

The rise and fall of air traffic



Credit: iStock/Aneese

Air traffic volatility is forcing an increased emphasis on planning flexibility.

Traffic volatility might seem like nothing new. Since aviation began, the industry has been a rollercoaster ride of booms and busts. In fact, up until 2007 traffic forecasts were generally correct and traffic flows well established. The global financial crisis tore this predictability asunder and has been followed by geopolitical turbulence.

Traffic variations are becoming more pronounced even as the industry at large enjoys a reasonably smooth ride.

Figures from Functional Airspace Block Europe Central (FABEC) demonstrate that the devil is in the detail. Monthly figures from 2017 show traffic varied from -3.5% to +12.8% on a monthly basis compared with expected traffic. That +12.8% was in September and hides even deeper daily volatility – going from -8.5% to +19%.

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ANSPs may plan for 5% growth per annum but that does not help when some days are 19% up. Variations in sector traffic can be even greater with a doubling of traffic compared to expected levels on some days. Worse, these record levels of oscillation have no discernible pattern. Saturday traffic can be strong, showing a 10% increase or it may not be noteworthy, registering perhaps a 2% increase.

Reasons for volatility

A confluence of factors has moved traffic volatility high up the agenda of ANSPs. Chief among them is capacity. Variations happened before but in Europe, and on key routes worldwide, airspace is becoming congested, particularly at peak times. In such circumstances, handling the expected traffic is difficult enough and resources are stretched.

There is no spare capacity to accommodate fluctuations. Perversely, when predictions go wrong the natural inclination is to reduce stated capacity to protect against volatility. This necessarily makes congestion – and potential traffic variations – far worse.

Other elements in increasing volatility include fundamental changes in the airline industry. Competition is fierce, and the rise of low cost carriers shows no sign of abating. Typically, these carriers have short-term planning windows and schedules can change quickly and dramatically. The predictability of summer and winter schedules has largely been consigned to the history books.

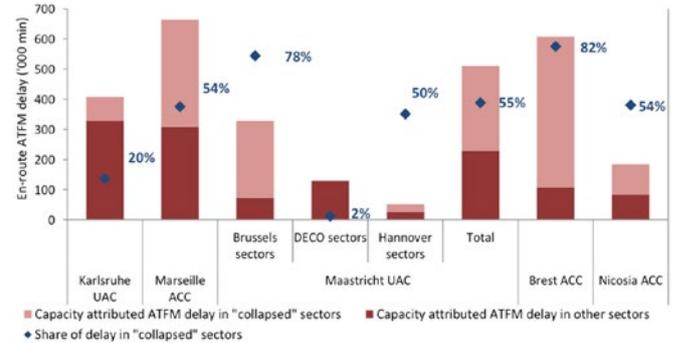
On key routes worldwide, airspace is becoming congested, particularly at peak times. In such circumstances, handling the expected traffic is difficult enough and resources are stretched. There is no spare capacity to accommodate fluctuations. Perversely, when predictions go wrong the natural inclination is to reduce stated capacity to protect against volatility. This necessarily makes congestion – and potential traffic variations – far worse.

Meanwhile, external events continue to unduly influence the industry despite concerted efforts in recent years to ‘shockproof’ aviation.

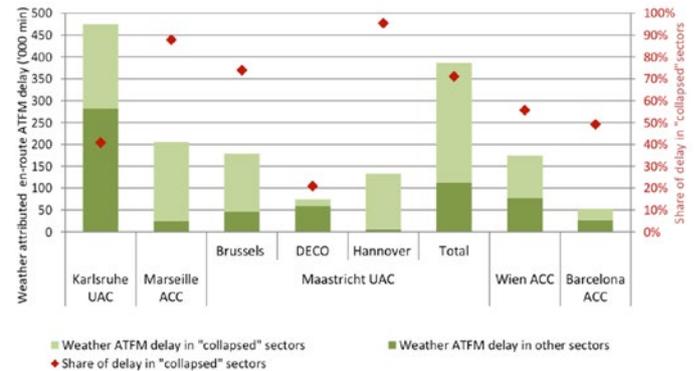
Weather is an obvious culprit. Climate change is forcing shifts in weather patterns that meteorologists are still studying. Storms in some areas, for example, seem to be increasing in frequency and intensity. And then there are always one-off events, such as volcanic eruptions that can affect flights to varying degrees for various amounts of time.

Geopolitical tensions play their part too. Consider flights over Poland – part of the Baltic Functional Airspace Block (Baltic FAB) – in summer 2014. Tensions between Russia and Ukraine were growing and MH17 had been downed in eastern Ukraine.

Very quickly, some 150 long-haul flights a day – a crucial source of income – moved to the south and out of Polish responsibility. Meanwhile, the contested areas in the Ukraine meant a sizeable increase in short-haul flights using the south-east of Poland; growth was close to 20% in quick order when the forecast anticipated a yearly increase of just 3%. Within weeks, revenue had dropped but the workload had increased. And because of the increased military



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activity in the area, some flights, such as the Copenhagen-Warsaw route, were taking convoluted and inefficient paths.

The Danube FAB experienced similar shifts in traffic because of these events, compounded by the closure of Syrian and Iraqi airspace. "In 2014, Danube FAB had to cope without warning with a traffic increase of more than 20% due to the closure of Ukraine airspace," says Veselin Stoyanov of Danube FAB / BULATSA. "To solve the situation a wide range of tactical, short- and mid-term measures had to be implemented – ranging from changes in rosters, airspace design up to new technical equipment."

Malta, part of the BLUE MED FAB, had problems of its own. Libyan airspace shutting down cut north-south flows. Much like in the Baltic



The impact of sanctions against Qatar on Malta FIR.

Source: bluemed.aero

Source: Draft PRR 2017

FAB, these were mainly en-route heavy aircraft and a valuable source of income. Meanwhile, the sanctions on Qatar has forced Qatari aircraft north and away from Maltese airspace while the problems in Egypt and particularly the Sinai Peninsula also had an impact on east-west traffic.

The fall-off in tourists travelling to previously popular Red Sea resorts meant summer tourism traffic altered. Tunisia picked up again after years in the doldrums but for flights from Russia that meant using a more westerly route to avoid Ukraine. Malta could not benefit.

The SW FAB had the opposite problem as southern Spain and the Canary Islands became immensely popular. Patricia Ruiz, ENAIRE's Head of En-Route and Terminal Manoeuvring Area Operations, says inevitably that meant traffic far exceeded projections. "In 2016, ENAIRE staffing was already 15% higher than predicted just three years earlier," she adds.

Coping strategy

Given increasing volatility and the likelihood of crisis situations occurring, ANSPs need to have a strategy for dealing with such events as best as they possibly can. Short term solutions – those that can be implemented within a few days – include changing staff rostering and increasing shift duration where possible. Complexity may need to be temporarily curtailed by denying optimum profiles, for example, and using simpler – but longer – routes. This affects airlines, passengers and the environment and so should be a restricted option. Meanwhile, existing ATM systems can be explored to see how they can best handle the traffic fluctuations being experienced.

In the medium term, defined in this instance as 4-6 weeks, airspace design comes into the equation, technology can be adapted and ATCOs can be retrained on different sectors.

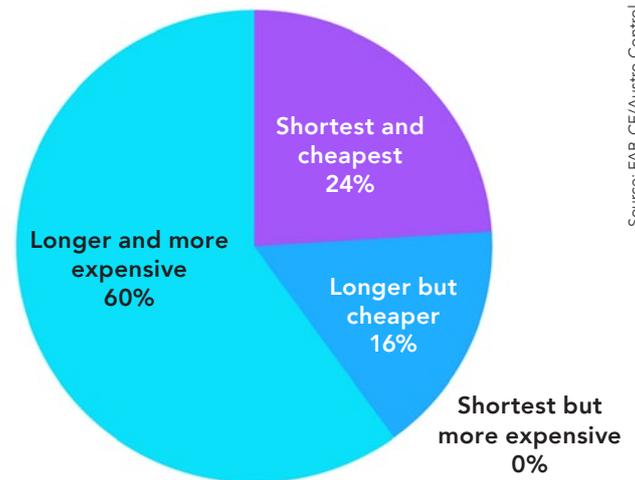
Longer term, up to a year out, new sectors and sector configuration can be implemented. ENAIRE has a new sector in Barcelona that borders with France, for example, and new sectors around Palma de Mallorca. There is also the opportunity to upgrade training facilities, operations rooms and critical flight information region interfaces. Most importantly, staff numbers can be increased.

High-end forecasts

But all the upgrades cost money at a time when volatility in air traffic could mean substantial revenue loss with an accompanying reduction in budget.

One way round this is to take higher-end forecasts as the planning guide. In short, make sure there is more than enough airspace capacity and more than enough ATCOs. Of course, this fails to win over other aviation stakeholders such as airlines and governments when austerity is the order of the day and efficiency the buzzword.

The most important ingredient of all for dealing with volatility is flexibility. The good news is that this is becoming easier to achieve with modern systems that are often designed with scalability and short-term fluctuations in mind.



Routes airlines actually fly – they need to be made part of an ongoing process.

"How do you increase staff and invest at a time when cost cutting is still paramount and everybody talks of efficiency?" asks Ruiz. "That is a delicate balance to achieve."

Collaboration will be vital. First, ANSPs should work together to smooth out volatility as much as possible. Smoothing out volatility necessitates a network-wide effort. Some industry experts have suggested a financial buffer would help in this regard. It would allow ANSPs that have coped well or are less affected to 'take a hit' in delays if they need to help the overall system.

Equally crucial is engaging with the airlines. Perhaps one flight may take a little longer, but then the ANSP can save on the next two flights by giving them optimised routes. Airlines' flight plans are an area of concern in this regard. Not only are they routinely revised en-route due to weather or other restrictions but also they can be sub-optimal to begin with. There are various reasons for this including scheduling, a lack of investment and potential military activity.

Airlines need to part of an ongoing process rather than complaining at plans made using a high growth scenario one year and then believing that not enough capacity was planned the next.

Ideal world

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Personnel are less adaptable but with rostering it is possible to be reasonably fluid in staffing. Regulations are the real stumbling block. There are targets for delays, for example, that take no account of the various factors involved. Regulatory targets need to be more dynamic.

Finally, it must be remembered that ANSPs cannot stop a Russia-Ukraine conflict or the downing of MH17. "It may need everybody to accept that is not a perfect world and we will not be able to achieve the perfect balance," says DSNAs Deputy Director of Operations, Geoffroy Ville.

"Nevertheless, we can improve the overall system and that is what we must strive to do. Otherwise, volatility will continue to increase and become a key barrier to harmonised growth." ➔