

Airport Performance

ACI EUROPE
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Executive Summary

Operational performance is a strategic priority for airports, underpinning safe, efficient, and resilient air transport. It drives passenger satisfaction, supports airline and stakeholder relations, and ensures optimal use of capacity. This paper outlines how airports can lead in orchestrating performance across the aviation ecosystem, shifting from reactive to proactive management, while embedding sustainability as a core dimension of operational excellence.

Why Airport Performance Matters

- **Passenger focus:** High performing airports ensure seamless journeys, reliable operations, clear communication, and resilience during disruption.
- **Capacity optimisation:** Performance management translates declared capacity into reliable daily delivery across runways, taxiways, stands, terminals, and airspace.
- **Competitive edge:** Poor performance risks reputational damage and loss of passengers to other airports or modes of transport.

From Measuring Outputs to Managing Inputs

- Traditional metrics (delays, on-time performance) are lagging indicators.
- Airports must instead manage leading factors: gate assignment, baggage reliability, staff capacity, and stakeholder coordination.
- The CARE model (Capacity, Assets, Reliability, Execution) provides a structured approach to anticipate and resolve bottlenecks.
- Collaborative tools such as the Airport Operations Plan (AOP) and Airport Collaborative Decision Making (A-CDM) enable predictive, data-driven performance management.

Sustainable Performance

- Performance is not just throughput but balanced, sustainable operations.
- Efficiency measures reduce emissions and noise (e.g. optimised taxiway use, green ground operations).
- Sustainable performance helps airports meet local environmental obligations while enhancing long-term resilience.

What Airports Can Do

- Align infrastructure capacity with demand through investment and planning.
- Ensure asset readiness (stands, IT systems, ground equipment) and reliable processes.
- Monitor real-time operational data with AI and digital tools.
- Strengthen collaboration with stakeholders through joint planning and reviews.
- Foster a culture of continuous improvement via post-operations analysis and innovation.

What Stakeholders Must Do

- Airlines: Schedule realistically, communicate tactical times, and ensure consistent ground handling.
- ANSPs: Provide predictable, efficient airspace management and staff capacity aligned with traffic flows.
- Ground handlers: Maintain staffing, training, and reliable equipment.
- Regulators/governments: Enable proportionate, risk-based regulation and ensure adequate staffing at border/security.
- Network Manager: Share tactical operational data and optimise slot and flow management.

Airports are both participants and leaders in performance management, orchestrating collaborative efforts while ensuring safety and sustainability. By focusing on inputs, leveraging data-driven tools, and engaging stakeholders, airports can deliver reliable, on-time, and sustainable operations that support aviation's growth and resilience.

Introduction

Operational performance is a matter of strategic importance for airports. As well as simply being a barometer for how the airport gets through the day, it is also at the heart of how an airport serves its passengers and community, its relations with airlines and other stakeholders, and how available capacity is used as planned.

The performance of an airport, whether over the course of a day or a whole season, can be influenced by many factors. These can include adverse weather conditions, major events, network and local airspace disruption or capacity issues, high traffic demand, maintenance work at the airport and unforeseen local disruption, including workforce shortage and strikes. Such occurrences are often specific, extraordinary events, but day-to-day airport performance is equally exposed not only to disruptions but also to underlying structural shortcomings, both of which require continuous monitoring and proactive management to mitigate inefficiencies and ensure the safe delivery of flight schedules.

In order to manage its operational performance effectively, an airport requires a clear overview and understanding of how the schedule is being met, focusing in particular on the aircraft turnaround process. This enables the airport operator to take actions, in collaboration with operational stakeholders such as ground handlers, Air Navigation Service Providers and aircraft operators, to improve performance based on challenges and opportunities identified through performance measurement. This means that **AIRPORTS ARE THE MASTERS OF THEIR PERFORMANCE.**

Ultimately, in the race to deliver high operational performance, airports are participants, as well as holders of the stopwatch and the location of the start/finish line. Getting across the line, though, is a team effort, and actions by all participants affect the race outcome. Safety is, of course, the overriding principle of any airport, and must not be compromised by actions to improve performance.

The elements of successful airport performance management

▪ PASSENGER FOCUS

Airport performance ultimately matters because it underpins the airport's core mission: to serve passengers by ensuring a seamless travel experience, and to handle cargo through reliable and predictable processing. This means on-time arrival along with a seamless journey, predictability in the operation, clear communication, and good service. A high-performing airport ensures that these goals are met, along with

having strong resilience and support for passengers to deal with disruption and can optimise capacity use to potentially increase the offer of flights and destinations served.

Airport operators understand that poor passenger experience leads to lost business and revenues, dissatisfied stakeholders, and reputational damage: powerful motivators that go beyond regulatory compliance. Airports are often seen as the source of disruption, regardless of whether that is the case. Nonetheless, the airport is in the prime position to be able to lead and coordinate efforts to drive up performance and mitigate disruption – without assuming the responsibilities of other stakeholders. With airports competing for business, passengers who have experienced poor airport performance may choose to travel elsewhere in the future, connect through a different hub, or even choose another mode of transport altogether. To truly excel, airports must collaborate closely and, above all, take the lead in guiding the wider community of stakeholders.

▪ **AIRPORT CAPACITY**

The performance of an airport is inherently linked with its available capacity. Airports are naturally incentivised to meet market demand by improving efficiency and accommodating growth, whether to support future investment, respond to community needs or fulfil public or commercial objectives. However, translating declared capacity into day-to-day operational availability depends on the coordinated performance of multiple actors, including air traffic management, regulators, ground handlers, security and border agencies and aircraft operators. These interdependencies highlight that while airports play a central role in assessing and declaring capacity, its delivery relies on the coordinated performance of the entire aviation ecosystem.

Actions taken to ensure optimal performance can affect the capacity available on the day – whether by temporarily reducing what can be delivered or unlocking additional capacity. Likewise, the numerous factors which determine airport capacity can also affect performance. These include¹:

- **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, usually expressed per hour. 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

¹ For a more detailed overview, see the [ACI EUROPE Airport Capacity Position Paper](#).

of what is acceptable in terms of accumulated delays. The practical capacity is therefore lower than the theoretical capacity.

- **Taxiway system**

The taxiway network determines how efficiently aircraft can move between runways, aprons, and terminals. Bottlenecks in the taxiway system can reduce overall capacity even if runways are available. The system's capacity depends on factors such as the number and layout of taxiways, the presence of parallel or high-speed exit taxiways, intersections, and rules for ground movement separation. Optimized taxiway design minimizes runway occupancy times and reduces the risk of congestion.

- **Apron**

The size of an airport's apron and the number of stands required to handle a number of aircraft within a given period 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, type of airlines (LCC or legacy) 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.

- **Terminal**

Terminal size depends on both annual passenger throughput and anticipated peak hour flows for arrival, departures and combined and may be a limiting factor on airport capacity. 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 check-in desks, security checkpoints, border control, boarding gates, and baggage sorting system. To measure terminal capacity, the Level of Service of each subsystem is assessed, also indicating the quality of the passenger experience.

- **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.

- **Environment**

Airport capacity is also influenced by environmental constraints, in particular

noise regulations and restrictions. The main purpose of these measures is to limit the impact of aircraft operations on surrounding communities and ensure compliance with environmental standards. However, the extent to which noise affects airport capacity depends on several factors such as the definition of night curfews, the allocation of noise quotas, the implementation of noise abatement procedures, or the proximity of residential areas. In practice, these constraints may reduce the number of operations permitted within certain timeframes, limit runway use, or require specific flight procedures, all of which can restrict the effective capacity of the airport.

- **Digital capacity**

IT systems and data infrastructure are increasingly critical to operational performance, and the successful implementation of tools and systems to manage performance can have a positive impact on airport capacity.

■ **SHIFTING FROM MEASURING OUTPUT TO DECIDING INPUT**

Many performance debates fixate on outputs like delays or on-time performance (OTP). These are what is known as lagging KPIs, i.e. they are the result of a mix of factors that cause an end result of an on-time or delayed flight. They ignore, however, the input which has gone into this result, i.e. leading factors. True performance leadership means understanding and managing the underlying drivers: gate assignment, stand utilisation, baggage system reliability, resource allocation, staff capacity, and cross-stakeholder coordination. Airports focus on proactive, predictive management, using operational data, analytics, and performance dashboards to anticipate bottlenecks before they materialise. **Regulatory frameworks often look backwards, while airport operators need to look ahead, focusing on how to improve, not just fixing what went wrong.**

Performance comes from how airports prepare, coordinate, and adapt, not just from tallying end results. This shift from lagging to leading is where airports can drive performance through improvement of indicators which they can measure and control. Implemented successfully, this is the most impactful performance management action that an airport can take.

The role of the airport in ensuring the best possible outcome in this context can be summarised by the **CARE** method.

The CARE method focuses on the input influenced by the airport operator that will lead to on-time performance. The four main categories are: **C**apacity availability, **A**sset readiness, **R**eliable operations and process **E**xecution.

Capacity: the airport ensures that demand is balanced with infrastructural capacity as declared.

If infrastructural capacity does not meet demand, suitable control measures must be found in order to accommodate flights, passengers, baggage and freight according to schedule. Works and project planning should incorporate these levels of service to ensure a balanced demand & capacity.

Infrastructural capacity is managed through long term master planning all the way to day-to-day-operations planning. Even distribution is ensured among all capacity users and co-makers such as handling agents, air traffic control and government agencies.

Examples of capacity are runways, taxiways, aircraft stands, check-in desks, security filters, gate areas, baggage system, IT system, etc.

Assets: to enable successful operational processes the airport provides various assets for infrastructure users to operate their processes. Assets provided by the airport should always be operational when they are required.

Examples of assets are docking systems, power supply, pre-conditioned air, fuel hydrants, check-in desk equipment, boarding gate equipment etc.

Reliability: to ensure and safeguard operational flow in case of disruptions the airport operator is responsible for managing integral reliability of the process.

If one or more flights/process/subsystem are disrupted the airport operator should ensure, through operations centres such as APOC, to isolate disruptors, focus on restoring normal operations and safeguard that other flights are not affected.

Examples of reliability disruptors are early arrivals, delayed towing, unpredictable delays.

E.g.: one handler's lack of staff means their flights will occupy stands too long (delay) – these issues should be isolated from the rest of the operation to prevent snowball effects.

Execution: the airport ensures that primary flight handling processes are executed as planned (on-time) and predictable. The number of processes operated by airports vary from airport to airport, but all airports operate crucial processes.

Examples of process execution are check-in, security screening, boarding, baggage

claim, transfer flows, marshalling, apron buses, fuelling, wildlife control, apron/ground control.

In enacting this vision, airports must make the case for data-driven, predictive performance management. Reactive or blame-focused approaches in contrast, only serve to reduce the effect of performance measures and can be counter-productive. Best practice in this regard is the use of an Airport Operations Plan (AOP). The AOP is “a single, common and collaboratively agreed rolling plan available to all relevant operational stakeholders which provides a common situational awareness for optimised processes”². It interacts with services, systems and stakeholders gathering information from several systems, supporting landside and airside operations at airports with an increased scope of data sharing between the airport and Network Manager building on the available A-CDM or Advanced Tower supporting systems. It supports four key Airport Performance Services:

- (a) steer performance service – setting KPIs aligned with the concept of operations;**
- (b) monitor performance service – measuring actual performance;**
- (c) manage performance service – intervening to recover to normal ops;**
- (d) perform post-operations analysis service – lesson learnt and process improvement.**

For further details on implementing an Airport Operations Plan refer to the [ACI EUROPE Airport Operations Plan Guidebook](#).

▪ ON-TIME PERFORMANCE

Airports wish to see a shift from delay management to on-time performance. Delay should not be seen as something to be lived with, but rather as a negative aspect which should be eradicated through a focus on arrival punctuality.

Delay management is reactive by nature; it only responds to what has happened. The best thing that comes out of that is that there is an effort to prevent that thing from happening again.

The game changer will be: being able to explain what variables you must tune to prevent delays from happening, not just reacting to past performance.

This shift is a shared responsibility. While airports influence factors like gate management, ground operations coordination, and passenger flow, airlines, local air

² Commission Implementing Regulation (EU)2021/116 (Article 2)

traffic control, and ground handlers play critical roles, too. Airports deploy collaborative ways of working like Airport Collaborative Decision Making (A-CDM) and / or Airport Operations Plan to ensure on-time performance by looking ahead. Emphasis is placed on root cause analysis, to identify the levers required to ultimately deliver an on-time arrival. Equally important is who is responsible for pulling each lever, as effective performance management depends on accurate, fair attribution and a collaborative approach to solutions. Airlines need to share appropriate information for this to function, including tactical times rather than just schedule times. Schedule buffering and poor schedule resilience or overscheduling impacts that airport's operation and on-time performance. While there is a huge benefit for the airlines to add a buffer via scheduled resilience, airports need to know about these planned buffers.

▪ SUSTAINABLE PERFORMANCE

Airport performance is not just about throughput or speed, but about balanced, sustainable operations. This can mean trade-offs, for instance, between a focus on on-block and off-block times and less time running engines on the ground. Efficient runway and taxiway use cuts fuel burn; optimised terminal flows reduce energy demands; green ground operations reduce emissions without sacrificing reliability. Airports increasingly embed environmental and social metrics alongside traditional performance measures, reflecting their broader public responsibilities, including those of the local communities. Rather than a trade-off, sustainability is becoming a core performance pillar, and airports are leading the way in balancing operational excellence with climate and community commitments. Likewise, ensuring optimum performance in the airport operation has an impact on meeting local environmental goals, such as noise emissions and air quality for ground staff and local communities.

The knock-on effects of airport performance issues can include sustainability impacts – for instance reactionary delay incentivises delayed flights to increase cruise speed and thus fuel burn in order to make up lost time. Ultimately, airport performance is a key element in how airports and aviation may grow sustainably.

What airports can do to improve performance

The airport has a key role to play in increasing operational performance, by orchestrating the efforts of the various actors in the airport ecosystem and setting the bar for higher performance. As well as this leading role, the airport has a specific operational part to play, in terms of offering sufficient and realistic capacity to airlines, ensuring that assets provided by the airport are in working order, directing reliable operations, and executing self-operated processes on-time and in a predictable manner. To achieve these goals, airports should:

- Assess and understand their contribution to performance (i.e. determine the inputs which they can control, as above).
- Invest in infrastructure that matches operational needs (e.g., stands, runways, taxiways, service roads, terminal infrastructures and technology).
- Ensure proper and effective training of staff in the delivery of on-time performance and the determining factors.
- Enhance operational monitoring of real-time data on aircraft turnaround, queues, delays, supported by IT and AI tools to identify issues and improvements.
- Strengthen collaborative processes e.g., joint planning sessions, daily operational reviews.
- Strengthen collaboration with ANSP (e.g. goals, interface process)
- Deploy innovation such as automation, AI-support tools and passenger self-service.
- Promote a culture of continuous improvement, embracing the lean manufacturing approach, using post operations analysis (including post-season and /or post-incident) reviews to learn from experience and adjust processes and solutions.
- Develop a level playing field and neutralise airport vulnerabilities by incorporating performance standards in contracts with other stakeholders operating in the airport ecosystem.
- Ensure continued adoption of 'just culture' approaches to incidents, internally and among stakeholders, to both enhance the safety of the operation and drive personnel towards continuous improvement of the airport's performance.
- Correctly plan maintenance on airport infrastructure with performance predictability in mind.
- Have a well-prepared recovery plan to restart operations after unexpected major events.

What other stakeholders can do

For efforts to increase airport performance to reach their full potential, both locally and network-wide, all players in the ecosystem have roles to play. Airports believe that the following actions from other stakeholders are essential in driving up airport performance. While not exhaustive, successful implementation of the below items would serve to greatly increase airport performance and resilience of the network:

- Regulators and government bodies:
 - Proportionate, risk-based regulation that supports flexibility and innovation, understanding that each airport is different.

- Support for cross-industry data sharing to improve planning.
 - Sufficient staffing of, e.g., border control, especially during peak periods.
 - Support sustainable growth
 - Support levers used at Fully Coordinated Airports (e.g. FLS) at Schedules Facilitated airports as well.
- Network Manager:
 - Share tactical operational data and flow management plans that affect airports sufficiently in advance. Proactively provide stakeholders, including airports, with relevant information for better managing local performance – even if no significant network impact is expected
 - Effective network coordination to manage slot pressures and optimise flows.
 - Support for cross-industry data sharing to improve planning.
- Airlines:
 - Realistic scheduling, especially under tight turnaround windows. Communicate “tactical times” earlier rather than only schedule times.
 - Consistency in ground handling arrangements. Align ground handling agreements with operational feasibility.
 - Willingness to share operational information.
 - Refrain from slot overbidding and other forms of misbehaviour which give an inaccurate picture of the season to come.
- ANSPs:
 - Strengthen collaboration with airport (e.g. goals, interface process).
 - Sufficient staffing and capacity.
 - Efficient, predictable airspace management to reduce airborne delays.
 - Efficient rostering adapted to the traffic flows and patterns.
 - Close coordination on arrival/departure sequencing.
 - Joint scenario planning for weather, events and operational disruptions.
- Ground handlers:
 - Sufficient staffing and equipment, especially during peak periods.
 - Well-trained staff.
 - Deploy appropriate and serviceable Ground Support Equipment.
 - Reliable performance on turnaround tasks.
 - Alignment with airport and airline operational targets.

- Slot coordinators:
 - Monitor arrival slot performance as well as departure.
 - Meaningful sanctions for misuse and poor performance.
 - Pre-monitoring of slots to ensure compatibility between slot allocations and airline flight intentions, thereby promoting predictability through schedule accuracy.

Airports can incentivise or enforce these actions, for example through Service Level Agreements, contractual obligations, or collaborative forums. ACI EUROPE strongly encourages members to engage with their stakeholders in such a manner.



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EVERY FLIGHT BEGINS AT THE AIRPORT.

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