

NAVIGATING THE COVID-19 CRISIS

Air Traffic Charging Models and
Financing of Air Navigation Service
Providers

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List of abbreviations

A4E	Airlines for Europe
ACC	Area control centre
ACI	Airports Council International
ADS-B	Automatic Dependent Surveillance-Broadcast
AEA	Association of European Airlines
AEI	Aircraft Engineers International
AIS	Aeronautical information services
ANS	Air navigation services
ANSPs	Air navigation service providers
ATFM	Air traffic flow management
ATM	Air traffic management
ATNS	Air Traffic and Navigation Services (South Africa)
ATCEUC	Air Traffic Controllers European Unions Coordination
ATCO	Air traffic control officer
ATSEP	Air traffic safety electronics personnel
BAA	British Airports Authority plc
BULATSA	Bulgarian Air Traffic Services Authority
CATCA	Canadian Air Traffic Control Association
CAAS	Civil Aviation Authority of Singapore
CAB	Civil Aviation Board (Thailand)
CANSO	Civil Air Navigation Services Organisation
CNS	Communication, navigation and surveillance services
COVID-19	Coronavirus disease (SARS-CoV-2 virus)
CTK	Capacity tonne kilometre
DFS	Deutsche Flugsicherung GmbH (Germany)
DHMI	Devlet Hava Meydanları İşletmesi Genel Müdürlüğü (Turkey)
EANS	Estonian Air Navigation Services
EBAA	European Business Aviation Association
ECA	European Cockpit Association
EHA	European Helicopter Association
ENAV	Ente Nazionale di Assistenza al Volo (Italy)
ERA	European Regions Airline Association
ETF	European Transport Workers' Federation
EurECCA	European Cabin Crew Association
EVA	Economic value added
FAA	Federal Aviation Administration (USA)
FY	Financial year
GATCO	Guild of Air Traffic Control Officers
HAL	Highlands & Islands Airports Ltd (Scotland)

IAA	Irish Aviation Authority
IAG	International Airlines Group
IAOPA	International Council of Aircraft Owner and Pilot Associations
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICAOPA	International Council of Aircraft Owner and Pilot Associations
IFAIMA	International Federation of Aeronautical Information Management Associations
IFATCA	International Federation of Air Traffic Controllers' Associations
IFATSEA	International Federation of Air Traffic Safety Electronics Associations
IFISA	International Flight Information Service Association
IFR	Instrument flight rules
ITF	International Transport Workers' Federation
LFV	Luftfatsverket (Sweden)
LVNL	Bij Luchtverkeersleiding Nederland
MCTOW	Maximum certified take-off weights
MET	Meteorological information for air navigation
MP	Member of parliament
MUAC	Maastricht Upper Area Control Centre
NATS	National Air Traffic Services (UK)
NOP	Network operations plan
NZALPA	New Zealand Air Line Pilots' Association
PANSA	Polish Air Navigation Services Agency
PPE	Personal protective equipment
PRC	Performance Review Commission (EUROCONTROL)
RPKs	Revenue passenger kilometres
SARS	Severe acute respiratory syndrome
SAR	Search and rescue services
SES	Single European Sky
SOE	State-owned enterprise
TATC	Trainee air traffic controller
TRS	Traffic Risk Sharing
UAV	Unmanned aerial vehicle
UNWTO	UN World Tourism Organization
USCA	Unión Sindical de Controladores Aéreos (Spain)
USD	United States dollar
WTO	World Trade Organization

Preface

During previous crises to hit the aviation industry, the focus was predominantly on airlines and airports as opposed to air navigation services (ANS). Indeed, our own research for the International Labour Organization (ILO) largely overlooked ANS following the events of 9/11 and included only limited information on ANS in our study of the impact of the global financial crisis.¹ On both occasions, national and international trade unions expressed concerns about not only the scale of job losses, which created subsequent recruitment and retention problems as the industry recovered, but also whether restructuring and the implementation of cost containment measures were the agreed outcome of social dialogue and collective bargaining or managerial fiat. The latter was found to retard the recovery of airlines as they subsequently experienced greater problems in terms of industrial relations and staff morale and commitment.

Prior to the outbreak of COVID-19, the social partners in air traffic management (ATM) in Europe were working together to promote social dialogue,² both as a vehicle to improve industrial relations and to facilitate the management of change, most notably in relation to the introduction of new (digital) technology.³ Our research associated with these initiatives was immediately grounded when the pandemic hit. Instead, we turned our attention to the impact of COVID-19, not only in terms of maintaining the safety of staff and services but also the financial impact of the pandemic and the sustainability of governance and operational arrangements. Air traffic controllers' trade unions and professional associations, at both the national and international levels, have long expressed concerns about the commercialisation of air navigation service providers (ANSPs) and the user pays system that funds investment in equipment and the training of staff. The COVID-19 pandemic exposed structural flaws in the commercialised provision of ANS in the most devastating way imaginable.

To their great credit, ANSPs and their workforce have kept the skies open throughout the pandemic, ensuring that essential medical, cargo and repatriation flights were still possible and always safe. Likewise, employees were kept safe at work through a wide range of measures typically agreed with staff representatives. Agreement has also been reached on a variety of cost containment measures, but ANS are not scalable in the same way as airlines who can park aircraft and lay off or furlough staff. ANSPs have high fixed costs and airspace must be controlled regardless of the number of flights. As Austro Control pointed out in its *Annual Report 2020*, 'It is not possible to simply put air traffic operations on hiatus: as it makes no difference whether there is one aircraft in the sky, or one hundred. The

¹ Turnbull P and Harvey G (2001) *The Impact of 11 September on the Civil Aviation Industry: Social and Labour Effects*. ILO Sectoral Working Paper No. 182, Geneva: International Labour Office, go to: https://www.ilo.org/public/libdoc/ilo/2002/102B09_516_engl.pdf; and Harvey G and Turnbull P (2009) *The Impact of the Financial Crisis on Labour in the Civil Aviation Industry*. Geneva: International Labour Organization, go to: http://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_161566.pdf

² The social partners (ATCEUC, CANSO and ETF) produced a *Toolbox for Successful Social Dialogue in Air Traffic Management*, go to: <http://www.atceuc.org/uploads/docs/brochure-atceuc-canso-etf-toolbox-march-2016.pdf> and the European Commission funded a project to promote the *Toolbox* via a series of training workshops, go to: <https://www.youtube.com/watch?v=l3spgGcd-sk>

³ Go to: <https://www.etf-europe.org/wp-content/uploads/2019/02/Change-Management-in-ATM.pdf>

personnel, infrastructure and processes have to be available at all times.⁴ It is the combination of high fixed costs and a catastrophic collapse in revenue caused by COVID-19 that has forced policymakers and many ANSPs to reflect on the resilience of ANS and to reappraise whether a commercial (user pays) charging system is still 'fit for purpose' to provide a safe, secure and sustainable service.

In order to establish the global impact of COVID-19 on ANSPs and the professional staff who keep our skies open and safe, we reviewed data published by a variety of international aviation organisations (e.g., CANSO, EUROCONTROL, ICAO, IATA), the annual reports of ANSPs, and a range of other secondary sources. These data provided the foundations for more in-depth research on the financial impact of the pandemic, the refinancing of ANSPs, and the sustainability of current models for charging and the designation of air navigation as a commercial service to users (private good) as opposed to a responsibility of the state and an essential element of every nation's transport infrastructure (public good). During the course of the research, we conducted more than fifty interviews with air traffic controllers, trade union officials, representatives of professional associations, ANSP managers, aviation authorities and airlines in more than twenty countries. We also attended several meetings of the Air Traffic Services Committee of the ITF and numerous (recorded) webinars organised by industry associations. We are grateful to all the organisations and individuals who shared with us their concerns about the impact of COVID-19 and their thoughts on the future of ANS.

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⁴ Go to: https://www.austrocontrol.at/jart/prj3/ac/data/publikationen/ACAnnualReport2020_final_web_2021-04-28_1504855.pdf

Summary

- COVID-19 is unlike any previous global crisis to befall the civil aviation industry, both in terms of depth (collapse of traffic) and duration.
- ANSPs implemented effective health and safety measures in response to the pandemic to protect employees' wellbeing. Nonetheless, the pandemic has taken its toll on the resilience of staff.
- COVID-19 has highlighted the importance of both personal resilience (especially that of front-line staff) and organisational resilience. The latter is not simply the sum of the former, but also depends on organisational policies and procedures, investment in new technologies, and secure funding.
- Air navigation service providers (ANSPs) have only survived the pandemic because of loans from the state and/or financial institutions, combined with significant changes to staffing levels, shift arrangements, recruitment and training, remuneration and other conditions of employment.
- There is clear evidence of different responses to the pandemic from ANSPs based on their model of financing and governance.
- Whilst some ANSPs have relied on constructive, co-operative, and continuous social dialogue others have imposed policies with detrimental effects on air traffic control officers (ATCOs) and support staff.
- Social dialogue is essential to (re)build social support and personal resilience within the organisation as well as the capacity to manage organisational change and future external disruption more effectively.
- The devastating impact of the pandemic on airlines, airports and ANSPs has raised fundamental questions about the sustainability of existing business models, in particular the 'user pays' approach to air navigation services.
- Traffic levels will eventually return to pre-pandemic levels, but when they do users will be expected to pay more at precisely the time when they can only afford to pay less.
- The scene is set for on-going conflicts of interest between service providers and users, with ever greater pressure on ANSPs to cut cost at precisely the time when they need to invest in both human and physical capital to enhance the future flexibility and scalability of air navigation services.
- The pandemic has demonstrated the public good nature of ANS and the minimum level of service and staffing that must be provided when only essential emergency, medical or cargo flights are permitted.
- The minimum (essential) level of service/staffing should be funded by the state. Beyond that, users might be charged directly for ANS, but policymakers need to reconsider who are the 'users' and how they pay for what is ultimately an invaluable but invisible service.

I. Introduction

'This pandemic has brought our industry to its knees. It is no longer sustainable to operate under the same parameters'.⁵

The civil aviation industry is more accustomed than most sectors to the ups and downs of the business cycle and the often-devastating impact of exogenous shocks to the economy. Over the years the industry has been hit by oil price hikes, wars, terrorist attacks, natural disasters, SARS and, just a decade ago, the global financial crisis. That said, all these events pale when compared to the unprecedented effects of COVID-19.

As worldwide scheduled passenger traffic plummeted by 60 per cent in 2020,⁶ air navigation service providers (ANSPs) suffered revenue losses of almost US\$13 billion.⁷ Revenue losses on this scale are clearly not sustainable, especially when operating costs cannot easily be cut back. While airlines parked aircraft⁸ and laid off staff, ANSPs kept the skies open for all aircraft permitted to fly, including military, emergency and repatriation flights, domestic travel, general cargo, and medical supplies. With the skies still open, there was far less scope for ANSPs to cut costs by closing sectors of airspace or laying-off staff.

In any event, cutting staff during the crisis is a false economy. When traffic eventually returns, ANSPs will need to invest considerable time and money to recruit, train and licence air traffic control officers (ATCOs) as well as air traffic safety electronics personnel (ATSEPs) and other professional front-line staff. Simply put, the parameters of air navigation services (ANS)⁹ are such that during periods of low demand, it is not practical or sensible to cut capacity to ensure financial viability.¹⁰

Financial viability is key in any assessment of the sustainability of ANS, especially for commercialised ANSPs.¹¹ That said, even if ANSPs are fully privatised, they continue

⁵ Kevin Shum, Director-General of the Civil Aviation Authority of Singapore, CAAS, and Chair of CANSO Asia-Pacific. Go to: https://airspace.canso.org/issue_49/working-towards-resilience-in-the-new-normal

⁶ Go to: https://www.icao.int/sustainability/Documents/COVID-19/ICAO_Coronavirus_Econ_Impact.pdf For 2021, passenger traffic was still down almost 50 per cent, based on preliminary estimates. Go to: https://www.icao.int/sustainability/Documents/Covid-19/ICAO_coronavirus_Econ_Impact.pdf

⁷ Go to: <https://data.icao.int/coVID-19/ansp.htm>

⁸ Go to: https://www.youtube.com/watch?v=xpls8Y9vgSs&ab_channel=CNBC

⁹ ANS include a range of functions, specifically: search and rescue (SAR); meteorological information for air navigation (MET); aeronautical information services (charts and flight procedures) (AIS); and air traffic management. The latter includes air traffic services, air traffic flow management, air space management, alerting services, flight information service, and air traffic control. ICAO (2016) *Procedures for Air Navigation Services: Air Traffic Management*, 16th edition. Go to: https://www.bazl.admin.ch/dam/bazl/it/dokumente/Fachleute/Flugplaetze/ICAO/icao_doc_4444_airtrafficmanagement.pdf

¹⁰ Dempsey-Brench Z and Volta N (2018) A cost-efficiency analysis of European air navigation service providers. Transport Research Part A, 111(May), p.13. In its Performance Review Report for 2020, EUROCONTROL's Performance Review Commission concluded that: 'Before any action is taken by ANSPs to reduce or cancel capacity and improvement plans, including staffing, the potential short-term cost reductions should be considered against potential future capacity problems and the resultant financial consequence this could cause to airspace users.' Go to: <https://www.eurocontrol.int/sites/default/files/2021-03/eurocontrol-draft-performance-review-report-prr-2020.pdf>

¹¹ The term 'commercialisation' embraces a wide range of organisational forms, including 'not-for-profit' and autonomous public-sector organisations.

to perform an important State function in accordance with Article 28 of the Chicago Convention on International Civil Aviation (1944). Specifically, the State is required to: 'provide, in its territory, airports, radio services, meteorological services and other air navigation facilities to facilitate international air navigation, in accordance with the standards and practices recommended or established from time to time, pursuant to this Convention.'¹² In providing these services, safety is a parameter that cannot be compromised – safety comes before cost-efficiency as the primary operational objective.

In contemplating the parameters that determine the provision of ANS and the performance of ANSPs, service providers around the world have acknowledged that the current situation is no longer sustainable. COVID-19 has exposed long-standing questions around political intervention as well as more contemporary concerns related to the financing of ANSPs. These and other concerns led international trade union federations and professional staff associations to call on policymakers and aviation stakeholders to:

'use the crisis to rethink the "old" system and to "repair" its structural weaknesses and distortions that the crisis revealed – which, if unaddressed, will hinder the recovery, weaken the aviation sector, and harm the public interest.'¹³

Aviation professionals are particularly concerned about:

- ➔ Environmental and social sustainability (e.g., public funding, bailouts and regulatory relief measures should be contingent on reducing CO2 emissions and help to preserve and promote employment);
- ➔ System integration and a better balance between the interests of different stakeholders (most notably between airlines, airports, ANSPs, regulators and trade unions/ professional associations, but also to involve environmental groups, manufacturers, and passengers);
- ➔ Skills and safety (e.g., potential loss of experience in the event of job losses and operational experience/recency as a result of a prolonged period of very low traffic); and
- ➔ The vulnerability of ANSPs' funding arrangements that only work in times of growing traffic (especially traffic risk sharing formulae that can usually accommodate pro-cyclical demand but not crisis levels of prolonged very low demand).

To address these concerns, Section II of this Report first sets out the scale of the COVID-19 crisis compared to previous crises that have beset the aviation industry and the typical pattern of (pro-cyclical) demand. As some ANSPs will be better placed than others to build back better, Section III considers the commercialisation of ANSPs, the different governance models currently in place, and whether, and to what extent, ownership or other factors influence the sustainability of ANS.

How ANSPs respond to the current crisis will determine their ability to recover. In particular, the measures taken today will influence how ANSPs are able to reform and reposition their services tomorrow. This is not simply in terms of ensuring that

¹² Go to: https://www.icao.int/publications/Documents/7300_orig.pdf

¹³ Go to: <https://www.ifatca.org/2020/09/covid-19-time-to-rethink/> The signatory organisations are: AEI, ATCEUC, EurECCA, ECA, IFAIMA, IFATCA, IFATSEA and IFISA. The ETF has issued a statement identical to and supportive of this statement. Go to: <https://www.etf-europe.org/wp-content/uploads/2020/09/COVID-19-statement-ETF-230920.pdf>

the necessary staffing is in place, but also whether ANSPs can pro-actively facilitate the recovery of air travel, tourism, and the wider economy. This will establish the foundations for ANSPs to not only rebuild but reimagine their service provision as new technologies (e.g., remote towers and space-based ADS-B) and new users (e.g., UAVs) transform the market. Section IV therefore reviews the initial response to the crisis while Section V examines the refinancing and (faltering) recovery of the aviation sector and ANSPs. Section VI reflects on the resilience of ANSPs and the longer-term prospects for sustainable provision of ANS.

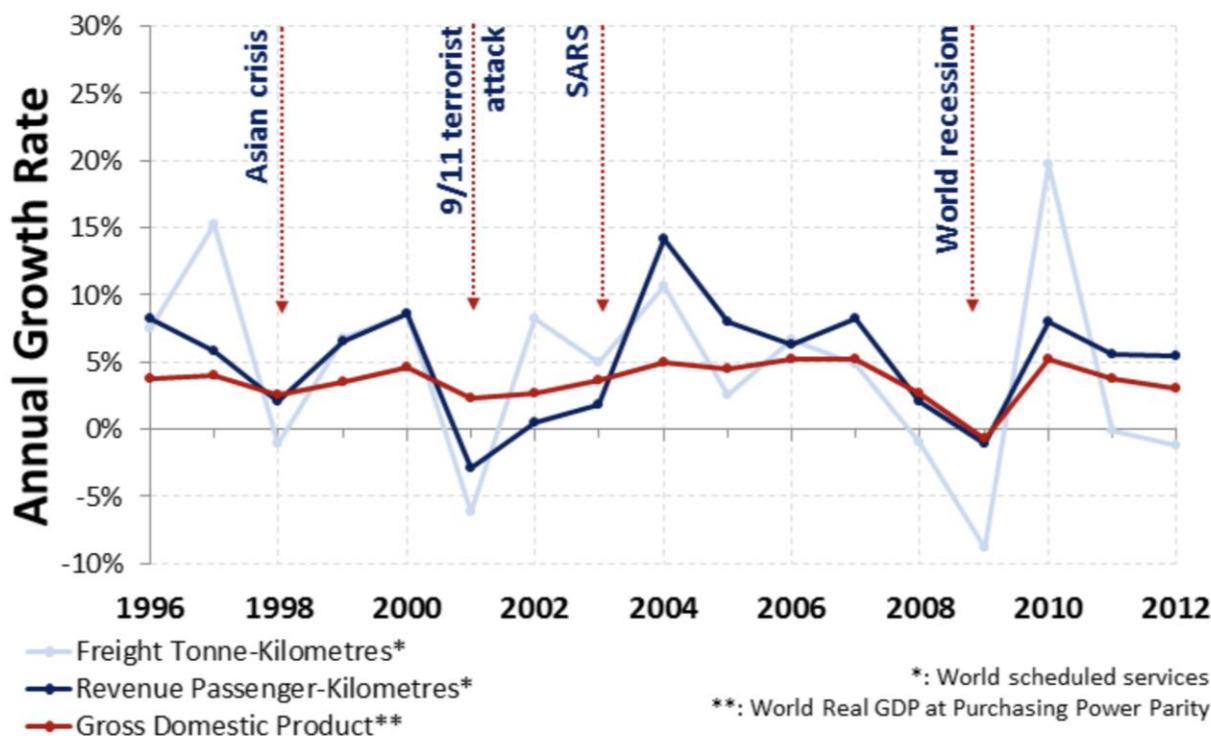
II. Turbulent times

Cycles and crises

*'You can't have a mid-life crisis in the airline industry because every day is a crisis.'*¹⁴

Demand for air transport is pro-cyclical and follows the ups and downs of the economy, albeit in a more exaggerated pattern, as depicted in Figure 1. In other words, air traffic generally expands (contracts) with increased (reduced) economic growth, but at a much faster rate. As a result, even normal economic conditions create a challenge for ANSPs in terms of investment decisions, capacity, pricing, and recruitment and training.

Figure 1. Pro-cyclical Demand for Air Transport¹⁵



ANSPs are routinely exposed to the financial risks of pro-cyclical demand. In Europe, for example, the difference between actual and expected traffic levels leads to more or less revenue for ANSPs, based on a Traffic Risk Sharing (TRS) mechanism.¹⁶ TRS takes into account the 'normally to be expected' traffic increase or decrease, such that deviations between actual and expected traffic levels of plus/minus 2 per cent are entirely borne by the ANSP while the risk is shared between ANSPs (30 per cent) and users (70 per cent) for any variation between 2 and 10 per cent. If traffic declines

¹⁴ Herb Kelleher, former CEO of Southwest Airlines.

¹⁵ Go to: https://www.icao.int/sustainability/pages/facts-figures_worlddeconomydata.aspx

¹⁶ Cost-related *en-route* and terminal 'Unit Rates' are calculated by Member States based on traffic forecasts.

by more than 10 per cent, the difference is fully borne by the airspace users.¹⁷ The calamitous effects of the latter scenario only came to light during the COVID-19 pandemic.

Similar financing and charging arrangements are found elsewhere around the world. For example, following privatisation in 1996, NAV CANADA established a rate stabilisation fund used to build up revenue when the aviation industry is healthy and to keep rates stable (by running down the fund) when the industry is ailing. New Zealand's Airways uses economic value added (EVA) (i.e., the difference between the net operating profit after taxes and the cost of capital) to self-regulate its pricing. A portion of any EVA above a certain level is returned to users in the form of a rebate. Pricing and financing mechanisms are therefore in place in different countries around the world to accommodate the normal (pro-cyclical) pattern of demand for ANS.

Black swans or grey swans?

*'Not every situation can be foreseen or anticipated. There isn't a checklist for everything.'*¹⁸

Civil aviation is highly susceptible to periodic crises such as terrorist attacks, regional conflicts, natural disasters, and pandemics. Figure 1 (above) identifies the impact of the Asian economic crisis, the terrorist attacks of 9/11, the SARS outbreak, and the global financial crisis. 9/11 caused a severe drop in traffic, especially for long-haul (inter-continental) flights to the United States, but it was clear that traffic would pick up once restrictions were lifted and passenger confidence regarding safety returned. Likewise, SARS impacted specific regions, routes, and carriers particularly hard, most notably in the Asia-Pacific, but traffic returned after 6 months. In fact, previous outbreaks of disease have rarely impacted traffic levels for more than 6 months, as Figure 2 clearly illustrates. The COVID-19 pandemic has already lasted longer than previous outbreaks of disease and the World Health Organization (WHO) has warned that it 'will not be the world's last health emergency.'¹⁹

Typically referred to as 'black swan' events, these periodic crises are not normally to be expected, but they occur all too often.²⁰ That being the case, given the frequency of exogenous shocks to the system perhaps it is time to reclassify these events as 'grey swans'? The latter term is used to describe a significant event whose possible occurrence *may be predicted beforehand* but whose probability is considered small. Even though the likelihood of grey swan events is small, they represent a significant risk with a potentially devastating impact. Thus, because there is even a slight

¹⁷ Article 27 § 3 of Commission Implementing Regulation (EU) 2019/317 of 11 February 2019 laying down a performance and charging scheme in the single European sky and repealing Implementing Regulations (EU) 390/2013 and (EU) 391/2013. The TRS is calculated at the end of each year and is recovered 2 years later through Unit Rate adjustments.

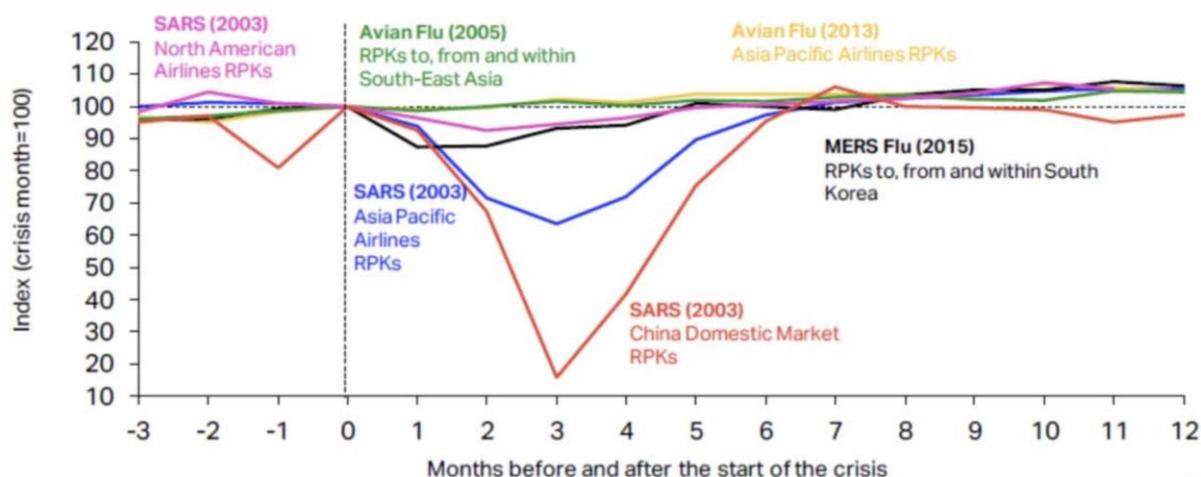
¹⁸ Captain Chesley 'Sully' Sullenberger (with Jeffrey Zaslow) (2009) *Highest Duty: My Search for What Really Matters*. William Morrow.

¹⁹ Go to: <https://www.who.int/news/item/01-10-2020-the-best-time-to-prevent-the-next-pandemic-is-now-countries-join-voices-for-better-emergency-preparedness> A global pandemic was predicted before the COVID-19 outbreak, and the next pandemic is already on the radar. Go to: <https://theconversation.com/the-next-once-a-century-pandemic-is-coming-sooner-than-you-think-but-covid-19-can-help-us-get-ready-139976>

²⁰ Black swan events are so-called precisely because they are beyond what is normally expected. In other words, they are unpredictable, although after the event (in hindsight) commentators often insist they were obvious.

chance the event will (re)occur it should be anticipated, with contingency plans in place (e.g. financial reserves for ANSPs).

Figure 2. Impact of Past Disease Outbreaks on Aviation



Short but never sweet

The short-term impact of other external events has been repeated in other regions of the world. The Icelandic (*Eyjafjallajökull* volcano) ash crisis of 2010, for example, severely impacted European air transport but the sharp reduction in traffic was followed by a rapid rebound to the previous growth trajectory. Short-haul (low-cost) airlines were hit especially hard by the volcanic ash crisis, but these airlines fared better in the face of other crises (e.g., 9/11), illustrating the differential impact of periodic crises on different airlines as well as different regions of the world.

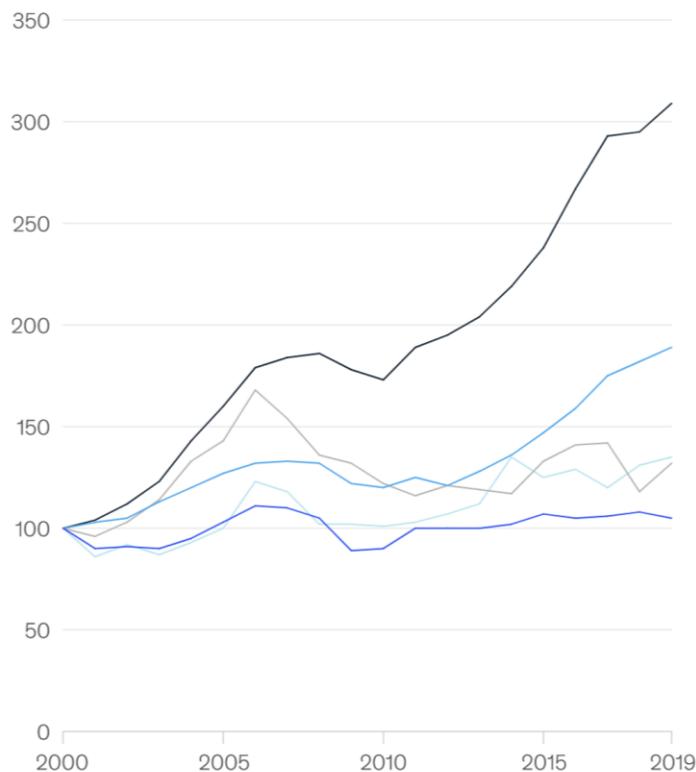
Even when a crisis impacts the entire world, as was the case in the wake the global financial crisis, some airlines still recovered faster than others, often depending on their target market(s) and/or passengers (e.g., holiday passengers and those visiting friends and relatives versus business passengers).²¹ The United States, for example, experienced a 13 per cent reduction in the number of international business trips after 2008, which took 5 years to recover, compared to a 7 per cent fall in leisure travel, which took only 2 years to recover.²² While the number of business travellers on international flights to and from the UK returned to their pre-crisis level in just 4 months after 9/11, they had still not returned to pre-crisis levels more than a decade after the global financial crisis, as illustrated in Figure 3. The decline in business travel has a disproportionate impact on network (legacy) airlines and their subsequent ability to pay for airport charges and ANS.

²¹ While 25-30 per cent of revenues for network (legacy) airlines such as Air France, IAG and Lufthansa come from business passengers, many low-cost airlines also target business class passengers with flexible (higher price) tickets. For example, almost 18 per cent of easyJet's 96 million passengers in 2019 flew on business and two-fifths of Southwest Airlines' passengers in America pay business fares.

²² *The Economist*, 11th February 2021.

Figure 3. Recovering from the Global Financial Crisis, UK (2000-2019)²³

International flights to/from the United Kingdom
by purpose, 2000 = 100%, %



Volume to reach
precrisis levels, years

	9/11	Global financial crisis (2008)
Visits to friends and relatives	0	3
Holiday	0	6
Study	4	6
Miscellaneous	0	Not recovered yet
Business	4	Not recovered yet

When viewed over a longer time period, as depicted in Figure 4, the pattern of pro-cyclical demand is barely visible and even wars, terrorist attacks, SARS and the global financial crisis do no more than flatten the growth curve for a comparatively short period as the industry continues along its upward trajectory. Extant traffic forecasts evidently remained valid after short-term crises (e.g., the volcanic ash crisis of 2010) and simply required recalibration after more significant and extended disruption (e.g., the global financial crisis). Thus, for ANSPs and indeed other service providers such as airports, sufficiently accurate forecasts were still available to determine operating costs and agree user charges. In contrast, COVID-19 ‘has led to a situation where traditional traffic forecasts are no longer valid.’²⁴ In Europe, for example, EUROCONTROL initiated a rolling Network Operations Plan (NOP) from October 2020 based on just 6-weeks traffic and capacity forecasts. Based on data from 130 airlines, the NOPs are updated on a weekly basis.²⁵ While these data enable

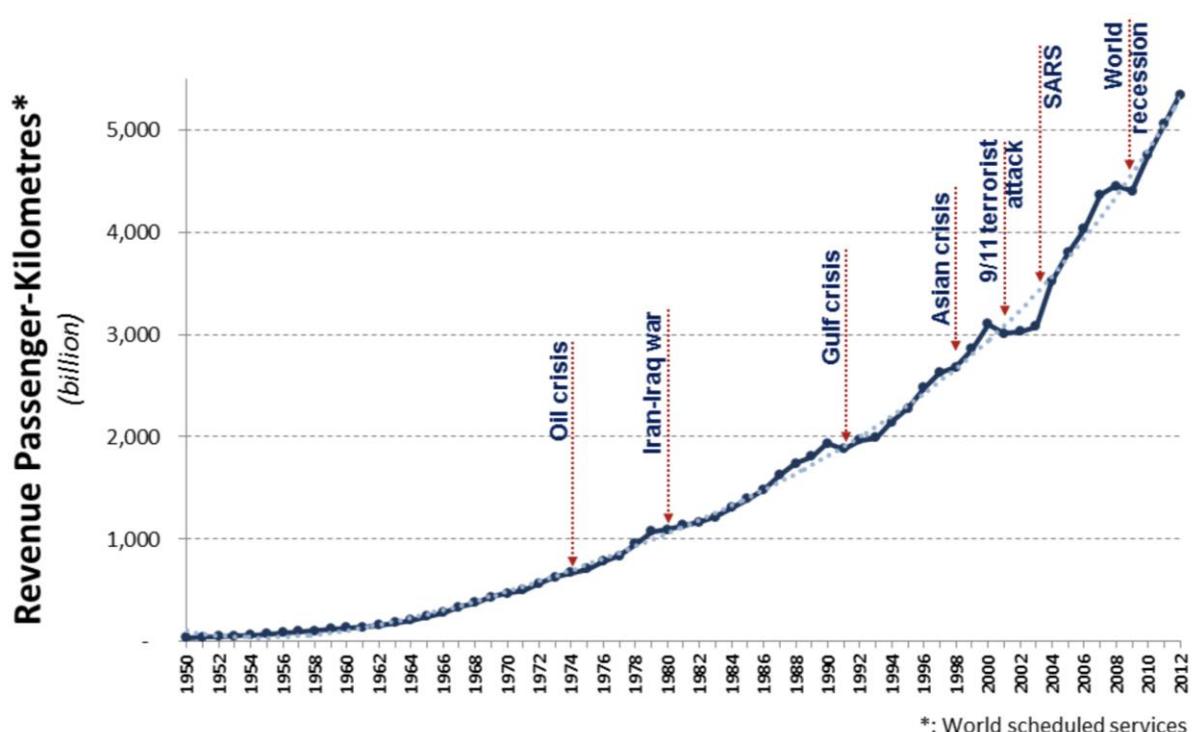
²³ Travepac, UK Office for National Statistics, 2000-19

²⁴ Go to: https://canso.fra1.digitaloceanspaces.com/uploads/2021/04/educated_guess.pdf, p.3.

²⁵ Forecasts are based on just 130 airlines as these carriers account for over 80 per cent of total traffic. The rolling 6-week forecasts were necessitated by a reduction in the average advanced booking period for flights falling from around 3-months (pre-pandemic) to just 2-3 weeks. Go to: <https://www.eurocontrol.int/sites/default/files/2021-12/canso-eurocontrol-grs-d2-bucuroiu.pdf>

ANSPs to plan shift patterns and immediate staffing levels, they leave many strategic (long-term) investment decisions on hold.

Figure 4. Long-term Growth of World Aviation, 1950-2012²⁶



The costs of a crisis

Charging airlines for the use of airspace is a comparatively recent development. In Europe, for example, *en-route* air traffic control was 'free-of-charge' for users prior to 1970 and full cost recovery came more than a decade later.²⁷ Today, commercialised ANSPs rely primarily on user fees to cover their costs. Consequently, 'an industry downturn presents a fundamental financial risk for such ANSPs that they must be prepared to mitigate, whether through a reserve fund, cost-cutting measures, user fee increases, additional borrowing, restructuring, or some combination of these or other options that will be sufficient to offset the decline in air traffic and the concomitant decline in revenue.'²⁸

Following the events of 9/11, many commentators made the rather obvious point that recently commercialised ANSPs were not structured to cope with the massive downturn caused by the terrorist attacks: 'Any form of economic regulation, including that pertaining to ownership, is *de facto* based on some actuarial assessment of market risk and events such as those of 2001 ... are simply outside of

²⁶ Go to: https://www.icao.int/sustainability/pages/facts-figures_world_economy_data.aspx

²⁷ Under a gradual cost recovery system, route charges initially represented 15 per cent of the cost from November 1971, 30 per cent from November 1973, 60 per cent from November 1975, and finally 100 per cent from October 1981.

²⁸ US Government Accountability Office, *op.cit.*, pp.24-5. The Accountability Office clearly adheres to the grey (rather than black) swan interpretation of exogenously induced crises.

these bounds.²⁹ In the case of NAV CANADA, for example, the company's rate stabilisation fund (over US\$66 million) was quickly depleted by the traffic slowdown after 9/11 and the subsequent effect of SARS in 2003, creating a cumulative deficit of almost US\$100 million.³⁰

NATS (UK) was especially vulnerable to the fallout from 9/11 as North American traffic accounted for 14 per cent of its flights and 44 per cent of its revenues. Faced with a 15 per cent decline in revenue, and to avoid insolvency, NATS secured short-term loan credit from its lending banks and then refinancing, bringing in a new equity partner and obtaining additional funds from government.³¹

During the global financial crisis, ANSPs around the world faced a 20 per cent reduction in revenues,³² prompting the Secretary-General of CANSO to declare that ANSPs faced 'an unprecedented financial crisis which may result in them not being able to meet their financial obligations.'³³ Whilst not wanting to gainsay the impact of past crises that have flattened the growth curve, this begs the question: what happens when traffic 'falls off a cliff'?

The COVID-19 cliff

World passenger traffic plummeted following the outbreak of COVID-19, as depicted in Figure 5. The global economy shrank by more than 3 per cent in 2020 (based on world GDP), more than enough to cause a severe decline in air transport, but the latter was compounded by the closure of international borders and strict quarantine procedures imposed by governments around the world.³⁴ As a result, airlines experienced their worst year on record in 2020:

- ➔ the number of passengers who flew in 2020 (1.8 billion) was down more than 60 per cent on 2019 (4.5 billion)³⁵
- ➔ industry-wide RPKs fell by two-thirds (year-on-year) with international RPKs down more than 75 per cent and domestic RPKs down almost 49 per cent

²⁹ Button K and McDougall G (2006) Institutional and structure changes in air navigation service-providing organizations. *Journal of Air Transport Management*, 12(5), p.251.

³⁰ The company was placed on credit watch while it responded to the crisis.

³¹ British Airports Authority (BAA) plc invested over US\$112 million, matched by an additional US\$112 million from the UK's Department of Transport.

³² Harvey G and Turnbull P (2009) *The Impact of the Financial Crisis on Labour in the Civil Aviation Industry*, Geneva: International Labour Organization, p.11. Go to: http://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_161566.pdf

³³ Alexander Ter Kuile, CANSO's Open Letter to Aircraft Operators, 27 March 2009. While insurance markets can, and do, cover the risks of many 'external events', actuarial calculations are virtually impossible for periodic crisis such as 9/11 or worldwide recession. As Button and McDougall (*op.cit.*, p.239) note, 'This tends to bring in government as a de facto guarantor for uncertain events.'

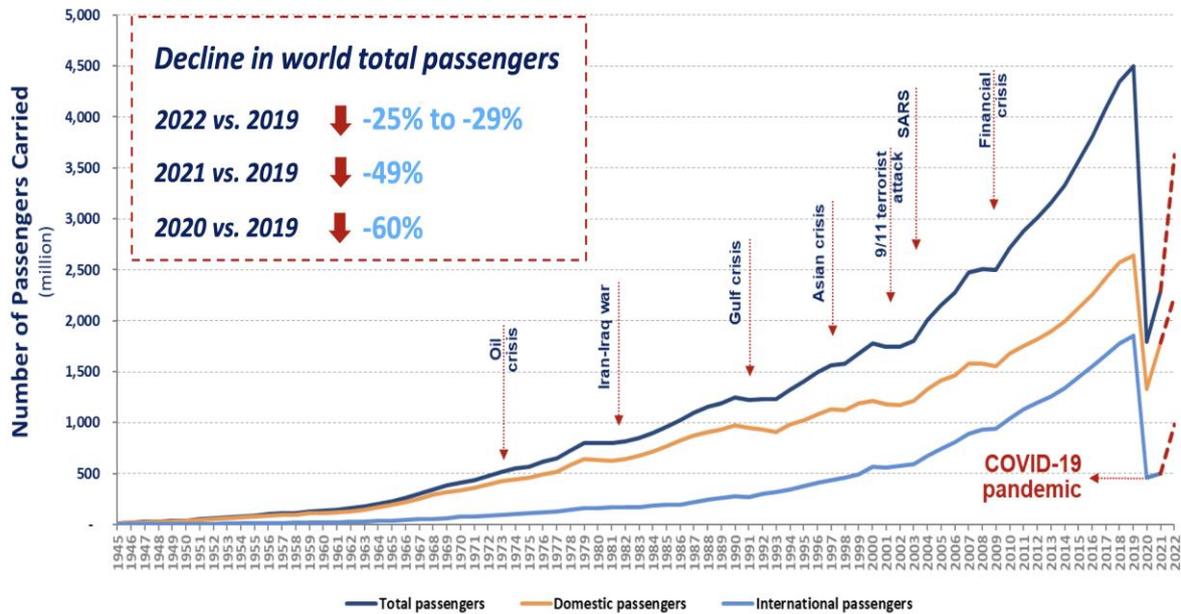
³⁴ Go to: <https://www.iata.org/contentassets/a686ff624550453e8bf0c9b3f7f0ab26/wats-2021-mediakit.pdf> p.4.

³⁵ Preliminary data for 2021 indicate a 49 per cent reduction in passenger traffic compared to 2019 with airlines losing approximately USD\$324 billion of gross passenger operating revenues. Go to: https://www.icao.int/sustainability/Documents/Covid-19/ICAO_coronavirus_Econ_Impact.pdf

- ➔ total industry passenger revenues fell by 69 per cent to US\$189 billion and net losses were more than US\$126 billion in total³⁶

According to Brian Pearce, former Chief Economist of IATA, the terrorist attacks of 9/11 and the global financial crisis were ‘nasty shocks’ but represented ‘small bumps in the road’ compared with COVID-19.³⁷ The immediate experience of a controller in the UK was not uncommon: “There are days on the afternoon shift when you can plug in for an hour and not talk to a plane.”³⁸

Figure 5. World Passenger Traffic and the Impact of COVID-19³⁹



The COVID-19 pandemic proved to be a truly global crisis. Figure 6 shows that aviation in all regions of the world was devastated.

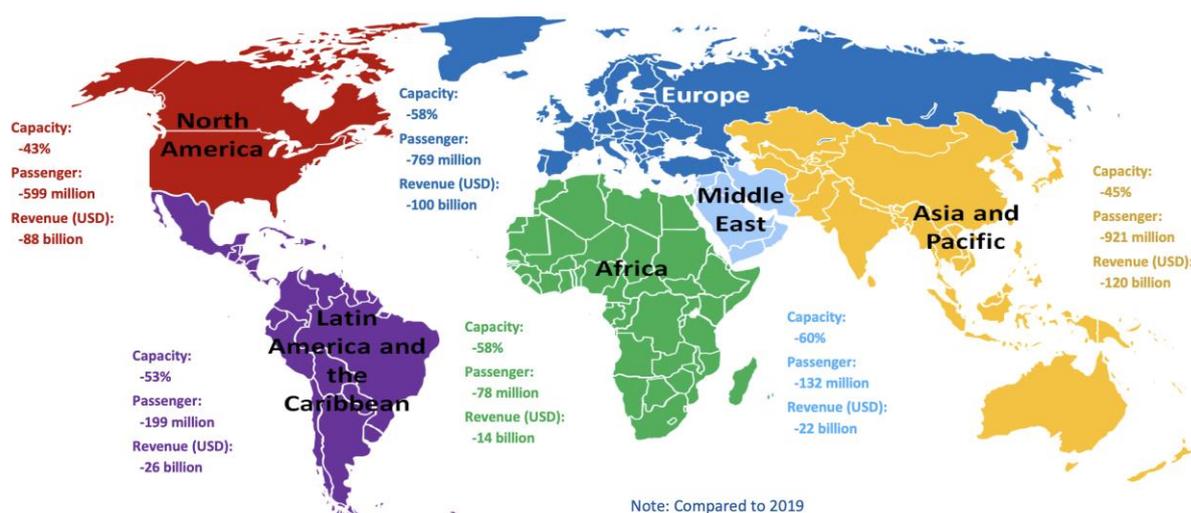
³⁶ Go to: <https://www.iata.org/en/pressroom/pr/2021-08-03-01/> IATA estimated losses in 2021 of more than US\$50 billion but expects losses of less than US\$20 billion in 2022. Airports Council International (ACI) estimated a loss of US\$125 billion in airport revenues in 2020 compared to ‘business as usual’ while the UN World Tourism Organization (UNWTO) calculated a decline in international tourism receipts of US\$1.3 trillion in 2020 compared to the US\$1.5 trillion generated in 2019. Go to: <https://www.icao.int/sustainability/Documents/COVID-19/ICAO%20COVID%202021%2008%2010%20Economic%20Impact%20TH%20Toru.pdf>

³⁷ Quoted in *The Economist*, 11th February 2021.

³⁸ Interview notes. All quotes from interviews conducted by the authors are signified by double inverted commas.

³⁹ Go to: https://www.icao.int/sustainability/Documents/Covid-19/ICAO_coronavirus_Econ_Impact.pdf

Figure 6. The Worldwide Impact of COVID-19 (2020 compared to 2019)⁴⁰



The collapse in traffic (Figures 5 and 6) was mirrored in the number of flights handled by ANSPs. In Europe, for example, between 2020 (1st quarter) and 2021 (1st quarter), *en-route* service units fell by almost 70 per cent in France, Spain, and the UK, and well over 60 per cent in Germany and Italy. The resulting navigation charge losses for ANSPs in 2020 exceeded US\$7,286 million in Europe. Elsewhere, the losses for ANSPs in 2020 exceeded:

- US\$3,364 million in Asia and Pacific
- US\$755 million in Latin America
- US\$570 million in Africa
- US\$506 million in the Middle East
- US\$448 million in North America

ANSPs experienced revenue losses of over 70 per cent in many countries, especially in the Asia-Pacific region (e.g., Cambodia, Hong Kong, Republic of Korea, Thailand, and Viet Nam) and only a handful reported navigation charge losses in 2020 of less than 50 per cent (e.g., Antigua and Barbuda, Dominica, Guadeloupe, Haiti and Togo). Worldwide, these losses add up to almost US\$13 billion, a reduction of more than 61 per cent compared to 2019.⁴¹ The loss of revenue suffered by ANSPs in 2020 clearly dwarfs the losses experienced after 9/11 and the global financial crisis.

Like ANSPs, airports suffered financially from the catastrophic collapse in passenger traffic caused by COVID-19. Aeronautical services (e.g., passenger-related charges from passengers and aircraft-related charges from aircraft operators) and non-aeronautical services (e.g., retail, food and beverages) typically account for around 95 per cent of airports' total revenue.⁴² Aeronautical revenues are a direct function

⁴⁰ Source: ICAO

⁴¹ Go to: <https://data.icao.int/coVID-19/ansp.htm> Accessed 18th August 2021.

⁴² The residual 5 per cent of income comes from non-operating sources that are not directly related to the volume of traffic handled by airports (e.g., subsidies, grants, asset divestments, or interest income on investments).

of traffic volume, resulting in a proportionate decline in revenue, but most non-aeronautical revenues are also generated by passengers, leading to an even steeper decline in commercial revenues.⁴³ Airports Council International (ACI) reported that the global airport industry experienced a reduction in revenue of almost US\$112 billion in 2020 compared to 'business as usual'.⁴⁴ To be sure, not all airports resembled a 'ghost town' during the pandemic – as the example of London Biggin Hill Airport (Box I) clearly demonstrates – but like airlines and ANSPs they face the same uncertain future.⁴⁵ Airlines, airports and ANSPs have a shared interest in a more resilient and sustainable aviation industry, but all too often their interests appear to collide rather than coincide.

Box I. London Biggin Hill Airport

While the COVID-19 crisis brought airports around the world to a virtual standstill,¹ London Biggin Hill Airport remained open throughout the pandemic. As soon as lockdowns were announced, the Airport launched a package of services to help operators maintain aircraft airworthiness and keep flight crew training current. The aim of this 'Return to the Skies' package was to ensure that flight operations could be ramped up quickly once travel restrictions were lifted. For a single landing fee, operators received six landings (all to be used on a single day), complimentary handling, free aircraft parking (for the first 2 hours), and access to crew support and the Airport's briefing room.²

'Contactless travel' soon followed, designed to reassure passengers of their safety and the Airport's commitment to customer service. Passengers arriving at the Airport can be airborne in just 15 minutes, with the option to be driven straight to the aircraft door without having to enter the Airport terminal. In-bound passengers can transfer directly to a helicopter and be in central London in just 6 minutes, with a complimentary door-to-door chauffeured car service to the client's final destination in the city.

With its very distinctive operating model, Biggin Hill is the fastest growing business aviation airport in the UK. All services are managed by the Airport, including air traffic control, such that aeronautical services generate around 90 per cent of the Airport's total revenue. Hence the importance of staying open and giving confidence to its passenger base. The Airport targets business travelers who fly when they want to fly, rather than when airlines schedule their flights. There will always be business passengers for whom time is the most important factor, and as the Airport's CEO pointed out: "There's a misnomer that Zoom and Teams can replace face-to-face business. Companies want to go out and do business, especially for acquisitions and mergers. They're not done by Zoom. They're not done by Teams. They're done by face-to-face meetings."³

Notes:

1. Go to: <https://aci.aero/news/2020/10/08/aci-world-airport-traffic-report-brings-home-how-far-airport-traffic-has-fallen>

⁴³ Every airport has a unique portfolio of non-aeronautical activities (e.g., an airport with a higher reliance on real estate income and rents has more of a cushion when passenger traffic declines). Most airports generate around two-thirds of their revenue from non-aeronautical services.

⁴⁴ Go to: https://aci.aero/wp-content/uploads/2020/12/Advisory_Bulletin_The_impact_of_COVID_19_on_the_airport_business.pdf

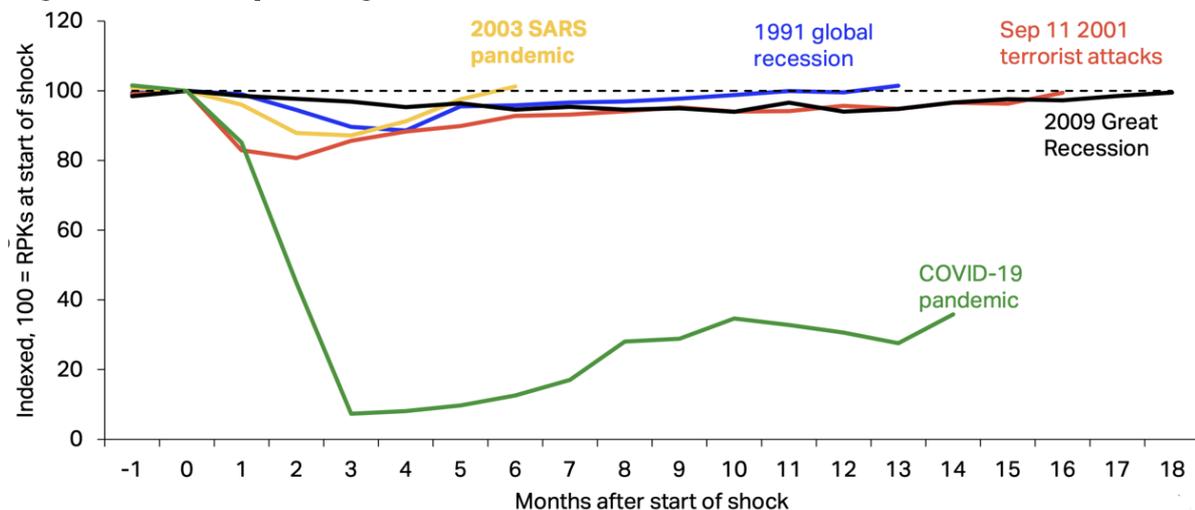
⁴⁵ Major international hubs such as London Heathrow and Dubai suffered very significant losses compared to airports with more domestic flights (e.g., Atlanta, USA).

2. 'Return to the Skies' was announced 2 April 2020 and was designed to run until 31 May 2020.
3. Interview notes. Analysts predict that around a quarter of business travel will not return post-COVID. The Economist, 11th February 2021. What is already evident, however, is the shift from business class to business jet travel. In the USA, business jet flight hours in 2021 exceeded the hours recorded in 2019.

Recovery on the horizon?

It is evident that the impact of COVID-19 is unlike anything that has gone before, not only in terms of breadth (worldwide) and depth (traffic collapse) but also duration (2 years and counting), mutation (new variants of the virus) and potential transformation of the entire aviation industry.⁴⁶ Figure 7 highlights both the depth and duration of the COVID-19 pandemic, which is characterised by a 'W-shaped' pattern of 'recovery' (down up, down up) as opposed to the more typical 'V-shaped' pattern that characterised previous crises. This W-shaped pattern is largely attributed to successive waves of COVID-19 infections in different countries around the world as new variants of the virus emerge and new lockdown and other restrictions are imposed.

Figure 7. Global passenger kilometres flown (RPKs)⁴⁷



CANSO has cautioned that 'a lack of medium-term forecasts is a significant hindrance to the financial and capacity planning required to enable ANSPs to successfully navigate the current crisis',⁴⁸ but the challenges facing the industry run much deeper than forecasting. Airlines will be expected to pay more for ANS at a time when they can least afford to. ANSPs are expected to reduce costs and enhance the efficiency, flexibility, scalability, and resilience of airspace capacity at a time when they have more limited funds for investment in human capital, hardware

⁴⁶ For example, for many routine business meetings, Zoom, Teams, Google hangouts, Skype and other video-conferencing services *will* replace face-to-face interaction, as well as staying in contact with family and friends. Add to this concern about the environmental impact of aviation and there is every expectation that even when traffic levels return to pre-pandemic levels the composition of traffic – who is flying where, for what purpose, and how often – will be very different.

⁴⁷ Source: IATA

⁴⁸ CANSO (2021) *Educated Guess: Interpreting Traffic Forecasting during the Pandemic*, p.3. Go to: https://canso.fra1.digitaloceanspaces.com/uploads/2021/04/educated_guess.pdf

and software. If nothing else, COVID-19 has demonstrated that while ANSPs operating under existing parameters might be *pro-cycle proof*, they are certainly not *pandemic proof*.⁴⁹ Many ANSPs will no doubt survive on a diet of government loans, refinancing from the private sector, the suspension of all non-safety critical investment, an increase in user charges and other short-term measures. But perhaps now is the time to address more fundamental concerns about the resilience and financial sustainability of ANSPs. COVID-19 might be the worst crisis to hit the aviation industry, but it is not the first and certainly will not be the last.⁵⁰

⁴⁹ In a statement of the obvious, EUROCONTROL's Performance Review Commission concluded that: 'the COVID-19 pandemic showed that the current ANS cost recovery schemes in Europe were not designed to cope with a crisis of this magnitude.' Go to: <https://www.eurocontrol.int/sites/default/files/2021-03/eurocontrol-draft-performance-review-report-prr-2020.pdf>

⁵⁰ A global pandemic was predicted before the COVID-19 outbreak, and the next pandemic is already on the radar. Go to: <https://theconversation.com/the-next-once-a-century-pandemic-is-coming-sooner-than-you-think-but-covid-19-can-help-us-get-ready-139976>

III. Commercialisation, competition and charges

Public or private goods?

ANS are the ultimate responsibility of the state for both legal and operational reasons. The former stems from the Chicago Convention (1944),⁵¹ the latter from the safety-critical nature of ANS and their public good characteristics. Whenever safety is paramount, due to high hazard⁵² and a consequent need for risk⁵³ to be minimised, 'societies generally turn to government to assure such performance, either as operators or as regulators.'⁵⁴ Likewise, the provision of public goods that benefit all citizens is typically the responsibility of the state. Public goods are both non-excludable (i.e., it is not possible to provide the good or service without it being possible for others to enjoy) and non-rivalrous (i.e., when the good or service is consumed this does not reduce its availability to others).

Street lighting is a standard example of a public good. However, unlike residents walking home at night, aircraft are guided through (often congested) airspace at a safe distance from other aircraft, ideally along the most direct route that will minimise fuel burn and thereby reduce environmental impact, flight time for passengers, and costs for the airline. Advocates of commercialisation have therefore proposed various pricing mechanisms to determine charges for the specific 'beneficial users' of ANS.⁵⁵ But exactly who are the users and how are charges calculated?

ANSPs are required to constantly improve safety standards, minimise costs, and expand or reduce capacity as demand dictates, as depicted in Figure 8. The safety of flying aircraft is a fundamental concern for citizens on the ground and not just passengers in the air. In the words of one ATCO, "ANSPs deliver for everyone, not just the airlines. If we prevent a mid-air collision, help to reduce CO₂ emissions, noise levels, that benefits everyone, not just the airlines."⁵⁶ That said, airlines and their passengers are most directly concerned with safety, costs, and capacity (e.g., lower costs will reduce ticket prices and flexible capacity ensures that aircraft depart and arrive on time). Consequently, advocates of the market mechanism argue it is not unreasonable to impose charges on these direct users.

⁵¹ Go to: https://www.icao.int/publications/Documents/7300_orig.pdf

⁵² Hazard refers to the characteristics of a production technology or service provision such that if the system fails the threat to life and/or the damage to property is considerable.

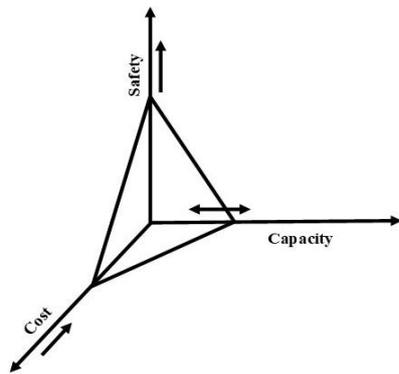
⁵³ In the engineering sense, risk is the product of the magnitude of harmful consequences and the probability of an event causing such consequences.

⁵⁴ LaPorte TR and Consolini PM (1991) Working in practice but not in theory: theoretical challenges of 'high-reliability organizations.' *Journal of Public Administration and Theory*, 1(1), p.21.

⁵⁵ See Button and McDougall, *op.cit.*, p.239.

⁵⁶ Interview notes. In the case of SAT Fluggesellschaft mbH v. EUROCONTROL (C-364/92), the European Court of Justice noted that, at the time, the European Commission considered air navigation control to be: 'a task involving the exercise of public authority *and is not of an economic nature*, since that activity constitutes a service in the public interest which is intended to protect both the users of air transport and the populations affected by aircraft flying over them' (emphasis added).

Figure 8. Performance Triangle of ANSPs⁵⁷



Note: arrows indicate the direction expected of an efficient system (i.e., improving safety, falling costs and flexible/scalable capacity)

User charges are typically determined under cost-plus (rate-of-return) regulation, a pure price cap, or some combination of the two. Under cost-plus pricing, the ANSP's charges are equal to total costs divided by traffic served plus a cost mark-up which allows the ANSP to make a small profit or surplus. Charges are determined *ex-post* and there is no reward for good performance. Under a pure price-cap, the regulator estimates ANSP costs *ex-ante* and determines the price-cap based on this assessment. Here the aim is to provide ANSPs with an incentive to reduce costs (e.g., cost-saving technology or collaboration between two or more ANSPs in order to realise economies of scale).⁵⁸

The sustainability of (commercialised) ANSPs is heavily reliant on the determination and regulation of user charges. ANS in Europe, for example, is almost entirely funded through route charges. Under simple cost-plus (rate-of-return) regulation there is only weak incentive to increase efficiency but strong incentive to over-invest, which can lead to sub-optimal capital-intensity.⁵⁹ Regulators therefore tend to favour a price cap, whereby the average service fee that can be charged is reduced on an annual basis. The downside, of course, is that this creates downward pressure on costs that might impact safety and capacity (as per the performance triangle depicted in Figure 8). In Europe, for example, the social partners in ATM⁶⁰ have recorded their concerns over the pressures created by performance targets in relation to safety, environment, capacity, and cost-efficiency.⁶¹ In particular, professional staff associations have drawn attention to the undue focus on cost to the detriment of the other key performance indicators.⁶² Cost-driven service delivery is a particular feature of market-based forms of governance.

⁵⁷ Papavramides TC and Aupée P (2004) Achieving sustainable performance in natural monopolies - the role of strategic planning in the European air navigation services. *International Engineering Management Conference*, 214-218.

⁵⁸ The desire to promote economies of scale helps to explain the logic behind the creation of functional airspace blocks (FABs) in the context of the Single European Sky (SES).

⁵⁹ When a company's profits to capital ratio is regulated at a certain percentage there is a strong incentive for the company to over-invest in order to increase profits overall. This outcome is commonly referred to as 'gold plating'.

⁶⁰ CANSO, ATCEUC and the ETF.

⁶¹ Go to: <https://www.etf-europe.org/wp-content/uploads/2019/02/Change-Management-in-ATM.pdf>, p.4. A Performance Review Commission (PRC) was established in 1997 to monitor and publicly report on the performance of European ANSPs. More than a decade later, a performance scheme was established for ANSPs with targets set by a Performance Review Body for designated Reference Periods (RP). During the first two Reference Periods (RP1: 2012-2014 and RP2: 2015-2019) none of the performance targets carried direct financial consequences for ANSPs besides cost effectiveness.

⁶² Go to: <http://www.etf-atm.org/WP/wp-content/uploads/2018/05/PSO-RP3-summary-position-paper-on-EC-RP3-proposals-website.pdf>

From government to governance

Paying for a service creates a more contractual (market-based) exchange between the parties. Contractual exchange is more efficient when there is competition in the market, but 'ANSPs are largely natural monopolies whereby economies of scale, scope, and density ... make competition untenable.'⁶³ Thus, commercialisation was not designed to create competition. It was rather driven by a desire to '*liberate* [ANSPs] from governmental budgetary controls', to '*free* the organisation from government funding and management constraints.'⁶⁴ In 1987, the New Zealand government created a state-owned enterprise paying dividends to the state. Australia and Canada then followed suit, the latter widely recognised as 'the real catalyst for change, and the focus of a demonstration effect.'⁶⁵ In 2001, NATS (UK) became the first 'for-profit' ANSP, operating under a public-private partnership.⁶⁶ Today, the majority of ANSPs around the world are classified as 'commercialised' service providers.⁶⁷

Transport economists have tried their utmost to demonstrate that commercialisation has improved the performance of ANSPs, with mixed if not contradictory results (see Annex I). It came as no surprise, therefore, when IATA claimed that: 'in many cases, commercialisation has resulted in significant increases in the ANS cost base and therefore charges. In addition, the promised increases in efficiency and productivity have not always materialized.'⁶⁸ In fact, research demonstrates that what matters is not government ownership *per se* but governance (see Annex I).⁶⁹

⁶³ Button and McDougall, *op. cit.*, p.237. For natural monopolies, the minimum efficient scale (i.e., the output level equal to the minimum long-term average cost) is far beyond the current market output level. Under these conditions, a single (monopoly) firm supplying the market will have lower production costs than a multitude of smaller (competitive) firms. Economies of scope arise from the unified provision of a range of air navigation services (ATM, CNS, MET, SAR and AIS). There is a clear consensus that *en-route* ANS is a natural monopoly and there can be no competition *in* the market (any attempt to do so would be politically impractical and practically impossible). For aerodrome services (airport approach and ground movements) there is much greater scope to create competition *for* the market (i.e., rival ANSPs can bid to offer services, typically for a fixed period, but once the contract is awarded there is a single operator). There is competition for terminal services in Germany, Spain, Sweden and the UK.

⁶⁴ Dempsey-Brench and Volta, *op.cit.*, pp.11 & 13. *Emphasis* is added to highlight the language used to describe the rationale for commercialisation. Similar language is used by the US Government Accountability Office in its 2005 review of *Air Traffic Control: Characteristics and Performance of Selected International Air Navigation Service Providers and Lessons Learned from their Commercialization*, p.5. Normative language is the 'stock in trade' of (political) policymakers, but readers should always be cognizant of the fact that all social science is *social*. Try as they might to ape the physical sciences, social scientists reveal their true colours in the language and assumptions used to construct their theoretical models and to describe their empirical results.

⁶⁵ Button K and Neiva R (2014a) European air navigation services industry regulatory reform and Averch-Johnson effects. *International Journal of Transport Economics*, 41(1), p.35.

⁶⁶ An important driver of the public-private initiative in the UK was the need to fund a major new investment programme. House of Commons Committee of Public Accounts (2002-03) *The Public Private Partnership for National Air Traffic Services Ltd*, London: HMSO.

⁶⁷ Commercialised ANSPs include those operating as an autonomous public-sector entity or a fully government owned entity that operates under private laws. The key factor is a change in management style (business-orientation) and focus (customer service and cost efficiency) *without* profit-maximising goals.

⁶⁸ IATA (2014) *Commercialisation of Air Navigation Service Providers*. Go to: <https://www.iata.org/contentassets/4eae6e82b7b948b58370eb6413bd8d88/commercialisation-ansps.pdf>

⁶⁹ This explains why IATA and international airline groups, despite their disappointment with commercialisation, still 'support the trend towards creating greater autonomy for ANSPs.' IATA (2014), *op.cit.*

Governance refers to any mode of coordination of integrated activities involving autonomous but interdependent organisations.⁷⁰ Just as direct (hierarchical) control by the state is widely regarded as ill-suited to the aviation sector’s need for system integration and a judicious balance between the interests of different stakeholders (e.g., airlines, airports, ANSPs, regulators, trade unions/professional associations, passengers, remote communities, etc.), so too is the ‘invisible hand’ of market competition. As an alternative to direct control and market competition, governance implies a more cooperative mode of coordination where state and non-state actors participate in a variety of public/private relationships.

At a minimum, there will always be state oversight of ANS, for example the enforcement of regulations and endorsement of user charges. Consequently, generic models of governance in the public sector have been used to classify ANSPs. The ‘ideal types’ summarised in Table 1 represent a means of ordering and comparing organisations and clustering them into categorical types. The different types are clearly not mutually exclusive.⁷¹ Rather, the purpose is to produce a parsimonious framework for describing complex organisational forms, which can then be used to assess the resilience of different ANSPs in the face of a global pandemic.

Table 1. Governance of Integrated Activities and Interdependent Organisations⁷²

Governance Type	Rationality	Form of Control	Primary Virtue	Service Delivery Focus
Procedural	law	rules	reliability	universal
Corporate	management	plans	goal-driven	targets
Market	competition	contracts	cost-driven	prices
Network	relationships	co-production	flexibility	brokerage

In brief, the procedural model described in Table 1 was the dominant form of public sector organisations until the early 1980s. In contrast to centralised and bureaucratic decision-making under the procedural model, the corporate model emphasises the decentralisation of decision-making and the introduction of managerialist private sector accounting and financial reporting.⁷³ The market model displays a preoccupation with performance and quantifiable targets while the network model

⁷⁰ The Commission on Global Governance defined governance as ‘the sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and cooperative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest.’

Commission on Global Governance (1995) *Our Global Neighborhood*. Oxford: Oxford University Press, pp.2-3.

⁷¹ For example, all ANSPs, to a greater or lesser extent, are subject to all the different ‘forms of control’ listed in Table 1.

⁷² Jones A and Guthrie J (2008) Protecting ‘public interest’ in modernised skies. Paper presented at the 5th International Conference on Accounting, Auditing & Management in Public Sector Reforms, Amsterdam, 3-5 September.

⁷³ This includes, for example, accrual accounting and budgetary control, performance audit and quality assurance.

relies on collaboration between officials and organised interest groups based on developing long-term co-operative relationships.⁷⁴

With no one-size-fits-all approach to commercialisation, it stands to reason that access to finance and price regulation (the determination of user charges) can differ widely between ANSPs. For example, some ANSPs have access to financial markets while others still rely on state funding. In many cases, the former is contingent on the latter. In addition, the government typically plays a role in price determination, usually through a state-mandated regulatory body that determines or at least approves charges to users.

After 9/11, it was clear that whatever the financial arrangements and user charges in place, the commercialization of ANSPs was ‘in no instance ... structured to cope with the massive downturn in demand ... providers’ reserves may well have been adequate to cope with normal commercial risk given the economic constraints placed on them, but not for what was, essentially, massive political uncertainty.’⁷⁵ As the COVID-19 pandemic has overshadowed all previous crises, the challenge goes beyond the implementation of emergency measures in response to the COVID-19 crisis (Section IV) and the refinancing of ANSPs in the face of unprecedented revenue losses (Section V). The real challenge is how to ensure more resilient, scalable and sustainable ANSPs (Section VI).

⁷⁴ Based on ICAO’s *Case Studies on Commercialization, Privatization and Economic Oversight of Airports and Air Navigation Services Providers*, it is not unreasonable to classify Brazil, Bolivia, Chile, China, Japan, India, Malaysia, Thailand, and Turkey as ‘procedural’ ANSPs. Others display a high level of state control but with a new corporate identity and expectations (e.g., Argentina and Peru). Others fall more squarely into the ‘corporate’ category (e.g., Australia, Jordan, New Zealand, and South Africa), while most European ANSPs included in this study (e.g., Belgium, Germany, the Netherlands, and the UK) are ‘corporatized’ but operate under the market pressures imposed by the Performance Review. Go to: https://www.icao.int/sustainability/pages/Eap_ER_Databases_CaseStudies_ANSPs.aspx

⁷⁵ Button and McDougall, *op. cit.*, p.251.

IV. Responding to COVID-19

*'ATM service providers and their staff have a special responsibility to ensure that they have well developed communication channels and seek to resolve problems before they escalate.'*⁷⁶

*"When COVID is over – well, probably it will never be over – but when we return to some normality, we are still the same people, and we should be working together. But they've destroyed the relationship."*⁷⁷

Constructive, co-operative, and continuous social dialogue between management and labour facilitates both smooth day-to-day operations and any on-going change management initiatives or major investment programmes. Bearing in mind that 'the workforce is part of the solution, not part of the problem',⁷⁸ especially during a crisis, what matters is not simply *what* changes are implemented in response to the pandemic, but *how*. In some countries, for example, the pandemic has proven to be an opportunity for management and unions to work more closely together (e.g., Jamaica), whereas in other countries (e.g., New Zealand) ATCOs reported deteriorating relationships. Contrast the experience of Australia, where the parties initiated more regular meetings and the internal resolution of problems instead of recourse to outside agencies such as the Fair Work Commission,⁷⁹ and the situation in Spain where the Unión Sindical de Controladores Aéreos (USCA) rejected the initial proposals from ENAIRE because they were not consulted on the company's 'Action Plan'.⁸⁰

As the world woke up to the deadly threat of COVID-19 and governments locked down their economies and closed international borders, the immediate response of ANSPs was to ensure that essential operational and management staff remained healthy by taking all necessary measures in line with global and national health directives and recommendations.⁸¹ A particular concern was protecting vulnerable staff in high risk groups such as older workers, pregnant women, and those with chronic respiratory diseases and hypertension. In Brazil and elsewhere, these high-risk workers were excused operational duties, typically with no reduction in pay or benefits.

In the early months of the pandemic, CANSO held more than seventy webinars to enable ANSPs to share 'best practice'. In CANSO's Asia Pacific region, for example, eleven ANSPs and thirty-eight airports came together on a regular basis via

⁷⁶ *Change Management in the ATM Industry: Principles and Process*, p.7. Go to: http://www.etf-atm.org/WP/wp-content/uploads/2018/11/brochure-change-management_final.pdf

⁷⁷ International trade union official discussing NAV Canada and NATS, interview notes.

⁷⁸ Toolbox for Successful Social Dialogue in Air Traffic Management, p.4. Go to: <https://canso.fra1.digitaloceanspaces.com/uploads/2020/03/brochure-atceuc-canso-etf-toolbox-march-2016.pdf>

⁷⁹ The Fair Work Commission, until 2013 known as Fair Work Australia, is the Australian industrial relations tribunal created by the Fair Work Act 2009.

⁸⁰ The union claimed that the Action Plan was incompatible with some aspects of ENAIRE's operational procedures. A working group was hastily set up within the company's Health & Safety Committee, but USCA continued to raise concerns about the most vulnerable staff, changes to legally mandated shift and break times, and overcrowding in some of the operation rooms, especially when training and unit evaluations took place.

⁸¹ CANSO (2020) *COVID-19: Ensuring Continuity of ATS Service Globally*, p.2. Go to: https://canso.fra1.digitaloceanspaces.com/uploads/2021/04/covid-19_ensuring_continuity_of_ats_service_globally.pdf

webinars to share daily air traffic flow management (ATFM) plans to help build a regional outlook on the impact of the pandemic, to ensure operational continuity, and to share COVID-19 related initiatives designed to mitigate the spread of the virus at ATM facilities. EUROCONTROL played a similar role in Europe.

Workplace cleanliness was an immediate priority for every ANSP as ATCOs work on jointly used, high-touch equipment. New cleaning protocols became routine and were relatively inexpensive to implement (e.g., regular use of hand sanitizer and periodic deep cleaning of facilities, especially during very low traffic at night or early morning). Whereas some controllers in Europe were willing to give their management “10-out-of-10” with respect to workplace health and safety measures – “they were absolutely brilliant”⁸² – in Africa controllers at more than one ANSP reported that insufficient funds were made available for basic essentials such as hand sanitizer, face masks, and rapid COVID-19 tests.⁸³ In order to minimise touch, ANSPs such as AirNav Indonesia introduced dedicated (personalised) use of specific equipment (e.g., headsets) and scan cards to trigger automatic (hands-free) access to different facilities. Many ANSPs also introduced mandatory wearing of face masks, but as CANSO acknowledged this proved to be problematic in area control centres (ACCs) and towers where clear communication is vital.⁸⁴

Social distancing measures were universally implemented but again proved to be more challenging in ACCs and aerodrome towers, given the close proximity of staff.⁸⁵ Many ANSPs fitted Plexiglas dividers between operational sectors, wherever possible, and some were able to close sectors in order to maintain social distancing. As traffic levels plummeted, it was possible to reduce the volume of ‘human traffic’ in facilities, albeit not in direct proportion and certainly not for all controllers at all times of day.⁸⁶ As a controller working for EUROCONTROL (MUAC) explained:

“If our traffic drops by 50 per cent, that doesn’t mean we’re half as busy. What it means is that at certain times of day, on certain days of the week, we’re operating with peaks of around 60 to 70 per cent of what we had in 2019. That’s overall, remember. There might be some sectors, at particular times, when the controllers are handling more than 70 or 80 per cent of the peak traffic.”⁸⁷

Other measures to ensure social distancing included the ability to work from home (for non-operational staff), a ban on all external visitors, the introduction of one-way systems around the facilities, and the closure or limited access to areas where staff often congregate (e.g., break rooms, canteens, water stations, etc.).

A widely adopted measure to minimise contact between staff was the introduction of ‘standby-shifts’, with ATCOs and other staff assigned to teams or ‘bubbles’ who always worked together on a specific shift. ATCOs on standby could be called in to replace an entire team at very short notice. This system, illustrated in Figure 9, did

⁸² Interview notes.

⁸³ Funds were sought from both the respective national governments and international agencies. At one of these ANSPs, on several occasions during the pandemic, even maintaining the power supply for equipment was under threat due to lack of funds. Elsewhere, ANSPs provided personal protective equipment (PPE) for all staff, but encountered problems with the supply of this equipment (e.g., new Zealand’s Airways).

⁸⁴ CANSO (2020) *COVID-19: ANS Restart and Recovery Guide*, p.4. Go to: https://canso.fra1.digitaloceanspaces.com/uploads/2021/04/covid-19_ans_restart_and_recovery_guide.pdf

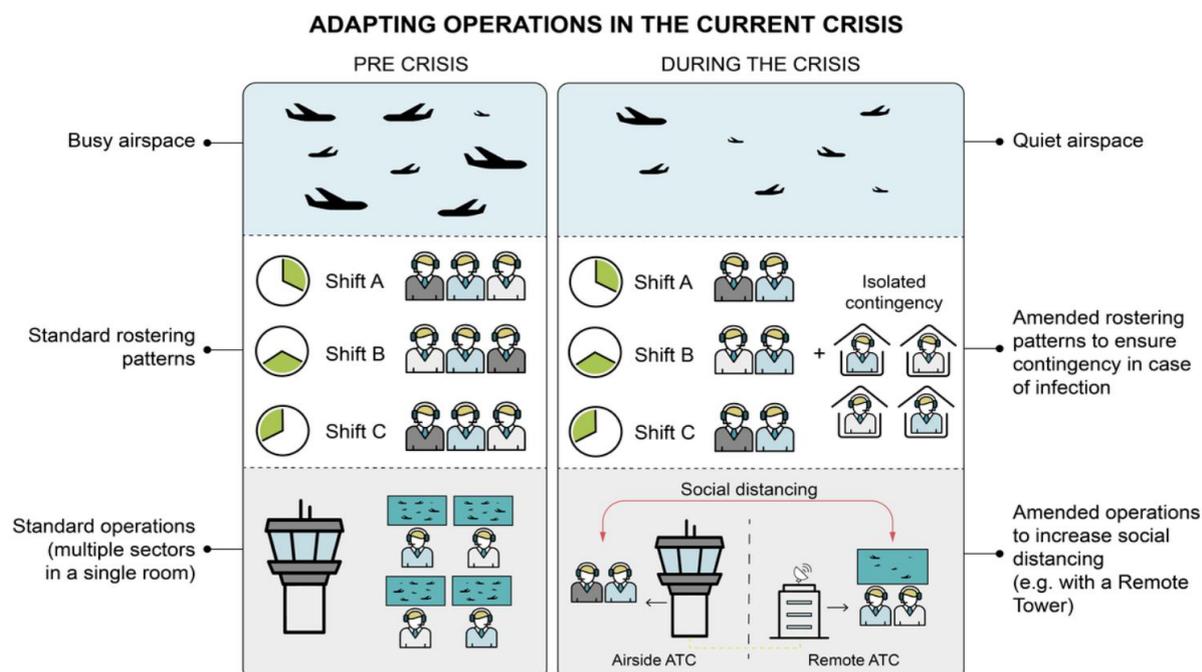
⁸⁵ Many ANSPs introduced regular measurement of CO₂ as traffic control facilities (especially towers) can be difficult to keep well ventilated.

⁸⁶ Several ANSPs reported that even with only 30 per cent of normal traffic, they still needed at least 50 per cent staffing to keep the skies open and safe at all times.

⁸⁷ Interview notes.

not completely prevent the loss of air navigation service hours due to the changeover of shift teams and the cleaning of facilities when cases of COVID-19 were reported. In the United States, for example, the FAA reported over 680 instances of ‘ATC Zero’ at various facilities in 2020 when ATC services were unavailable.⁸⁸

Figure 9. Staffing Levels and Standby Teams⁸⁹



In Italy, ENAV quickly introduced a three-team system, with one team working, a second team on paid leave, and the third on standby. If any member of the working team tested positive for COVID-19, the entire shift was replaced by the standby team. This system operated in the early months of the pandemic, with a return to normal working during the summer months of 2020 as lockdown restrictions eased and holiday traffic picked up. Although traffic was still only 40 per cent of the previous summer, the return to a regular roster was made possible by ATCOs taking unused vacation days.⁹⁰

Likewise, within just one week of a national lockdown, Airservices Australia introduced a flexible ‘resilience roster’.⁹¹ Four teams (watches) were deployed over morning, afternoon, and night shifts, with a reserve team on standby at all times in

⁸⁸ These instances accounted for the loss of over 4,000 ATC hours. Contrariwise, the FAA estimated that more than 700 ‘ATC Zero’ instances were avoided with new cleaning protocols. Go to: <https://www.eurocontrol.int/event/canso-eurocontrol-global-resilience-summit-2021>

⁸⁹ Go to: <https://www.egis-aviation.com/insight/covid-19-and-aviation-a-step-change-towards-scalability-and-resilience/>

⁹⁰ Some employees had up to 60 days unused vacation days, accumulated in previous years when ATCOs were unable to take vacation days, especially during the busy summer months.

⁹¹ Over 2,000 operational staff were placed on the resilience roster, with a further 1,000 non-operational staff working from home.

case a team had to be replaced. A similar pattern was repeated elsewhere, with most ANSPs introducing longer shifts (in a few cases as long as 24 hours) with fewer working days in order to keep whole teams (shifts) separate.⁹² In South Africa, in contrast, Air Traffic and Navigation Services (ATNS) reduced some shifts from 8 hours (with breaks) to 5 hours (continuous working).⁹³ In Scotland, ATCOs often worked extended shifts at small aerodromes because of delays caused by poor weather conditions. During the pandemic, Highlands and Islands Airports Limited (HIAL) introduced a standby policy whereby controllers were sent home (on full pay) if there was no traffic but could be recalled within 30 minutes to resume their shift.

As traffic levels were at record levels in 2019 prior to the pandemic, with many ANSPs under-staffed at the time, much of the initial reduction in traffic was accommodated with a reduction in overtime and controllers taking their full holiday entitlement.⁹⁴ In Ireland, for example, total overtime hours worked by ATCOs had increased by over 58 per cent between 2014 and 2018 (from 12,973 hours to 20,524 hours) and total annual leave carry over days increased from 857 days to 1,236 days over the same period.⁹⁵ Likewise, prior to the COVID crisis, controllers working for Austro Control (Austria) were typically working 3-6 extra days per month. As one of the company's ATCOs remarked somewhat wryly, "We had to wait for a pandemic to get to a normal roster!"⁹⁶

In several countries, trade unions and professional associations negotiated new shift patterns and other measures designed to accommodate the collapse in traffic volumes and reduce costs. At EUROCONTROL (MUAC), for example, if a controller was not required to work a paid shift (i.e., rostered for work and not on a regular day off or paid holiday), then half the total number of these shifts not worked by the end of 2020 will be 'worked back' for no pay by the end of 2024. In France, Direction des Services de la Navigation Aérienne (DSNA) introduced a system of working whereby shifts are averaged at one day in two over the year, with more working days in summer (e.g., 4 days working, 2 days off) compared to winter (e.g., 2 days working, 4 days off). In several cases, however, changes to shift patterns and staffing levels were imposed rather than negotiated, with detrimental effects for ATCOs in general and trade union representatives in particular. The experience of Polish controllers and other staff, briefly reported in Box II, is a case in point. At all times, but especially in a crisis, social dialogue should be an *obligation*, not an option, for ANSPs.

Box II. PANSA

"The aeroplane is not a computer game, you cannot press pause"

One of the immediate responses to the pandemic by the Polish Air Navigation Services Agency (PANSA) was to extend the system of single person working at what would normally be the busier aerodrome towers in major cities such as

⁹² Go to: <https://www.ifatca.org/covid-19-survey/>

⁹³ Many staff expressed a preference for the shorter shifts.

⁹⁴ Given rates of pay for overtime (e.g., 1.9 times the hourly rate of pay in Airservices Australia), the reduction in overtime represented a significant cost saving for ANSPs.

⁹⁵ IAA (2019) ANSP Business Plan 2020-2024, p.92. Go to: https://www.iaa.ie/docs/default-source/misc/non-confidential-rp3-iaa-ansp-business-plan.pdf?sfvrsn=f42a00f3_2

⁹⁶ Interview notes.

Warsaw. Several trade unions recognised by PANSAs, including ZZKRL, one of the controllers' unions,¹ raised concerns about the impact on safety, specifically a lack of proper safety analysis, procedures and training. In October 2020, for example, at the Lawica airport in Poznan during a busy afternoon period with commercial and military flights, the one controller on duty had to call on assistance from a colleague who fortunately was on shift elsewhere in the building. If the incident had happened later there would have been no one to call on as office hours end at 16.00. A controller who was later dismissed by PANSAs observed that: 'She was lucky. The question is how long should serendipity be an important element of ensuring safety in the Polish skies?'¹

Dismissal is covered by the Polish Labour Code, which protects the rights of recognised trade unions and the terms and conditions of any collective agreements. By (unlawfully) derecognising the union, PANSAs was able to dismiss without notice two controllers who spoke out publicly about their concerns over safety.² Both controllers are active members of ZZKRL's Executive Board. The dismissals were the culmination of a long-running dispute between the management of PANSAs and a united representation of the recognised trade unions in the company.³ Although employees were willing to limit their salaries to save costs during the pandemic, negotiations broke down when PANSAs resorted to unilateral action. Dismissing active union board members is not only a breach of Polish domestic law, but also stands in contradiction with Directive (EU) 2019/1937 on the protection of persons who report breaches of Union law.⁴ One of the many negative consequences of these actions is around 300 lawsuits filed against PANSAs by its employees in Polish labour courts.

The atmosphere inside PANSAs has been described by one controller as 'toxic', because 'people are afraid to even speak ... know[ing] that every word or even look can be used as an excuse for firing.'⁵ In its COVID-19 *Restart and Recovery Guide*, CANSO highlights the differential impact of the pandemic on employee wellbeing, including stress arising from 'personal situations ... or stress related to an uncertain future.'⁶ For controllers at PANSAs, uncertainty about the future is not only a result of the pandemic, but also 'los[ing] their protection and hav[ing] to take into account the possibility of dismissal.' As an experienced PANSAs controller lamented: 'It's impossible to work normally. I hardly sleep at night. The stress is extraordinary.'⁷ In its survey of member associations in 84 countries, IFATCA found that in at least a third of workplaces, changes introduced as a result of the pandemic had not been validated via a Safety Management System.⁸

Notes:

1. Go to: <https://newsbeezer.com/polandeng/polish-air-navigation-services-agency-disciplinary-dismissal-of-inspectors-who-raised-the-alarm-about-the-threat/>

2. Go to: <https://tvn24.pl/premium/gdansk-kontroler-zasnal-gdy-samolot-podchodzil-do-ladowania-pracowal-w-trybie-jednoosobowym-5045459>

3. PANSAs recognises more than a dozen trade unions.

4. This Directive is widely referred to as the 'whistle-blower protection Directive'.

5. Go to: <https://polishnews.co.uk/polish-air-navigation-services-agency-flight-controller-discharged-by-disciplinary-action-one-of-the-reasons-for-mobbing-the-boss/>

6. CANSO (2020) COVID-19: ANS Restart and Recovery Guide, p.5. Go to: https://canso.fra1.digitaloceanspaces.com/uploads/2021/04/covid-19_ans_restart_and_recovery_guide.pdf

7. Go to: <https://polishnews.co.uk/polish-air-navigation-services-agency-flight-controller-discharged-by-disciplinary-action-one-of-the-reasons-for-mobbing-the-boss/>

8. Go to: <https://www.ifatca.org/covid-19-survey/>

Around the world, pay negotiations were invariably suspended in 2020 (pay freeze) and ACTOs everywhere reported a reduction in take-home pay as overtime was no longer required and bonuses for meeting performance targets were now redundant. In addition, real pay has been eroded in many countries as a result of price inflation. All told, around one-in-seven ANSPs around the world cut pay.⁹⁷ However, not all trade unions were willing to make concessions on staff costs. When ENAV paid over EUR€110 million to shareholders in May 2020, “This was unbelievable for controllers. All the aviation industry was stopped, and they gave all this money to shareholders! That is why we didn’t accept any, *any* cut related to staff costs.”⁹⁸

As the pandemic continued to starve ANSPs of revenue, further cuts to pay and benefits were implemented and many ATCOs reported that they anticipated more cuts in the future.⁹⁹ In some countries, such as Albania, these cuts were substantial, adding to the stress caused by the threat of COVID-19 to the health and wellbeing of ANSP staff, their families, and friends. It may seem counter-intuitive that stress at work might be heightened during periods of very low demand, but monotony can reduce one’s adaptability and responsiveness, boredom (a lack of stimulation) can leave controllers craving relief, and reduced vigilance can result in controllers missing things, which undermines confidence and their sense of professional competency.¹⁰⁰ If this poses a threat to safety, controllers are expected to declare ‘provisional inability’.¹⁰¹ Equally important, ANSPs are expected to respect the controllers’ declaration. When politics rides roughshod over professionalism, as was the case in Albcontrol a year into the pandemic (Box III), the skies are no longer safe.

Box III. Albcontrol

‘never allow a crisis to go to waste’¹

Albcontrol is a state-owned ANSP that officially ‘consider[s] human resources as a precious asset and it is a priority to us to provide the employees with the highest standards of working conditions, and to reduce risk and liability exposure on the organization.’² A year into the pandemic, however, when five controllers in Tirana declared ‘provisional inability’ at the end of their shift (6th April 2021), they were immediately issued with notice of dismissal.

By April 2021, after almost a year of fruitless discussions between the Independent Union of Air Traffic Control of Albania (SPKTA) and Albcontrol, the Union reported that their members faced a ‘dire situation ... a dangerous environment and high levels of stress for air traffic controllers.’³ The controllers dismissed by Albcontrol

⁹⁷ Go to: <https://www.ifatca.org/covid-19-survey/>

⁹⁸ Interview notes. ENAV’s personnel costs increased by over 5 per cent in the first half of 2021 compared to the first half of 2020. Over the same period, revenue from operations was down by over 13 per cent.

⁹⁹ Go to: <https://www.ifatca.org/covid-19-survey/> In Europe, a temporary reduction in salary was reported by ANS CR, DSNA, IAA, LPS, M-NAV, NATS and PANSO. Other ANSPs, such as AEROTHAI, suspended contributions to staff welfare funds for a limited period.

¹⁰⁰ CANSO (2020) *COVID-19: ANS Restart and Recovery Guide*, p.6. Go to: https://canso.fra1.digitaloceanspaces.com/uploads/2021/04/covid-19_ans_restart_and_recovery_guide.pdf

¹⁰¹ In Europe, ‘provisional inability’ is defined by Commission Regulation (EU) 2015/340, Article 4 (19) as a temporary state in which the professional licence holder is unable or is prevented from exercising the privileges of the licence when ratings, endorsements and his/her medical certificate are valid.

after they declared provisional inability had simply succumbed to the stress and anxiety associated with COVID, exacerbated by a 70 per cent cut in their pay.⁴

A meeting of union members was hastily called at an airport hotel, attended by 50 ATCOs to discuss how they might support their colleagues.⁵ In what can only be described as an act of political repression, the meeting was broken up by the authorities, mobile phones were confiscated, and the controllers were taken for questioning by the police. The army and police took over the airport and Albcontrol's premises, while ATCOs were brought in from Turkey on the premise of covering for a shortage of controllers caused by COVID-19.⁶

Commission Regulation (EU) 2015/340, specifically the General Requirements for the exercise of the privileges of licences and provisional inability, SUBPART A (ATCO.A.015) clearly states that:

(b) Licence holders shall not exercise the privileges of their licence when having doubts of being able to safely exercise the privileges of the licence and shall in such cases immediately notify the relevant air navigation service provider of the provisional inability to exercise the privileges of their licence.

(d) Air navigation service providers shall develop and implement objective, transparent and non-discriminatory procedures to enable licence holders declaring provisional inability to exercise the privileges of their licence in accordance with point (b).⁷

The controllers were therefore acting in accordance with the professional requirements and privileges of their licence. But that was not how either Edi Rama, the Prime Minister (PM), or Belinda Balluku, the Minister of Infrastructure and Energy, portrayed the situation. The Prime Minister raised the stakes by declaring the controllers' action to be part of a 'coup d'état by Albania's President Ilir Meta and former PM Sali Berisha.'⁸ Meta was accused by the Prime Minister of inciting a 'mad coup, as part of your tireless efforts to bring down the government and the state.'⁹ Balluku accused the controllers of trying to 'take our country hostage', leading one controller to despair: 'I don't know how I can continue working like this.'¹⁰

The controllers arrested by the police after the union meeting were quickly released, but not before signing a 'fit to work' declaration (under the threat of dismissal) and being publicly 'named and shamed' for their actions.¹¹ Three of the five who declared provisional inability - Flora Ndreca, Armando Fezga and Muhin Mezini - were gaoled. Flora has a young child and was subsequently transferred to house arrest, but only after 72 hours in gaol with no food, one bottle of water, and sharing facilities with male prisoners. The controllers' crime was deemed to be an 'abuse of power', a form of collective action as opposed to an individual declaration of provisional inability.¹²

The actions of the Albanian government were condemned by IFATCA¹³ and ATCEUC,¹⁴ the latter accusing the government of acting 'in a way reminiscent of a dark Stalinist past',¹⁵ but international safety organisations (e.g., ICAO and EASA) and European politicians remained surprisingly silent. Albania applied for EU membership in April 2009 and, since June 2014, is an official candidate for accession. Prior to the outbreak of COVID-19, Albania had received EUR€1.2 billion of developmental aid to assist, *inter alia*, with the application of EU legislation (*acquis*), including technical requirements and administrative procedures relating to air traffic controllers' licences and certificates.¹⁶ In the midst of the pandemic, Albcontrol secured a loan from EUROCONTROL.¹⁷

Although a question was raised in the European Parliament, asking how the Commission will ensure that Albania complies with EU regulations and engages in social dialogue with ATCOs,¹⁸ the Commission simply stated that EASA will assess the safe and uniform implementation of ATCO licensing in its next standardisation inspection in Albania while the Commission itself is 'fully committed to promote social dialogue and meets annually with Albanian authorities and trade unions to discuss the state of social dialogue.'¹⁹ In the interim, two controllers – Flora Ndreca and Muhin Mezini – are still out of work awaiting trial and IFALPA has advised pilots to 'exercise extreme caution while operating within Albanian airspace' due to a heightened risk of degraded ATC services.²⁰

Notes:

1. This quote is attributed to Rahm Emanuel (March 2020), a former Mayor of Chicago and Democratic Congressman who, in response to the global financial crisis, famously said: 'You never want a serious crisis to go to waste. And what I mean by that is an opportunity to do things that you think you could not do before.'
2. Statement 4th September 2017. Go to: <https://albcontrol.al/en/?p=1062> Albcontrol is a joint stock company, with fully state capital, and is the property of the Ministry of Economy of the Republic of Albania.
3. Go to: <http://www.tiranaecho.com/latest-news/air-traffic-controllers-walk-out-forces-closure-of-albanian-airspace-and-main-airport/> Social dialogue in Albania is at best described as 'weak'. Go to: https://ec.europa.eu/neighbourhood-enlargement/system/files/2020-10/albania_report_2020.pdf
4. In April 2020, one month into the pandemic, the Supervisory Board of Albcontrol (all appointed by the government) decided to reduce employees' salaries and suspend the collective agreement with the controllers' union 'until the financial situation of the company returns to normal'. The union had written to the Prime Minister on three separate occasions prior to the dismissal of controllers in April 2021. Go to: <https://albaniandailynews.com/news/why-controllers-protested-rama-air-union-communication-unveiled-1-1-1>
5. Thirty-one declared provisional inability, the remainder were either on medical leave (COVID-19) or annual leave at the time.
6. With more than 60 ATCOs 'walking out' for 24 hours, a request was also made for controllers from Greece to break the strike – or 'share their experience' in the words of the Prime Minister (<https://exit.al/en/2021/04/11/albanian-court-approves-arrests-of-air-traffic-controllers-for-suspending-work/>) – but this request was refused. ATCEUC, amongst others, pointed out that air traffic controllers from foreign countries with no training in the sectors or procedures, and therefore with no valid ratings, were not fit to replace the Albanian controllers. Go to: <http://www.atceuc.org/uploads/docs/20210410-atceuc-press-release-issue.pdf> The Turkish controllers worked the screens for several hours before the airspace was closed.
7. Note that the text refers to 'licence holders' (plural). Albania's national competence scheme for ATCOs is consistent with EU 2015/340. The International Convention on Civil Aviation likewise prohibits air traffic controllers from exercising the privileges of their licences and related ratings at any time when they are aware of any decrease in their medical fitness that might render them unable to exercise these privileges safely and properly. It is considered unsafe to have any person perform air traffic control who is physically or mentally impaired in any way.
8. Go to: <http://www.tiranaecho.com/latest-news/air-traffic-controllers-walk-out-forces-closure-of-albanian-airspace-and-main-airport/> SPKTA had previously met with the President in the American Embassy.
9. Ibid.
10. Go to: <https://www.wsws.org/en/articles/2021/04/13/alba-a13.html>
11. Several controllers reported receiving threats after their names were made public. The Prime Minister declared that any controllers who failed to 'return to work tomorrow, will not have a place at Albcontrol any longer.' Go to: <http://www.tiranaecho.com/latest-news/air-traffic-controllers-walk-out-forces-closure-of-albanian-airspace-and-main-airport/>
12. Abuse of power is punishable by up to 7 years in prison.
13. Go to: <https://www.ifatca.org/2021/04/dossier-albania/>
14. See, for example: <http://www.atceuc.org/uploads/docs/20210408-pr-on-albania-issue.pdf>; <http://www.atceuc.org/uploads/docs/20210408-pr-on-albania-issue.pdf> ; <http://www.atceuc.org/uploads/docs/20210410-atceuc-press-release-issue.pdf>; and <http://www.atceuc.org/uploads/docs/20210418-appeal-on-albania-issue.pdf>
15. Go to: <http://www.atceuc.org/uploads/docs/20210408-pr-on-albania-issue.pdf>
16. Albania has advanced towards EU membership at a very slow pace. The main remaining obstacles include flaws in the functioning of its judiciary, the fight against corruption and in the safeguarding of media freedoms and minority rights. EU accession negotiations with Albania were cancelled in 2020 following opposition from the Dutch government.

17. Go to: <https://www.eurocontrol.int/sites/default/files/2021-03/eurocontrol-draft-performance-review-report-prr-2020.pdf> Albcontrol became a member of EUROCONTROL in 2003.
18. Go to: https://www.europarl.europa.eu/doceo/document/E-9-2021-002324_EN.html
19. Go to: https://www.europarl.europa.eu/doceo/document/E-9-2021-002324-ASW_EN.html
20. Go to: <https://www.ifalpa.org/media/3627/21sab07-safety-concerns-in-tirana-fir.pdf>

The on-going impact of the pandemic resulted in progressive (ever deeper) cost-cutting measures at many ANSPs. The Irish Aviation Authority (IAA), for example, implemented a three-phase cost containment programme, starting in March 2020 with a moratorium on recruitment, the suspension of training for twenty-four recruits, the suspension of all non-essential training, no pay increase, and a review of all capital expenditure to determine if any investments could be deferred. Between July and October 2020, operational staff were paid on the basis of a 4½ day week (effectively a 10 per cent pay cut), and in January 2021 all staff earning more than EUR€38,500 per annum saw their pay rates reduced by around 10 per cent (to run throughout 2021). Despite these cutbacks, staff were sanguine about job security, both because the IAA entered the pandemic with a shortage of staff in several areas (e.g., engineering) and the expectation that traffic would eventually return. Moreover, it takes the IAA fully 2 years, and around EUR€250,000, to recruit and train a controller.¹⁰² As Steve Cotton, the ITF’s General Secretary pointed out, “You can’t buy ATCOs, you have to invest in them.”¹⁰³ But then how can a commercialised ANSP “justify spending that money now [in a pandemic] to start training someone who’s not going to come online until 2024?”¹⁰⁴

Reducing staffing levels proved more or less problematic for ANSPs depending on a range of factors such as pre-pandemic shortages or surpluses of labour, the age-profile of the workforce, applicable employment law, the contractual status of staff, collective agreements that protect job security, the financial position of the ANSP, and any government support for short-time working, furlough schemes and the like.¹⁰⁵ For example, with an ageing workforce, it would be pure folly to both suspend recruitment and reduce headcount (e.g., via early retirement), knowing that traffic will eventually return. Many European ANSPs faced difficult choices in this regard, as a considerable number of ACTOs are due to retire by the time traffic returns to its pre-pandemic level. Austro Control, for example, expects around 50 controllers to retire by 2025, ENAV expects around 300 (1-in-6) ATCOs to retire within the next 5 years, and MUAC expects around a third of its controllers to retire by 2026.¹⁰⁶

Contract labour is more easily ‘flexed’ during a downturn in demand. In Nigeria, in addition to 275 ATCOs permanently employed by the Nigerian Airspace Management Agency (NAMA), the Agency also has access to 25 ‘retired’ ATCOs who work on a contract (on demand) basis. As demand collapsed, there was no recourse to retirees. As traffic returned, the Agency certified 24 new controllers

¹⁰² There were some concerns that the IAA’s Board, with its eye on the financial accounts, might see cutting staff as a way to balance the books. At the operational level, in contrast, controllers pointed out that “line managers are terrified of losing any staff.” Interview notes.

¹⁰³ ITF ATM meeting, 1st July 2021.

¹⁰⁴ Interview notes. This question was posed by a senior official of a national civil aviation authority.

¹⁰⁵ In Europe, a reduction in staff numbers was reported by Albcontrol, ANS CR, ANS Finland, ARMATS, Avinor, Croatia Control, EANS, NAVIAIR, and NATS. LfV announced 500 job losses in April 2020 (approximately 40 per cent of the workforce), but the Swedish Parliament granted additional appropriations of SEK900 million for the loss of revenue and the job losses were averted.

¹⁰⁶ Interview notes.

(April 2021), but still needed to engage non-technical staff as well as retirees to address a shortage of controllers by autumn 2021.

In the UK, NATS reduced the number of contractors utilised by the company, reprioritised work and redeployed the company's own employees. At the peak of the pandemic, NATS furloughed over 3,000 staff and was in receipt of over UK£37 million in grant income under the government's job retention (furlough) scheme.¹⁰⁷ The roll-out of furlough payments was agreed with the ATCO Branch of Prospect the trade union.¹⁰⁸ However, having already agreed to reverse the 2020 pay award that had been agreed with the company (part of a package that saved the company around UK£10 million), the union was dismayed when NATS withdrew from the Redundancy and Relocation Agreement (NATSAG001) at the end of May 2020 without proper consultation and certainly not in accordance with the 'Working Together' approach to open and honest communications between the two sides.¹⁰⁹

There was further disquiet over NATS' decision to terminate the training of more than 100 trainee air traffic controllers (TATCs).¹¹⁰ For the Guild of Air Traffic Control Officers (GATCO), the company's decision was: 'the continuation of the boom-bust cycle of ATC recruitment and training we have experienced over the years not just in the UK but across Europe. Decisions in the past to stop ATC recruitment and training have, in recent years, resulted in controller shortages followed by increasing delays for air traffic. Cutting TATCs now makes that same outcome very likely in the future.'¹¹¹ A member of Prospect's ATCO Branch was even more scathing:

"NATS have never really had a proper workforce plan, they seem to make it up as they go along. They go through these cycles of, 'Oh, we haven't got enough

¹⁰⁷ Furlough schemes in Western countries supported businesses in retaining employees during the pandemic by subsidising some or all of their salary. Most schemes subsidised between 60-75 per cent of the employee's gross monthly salary (e.g., Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, France, Germany, Ireland, Italy, Lithuania, Malta, Portugal, Romania, Spain, and Turkey) but some paid for 80 per cent (e.g., Austria, Italy, Luxembourg, Norway, and the UK), 90 per cent (e.g., the Netherlands) or even 100 per cent (Croatia, Greece and New Zealand), although most schemes had a fixed upper limit per employee and the duration of these schemes varied considerably. In addition, some schemes were more flexible than others. In Switzerland, for example, SkyGuide was able to reduce staffing levels via a state furlough scheme that allowed ATCOs to take one day off per week (effectively a wage subsidy for short-time working). In the majority of countries with furlough schemes, employers were prohibited from making redundancies in return for the subsidy, thereby providing some degree of job security for employees.

Go to: <https://www.lewissilk.com/en/insights/international-approaches-to-covid-19-job-retention-and-wage-subsidy-schemes>

¹⁰⁸ Unlike the UK scheme, more than three-quarters of furlough schemes do not require employee consent in order to be furloughed or to be in receipt of wage subsidies following a temporary lay-off. At the peak of pandemic, NATS furloughed over 3,000 staff. In combination with other measures (e.g., freezing recruitment, pay restraint, releasing most external contractors, and deferring £70 million of capital investment), NATS conserved cash amounting to £200 million.

¹⁰⁹ This approach to social dialogue has ensured a prolonged period of industrial peace, with no form of industrial action in UK air traffic management for almost 40 years. The *Toolbox for Successful Social Dialogue in Air Traffic Management*, jointly developed by the European social partners, proposes a procedural agreement between the parties that is very similar to the principles agreed by NATS and the ATCO Branch of Prospect. Go to:

<https://canso.fra1.digitaloceanspaces.com/uploads/2020/03/brochure-atceuc-canso-etf-toolbox-march-2016.pdf>, pp.8-9.

¹¹⁰ A number of trainees were within 2 weeks of completing their ab-initio training and acquiring their student ATC licences.

¹¹¹ Go to: <https://www.gatco.org/wp-content/uploads/2020/09/GATCO-NATS-TATCs.pdf> Prior to the pandemic, rising traffic delays across Europe were attributed, in significant part, to the declining number of ATCO trainees (between 2008-2014). The number of trainees increased after 2015 but were still 14 per cent below the 2008 number in 2019. The PRC concluded that the ATC capacity plans in some ANSPs, *including staffing*, were not sufficient to cope with the traffic growth, leading to substantial capacity shortages in some ANSPs in 2018/19. Go to: <https://www.eurocontrol.int/publication/draft-performance-review-report-prr-2021-consultation>

people, we must recruit quickly’, through to, ‘We’ve got too many people, we need to get rid of some’. They never seem to have a long-term view.”¹¹²

The what (job losses) and the how (unilateral decision and announcement by management) proved to be highly contentious in other ANSPs around the world. In South Africa, for example, ATNS failed to consult the trade unions prior to announcing more than 170 job losses (almost 14 per cent of the workforce). As the company remains “tight-fisted with information” and seemingly determined to “push the losses down onto the workforce”, the case will go before the Commission for Conciliation, Mediation and Arbitration (CCMA).¹¹³

The initial phase of the pandemic saw a continuation of cooperative relationships between management and unions at NAV CANADA as both sides worked to contain costs. Cancelling all contract work and offering early retirement proved relatively uncontentious, but relationships “turned sour” and the cooperative relationship that had “taken 15 years to build took only 5 minutes to break”¹¹⁴ when the company announced 720 job losses in September 2020 (equivalent to around 14 per cent of the workforce). A further 180 redundancies were announced in December 2020, although the number of layoffs was subsequently reduced by 128 jobs when controversial plans to close the St. Jean tower in Quebec and transition six towers (Fort McMurray, Regina and Whitehorse in Alberta, Prince George in British Columbia, and Sault Ste. Marie and Winsor in Ontario) to Flight Service Stations was rejected.¹¹⁵ The proposed transition to Flight Service Stations, described by one union official as an “ANSP lite service”,¹¹⁶ was designed to replace ATCOs with flight service specialists who would simply provide advisory services and information about weather, runway conditions and air traffic, leaving it up to pilots to keep a safe distance from other planes. Any suggestion that this would not put safety at risk, according to the Canadian Air Traffic Control Association (CATCA), was ‘disingenuous’ and ‘irresponsible’.¹¹⁷

CATCA was not alone in expressing its concerns over the psychological impact of commercial (cost-driven) management decisions on ATCOs during the pandemic, especially when they receive notice of impending redundancy or ‘feel their positions are in an ongoing precarious state. The impact of a looming or potential job loss on employee mental health cannot be overstated, particularly in one of the most demanding and high-stress professions and one that is essential to ensuring public safety.’¹¹⁸ Cost-cutting today will impede recovery tomorrow, especially when ANSPs reduce their experienced workforce, release trainees, and suspend all recruitment of new trainees. In Canada and elsewhere, unions and users expressed concern over the timing of a recovery in traffic coinciding with a shortage of

¹¹² Interview notes.

¹¹³ Interview notes. The CCMA was established under the Labour Relations Act, 1995 (as amended) and is mandated to promote social justice and fairness in the workplace by delivering ethical, qualitative, innovative, and cost-effective dispute and resolution services.

¹¹⁴ As another controller commented: “Goodwill made the model work before the pandemic – goodwill isn’t there anymore.” Interview notes.

¹¹⁵ In total, the Company’s restructuring efforts since the onset of the COVID-19 pandemic have resulted in a reduction of its workforce by approximately 650 people across the country. Go to: <https://www.navcanada.ca/en/annual-report-2021.pdf>

¹¹⁶ Interview notes.

¹¹⁷ Doug Best, President and CEO of CATCA. Go to: <https://www.wingsmagazine.com/nav-canada-actions-speak-louder-than-words-when-it-comes-to-public-safety/>

¹¹⁸ Ibid.

controllers. Moreover, while no country has ceased to provide air traffic services, no matter how strict the lockdown or border controls, this has only been made possible by refinancing ANSPs and deferring user charges. In short, when traffic returns, ANSPs might find themselves short of staff, short of cash, and seeking to recover revenue from users who are themselves in dire straits.

V. Refinancing and recovery

“Crisis management is what ANSPs are well-prepared for, dealing with the immediate impact [of COVID-19]. The problem is that this particular crisis has turned into a catastrophe for the entire aviation system.”¹¹⁹

Whereas 9/11, SARS and the global financial crisis highlighted the ‘boom-bust-boom cycle in aviation’, the COVID-19 pandemic has exposed ‘a structural flaw in the system’ as (user pays) charges are clearly ‘unreliable as a sole source of revenue.’¹²⁰ More to the point, as the industry is ‘almost certain to experience another demand-exceeding-capacity situation following the recovery from the pandemic’¹²¹ – once again shifting the focus from cost-containment to investment in human and physical capital – ‘Maybe we should completely rethink the funding of air navigation services in the future. Of course, it would require a global change, but the crisis really showed that the system has its difficulties and its flaws.’¹²² In simple terms, the structural flaw at the heart of the ATM system is that when aviation does eventually recover from the pandemic, airlines will be expected to pay more for ANS at a time when they can least afford to, while ANSPs will be expected to invest more in skills and equipment at a time when they have exhausted cash reserves and are trying to recover lost and deferred revenue. When users are expected to pay during a crisis, commercialisation and market-based forms of governance (Table 1) can heighten conflicts of interest between airlines and ANSPs.

The first point to make is that traffic levels will recover. This is evident from the removal of various travel restrictions and COVID-related requirements for designated routes, the recovery of several domestic markets, and future regional traffic scenarios based on the (in)effectiveness of the vaccine rollout. For example, when the UK government announced a traffic light system – red, amber and green – to classify different countries in terms of risk of infection and associated travel restrictions, leisure travel to countries on the green list surged (e.g., Gibraltar, Iceland and Portugal), increased only marginally to countries on the amber list (e.g., France, Germany, Greece, Italy and Spain) and declined to countries on the red list (e.g., Turkey and UAE).

Domestic markets have been opened once controls have been put in place to contain the spread of COVID-19.¹²³ Figure 10 illustrates how out-of-state arrivals to Hawaii quickly recovered towards pre-pandemic levels when 14-day quarantine was no longer required for passengers who could document a negative test result for COVID-19.

¹¹⁹ ATCO based in the Caribbean, interview notes.

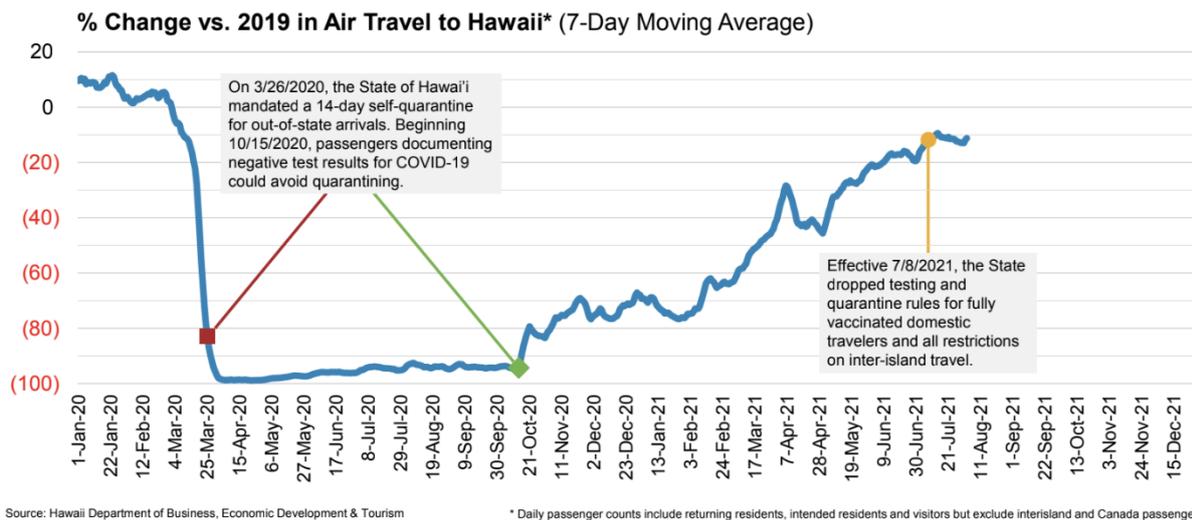
¹²⁰ Paper presented by United Arab Emirates to the ICAO High-Level Conference on COVID-19, Safety Stream, Agenda Item 2.1, ‘Resilience of the Air Traffic Management System’, Montréal, 12th - 22nd October 2021.

¹²¹ Ibid.

¹²² Thomas Reynaert, Managing Director of A4E, welcome message to the A4E Aviation Summit, 10th June 2021. Go to: <https://a4e.eu/publications/a4e-aviation-summit-2021/>

¹²³ This includes societal measures such as regular rapid testing, track and trace, and vaccination programmes, combined with airport/airline measures such as vaccination passports and mandatory wearing of face masks. The Federal Aviation Administration (USA), for example, introduced mandatory wearing of face masks, with US\$9,000 fines for non-compliance.

Figure 10. Inter-State Traffic to Hawaii

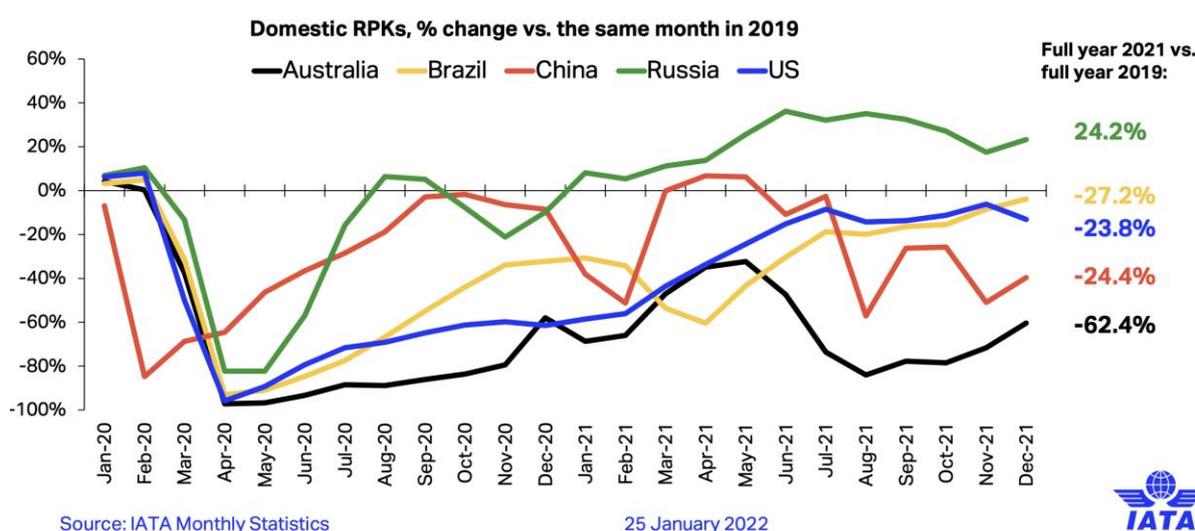


Where domestic air travel is vital to the wider economy or simply to provide transport links for isolated communities, governments have introduced wide-ranging measures to sustain both aviation and economic recovery (especially where the latter is contingent on the former). In Scotland, for example, public service obligations, and public funding, ensures that HIAL and Logan Air maintain ‘lifeline services’ to remote islands. In Australia, the government introduced an Airline Financial Relief Package (April-September 2020) that included the refunding and on-going waiving of a range of government charges including aviation fuel excise, domestic and regional aviation security charges, and Airservices Australia charges on domestic airline operations. The latter included AUS\$250 million for Airservices in the 2019-20 financial year, which enabled the company to waive AUS\$92.5 million in charges for domestic aircraft operations, with a further AUS\$581.8 million for the 2020-21 financial year.¹²⁴ As one of the company’s ATCOs pointed out, “The government understands that aviation and Airservices is vital to the Australian economy. It’s a small cost to put a few hundred million dollars into Airservices to keep the domestic economy ticking over, as they know they’ll get billions back.”¹²⁵ With Australia’s international borders closed, except for repatriation and cargo/medical flights, international traffic was down 68 per cent in 2020-21 compared to 2019-20, whereas domestic traffic was down 24 per cent. What is clear from Figure 11, however, is that domestic recovery of traffic can falter in the face of further outbreaks (variants) of COVID-19

¹²⁴ Airservices has received three grants of financial assistance totalling AUS\$1.1 billion by the end of the financial year to June 2021. The company returned a AUS\$200 million capital repayment to the shareholder (the Australian government) in 2019.

¹²⁵ Interview notes.

Figure 11. Domestic Recovery of Traffic, 2020-21



Around the world, regions with large domestic markets are expected to recover first, with a slower recovery in Europe, Africa, and the Middle East.¹²⁶ This pattern is clear in Figure 12, with recovery accelerated in many countries and regions by financial relief measures for airlines and the extension of payment terms for ANS.¹²⁷ Government bailouts for airlines in 2019-20 were estimated to be over US\$225 billion.¹²⁸ European airlines have received substantial financial support from national governments,¹²⁹ but they still protest that ‘States have chosen to protect their monopoly ANSPs and themselves from paying for revenue gaps ... At a time when airlines have been financially crippled through no fault of their own ... States continue to throttle the economic and sustainable recovery of the aviation sector.’¹³⁰

¹²⁶ Go to: <https://www.iata.org/en/iata-repository/publications/economic-reports/an-almost-full-recovery-of-air-travel-in-prospect/> Environmental concerns might also slow the recovery of domestic travel in some countries. In France, for example, MPs recently voted to suspend domestic airline flights on routes that can be travelled by direct train in less than 2½ hours, as part of a series of climate and environmental measures.

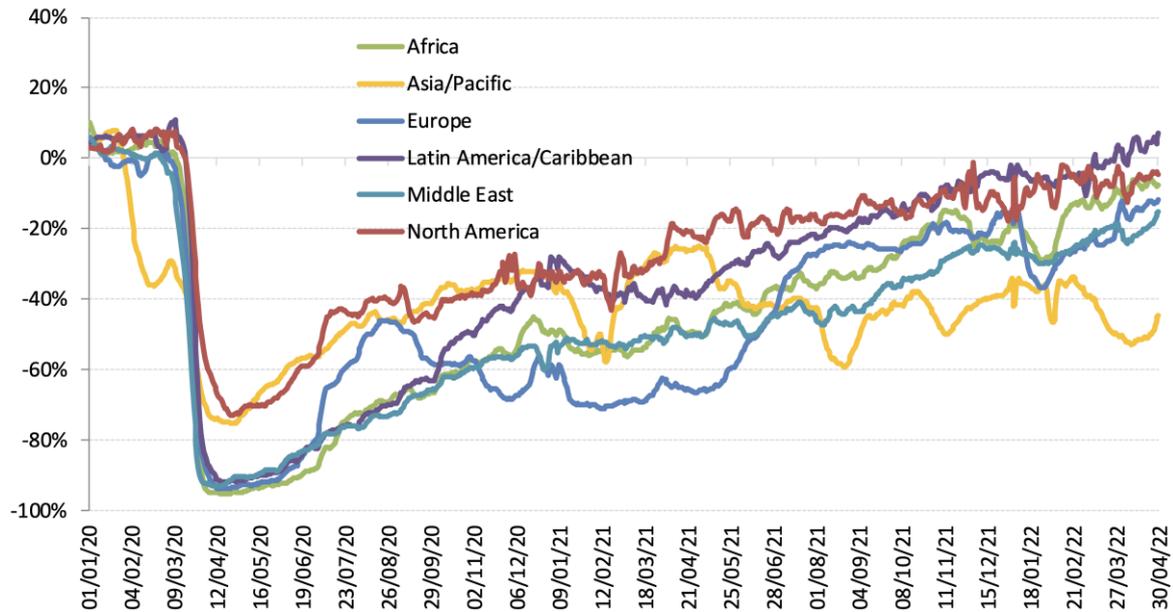
¹²⁷ For example, in Paraguay, a government Decree 3953 gave temporary relief to airlines for air traffic control, parking and ground assistance provided by DINAC (Paraguay’s Civil Aviation Authority).

¹²⁸ Governments still have a stake or controlling interest in 29 of the world’s 100-odd listed airlines. Most loans are conditional on rapid repayment, which may result in governments swapping debt for equity. *The Economist*, 11th February and 6th July 2021.

¹²⁹ <https://www.transportenvironment.org/challenges/planes/subsidies-in-aviation/bailout-tracker/>

¹³⁰ Joint statement by A4E, EBAA, EHA, ERA and IAOPA, ‘Europe’s airspace users expected to cover up to €5.4 bn in lost ANSP revenues through higher ATC charges beginning in 2023’, 12th May 2021. Go to: <https://a4e.eu/publications/europes-airspace-users-expected-to-cover-up-to-e5-4-bn-in-lost-ansp-revenues-through-higher-atc-charges-beginning-in-2023/>

Figure 12. Regional Return of Traffic (total seat capacity, 7-day average, YoY compared to 2019)¹³¹



Governments around the world have provided significant financial support for domestic air travel. In Brazil, for example, air navigation charges in 2020 were deferred to the end of the year,¹³² the Ministry of Land, Infrastructure, Transport and Tourism in Japan committed JP¥120 billion (~US\$1 billion) to fund a 90 per cent reduction of parking charges, landing charges and air navigation service charges for domestic flights (from April 2021 to March 2022), and the CAB in Thailand ordered a 50 per cent discount on domestic flights (20 per cent on international flights).¹³³ COCESNA, the Central American Air Traffic Service Provider for Belize, Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua, extended all payment terms for ANS charges for an additional 15 days, effective from 1st April 2020 for a period of 6 months.

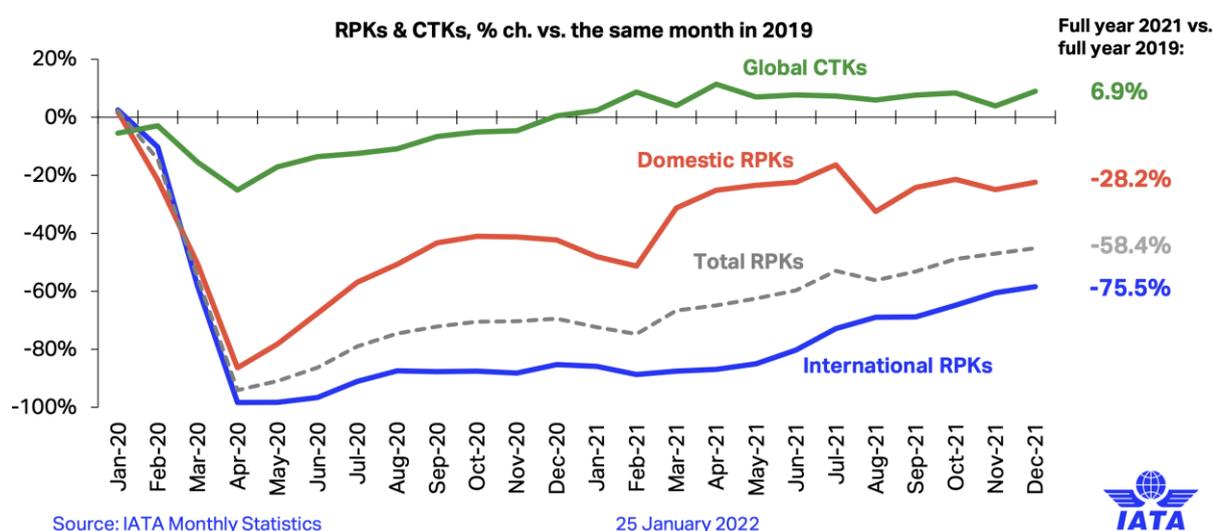
The global recovery of traffic in 2020-21 is depicted in Figure 13. Cargo flights surpassed the comparable period in 2019 by late 2020 as the vaccine programme was rolled out around the world. Domestic air travel shows a stronger but stuttering recovery (the ‘W-shape’ already evident in Figure 7) while international travel is still well below 2019 levels.

¹³¹ Source: ICAO

¹³² Decree n° 10,284, regulated by the Department of Airspace Control (DECEA - Air Force) Deferral of payment of air navigation tariffs. Decree n° 10,284 2020 authorized DECEA to extend the deadline for the payment of air navigation fees due by airlines.

¹³³ In addition, the CAB required AEROTHAI to extend credit terms (exemption of interest charges on monthly invoices of ANS charges) for airlines and other aviation customers.

Figure 13. Global Recovery Air Traffic, 2020-21



Although traffic forecasting has been replaced by ‘recovery scenarios’¹³⁴ based on the rollout and (in)effectiveness of available vaccines against new variants of COVID-19, these are reasonably consistent in predicting a ‘most optimistic’ return to pre-pandemic traffic levels by 2023¹³⁵ and by 2024-25 based on the ‘most likely’ scenarios.¹³⁶ In Europe, for example, EUROCONTROL set out three possible scenarios, depicted in Figure 14, with the most likely (base) scenario showing 2024 traffic recovering to 95 per cent of the 2019 figure, based on widespread vaccination take-up across Europe and coordinated easing of travel restraints being reached by 2022.Q1 between global regions, with more long-haul flights starting to return.¹³⁷ Low-cost airlines are expected to be well-placed to take advantage of more immediate pent-up demand, especially in the VFR (visiting friends and relatives) and tourism markets, due to their ability to rapidly (re)hire aircrew.¹³⁸ The most pessimistic scenario assumes traffic in 2024 will only reach 74 per cent of the 2019 figure, with a full recovery not before 2029, based on persistent restrictions owing to patchy vaccine uptakes and/or outbreaks of new

¹³⁴ Go to: https://canso.fra1.digitaloceanspaces.com/uploads/2021/04/educated_guess.pdf, p.8.

¹³⁵ IATA revised its forecast down in the early months of 2021 but still expects a return to pre-pandemic traffic levels by 2023. Go to: <https://www.iata.org/en/iata-repository/publications/economic-reports/an-almost-full-recovery-of-air-travel-in-prospect/>

¹³⁶ ATNS (South Africa) and many other ANSPs have also contemplated an ‘outlier’ scenario, which assumes that it will take the aviation industry 8 to 10 years to recover.

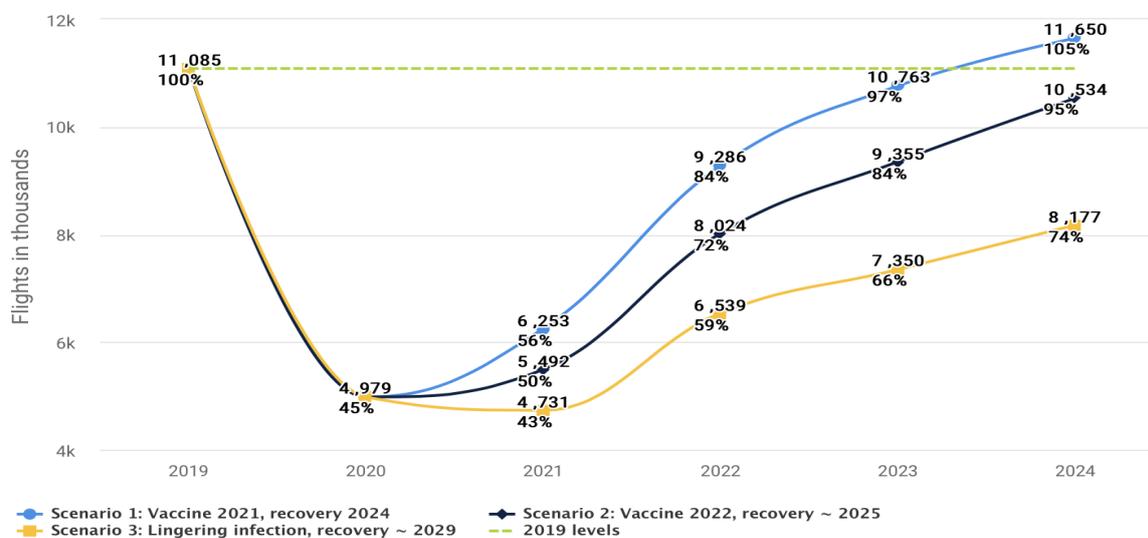
¹³⁷ After tracking below the baseline (Scenario 2) in the latter months of 2021, traffic increased to 86 per cent of 2019 levels in the first 3 weeks of May 2022 as travel restrictions were lifted across Europe, i.e., slightly above the high (Scenario 1) level depicted in Figure 14. Go to: https://www.eurocontrol.int/sites/default/files/2022-05/eurocontrol-comprehensive-air-traffic-assessment-20220525_0.pdf Updated scenarios published in April 2022 envisage baseline (Scenario 2) traffic at 90 per cent of the 2019 level by the autumn months of 2022.

¹³⁸ Ryanair, for example, Europe’s largest low-cost airline, hires cabin crew via agencies on short-term contracts and pilots who are ‘self-employed’. See Harvey G and Turnbull P (2020) Ricardo flies Ryanair: strategic human resource management and competitive advantage in a Single European Aviation Market. *Human Resource Management Journal* 30(4): 553-65; and Turnbull P (2020) *Tackling Undeclared Work in the Air Transport Sector, with a Special Focus on Bogus Self-Employment of Aircrews: a Learning Resource*, Brussels: European Platform Tackling Undeclared Work. <https://ec.europa.eu/social/BlobServlet?docId=23097&langId=en> The latest data from EUROCONTROL indicate that low-cost airlines have indeed been able to increase flights/passengers more rapidly than mainline (network) airlines. Go to: https://www.eurocontrol.int/sites/default/files/2022-05/eurocontrol-comprehensive-air-traffic-assessment-20220525_0.pdf

virus strains (e.g., Delta and Omicron), with passenger confidence negatively impacted.

Figure 14. Scenarios for the Recovery of European Traffic

EUROCONTROL STATFOR 4-year forecast for *Europe 2021-2024
Actual and future IFR movements, % traffic compared to 2019



*Europe = ECAC 44 Member States

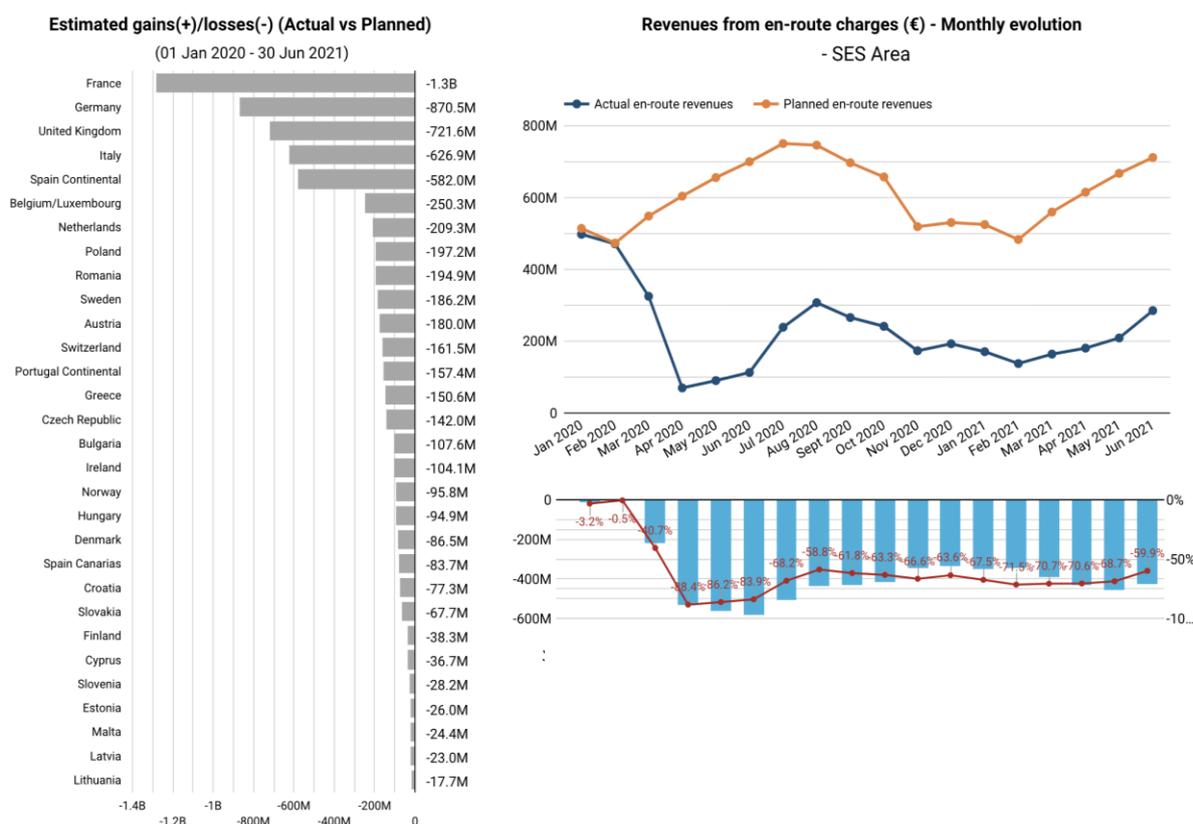
With the grounding of flights around the world in 2020, and the realisation that traffic would not bounce back any time soon, ANSPs recognised that neither non-core revenues nor legally mandated cash reserves would be sufficient to preserve liquidity. One argument in favour of commercialisation is that it incentivises more entrepreneurial management of ANSPs and promotes a diversification of the business (e.g., services to other ANSPs such as consultancy, training, technology transfer and the like).¹³⁹ However, revenue from these sources rarely amounts to more than 10 per cent of total revenue and many of these activities have also been curtailed or significantly impacted by the pandemic.

Turning to cash reserves, the situation in Europe is illustrative of the mismatch between liquidity and revenue during the pandemic. At the end of 2019, European ANSPs had EUR€2.7 billion in cash, whereas the estimated revenue reduction in 2020 was over EUR€5 billion. In other words, cash reserves held by ANSPs covered only slightly more than half of the reduction in ANS charges in 2020. These losses continued into 2021, as illustrated in Figure 15.¹⁴⁰

¹³⁹ These activities are typically described as ‘non-core’, ‘non-regulated’ or ‘marketable services.’ See, for example, Buyle, S, Dewulf W, Kupfer F, Onghena E, Meersman H and Van de Voorde E (2021) From traditional to professional Air Navigation Service Provider: A typology of European ANSP business models. *Journal of Air Transport Management*, 91(March).

¹⁴⁰ Other ANSPs, such as ATNS (South Africa), maintain a minimum cash balance of just two months’ operating expenditure plus capital loan payables.

Figure 15. Revenues from *En-Route* Charges (actual vs. planned), EUR€ million¹⁴¹



As one might expect, some ANSPs had more cash in the bank than others. The IAA, for example, had cash reserves of almost EUR€233 million at the start of the pandemic, and these reserves, when combined with cost containment measures, proved sufficient for the company to continue operating within the level of its available liquidity.¹⁴² That said, under the second European Performance Review (RP2, 2015-19),¹⁴³ performance targets were achieved only at the expense of diverting resources from planned capital projects to core operations and by ensuring that sufficient frontline staff were available at the expense of capital investment.¹⁴⁴ At the end of 2018, the IAA had almost EUR€18 million of capital-related costs not utilised, which the Authority committed to returning to users in 2020. A further EUR€6.7 million of unused capital-related costs in 2019 were planned

¹⁴¹ Source: Central Route Charges Office

¹⁴² Cash reserves were reduced to less than EUR€170 million by end of 2020 and the IAA made its first loss (EUR€0.9 million compared to a profit of almost EUR€28 million in 2019) since its establishment in 1994. The IAA returned to profit in 2021 (EUR€9.5 million).

¹⁴³ The Single European Sky (SES) Performance Scheme regulates European Union member states and their ANSPs with set targets and monitoring in four key performance areas: safety, environment, capacity and cost efficiency. Go to: <https://www.eurocontrol.int/air-navigation-services-performance-review>

¹⁴⁴ The IAA had a CAPEX underspend of over EUR€20 million, mostly due to lack of engineer and ATCO resources required for certain projects. IAA (2019) *ANSP Business Plan 2020-2024*, p.93. Go to: https://www.iaa.ie/docs/default-source/misc/non-confidential-rp3-iaa-ansp-business-plan.pdf?sfvrsn=f42a00f3_2

to be returned to users in 2021.¹⁴⁵ The IAA receives no state funding and is certainly ‘customer focused’, offering to voluntarily return almost EUR€23 million in terminal and North Atlantic communications invoices in addition to the extension of payment terms agreed with other member states of EUROCONTROL for *en-route* invoices due in April, May, June and July 2020.¹⁴⁶ However, with one of the lowest *en-route* user charge unit rates in Europe, a small asset base and consequently thin margins, the company’s investors are exposed to higher systematic risk (beta or β)¹⁴⁷ than other ANSPs, as illustrated in Table 2.

Table 2. ANSP Betas and Riskiness¹⁴⁸

Company	Beta	Loss of profit caused by -2% loss of traffic
NERL (NATS En-Route)	0.505	-20%
Airservices Australia	0.55	-20%
Airways New Zealand	0.60	-20%
IAA	0.65 to 0.70	-20% to -65%

Commercial investment in some ANSPs is evidently less risky than others, especially when the state is a major or sole shareholder. As Ben Stanley of egis-aviation recently pointed out, “Many ANSPs do not have to manage their cash flow in a way that a private company would in order to be resilient as an organisation.”¹⁴⁹ AEROTHAI’s triple A credit rating, for example, is attributed to the ANSP’s ‘status as a government-related entity (GRE) integrally linked to the government and the view of an almost certain likelihood that AEROTHAI would receive timely and sufficient support from the Thai Government in the event of financial distress.’¹⁵⁰ In fact, most ANSPs have only survived during the pandemic on a diet of loans and state financial support. This is demonstrated in Figure 16, which presents data from CANSO’s Global Benchmarking Workgroup. While 30 per cent of respondents to the Workgroup’s survey reported that they relied on government assistance during the pandemic (with 17 per cent reporting sole reliance on state loans or grants), almost three-quarters of ANSPs accessed commercial loans (in many cases backed by the state).

¹⁴⁵ The IAA decided to return these sums to users as a measure of ‘good faith’ as ANSPs were not required to return unspent CAPEX during RP2.

¹⁴⁶ Payments were deferred to November 2020, February, May and August 2021 respectively.

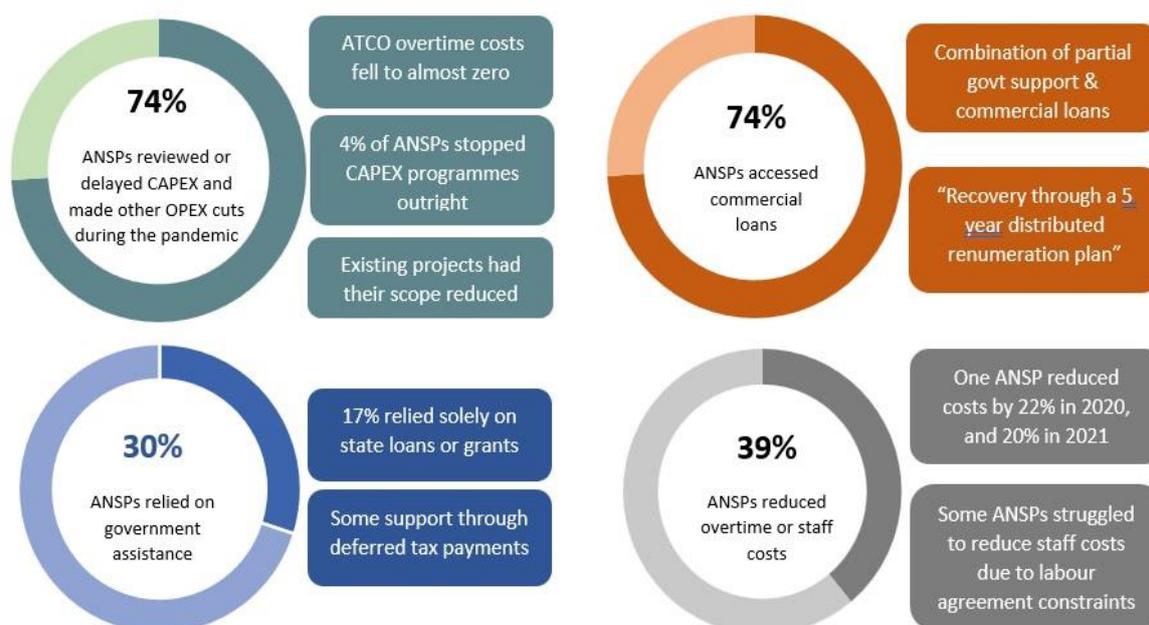
¹⁴⁷ Beta is used in the capital asset pricing model, which describes the relationship between systematic risk and expected return for assets (usually stocks). A beta greater than 1.0 suggests that the stock is more volatile than the broader market, and a beta less than 1.0 indicates a stock with lower volatility.

¹⁴⁸ First Economics (2019) *IAA’s En Route and Terminal Services Costs of Capital*, p.10. Go to: [https://www.iaa.ie/docs/default-source/misc/iaa-cost-of-capital-report-\(may-2019-final\).pdf?sfvrsn=1b9500f3_2](https://www.iaa.ie/docs/default-source/misc/iaa-cost-of-capital-report-(may-2019-final).pdf?sfvrsn=1b9500f3_2)

¹⁴⁹ Go to: <https://www.eurocontrol.int/event/canso-eurocontrol-global-resilience-summit-2021>

¹⁵⁰ Aeronautical Radio of Thailand, *Annual Report 2020*, pp. 8 & 57. Go to: https://www.aerOTHAI.co.th/sites/default/files/files/document/annaulreport_en.pdf An AEROTHAI manager pointed out that as banks were also severely impacted by COVID-19, there were fewer financial institutions able to offer financial support, despite the GRE’s triple A credit rating.

Figure 16. Mitigating the Financial Impact of the Pandemic¹⁵¹



In Europe, state financial support was predominantly aimed at safeguarding ANSPs liquidity and alleviating payroll costs when furlough schemes were introduced. Table 3 summarises both the financial support accessed by European ANSPs, and the cost containment measures they introduced in response to the pandemic. Financial support took various forms such as direct or indirect contributions to equity (e.g., Avinor, DFS, LGS, LPS and Skyguide),¹⁵² state loans (e.g., ANS CR, NAVIAIR, Slovenia Control), payment of EUROCONTROL costs (e.g., ANS Finland), and financing of furloughing schemes (e.g., NATS) or other temporary measures reducing staff costs (e.g., Austro Control).¹⁵³ In April 2020, EUROCONTROL was authorised to take a loan of up to EUR€1.27 billion, used to help ANSPs pay 51 per cent of their operating costs for four months, either as a main financing vehicle or as a complement to other loans. For some ANSPs, the sum taken was considerable (e.g., for Slovenia Control it represented almost half of the balance sheet value at the end of 2019).

¹⁵¹ Source: <https://canso.org/what-does-the-data-say-about-ansps-resilience-through-the-pandemic/>

¹⁵² The Swiss Parliament approved a two-tranche refinancing of Skyguide, of CHF150 million in 2020 and CHF250 million in 2021. State aid was invariably conditional on the implementation of longer-term restructuring and/or cost containment measures.

¹⁵³ For *en-route* costs, the 29 member states of the SES (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and Switzerland) reduced staff costs by EUR€170.5 million in 2020 compared to 2019, with further savings from other operating costs (EUR€31.1 million), lower depreciation costs (EUR€16.2 million) and lower cost of capital (EUR€49.8 million). In contrast, 'exceptional items' increased by EUR€96 million, driven primarily by redundancy payments and early retirement. Go to: <https://www.eurocontrol.int/sites/default/files/2022-03/eurocontrol-draft-performance-review-report-prr-2021.pdf>

Table 3. Mitigation Measures Implemented or Planned by European ANSPs, 2020-2021¹⁵⁴

Aid from national government	Loans	Cost-containment measures		
		Staff	Non-staff	Capital expenditure
ANS CR, ANS Finland, Austro Control, DFS ^(b) , LGS ^(a,b) , LPS ^(b) , NATS ^(a) , NAVIAIR, skeyes ^(a) , Slovenia Control				
		Albcontrol, ARMATS, Avinor, BULATSA, Croatia Control, DCAC Cyprus, DSNA, EANS, ENAIRE, HungaroControl, IAA, LFV, LVNL, M-NAV, MUAC, NAV Portugal, PANSA, ROMATSA, Skyguide, SMATSA, UKSATSE		
Skyguide ^(b)	Albcontrol ^(a) , ARMATS, Croatia Control, DHMI ^(a) , DSNA, EANS ^(a) , HungaroControl, IAA, LVNL ^(c) , MATS ^(a) , NAV Portugal, Oro Navigacija ^(a) , PANSA, ROMATSA, Sakaeronavigatsia, SMATSA, UKSATSE	ENAV	DHMI	DHMI
Avinor ^(b)		HCAA	ENAV	HCAA
		MATS	MOLDATSA	MATS
		MOLDATSA		Sakaeronavigatsia

(a) EUROCONTROL Loan. (b) Increase in equity. In the case of Avinor from the mother company, which is a State owned enterprise. (c) LVNL operates in a specific environment where the balance in its current accounts is ensured by Treasury banking.

Wherever a commercial logic prevails, the tension between ANS as a public vs. private good is all too apparent. In Europe, this tension has played out between airlines, ANSPs, regulators and States over performance plans and the application of the TRS mechanism for the third reference period (RP3 2020-24). The IAA, for example, noted in its Annual Report (2021) that the revised plan for RP3:

‘sets challenging targets ... and we cautioned our regulators through the consultation process that the cuts which they implemented to the required allowances which the ANSP had proposed may impact on our ability to maintain the high-quality service that our customers have become accustomed to ... economic regulators at both European and national level need to consider the longer-term priorities for the provision of ANS services ... A regulatory system which does not recognise established efficiencies and prioritises downward pressure on charges does not serve the long-term interests of airlines, States or indeed passengers.’¹⁵⁵

Elsewhere, tensions between different stakeholders have played out through disputes over price increases and/or service levels. In all cases, these disputes are a demonstration of the fact that ANS is a vital part of every nation’s infrastructure, a public good that cannot be allowed to succumb to the commercial imperatives of the market.

In Europe, the relationship between ANSPs and airlines “has been a one-way conversation for years, with airlines making demands on ANSPs for cost reduction.

¹⁵⁴ Source: Eurocontrol

¹⁵⁵ Peter Kearney, Chief Executive IAA. Go to: https://www.iaa.ie/docs/default-source/publications/corporate-publications/annual-reports/10342-iaa-annual-report-2021-eng---screen.pdf?sfvrsn=dbef12f3_10

They [airlines] tend to be more aggressive, we [ANSPs] tend to be more defensive. We're perceived as being more conservative, in their view, because they believe we're defending a privileged position of some sort. We're not, we're defending the service."¹⁵⁶ This has created what many ANSPs readily acknowledge to be "a real contradiction between what is an essential infrastructure and a commercial service with payment by the users. That's why there's always a fight between the ANSPs and the airlines, with the European Commission in the middle. I don't see how we can continue with this."¹⁵⁷ This contradiction has been played out through the performance plans for RP3 submitted to the European Commission for assessment against performance targets *prior to* the outbreak of COVID-19.

These targets had already raised the ire of European air traffic unions and professional associations, due to a disproportionate focus on cost efficiency compared to other performance targets for safety, the environment and capacity: 'it is now difficult to gauge what the performance scheme is now in service of, other than general improvement, which in reality translates to "just be cheaper".'¹⁵⁸ In November 2020, the Commission issued a new Regulation governing the performance and charging scheme (2020/1627), which in addition to modifying the mechanism for measuring balance revenues for 2020-2021 also required the EUROCONTROL member states to develop new financial and operational plans for RP3 with the preparation of a new performance plan.

Following intensive lobbying by airlines, especially low-cost airlines via Airlines for Europe (A4E),¹⁵⁹ in March 2021 the Commission issued a preliminary proposal on the efficiency levels expected for RP3. True to form, the Commission called for a reduction in determined costs at the European level of 10 per cent in real terms, which Member States (via national regulatory authorities) rejected. Less stringent efficiency targets were subsequently agreed, much to the displeasure of A4E: 'While ANSP requirements fell by 60 percent, they *opted* to reduce their costs by just 1 percent.'¹⁶⁰ The suggestion that ANSPs have a 'choice' over cost reduction fails to recognise the fact that: 'The provision of ATM does not lend itself by design to rapid scalability ... driving down ATM costs, at all costs apparently, whilst expecting the critical infrastructure to be there as traffic returns simply does not work, and it has to stop.'¹⁶¹

Interviews with ANSP managers revealed very different views on RP3 and the TRS mechanism. While some regarded it as a guarantee that they would (eventually) recover lost revenue,¹⁶² others were less sanguine, primarily because, in line with the

¹⁵⁶ European ANSP manager, interview notes.

¹⁵⁷ European ANSP manager, interview notes. It is for this reason that Skyguide, for example, has called for the European Commission and the nation states of Europe to jointly forge new provisions for financing the continent's air navigation services. But 'Until they do, it is the states that must step in to ensure that Europe's ANSPs can continue to perform their mandated mission and help avoid a total collapse of the continent's aviation system.' Go to: https://api.skyguide.ch/wp-content/uploads/2021/03/SKY_Annual_Report_2020_EN_Final.pdf

¹⁵⁸ Go to: <http://www.etf-atm.org/WP/wp-content/uploads/2017/04/RP3-Position-Paper-Final.pdf>

¹⁵⁹ A4E was described by one union official as nothing more than "the megaphone of Ryanair." Interview notes.

¹⁶⁰ Thomas Reynaert, Managing Director of A4E, emphasis added. Go to: <https://a4e.eu/publications/europes-airspace-users-expected-to-cover-up-to-e5-4-bn-in-lost-ansp-revenues-through-higher-atc-charges-beginning-in-2023/>

¹⁶¹ Go to: https://www.etf-europe.org/wp-content/uploads/2020/06/03062020-ETF-letter_withdrawal-statement_final.pdf Agreed targets might be less stringent but still demand significant cost reduction during RP3.

¹⁶² NATS, for example, while recognising that 'The regulatory framework was never designed for an event as unprecedented as COVID-19', nonetheless maintains that 'provision exists for regulatory settlements to be re-set

independent Performance Review Commission (PRC) of EUROCONTROL, they recognised that: 'the current Air Navigation Services (ANS) cost recovery schemes in Europe were not designed to cope with a crisis of this magnitude.'¹⁶³ In the words of one union official, "If the TRS worked as it's supposed to work [in a downturn], it would ruin the airlines."¹⁶⁴ For ATCOs and their representatives, the pandemic has finally demonstrated that:

"This is not sustainable. We said this when the performance scheme was introduced, but we had no proof, we'd never had that big a reduction in traffic, certainly not over a sustained period. Now with COVID, we have the proof: it's not sustainable."¹⁶⁵

Some ANSPs have committed to retaining price reductions agreed prior to the pandemic, albeit only through a combination of government assistance, increasing debt and sustainable cost savings.¹⁶⁶ In contrast, price increases, whether planned or implemented, appear to hinge on the relationship between ANSPs and national regulatory authorities and/or airlines, especially whether airlines are represented on the board of the ANSP. In the UK, for example, NATS rejected the Civil Aviation Authority's (CAA) price control for RP3 (2020-24), leading to a referral to the Competition and Markets Authority, whose findings were then overtaken by COVID-19. The CAA will now reset the price control by the start of 2023, creating an additional year of reconciliation (i.e., pushing out the recovery of costs into the future) which will put more pressure on affordability and financing.¹⁶⁷ Put differently, shareholders may need to provide additional support for NATS regulated business. This is consistent with airlines' request for a new cost baseline (i.e., 'affordable' charges defined as no increase in real terms or a decrease) and an extended recovery period, with no steep increase in charges and cost sharing by shareholders and the government.¹⁶⁸

Where ANSPs have maintained a cooperative relationship with airlines, managers are more confident in their ability to raise prices to recover lost revenue. AEROTHAI,

following major traffic shocks, and this is the case for RP3.' NATS Holdings Ltd, *Annual Report and Accounts Year ended 31 March 2020*.

¹⁶³ Go to: <https://www.eurocontrol.int/news/eurocontrols-prc-publishes-prr-2020> As the PRC note in its draft report for 2021, 'With a large part of the ANSPs costs being fixed in the short term, the immediate cost containment measures implemented by European ANSPs could only reduce the gate-to-gate ATM/CNS costs by 5.0% in 2020 compared to 2019.' Go to: <https://www.eurocontrol.int/sites/default/files/2022-03/eurocontrol-draft-performance-review-report-prr-2021.pdf>

¹⁶⁴ Interview notes.

¹⁶⁵ Interview notes.

¹⁶⁶ AirServices Australia, for example, last increased prices in 2015, which allowed the company to recover all reasonably incurred costs related to the delivery of services (including a return on capital employed), and then reduced prices by 2 per cent in 2019. Significant sustainable costs from staff are anticipated in future financial years, falling from AUS\$774.6 million in 2020-21 to AUS\$616.5 million in 2022-23 and AUS\$570.2 million by 2024-5.

¹⁶⁷ In August 2020, NATS agreed additional bank facilities for NERL of UKE380 million through to July 2022. In June 2021, NERL completed a full refinancing of its debt structure. It secured UKE1.6 billion of funding by issuing UKE750 million of unsecured bonds and agreeing UKE850 million of new unsecured bank facilities. This enabled the repayment of more expensive secured bonds in place since 2003 and of existing bank borrowings, including the UKE380 million facility agreed in August 2020 which provided immediate liquidity in response to Covid.

¹⁶⁸ CAA (2021) *Economic Regulation of NATS (En Route) plc: Update on Approach to the Next Price Control Review*, CAP 2119. When these matters are considered by the CAA, the question of government support as an alternative to regulatory intervention is not factored into the economic regulation of NATS as a public private partnership, even though the government holds a 49 per cent share (the Airline Group holds 42 per cent, NATS staff hold 5 per cent, and LHR Airports Ltd hold 4 per cent).

for example, has 112 airline shareholders¹⁶⁹ and has maintained comparatively low user charges (the 7th lowest in the Asia-Pacific region) that have not increased for more than a decade. This gives the company some confidence (and justification) that it can raise charges if revenue losses reach a critical point.¹⁷⁰ In contrast, more commercially oriented ANSPs would appear to have more difficulty persuading airlines of the propriety of (significant) price increases in response to the pandemic, at least if the experience of NAV CANADA (Box IV) is anything to go by.

Box IV. Appealing for Price Restraint

NAV CANADA maintains comparatively low charges and had not increased prices since 2004 – in fact, the company had reduced rates four times over the past 15 years. When COVID hit, NAV CANADA developed a strategy of relying on a combination of government support, cost reductions, and a rate increase. At the very onset of the pandemic, the company sought funding from the Government of Canada that would have allowed it to avoid a rate increase for its customers, but no such funding was provided.¹

As a result, NAV CANADA faced a liquidity shortfall that required CAN\$900 million in new financing. However, to raise this capital, NAV CANADA had to meet an additional indebtedness covenant test on its existing CAN\$1.5 billion of debt. The test required NAV CANADA to demonstrate that it would have sufficient revenues to meet certain costs including a ‘debt service coverage’ multiple of x1.25. As the company could not pass this test, and cost cuts alone (including job losses) could not rectify the problem, the only option that remained was to increase fees on customers.

Therefore, in May 2020, the company announced an average 29.5 per cent increase in charges (effective September 2020)² for the services that it provides its customers as follows:

- terminal service charges increased by 30.8 per cent;
- *en-route* service charges increased by 26.4 per cent;
- North Atlantic *en-route* facilities increased by 48.5 per cent; and
- international communications increased by 41.0 per cent.

The revised charges would allow NAV CANADA to increase borrowings and provide the liquidity needed to navigate the pandemic. Without an increase in revenues, the company faced the prospect of being in breach of its debt covenants, both in relation to its annual certification requirements and as a precursor to raising debt. The company calculated that it required a minimum of CAN\$1,062 million to meet its debt covenant whereas the traffic forecast for its 2021 fiscal year translated to projected revenues of CAN\$820 million, leaving a shortfall of CAN\$242 million. This shortfall translated to the 29.5 per cent increase that makes up the revised charges.

¹⁶⁹ Airlines have a minority shareholding of Baht 60 million compared to the government’s shareholding of Baht 600 million.

¹⁷⁰ Interview notes.

NAV CANADA could have raised its rates by 42 per cent to cover all its financial needs, and effectively break-even, but chose instead to proceed with a rate calculation that allowed it to meet its debt covenants and raise new debt. This option permitted it to use its borrowing capacity to replace the cash shortfall rather than doing so solely through charges to its customers. Despite this calculation, WestJet's CEO described the 'price hike' as 'scandalous'³ and the airline launched an appeal to the Canadian Transport Agency (the national transport regulator).⁴

WestJet's appeal cited what the airline regarded as: (i) a 'less than transparent' methodology used to determine the rate increase, and (ii) charges that were not 'reasonable and prudent' (i.e., the rate increase would generate revenues in excess of NAV CANADA's current and future financial requirements in relation to the provision of civil air navigation services), as set out in Subsection 35(1) of the Civil Air Navigation Services Commercialization Act, 1996 (CANSCA). WestJet submitted that since NAV CANADA has a monopoly, its ability to unilaterally increase prices, which ultimately get passed on to passengers, can only be tempered through price regulation, an appeal to the Canadian Transport Agency or full privatization.

NAV CANADA maintained that WestJet's Appeal was in fact a misplaced appeal to the Government of Canada for financial aid. In its submission to the Canadian Transport Agency, NAV CANADA pointed out that the consideration of what is 'reasonable and prudent' does not include an analysis of external circumstances in the aviation industry, as confirmed by the Agency in Decision No.650-NC-A-2003, which states: the phrase 'reasonable and prudent', as it is used in paragraph 35(1)(i) of the CANSCA does not include a consideration of either the financial condition of NAV CANADA's customers or the general condition of the industry in which NAV CANADA's customers operate, or whether NAV CANADA's charges are set at the most efficient and cost-effective levels so as to ensure the continued competitiveness of the carriers served by NAV CANADA. In this same Decision, the Agency also stressed that, like any private corporation, NAV CANADA 'is required to act in its own best interests and not in the interests of any particular stakeholder in making its business decisions.'

The Agency agreed with NAV CANADA, dismissed WestJet's Appeal, and prices increased by almost 30 per cent.

Notes:

1. NAV CANADA did receive CAN\$86 million in the 2020 fiscal year through the Canada Emergency Wage Subsidy program. It is worth noting that NAV CANADA has a less conservative financial profile - higher debt/capital ratio - than many other major ANSPs (e.g., AirServices Australia and DFS). All else being equal, the higher the debt-to-capital ratio, the riskier the company (i.e., the more the company is funded by debt than equity, which means a higher liability to repay the debt and a greater risk of forfeiture on the loan if the debt cannot be paid timely). A price increase is therefore more attractive than more borrowing.

2. The increase was subsequently deferred to September 2021.

3. Go to: <https://simpleflying.com/westjet-nav-canada-price-hikes/>

4. Canadian Transport Agency (2021) Appeal by WestJet against NAV CANADA, pursuant to section 42 of the Civil Air Navigation Services Commercialization Act, SC 1996, c20 (CANSCA), regarding NAV CANADA's revised charges, Case No.20-08300. 12th January Decision NO.4-A-2021.

An alternative to raising prices to recover lost revenue is to contain or cut costs by reducing service levels. If anything, this strategy appears to have generated even stronger opposition from a variety of stakeholders who clearly still consider the provision of ANS to be a 'public good'. In Canada, for example, local communities and their political representatives vehemently opposed NAV CANADA's plans to

their countervailing power) as the direct customer would also remove any (limited) existing constraint that is placed on Airways' behaviour.¹⁸¹

New Zealand's Ministry of Transport agreed that 'while many of the things that Airways are doing are sensible for its business and the SOE [state-owned enterprise] model ... it is causing some issues in the system ... [specifically] ... whether Airways has the right incentives through the SOE model to consistently support broad transport system outcomes.'¹⁸² This is a diplomatic way of saying that profiting from the exploitation of private goods cannot be allowed to trump the provision of public goods. Faced with concerted opposition – documented in Annex II – Airways decided not to change its Service Agreement.

If there is one lesson from the refinancing and restructuring of ANSPs in response to the crisis, it is that while existing funding mechanisms for commercialised ANSPs might ensure financial liquidity and appropriate service levels during times of growing air traffic, they falter during a global pandemic. To be sure, the COVID-19 pandemic is unprecedented, but it was not entirely unpredictable and there is a very strong possibility that aviation will face similar crises in the future. Consequently, there is now a pressing need to rethink and redesign current financial arrangements and business models in order to (re)build the resilience of ANSPs. As Simon Hocquard, the recently appointed Director General of CANSO pointed out: "While ANSPs were in a strong position to manage the impact of an extreme event – no question about that – it's clear that the longer-term impact on revenue and skill levels have become the most pressing issues to address."¹⁸³

¹⁸¹ According to New Zealand Airports, the nature of the service and the customer would not change – 'The only thing that is changing is Airways' unilateral view on who it wishes its customer to be.' Unwelcome behaviour on the part of Airways, according to the Ministry of Transport, includes 'signs of rent seeking behaviour in its pricing decisions, and leveraging its monopoly to expand into new services'. Briefing to the Minister of Transport, 'Airways – Structure and Incentives', 31st October 2019. Go to:

<https://www.airways.co.nz/assets/Documents/2021-Service-Framework-Submissions/NZ-Airports-Association.pdf>

¹⁸² Ministry of Transport briefing to the Minister of Transport, 'Air Navigation Services and Regional Connectivity', 9th February 2021, and Ministry of Transport briefing to the Minister of Transport, 'Airways – Structure and Incentives', 31st October 2019. Go to: <https://www.airways.co.nz/assets/Documents/2021-Service-Framework-Submissions/NZ-Airports-Association.pdf>

¹⁸³ ITF Air Traffic Management meeting, 1st July 2021.

VI. Resilient and sustainable ANS

“We have the state behind us, so that gives us some guarantee, some security. The problem is that the airlines want us to reduce our operating expenses, but also ensure that we have the capacity, the resilience.”¹⁸⁴

“If funding was secure, more predictable, we wouldn't shed staff, we'd retain the experience we have and build our resilience.”¹⁸⁵

In December 2021, CANSO and EUROCONTROL hosted a 2-day Global Resilience Summit to “demystify the word ‘resilience’ and what it means for the air traffic management community.” In his introduction to the Summit, Tony Licu, Head of EUROCONTROL’s Safety Unit, pointed out that: “The COVID-19 pandemic demonstrated that the resilience of air traffic management systems is fundamental to ensuring that ATM can plan for, manage and recover quickly from different conditions.”¹⁸⁶ The capacity to ‘recover quickly’ from difficulties is the standard (dictionary) definition of resilience,¹⁸⁷ but recovery from the pandemic has been anything but quick. As resilience is ‘arguably the most important positive resource for navigating a turbulent and stressful workplace’,¹⁸⁸ the pandemic has threatened both individual and organisational resilience.

A resilient workforce?

For individuals, the accepted definition of ‘recovery resilience’ in response to singular or unique events is: “the positive psychological capacity to rebound or “bounce back” from adversity, uncertainty, conflict, failure or even positive change, progress and increased responsibility.”¹⁸⁹ In times of crisis, organisations evidently need resilient employees, especially high-reliability organisations such as ANSPs,¹⁹⁰ as ‘the ATM workforce ... [is] ... the most critical source of its performance, safety and resilience.’¹⁹¹

To be resilient, employees need *confidence* (i.e., having feelings of competence, effectiveness in coping with stressful situations and strong self-esteem), *adaptability* (i.e., flexibility and responsiveness to changing situations beyond the immediate

¹⁸⁴ ANSP manager, interview notes.

¹⁸⁵ ATCO, interview notes.

¹⁸⁶ Opening remarks, Tony Licu, Head of EUROCONTROL Safety Unit. Go to: <https://www.eurocontrol.int/event/canso-eurocontrol-global-resilience-summit-2021>

¹⁸⁷ <https://www.lexico.com/en/definition/resilience>

¹⁸⁸ Avey JB, Luthans F and Jensen SM (2009) Psychological capital: a positive resource for combating employee stress and turnover. *Human Resource Management* 48(5): 677-93.

¹⁸⁹ Luthens F (2002) The need for and meaning of positive organizational behavior. *Journal of Organizational Behavior* 23, p.702.

¹⁹⁰ LaPorte and Consolini, *op. cit.*

¹⁹¹ SESAR (2015) *European ATM Master Plan: The Roadmap for Delivering High Performing Aviation for Europe*, p.iv. Go to: <https://www.sesariu.eu/node/2865>

control of the individual), *purposefulness* (i.e., having a clear sense of purpose, clear values, drive and direction), and strong *social support* from the organisation (i.e., positive relationships with co-workers and management, both directly on a one-to-one basis and indirectly via trade union representation or a professional association). It is difficult to maintain a sense of purpose when the future is so uncertain, and this also undermines adaptability as staff might feel helpless in the face of external events. Most notably, as previously documented in this Report, staff expressed concern about the attrition of skills and consequent erosion of confidence in their ability to cope if traffic suddenly ‘bounces back’,¹⁹² a concern compounded by the difficulties of maintaining on-the-job training as ANSPs sought to control (cut) costs.¹⁹³ The danger, as Steve Cotton, the ITF’s General Secretary pointed out, is that: “Professional standards are taken for granted. But what happens [to the skill set] when you pull out 18 months of personal development?”¹⁹⁴

As many ANSPs reported being understaffed prior to the pandemic, the resilience of the workforce is a major concern in the context of a crisis-induced freeze on recruitment and training, the challenge of revalidating licences,¹⁹⁵ and significant job losses in many countries. The staffing policies of the more commercialised ANSPs such as NAV CANADA and NATS, both during and before the pandemic, are a particular cause for concern. One of NAV CANADA’s major airline customers, for example, was perturbed by the company’s recent job cuts and how this might constrain the recovery, especially as: “It takes eons to train a new controller.”¹⁹⁶ NATS has also cut jobs and student training during the pandemic, yet prior to the outbreak of COVID-19 was found to be in breach of its licence due to a persistent lack of staffing resilience at Stansted and Luton airports and the failure to anticipate and implement adequate and timely steps to resolve these issues.¹⁹⁷ When commercialised ANSPs answer to shareholders and are beholden to market forces, they are more likely to adopt a shorter-term perspective (a focus on the present) that is out of sync with the longer-term requirements for human resource planning and the future well-being of employees.¹⁹⁸

¹⁹² In almost every interview with ATCOs, concerns were raised about “controllers losing confidence and capacity – the personal capacity – to deal with any sudden increase in traffic.” A recent study by AustroControl found that skills will typically ‘fade’ after 3 months in a low traffic environment. Recently learned skills that have not yet had a chance to embed (e.g., new procedures and/or technical skills) can start to recede in just 2 weeks to 2 months. Even more established complex skills (e.g., applying traffic management initiatives or deviations due to poor weather conditions) can recede between 3 to 6 months. Go to: <https://canso.org/publication/covid-19-restart-and-recovery-guide/>, p.7. At larger ACCs, ATCOs reported that there was more scope to keep skills current whereas those at smaller ACCs and towers expressed greater concern about skills degradation and “experience drift”. Interview notes.

¹⁹³ Go to: <https://www.ifatca.org/covid-19-survey/> As one ATCO pointed out, restarting a complex socio-technical ATM system “isn’t like starting your car, turn the ignition key, into first gear, release the handbrake and off you go.” Interview notes.

¹⁹⁴ ITF ATM meeting, 1st July 2021.

¹⁹⁵ Faced with these difficulties, many countries extended the period for licence revalidation during the pandemic (e.g., the Directorate General of Civil Aviation in Turkey extended the validity of training and health and safety certificates for ATCO and air traffic safety employees from March to the end of July 2020, and in Barbados the Civil Aviation Department extended licences for ATCOs by 6 months from April 2020).

¹⁹⁶ Interview notes

¹⁹⁷ The UK’s CAA concluded that several underlying issues identified by the company – including short term illness, early retirements, and the challenges and limitations of on-the-job training – were long-standing and therefore reasonably foreseeable factors that should be built into effective human resource planning, ideally with some margin for error.

¹⁹⁸ State-owned enterprises tend to adopt a longer planning horizon. AEROTHAI, for example, operates a 5-year and 10-year human resources plan.

Personal resilience is not simply an innate trait, but rather a dynamic process that interacts with the external environment and internal organisation of the ANSP.¹⁹⁹ Adapting to an external crisis that is beyond the immediate control of the individual, whilst retaining one's sense of purpose when the future is so uncertain, demands strong social support within the organisation. In contrast, commercial pressures led several ANSPs to abandon social dialogue and cooperative relationships with trade unions and professional associations in favour of managerial fiat²⁰⁰ – in all cases to the detriment of personal and organisational resilience (see, for example, Boxes II and III). In times of crisis, social dialogue is *more*, not less important to sustaining organisational resilience.²⁰¹

Are ANSPs resilient?

By design, ANSPs are operationally resilient organisations, with the resources and capabilities to maintain safe and efficient service levels under a wide range of conditions (e.g., the peaks and troughs of daily flights, seasonal variation, and pro-cyclical demand). ANSPs are expected to respond to the actual (know what to do), monitor the critical (know what to look for), anticipate the potential (know what to expect), and learn from the factual (know what has happened).²⁰² This (engineering) process constitutes the 'intrinsic ability of [an ATM] system to adjust its functioning prior to, during, or following changes and disturbances.'²⁰³

ANSPs could be criticised for not learning from what happened in the past, in particular the impact of putting investment and technological upgrades 'on hold' after both 9/11 and the global financial crisis, which subsequently played no small part in the capacity constraints experienced by many service providers prior to the COVID-19 outbreak. Figure 17 depicts the impact of COVID-19 on investment plans in Europe, a pattern repeated around the world as investment has once again been scaled back or postponed. As Alex Bristol, CEO of Skyguide has pointed out, when faced with unprecedented commercial pressures, ANSPs can find it difficult to do anything other than cut back on investment simply maintain the status quo.²⁰⁴ That said, as Skyguide and many other ANSPs acknowledge, without on-going investment to upgrade human and physical capital, the status quo is not sustainable.

¹⁹⁹ According to the charity MIND, 'Resilience is not just your ability to bounce back, but also your capacity to adapt in the face of challenging circumstances.' Go to: <https://www.mind.org.uk/information-support/types-of-mental-health-problems/stress/developing-resilience/>

²⁰⁰ The IAA, for example, experienced industrial relations difficulties and conflict in late 2021, leading to the Authority seeking independent mediation to help resolve matters. NATS has experienced a similar pattern of cooperation turning to conflict. As an international trade union representative remarked, "Too many ANSPs are reverting to old habits, the hard bargaining approach rather than cooperative social dialogue." Interview notes.

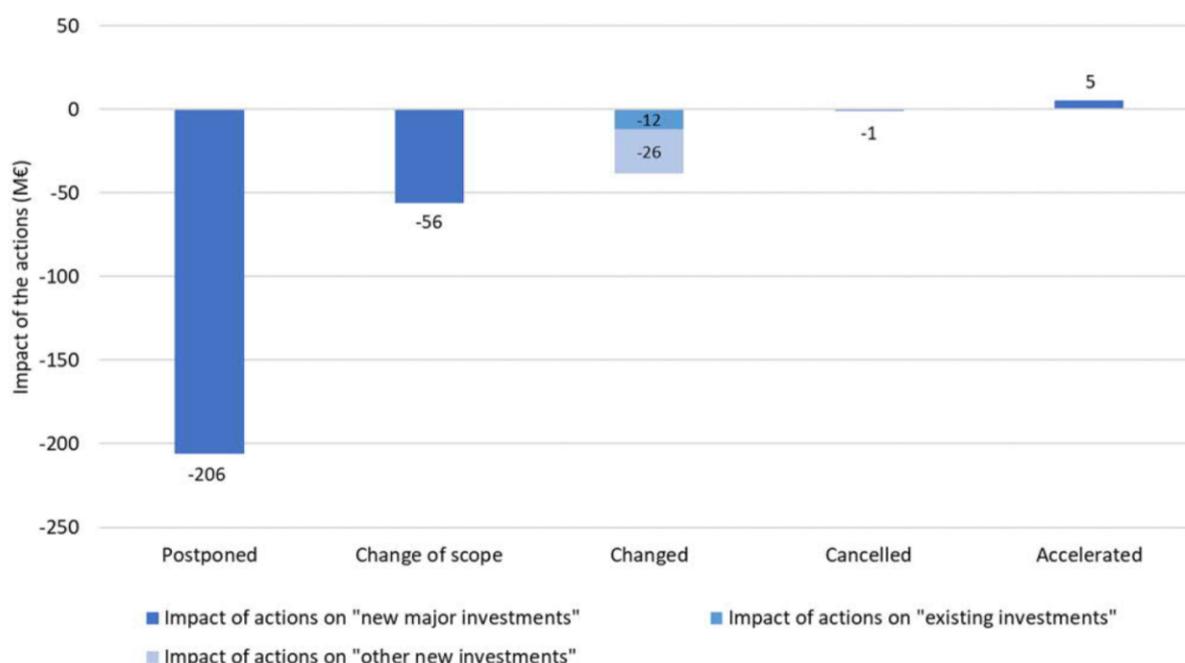
²⁰¹ Go to: http://www.atceuc.org/uploads/docs/brochure-change-management_final.pdf

²⁰² Hollnagel E (2009) The four cornerstones of resilience engineering. In Nemeth CP, Hollnagel E and Dekker SWA (eds.) *Resilience Engineering Perspectives*, Vol.2: Preparation and Restoration, Farnham: Ashgate, pp.117-33.

²⁰³ EUROCONTROL *White Paper on Resilience Engineering for ATM* (emphasis added). Go to: <https://www.eurocontrol.int/sites/default/files/2019-07/white-paper-resilience-2009.pdf>

²⁰⁴ Go to: <https://www.eurocontrol.int/event/canso-eurocontrol-global-resilience-summit-2021> A manager at one company commented that: "As a commercial ANSP, we're financially resilient in terms of our ability to access money from the financial markets. But the company isn't so resilient when it comes to costs, because we're a people-dependent business and we have big capital investments." Interview notes.

Figure 17. Impact of COVID-19 on Investment Plans of European ANSPs²⁰⁵



Organisational resilience is not simply about the ability to accommodate and manage adverse and disruptive situations, but the capacity to capture or realise any presenting opportunities.²⁰⁶ While it might seem counterintuitive to think of COVID-19 as presenting an opportunity for ANSPs, it should be noted that several ANSPs have used the pandemic to accelerate planned investment and organisational redesign that will enhance future organisational resilience. For example,

- ➔ ENAV has been able to accelerate the process of consolidating four ACCs into just two, giving the organisation greater scope for workforce flexibility as demand dictates, thereby increasing capacity and scalability.
- ➔ In Hong Kong, a new spacing management system and enhanced wake turbulence separation minima were introduced in November 2020 during what the Civil Aviation Department described as a 'conductive' (low traffic) environment. This enabled ATCOs and airline pilots to become competent and confident with the new system before traffic returns to pre-pandemic levels.
- ➔ At Changi Airport (Singapore), trials introduced during low traffic conditions included new continuous descent and climb operations, time-based sequencing of arrivals, user-preferred routes, and digital tower operations.

For ANSPs around the world, new technologies that are more flexible and scalable are widely regarded as the route to greater resilience and a more sustainable service in the face of future crises that will no doubt befall the industry. This is not to gainsay the importance of human factors – when the technology goes wrong the only back-

²⁰⁵ Source: EUROCONTROL

²⁰⁶ Sutcliffe KM and Vogus T (2003) Organizing for resilience. In Cameron KS, Dutton JE and Quinn RE (eds) *Positive Organizational Scholarship: Foundations of a New Discipline*. San Francisco: Berrett-Koehler, 94-110. The capacity to turn threats into opportunities is often referred to as 'strategic resilience'.

up is people – rather to highlight the potential of digital technologies, data management systems, ADS-B, remote towers, and other innovations with the potential to transform the very nature of ATM.²⁰⁷ According to research by CANSO’s Global Benchmarking Workgroup, the majority of ANSPs anticipate an increase in digitisation and a similar number anticipate being able to make scalable up to 30 per cent of total future costs.²⁰⁸ It goes without saying, however, that as the return of traffic and revenue to pre-pandemic levels is still uncertain, ANSPs face short- and medium-term threats to liquidity and their ability to invest.

In Europe, the threat to future investment has been exacerbated by exceptional measures under the TRS mechanism that extends the recovery of ANSPs’ revenue losses for 2020 and 2021 from the usual 2 years to a period of 5 to 7 years.²⁰⁹ While European ANSPs are expected to ‘adjust their operations to the new realities’ (i.e., find alternative sources of cash to finance their operations), ‘airspace users are shielded from a sudden increase of ANS charges during recovery from the COVID-19 pandemic.’²¹⁰ This asymmetry reflects a structural weakness in the commercial (user pays) approach to ANS, which the PRC considers: ‘will become unsustainable in the next few years. The PRC therefore recommends that States consider assessing options with the view to revising the current charging scheme, (for instance by restructuring debts *or by having a mix of financing between State budget and air navigation charges*).’²¹¹

Can (or will) users pay?

When traffic does return, ANSPs will face ever more stringent environmental standards, new demands on their services (e.g., UAVs) and, most crucially, reduced revenue streams and more intense pressure from airlines to cut charges by reducing operating costs. Reduced revenue streams are not simply a result of traffic volumes, but also traffic composition. Airservices, for example, derives 60 per cent of its revenue from just 30 per cent of its flights, as international flights to/from Australia attract higher charges based on a ‘weight x distance’ formula. With a different mix of aircraft anticipated in the future,²¹² Airservices expects to earn only 80 per cent of the revenue it generated in 2019 when traffic eventually returns to pre-pandemic levels.²¹³ Effective governance of the relationship between airlines and ANSPs is

²⁰⁷ This transformation is often described as ANSPs shifting from ‘asset management’ to ‘data management’. Social dialogue is essential for the successful implementation of new technologies. Go to: http://www.atceuc.org/uploads/docs/brochure-change-management_final.pdf

²⁰⁸ Go to: <https://canso.org/what-does-the-data-say-about-ansps-resilience-through-the-pandemic/>

²⁰⁹ Given the collapse of traffic and the fact that ANSPs are not ‘cost responsive’, the TRS mechanism was expected to result in a massive increase of ANS charges from 2022 under the standard ‘n+2’ formula (i.e., losses incurred in year n=2020 would be recovered in 2022, n=2021 in 2023).

²¹⁰ FAA/ATO and EUROCONTROL (2021) *Special Report on the Impact of the COVID-19 Pandemic on the U.S. and European ANS Systems*. Go to: https://transport.ec.europa.eu/news/special-report-impact-covid-19-air-navigation-service-provision-europe-and-us-2021-12-08_en p.21.

²¹¹ The PRC considers this to be the case regardless of whether user charges are determined according to ‘full cost recovery’ or ‘determined costs.’ Go to: https://ansperformance.eu/publications/prc/news/2021_02_19_prc_news/ (emphasis added).

²¹² Airbus has cancelled production of the A380 as airlines have opted to instead fly more efficient twin-engine jets like the Airbus A350 and Boeing 787.

²¹³ Likewise, ATNS has higher margins on larger aircraft and in recent years has benefitted from hub carriers flying larger aircraft to South Africa. However, with the pandemic limiting national travel, coupled with fewer

therefore critical for the resilience and sustainability of ANS. Aviation might be a competitive business, but it is also a network of interdependent organisations and integrated activities, characterised by public goods, legal obligations, and highly dependent on both inter- and intra-organisational cooperation. The pre-pandemic direction of travel was all too often the very opposite.

In different markets around the world, pre-pandemic traffic growth was largely generated by low-cost airlines.²¹⁴ With a multi-base operation that enables low-cost airlines to respond more flexibly to changes in travel restrictions imposed by different countries, there is already evidence that low-cost carriers will recover more quickly than network airlines operating a ‘hub-and-spoke’ system from their ‘home’ (hub) base.²¹⁵ As a result, if low-cost airlines continue to increase their share of traffic, and if it is indeed low-cost airlines that drive the recovery, then ANSPs can expect ever greater pressure to cut costs under current user-pays charging.

All airlines, whether low-cost or network carriers, will be expected to pay more for ANS (to enable ANSPs to recover lost revenue) at a time when they can only afford to pay less (due to their own revenue losses and repayments on loans secured to ensure their survival during the pandemic).²¹⁶ The increase in airport and ANS charges worldwide was already estimated to be US\$2.3 billion by October 2021. Willie Walsh, IATA’s Director General, expressed his outrage in no uncertain terms: ‘placing the financial burden of a crisis of apocalyptic proportions on the backs of your customers, just because you can, is a commercial strategy that only a monopoly could dream up. At an absolute minimum, cost reduction – not charges increases – must be top of the agenda for every airport and ANSP.’²¹⁷ As an ATCO pointed out somewhat wryly, “Airlines are happy with user pays, as long as that means pay less.”²¹⁸

international flights, ATNS expects this trend to be reversed as airlines shift to lower frequency services and smaller aircraft.

²¹⁴ In Europe, the seat capacity of low-cost airlines more than trebled between 2004 and 2013, and by 2020 these airlines offered more than 40 per cent of all seats on short- and medium-haul flights. Over the same period, low-cost airlines increased their market share (seats offered) from just over 20 per cent in North America to well over 30 per cent, and from just over 5 per cent to more than 25 per cent in the Asia-Pacific region. Worldwide, low-cost airlines had a market share of 35 per cent by 2020. Go to:

<https://www.statista.com/statistics/586677/global-low-cost-carrier-market-capacity-share/>

²¹⁵ For example, prior to the pandemic, Ryanair operated from more than eighty bases across Europe. In the last week of March 2022, Ryanair flights were up 13 per cent on the same week in 2019 while network airlines were still down by 20 per cent or more (e.g., KLM and Air France), more than 30 per cent (e.g., BA), or more than 40 per cent (e.g., Lufthansa and SAS). Go to:

<https://www.eurocontrol.int/sites/default/files/2022-03/eurocontrol-comprehensive-air-traffic-assessment-20220331.pdf> As traffic picked up across the European network in May 2022, low-cost airlines continued to fare much better than their network rivals. Go to: <https://www.eurocontrol.int/publication/eurocontrol-comprehensive-aviation-assessment> It is also worth noting that Southwest Airlines and Ryanair, the market-leading low-cost airlines in North America and Europe respectively, have a much better debt-to-equity ratio compared to network airlines and are therefore in a stronger position to recover from the crisis.

²¹⁶ Airlines have one of the lowest returns on capital employed (ROIC) of any industry. ROIC, defined as net operating profit after tax divided by invested capital, is a measure of how well a company is using its capital to generate profits. Go to: <https://centreforaviation.com/analysis/reports/airline-profitability-airlines-can-no-longer-afford-to-be-the-poor-relations-of-aviation-117521> IATA estimated that public support for aviation exceeded US\$225 billion globally between March 2020 and March 2021, which helps to explain why fewer airlines entered bankruptcy worldwide in 2020 (43 airlines) compared to 2008 (56) and 2009 (46) in the wake of the global financial crisis. At some point in the not-too-distant future, lenders will want their money back, and airlines will find it more difficult to repay loans due to worsening credit ratings and higher financing costs. Go to: <https://www.economist.com/business/2021/07/06/which-airlines-will-soar-after-the-pandemic>

²¹⁷ Go to: <https://www.iata.org/en/pressroom/2021-releases/2021-10-04-06/>

²¹⁸ Interview notes.

When a commercial logic prevails, with contractual ‘market exchanges’ between different parties that focus on performance metrics (Table 1), conflicts of interest are bound to surface and might stymie the recovery of ANSPs. More effective governance can only come about through an integrated approach that considers the entire value chain comprised of three key components – airlines, airports, and ATM – and a range of ancillary services and suppliers.

Within this integrated (network) system, ANS is a ‘high value, low cost’ element of an airline’s total operating expenses, as illustrated in Figure 18. Note that, given the high proportion of operating costs accounted for by fuel and oil, the proportion of different cost elements listed in Figure 18 will be highly sensitive to global oil prices (currently rising steeply due to inflation and the war in Ukraine) but also different business models. Low-cost airlines have much lower labour costs compared to network airlines, often because cabin crew are employed on ‘atypical’ (temporary/agency) contracts and flight crew are hired as ‘self-employed’ pilots.²¹⁹ Tantamount to ‘social dumping’,²²⁰ these contractual arrangements not only distort competition between airlines, causing a ‘race-to-the-bottom’, but also increase the proportion of non-labour operating expenses for low-cost airlines, including ANS.²²¹

²¹⁹ Harvey G and Turnbull P (2012) *The Development of the Low Cost Model in the European Civil Aviation Industry*, Brussels: ETF. Go to: http://www.etf-atm.org/WP/wp-content/uploads/2016/03/190_Final-Brochure-LFAs-220812.pdf; Harvey G and Turnbull P (2014) *Evolution of the Labour Market in the Airline Industry due to the Development of the Low Fares Airlines (LFAs)*, Brussels: ETF. Go to: https://www.etf-europe.org/wp-content/uploads/2018/10/271014_LFA-final-report-221014.pdf

²²⁰ Turnbull P (2020) Tackling Undeclared Work in the Air Transport Sector, with a Special Focus on Bogus Self-Employment of Aircrews: a Learning Resource, Brussels: European Platform Tacking Undeclared Work. Go to: <https://ec.europa.eu/social/BlobServlet?docId=23097&langId=en>

²²¹ In Europe, A4E has criticised states for ‘protect[ing] their monopoly ANSPs and themselves from paying for revenue gaps’ (go to: <https://a4e.eu/publications/europes-airspace-users-expected-to-cover-up-to-e5-4-bn-in-lost-ansp-revenues-through-higher-atc-charges-beginning-in-2023/>) but its low-cost members in particular benefit from state funding to airports. For example, almost a quarter of the EU airports served by Ryanair are likely to be loss-making and propped up by taxpayers’ money. More than fifty of the low-cost carrier’s 214 airports served are either documented to be receiving subsidies (35) or have fewer than 500,000 passengers a year (17) – a conservative estimate of the threshold for profitability. For example, nearly half of Ryanair’s struggling airports are in France (16) and Italy (7), where they receive state aid from governments and local authorities through direct payments or tax exemptions. Paris Vatry, for example, served just 108,000 passengers in 2017 yet received EUR€3 million in public subsidies – just under EUR€30 per passenger. Go to: <https://www.transportenvironment.org/discover/24-ryanair-airports-likely-be-propped-subsidies-fueling-rapid-emissions-growth/> For the case of Montpellier in France, go to: https://ec.europa.eu/commission/presscorner/detail/en/IP_19_4991

Figure 18: European Airline Operating Expenses²²²



When viewed from the perspective of ATM within an integrated value chain, the pandemic has demonstrated that the system is simply not resilient and therefore not sustainable. In Europe, airlines are bracing themselves for a significant increase in ANS charges under the TRS mechanism. But consider the impact of the opposite process that has prevailed in recent years, namely a reduction in ANS charges under the logic of governance via the market. As previously documented in this Report, cost reduction targets for ANSPs are often ‘challenging’ and can lead to an undue focus on labour costs (given that labour costs typically account for around 50-70 per cent of ANSPs total operating costs). For example, under the second reference period of the Single European Sky performance scheme (RP2: 2015-19), NATS was required to reduce ANS charges by 5.1 per cent. In 2015, IATA estimated that the average price for a return airfare was around UK£300. At the time, ANS charges were estimated to account for just 5.81 per cent of airline operating costs (Figure 18), or UK£17.43 of the ticket price. Thus, a significant cost reduction for the ANSP translated into an insignificant price reduction for the passenger of just UK£1 (assuming this price reduction is passed on from the airline to the passenger).²²³ If

²²² Go to: <https://library.prospect.org.uk/id/2015/September/11/Towards-sustainable-aviation-industry-UK?display=preferred>

²²³ An Austrian ATCO made a similar point: “A 25 per cent reduction in charges would of course be welcomed by the airlines, but it doesn’t do much for the passengers and it would kill the ANSPs” (interview notes).

the ‘user’ who pays for ANS is genuinely the passenger rather than the airline, with cost items clearly listed on a paper ticket (as illustrated in Figure 18) or digital app, would passengers balk at paying an extra UK£1 for a safe, on-time flight?

It’s not just the ticket

The COVID-19 crisis has once more raised fundamental questions about the funding of ANS, specifically: ‘who pays’, ‘what are they paying for’, and ‘how much do they pay’? If the crisis has demonstrated anything, it is that air navigation services are a public good – it was essential to keep the skies open and safe for cargo and other flights throughout the pandemic,²²⁴ and *everyone* benefitted from these flights (e.g., provision of PPE, medical supplies, and vaccines). States have demonstrated their willingness to provide financial support for ANSPs during the crisis to protect the public interest, and it is not unreasonable for states to fund the basic infrastructure and 24/7 ‘core operations’ with minimal staffing from general taxation on an on-going basis.²²⁵

In the USA, air transport infrastructure is a budgetary responsibility of the Federal Government, with expenditures authorised by Congress each year according to the requirements of the Federal Aviation Administration (FAA).²²⁶ Excise taxes are imposed on domestic passenger tickets, domestic flight segments, international passenger arrivals and departures, purchases of air travel miles for frequent flyer and similar programs, air cargo waybills and aviation fuel purchases. The largest source of excise tax revenues is related to the transportation of domestic passengers (more than two-thirds of all taxes) and international tickets (more than a quarter of all taxes). Strictly speaking, therefore, there are no revenues or charges, only taxes on passenger tickets and freight, and there is full transparency of these taxes.

In 2020, under the Coronavirus Aid, Relief and Economic Security Act, the US Congress imposed an excise ‘tax holiday’ from 27th March to 31st December 2020 (i.e., suspension of certain excise taxes that fund the FAA), including taxes on transportation of persons and property by air as well as aviation fuel for commercial use. Following the drop in aviation taxes and surcharges, Congress appropriated a US\$14 billion transfer from the Treasury’s general fund to support the entire FAA budget. These measures were more expeditious than previous annual appropriations that can be subject to ‘pork barrel politics’ (i.e., appropriation of government spending for local projects or to bring more money to the district of a political representative), which in the past has created a ‘stop-and-go’ funding stream that can serve to: ‘undermine air traffic control services, staffing, long-term modernization projects, preventative maintenance, and ongoing modernization to the physical infrastructure. It also slows the hiring and training process while preventing the timely implementation of modernization programs and the

²²⁴ Although cargo flights in Europe account for a comparatively small share of the total flights, the need for goods and equipment to fight the pandemic resulted in a 2 per cent increase in all-cargo flights in 2020. Go to: <file:///Users/peteturnbull/Downloads/Special%20report%20on%20COVID-19%20impact%20on%20the%20US%20and%20European%20ANS%20systems.pdf> p.10.

²²⁵ Minimum capacity – or ‘service for one flight’ – should include all operational facilities (ACCs and towers) and maximum consolidation of sectors (‘night-time configuration’), calculated on the basis of services for IFR traffic only. The determination of minimum capacity should also include other ANS functions (e.g., CNS) and maintenance.

²²⁶ The Airport and Airway Trust Fund (AATF) provides the primary source of funding for the FAA. Expenditures from the Trust Fund are subject to Congressional appropriations and included in the Federal budget.

integration of new users into the system.²²⁷ Clearly, any system of governance and funding of ANS must be founded on cooperative and expeditious ways of mediating between all the different organisations and interests in the ATM system. That said, the FAA ‘continues to provide the world’s safest and most efficient air traffic services during the COVID-19 public health emergency.’²²⁸

Political interference is a common criticism of state ownership and funding via general taxation (procedural forms of governance described in Table 1), but a commercial approach to ANS based on the user pays principle is itself a *political choice* – ANS is a ‘natural monopoly’, not a ‘natural market’²²⁹ – and there is extensive ‘interference’ from (more or less) independent regulators. For example, under price cap regulation, conflicts of interest arise between regulators who determine efficient costs and ANSPs who must operate under actual costs. Hence the recommended alternative approach for the state to fund the minimum level of service and staffing needed to protect the public interest. One of the consequences of COVID-19, with traffic at times reduced to essential services only, is that states and ANSPs now appreciate the actual cost of ensuring that the public good is protected (e.g., most ANSPs needed around 50-60 per cent of normal staff levels to ensure the skies remained open and safe during the pandemic). Funding the minimum service/staffing from general taxation is not unreasonable, especially as many more people now have the option to fly. For example, in 2020, the average ticket price for a Ryanair flight was just EUR€38,²³⁰ which the Austrian government has calculated to be less than the actual cost of flying.²³¹

Fair pricing for ANS

Just as a nation’s road network is typically funded from general taxation and a car tax or tolls for those who use the network, a similar approach is entirely feasible for ATM. With essential service levels and staffing fully funded by the state, an additional (transparent) tax on tickets for ANS (as per Figure 18) would no doubt represent a price worth paying for a safe and on-time flight. Equally important, this would provide passengers with the information they need to understand the ‘real cost’ of flying in terms of safety, environmental impact, and maintaining high social standards. Moreover, if user charges are levied on airlines only for the cost of flights beyond the minimum (public good) service level funded by the state, then ANS charges will represent a much smaller proportion of the airline’s operating expenses.

²²⁷ Evidence of the National Air Traffic Controllers Association (NATCA) to the Subcommittee on Aviation Safety, Operations, and Innovation Committee on Commerce, Science, and Transportation, United States Senate. Go to:

<https://www.commerce.senate.gov/services/files/3CF245B2-F486-4EF3-BA98-470459DF33E5>

²²⁸ Go to: https://transport.ec.europa.eu/news/special-report-impact-covid-19-air-navigation-service-provision-europe-and-us-2021-12-08_en p.25.

²²⁹ As previously noted, a ‘contestable market’ can be created for tower operations, but the downside is a fragmentation of service provision and providers who ‘come and go’ (e.g., Air Navigation Solutions at Gatwick, UK). The ‘choice’ made by states is to shift the cost of a ‘public good’ onto ‘private users’.

²³⁰ Average ticket prices for other European low-cost airlines were just EUR€63 for easyJet and EUR€73 for Wizz Air (IAG posted the lowest ticked average ticket price for a network airline at EUR€176). Go to: <https://www.statista.com/statistics/1125265/average-ticket-price-selected-airlines-europe/>

²³¹ In June 2020, the Austrian government proposed a minimum ticket price of EUR€40 to prevent airlines selling tickets for less than the actual cost, justified as a measure to combat social and environmental dumping. Go to: <https://www.aerotelegraph.com/en/austria-defines-a-minimum-price-for-flights>

It is not unreasonable to expect this system of funding and charges to thereby mitigate the conflicts of interest currently witnessed between airlines and ANSPs.

The ideal scenario, of course, is a system that promotes cooperation between all relevant stakeholders, both within the sovereign territory of the nation state and between states at the regional and international levels. The ANSPs who are best placed to 'build back better', with more resilient staff and the capacity for strategic organisational resilience, are those with clear and effective procedural forms of governance and the ability to develop stronger forms of network governance. What is called for is:

- Funding minimum service and staffing levels for ANSPs from general taxation
- Transparent ticket pricing with all service costs clearly identified
- Any system of user charges to include provision for ANSPs to accumulate a 'reserve fund' to ensure organisational resilience when faced with any future crises
- On-going investment in recruitment and training, based on long-term planning to accommodate pro-cyclical demand
- Investment in new (human centred) technologies that will enhance the flexibility and scalability of ANS
- Promotion of social dialogue to (re)build social support and personal resilience within the organisation and the capacity to manage organisational change and external disruption more effectively

Annex I. Economic Studies of ANSPs’ Performance

The commercialisation of ANS was promoted as a way to create stronger incentives for investment, innovation, and more entrepreneurial forms of decision-making. It was therefore expected that a change of ownership and control would improve the performance of ANSPs, thereby confirming the propriety of commercialisation and privatisation.

Initially, however, research found no impact of ownership with respect to productivity, service quality, safety, security,²³² cost efficiency and cost structures.²³³ In fact, some studies found the very opposite of the usual (economic) assumptions in favour of private ownership, demonstrating that ANSPs more closely linked to government were relatively *more* efficient.²³⁴

Faced with this conundrum, transport economists have refined, and redefined, their theoretical models, data sets, and data analysis. For example, by separating *en-route* and terminal activities – which can mask some of the variation between ANSPs as some compete for airport terminal services – a recent study of ownership and performance was able to find support in favour of a public-private ownership form with stakeholder involvement when compared to either a government corporation or a state agency.²³⁵ The results of this study, however, in common with all economic studies of ANSPs’ performance, were heavily influenced by model specification²³⁶ and associated assumptions about the relationships between different variables, sample size/composition, and time period(s).

With regard to model specification, the researchers assumed that the objective of ANSPs is to jointly maximise: (i) the ‘consumer surplus’ of users (airlines), (ii) profits from *en-route* and terminal activities, and (iii) ‘national interest’. The latter was assumed to combine the interests of national manufacturers of air navigation equipment and the interests of trade unions who are assumed to want ‘higher wages and more relaxed working conditions.’²³⁷ The desire for ‘relaxed working conditions’

²³² Button and McDougall, *op.cit.*

²³³ Dempsey-Brench and Volta, *op.cit.*

²³⁴ Button and Neiva (2014a) *op.cit.*, and Button K and Neiva R (2014b) Economic efficiency of European air traffic control systems. *Journal of Transport Economics and Policy*, 48(1): 65-80. All these studies focus on European ANSPs, using data collected by EUROCONTROL for benchmarking analysis. Since 1999, Member States have been required to ensure that ANSPs provide information prepared in accordance with Generally Accepted Accounting Principles and independently audited.

²³⁵ Adler N, Delhaye E, Kivel A and Proost S (2020) Motivating air navigation service provider performance. *Transport Research Part A*, 132(February): 1053-1069. EUROCONTROL requires ANSPs to submit limited separation of key revenue, cost and asset items into those for *en-route* and those for approach and terminal activities (these data are also independently audited).

²³⁶ ANSP cost-efficiency is typically estimated using either Data Envelopment Analysis (DEA) or Stochastic Frontier Analysis (SFA).

²³⁷ Adler et al, *op.cit.*, p.1055. The authors assume that ‘national interests’ will increase the bargaining power of domestic manufacturers and trade unions, thereby increasing costs and reducing productivity (e.g., the technology of domestic manufacturers may be inferior to and more expensive than overseas rivals while trade unions negotiate more ‘relaxed’/less efficient working conditions for their members). Other studies acknowledge that the ANSPs ‘objective function’ will include consumer surplus and national interests, but then excludes these objectives on the grounds that they are ‘more challenging to quantify.’ Buyle S, Dewulf W, Kupfer F, Onghena E, Meersman H and Van de Voorde E (2021) From traditional to professional Air Navigation Service Provider: A typology of European ANSP business models. *Journal of Air Transport Management*, 91, pp.3-4. Go to: <https://www.sciencedirect.com/science/article/pii/S0969699720305858> Results might be robust (statistically significant), but this does not mean they are realistic.

- or what might alternatively be dubbed the 'indolent ATCO' assumption - clearly contradicts the nature of work in air traffic control centres and towers and the demands on staff.²³⁸

ANSPs are one of a class of high reliability organisations that 'must not fail' as the costs associated with major failures (e.g., collisions in the air or on the ground) are immeasurably greater than the value of any lessons learned from them.²³⁹ In order to create a low-risk system, ANSPs need to meet the conditions of a 'closed rational system', typically defined as: 'a well-buffered, well-understood technical core requiring consistency and stability for effective, failure-free operations.'²⁴⁰ For most tasks, most of the time, in most situations, standard operating procedures (SOPs) ensure routine, calculative and consistent decision-making.²⁴¹ What might appear to the outsider as a 'relaxed' working environment is in fact highly regimented.

During peak times, ANSPs must be ready to increase performance, which is precisely when they rely on more incremental, professional, and judgemental decision-making by ATCOs and other professional staff. In this situation, cooperation and coordination is needed to deliver optimum capacity for airspace users (e.g., supporting ATCOs in the 'hot seats' of the busiest sectors). At all times, but especially during high-tempo activities, yet another 'emergency mode' of decision-making is waiting to be activated in the event of overload or breakdown in the system.²⁴²

Given the actual working environment and the motivation of ATCOs and other professional staff, we should not be surprised when transport economists find that increasing scale (traffic volume) and scope (traffic complexity) is *positively* related to the performance of ANSPs (productive efficiency and cost efficiency).²⁴³ Given that labour costs are anywhere between 50-70 per cent of total operational costs for ANSPs around the world,²⁴⁴ the assumed relationships between variables in these economic models can either bias results or confound the author(s) when the opposite is found to be the case. For example, ANSPs who employ more front-line staff such as ATCOs relative to 'all staff' (i.e., more of the 'highest cost' labour with the strongest bargaining power²⁴⁵ and supposedly most 'relaxed' working conditions) achieve *higher* technical efficiency.²⁴⁶

²³⁸ Economists are apt to make 'convenient' rather than realistic assumptions.

²³⁹ LaPorte TR and Consolini PM (1991) Working in practice but not in theory: theoretical challenges of 'high-reliability organizations'. *Journal of Public Administration and Theory*, 1(1): 19-47. Other examples include operating nuclear power plants and assuring the safety of bridges and dams.

²⁴⁰ LaPorte and Consolini, *op.cit.*, p.24.

²⁴¹ It is for precisely this reason that high reliability organisations (HROs) invest considerable time in recruiting, training and socialising staff - everyone should be 'on mission', SOPs must be routinely followed, and consensus is unequivocal.

²⁴² If this happens, decision-making is 'based on predetermined, pre-programmed allocation of duties, a directed - in a sense scripted - collegial teamwork process of instant response'. LaPorte and Consolini, *op.cit.*, p.35. ANSPs devote considerable effort to stimulating emergency situations and practicing responses to them.

²⁴³ Adler et al, *op.cit.*, pp.1058 and 1064.

²⁴⁴ See, for example, EUROCONTROL (2018) *ATM Cost-Effectiveness (ACE) 2016 Benchmarking Report with 2017-2021 Outlook*, Performance Review Unit (PRU) p.iii. Go to: <https://www.eurocontrol.int/ACE/ACE-Reports/ACE2016.pdf>; and Button and Neiva (2014a) *op. cit.*, p.48.

²⁴⁵ Blondiau T, Glazer A and Proost S (2018) Air traffic control regulation with union bargaining in Europe. *Economics of Transportation*, 13(March): 48-60.

²⁴⁶ Button and Neiva (2014b) *op.cit.*, p.69.

To date, most studies of the performance of ANSPs have focused on Europe, largely because of the availability of performance data.²⁴⁷ On behalf of the European Union, EUROCONTROL has undertaken joint studies with the US Federal Aviation Administration (FAA) in order to understand differences between the two ATM systems with a view to optimizing ATM performance and to identify best practices for the benefit of the overall air transport system. Key performance indicators (KPIs) are 'harmonised' to develop reference conditions for assessing ATM performance, and in many respects the two systems are 'comparable'. Except that Europe is not one system, despite the Single European Sky (SES) initiative and the creation of functional airspace blocks (FABs).

Our ability to generalise from Europe vs. USA or Europe-specific research is further limited by the fact that it tells us very little about impact of exogenous shocks to the system. To be sure, the time-period of most studies includes the impact of the global financial crisis, and there is evidence that this particular crisis wiped out previous efficiency gains in the years leading up to the downturn in traffic,²⁴⁸ but the COVID pandemic is unprecedented, unpredictable and its impact unmatched.

²⁴⁷ EUROCONTROL's ATM Cost-Effectiveness (ACE) Benchmarking Reports. Go to: <https://www.eurocontrol.int/publication/air-traffic-management-cost-effectiveness-ace-benchmarking-report-2019>

²⁴⁸ Bilotkach V, Gitto S, Jovanović R, Mueller J and Pels E (2015) Cost-efficiency benchmarking of European air navigation service providers. *Transportation Research Part A: Policy and Practice*, 77(July): 50-60.

Annex II. Proposals for Airways' Service Framework and Stakeholder Responses

Airways Corporation of NZ Ltd.	Air New Zealand	New Zealand Airports
<p>The Civil Aviation Act, section 99(1) makes a distinction between <i>statutory monopoly services</i> (area control services; approach control services; and flight information services), and <i>contestable services</i> (aerodrome control services and aerodrome flight information services). Airways proposes to exclude contestable services from the Pricing Framework because the price of those services would be negotiated on a case-by-case basis.</p> <p>Note: Airways 'want to continue supplying the Aerodrome ATM Service to <i>all</i> the airports who currently purchase it where the Civil Aviation Authority regards the service as necessary and subject to appropriate commercial terms.'</p>	<p>It is not immediately clear what benefit this change will provide to airlines as customers. ATM services will still need to be provided by a certificate holder – and at present Airways is the only certified operator. We reflect that this means that Airways remains a monopoly supplier of that service.</p> <p>Note: Air New Zealand is supportive of contestability for services provided by Airways. While other Air Navigation Service suppliers have not sought to compete in the New Zealand market to date, with the development of digital air traffic control this may change in the coming years.</p>	<p>While the statutory framework creates a distinction between monopoly and contestable services, the reality is that contestability does not currently exist in practice. There is only one provider of ANS in New Zealand and that is Airways. Maintaining a seamless ANS network in the interests of safety, <i>and not commercial objectives</i>, should be the paramount consideration for Airways' review of its services framework. This new commercial focus – treating some services as contestable – might prejudice the existing ANS network.</p>
<p>Current provision of aerodrome services is inefficient and fails to align incentives. The contract to supply aerodrome ATM services is with the airports, but they pay nominal consideration and the cost is borne by airlines and other users. This obscures the value proposition of the services and passes the cost on to users who are not involved in the purchasing decision. It misaligns incentives</p>	<p>We appreciate that airport companies currently nominally contract services from Airways, but they do not currently set prices for these services. We do not consider that this 'obscures the value proposition of the services.' There is a risk of service level degradation given the proposed 'arm's length' structure. Any ATC service failures would</p>	<p>By requiring airports to pay for its contestable services, Airways would acquire greater commercial leverage in its dealings with regional airports (i.e., more easily refuse to provide or reduce services if airports are unable to meet its commercial demands). The Proposal will create a greater risk of disruption to regional connectivity. Airways has already</p>

<p>because airports are not paying for the service and are not required to assess its value to their operation.</p>	<p>need to be reported by airlines through to Airways for resolution – and then back via airport companies to airlines. This would be inefficient and slow.</p>	<p>demonstrated a strong desire to withdraw from regional aerodrome services and has been clear that it will only continue to provide aerodrome services that the CAA deems are required for safety reasons if the commercial terms are acceptable.</p>
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About the authors



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He is the co-author of *Dock Strike* (with Charles Woolfson and John Kelly) and *The Dynamics of Employee Relations* (with Paul Blyton) and co-editor of *Reassessing Human Resource Management* (with Paul Blyton) and *Reassessing the Employment Relationship* (with Paul Blyton and Ed Heery).

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