the need for airports to cooperate with other airports and NATs. This also links to the wider EU project to "simplify and harmonise airspace and air traffic control through the Single European Sky project". This process is seen as key to achieving sustainable growth as well as other societal and safety benefits. In turn achieving these aims is contingent on new technology in shifting from ground based navigation aids to satellite navigation systems as set out in the international requirements for Performance-Based Navigation (PBN), and an automated design process that shifts from "expert" human designers to data-driven computer generated design.

These changes would have major impacts on jobs in air traffic control where a safe service is heavily reliant on tactical controller interventions, and particularly at lower levels (below 6,000 ft), a highly skilled controller workforce. With the closeness of airports in the London and the South East, there are additional complexities of managing this airspace at individual airports. It's anticipated that the ATC role will change to such an extent that retraining will be needed to learn new airspace structures, toolsets and procedures, along with supervisory, engineering and support staff, other airport staff.[75]

Putting aside issues around the impact of digitalisation and automation on jobs, these initiatives highlight important infrastructure questions which should remain the preserve of governments. Just as we would argue a transmission or distribution network for energy is a natural monopoly, so too are navigation services. Data collection and ownership, should also remain within the preserve of governments under tight standards and rules of governance for their use. But such data, could inform the development of a publicly owned and controlled shared integrated transport platform to provide transport and mobility services as a public good.

6. Work in the Aviation Sector

The transport sector has been a significant employer in the UK, growing massively during the post war years particularly in relation to the automative sector. In aviation, the British aircraft industry expanded from 35,000 workers in 1935 to 250,000 by 1955.[76] As major transport hubs, airports also generate economic activity at the airport, in surface transport links – road and rail, retail and hospitality as well as local infrastructure to house and support airport workers.

Pre Covid-19 the aviation sector was estimated to support 65.5 million jobs globally – directly, indirectly, induced or catalysed employment such as in tourism enabled via aviation. This graphic shows how this breaks down across the categories:

65.5 million	
36.7 million	**Tourism catalytic**
7.8 million	**Induced**
10.8 million	**Indirect**
10.2 million	**Aviation direct**

Source: Aviation Benefits beyond Borders[77]

Of the direct employment, this includes:

- Airport operators (525,000)
- Other airport-based roles (5.6 million in retail, car rental, customs and immigration, freight forwarders and catering)
- Airlines (2.7 Million flight and cabin crews, executive, ground services, check-in, training maintenance staff)
- Civil aerospace (1.2 million engineers and designers of civil aircraft, engines and components)
- Air navigation service providers (233,000 air traffic controllers, executives)

Indirect employment includes goods and services to support the aviation industry such as fuel suppliers, construction companies, aircraft components, manufacture of goods sold at airports as well as business support e.g. call centres, IT and accountancy, legal services.

The other 7.8 million **induced** jobs are related to industry employees purchasing goods and services for themselves along with 36.7 million in tourism which are catalysed by aviation.

The impact of the Covid-19 pandemic has seen a wave of major job losses across the global value chain. Some corporations, such as British Airways, have clearly seized this as an opportunity to restructure their business which militant opposition from trade unions had successfully fought against in the past.[78]

The aviation sector is highly gender-segregated with enduring historical perceptions of gender related work.[79] According to the Aviation Job Search service[80], the workforce breaks down as around 69% male and 31% women. Men dominate in what may be deemed as more technical and skilled roles i.e. pilots, technicians, engineers whilst women are over-represented as cabin crew staff and slightly more in customer service roles which attract far lower salaries than most other roles within the industry. The industry also struggles on other diversity indicators such as race and disability although there is a lack of data collection on this.

Of course many employees at airports, work for other entities such as retailers, food outlets, or financial services. And in efforts to cut costs, outsourcing and other types of "atypical" working

practices are becoming more prevalent such as agency working, bogus self-employment and zero-hours contracting.[81] Initially driven by low-cost carriers, this model is increasingly being adopted across the sector to drive down labour costs.

As indicated earlier, this is indicative of a number of labour rights abuses across the industry, and why PCS has continuously argued that jobs tied to expansion, do not mean they would be 'good' jobs. Whilst not exclusive to the aviation sector, the 'race to the bottom' on jobs is prevalent to their business model which has an impact on the health, safety and welfare of workers which in turn impacts the travelling public.[82]

CAPA – Centre for Aviation which describes itself as one of the world's "most trusted sources of market intelligence for the aviation and travel industry" is clear about the need for this race.[83] The existence of unions with fragmented labour law across Europe is seen as a barrier for aviation Executives. On the other hand it's also seen as an opportunity to access low cost labour and flexible working exploited by airlines such as British Airways through practices such as multiplication of operational bases. [84]

It's encouraging that CAPA recognise the power of unions when noting that "even Ryanair was forced to recognise unions" which saw increases to their staff pay. However as they equally note, unions have grave concerns around the outsourcing business model of employing pilots and cabin crew on an agency basis, where they are only paid for hours worked, removing fixed labour costs and shifting bargaining power to management in industrial relations.

Without any irony, such organisations argue these business models create jobs that wouldn't be possible otherwise due to regulations around ownership and control, market access, safety, and employment regulations. This liberalisation of the market has weakened employee protection and union organisation as airlines register themselves in countries with the lowest trade union and labour law protections.

6.1 Future of work in aviation

In 2013, the International Labour Organisation produced a detailed report[85] looking at civil aviation and the changing world of work in the sector due to the introduction of new business models such as low cost carrier airlines and an industry that has been "ridden with crises since 2000". This included the 9/11 terrorist attack, SARs 2002–2003, financial crash 2008/09, volcanic ash from Iceland 2010. Now a decade on, the industry has been rocked once again, and to more devastating effect, by the Covid-19 pandemic.

Unlike previous crises, there is no possibility to 'bounce back' quickly, and certainly not as quickly as it did from past epidemics such as SARs (3-6 months). A briefing from IATA in June 2020[86], updated its forecast to say that the worst may yet be to come

just as Europe was looking at relaxing restrictions and opening up "air corridors" to help the tourist industry.[87] There is real concern about how the slowness of the industry to respond to the virus enabled it to become a "super spreader" of the virus equally putting workers in the industry at risk.[88] An important point when more pandemics are expected in the future.[89]

Climate change is not only exacerbated by aviation but in turn presents a risk to the industry and future of work. Whilst less focussed on, these risks can be categorised into five areas[90]:

- Precipitation changes – airfield flooding, reduction in airport throughput, impacts to surface transport and utilities e.g. loss of power
- Sea level rise – loss of airport capacity and impacts on en-route capacity due to lack of ground capacity, loss of ground transport access
- Temperature changes – changes in aircraft performance
- Wind changes – convective weather disruptions to operations and route extension; jet stream and potential for en-route turbulence; crosswinds and reduction in capacity
- Extreme events: disruptions to operations, ground transport access and utilities.

Whilst the sector is confident of rising to these challenges and building resilience into their operations, clearly managing aviation within global and national carbon budgets and mitigating the risk would be a better path to go down, rather than pushing for more growth.

Beyond external risks, the other risk to workers in the industry is in how technology is starting to impact the aviation sector by either directly displacing workers or changing their nature of their jobs. It's estimated that 25,00 jobs at airlines and 12,000 at airports and around 4,000 at aircraft manufacturers are likely to be displaced by digitalisation.[91]

There is also the impact of technology on monitoring of workers with wearable devices that can undertake so called non-intrusive real time performance monitoring. For example, the EasyJet advanced uniforms technology that can detect reduced human performance (due to fatigue, stress); develop better and more reliable human performance adaptive automation; improve skills and rate of learning based upon neuro assessment of learning processes in aviation.[92]

Prior to the Covid-19 pandemic, the industry was forecasting personnel needs based on growth forecasts. For example, the need for new pilots, air traffic controllers, maintenance technicians, and cabin crew. Clearly this vision of the world has greatly changed at least in the short term. Therefore PCS believe this is the time to restructure the industry to re-vision it in line with the need to address both climate change, poor labour standards and the need for a pro-public transport system.

The final sections therefore look at how we propose this should be taken forward.

7. The case for aviation public ownership as part of an integrated transport system

As PCS elaborated in its Alternative Vision for Transport 2019, the transport sector is a major part of the UK economy and of everyone's everyday life. The development in technological change associated with all forms of travel means a more integrated and less environmentally damaging set of policies can shape the future for the benefit of all.

In an uncertain world order, the case for more state ownership and control is compelling. Privatisation and outsourcing have been found wanting: deregulation has largely failed to produce desired outcomes; the philosophy of 'modern' public sector management has created more unaccountable and unrepresentative decisions.

As we have seen, the government clearly consider the aviation sector, or more the airways it occupies, part of the UKs transport infrastructure. Therefore any discussion about transport services, must include aviation. The infrastructure in the air is dependent on the infrastructure on the ground as in the airports and the service they provide, and surface transport connections, and should be considered an important national asset just as the roads, rivers and railway lines.

Covid-19 has displayed that the markets are incapable of responding to a national, and indeed global, level crisis. The collective coordination required shows it is fundamentally unequipped to respond to the crisis of climate change and the economic crisis that has been made significantly more acute by the pandemic.

Despite efforts to look like the 'restart and recovery' strategy will enable the aviation industry to 'bounce back' it's clear that even if wanted, this would be a slow process. It's also a time to reflect on how the sector can rapidly spread viruses when the Covid-19 Pandemic is said to be a sign of more to come in the future.

That is not to argue against aviation per se or indeed international travel. However clearly an industry so driven by profit and greed, cannot be left to take responsible decisions that may impact their bottom line profit margins. Public ownership is not the only answer but, as we argue for the power sector, only governments have the power and resources to coordinate a decarbonisation plan at the pace and scale required.

As we have seen throughout this report, Government remains integral to the funding of aviation. If the sector is to benefit from vast subsidies such as it enjoys from the VAT relief on aviation fuel, then that should be done in the name of the public, not private profits.

We also assert that natural monopolies such as air traffic

management should be in public ownership rather than creating artificial divisions between en-route and airports service for the sake of stimulating competition. Equally creating an artificial competition between airports doesn't make for the most efficient transport strategy. Even IATA warn against privatisation of airports[93] as best left in the hands of public ownership. Given in the UK there are still publicly owned airports, this would make sense to ensure that local transport strategies can align with a publicly owned rail and bus network along with other mobility options such as walking and cycling.

Money that has already been found to support aviation sector workers impacted by the Covid-19 pandemic, should indeed be continued and reinvested into a Just Transition for workers and communities. Now is not the time to discard their skills and knowledge. Only the government can underwrite such a programme that will require retraining and reskilling for a new zero carbon publicly owned integrated transport system as well as other sectors of the economy.

In WWII, the creation of shadow factories showed how workers and production lines could be urgently repurposed to align to national need. Something the TUC at their 1945 Congress sought to retain.[94] There is an urgent need now for something similar to create socially and ecologically beneficial jobs to address the climate crisis, the economic and social crisis, as well as regionally diverse economies.

Finally, the UK Government Transport Decarbonisation Plan (TDP)[95] includes all transport modes. PCS welcome that the UK government is considering aviation within these plans as part of a whole transport sector decarbonisation plan along with the interconnectedness of economic activities.

Certainly the government needs to go back to its seven aviation strategic themes outlined at the start and reconsider these as part of an integrated transport system based on responding to climate change, digitalisation and automation, the Covid crisis, and the creation of a pro-public aviation industry.

Now is the time to seize this opportunity to change our transport system.

8. A Just transition for aviation

The Covid-19 pandemic forced the aviation industry into a transition which is far from just. As noted above, the crisis has been used opportunistically by corporations to shed jobs that they likely would have attempted to make redundant anyway.

However these are jobs that could be repurposed to support a wider transport decarbonisation strategy. At the height of the pandemic, Airbus's plant in Broughton where jobs are being lost on the border of Wales was repurposed to produce ventilators.[96] Illustrating that indeed, governments' can invest in plant to

change their operations if needed for a wider collective plan.

It would be arrogant of PCS to suggest what alternative jobs workers across the aviation sector could do outside a process which collectively bring together workers and trade unions to discuss this. However, as with all sectors beyond some very specialist roles – in the case of pilots for example – there are some broad comments that can be made:

- Research and development. Long term goals for a sustainable and climate resilient aviation sector will require new aircraft and ground services designed in a collaboration, integrated with other transport forms.
- Maintenance, Repair and overhaul workers will be involved in retrofit of aircraft as well as recycling into alternative modes of transport to reduce the waste as part of a wider 'circular economy' for aviation and transport.
- Shared transport platforms to assist with travel should be run under public ownership and staffed for example by the skilled operators that have serviced the airlines industry. A public service that will help with scheduling and formed as part of an integrated transport network including active travel such as walking and cycling.
- Pilots – the need for flying will not go away as part of a smaller public service based operation, and existing pilots can retrain for new models and assist with training and support for younger people coming into the industry. However this may be to service offshore wind farms rather than taking the rich to offshore tax havens.
- Transport worker – as with energy, we envisage a new definition of transport worker defined by the integrated nature of their sector rather than by the mode of transport. With more collectivised forms of transport under public ownership more workers will be needed to run services safely and securely for passengers.
- Planners, designers and construction – an integrated transport system will need careful planning across the country to ensure interconnectivity, universality and accessibility. Our UK spatial mass has to date been largely driven by the aviation and automobile sector. This will need to be comprehensively revised and overhauled to enable not just more rail travel but also walking and cycling particularly in our dense urban areas, to ensure cleaner air and access to green spaces.
- Land use – reducing airport and road capacity will enable us to reclaim land back to productive food use, green space, and afforestation for carbon capture purposes. This will help in restoring our natural environment and building food sovereignty to negate flying both perishable products and unnecessary unseasonable goods around the world.
- Health and social care – aviation is a polluter in noise, particulates and mental health, which will leave a legacy for some years. More resources are required in both these areas and social care particularly should be seen as a skilled and valued job to transition into.

These are thoughts to provoke discussion. Through the development of an integrated transport system the specifics of

jobs will emerge including their interaction with other parts of the economy. For this there needs to be a clear process which as stated at the outset, has to involve workers and trade unions.

We are very clear that we cannot ignore the sense of pride and solidarity that workers develop around their sectors. However we also know that workers don't live outside the real world discussions and understanding of the threats posed to their sectors particularly in terms of contributing to climate change or environmental degradation.

Therefore whatever we do, we have to ensure a shift away from the language of high-skilled and low-skilled work that suggests one is of greater value than the other. If the Covid-19 pandemic should have taught us one thing, it is that the cleaners, security guards, shop workers and so on are as essential as the designers, planners and so on. We also have to consider how the transition will address issues of race, gender and disability so we are not recreating the same institutionalised structures that work against different groups.

And if all this sounds utopian, then every trade union should rip up their equalities and equal pay policies.

9. How do we make this happen?

So how do we get there. In the first phase we have to ensure that the current skills and knowledge in the industry is preserved. As the New Economics Foundation/Possible/TUC Report[97] set out, we need to coordinate a sector-wide package to support workers whilst they transition from crisis to new employment, which we argue should be part of an integrated transport system. This includes social protections of wages, pensions and other related terms and conditions. The job retention scheme used in the early months of the pandemic should be used as a model for a new transition fund for workers and communities, including to support a training and skills programme giving a job guarantee for all workers in the sector who want to continue working.[98]

The establishment of a Just Transition Commission will enable the aviation sector to develop a transition pathway as part of a pro-public aviation service integrated into a wider transport system.

Our key demands are:

1 Public ownership of the aviation sector as a matter of urgency, to protect jobs, the public and the planet.
2 No corporate bail-outs – government funds used to protect workers jobs and build the transport sector of the future.
3 A coordinated, integrated public transport system including aviation as a public service.
4 Clear decarbonisation plans to prioritise the climate emergency and provides the jobs necessary to achieve that aim as part of an economy wide Just Transition.

5 Utilise the skills and experience of workers across the transport sector to develop a plan for the future jobs in a fully integrated public transport sector.
6 Manage the demand for flying to curb the excesses of the wealthy minority including the implementation of a progressive tax scheme.
7 End the self-generated, greed-driven, expansion of aviation.

10. Conclusion

Cheap flights and the private car were seen to democratise transport, just as privatisation and the sale of national assets was sold to the public as part of a shareholding democracy. In reality we see that the majority of the aviation industry works in favour of the rich, and an increase in transport poverty across the country. Access to basic means of affordable and reliable transport services has a major impact for employment prospects and freedom of movement before even considering getting on a plane.

Whilst PCS believes everyone has a right to travel overseas, and for the working class to have a 'sunshine' holiday, we think it is now time to look back to our past to understand our future. The start point for that is seeing the link between transport modes that lower greenhouse gas emissions such as rail run on renewable energy, walking or cycling, a universal service that gives access at affordable prices, and linked to having time to travel. Clearly technology will advance to enable faster rail travel and real sustainable aviation but we must also look at social innovations that enable more time for travel such as additional holiday time or shorter working time.

Finally, the increasing informalisation of work and a-typical contracts means we need to link a new public integrated transport system to sector wider collective bargaining. A public service which workers are proud to work in and where the public and workers play a more democratically participatory role in its running.
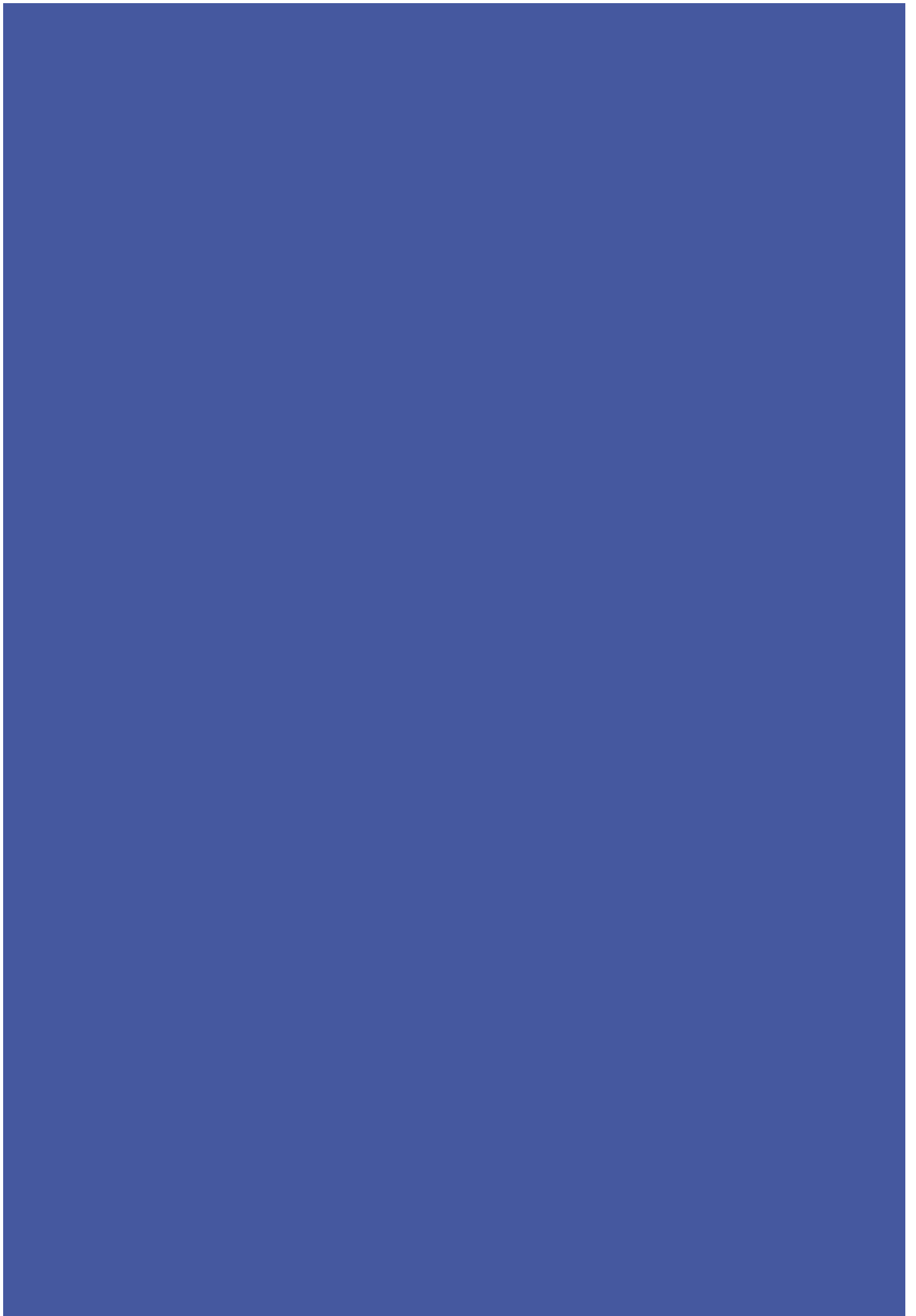
Only a managed aviation sector within our planetary boundaries will ensure we can have an integrated transport system that works for people, workers and the planet.

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Notes