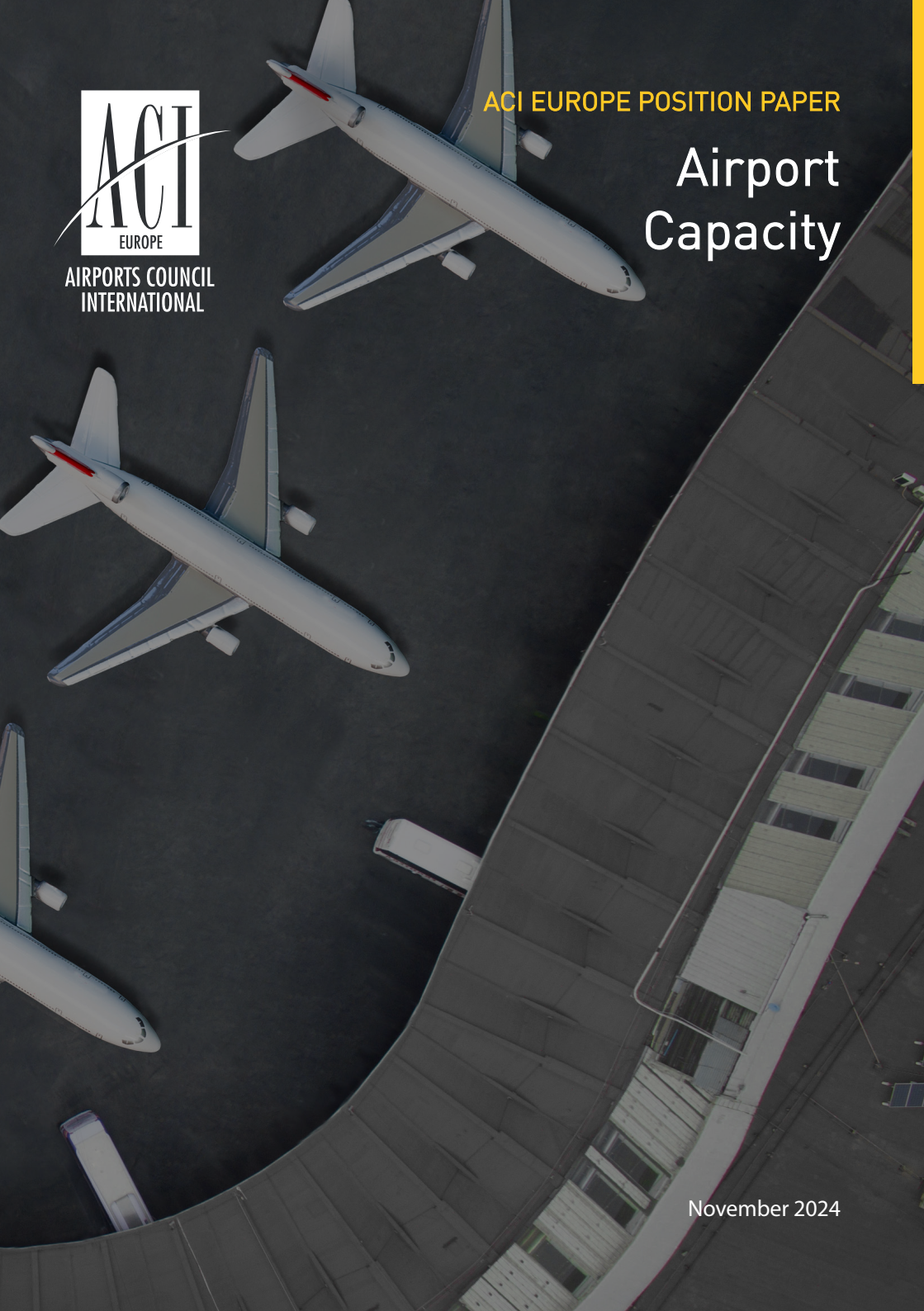

ACI EUROPE POSITION PAPER

Airport Capacity

November 2024

Introduction

Airport capacity is a crucial component in the overall performance of the aviation system and the ability of airports to serve passengers and optimise their travel experience. With demand for air transport predicted to continue growing in the coming decades, it is essential that airports are able to accommodate growth in a sustainable manner but also to ensure smooth and punctual journeys as well as a route offering which satisfies passenger demand.

The availability of airport capacity not only matters because it dictates the ability of airports, as part of the air transport system, to respond to passenger demand, but also allows airports to face the challenges presented by adverse weather conditions or en-route restrictions, such as lack of ATC staff in parts of the Network. Furthermore, ensuring the provision of adequate airport capacity allows for entry by new airlines and increases of frequency, generating the conditions for more airline competition. The level of airline competition is a significant determinant of air fares on a route.[1]

In many cases, the provision of adequate capacity at airports can be done through infrastructure or system development, which tend to imply significant investment. However, continued effort to optimise the use of existing capacity will allow airports to postpone these significant investments in physical infrastructure or systems, and therefore avoid increases in airport charges to fund such investments.

The capacity provided by the airport system is determined by multiple factors, many of which are not directly within an airport operator's control. Ensuring that these factors are addressed in an optimal manner, through integrated operations and collaborative decision-making, is key in ensuring that airport capacity is best used and even optimised when possible.

1. https://www.icf.com/resources/reports-and-research/2018/identifying-the-drivers-of-air-fares

The following paper shall set out how airports may best achieve improvements in the use of available capacity within the airport system and, although it is a stand-alone document, is supplemented by the ACI EUROPE Position Paper on Airspace & ATM, the ACI EUROPE Position Paper on Airport Slot Allocation as well as the ACI EUROPE Guidelines for Passenger Services at European Airports. These three elements of the airport system have a direct impact on the overall system's performance. The paper should be read in conjunction with the ACI World Guidance on Airport Capacity Declarations and the ACI EUROPE APOC Guidance.

Ultimately, airports should be recognised as being the masters of their capacity. An airport which has little or no capacity available can find itself at the mercy of others in how its capacity is used and allocated – thanks, for instance, to slot rules which permit incumbent airlines to decide themselves how capacity is used and which can be exploited in order to shut out their competitors. This can mean airport capacity being used sub-optimally, without the airport's own connectivity and competition goals being considered. Further detail on the regulatory amendments required to remedy this situation may be found in this paper and in the others referenced above.

Istanbul Airport / IST

What determines airport capacity?

Numerous factors combine to determine an airport platform's capacity. The available capacity is maximised when each factor is put to use at its optimal level, bearing in mind that increasing capacity in one area can decrease capacity elsewhere, thus reducing the overall effectiveness (e.g. increasing runway throughput without appropriate apron or terminal capacity or an efficient turnaround process). In addition, the airport capacity can be divided into throughput and practical/sustainable capacity. Off-peak or buffer periods are needed to recover from over-demand during peak times (e.g. in case of delays).

As outlined in the ACI World Guidance on Airport Capacity Declarations, *"The capacity of an airport facility is the volume of demand that can be accommodated or processed through an airport facility while delivering desired levels of service.*

"The level of service is measured in terms of the queue times for aircraft to use the runway or passengers to be processed through check in, security, immigration, etc. Level of service also includes space-per-passenger standards designed to avoid excessive congestion and crowding.

"Capacity management needs to strike a balance between the benefits of additional capacity to meet demand and the risk that extra declared capacity will result in poorer operational performance or resilience."

The numerous determinants of airport capacity include:

Runway

An airport's runway capacity is defined as the number of departures and landings (aircraft movements) that can be handled in a given period of time, either in a maximum design hour or per year. A common target for the maximum design hour for a runway is an hour that occurs a minimum of 30 times per year of operation, according to the International Civil Aviation Organization (ICAO).

A distinction is made between practical and theoretical runway capacity. Theoretical capacity is the capacity the system must be able to handle under optimal conditions in the absence of operational disruptions. The practical capacity is based on what the system can handle under normal operating conditions, where you must be able to handle delays without exceeding the limit of what is acceptable in terms of accumulated delays. The practical capacity is therefore lower than the theoretical capacity.

Practical capacity is determined by a number of criteria, which often intersect with other elements of capacity including airspace capacity. These include:

- The number of runways in use, their location, their use in different weather conditions, the design of exits and taxiways, etc.
- In-trail separation of aircraft - how closely aircraft can be spaced one after another when approaching the runway,
- Lateral separation, especially in bad weather, between aircraft approaching the same airport on parallel runways,
- Whether multiple runways may be operated independently of one another,
- The sequencing and separation of departing and landing aircraft on runways that intersect,
- The sequencing of departing and arriving aircraft on a single runway,
- The sequencing of aircraft approaching airports located in close proximity to one another, where one aircraft must cross the path of another aircraft landing at a nearby airport (see also airspace capacity below).
- Environmental/governmental restrictions which affect runway throughput, such as night (shoulder) curfews or restrictions.
- Availability of optimal departure routes. This may not be possible, particularly for noise mitigation purposes, even if the route restrictions were put in place based on aircraft being noisier at the time than they are today. Availability of optimal arrival routes (e.g. RNAV/RNP approaches).
- The presence of obstacles that limit the use of runways according to the aircraft performance, especially for very large aircraft
- Aircraft mix operating at the airport (aircraft wake vortex categories which determine the spacing of aircraft approaching and departing

the runway, runway occupancy time, separation standards, approach speeds, operational and navigational performance and equipage…),

- Weather conditions (visibility, ceiling, wind direction and speed, precipitation, low temperatures…),
- The condition of the runway due to weather, and the negative effect on aircraft performance (reducing airport capacity / throughput)
- Equipment (type of navaids provided, ATC equipment…),
- Level of ATC staffing, etc.,
- Percentage of arrivals versus departures within a given period of time and how this percentage changes during the day (i.e. Hub in, Balanced, hub out waves)

Heathrow Airport / LHR

Apron

The size of an airport's apron and the number of stands required to handle a number of aircraft within a given period of time determine apron/stand capacity. Again, annual throughput and peak capacity are decisive while the apron/stand capacity is further influenced by elements such as turnaround times and the mix of aircraft operating at the airport, including the number of based aircraft. Ideally, the mix of stands available matches the capacity requirements of the mix of aircraft operating at the airport. De-icing processes applicable at an airport can have an impact on apron/stand capacity – e.g. at some airports this is done while aircraft are parked on the stand, while other airports have separate de-icing pads.

Apron/stand capacity can be a limiting factor when aircraft operators upgrade aircraft types or fleet mix which, in some cases, is done fairly rapidly. However, the construction or modification of aircraft stands (including for the accommodation of new energy sources such as electricity and hydrogen) can be a longer process and might even incorporate temporary decrease of capacity.

Terminal

Terminal size is not dictated by annual capacity but rather depends on both annual passenger throughput and anticipated peak hour flows (thus linked to runway capacity measured in aircraft movements per hour), and may be a limiting factor on airport capacity. In order to allow the efficient movement of passengers through touchpoints within an airport terminal, the passenger processing capacity of these touchpoints is decisive. Examples of touchpoints include security checkpoints, border control, boarding gates, baggage sortation system, or check-in desks. The terminal design and configuration, the level of service to passengers, and appropriate signage and wayfinding, therefore have an impact on capacity through both the space available as well as the assurance of a smooth passenger flow through the terminal. Limitations on any one of these touchpoints can have a significant impact on the overall airport capacity. Landside accessibility (car parking, access roads, public transport connections) may also have an impact.

Airspace

Airport capacity is influenced by the capacity of the airspace surrounding an airport, in particular the capacity of the Terminal Manoeuvring Area (TMA) - a designated area of controlled airspace surrounding an airport. The main purpose of the TMA is to connect the airport approach or departure routes with the en-route structure of the upper airspace. However, the capacity of the TMA depends on a number of factors such as the design of arrival and departure routes to and from an airport or the configuration and interfaces between two or more TMAs serving individual airports in the same portion of airspace.

The sequencing of aircraft approaching airports located in close proximity to one another, where one aircraft must cross the path of another aircraft landing at a nearby airport, particularly impacts the capacity of these airports. Further examples of factors influencing TMA capacity could be military or other airfields located in the area surrounding an airport or restrictions regarding the overflight of residential areas for noise reasons. The availability of divergent standard instrument departures (SIDs) and the impact of any noise mitigation by way of aircraft departure routing can also affect capacity. The technical support systems in use by the ANSP and regulatory developments will also be factors determining the airspace capacity.

Lisbon Airport / LIS

What is the capacity problem?

According to the EUROCONTROL Aviation Outlook 2050, demand for air traffic in Europe is expected to grow by 44% by 2050 compared to 2019 levels. While the report notes that the size of Europe's capacity gap has been reduced compared to previous forecasts, due to the impact of the COVID-19 pandemic, it nonetheless expects that 3-12% of demand will not be accommodated by European airports in 2050. Airports in at least six European countries are expected to have capacity gaps in 2050.

The expansion of physical airport capacity is the most obvious means of increasing overall airport capacity but often requires governmental and public approval, which is presently a long and difficult process in Europe. The lack of available space, environmental concerns and the impact on neighbouring communities makes such a solution often physically and politically complicated. These same political and environmental concerns are equally having an increased impact on the usage of available capacity, through actions such as requiring changes to approach or departure routes due to noise or the implementation of more stringent night ban regulations. In the future, the implementation of Sustainable Aviation Fuel (SAF), Hydrogen and Electric powered aircraft may impact on apron infrastructure and turnaround times/procedures, with a resulting effect on the available capacity at an airport. It remains to be seen whether this will be a net positive or negative, but matters such as the space required for new infrastructure/ground support equipment, charging/fuelling times and related safety regulations may have a downward impact on capacity. The expected transition to zero- and low-emission aircraft may arise through the introduction of smaller electrified or hydrogen-powered aircraft for short haul. Current projections indicate that these aircraft will have up to 100 seats, meaning that at some airports this will lead to a much higher number of aircraft movements to carry a constant or growing number of passengers, thus leading airports to meet capacity limitations a lot sooner. Furthermore, changing demand patterns and regulations also affect the declared capacity (i.e., new security regulations, Brexit, EES, etc) and this may imply a change in the declaration to introduce new parameters.

Airline and passenger demands on airports' services impose infrastructure costs on the airport operator for efficiency and operational excellence as well as passenger satisfaction.[2] Additionally, investment into capacity expansion must be financed. Because airport infrastructure often comes in relatively large amounts compared to the asset base, it may result in short-term increases in airport charges or pre-financing of the infrastructure, which are then lowered as the new capacity is in use. As a result, airlines have incentives to oppose any investment that increases costs, and this opposition to investment is especially strong if an airline will see that capacity used by competitors, since air fares are determined by competition on a route. Hence, in jurisdictions where economic regulation gives more power to airlines, there is an additional regulatory hindrance to capacity expansion.

Airports' ability to maximise their capacity on the ground is also impacted by the capacity crunch in the air, where a shortage of ATM capacity has led to record delays and underlines the necessity of achieving the implementation of a Single European Sky. The implementation of new ATM technology and procedures offer promising advances in runway throughput, but require investment and a holistic view incorporating airspace and physical airport capacity in order to deliver the most benefits.

Finally, airport capacity may also be optimised through slot allocation, however the slot allocation process in Europe, as governed by Regulation 95/93, requires reform in order to ensure better use of available capacity and avoid undesired behaviours by airlines which lead to capacity being wasted. With Europe accounting for half of the world's slot-coordinated airports, this is a critical front in the quest to optimise and maximise the use of airport capacity in Europe.

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2. ACI EUROPE's Recommended Practices for interpretations of Articles 6, 7 & 8 of the European Airport Charges Directive further explain the disconnect between airlines' demands on the airport for infrastructure services and their expectations about paying for the costs imposed on the airport from airlines' operations. https://www.sipotra.it/wp-content/uploads/2017/05/Interpretation-of-Articles-6-7-8-of-the-Airport-Charges-Directive.pdf

Making best use of existing capacity

With so many factors influencing an airport's capacity, it is essential to find the right mix and to squeeze the most out of each determinant, in a way which optimises capacity to meet current and future demand. The right mix will depend on numerous local and network-wide factors, and as mentioned above the effect of addressing one capacity driver on the constraints provided by others must always be considered. In this context, airports wishing to optimise the use of available capacity may consider the following points.

Physical infrastructure

Optimisation of runways and taxiways is essential to making the best use of an airport's physical infrastructure. This can be achieved through building of rapid-exit taxiways, installation of routing & guidance technology, and improved taxiway design and layout, for instance. In addition, more accurate runway condition information allows pilots to set their braking action to be more in-line with the actual runway condition experienced, thus optimising runway occupancy time on landing.

Not only does the number of stands and their size impact capacity, the handling of the aircraft requires a number of vehicles and equipment that need to be nearby the stands or which require easy access to the stands and the terminal so as to carry passengers, baggage and goods to and from the aircraft. To reduce the number or the size of the vehicles and the environmental impact, the apron parking stands can be equipped with centralised systems (GPU, PCA, VDGS, refuelling points, boarding bridges). Another solution would be equipment pooling by ground handling service providers, which has proven to de-clutter apron areas. All of the elements combined enable better management and use of stand capacity, giving better control over the turnaround process and thus contributing to the number of movements which an airport can handle in a given period.

Within the terminal, a range of new technologies permit the automation of some processes so as to reduce the number of operators, reduce the processing time at critical touchpoints and maximise the use of available space (e.g. automatic border controls, self-check-in desks, self baggage

drop, self-boarding gates, biometric controls). This can increase the number of passengers served and increase throughput, again contributing to the optimal use of the available capacity of the airport and the overall number of flights and passengers which may be served[3].

Operational technology and procedures

Operational assessment identifies whether forecast demand will exceed physical capacity according to the criteria (including maximum waiting times at terminal processors) defined for each main operational flow for the week/month or rest of the season. Software and Artificial Intelligence applications are increasingly being used by airports in this context to proactively manage and predict capacity use. This can include simulation tools which demonstrate the interaction between passenger/traffic flows and constrained airport capacity, and the impact of actions such as pre-emptively opening extra security lanes or border control desks in anticipation of peaks. Turnaround monitoring tools allow airports to identify and predict delays in the turnaround process, informing decision-making and enhancing collaboration between airport stakeholders, so as to minimise and mitigate delay. Operational performance measurement, monitoring and management helps airports to both manage tactical issues as well as identify areas for improvement, which may help in optimising capacity use as well as unlocking latent capacity. Analytical tools enable almost automatic collaborative decision making, such as for Demand-Capacity Balancing purposes as part of the Airport Operations Plan. Furthermore, automation/robotisation of the ground handling process is a growing part of airport life – with lack of available staff a key motivating factor – which may affect available capacity.

Real-time delay analysis and correct delay code setting can help in identifying the real reasons for delay and enable airports to adjust during the day itself. By doing this, the impact on the flights for the remainder of the day may be reduced, thus allowing the remaining capacity to be used in a more optimal way.

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3. See Chapter 7 of the ACI EUROPE Guidelines for Passenger Services at European Airports for further details.

In the air, the separation applied by ATC for approach and departure can change runway throughput significantly and is affected by the aircraft size mix. Procedures and technologies can increase the capacity of the TMA (e.g. Performance Based Navigation, RECAT, Time-Based Separation, Trombones).

Optimising existing capacity is supported by technologies and procedures developed in the Single European Sky ATM Research Programme (SESAR). According to the 2018 Challenges of Growth report, SESAR solutions offer the potential to reduce the capacity gap, which that report had identified, by 28% by 2040. Available options include, RECAT-EU, time-based separation, arrival and departure management (AMAN/DMAN), separation optimisation and data-link.

However, it should be determined on a case-by-case basis whether the developed technologies and procedures actually have a positive impact on capacity and efficiency of individual airports. A one-size-fits-all approach, with mandatory implementation, is likely to worsen the situation as the funding required for physical capacity expansion would be allocated to the implementation of technologies and procedures that may not necessarily benefit the individual airport's capacity and efficiency. While some airports are held up as examples of capacity optimisation which others should replicate, in many cases their good performance is due to a combination of unique factors. This can include geographical situation, the airport-ANSP relationship, runway configuration and usage mode, descent procedures and the mix of aircraft in use at the airport which directly affects runway occupancy time and separation on approach. Aircraft movement-centric measures, such as managing the separation between several widebody aircraft on approach, may help manage the airspace capacity impact, but this would then conflict with the airport's passenger-centric approach, whereby the arrival of several hundred passengers in quick succession would put strain on ground and terminal infrastructure.

Moreover, taking a network-wide view to capacity constraints is necessary so as to ensure that changes to the airspace network (including airports) are considered as a whole, and the effects or impacts of increases or bottlenecks in one part of the network are identified across the entire network. However,

network capacity should not come at the expense of local capacity. Trade-offs are required in order to ensure that airports may continue to serve passengers in the optimal manner.

Zurich Airport / ZRH

Airport and ANSP relationship

Establishing a solid relationship between the airport operator and the ANSP, both on an operational and management level, is one of the key factors for success in ensuring the best use of system capacity. The partners should seek to establish a common vision and goals on a local level, ideally based around optimal delivery of services to airspace users and ultimately passengers.

This common vision should include strategic alignment on issues such as forecast growth, current and forecast capacity, route and procedure developments, required staffing levels, common infrastructure or system developments. Ideally a document detailing this common vision should be developed and agreed between the ANSP and airport operator.

Depending on the legal framework as well as organisational setup, the relationship between the two organisations can be either informal, for example based on a memorandum of understanding, or formal, for example based on a letter of agreement or formal contract. In the case of a formal agreement, the airport operator should also consider establishing formal Key performance indicators (KPIs) or an Service Level Agreement (SLA) that will provide a basis for monitoring the performance of the ANSP within the airport system.

Slot allocation

The slot regime encompasses all regulatory provisions impacting declared capacity and the allocation of slots. It is clear that an efficient slot regime would result in a better use of existing capacity, for instance, through the possibility to apply local rules at airports that could for instance favour larger aircraft, or through the introduction of a slot reservation system. Such a system would incentivise airlines to hand back their slots in time (before the slot return date) in order to allow the swift reallocation of the slots to other carriers. The slot system is also where airports see capacity constraints impacting on their connectivity and the competition between airlines at the airport.

Modernisation of the outdated Regulation 95/93 is required in order to ensure better use of available capacity through optimum slot performance. The current slot system was never intended to deal with permanent saturation of airport capacity. Airport slots were essentially meant as a temporary measure to manage capacity at constrained Level 3 airports until such time as congestion can be relieved and capacity freed up. With the majority of Level 3 airports worldwide located in Europe, and with their number expected to grow, the regulatory framework must evolve in order to maintain a competitive environment when there is little slot turnover, as well as preserving and boosting connectivity.

Pricing

The pricing of the airport services (aircraft landing, take-off and parking charges and passenger service charges) can be modulated or differentiated to send the correct economic signals. Pricing is a powerful tool and motivation to incentivise desired behaviours, in this case the optimal use of the airport's capacity by its users. Economic regulation should not constrain an airport from using differentiated prices, modulations or offering incentive and rebates, as long as they are not discriminatory between comparable conditions of users. The use of these pricing strategies will allow an airport to incentivise users to better use the capacity.

Community relations

In many cases the local political pressure on airports, in particular due to noise and to a lesser extent air pollution, can be a hindrance to the physical development of the airport platform or to any changes that may be proposed to the operating regime (e.g. operating hours, departure or arrival routes). Developing a strong community relations programme whereby local stakeholder groups and community leaders are integrated into discussions on the usage and further development of the airport can lead to a better understanding by affected parties and reduce the pressure exerted on the airport system. In this context, airports should ensure adequate public consultation processes are applied for key aspects of the airport's development, such as master planning or airspace reconfiguration.

Unlocking latent capacity

The next step beyond making optimum use of an airport's existing capacity is to find ways to tap into extra capacity which may be released through successful implementation of methods such as those outlined above. By intelligently combining different capacity-optimisation measures, airports may not only ensure that their operations are as efficient as possible within existing constraints, but may also create additional capacity in which additional aircraft movements may be accommodated. This can result, for instance, from a combination of ATM procedures and system upgrades to increase runway throughput, the creation of new rapid exit taxiways and aircraft stands, and additional terminal capacity, as well as operational performance monitoring.

In order to successfully do this, all stakeholders operating at an airport need to be involved. Otherwise, each stakeholder determining or contributing to airport capacity will try to optimise capacity within its domain. This would be suboptimal for the entire airport system as, for example runway capacity may not be aligned to terminal capacity nor to apron/stand capacity. Additionally, the actual capacity of the different capacity drivers mentioned above is usually not determined by a single stakeholder but results from the efficient interaction of the different stakeholders involved, for example the processing capacity of border control is ultimately decided by border police or customs.

Therefore, effective coordination of the different stakeholders determining or contributing to airport capacity is required. The airport operator, ATC, ground handling service providers, pilots, police and customs all have an important role in the airport system performance in terms of punctuality, flow and resilience. This should include both strategic and tactical alignment based on extensive information sharing through an integrated airport operations plan (AOP) and Collaborative Decision Making. These processes should be implemented in the interest of the connectivity of people and goods both locally and through a modernised airspace network as well as to balance the demand and the capacity available also in contingency situations.

Improved collaboration and communication on an airport wide level is expressed through the Ground Coordinator concept and in its most complete form is embodied in the Airport Operations Centre (APOC), although for smaller airports there might be alternatives to a fully-fledged APOC. The consolidated execution of the AOP, that makes predictable passenger journeys possible, may happen through physical or virtual operations centres where the common goal and the focus on the end user supersedes individual stakeholder/company interests.

It must be borne in mind that the declared capacity of an airport, which in particular influences the slot coordination process, is not necessarily the same as the airport's true operating capacity. The capacity of an airport may be subject to constraints which could reduce the actual capacity, and if the capacity is declared at too high a level, the airport could experience a build-up of delay and congestion.

Therefore, when new capacity at an airport is made available, the airport's declared capacity may increase, thus unlocking new arrival and departure slots (in the case of slot coordinated airports). However, in such circumstances it is essential for the airport to declare its new capacity at a level which can be managed in the peak traffic periods. It may be appropriate in such circumstances to release the new capacity gradually across several seasons.

In addition to this, **all drivers of airport capacity are usually further impacted by operating procedures and regulations**, for example, due to noise considerations, special approach and departure procedures or airspace design requirements, limitations to runway use, night curfews. The variability of passenger, aircraft flow throughout the day, week and season produces peaks and troughs of activity at many airports, as does the airlines requirements for hub and spoke operations with minimum connect times.

As a result, declared airport capacity may be lower than actual operated airport capacity. Nonetheless, advances in managing the numerous constraints above mean that extra capacity can be still be created out of the existing system, by allowing airports to declare higher levels of capacity than before.

Dealing with capacity shocks

Situations such as adverse weather, network incidents, delay build-up etc. all constitute contingencies which can have immediate, negative impacts on capacity, as can longer-impact shocks such as the shutdown caused by the COVID-19 pandemic. Airports must be able to accommodate the temporary reductions in capacity in such situations, as well as the return to normal operations thereafter. The number of stands must be suitable for the contingencies that an airport can reasonably expect to face, while schedules need to be resilient enough to accommodate such events. Adverse weather conditions or a reduction of runway capacity in arrival or departure may increase the turnaround time, which can affect other airports in case of diversion as well as through reactionary delays, therefore impacting capacity utilisation. Demand-Capacity Balancing is a vital means for dealing with imbalances in capacity (e.g. in case of adverse weather) and resolving them on the day of operations.

A key part of minimising the gap between 'normal' operating capacity and deteriorated capacity in adverse circumstances, and closing it once the situation returns to normal, is integrated operations management. Collaboration, coordination and consolidation between the airport stakeholders ensures clear lines of communication, a common view on how capacity is being utilised and where it may be available, and optimises the speed of recovery after contingencies. An integrated view of the real-time and predicted situation at an airport, established through an APOC, gives clarity over the capacity situation, expected shortfalls during the day, and enables a coordinated response in order to overcome contingencies and re-establish 'normal' operations.

Regulatory responses to shocks, such as slot-use waivers, should take into account the effect on capacity and airport operations. In the case of slot allocation, waivers should incorporate measures that ensure early return of slots to facilitate planning of resources at airports. Guidance is required on how to address long-term capacity reductions, with clear procedures on how to manage the demand with a long-term reduced capacity. The COVID-19 pandemic was one such example, but this may also include other events,

such as a fire that destroys and closes a part of the terminal. It is furthermore necessary for airports to prepare not only for temporary capacity shocks but also for permanent ones. This can be based, for example, on required changes of procedures, such as the implementation of the EU Entry-Exit System.

The way forward

The capacity crunch in Europe's aviation system demands action now. As outlined above, there are multiple factors at play in determining an airport's capacity and its potential for being increased, which must be considered carefully, and in their entirety, when deciding on the appropriate actions for each airport.

Furthermore, a network-wide view of capacity measures will ensure that the overall network capacity is balanced and optimised. There can only be so much capacity on the ground as there is in the air, and vice-versa, yet while airport measures can influence the network, the network has a direct impact on the airport.

Given the number of stakeholders determining or contributing to airport capacity and the risk of inefficiencies, organisation and collaboration on operational matters are essential at every single airport, in order to share the challenges both locally and Network-wide, and to decide on collective mitigation actions. Integrated and collaborative airport planning at season level should be promoted, where airports share their plan at local level and make sure relevant stakeholders share the level of service they expect.

The form of this organisation and collaboration may vary depending on airport size and scope, and is scaleable, meaning that smaller airports or those starting out in this process may start small, and deepen/formalise as desired. Airport Collaborative Decision-Making (A-CDM) is one of the first steps in local collaboration with the aim of increasing predictability and efficiency of the departure process. Building on these existing elements, the Airport Operations Centre (APOC) can provide a means of unlocking

potential or latent pockets of capacity and efficiency across the operation. It aims to do so through better communication and collaboration between stakeholders at the airport. The APOC brings together all operational partners at the airport: airport operator, airlines, ANSPs, and ground handlers, to monitor operations and provide solutions to problems together. To deliver this capability, the APOC can be supported by advanced technology and can exist as a "virtual" concept as well as the more traditional definition of a single room within the airport where stakeholders work together. The APOC is also the platform that ensures communication with not only the local airport stakeholders (through inclusion in the APOC or by means of structured lines of communication), but also the main communication channel between that airport and the network.

Airports must be at the centre of initiatives to develop the capacity of the air transport system, working in close coordination with all other operational stakeholders. This includes development of physical airport capacity, slot allocation rules, research and development of technological solutions and processes to increase runway throughput, development of TMA capacity, its interfacing with the airspace network, and overall ATM reform. Concepts such as A-CDM, AOP, APOC and Total Airport Management, are integral in the airport taking ownership of its capacity management, and therefore should be promoted and entrenched in the running of Europe's airports.

AIRPORTS COUNCIL INTERNATIONAL

ACI EUROPE is the European region of Airports Council International (ACI), the only worldwide professional association of airport operators. ACI EUROPE represents over 500 airports in 55 countries. Our members facilitate over 90% of commercial air traffic in Europe. Airports and air connectivity support 14 million jobs, generating €851 billion in European economic activity (5% of GDP). In response to the Climate Emergency, in June 2019 our members committed to achieving Net Zero carbon emissions for operations under their control by 2050, without offsetting.

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