Slots White Paper

Future Airport Slot Policy and the Airline Industry

Refocusing on Slots: a global picture of slot policy

2024 Release

Executive Summary

The International Air Transport Association (IATA) is the trade association for the world's airlines, representing some 340 airlines and over 80% of total air traffic. This White Paper presents IATA's position, on behalf of its member airlines, on the future of global slot policy.

Unfortunately, airport infrastructure continues to be insufficient to meet customer demand in many locations. While the airlines will continue to call for infrastructure improvements, it is also understood that this is an unwelcome but expected part of the business which will not be remedied in full in the foreseeable future.

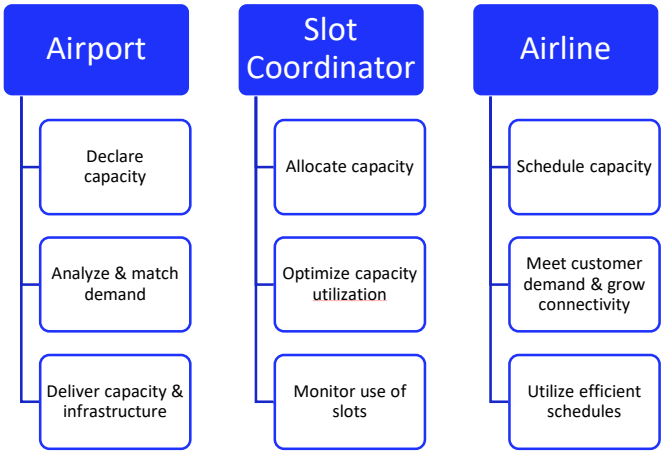
It is therefore critical that the industry maximizes the capacity which is available, and a strong global slot policy is a vital tool in reaching that goal. This is only possible through industry-led cooperation and compromise, as embodied in the Worldwide Airport Slot Guidelines (WASG) established by the airport-coordinator-airline Worldwide Airport Slot Board (WASB).

The WASG and the global slot process blend the stability of year-to-year, decade-to-decade policy with a process of continuous evolution to ensure that the process does not stagnate and remains able to meet the changing needs of the industry. Quite simply, without the certainty and consistency provided by a global slot process which recognizes the historic investments of the airlines, the aviation industry could not function as it does today.

IATA believes both that the WASG is the best existing system for slot allocation – and that it can and should be further improved to ensure that all stakeholders are playing their part in maximizing existing capacity. In this paper, IATA calls for changes to the WASG, highlights the important policies which should be maintained, and notes some slot allocation mechanisms which should be stopped altogether.

The White Paper contains the following chapters:

1. **Introduction** – An explanation on the basics of the slot process, the WASG, and the three stakeholders (airports, coordinators, and airlines) who must each contribute to schedule optimization:

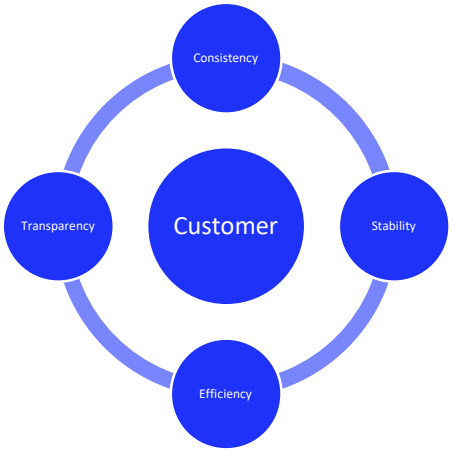


2. **A brief history of slots** – A journey through the continuous evolution of slot policy from the 1940s to today, leading to the "living document" model of the WASG.

3. **Why slots matter** – A discussion of how a strong slot policy strengthens other policy goals including consumer and social welfare, accessibility and connectivity, economic development, and environmental sustainability – and why slot policy should not be put at risk by attempting to use it to directly solve these additional policy goals in isolation.

4. **Economics of the airline business and slots** – An examination of why consistency, in the form of historic slots, is key to the asset-heavy airline business model – enabling airlines to make the long-term investments necessary to maintain a modern aircraft fleet.

5. **The airline vision for slots** - Slot policy is a universally compatible, customer-focused solution to manage a severe lack of aviation infrastructure, delivering benefits despite these constraints. The slot process must work for all carriers, fairly and equally, providing a strong, stable support to airline planning no matter where in the world they plan to operate.



6. **Refocusing and innovating slot policy** – A statement of IATA's position on the "start, continue, and stop" priorities for slot policy and the WASG. These are summarized in the table below.

Start	Continue	Stop / Do Not Implement
Balanced accountability: strengthen airport and coordinator provisions	Historic slots precedence	Primary market allocation (e.g. auctions)
Accurate, transparent, and updated capacity declarations	Flexibility to change the use of slots	Local deviations from the consistent global framework
Create alternative dispute resolution mechanisms to review coordinator decisions	A global calendar of slot activities on a seasonal cycle	Constantly shifting regulatory practice leading to instability and uncertainty
Improve access policies	Secondary trading and slot mobility	Proposals to dictate airline choice of destination and equipment
Use data and portals to increase transparency and openness	Independent slot coordinators	
Adopt technology to drive systems integration forward		

7. **Conclusion** – A review of the discussions throughout the White Paper, a repository for additional sources of information for future reading, and a call to action for governments, airports, and other stakeholders to work with the WASB, rather than against it, to continue to evolve slot policy into the future.

Table of Contents

1. Introduction

Airport slots are a fundamental, permanent part of today's aviation industry that provide the public with reliable and convenient air transport. They have been an essential feature of airline schedule planning and airport capacity management since the early 1960s. The well-recognized and globally adopted guidance for slot management and coordination is outlined in the Worldwide Airport Slot Guidelines (WASG). This system has evolved for over five decades to continue to support a mix of carriers, destinations, and products being offered at the world's most severely congested airports. Without this slot process there would be excess delays and operational chaos, but there would also be far deeper industry impacts than policy studies and academics calling for fundamental change have considered.

Managing the continually deteriorating gap between the supply of aviation infrastructure and consumer demand for flights, airport slot coordination is highly complex but vital to the sector's success. As an essential framework for planning, this cyclical process supports the entire sector and is currently employed at nearly 200 congested airports every season where the WASG is almost exclusively applied. The airports subject to slot coordination are not only large, international hubs, but also smaller strategically important facilities that serve point-to-point traffic – this process is not about size or status, but rather about the ability to meet demand with available infrastructure.

Airport slots are the bedrock for airlines operating at congested airports. Without a stable slot allocation system, the aviation network would crumble, and the investments which underpin the industry would dry up because there would no longer be certainty as to where airlines can operate and for how long.

For many airlines, slots are part of every route they operate, with requirements attached to their use and how the airlines plan their schedules. They are restrictive – and yet also relied upon. The system outlined in the WASG has supported carriers to invest and develop technology, connectivity, and route networks that span the world driving trade, travel, and tourism.

But slots are a solution, not a problem. The problem is the severe lack of aviation infrastructure to enable all operators to fly available capacity to meet consumer demand. The slot process is the remedy to this supply-side constraint and works incredibly well to manage the imbalance fairly, transparently, and without further costs to the industry and passengers.

Further, as congestion continues to grow, it is clear that focusing regulator efforts solely on the airlines is no longer sufficient to maximize existing capacity. Regulation and the WASG must equally address the necessary contributions of both the airports and the coordinators to continue to meet these challenges.

Airlines have a clear vision for how they see the slot process developing in the future to ensure the biggest benefits for the consumer and air transport sector. Leaning on airline technical expertise and long-standing role in leading the development of slot rules, this paper takes a unique perspective setting out the airlines' vision and core values for slots alongside thoughts on how to innovate slot policies for the future to make the most efficient use of available capacity.

Airlines are concerned that the most important features of the slot process are being disregarded and misunderstood in efforts to reform slot policy. This is a finely balanced system that works as a whole, with many interlocking policies underpinning its global application. The airline industry has been a stalwart of the slot process since its inception and remains a key stakeholder championing its continued relevance in today's highly interconnected and global world. Recognizing that the process must continually evolve and is open to innovation, this paper is designed to inform policy makers of the airline industry's views on future slot policy development and opportunities for important improvements that would preserve the continued constructive development and global application of the WASG and that will drive consumer and economic benefits through increased trade and tourism.

The airlines' vision for the future management of slots has been developed after substantial input from global carriers operating all business models to serve today's customers.[1] This paper addresses the critical impact of slot policy on the airline business and how it can be improved to increase viability of future networks, asset investment, and delivery of robust schedules while setting out the airlines' view on the most important and resilient policies that should be retained. Most importantly, the paper sets out a new set of values that should underpin the purpose of slot management and its role in aviation – primarily to serve the customer efficiently and reduce delays and congestion.

What is an airport slot?

An airport slot is a time on a specific day for which an airline is granted a right to plan its future operation, allocated in advance by coordinators to manage demand at the world's most congested airports. Much like a restaurant reservation made in advance to secure a time for dinner, they are based on the characteristics of the planned flight (passengers, freight, size of aircraft, and destination) but can be changed, subject to the coordinator's approval. Unlike most dinner reservations, however, there are penalties for not showing up. Not every airport is slot coordinated, or "Level 3" – only those airports which suffer from a lack of available capacity should be declared given that the parameters around planning and operating flights at Level 3 airports are cumbersome and highly complex.

Airport slots are not the solution to all the industry's challenges – for example, operational impacts, noise restrictions, or metering departures due to weather cannot be managed through this process and indeed are addressed through dedicated regulatory measures. A slot is instead inherently a planning tool that should not manage on-the-day disruptions or ATC concerns or to achieve some unrelated policy objective.

Understanding what an airport slot is (and what it is not) is fundamental to determining the reach and unintended impacts of possible policy changes. All too often, policy recommendations for changes to slot coordination lack due consideration for the broader impact on the industry and its functioning, as well as its customers. In particular, ideological market-based allocation would remove stability, fairness, and consistency – which are at the heart of today's framework for managing scarce aviation infrastructure.

What is the WASG?

The Worldwide Airport Slot Guidelines – commonly referred to as the WASG – are the basis of the global system of allocating slots and managing their use every season. Developed over decades to reflect best practices, they include both policy and practical methodology for the entire process from start to finish.

This is a tried and tested approach that has been adopted globally, transposed into legislation, and agreed as the industry standard. It is a commonly applied set of rules that ensures efficient use of scarce airport capacity, outlines how to make independent and neutral decisions around slot allocation, and sets out a framework for all stakeholders to universally apply the rules consistently, worldwide – which is one of its key values.

The Worldwide Airport Slot Board – the WASB – is the governance structure around the guidelines, made up of airlines, airports, and slot coordinators.[2] This three-party group ensures expert leadership of developments to the WASG to provide continual evolution of the process in line with industry and government needs but does so under careful consideration for the whole process remaining compatible and effective, not isolating policies from one another.

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[1] In compiling the paper views were heard from network/legacy carriers, low-cost carriers, hybrid operators, leisure and tour operators, cargo, and express transport providers.

[2] The WASB membership is led by Airports Council International (ACI), Worldwide Airport Coordinators Group (WWACG), and IATA.

Slot allocation is focused on optimization to deliver the best schedule to the customer

The slot process is designed to optimize the flying schedule through synchronized activities referred to as slot coordination. The coordination process is highly reliant on the system of coordinated airports all working to the same rules and timelines globally, ahead of each season. This ensures that all airlines can secure the slots needed on each end of the route to operate a viable flight, considering flight times and aircraft fleet changes. The process is immune from discrimination, serving all types of airport and airline business models equally.

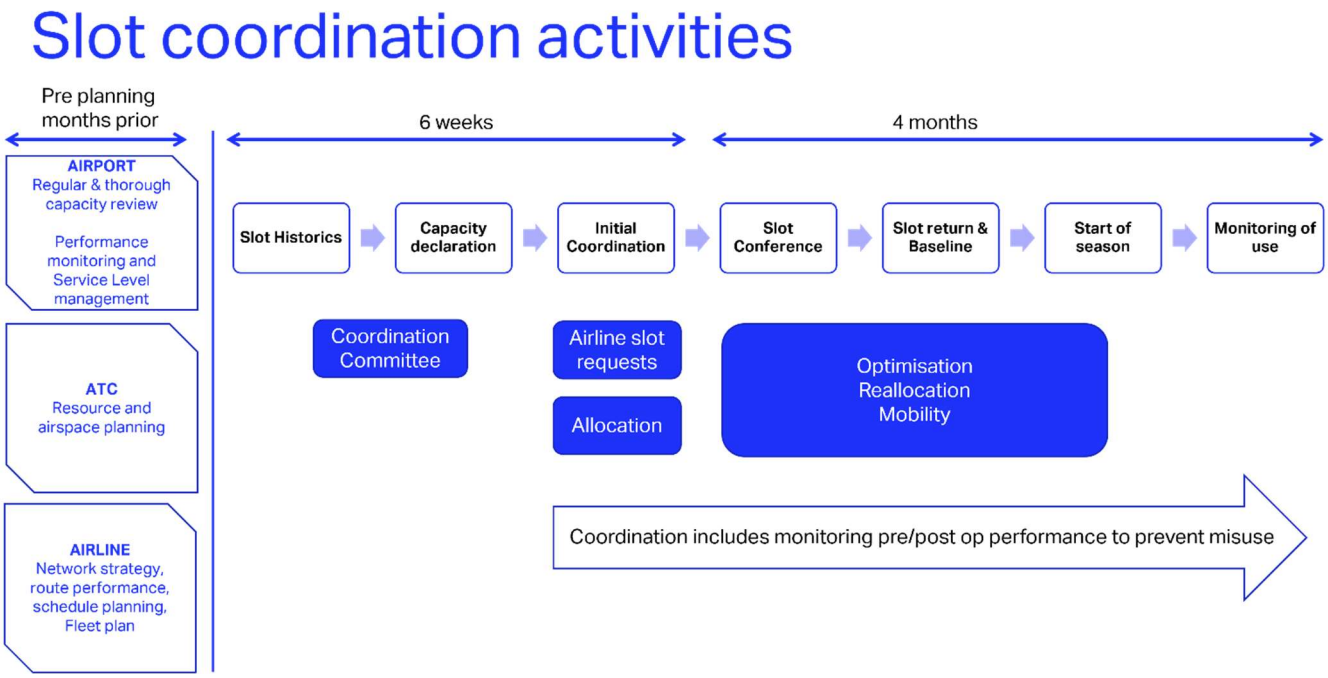
One of the fundamental elements of the WASG process is the calendar of critical dates and deadlines,[3] designed to ensure optimal use of capacity and allow airlines sufficient time to determine and market their schedule and airports to prepare for projected demand. This, in turn, provides certainty to and better service for the customer.

The initial preparation phase of the slot process swiftly moves into a longer period of optimization:

1. **Preparation and parameters – 6 weeks' duration (6 months prior to season start).** This initial phase determines how the available capacity will be allocated according to the procedures and criteria contained in the WASG that support the slot coordinator's neutral and impartial decision making, using the airport's declared capacity and wish list alongside the airlines' requests for slots – both those previously held with historic rights and new requests (from new airlines and existing operators).

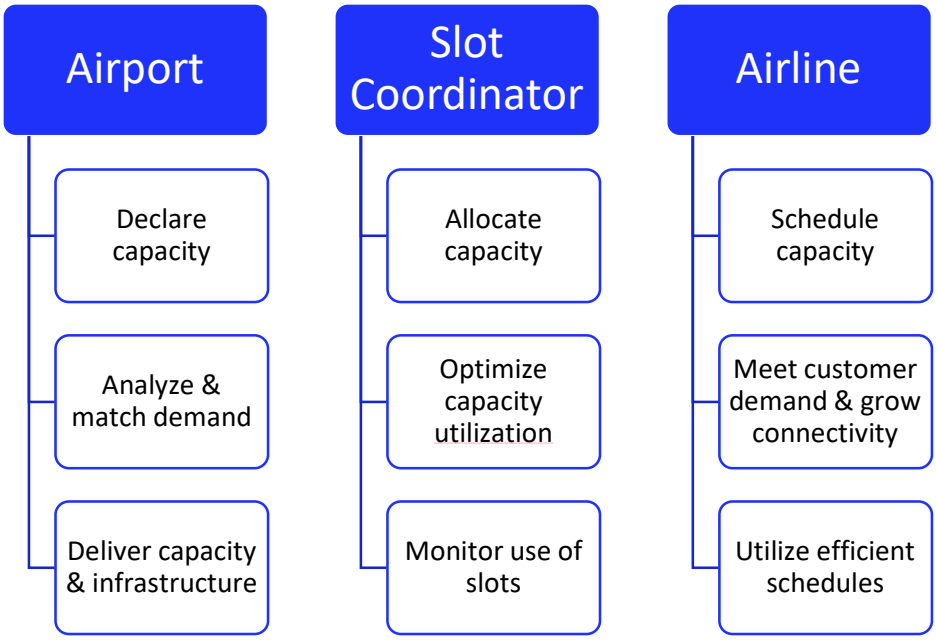
2. **Optimization – 4 months' duration (4 months prior to season start).** This phase is all about optimizing the initial plan for the season and encompasses a much longer period to allow for the allocated slots to be evaluated against the airline's schedule, reworking of the plans against the available capacity and slot swaps to achieve the best possible outcome ahead of the season. This may involve a small retiming of a slot through a swap with another airline to calibrate a fleet change on the route, or it could involve a delay to a route opening because the slot requested could not be allocated with the current capacity constraints. Similarly, an airline may be offered an alternative timing and eventually have to return the slot to the pool because the service does not match and sync with their network plan – which allows the coordinator to reallocate it to the next carrier on the waitlist. This part of the coordination process is dynamic and all about communication, relying on the global community working in synchronization to maximize opportunities for optimizing plans.

[3] The Calendar of Coordination Activities for slot coordination adopted globally at Level 3 airports: Calendar by Aviation Season



The three key players in ensuring optimal slot planning

The slot process is a cycle of identifying the capacity available and allocating historical and new slots before the planned schedule is finalized and the use of slots is monitored. There are three parties integral to the process, each with their own responsibilities identified in the WASG (and in some countries, regulated through legislation). Importantly, none of the stages are static but require a dynamic approach, involving resources and expertise combined with technology to produce the most optimized and efficient airline schedule plans for customers.



The Airport: The airport's role is to identify and declare the maximum available slot capacity, including new capacity and existing capacity, considering the facilities and their capabilities. The airport is then responsible for delivering the declared capacity in the operational phase. This is a critical role because under-declaring or under-delivering capacity reduces the airlines' ability to meet consumer demand. A robust capacity review and

declaration process is the vital first stage of the slot coordination process and defines what opportunities there will be for new entrants to enter the airport. Even if new capacity is not available, the available capacity must be optimized to match demand. This is a dynamic responsibility – review, analyze, declare, and deliver – every season. Where this maximized infrastructure is nevertheless insufficient to meet projected demand, the airport must also plan to timely address this future shortfall through infrastructure improvements.

The Slot Coordinator: The slot coordinator's role is to take the airport capacity declaration and formulate a slot pool to allocate the airline requests for slots, based on historic slots and new requests. They are responsible for optimizing the final schedule at the airport they coordinate in the most efficient way given infrastructure constraints, while achieving a fair, impartial, and balanced allocation of slots that is pro-competition. The coordinator's decision-making should be insulated from intervention by interested parties. Overall, the coordinators are limited to technical and process related issues and should not act as a policy maker. Their role is both in allocating and monitoring the use of slots and is very dynamic, updating the allocation plan regularly by identifying improvements in slots and managing the 'waiting list.'

The Airline: The airline's role is to plan a feasible schedule based on its network, customer demand, and aircraft fleet capabilities, and then request the corresponding slots for this schedule from the coordinator. They are then usually required to adjust their plans according to the actual allocation – which can be quite different to their original requests due to the lack of capacity to satisfy all requests – to ensure a viable final schedule for operation. The airline is the party primarily responsible to the customer in the current regulatory environment and has numerous rules around its planning and use of airport slots that add complexity to flying – especially at times when there is operational disruption like poor weather, ATC strikes, or war zones preventing overflights. Airlines are monitored by the coordinators on their slot use per flight, according to strict usage rules, as they need to use each series of slots at a minimum rate of 80% in order to receive the same operating time back the next equivalent season. They are also monitored for misuse, on-time performance, and other related operational activities.

2. A brief history of slots

The process of coordinating airline schedules has been an essential feature of aviation planning for over 60 years. Through largely voluntary measures, carriers have found solutions to infrastructure constraints that would otherwise prevent them from efficiently operating and meeting demand. It is fair to say, as airline deregulation took place, that the most pressing constraint became the infrastructure that the industry relied on to operate and serve demand. Capacity has not increased at the rate needed to match the forecast growth in air transport, constraining its potential. This long-term supply and demand imbalance has continued, and today results in over 200 capacity-constrained airports being formally declared as slot coordinated.

The societal and economic cost of the imbalance between capacity and demand has led to the development of guidelines to oversee the process of planning schedules at these airports so that it is fair, impartial, transparent, and pro-competition. However, the cost of the failure to supply capacity to meet demand is seen in escalating delays, suboptimal schedules, and constrained networks. Against these challenges the airline industry is incentivized to utilize their assets as intensively as possible, which means maximizing load factor and finding operating efficiencies from sophisticated schedule planning. The 'perfect' schedule is a concept unlikely to be realized in today's fractured infrastructure situation because airspace and airport capacity severely lag what is needed to operate at the most economically valuable times and with the most appropriate equipment.

The guidelines developed over decades have continuously evolved (as seen in the **33 versions** of the WASG and its predecessors since 2000) to adapt to the industry's needs while constantly battling this imperfect situation of constrained capacity.

The pre-slot years: timetable coordination: 1948 to 1969

In many ways the origin of the modern slot system can be traced back to the first biannual Timetable Coordination Meeting, convened by IATA in 1948. Modern attendees to the Slot Conference would likely smile at the size of this meeting, attended only by three airlines (BEA, Alitalia, and Air France) – but it represented the first organized attempt by airlines to better optimize their schedules and interlining opportunities in the early days of commercial aviation.

During these early meetings, the focus was not on delay management, but rather on planning a schedule that met consumers' needs and effectively allowed connections at airports through synchronized waves of flights and multi-sector journeys to reach destinations, due to the range limitations of the fleets of the day.

The concept of synchronizing flights to build 'scheduling windows' remains a pivotal principle of airline network planning. Especially at slot constrained airports, these windows ensure that airlines can utilize their slots as effectively as possible to serve the maximum number of destinations and multiple combined city-pairs despite a lack of available infrastructure.

As the regularity of the aviation schedule and consistency of the services developed into the 1950s, consumers and globalized supply chains could start to benefit from reliable and expedited networks. Aviation quickly became a catalyst for economic development and growth. Across the business, the industry began efforts to standardize much of the sector, given the need for globally aligned approaches.

On the scheduling side, carriers were integrating new aircraft with significant payload advantages into their business – but investing in these high-tech assets required long term certainty. The airline business needed the certainty that they could deploy such costly assets across their developing networks and have predictable access to the infrastructure necessary to operate, given the significant investment in opening routes. The airlines also faced increasing challenges caused by the lack of infrastructure being inadequate to cope with growth of traffic.

To address these risks, airlines spearheaded a voluntary process of negotiating and balancing all their planned operations against the capacity available using a standardized procedure that worked to formalize schedules far in advance of the planned operations. This required airlines to plan their operations farther in advance to ensure that access would be granted and their schedules agreed at each congested airport. This provided the industry with the benefits of a planning process that built predictable and reliable schedules. The growing certainty of the process and standardized approach allowed all aviation stakeholders to better plan their activities, assets, and resources, while supporting further investment to match demand.

In 1962, the Timetable Coordination Meeting was formalized, moving to the June-November biannual calendar which is still followed by its successor, the Slot Conference.

Year 1, S.C.E. (Slots Common Era) – 1969 to 1992

The High Density Rule, adopted by the U.S. FAA in 1969, represented the first entry of regulators into the area of schedule and capacity management. This rule provided a process to manage a specific number of airports' runway capacity (at that time, JFK, DCA, LGA, EWR, and ORD) in order to limit significant flight delays. Essentially, the rule provided a quota of air traffic movements, which were allocated to three traffic types – of which only 'air taxi' operators received any historic right to previous operations. Each carrier was allocated a total quota of movements (effectively, slots) which were then 'optimized' by hour/day assignments to result in a workable schedule for all air carriers via scheduling committees.

The High Density Rule reflected several concerns which are still present today. The Rule provided the carriers with a greater sense of certainty in the form of explicit allocation of capacity, building on the benefits seen from the earlier voluntary processes. There was also a recognition of the need to provide fair access across carriers and business models, and an acknowledgment of the need for flexibility – as evidenced by the scheduling committee meetings to allow carriers to meet demand through use and time changes, capacity permitting.

In 1974 the industry joined together to draft the Schedules Procedures Guide (SPG), the first industry-led, global guidelines for the allocation process. Initially managed by the Slot Procedures Committee within IATA, this guide relied on scheduling experts to identify and address common issues experienced around the world. The guide would both greatly assist in those countries where regulation did not exist and serve as a template for that regulation when the capacity and demand balance required government action.

Among other features which have survived to current practice, the Slot Procedures Guide provided a declaration process for congested airports – thus ensuring that slot processes were only applied at those airports where they were truly necessary due to demand outstripping available infrastructure.

In 1986 the U.S. amended the High Density Rule to include a slot usage requirement – historic rights would be provided, but only where the airline operated at least 65% of its allocation. This codified the expectation that airlines must commit to use the capacity allocated to them, providing certainty to customers and the airport while providing that same certainty to the airline in the form of historic rights. The amendment also included the ability for airlines to buy, sell, or lease slots on the secondary market, a new concept in slot regulation to unlock greater mobility of slots at congested airports.

In the late 1980s the SPG evolved to include an 80:20 usage ratio requirement and a New Entrant rule. The 80:20 ratio reflected the international view that the U.S. ratio did not provide a strong enough incentive for carriers to return those slots which would not be used and to avoid wastage of slots allocated at highly demanded congested airports. Under this ratio, airlines were required to plan their schedules realistically and return those slots which could not be operated prior to a baseline two months prior to the season's start. The New Entrant rule was intended to fairly balance access to and competition from those carriers with no or limited operations to an airport (<5 slots per day of the week) by reserving for those carriers 50% of available capacity after honoring historic rights.

This era also saw the advent of computer-assisted scheduling. Although they were not yet portable enough to be brought to the Timetable Coordination Meeting, the ability of computers and technology to manage the heavy data inherent in a complex global scheduling process was evident – and has of course only continued to grow with the exponential increase in computing power through to the modern day.

Maturation of the Global Process – 1993 to 2010

The next major slots regulation was adopted in 1993 by the European Union. Working closely with the Slot Procedures Committee, the EU enacted the European Slot Regulation (Regulation (EEC) No 95/93) to provide common rules for the allocation of slots at congested EU airports. The close coordination between the regulator and the industry, with only minimal divergences between the regulation and the SPG, led to a truly best practice regulation which has stood the test of time and played a major role in ensuring global harmonization.

An important feature of the EU Slot Regulation was an explicit requirement that coordinators must be independent in order to ensure neutral, non-discriminatory, and transparent allocation. Difficult as it may be to imagine today, it had been common in earlier periods for coordination to be done by the home-based carrier or the airport. The industry started to move away from this practice in the early 1990s, but including the principle of independence in a major regulation spurred the transition and to the benefit of all stakeholders.

Over the subsequent years the SPG and regulations continued to mature and evolve as the industry held recurring slot process reviews to ensure that the system continued to meet customer needs. Australia joined in alignment with the SPG in 1998, via its Sydney Demand Management Regulation. Shortly thereafter, in 2000, the SPG was rewritten to form edition 1 of the Worldwide Scheduling Guidelines (WSG), which provided a minimum series length of 4 weeks and established different levels of coordination for airports so that slots would only be necessary in those instances where capacity is truly insufficient to meet demand. The governance structure was also amended to include the newly independent coordinators and the airports,[4] in recognition that the best practice is strongest when contributed to by – and meeting the needs of – the key players in the aviation industry.

In 2004 the EU Slot Regulation and the WSG extended the minimum series length to 5 weeks, in acknowledgement of the practical reality of the existing provisions. With a 5-week series, the 80:20 usage rate cleanly provides for a single allowed cancellation for every potential series length (i.e., 4 weeks of a 5-week series). The next major revision of the WSG came in 2008, when coordinators suggested providing an incentive to airlines to hand back capacity early, through a 20% pre-season hand back process.

In 2010 the coordinator-airline Joint Slot Advisory Group (JSAG) overhauled the WSG, simplifying, streamlining, and restructuring it to help it better serve as a clear global best practice. The guidelines, which had reached a 20th edition, were reissued and renamed as the new Worldwide Slot Guidelines, edition 1 in recognition of this rewrite.

Modern Slot Allocation – 2011 to Present

The coordinators and airlines continued to work together from 2011 to continuously improve and evolve the newly issued WSG edition 1. As the number of coordinated airports continued to grow, and the importance of globally harmonized standards became ever more apparent, the airports approached JSAG with a request to rejoin the governance structure.

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[4] Unfortunately the airports only chose to participate for a short period of time, ultimately rejoining the governance groups in 2020.

Understanding the benefit of airport feedback to the drafting process, the coordinators and airlines welcomed the airports back into the fold – first, through a joint airline-airport-coordinator Strategic Review of the WSG. Lasting from 2016-2019, this effort involved dozens of experts from each of the industry groups, working topic-by-topic to further evolve and improve the guidelines. This collaboration yielded strong results: the New Entrant threshold was increased from less than 5 to less than 7 movements, allowing a carrier to operate three rotations per day (three arrivals and three departures) while maintaining new entrant status. Additionally, a new chapter was drafted on slot performance monitoring, explaining this important process in detail and establishing the critical role of each of the stakeholders – airport, coordinator, and airline – in a robust monitoring system. The Strategic Review also led to strengthened procedures for capacity declaration and data sharing, according equal priority of access between New Entrant and existing (re-timing) requests, and a rewriting of the secondary criteria for allocation with a focus on competition, connectivity, and the environment.

Following the success of the Strategic Review, the JSAG was reformed into the Worldwide Airport Slot Board (WASB), a joint airport-airline-coordinator body, and the WSG were renamed as the Worldwide Airport Slot Guidelines (WASG). The WASB continues to work together to evolve this document and to meet the other challenges of the modern capacity crunch. One sterling example were the frequent video calls held by the WASB during the COVID crisis, resulting in joint industry guidance to the industry as to how operations should be managed and jointly supporting slot usage relief from the regulators during the period of reduced flying due to border closures and operational restrictions.

From 2011 to 2024, there have been 11 different versions of the WSG/WASG as this living document continues to adjust to the needs of the customer – whether passenger or cargo – and the traveling and shipping public. Unfortunately, the challenge of insufficient infrastructure continues to grow and threaten the industry, but the joint and continuous work of the WASB is a strong force for the industry to help ensure that we get the best possible use out of existing capacity.

Towards the Future of Slots

As we move into the future of slot coordination and allocation, it is important not to forget the lessons learned in the past, throughout the development of today's regulations and best practices. The table below summarizes the evolution of slot policy since 1948, listing major developments and updates along with how those policies have survived into the modern guidelines.

Hundreds of airline, airport, and coordinator slot experts have dedicated years of hard work to bring the SPG, WSG, and now WASG to where they are today - not to mention the global regulations which in the vast majority of cases align with the WASG. This short summary cannot possibly serve as an exhaustive retelling of the evolution of these documents – but is intended to put to rest the misguided claims that the WASG or slot regulations are stagnant documents which have not changed in decades.

Far from standing in the way of progress, the airlines remain committed to leading the continued evolution of the WASG to meet tomorrow's challenges.

Summary of policy development in slot coordination – the evolution of the Slot Guidelines

Year	Evolution	Policies Retained / Lessons Learned
1948	First Timetable Coordination Meeting	• Regularly scheduled optimization meetings (today, the Slot Conference) • Synchronizing flights to create "scheduling windows" and maximize connectivity
1950's	Development of first standards for scheduling process	• Global alignment in the timing and content of scheduling processes
1962	Timetable Coordination Meeting formalized, moved to June/November	• Biannually scheduled optimization meetings on a global, fixed calendar basis
1969	U.S. High Density Rule – "quotas" as the forebear of slots; change in use/time permitted subject to agreement	• Certainty of operation through explicit allocation of capacity to carriers • Fair access across carriers and business models • Flexibility ensured for airline, capacity permitting
1974	Schedules Procedures Guide v.1	• Industry experts creating a global best practice for allocation • Declaration process for congested airports to ensure slot process is applied only where needed
1980's	Computer-assisted scheduling begins	• Importance of technology in optimization of complex schedules

Year	Evolution	Policies Retained / Lessons Learned
1986	U.S. High Density Rule – 65:35 slot use ratio; buy/sell/lease rules	• Explicit obligation for airlines to use the allocated capacity in order to qualify for historic rights • Recognition of the value of secondary trading in congested markets
Late 1980's	SPG revised to include New Entrant Rule and 80:20 slot use ratio	• Retention of a designated portion of capacity for new entrants to encourage competition by carriers with no/limited current operations • Global application of the obligation to use the allocated capacity
1993	EU Slot Regulation passed in consultation with the Schedule Procedures Committee; mandated independent coordinators	• Alignment of local regulation with the industry-agreed global best practices • Coordinators must be independent to ensure neutral, non-discriminatory, and transparent allocation
2000	Worldwide Scheduling Guidelines v.1 – Minimum Series Length (4 weeks); Airport Levels	• Carriers must commit to a minimum period of continued operation at an airport in order to secure historic rights • Different levels of congestion require different solutions, with slots only necessary in those instances where capacity has not evolved to meet demand
2004	EU/WSG revisions: Minimum Series Length extended to 5 weeks – aligns 80:20 usage rate to minimum series length; a period of 5 weeks yields a requirement to operate 4 of 5 slots	• Regulations must consider the practicality of interacting provisions
2008	WSG revisions: Series Return Deadline; Pre-Season Handback	• Slot policy is strongest when balancing incentives with consequences to encourage optimal alignment
2010	WSG relaunch – simplified and re-structured as new v.1; Biannual meeting re-named the "Slot Conference"	• In a global business, clarity and simplicity of the global best practice is a key factor in harmonization

Year	Evolution	Policies Retained / Lessons Learned
2016-19	WSG Strategic Review: New Entrant level increased (<5 to <7) and New Entrant vs. Retime priority balanced, Ch. 9 added on Slot Performance Monitoring, Strengthened procedures for capacity declaration and data sharing	• The return of the airports to the guideline drafting process strengthens the value of the guidelines for all stakeholders • As demand continues to grow, additional processes are needed to ensure that the use of existing capacity is maximized • Periodic detailed review of the guidelines remains an important factor in their continued relevance
2020	WASB and WASG v.1 – Revision of secondary criteria (inc. competition, connectivity, and environmental factors)	• Additional details and guidance is required as to how to select between competing requests for scarce capacity

3. Why slots matter

Managing a long term, severe supply-side problem

The societal and economic cost of the imbalance between capacity and demand has led to the development of guidelines to oversee the process of planning schedules at these airports so that it is fair, impartial, transparent, and pro-competition in application. However, the cost of the failure to supply capacity to meet demand is seen in escalating delays, suboptimal schedules, and constrained airline networks. Against these challenges the airline industry has maintained a constant stream of consumer benefits in the form of connectivity growth, fare reductions, and sustainability initiatives that will reduce emissions while allowing continued growth.

Airlines are incentivized to utilize their assets as intensively as possible, which means maximizing load factor and finding operating efficiencies from sophisticated schedule planning techniques that support airlines' ability to compete. This is further supported by the rigorous requirements of the existing slot rules contained in the Worldwide Airport Slot Guidelines (WASG). The business drivers for utilization go hand in hand with the WASG's policies for optimizing slot use.

While the 'perfect' schedule is a concept unlikely to be realized because of today's constrained airport infrastructure (that limits demand being met because airspace and airport capacity severely lag behind what is needed to operate at the most economically valuable times and with the most appropriate equipment) the slot rules have provided an essential structure to make the best of this supply failure and helped manage air traffic to avoid chaos.

Efficient slot management leads to a sustainable and reliable air travel experience that is more accessible and convenient for the general public

The slot process is underlined by policies and practices that ensure it can operate regardless of location, with minimal government intervention to maintain fairness, and clear, transparent rules that enable a level playing field to support competition and efficient use. With over 200 airports declared as Level 3 and nearly 50% of all journeys starting or ending at one of these slot-coordinated airports, the role of slots in aviation – and more widely, their contribution to society – cannot be overstated. IATA estimates that above 90% of these airports apply the full WASG process.

The complex and intricate process of planning slots and operating a schedule to allow customers to fly where they want, when they want, as quickly as possible, at the lowest fare, requires a stable framework, especially when the operating phase has become prone to disruption due to external factors.

Network planning and scheduling teams sit uniquely in the middle of the airlines' commercial and operational teams – much like a conductor keeping the rhythm and directing the changes across an orchestra, their role is instrumental in driving the success of the airline. Never more than now has the planning role been both about long-term commitment and short-term agility to adapt to changing consumer demand and the increasingly volatile external realities. The pandemic has shown the need for resilient slot policies but also demonstrated the strength of the WASG's core principles of consistent, transparent, and customer-centric slot planning processes. Only the slot use requirements were adapted in COVID to reflect the plummet in demand – the rest of the slot framework remained in place as the foundations of the entire airline business.

A network industry: Aviation is a network industry – consumers derive value from two parts of the 'product' being sold – the start and end of the journey. Merely boarding an aircraft but going nowhere has no value for the customer. Airlines understand this well, but unfortunately and all too often this characteristic of aviation is not well considered in the assessments made of how slot policy changes will impact the consumer, airline, or

airport. Route networks between airports are the foundations of the aviation industry, and **slots have become integral to these networks by defining when and where an airline operates. Disrupting global slot policy in isolated, local approaches will cannibalize the route networks that consumers rely on.**

An airline CEO[5] once said that slots are the lifeblood of the airline because without slots, the future of airlines is bleak. Underlining the certainty and stability needed globally to continue to build connectivity on existing foundations of the aviation network is not taken into enough account in many academic proposals for slot policy. Neither is the impact on the airline industry's impact from their proposals, which in most cases would be devasting to the established schedule which customers rely on. The proposals would also undermine the high fleet utilization built across a network of precisely timed operations that drives the industry's ability to reduce fares, increase capacity, and serve demand.

Schedules are complicated and are underpinned by slot certainty and stability

The complex and global nature of schedule planning is not well understood, but in the most basic form requires compatible and complementary slots to match on each end of the route for the schedule to work. As a result, any upheaval at one end of the route can have the effect of unraveling a carefully constructed global network.

The complex schedule network that an airline plans depends on many factors coming together to generate a feasible schedule to be sold to the customer: fleet availability and suitability; access to airports and related infrastructure at the right time; the granting of traffic rights and approvals; the retention of third-party suppliers such as catering, ground handling, maintenance, and passenger services; and crew flight time limitations. These must all be combined with adequate demand, which is often influenced by the time of the flight and fare. If any one of the components is missing, schedules are put at risk. It is therefore vital to avoid isolated and cumbersome slot policies that deviate from the slot allocation process followed by the rest of the world and render it much more difficult for airlines to solve this complicated puzzle.

Government policy objectives also drive certain outcomes and influence access. This is alongside an airport's own aspirations for its network, as network quality for one airport may be based on international flights while a hub seeks efficient connections and multiple operations in waves to create maximum destination choice, which is also reliant on feeder services and regional flights to feed the long-haul schedules. Maximizing the capacity utilization of the airport alongside policy objectives ultimately drives the coordinators' allocation decision-making.

The WASG artfully allows all the objectives of the air transport system to be promoted in conjunction with practical issues like the airline's time on the waitlist, resulting in feasible schedules each season that reduce chaotic delays and congestion to the benefit of airports and airlines and their customers.

The WASG process now has two primary functions

The WASG process was always designed to provide a **planning framework** to allocate capacity in advance to ease congestion and delays and ensure long term certainty for an asset heavy industry while maximizing efficient use.

Today, the process has evolved to also be part of the operational phase and drives certain operational behaviors and outcomes. It is also being used as a tool to manage a multitude of restrictions (noise) and new characteristics of capacity that were not required previously. While these are all challenging, the most challenging aspect of all is a lack of consistent approaches, non-disclosed rules and requirements, and policies

[5] Jean-Cyril Spinetta, Air France, 2001 – Brussels meeting of the Association for European Airlines.

that prevent customer-focused solutions. There should be limits to the slot process in the operational window given that it is a planning tool, not a vehicle for achieving unrelated government policies (no matter how legitimate they may be).

The risk today is that where the WASG is silent on operational policy regulators will take their own local approach and the consistent and fair process will be eliminated in the actual operating season – reducing the benefits gained from well organized, approved schedules that reduce delays, congestion, and emissions.

The process is now being used to achieve far more than a robust allocation of capacity and, rather than push back, airlines are ready to embrace this reality and want support to make it work better, for the customer and themselves – mitigating local approaches and rules. It would be beneficial to define the timeframes in which slot processes apply and when they do not – or should not. For example, the three-day period comprised of the day before, the day of, and the day after the flight could be excluded from slot management to avoid customer impacts when the most important priority is to operate the flight and get the passengers to where they booked on time. This would reflect the airlines' own internal protocols whereby the schedule teams hand their planning over to the operational experts whose responsibility it is to implement the plan on the day of operation.

Government policy objectives and slots

While each country has its own unique circumstances and public policy objectives, there are several principles that underpin aviation objectives globally and can be linked to driving slot management policy:

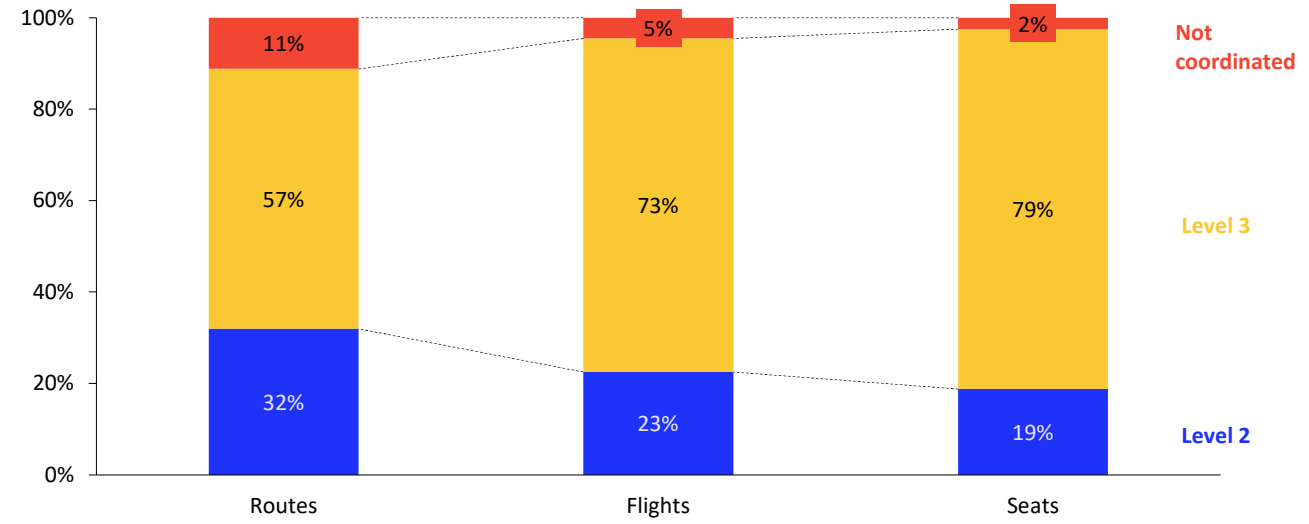
- Consumer and social welfare
- Accessibility and connectivity to support trade and tourism
- Economic development
- Environment

In order to achieve these objectives, the regulatory approach to slots is mainly focused on ensuring competition and access to markets, connectivity, and maximizing destinations accessible from their country, and efficient use of aviation infrastructure that is increasingly lagging behind demand for air travel.

Looking at competition, fares, and the availability of routes from Level 3 airports provides a good indication of economic performance in managing airport capacity scarcity, alongside the productivity and efficiency outcomes of these policies in terms of utilization of airport capacity, aircraft, and reduction of emissions and delays.

As one example, the 2024 schedule data for the United Kingdom reveals that while Level 3 airports cover 57% of routes to and from the UK, they represent 73% of flights and 79% of seats. There are thus a large proportion of routes from slot-constrained airports, which are served by multiple airlines. Customers are thereby given a choice in terms of the timing, price, and service offering that they can choose from, notwithstanding the congestion at Level 3 airports.

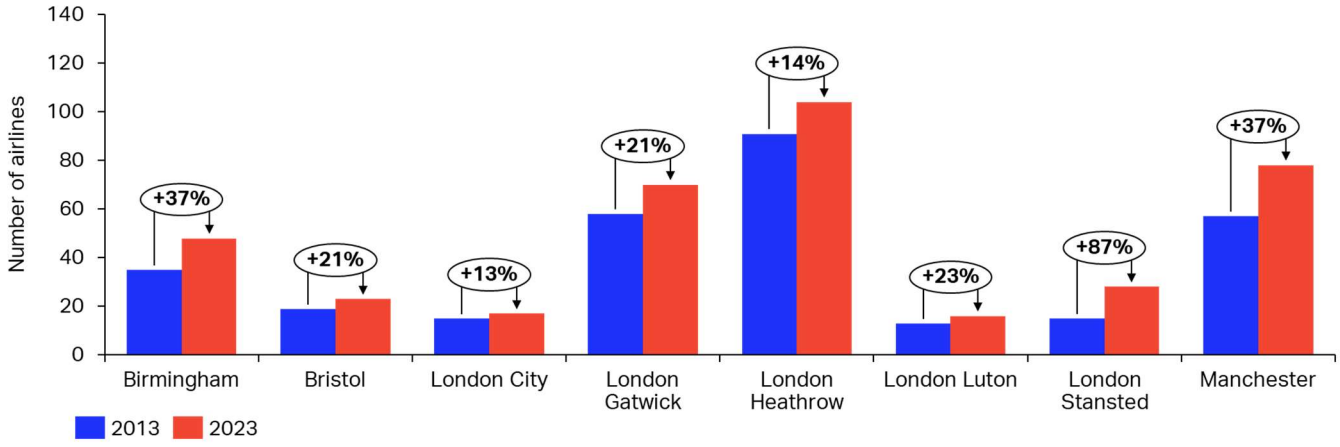
Number of scheduled routes, flights, and seats by the level of coordination in 2024: UK airports



Source: IATA Sustainability & Economics, OAG

Equally, airlines have been able to access Level 3 airports in the United Kingdom notwithstanding the need to first obtain a slot. From 2013 to 2023, there was an increase in the number of carriers operating to every single Level 3 airport in the UK – from 13% at LCY to 87% at STN.

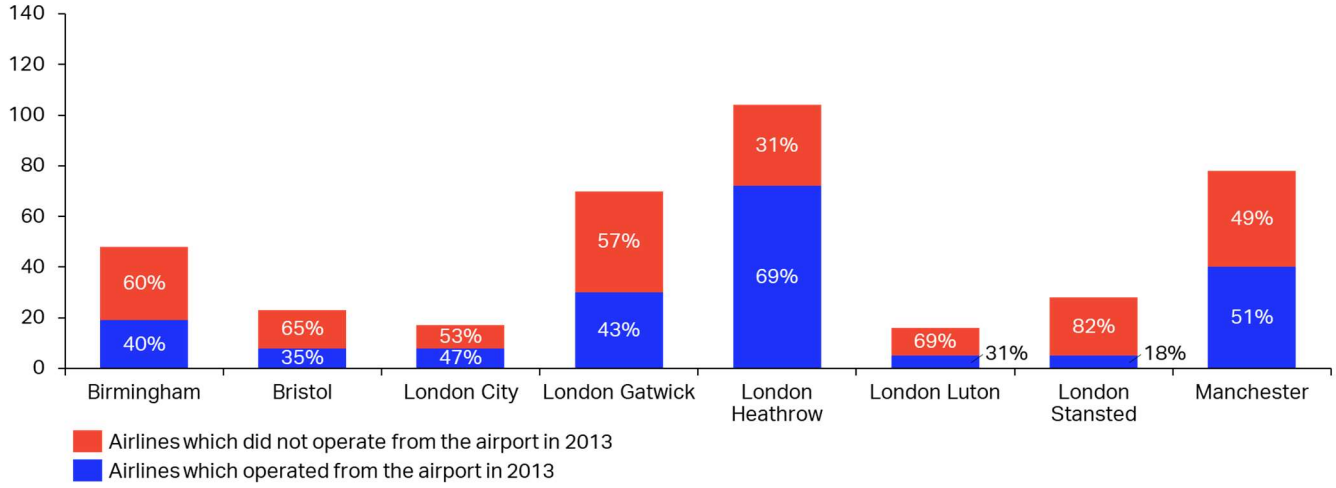
Number of airlines operating at UK Level 3 airports (2013 and 2023)



Source: IATA Sustainability & Economics, DDS

Not only has competition intensified at these Level 3 airports, but there has also been considerable change in the composition of airline operators over time. For example, of the airlines operating at LHR in 2023, 69% also operated in 2013, whereas 31% were different carriers. The biggest composition change is observed at STN, where 82% of airlines operating in 2023 were not present at the airport in 2013. At six of the eight Level 3 UK airports, more than half of the airlines operating last year were not present in 2013.

New airline entrants: composition of airlines operating flights from UK Level 3 airports in 2023



Source: IATA Sustainability & Economics, DDS

This growth in competition and connectivity directly drives the government policies mentioned above. We caution, however, that this strong progress is not put at risk by attempting to use the slot planning system as a universal tool to try to solve all government challenges and priorities. For example, there has been some consideration by regulatory authorities and policy makers to link slot allocation to the environmental performance of aircraft. While certainly an important priority, environmental challenges are not best addressed through the planning tool of slot allocation, and using this tool for an unintended purpose can quickly lead to unintended and counterproductive consequences, harming competition and connectivity with no (or even negative) benefit to the environment. In fact, there are regulatory regimes that are specifically and better designed to address environmental concerns, including the UK Emissions Trading Scheme and CORSIA.

4. Economics of the airline business and slots

Air transport is vital for creating economic value across the globe. It enhances economic activity by accelerating the flow of people, goods, and services between regions. It has the potential to improve local employment opportunities and living standards and enhance the competitiveness and productivity of businesses and industries.

Nonetheless, aviation is a complex and challenging industry which requires the collaboration of multiple stakeholders across the value chain for success. Airline profitability is far from given, hence careful planning as well as cost and investment management are at the heart of airline operations. The objective of this section is to demonstrate the key considerations related to the economics of the airline business. It sheds insight into the key fundamentals, creating an understanding of the important role played by certainty – as provided, at Level 3 airports, by the WASG and in particular the rule governing historic slot rights – in underpinning the performance of the industry.

When considering airline economics, it is important to recognize that aviation is a highly dynamic and competitive business. As such, airlines constantly monitor the consumer and wider economic trends, to understand demand and cost patterns and respond accordingly. In this context, airlines must adopt a flexible approach to conducting business – they can adapt their routes in response to consumer needs (although it is not always straightforward to do so!). On the other hand, airline operations are both capital and labor intensive. Airlines must plan for aircraft purchases, staff recruitment, and training well in advance, as there is a long lead time between the planning or investment decision and having the aircraft and crew enter operations.

The overview of the fundamentals of airline economics has been structured as follows:

- Fundamentals of airline supply and demand
- Airline network and business models
- Airline route planning
- Airline cost and investment management
- Profitability

Fundamentals of airline supply and demand

Air travel demand is influenced by a variety of factors. Over the longer-term, key demand drivers include income, population, demographics, and price. In addition, the industry is susceptible to unforeseen 'shocks,' including economic downturns or recession, geopolitical tensions, war, terrorism, health concerns and associated government travel limitations, and climate-related events and disruptions. All of these factors can impact passengers' willingness and need to fly and the nature of global trade flows. To varying degrees, consumers are also price sensitive and may choose to delay their flight or shipment, not travel or ship at all, or find an alternative mode of travel entirely if the price of air travel is considered too high. This is particularly true for leisure travelers, who frequently adjust their chosen destination and travel date depending on the prices offered. Business travelers tend to be less price sensitive, due to the generally more urgent need for the trip combined with the limited flexibility in terms of timing and chosen destination.

Supply in the airline industry revolves around the capacity and availability of flights and seats. Unlike in many industries, airline seats are a perishable item – once the flight departs, the seat or ULD (cargo) position is no longer available. It does not become part of inventory that can be sold at a later date. Fundamentally, available capacity relates to the availability of fleet, and hence the ability of airlines to purchase or lease aircraft. As such, this will be dependent on the activities in the wider supply chain, both in relation to the manufacturing process (new aircraft) and maintenance, repair, and overhaul (MRO) activities (existing fleet). Additionally, an airline requires qualified staff – across the business – to ensure the fleet can be operated. Staff recruitment and

training often requires multiple months or years, and hence also needs to be planned in advance, consistent with the airline's broader strategic plan and outlook.

Further elements which affect the supply are the costs related to business operations, including fuel prices, labor costs, maintenance expenses, airport or overflight fees, and taxes. As with any business, airlines may choose to limit or not to operate services at all in areas where the combined costs are too high to allow for a financially viable return.

Airlines continually evaluate their fleets, seeking to optimize efficiency, reduce operating costs, and enhance passenger comfort. Fleet modernization through the acquisition of more fuel-efficient planes allows airlines to augment their supply while maintaining cost-effectiveness. However, unlike in many other industries, the aircraft asset has a long lifecycle – 20-30 (or more) years in many cases – which highlights the importance of the initial investment decision. Providing for some flexibility in operations, airline investment has shifted away from outright purchase towards aircraft leasing over recent decades. Currently around 50% of the global fleet of aircraft are leased by airlines.

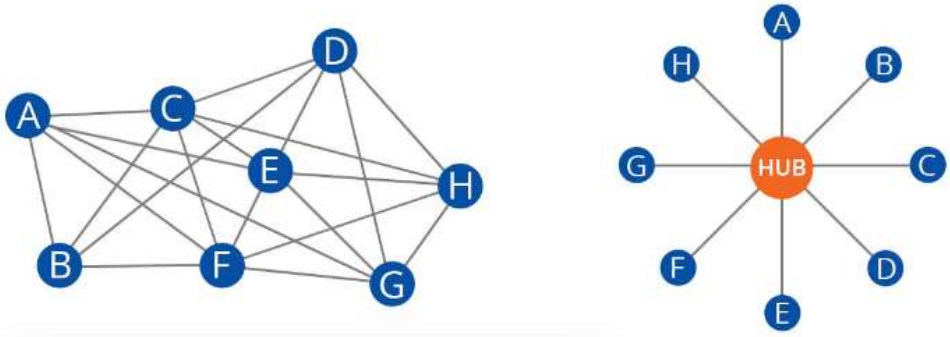
Regulatory frameworks, both domestic and international, also influence supply dynamics. Aviation regulations pertaining to safety standards, routes, taxes, fees and charges, and environmental policies can all impose constraints on airlines, impacting their ability to expand or modify their operations. Infrastructure constraints, including airport capacity – impacting the availability of slots – and air traffic management also affect the industry's supply side. Congested airports and airspace limitations can impede an airline's ability to add more flights or routes, restraining the supply of available seats. Airline investment and route planning considerations are presented further below.

Airline network industry and business models

There are two primary models of airline networks: the hub-and-spoke model and the point-to-point model. The hub-and-spoke model is a system in which airlines operate flights from a central hub airport to multiple destinations. The hub airport serves as a central connecting point for passengers and cargo traveling to different destinations. This model allows airlines to operate more efficiently by consolidating passengers and cargo and reducing the number of flights required to serve multiple destinations. Also, the hub-and-spoke model typically enables airlines to offer more frequent flights to smaller destinations by connecting them to larger hubs. The hub and spoke network is particularly important for consolidating traffic onto long-haul networks.

The point-to-point model is a system in which airlines operate flights directly between two destinations without a central hub. This model is predominately used for airlines that operate short-haul flights between nearby destinations. However, this model requires airlines to operate more flights. If an airline operates a hub-and-spoke model, they can fly fewer routes to connect the same number of destinations. For example, to connect ten destinations under the hub-and-spoke model only nine routes would be required, but with the point-to-point model 45 routes would need to be operated.

Illustrative Hub-and-Spoke vs Point-to-Point Networks



In addition to having various network types, airlines also operate across a spectrum of different business models which is made possible by the liberalization of air transport markets. The main categories are discussed briefly below, although the distinction is becoming increasingly blurred as airlines respond to the pressures of competition.

Full-Service Network Carriers (FSNCs) are the 'traditional' airlines which offer a broad range of services and fly to many destinations, often utilizing a central hub or hubs. The existence of a main operational hub – which provides more certainty that they can maintain a presence and grow – creates the conditions that allow the FSNCs to invest in infrastructure and amenities, new routes, and connectivity, to the benefit of customers. Additionally, FSNCs tend to rely more on relationship marketing and frequent flyer programs to retain customers.

As the name suggests, **Low-Cost Carriers** (LCCs) are airlines that focus on minimizing costs and offering low fares to passengers, supplemented by various 'ancillary' revenues (such as bag fees, purchasing meals onboard or extra legroom). As the original industry disruptors, the LCCs have grown the market and typically offer a single-class service with limited amenities and utilize direct sales channels. LCCs predominantly operate under a point-to-point network model.

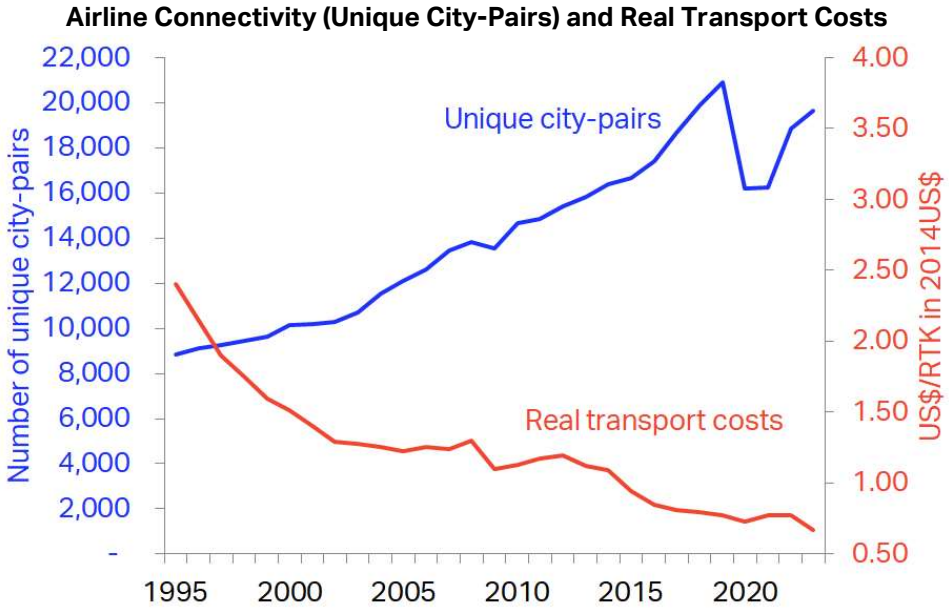
LCCs tend to be more agile in terms of their network, redeploying their fleet to take advantage of profitable market (route) opportunities as they arise. In part, this is enabled by undertaking less investment into a particular city or route than the FSNCs, and the relative simplicity of the point-to-point network structure. A consequence of this is that the networks of LCCs tend to change more frequently than that of the FNSCs; this is both positive (new route development) and negative (route churn and cessation of service) for consumers.

Over time, the distinction between LCCs and FSNCs has eroded, with each adopting characteristics of the other. For example, some LCCs have developed loyalty programs and begun to pursue the business market while many FSNCs have introduced fees for ancillary services and are increasingly differentiating their product across the cabin and competing for low-cost traffic. This has created a number of so-called **Hybrid** airlines which offer a mix of services and fares to appeal to different segments of customers. The cost difference between the LCCs and FSNCs has consequently been eroded, with competition driving airfares lower. More recently **Ultra Low-Cost Carriers** (ULCCs) have emerged, whose cost structure seeks to undercut those of the original LCCs, thereby further intensifying competition in the industry.

Regional airlines operate within a specific region, often in partnership with FSNCs, providing 'feeder traffic' into the FSNC hub airport. They use smaller aircraft and serve niche markets, driving connectivity and support for a broad section of the populace that might not otherwise be well-served by aviation. **Charter** airlines operate on a contract basis, usually for tour operators.

Cargo airlines transport goods rather than passengers. They use dedicated cargo aircraft to major cargo hubs and have high asset utilization rates. **Cargo Integrators**, or express cargo networks, operate large numbers of not only aircraft but also trucks and couriers in order to provide a door-to-door service for shippers. By contrast, **General Cargo** airlines focus on the air transport sector only, with freight forwarders or other intermediaries handling the ground transit to and from the flight itself. As with passenger carriers, there is some hybridization between these models. Broadly speaking, dedicated cargo airlines carry around 50% of total air freight volumes, with the remainder carried in the cargo hold of passenger aircraft. It is estimated that air cargo (Cargo Integrators and General Cargo together) transports around 5% of international trade by volume, but around 35% by value.

The variety of operating models continues to evolve, with the evolution being driven by the demands of the consumer, resulting in a competitive industry, increased connectivity, and cheaper fares and cargo rates.



Source: IATA

Route planning

Route planning is at the core of an airline's strategic activities. Dedicated teams continually monitor existing route performance along with potential new markets that an airline might consider entering. The first step of route planning relates to demand monitoring and forecasting. Are there enough passengers who would be willing to travel on a certain route? What ticket prices would they be willing to pay, and is that sufficient to cover the costs of the proposed operations? What are the current (or historic) flows of cargo on the given route, and what rates are being charged? The ultimate objective is to identify whether the proposed new offering creates the best value to the end consumer, at a price that is viable for the airline. To answer these questions, airlines use their large databases of historic ticketing information along with various economic and other activity indicators.

Once a potential new route is identified, the route planning team considers a series of operational questions: When should the route be operated to best fit into the existing schedule and network? If an airline operates a hub and spoke network, it is key to ensure that passengers and cargo from the new route can connect to their onward destination in a timely and efficient manner which may entail coordination with airline alliance or codeshare partners. The planning team must also consider if the right type of aircraft and the crew qualified for this aircraft are available at this given time and day. Simultaneously, the team must assess if wider infrastructure is available. Would the airline be granted permission to take off and land at both the origin and destination airport at the required times? Do the airports have available capacity or is it limited due to regulatory constraints or physical limitations? Do the airports have the required infrastructure for the aircraft that the airline wants to operate? This is particularly important when an airline plans to use widebody aircraft, as not all airports have the runway, tugs, aircraft steps or other ground handling equipment to enable such operations.

Finally, the airline must consider and analyze numerous regulatory requirements. This covers operational safety, security, and international agreements, but may also extend to, for example, becoming familiar with regional tax legislation. Navigating these legal requirements can be complex and time-consuming, with airlines investing heavily in ensuring that compliance is maintained.

Given the competitive nature of the business, airlines also analyze and invest in creating and developing consumer loyalty. This is done through ensuring that the needs of the (various segments of the) target consumer market are well understood and the airline offering carefully addresses those needs. Depending on

the airline, its target market, and the route, this may result in a carefully tailored product offering, a specific route scheduling, the ability to purchase tickets in a specific price range, or a dedicated loyalty program.

As supply and demand are not constant over time, airlines look to strike a delicate balance between these two elements to maximize profitability. During periods of high demand, airlines might increase flight frequencies, expand routes, or deploy larger aircraft to cater to the surge in passengers. Conversely, during low-demand periods, carriers may reduce flight frequencies, consolidate routes, or utilize smaller planes to manage costs and optimize capacity utilization.

Efficient aircraft route planning is the backbone of airline profitability and securing a return on investment. However, this is reliant on seamless coordination across an airline's own fleet planning, schedule planning, passenger reservations, flight operations, air traffic controllers, airport authorities, ground operations, and airplane maintenance systems. Meticulous planning and implementation are paramount when operating in such an uncertain and complex network of interdependent parties.

Airline cost and investment management

Airlines strategically invest in various types of assets to improve their services, increase operational efficiency, boost profitability, and foster growth. The type and scale of investments differs based on the airline's size and business model. One major aspect common to the whole airline industry lies in its capital-intensive nature.

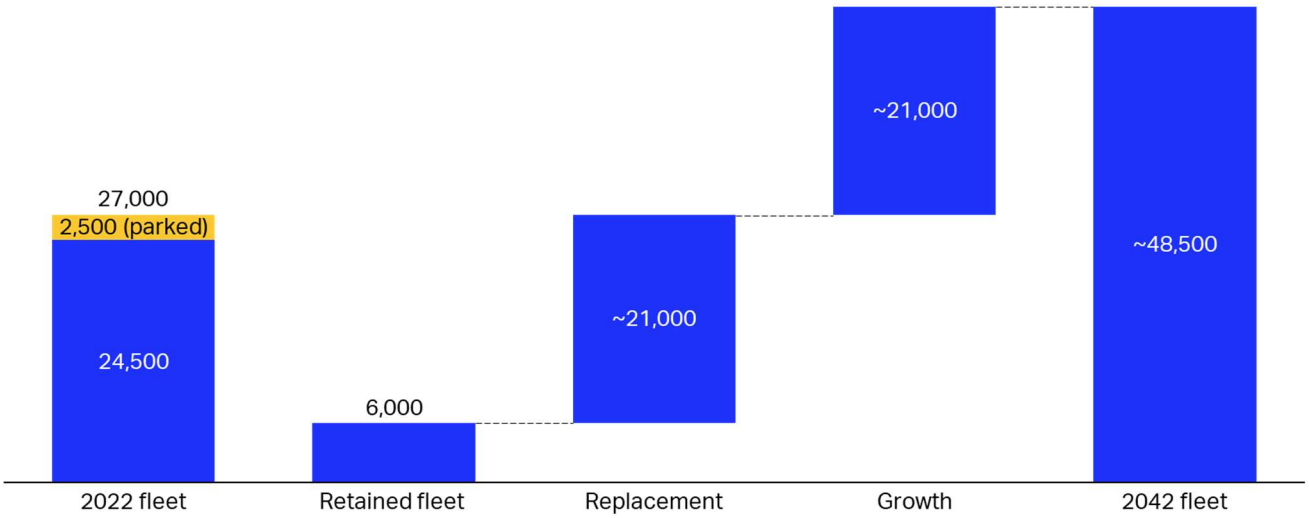
Capital-intensive industries – not just aviation – require relatively high levels of investment to produce the goods or services they offer and have a high share of fixed assets. Accordingly, these industries tend to be associated with a high ratio of fixed costs to variable costs and high levels of asset depreciation. Capital-intensive industries require a high volume of production to provide adequate returns on their (sizeable) investments.

Due to their significant investments in infrastructure, with aircraft representing a cornerstone capital asset, airlines are among the most capital-intensive industries. Fleet decisions – including the choice between newer, costlier models or maintenance of older, less efficient ones – profoundly impact costs and profitability.

Aircraft fleet renewal is an ongoing, long-term planning process that demands substantial investment. Airlines cannot swiftly change their fleet size or composition; they must plan at least several years ahead to allow for the delay between order and delivery. Before every major investment, airlines therefore carefully consider a multitude of factors such as existing fleet capabilities, demand and market conditions, aircraft economics, aircraft performance, financial considerations, as well as route and network dynamics. The choice of airframe, engine, belly capacity, cabin, and seat or cargo configurations will primarily depend on demand segments in the target market. Operational efficiency, fuel economy, and regulatory compliance are also key considerations for airlines when making these decisions.

The major aircraft manufacturers estimate that the size of the global fleet will approximately double over the next twenty years, to accommodate the expected increase in the demand for air transport services – both passenger and cargo. The total investment, which takes into account both the replacement of ageing aircraft and the need for additional capacity, will cost somewhere in the order of USD 5-6 trillion over the period. Such fleet renewal will also assist in achieving the industry's sustainability goals, increasing fuel efficiency, reducing emissions and in time, incorporating new technology and fuel sources.

Fleet Forecast to 2042



Source: Boeing

Beyond the aircraft fleet, airline investments also extend to office buildings, airport slots, terminals, hangars, and maintenance and training facilities, as well as special equipment and technology for reservations and safety, security, and accessibility provisions. Many carriers also heavily invest in the hubs from which they operate, where they outfit terminals, check-in areas, lounges, and other assets that help them streamline operations and enhance passenger experience. For example, in 2023, United announced a major USD 2 billion joint investment with Houston Airport in the transformation of its Terminal B.[6] These investments have a direct impact on the comfort and efficiency of passenger journeys. Fundamentally, airlines are only willing to undertake airport-based investments when they have a certainty that their customers will be able to make use of these facilities.

Cargo airlines, by comparison, invest extensively in storage and sorting facilities at the airports they serve. DHL Express, for instance, unveiled plans in 2023 to invest roughly USD 200 million in a new aircraft maintenance facility at its primary hub at Cincinnati/Northern Kentucky International Airport.[7] Similarly, cargo airlines invest in their storage and sorting facilities only when they have the confidence that they will be able to continue making use of them for a prolonged period, allowing them to make a return on investment. If an airline was faced with the risk of not being able to use the facility in the long term, they would not invest further and would likely move their operations to a different location.

The magnitude and variety of airline capital investments and the associated high ratio of fixed to variable costs explain why aviation, as a capital-intensive industry, is more vulnerable to economic downturns and other shocks compared to other business types. This is because the fixed costs – for example the liabilities related to their aircraft fleet and associated infrastructure – must continue to be paid, even where revenue-generating activity has been disrupted or halted.

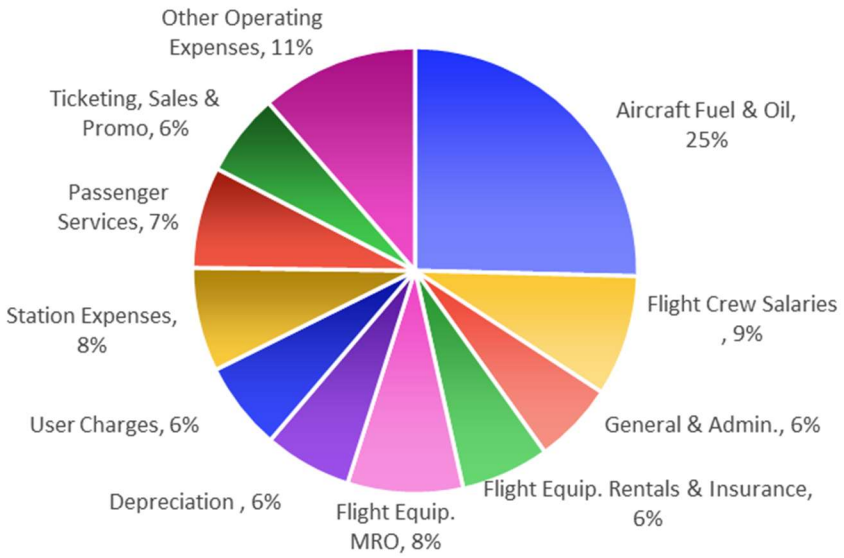
While investment strategies are key to airline operations, close management of variable costs is also pivotal to airline financial sustainability. The key variable costs are fuel and labor costs. Fuel typically represents around 20-30% of the operational cost for airlines, so any fluctuation in prices can have a major impact on airlines'

[6] https://aviationsourcenews.com/airport/united-airlines-invests-in-major-terminal-b-transformation-at-houston-iah/
[7] https://www.airport-technology.com/news/dhl-expand-us-superhub-192m-investment/?cf-view

profitability. To increase certainty in future operating cost levels, airlines may, as part of their risk management strategy, choose to hedge their fuel purchases.

The backbone of airline services are the employees who facilitate air transport. Labor costs account for a significant proportion of operating costs.[8] Airlines need to carefully monitor the remuneration packages offered to ensure they remain an attractive employer and have the human resources available to support future growth and investment. As with fuel hedging, human resources must be taken into consideration when planning routes. If continued operation in a specific location is not secured, this can lead to sunk costs for the airline and create serious difficulties in the employees' own personal situations.

Airline Operating Cost Structure, 2019



Source: IATA

Profitability

Across the 110-year history of commercial aviation, we estimate that the global air transport industry has generated a cumulative loss (even before the massive Covid-related losses are taken into account). Financial performance can vary widely across airlines and is independent of size, region, and business model. This highlights the competitive and challenging nature of the industry.

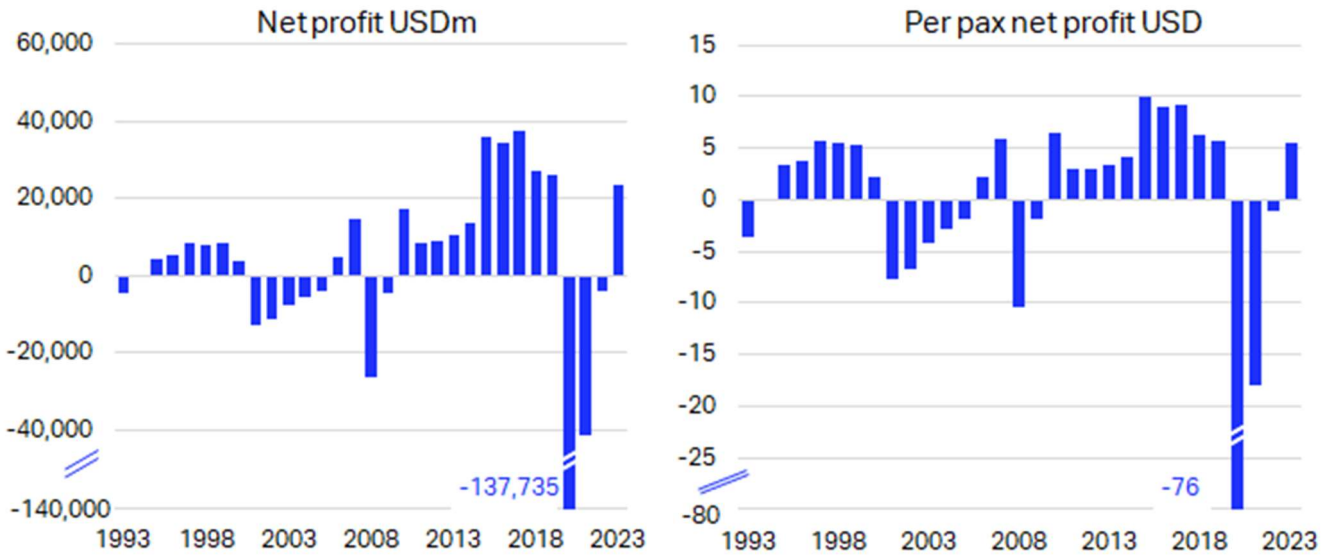
Having said that, the resilience of the industry is also evident from the financial performance whereby the industry typically bounces back strongly and swiftly following the impact of the unanticipated shocks. The post-Covid 19 experience is a case in point. After generating losses of around USD 140 billion in 2020 – easily the largest shock and worst financial performance on record – the industry has returned to profitability just three years later. Nevertheless, profits remain elusive, and the industry is clearly a high volume, low margin business. For example, on forecast revenue of around USD 800 billion, per passenger net profit in 2024 is expected to be a little less than USD 5.50.

This volatile and overall fragile financial performance has also created challenges for airline investors. Historically the air transport industry has struggled to deliver the returns expected by equity investors for

[8] https://www.investopedia.com/ask/answers/040715/what-are-major-expenses-affect-companies-airline-industry.asp. For example, for US airlines in 2023, labor costs accounted for approximately 31% of total expenses, although with variation across carriers. see https://www.airlines.org/dataset/a4a-quarterly-passenger-airline-cost-index-u-s-passenger-airlines/.

risking their capital. As such, the goal of a sustainable financial future for the industry remains a work-in-progress.

Industry Net Profit (USDm) and Per-Passenger Profitability (USD), 1993-2023



Source: IATA

Conclusion

Businesses, investors, and consumers like certainty. This is because certainty implies a stable environment leading to informed decision-making and strategic planning. When certainty is high (and the risk of unforeseen challenges low), businesses can allocate their resources with confidence and focus on innovation and expansion, knowing that their investments are likely to yield the expected returns.

For capital-intensive industries such as aviation, certainty is particularly important given the significant upfront investments required for their assets. Airline investments are often long-term and irreversible. As a result, any uncertainty – whether it is related to the economic backdrop, market volatility, regulatory changes, or technological disruptions – can hamper investment, and in turn have a negative impact on a company's competitiveness, growth, and ultimately its survival.

Airlines invest billions in their aircraft fleet, with the useful life of an aircraft spanning two to four decades. To justify such large-scale and long-term investments, airlines depend on certainty with respect to infrastructure access and the regulatory environment. This is one of many key arguments supporting the importance of reliable and stable global slots rules –in particular, the certainty of historic slot rights at Level 3 airports.

When airlines add a new city pair connection, they save shippers and travelers both time and money. That way, airlines can spur tourism, boost trade in goods and services, attract business investment and human capital, and ultimately stimulate economic growth in the regions that they serve. This leads to job creation and improved living standards, thereby contributing to the overall development of the area.

Airlines play a crucial role in enhancing consumer value by establishing a global transportation network that connects people and facilitates access to goods, capital, services, knowledge, and ideas. The significant growth of the airline industry over the past century, which manifests itself in the combination of a decreasing (real) cost of air transport and a continuously increasing number of city-pair connections all over the world, has made air travel more accessible and convenient for billions of consumers and has generated significant benefits to national economies.

5. The airline vision for slots

Airline schedules are planned to accommodate demand each season based on a deep understanding of the customer and the market and a desire to operate as efficiently as possible – including optimizing the network and routings to maximize utilization of the airline's resources and drive a highly connected, efficient product that allows innovation to strategically compete. However, this goal faces myriad challenges which complicate planning and require a series of compromises – not least the lack of capacity available to operate flights when and where the customer wants to go and night restrictions that close airport facilities hindering efficiencies further. It is the airline that bears the risk of starting new routes and establishing demand to sustain the planned schedule.

The sector relies on having a predictable and stable process for coordinating slots to plan schedules and invest in future routes and sustainable fleet because there are so many other 'moving parts.' Stability is essential to create opportunities for expanding network value through connecting flights, increasing global connectivity and the international benefits of aviation.

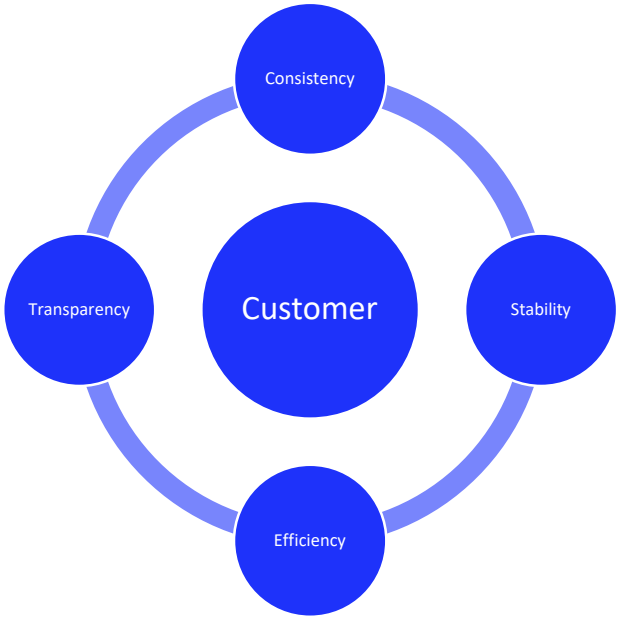
While airlines accept the compromises made between the ideal operating time and what is actually feasible in terms of availability, the benefit to the industry and the customer is less congestion and delay on the day the flight operates, balanced with efficiency. The system also stabilizes the network one season to the next so all users can plan longer term and sell realistic flying schedules, whether that be for express parcel delivery, business travel, or leisure holiday travel.

Vision

Slot policy is a universally compatible, customer-focused solution to manage a severe lack of aviation infrastructure, delivering benefits despite these constraints. Successful slot policy achieves efficient and resilient operations that contribute to the sector's environmental initiatives for fuel efficient operations through reduced delays at airports that are truly congested. Policy is designed so that stakeholder interests are balanced in a fair and neutral, non-interventionalist manner, and the customer benefits from vibrant competition, global connectivity, and reliable, convenient schedules.

The slot process must work for all carriers, fairly and equally, providing a strong, stable support to airline planning no matter where in the world they plan to operate to. The cooperation and contribution of each stakeholder in the process – airport, coordinator, and airline – is essential to achieving this goal.

There are several core principles associated with the slot process that remain critical ingredients for success, centered around the customer.



These guiding principles and core policy values of the slot process underpin the airlines' views on the purpose, accountabilities, responsibilities, and requirements of slot rules and procedures. The airlines' vision for future slot policy is based on these core policy values being incorporated into all elements of slot management.

The Customer

The customer is central to everything the aviation industry does, including schedule planning and slot management. Schedules are planned to offer the customer the best possible routing, fare, and product to meet their needs –for passengers and shippers.

The rules and procedures should not prevent carriers making **resilient, sustainability-driven scheduling decisions** focused on the **customer**, which means **improving flexibility in the process**. With flexibility to adapt to ever-changing external impacts, air carriers are better able to make customer-centric decisions in the planning and operational phase, improving resilience and performance of the sector.

The pro-competition policies of the process are two-fold, ensuring customer benefits can be realized in the most constrained aviation operating environments through access and mobility. First, they promote access for new entry and enable meaningful size and scale to be established at airports without abundant supply-side offerings. Second, they ensure mobility within the pool to provide opportunities to access slots on secondary markets.

Consistency

Since its inception, the fundamental principle of slot policy development was to standardize the process for allocating and managing slots at a worldwide level. This remains pivotal to this network industry.

Global adoption of consistent and coherent slot rules enables efficiencies in planning for all stakeholders, is a catalyst for route development and increasing connectivity, and lowers barriers to entry – which all in turn increase the social and economic benefits of aviation.

Consistent application of slot policy, regardless of location or airport, enables fair and equitable allocation and use that creates a level playing field and promotes competition among carriers. Customers expect consistent, reliable schedules one season to the next.

Certainty

The stability and predictability of the slot allocation process is essential for airports and airlines, considering the myriad unpredictable external challenges that are out of their control. Customers want reliable schedules which serve their needs, build trade opportunities, and support economic growth, while airports and airlines need certainty from one season to the next to plan adequately and invest in their assets. Clear and certain rules foster fair competition conditions whereas opaque and unpredictable rules and policies add further complexity and distort competition. Certainty provides the stability needed to support industry investment, a vital requirement to achieve sustainability objectives.

Transparency

Transparency is fundamental to the impartial nature of the process. The availability of slot data, capacity information, and timely, regular updates increases efficiency for all parties. Transparency supports competition and improves access and schedule optimization opportunities. Transparency of slot performance-related data will inform future improvements and help to manage delay and congestion.

Efficiency

While the process itself is designed to be efficient and effective globally, the outcome of the rules should ensure the efficient use of scarce infrastructure, in both an economic and social sense, while resulting in strong productivity.

Cost efficiency and long-term investment in the sector drives economic value and will help support sustainability objectives by allowing airlines to operate efficient schedules, secure new fleet, and invest in new technologies.

Disrupting slot policy in isolation can hinder a country's connectivity – avoiding regulatory pitfalls will be important in the future design of policy. There is no evidence that alternative slot allocation models would better enable connectivity growth and retention. In fact, most studies advocating alternatives to the WASG lack meaningful and realistic consideration of the impacts on connectivity, route choice, and future schedules. Conversely, connectivity is aviation's biggest contribution to society, enabling economic mobility, growth, and social interaction – which aviation is supporting through sound regulatory policy.

6. Refocusing and innovating slot policy

The wide angle: Collaboration

The Worldwide Airport Slot Guidelines (WASG) have provided a stable framework for slots and continue to be the foundation for the industry to work on collaborative improvements and refine the policies adopted globally.

The WASG practices and policies are reviewed and updated regularly to ensure compatibility with industry and market developments and support government objectives for connectivity, competition, efficiency, resilience, and sustainability. The forum for achieving improvement and innovation in slot practices is the Worldwide Airport Slot Board (WASB) – a three-party governance structure involving airports, coordinators, and airlines, and responsible for creating, allocating, and using aviation capacity – working alongside global governments and regulators.

It is important that the WASB continues to be a leading light in developing the slot policies of the future so that there is a relatable, expert-led consideration of any changes to the slot framework. Mindful of the governments' right to drive their own policy formation, airlines want to encourage regulators to work with the WASB and seek their input to policy consultation so there is a mutually beneficial outcome, rather than a patchwork future to the development of government slot policies. In this regard, we support legislation which allows governments to adopt changes to the WASG in an expedited manner so that dynamic changes to the global standard can be quickly applied nationally and regionally.

The complexity of slots and the intricate way that slot policy impacts the air transport sector and beyond is not clearly depicted in academic research, which usually only considers the external efficiencies or market forces *a priori*. The airlines depend on the core values laid out in this paper being incorporated into all future policy assessment, not so they succeed as businesses in their own right, but rather so that they can perform the myriad planning functions that allow air transport to make long term investments in a network of interconnected airports – many already severely full and unable to serve market demand.

Through the WASB, all impacts can be evaluated thoroughly by airports, airlines, and coordinators *a posteriori*, resulting in final proposals benefiting from industry support with realistic implementation horizons that allow uniform adoption globally.

Focus: Direction and future strategy

The airlines' view on the necessary changes and improvements is published here along with the practices that – if ignored – could devastate global networks harming trade and tourism as well as customer satisfaction. There is also an overview of where innovation and future trends should be integrated into policy to realize further benefits. This needs the support and partnership of regulators and industry to build coherent policies that can be adopted consistently worldwide with lasting impact.

Innovation and improvement areas

The airline industry is supportive of innovating slot processes to:

- improve efficiency of allocation through balanced accountability and responsibility sharing,
- oversee capacity declaration requirements to facilitate supply and demand balancing,
- allow a speedy review of coordinator decisions through alternative dispute resolution mechanisms,
- provide better access policies to create opportunities,
- increase transparency and openness through use of data and portals, and
- adopt technology to drive systems integration forward.

Practices to continue and retain

The airline industry is seeking to retain and maximize the benefits of existing policy in these areas given their contribution to aviation benefits:

- historic precedence,
- the flexibility to change the use of slots,
- the calendar of slot activities combined with the seasonal cycle,
- secondary trading and slot mobility, and
- the independent role of the coordinator.

Concepts to discontinue

There are some concepts under consideration that would cause unintended consequences and unnecessary disruption to this complex area of the air transport industry. They create unmeasured risk to connectivity and therefore efficiency. The specific ideas and practices airlines want to see discontinued are:

- primary market allocation outside of the proven administration allocation model,
- local and bespoke, isolated approaches that deviate from the consistent global framework, and
- the introduction of instability and uncertainty through constantly shifting regulatory practice that depart from the WASG, the globally accepted standard.

Zooming in: Recommendations for future slot policy

Innovation and improvement areas

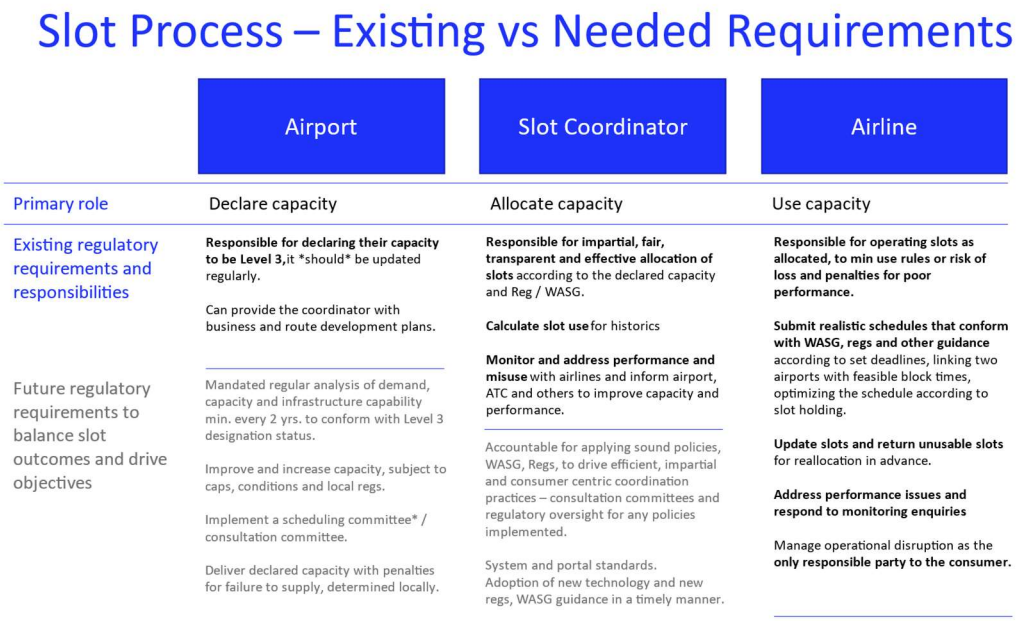
Balanced accountability and responsibility sharing

The role of airports in the slot process is clearly defined as the capacity providers (of slots), but the requirements do not extend beyond the theoretical declaration phase to the operational phase when the capacity has to be delivered. Conversely, the airlines are accountable across several regulatory provisions not only to plan a schedule in accordance with slot limitations but to operate this schedule with penalties and sanctions for not doing so as published. These provisions on airlines include the use-it-or-lose-it (80/20) rule, slot use monitoring and on-time reporting, performance-related slot sanctions, requirements to pay compensation for delays and cancellations – all of which are apportioned solely to the airlines. Balancing the performance outcomes across those parties integral to achieving efficient operations, including airports, would result in a proportional and more efficient means to drive the right consumer outcomes.

At a minimum, there should be regulatory oversight of all capacity providers that encourages meaningful and realistic plans that have been declared to be fully operationalized and delivered. Where necessary, airports should invest in modern technology to ensure that this capacity declaration is done as efficiently as possible to maximize the use of existing infrastructure. When this fails, monitoring and management of performance should kick in. The WASG contains an entire chapter dedicated to slot performance monitoring to ensure identification, management, and correction of any issues. The airlines encourage regulators to better balance the regulation to also address airport performance: review of capacity declarations, periodic monitoring and management of actual performance, defined service levels, and a clear escalation process when delivery falls short. This will ensure that consumers benefit from practices that ensure optimal use of capacity to meet their travel and shipping demands.

Likewise, the accountability of the coordinator should be enhanced to ensure they are effective and productive, while becoming responsible to the customer in their decision making. Any policy decision designed to clarify a coordinator's function or provide interpretation or update on implementing policy should be subject to coordination committee oversight, as the local forum for interested parties on slots. The *modus operandi* should always be to ensure that coordinators are taking decisions compatible with the customer-centric

approach taken by airports and airlines. This accountability can be further strengthened by providing an opportunity to quickly review contested decisions through an alternative dispute resolution process.



Capacity declaration and oversight of the airports' responsibilities

Seasonal capacity declaration and the airports' role in determining this first step of the slot process should be included in the regulation, with specific requirements and responsibilities set out to ensure that future declarations optimize and maximize opportunities, regardless of whether there is large scale infrastructure expansion.

The declaration of capacity parameters each season by the airport managing body is included in the WASG, however there is no requirement for this to be regularly reviewed and updated to ensure it is maximizing all available capacity in relation to the developing and changing demand patterns each season. The reality is that some airports declare the same parameters season after season due to no change in capacity, but this fails to recognize and consider how demand changes each season from both a consumer and airline perspective, which should better inform a dynamic slot parameter declaration. Given this is the basis of the seasonal slot process – determining available capacity in quantity and at what time of day is fundamental to ensuring maximum use of scarce infrastructure – regulations should be firm on the need to undertake capacity analysis and to review the traffic demand ahead of each season's declaration subject to government oversight.

Separately, the regulation should also require a thorough analysis to initially declare an airport as coordinated. By the same token, the regulation should require the airport to update and reassess regularly its eligibility to maintain Level 3 status, again subject to government oversight.

A dynamic, responsive capacity declaration is fundamental to ensuring that the following key objectives can be met: providing access and competition, increasing connectivity, and delivering consumer choice**. If the process fails to work efficiently at this first step, the rest of the process of allocating and operating the capacity is already destined to be sub-optimal.** Airlines invest heavily in updating and changing their schedules one season to the next to maximize route, connections, and destinations served in response to demand. The airport must be required to do the same for their capacity declaration, so that changes in aircraft and airline mix, route changes, and subsequent payload variation are all fed in, and an optimal declaration is made to the coordination committee for the coordinator to allocate against.

Coordinators should be subject to an obligation to manage the waitlist actively to offer opportunities to carriers to improve slot timings and new slots when they are available before and during the season, not only when allocation initially takes place. This would further optimize use of infrastructure, increase efficiency, access, and consumer benefits of better schedules and new services.

Airport accountability for delivery of the operation and improving performance

Airport accountability for delivering declared capacity and performance is not currently part of the regulation, yet is fundamental to the process achieving its efficiency and consumer-driven objectives alongside airline slot use requirements. Ensuring that there is due responsibility for delivering the capacity declared would balance the regulation and slot process responsibilities equitably across the parties involved, while supporting better performance outcomes.

Performance monitoring of airline use of slots has resulted in distinct improvements in the performance of the network generally, but this can be limited by other partners in the industry failing to meet their own obligations to deliver capacity. Slot performance monitoring is championed by the airline industry; the slot performance monitoring guidance in the WASG has been updated and enhanced in recent years and there is strong support for implementing this fully at Level 3 airports, either through distinct slot performance committees or via the coordination committee.

Similarly, coordinators should be empowered through the coordination committee structure to perform monitoring functions to identify misuse that would waste capacity, manage performance, and improve outcomes in a constructive manner but not during the operating phase. The operating phase is best managed dynamically by those parties responsible for the schedule and flights operating in an active way, not by the coordinators who miss real-time operational information on aircraft rotations, crewing complexities, load factor and passenger changes, and flight disruption impacts. The operating window is heavily influenced by external realities, so the most efficient approach is for the airport and airlines, as well as ATC, to coordinate the plan into operation themselves – i.e., during the three-day period comprised of the day before, the day of, and the day after the flight.

Coordinator accountability through alternative dispute resolution

It is currently difficult, expensive, and time-consuming to challenge a coordinator's decision. The courts are generally unfamiliar with the slots process and therefore ill-equipped to review coordinator decisions without assistance from experts or extensive education by the litigants. An alternative dispute resolution mechanism, involving expert arbitrators, would provide stakeholders with the ability to seek meaningful review of coordinator decisions in a timely manner – i.e., prior to the relevant season.

Some coordinators have advised that they are concerned about potential legal risk if they do not take the strictest possible interpretation of the WASG or applicable slot regulation. Not all coordinators are indemnified for their legal costs in the event of such a challenge, and few coordinators wish to incur the cost and delay of such proceedings.

Similarly, the current judicial review process disincentivizes airlines to raise challenges, both because of the cost but also the delay inherent in court proceedings. Given the time-sensitive nature of these decisions in the allocation process, it would be very difficult for the courts to ever rule quickly enough for a decision not to have become moot in the interim.

We therefore recommend the creation of an alternative dispute resolution mechanism for coordinator decisions. This could take the form of an independent expert selected by the coordination committee(s), who would be authorized to review coordinator decisions (with an ability for all airlines to comment, if on an issue impacting multiple carriers such as justified non-utilization of slots) and rule on whether they are compliant with the WASG and applicable regulations. If implemented successfully, this would greatly reduce the cost and delay

of appeals of a coordination decision. It could also give the coordinators some comfort that their decisions would not expose them to unwanted, excessive, and sometimes un-indemnified legal fees.

New entrant and access opportunities

New entrant policy can and should be reviewed considering the severe lack of capacity and the need for all airlines to be offered opportunity to access congested airports and grow to best serve the customer, improve network efficiencies, support competition between operators on routes, and provide new services.

The customer benefits the most when slot allocation takes place dynamically, managing waiting lists and requests from airlines driven by their need to meet customer demand. Policies that underline waitlist management in the coordinator's responsibilities would support dynamic optimization.

New entry at congested airports provides a competitive force on existing operators which ensures strategic route development and schedules that match demand and supports innovation. A policy that adopts a priority for new entrants balanced with growth for existing operators, as the WASG promotes, could be further expanded to provide certainty as to how new entry can be achieved in the most constrained circumstances.

Despite a lack of slot capacity at most Level 3 airports, new entrant policy can be used to maximize minor capacity gains to the customers' benefit.

Transparency and data sharing to foster efficient and fair access combined with technology integration will maximize benefits of slot management

Increase transparency in the process to enhance fairness through use of data and portals. As a sector reliant on data and analysis, there is a need to make minimum standards for transparency mandatory at all Level 3 airports globally.

The lack of minimum standards in technology for coordinating slots is a potential threat to the process and will result in a widening gap of the performance of coordination and performance monitoring and will drive policy shifts as a result (to cope with inadequate coordination systems). Airlines need a level playing field to compete fairly and transparency of data to inform decisions about route development and future schedules. Without freely available data on capacity, slot availability, and current operators at an airport, the process is unable to meet its full potential for delivering efficient slot management and optimizing access. This transparency is even more important in those jurisdictions where coordination committees have not yet been established or where their activities may be limited by local law.

It can never be acceptable in the medium or long term for a coordinator or service provider to refuse to implement policy changes agreed by the industry or imposed by regulators on the ground that their coordination system is incapable of processing the change. Where necessary, systems must be updated to allow for the continued evolution of slot policy.

Practices to continue and retain

Historic precedence – the right to retain a slot according to slot use requirements

Historic precedence is a founding feature and remains fundamental to air transport networks and for future investment in this industry. It cannot be overstated how vital this principle is and the risks involved in altering this concept. Operators have prioritized the retention of historic precedence as a critical policy of the slot process that interlinks with the entire aviation value chain.

The certainty connected with the use-it-or-lose-it rule and the requirements of use are balanced to achieve efficient use of scarce capacity in both productivity and social benefits. The usage rate is based on encouraging slot returns in advance but today primarily ensures that slots are highly utilized. If an airline

engages in reasonable assumptions of realistic demand being served through well-planned schedules (e.g., an airline doesn't offer more services than they can realistically operate), there should be little possibility for failing on some of the planned schedule over the course of the season. By striking the right balance, the 80% use rate allows airlines a small flexibility to accommodate unexpected and unplanned alternative scenarios once the season becomes 'live,' while still mandating well-planned and reasonably forecasted schedules.

Loss of certainty around the consistent and uniform nature of policies related to historic slots would greatly harm connectivity and potentially have the opposite effect on competition than academic theory has suggested. Rather than promote mobility or churn in slots (with the underlying and largely incorrect assumption that this would see new competition and entry), changes to determining historic rights would cause a ripple effect across the airlines' network. The likely scenario would be airlines having to focus attention disproportionally on their operations at the congested airports to protect their network for these most heavily demanded flights in lieu of lesser value routes and services, sending less congested airports into a tailspin of route loss, operator dilution, and consumer disbenefits.

Regulatory uncertainty and burden – in terms of rules for retaining slots – further increases barriers to entry by exerting risk on investing in these operations and routes.

It is therefore critical to maintain the positive outcomes of historic precedence:

- Customers benefit from reliable and predictable schedules each season because there is continuity and stability in the industry.
- Connectivity and network grow, with efficient connections at hubs, supporting travel and trade and GDP growth.
- Tourism and trade investment can be supported with air service development.
- Airports can optimize infrastructure deployment and investments through a solid, reliable airline user base – their customers are almost guaranteed each season reducing their risks.
- Airlines take longer term decisions and investment opportunities, and investment in new routes and frequencies is rewarded and encouraged.

However, **historic precedence without the flexibility to change the use of slots would be negative for the industry and the community the airport serves** and harm operational efficiency.

Flexibility to change use of slots and adapt to changing market needs

Promoting and enhancing flexibility allows the full benefits of aviation to be realized as it develops and economies grow and transform. Conversely, a policy that freezes a slot under certain conditions for a specified timeframe will harm the outcomes listed above.

Airlines have become powerhouses in adapting schedules to meet demand and react to external realities in recent years to survive and recover. The ability to switch slots from one route to another once approved by the coordinator is another pivotal principle of the process that enables sustainable and efficient schedules to be built over time, as well as to adapt in crisis.

COVID saw previous planning protocols go out the window as airlines had to make schedule changes immediately to survive. While this has calmed down greatly and could not be sustained, there are still certain dynamics that may never revert to pre-COVID 'norms.' Airlines that operate point-to-point have more flexibility to pivot their schedule to a new route if the planned operation is not performing and maximize benefits quickly. This agility requires slots to be flexible if the network relies on Level 3 airports, but while the route may be changeable it is increasingly likely that the timing of the slot is not. This means point-to-point operators, and those with few Level 3 airports in their network, have a competitive advantage over carriers with high a high number of slots to overall network ratio.

Flexibility has provided much needed resilience to the whole air transport system in recent seasons, without which there would be far worse customer outcomes. Airlines able to change their fleet or the destination of a slot can better manage their schedule and still ensure the customer flies when and where they expected. Without flexibility in the operational phase, a customer will be negatively impacted as the most optimal solution cannot be the one chosen by the operational teams on the day.

The slot process should not restrict operational flexibility to make changes necessary on the day to react to unknown and unplanned impacts. In terms of a carrier's intention to operate and utilize their slots, this should be measured in the pre-operation phase and is evidenced through activities such as the schedule being live and for sale.

Timeframes and global calendar of slot activities

The global Calendar of Activities was a front-runner to the slot process in the 1960s because it supported carriers in building coherent schedules at a global level by having all airports in the process adhering to the deadlines in a standardized fashion.

While the calendar has been updated as policies were introduced, such as hand back deadlines and a fixed moment when all slot portfolios were baselined for future utilization calculations, the concept has remained consistent: all airports designated as coordinated had a coordinator assigned who worked to the same deadlines as the airlines globally.

It is true the process is not as rigid as it once was – 10-day long Slot Conferences to enable swapping of slot times are now 3 days, while waitlist management and reallocation takes place throughout the optimization phase and operational season. However, the conformance to deadlines remains a critical component of driving efficient and stable schedules and in turn supports airline and airport advance planning. To maintain a stable global network, it is imperative that all Level 3 airports adhere to the same timetable.

Airlines underline the calendar as a critical requirement for certainty and global consistency. Any country departing from this standardized approach would unravel the highly efficient, practical coordination efforts globally.

Slot mobility and secondary trading

Slot mobility is a value-add to the overall workings of the slot process. Much like flexibility in use of slots, mobility contributes to efficiency outcomes and customer benefits. A secondary market policy that comes into its own at the most congested Level 3 airports is compatible with an administrative allocation of slots.

Slot mobility takes several forms and can involve compensation or be purely non-monetary in nature. The ability for policy to support mobility is essential if the true benefits of slot coordination are to be realized. The more mobility and flexibility in the slot process, the more efficient the outcome is in terms of use of capacity and ability to meet customer demand. This is true of all operators and in all regions – while the constraint to the industry is availability of capacity and the regulatory requirements of slot use are retained to maintain historic precedence, there need to be tools to provide flexibility and mobility opportunities, or the industry could no longer plan realistic schedules against the unpredictable and ever-changing external landscape.

The flexibility for airlines to change the use of slots, within their own portfolio of slots, is an essential flexibility of the slot process that allows airlines to optimize their networks and respond to changing consumer demand. It is a basic principle of the slot process permitted at coordinated airports worldwide.

The change of use of slots is subject to confirmation by the coordinator. The coordinator's confirmation primarily relates to ensuring that the new use of slots fits within the declared coordination parameters.

Type	Definition
Change of use of slots within an airlines' own portfolio	• One airline moving slots within its portfolio to optimize the schedule timings, routing or aircraft assigned. • Coordinators are required to approve feasibility against capacity. • Routinely and extensively used globally to adjust schedules and respond to demand and market activities, within the airline's own control and commercial strategy. • Competitive tool to strengthen position in an existing market and compete.
Transfers	• Transfer of slots from airline A to airline B – can be for compensation, subject to legislation. Requires coordinator approval of new entrant. • Sometimes known as secondary trading – the activity of unrelated airlines taking consideration for their slot when transferring to another operator permanently.
Swaps	• Two-way exchange of slots at the same airport without any form of compensation. • Long-standing policy to support initial coordination optimization allowing improvements across the airports' slot portfolio and supporting airline scheduling issues to be solved. • Requires transparency of slots held by airport to facilitate swaps which is reliant on coordinator data, portals, and waitlist management to effectively work. • Encouraged and routine in day-to-day slot management, spearheaded through slot conferences to maximize efficiency and adjust networks to changing factors such as demand, fleet capabilities, hub structures, and operational realities.
Shared operations	• Temporary transfer between partners for a defined period with or without compensation. • Practice used extensively and beneficially without misuse due to the coordinators oversight of the slot use. • Maximizes the value and efficiency of the network and partnerships and allows short term solutions to disruption of operations and planned operations without alleviation.

The reality is that airlines cannot forecast the long-term or even short-term impacts that could hamper their ability to operate their planned schedules. Despite their best endeavors to pivot plans to what is feasible, the industry is asset-heavy and capacity is not readily available at short notice to switch plans. Without mobility policies in place the coordinator is burdened with alleviation and justified non-use requests for slots subject to these impacts, when the industry is capable and willing to solve these supply and demand side issues themselves, transparently, and with the most efficient outcomes.

Mobility provides several benefits:

- Allows airlines to make near immediate changes to their plans to react to external and internal factors that would otherwise render their slots useless and hinder the long-term operation of an established route – harming connectivity.
- Provides airlines with the flexibility to adjust timings of slots to match their ultimate plan when entering an airport with suboptimal slots.
- Allows growth of an airline to a competitive position in a constrained airport.
- Results in a more efficient use of the slot given exposure to the market.
- Opens a constrained market to entry and growth for all operators and provides access to slots at larger volume in some cases.

Transparency is a prerequisite of vibrant mobility that is pro-competitive and efficient. Awareness of market opportunities and clear regulatory support for mobility activities to take place without 'friction' is where the government policy around slot mobility can encourage a truly mobile market alongside the administrative

allocation process. Both are compatible and enhance the mutual outcomes of slot management, being complimentary to the overall core values of the process.

Secondary trading in otherwise truly congested airports exposes a carrier to the value of their slot and provides an opportunity to allow market forces to establish a trade enhancing mobility. However, it is recognized that secondary trading can be seen as a niche solution at airports once the level of supply failure reaches a critical level with little to no capacity available (e.g., the UK allows secondary trading throughout but only sees its real use at LHR and LGW where the market has naturally developed over time to reflect the lack of available capacity). Allowing secondary trading as a principle will enable the market to naturally respond when the appropriate conditions prevail.

Regulatory interest in the secondary markets and mobility should be focused on enhancing this activity in the future while improving transparency of the availability of slots and matching willing traders. Focusing regulatory requirements on the actual outcomes of the trade in terms of monetary or other considerations which may be commercially sensitive would only serve to dilute and cool the secondary market and therefore weaken its relevance.

Recommendations for improving mobility:

1. Enhance transparency of data and use of portals in real time to identify opportunities for carriers to swap, transfer or lease slots.
2. Incorporate regulatory structures that reduce friction in slot mobility, simplifying the process and reducing costs.
3. Stipulate clear requirements for transfers to be subject to two seasons' use prior to transfer restricting mobility to historic slots only.
4. Maintain post-trade transparency (without monetary commercial information involved) but allow pre-trade transparency to be voluntary or via anonymous portals.

Independent coordination without intervention

The independence of the slot coordinator is vital to a neutral, transparent, and non-discriminatory process. Without this independence, stakeholders cannot trust how the allocation decisions are being made. A lack of independence also threatens the most efficient utilization of airport capacity and the ability of the airlines to develop networks in support of customer demand.

True independence requires both financial and functional separation from any stakeholder with an interest in the allocation process – whether airline, airport, or regulator. This policy applies throughout the allocation process and must cover not only the coordinator itself but also any attempts to improperly influence the coordinator's decisions – by any interested party.

Although this principle is enshrined in the WASG and in many regulations, it is not universally followed worldwide. It is both unfair and unreasonable to expect any party with an interest in allocation to put that interest aside in order to neutrally allocate slots, and any such conflict of interest can only be avoided through a truly independent coordinator.

Concepts to discontinue

Primary market allocation

Academics and economists often – seemingly reflexively – call for auctions or other primary market-based mechanisms for the allocation of slots. We strongly oppose any such suggestion, which would damage competition, connectivity, and capacity utilization and increase costs to the consumer.

Slot coordination is a complex process by which all constrained airport infrastructure is allocated for use, including terminal facilities, gates, aprons, runways, and other associated airport infrastructure. This ensures that all infrastructure can accommodate planned flights and is ideally completed in a single coordination process. It is very hard to envisage how an auction could be designed to allocate all these discrete capacities in one process and still maintain the same principles of fairness, non-discrimination, transparency, certainty, and consistency.

Airport congestion is a global problem, meaning airlines operating between countries and continents are often faced with the challenge of securing slots on each end of the route. Approximately 50% of passengers depart from Level 3 airports globally, and about 35% of flights operate between two Level 3 airports. Securing compatible slots at both ends of a route which match anticipated demand would be much more difficult under an auction system – and likely to result in suboptimal planning and inefficient allocation and utilization of scarce capacity. Extrapolated to network connectivity and the benefits and efficiencies provided by a hub and spoke network system, and an auction system is recognized as likely to cause industry chaos.

In 2004, a NERA study[9] concluded that while in theory primary auctions could be an efficient solution, in practice the auctions would be so complex, both for auction organizers and for airlines bidding in them, that it was impossible to determine whether an efficient allocation of slots would emerge. This is understandable, as airline schedule planning is far more complex than a relatively simple broadband auction. Scheduling a flight requires slots to be agreed at both ends of the route, which would be akin to requiring a broadband auction in two locations, and if the timings of transmission don't perfectly match, the broadband signal would not be provided.

No auction has ever succeeded in the aviation context. In 2015, the Chinese CAAC conducted two pilot auction projects at Guangzhou Baiyun and Shanghai Pudong Airports for the allocation of slots for use on domestic routes. The initiative was designed to provide new entrants with a fairer opportunity to secure slots. Ultimately, no new entrants gained access as a result of the auctions. Instead, the main Chinese airline groups consolidated their presence at the airports and the costs were much higher than anticipated. Ultimately, the government abandoned the process as wholly unsustainable.

The U.S. Federal Aviation Administration invested considerable time and resources in the mid- to late-2000s attempting to design an auction system for the allocation of slots at congested New York airports. The FAA conducted a number of simulation exercises involving government officials, airline experts, and academics before the Obama administration decided to abandon the initiative in 2009. According to DOT's filing in the *Federal Register*, many objecting to auctions stated that "the FAA had failed to demonstrate how the proposal would achieve any significant relief from congestion. Rather, according to the commenters, [a final rule] would impose an untested and unproven auction process on airlines that would not address the fundamental airspace congestion issues in the New York metro area."[10]

In summary, we strongly believe that the imposition of auctions or other market-based measures for primary slot allocation would be a disaster for aviation. The concerns and challenges with auctions are wide-ranging, and there is simply no evidence supporting the need for such a drastic deviation from global best practice.

Local approaches to slots, isolating policy from global standards

The more removed the slot process is from a global standard the less effective and efficient it can be in practical terms and the more precarious it becomes from a political position. Standards reap benefits across the whole air transport value chain due to the global nature of aviation. Breaking down political and

[9] www.nera.com/content/dam/nera/publications/archive1/PUB_SlotAllocationSchemes_NPL.pdf
[10] 74 Fed. Reg. 22,718 (May 14, 2009) – www.govinfo.gov/content/pkg/FR-2009-05-14/pdf/E9-11291.pdf

geographical tensions, standards underpin airlines' ability to grow global networks of routes that connect continents, work in harmonized and compatible ways and, importantly, level the playing field for competition.

Isolated attempts to pioneer new slot policy outside the global framework will have unintended consequences. Instead, the recommendation is simple: work alongside the WASB to promote new objectives and priorities where needed to shape new policies and approaches that can be incorporated into the WASG at global level for worldwide adoption.

Threatening stable slot policy by constantly shifting slot policy

Without a stable regulatory basis for slot management, airlines' future planning and long-term investment is jeopardized, harming more than connectivity and the route network. Long-term investment in future fleet and technology, new route choices, and competition between business models is established on the back of regulatory certainty. When it comes to slots this is two-fold: regulatory certainty creates open markets for airlines to compete fairly in, enticing entry and growth, while slot rule stability underpins an airline's decision to enter congested and difficult airports because the operational challenges can be balanced with the certainty that the market holds long term potential if the airline utilizes their slots sufficiently.

The long-term supply-side failure in aviation infrastructure will hamper consumer demand being met in future, creating a regulatory system which would otherwise lead to congestion and delay.

A well-structured and stable slot policy can incentivize airlines to explore new routes, develop innovative schedules, and expand their networks, promoting healthy competition and a diversification of services. The WASG is the global standard that fulfills this objective.

7. Conclusions

Aviation has been well served by the global scheduling and slot process for over 70 years, which have seen the system evolve from a meeting between three airlines to an industry-led, global, and "living document" solution impacting hundreds of airlines and airports – and millions of passengers. This system provides airlines, airports, and customers with the certainty and flexibility needed to continue to meet changing demands amidst the ever-present challenge of insufficient infrastructure.

Against this backdrop, the airlines' vision for slot policy is for it to remain focused on the customer, with greater importance placed on the need for all three major stakeholders – airports, coordinators, and airlines – to cooperate to deliver the maximum possible use of existing capacity.

Call to action

In line with this vision, airlines commit to working with the Worldwide Airport Slot Board to continue to evolve the WASG, raising those items highlighted in this paper as areas for change while remaining open to the suggestions and needs of their partners at the Slot Board.

Similarly, airlines call on the airports and coordinators to continue their work with the Slot Board to strengthen the WASG and ensure that all stakeholders' interests – and obligations – are fully captured in the document.

The airlines also welcome the engagement of governments and regulators with the Slot Board on slot policy. Airlines encourage them to work with the Slot Board, rather than against it, to drive slot policy forward while maintaining the necessary global harmonization which is so key for the complex global aviation industry. In so doing, the industry can help identify and avoid unintended consequences which could harm both slot policy and government priorities in other areas.

Additional resources

Worldwide Airport Slot Guidelines: link

Airlines Magazine Special Supplement on Slots: link

Airport Slots Documentary: link

Slots 101 Whiteboard Video: link

Slots in 2023 – Whiteboard Sequel Video: link

IATA Slots Conference (visit past Conferences for recordings of on-site presentations): link

IATA Slots Training courses: link