

Policy Brief

Airport networks and
the sustainability of small airports

% of States that
have some kind of
airport network
arrangement

78%



% OF GLOBAL
PAX TRAFFIC
GOING THROUGH
NETWORKS

42%

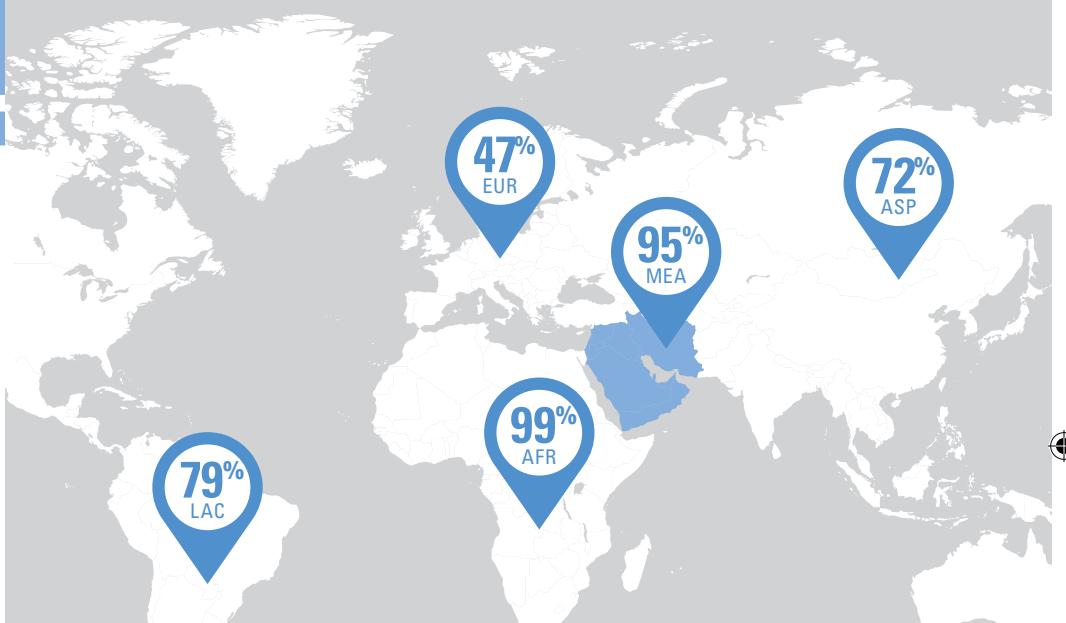
3.7 BILLION PASSENGERS

VERSUS GOING
THROUGH
NON-NETWORKS

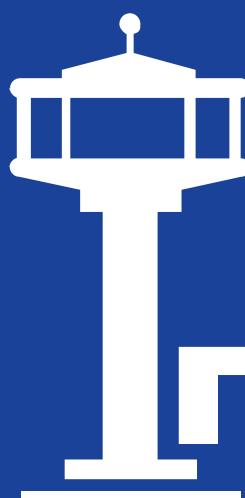
58%

GLOBAL PAX TRAFFIC

% of airports belonging
to networks by region



More than half of all small airports in the
world are operated by airport networks



% OF SMALL AIRPORTS
OPERATED BY
AIRPORT NETWORKS

56%

ABOUT 1,700 SMALL AIRPORTS
ARE IN NETWORKS AND TOGETHER
THEY SERVICE 345 MILLION PASSENGERS
PER ANNUM.





KEY FINDINGS:

- ↗ The 2019 ACI Inventory of Airport Networks reveals that 151 out of 193 ICAO Member States (78%) have some sort of airport network arrangement. That is to say, at least one airport network can be identified in these States, either directly operated by a government through a civil aviation authority or a ministerial department, or through a corporatized national or sub-national airport network company.
- ↗ An estimated 2,186 or more than half (55%) of the world's airports belong to airport networks of some kind and they handle an overall annual traffic volume of 3.7 billion passengers, 42% of all global passenger traffic.
- ↗ Airport networks operate under a variety of ownership models. The absolute majority of networks (80%) are publicly owned, with a significant number of networks being operated directly by governments or by corporatized but government-owned airport companies. Private and public-private partnerships account for 20% of networks in total.
- ↗ Airport networks are responsible for managing and operating a significant number of small airports: more than half (56%) of all small airports in the world are operated by airport networks.
- ↗ The airport-network approach is frequently used to sustain small, economically non-viable airports. The latest estimates suggest that as many as 66% of the airports in the world operate at a net loss and that over 94% of the loss-making airports handle fewer than one million passengers per annum. In the Africa, Latin America-Caribbean and Asia-Pacific regions, an overwhelming majority of all small airports belong to airport networks (99%, 83% and 74% respectively). Overall, 1,780 small airports are in networks and together they service 345 million passengers per annum.
- ↗ Cross-subsidization within airport networks represents a business model which is equivalent to air navigation services providers providing air traffic control facilities and services, or airlines providing network services.
- ↗ Airports belonging to airport networks benefit from economies of scope and scale that generate efficiencies in terms of costs and charges.
 - Airport networks have relatively low operating expenses, as well as low capital costs on a per-passenger basis. From the total-cost perspective, the per-passenger cost at network airports is less than half (46%) of that at single-airport operated airports: US\$ 6.79 and US\$ 14.78, respectively.
 - Cross-subsidies from larger to smaller airports within a network do not increase the overall costs of providing airport facilities and services. The efficiency gains in operating costs and capital costs more than offset cross-subsidies and generate value for airlines and passengers using airport networks.
 - There is no correlation between a network levying a high level of charges and a large hub airport forming part of that network. Cost efficiencies derived from airport network membership enable airport operators to levy competitive charges that ultimately benefit airlines, passengers and countries' wider economies.
 - A network approach facilitates sharing of best practices in customer experience among the network-member airports. ACI's Airport Service Quality (ASQ) programme demonstrates that customers rate network-member airports have high service-quality levels.



ACI POLICY RECOMMENDATIONS:

AIRPORT OWNERS ARE FREE TO DETERMINE THE MANAGEMENT MODEL THAT IS BEST SUITED TO MEET PUBLIC-POLICY OBJECTIVES AND COMMERCIAL STRATEGIC OBJECTIVES.

A wide body of evidence demonstrates that the airport management model is just one factor in determining airport performance. For this reason, airports should be permitted to operate under a wide range of management models such as single-airport, airport systems and airport networks to serve their specific missions, business needs and local circumstances.

AIRPORT NETWORKS CROSS-FINANCE SMALLER AIRPORTS TO BENEFIT AIRLINES, PASSENGERS, AND THE COMMUNITIES THEY SERVE.

Most airport-network operators manage a handful of larger airports and an array of smaller airports. In such situations, in many parts of the world, cross-subsidies from larger to smaller airports are used to keep the smaller airports operational, especially when they cannot count on public funding. Accordingly, airport-network operators should be given the flexibility to determine the most appropriate charging system for recovering their costs, generating returns for shareholders and ensuring sustainable operation of the smaller airports in the networks.

CONSISTENT WITH ICAO'S AIRPORT ECONOMICS MANUAL (DOC 9562, 4TH ED.) APPROVED BY THE ICAO ASSEMBLY IN 2019, AIRPORT NETWORKS SHOULD COMPLY WITH ICAO'S POLICIES ON CHARGES, RECOVERING FROM USERS THE FULL COST OF PROVIDING A NETWORK OF AIRPORTS WHEN APPLYING CROSS-SUBSIDIES.

It is a common and well-accepted practice for airport networks to compute their costs at the overall network level and then recover the costs through a charging scheme common to all airports in the network: the cost of using the network is then charged to its users. This practice is fully aligned with ICAO policies, which provide that charges should be related to the cost of providing airport facilities and services. Airport operators should be free to determine whether charges are site-specific or if, instead, there should be a common charging scheme at the network level to recover the costs incurred by providing a network of facilities and services.

Overall compliance with the ICAO framework at network level should be ensured through adherence with the ICAO's charging principles and safeguards relating to the following:

- non-discrimination between airlines, irrespective of their nationality;
- overall cost-relatedness of charges at the network level, whereby each network's users are charged for the cost of using the network;
- transparency and effective consultation with airlines proportionate to the market power exerted by the airport operator; and
- compliance with the additional safeguards contained in ICAO's material to ensure that airports benefiting from cross-subsidies: have the same operator; are currently in use; and, the costs to be shared between one airport and another be reasonably related to the aviation benefits that accrue to the users of the primary or larger airport.

REGULATORY OVERSIGHT SHOULD BE PROPORTIONATE TO EACH AIRPORT OPERATOR'S MARKET POWER.

In an increasingly dynamic and competitive market, a regulatory framework should be proportionate to the degree of airport market power, only intervening to correct market failures. The framework should serve primarily to facilitate and incentivize commercial agreements between airports and airlines in a flexible manner, rather than burdening stakeholders with unnecessarily strict rules and procedures.



1.

INTRODUCTION:

TRENDS IN AIRPORT NETWORKS

This evidence-based ACI Policy Brief gives visibility to a specific organizational and management model for airports: the airport-network model. It emphasizes that airport networks build on synergies, economies of scale and scope and the pooling of revenues, costs and profits among all airports to ensure that the smaller airports—which are vital for both communities and an integrated air transport system—remain in operation and continue generating sustainable benefits for all stakeholders.

While this ACI Policy Brief focuses specifically on airport networks and highlights patterns of this model of management and its related policy recommendations, ACI does not prescribe any particular management model. Airports should be permitted to operate under the management model best suited to their specific missions, business needs and local circumstances.

1.1 The different types of airport management model

Multiple models of airport management prevail in the industry and are adopted by airport operators depending on their specific circumstances. In addition to the single airport model, whereby an airport operator manages and operates a single airport, the ICAO *Airport Economics Manual* (Doc 9562, 4th ed.) recently approved at the 40th ICAO Assembly provides for the following categories (para. 2.35 refers):

- **Airport systems:** “Two or more airports serving the same metropolitan area and operated under a single ownership, management and control structure.” This model allows integrated airport development at the scale of the city, providing integrated and orderly management of air traffic and passenger flow. For instance, Groupe ADP-Paris Aéroport has developed its facilities under an integrated model at the metropolitan scale: Paris

Charles de Gaulle serves as a hub for Air France and is the prime airport for intercontinental traffic, while Paris-Orly focuses on strong point-to-point traffic between the city of Paris and European and North African cities. While it encompasses different airports, the airport operator remains a single business entity and often opts to pool costs and revenues at the system level.

- **Airport networks:** “Two or more airports within a State operated under a single ownership, management and control structure. It can include all airports serving the territory of this State or only some of these airports.” Historically, several countries have opted for a network approach to developing and operating airport facilities and services. Under the airport-network approach, several organizational models are found, but in most cases, they share a common feature: costs and revenues are pooled at the network level and the network is considered a single business entity.

- **Airport groups:** “Two or more airports operated at the international or multinational level under a single ownership and control structure.”

Even though all these forms of airport management provide benefit to airport operators and the passengers and the communities they serve, the main focus of this Policy Brief is on the airport network management model.

1.2 The network approach: a common characteristic of the civil aviation system

The network model is common to many industries. It is especially relevant to the transportation sector, in general, and the air transport industry, in particular, as the very nature of transportation implies connecting at least two points distant from each other.



Several airlines and air navigation services providers (ANSPs) have opted to pool their overall costs at the company level and thus ensure an even recovery of the costs at the company level. For example, airlines organize their routes and destinations in networks aimed at ensuring connectivity and profitability. Some airlines rely on their long-haul flights to generate revenues and profits and those flights are used to subsidize short-haul operations. In other words, long haul passengers are paying airfares higher than their fair share of the cost of traveling provided by the airlines; and surpluses cross-subsidize passengers on short-haul routes who are transported at a loss. Other instances of cross-subsidization in the airline business include management of passenger and cargo services with different yields, meaning that not only carrying passenger and cargo can generate different profits, but also different types of passenger services, e.g., business versus economy class products.

Similarly, the network model is widely spread in the airport industry, whereby two or more airports are managed under the same ownership, control and/or management structure.

1.3 The scale of airport networks across the globe

Two models of network approaches are common:

National airport networks:

- **State-operated airport networks**, where States have retained direct control and management of airports through a civil aviation authority or a ministerial department. This organizational format is quite common in Sub-Saharan Africa and in the Pacific Islands nations.

• **Corporatized national airport networks**, whether the network operator is publicly or privately owned, which manage the vast majority of airports within a country or the airports handling most of the traffic. Cases in point are Aena SME, S.A., which manages all general-interest airports and heliports in Spain; and the Israel Airports Authority (IAA), which manages all of Israel's major civilian airports.

Sub-national networks:

- **Corporatized sub-national airport networks**, which can be publicly or privately owned, manage several airports at the regional level within a single country. Examples are PT Angkasa Pura I, which operates airports in Central and Eastern Indonesia; and PT Angkasa Pura II, which operates airports in Western Indonesia. Other illustrations are Ravinala Airports, which manages Madagascar's largest airports, Antananarivo and Nosy Be; ADEMA, which handles all other airports in Madagascar; and Mexico, where Mexico City Airport is managed by a separate airport operator and four sub-national airport network operators manage other Mexican airports on a regional basis.

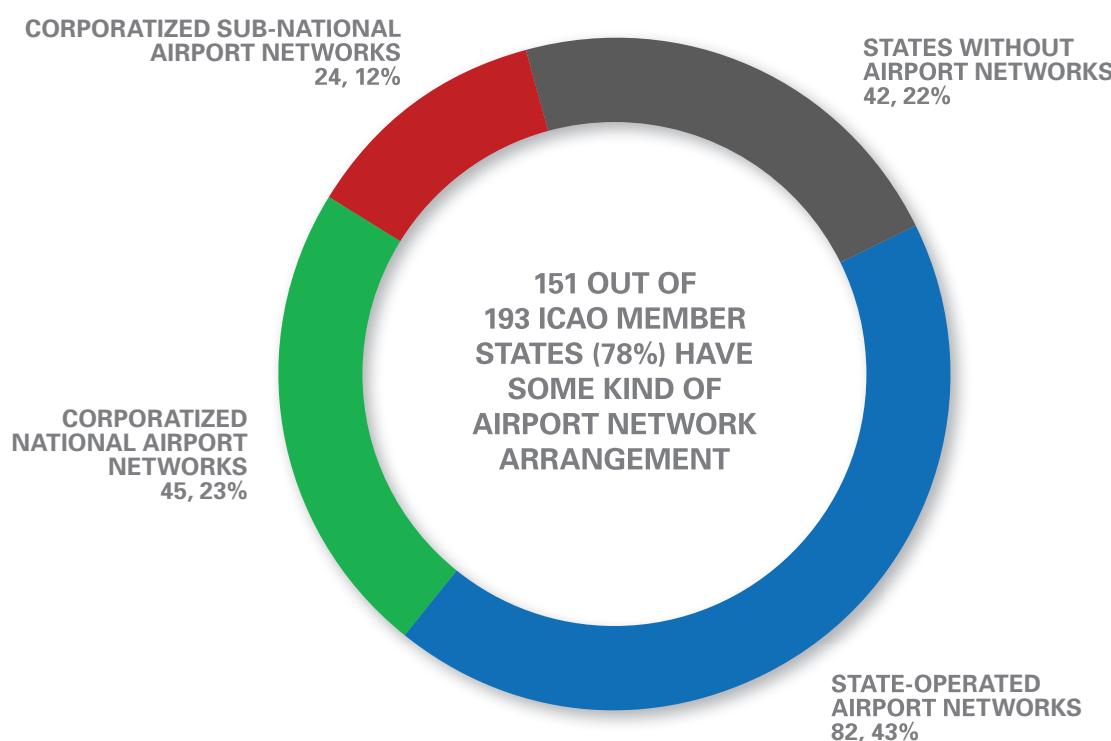


1.3.1 Overview of airport networks across the globe

As recognized in the ICAO *Airport Economics Manual* (Doc 9562, 4th ed.) “The airport network model is a form of organization that is becoming increasingly common at a national level in all world regions, in advanced and emerging States, and aviation markets

of all sizes.” As of 2019, 151 out of 193 ICAO Member States (78%) have some sort of airport network arrangement. That is to say, at least one airport network can be identified in these States, either directly operated by a government through a civil aviation authority or a ministerial department, or through a corporatized national or sub-national airport network company (see Chart 1).

CHART 1: NUMBER OF STATES WITH VARIOUS AIRPORT NETWORK ARRANGEMENTS (2019)



Source: ACI Inventory of Airport Networks (2019)

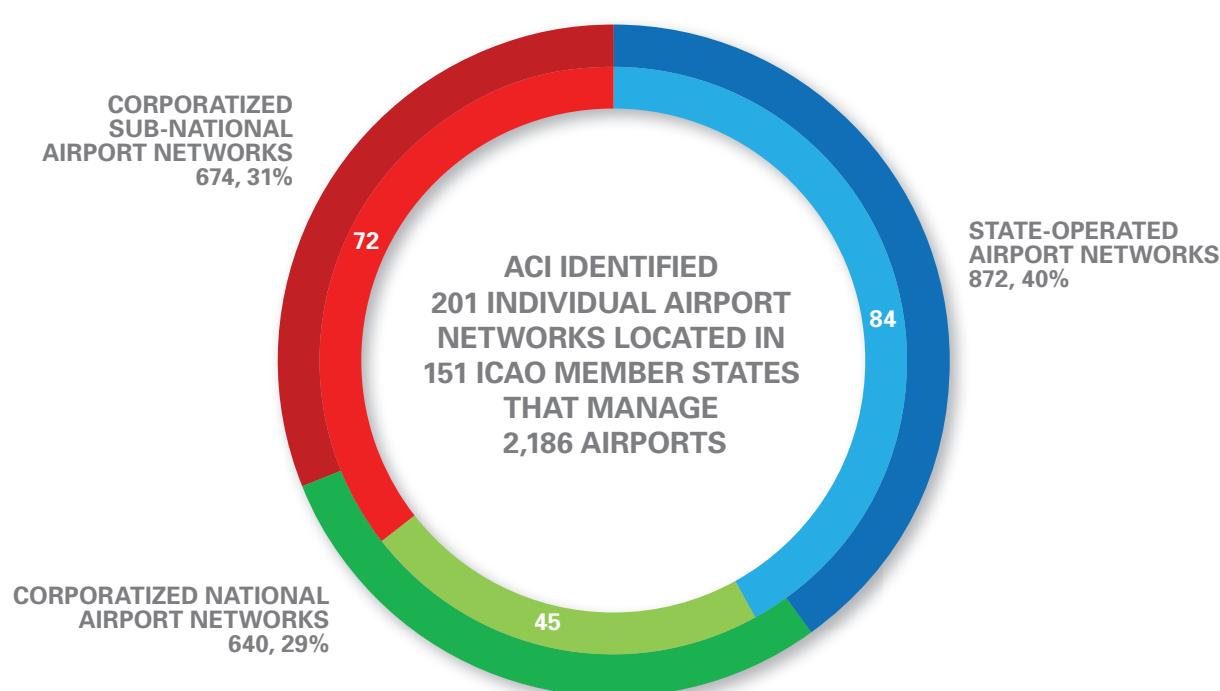


201 networks spread across 151 country manage 2,186 airports with a corresponding volume of 3.7 billion passengers per annum as of 2018. 16 countries appear to have more than one airport network. Examples of such countries include People's Republic of China—home to multiple regional networks, Mexico with three privatized and one government-operated network, and Thailand with two parallel networks—public and private. State-operated airport network is the major model with 84 airport networks managing 872 airports or 40% of the airports worldwide. The number of corporatized national airport networks is relatively small; however, these 45 networks manage

640 airports or 29% of all airports in the world. The rest 31% of airports are managed by 72 corporatized sub-national airport networks (see Chart 2).

Africa stands out as the region with the largest number of States dominated by government-run airport network arrangements (54). It is followed by the Asia-Pacific (37) and Latin America-Caribbean (28) regions. 23 European States have airport networks. The Middle East is home to eight States with airport networks. Some regional airport networks are present in North America, such as the Airports Division of Hawaii in the United States.

CHART 2: IDENTIFIED AIRPORT NETWORKS (INNER) WITH A CORRESPONDING NUMBER OF AIRPORTS (OUTER) (2019)



Source: ACI Inventory of Airport Networks (2019)

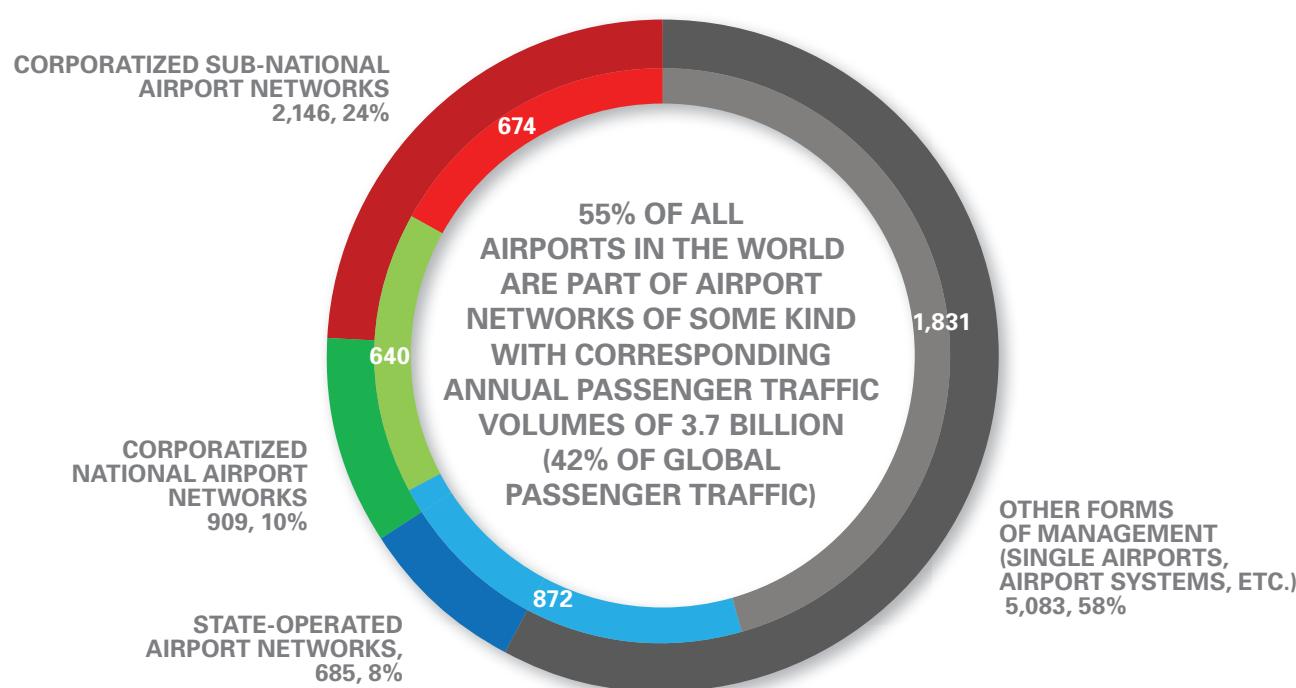


For airports with scheduled commercial passenger traffic, 2,186 out of 4,017 of all airports, or more than half (55%), belong to airport networks of some kind. These airports have a combined annual passenger traffic volume of 3.7 billion, or 42% of global passenger traffic (see Chart 3). A significant share of airports in the Middle East and Africa belong to airport networks—95% and 99%, handling 54% and 98% regional shares of traffic, respectively. These two regions are followed by Latin America-Caribbean and Asia-Pacific, where 79% and 72% of airports respectively belong to airport networks, handling 49% and

60% shares of passenger traffic. Half of all airports in Europe (47%), with a corresponding 38% share of passenger traffic volume, belong to airport networks.

Only 1% of the airports belong to a network in North America with a corresponding 2% share of traffic. Conversely, the region has a large number of airport systems, whereby a group of airports in the same conurbation are operated and managed by a single entity. In such situations, cross-subsidies from larger airports in the system to smaller ones are frequent.

CHART 3: NUMBER OF AIRPORTS IN STATES WITH VARIOUS AIRPORT NETWORK ARRANGEMENTS (INNER) AND CORRESPONDING PASSENGER TRAFFIC VOLUMES IN MILLIONS (OUTER) (2018)



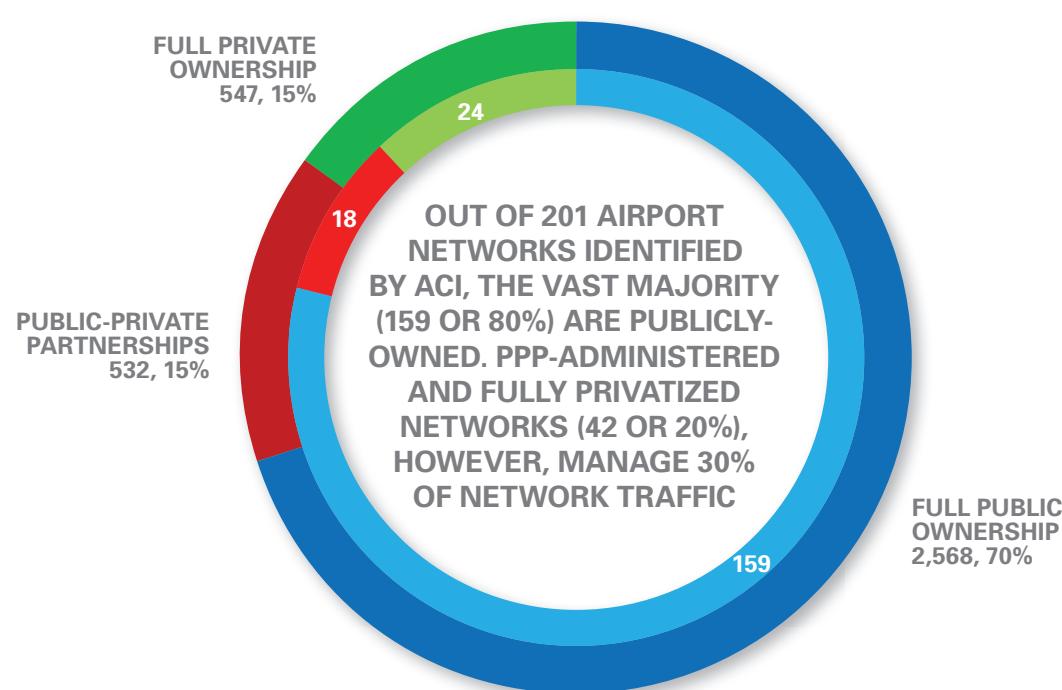
Source: ACI Inventory of Airport Networks (2019)



Finally, airport networks operate under a variety of ownership models. The absolute majority of airport networks—159 (80%)—are publicly owned, as a significant number of them are either operated directly by governments or are corporatized but remain state run airport companies. Private and public-private partnership (PPP) networks account for 24 (12%) and 18 (8%)

respectively, indicating that airport networks can successfully attract private investments (see Chart 4). PPP-administered and fully privatized networks (42 or 20%), however, manage 30% of passenger traffic attributed to airport networks. This is another testament to the fact that private investment tends to flow to airports with higher throughput.

CHART 4: NUMBER OF AIRPORT NETWORKS BY OWNERSHIP TYPE (INNER) AND CORRESPONDING PASSENGER TRAFFIC VOLUMES IN MILLIONS (OUTER) (2018)



Source: ACI Inventory of Airport Networks; ACI World Annual Traffic Database; Official Airline Guide (OAG) (2019)



1.3.2 Small airports within networks – a matter of sustainability

The airport industry faces a conundrum. Irrespective of ownership—whether public, private or PPP-based, many airports are run as commercial enterprises following best business practices and standards. There are equally successful airports located at all points of the ownership continuum. However, airport size in terms of throughput is a much stronger determinant for economic sustainability. While the industry as a whole is profitable, the financial statements show that a significant number of airports are systematically operating at loss. Many small airports are owned by governments and charge much lower fees which are insufficient to cover their operating and capital costs, in an attempt to attract the airlines. As a rule of thumb, an airport that has fewer than one million passengers per annum is more likely to operate at a net loss as compared to its bigger counterparts.

The industry's overall earning propensity and profitability is concentrated among airports with higher passenger throughput. In essence, the net profits of a minority of high-traffic airports significantly exceed the net losses of the majority of smaller airports. In this context, providing sustainable funding for operating and developing smaller airports remains challenging, for two primary reasons. First, due to constrained public budgets and competing priorities, governments are no longer able or willing to subsidize small, loss-making airports. Second, private investment flows to airports with high throughput, or potential for high throughput, to guarantee expected returns for the investors.

Taking stock of the industry profitability challenge, ICAO recognizes in its material contained in the *Airport Economics Manual* (Doc 9562, 4th ed., para 2.37 and 2.38 refer):

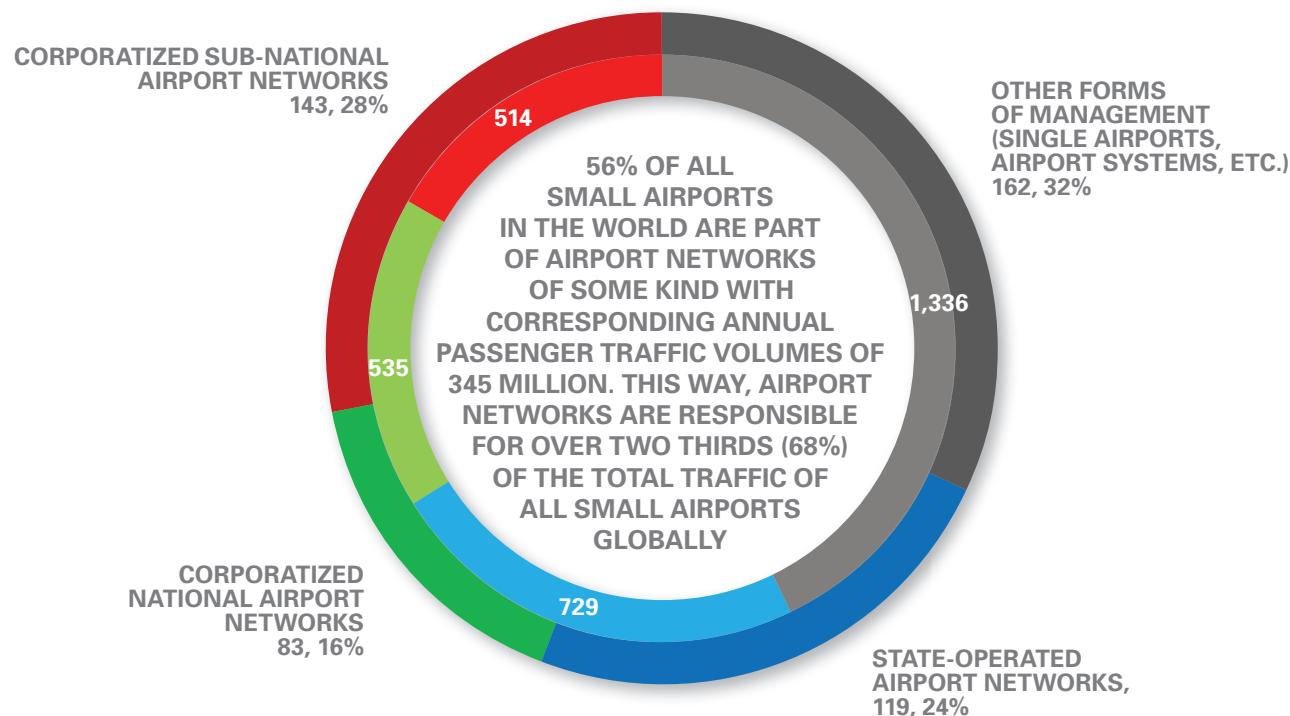
"For example, smaller airports may derive some benefit within a common ownership, regardless of whether it is public or private, which could include: greater access to capital markets; managerial and administrative efficiencies; use of economies of scale and scope associated with a network; bulk purchasing; and shared marketing."

In situations where the operation of one airport provides a clear benefit to the users of another airport within an airport system or network, it may be beneficial for the airport users to share some of the costs associated with the operation of both airports, regardless of whether the users operate at both airports. An example would be where a smaller, perhaps less economically viable airport, served as a reliever airport in which some air traffic could be diverted to the smaller airport and reduce congestion and operating costs at the larger airport. Other considerations when assessing whether to adopt this approach would be the degree to which operations at the airports are integrated; for example, through a unified administrative structure, or collective purchasing. In addition, the degree to which smaller airports served as feeders to the larger airport, providing increased connectivity and increased number of viable routes through transiting passengers, would also be a factor. These aspects of an airport network could be considered in the context of decreasing availability of public funding for small, regional or remote airports. In summary, an airport network can be a valuable method of collectively managing airports that, taken individually, would not be viable."

In summary, the network approach, which allows economies of scale and scope at the network level and cross-subsidization of smaller airports, represents a major model of operating small airports sustainably.

ACI estimates that over a half of small airports are operated by airport networks. 56% of all small airports in the world are part of networks with a corresponding annual passenger traffic volume of almost 345 million. See Chart 5.

Looking at the issue of small airports from an even more granular perspective strengthens the importance of the airport network model in economic sustainability of small airports even further. Within the traditional size category heavily employed by ACI—the one denoting airports with fewer than one million passengers per annum—there are a significant number of airports that are even smaller than indicated by this rather arbitrary threshold. Thus, it is of value to look at

**CHART 5: NUMBER OF SMALL AIRPORTS UNDER VARIOUS AIRPORT NETWORK ARRANGEMENTS (INNER) AND CORRESPONDING PASSENGER TRAFFIC VOLUMES IN MILLIONS (OUTER) (2018)**

the industry's landscape in terms of airports that handle fewer than hundred thousand passengers or even fewer than ten thousand passengers per annum.

First, it would be important to mention that ACI World has conducted a research on the industry composition in terms of small airports—those with annual traffic volumes below the one million, as well as hundred thousand and ten thousand-passenger thresholds. The assessment was based on ACI traffic data holdings, as well as some estimated figures based on OAG data.

In 2018, out of 4,187 airports with scheduled commercial traffic, 3,265 airports (78%) handled passenger volumes below the one-million mark. The total volume of traffic for these airports was estimated at 521 million passengers (only 5.5% of global pas-

senger traffic). Even though four out of five airports worldwide handle traffic volumes of fewer than one million passengers per annum, their traffic share on the global scale is rather limited.

Out of 4,187 airports, 2,010 (48%) airports handled passenger traffic volumes below the hundred-thousand mark. The total volume of traffic for these airports was estimated at 56 million passengers (only 0.6% on the global scale).

Finally, 695 airports (17%) handle traffic volumes below the ten-thousand mark. The total volume of passenger traffic handled by these airports is 3 million (0.03%). Almost seven hundred airports are handling altogether passenger traffic volumes of a typical regional airport in a developed market such as the United States, Germany or Japan.

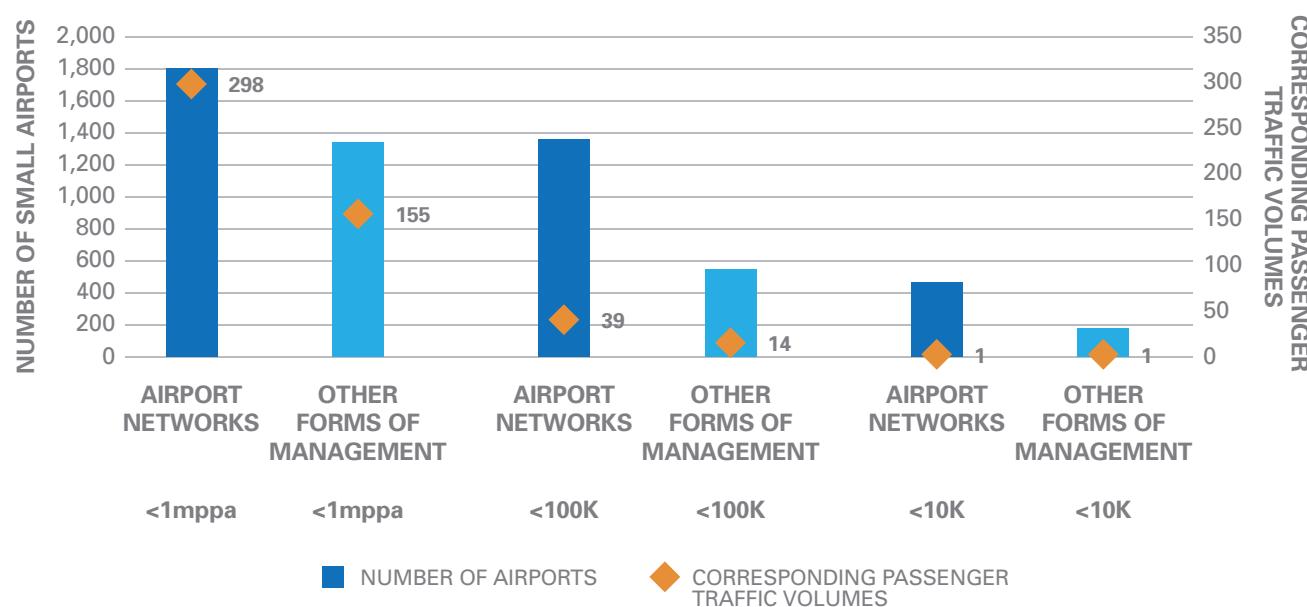


Chart 6 clearly shows that airport networks, as opposed to other forms of airport management such as single airports and airport systems, bear the burden of managing small airports. This way, there are almost 1,350 airports handling annual passenger traffic volumes below the 100,000 mark, with a combined total traffic volume of 39 million. That reflects a sharp contrast with other forms of management that account

for just over a third of this number (543 airports) within a pool of airports handling traffic volumes below the 100,000-passenger mark.

Similarly, airport networks are managing a higher number of airports with annual passenger traffic volumes below the ten thousand mark: 462 versus 171 managed otherwise. See Chart 6.

CHART 6: NUMBER OF SMALL AIRPORTS (<1MPPA, <100K AND <10K) AND CORRESPONDING PASSENGER TRAFFIC VOLUMES IN MILLIONS (2018)



Source: ACI Inventory of Airport Networks (2019)



1.4 Benefits of airport networks

Depending on local circumstances, business needs and public policy interests, a network approach to airport management and operation ensures sustainable funding of smaller airports, with the profits of higher-throughput airports compensating for the net losses of smaller airports. Therefore, opting for a network approach often enables significant benefits and, depending on local circumstances, is instrumental for safety, for local and socioeconomic development and for generating positive business conditions and opportunities for airlines. As indicated above, these benefits are recognized by ICAO in its material to States.

- **Safety:** States and oversight authorities often give airport-network operators responsibility for providing airport facilities and services which offer integrated coverage of a given territory. For safety and security reasons at national and regional levels, such coverage can provide alternate airports for emergencies—e.g., for Extended-range Twin-engine Operational Performance Standards (ETOPS) operations. Opting for a net-

work approach is often the preferred solution for countries with large territories and uneven distributions of transport infrastructure.

- Contributions to **social and economic development** of the surrounding communities: Airport networks offer an option for enhancing connectivity for all regions and ensuring that all areas remain interconnected without any community being neglected. Airport networks allow for economic and social development, e.g., by generating tourism flows and by enabling business opportunities.
- **Positive benefits to airlines:** Important economic synergies are generated between smaller airports and larger airports within a network. Indeed, small airports and airlines act as catalysts in feeding traffic into hub airports for onward journeys to other major national and international destinations. Smaller airports within a network generate traffic that ensures the sustainability of larger airports, resulting in improved load factors and optimal aircraft utilization by airlines.



2. AIRPORT NETWORKS ARE EFFICIENT AND COMPETITIVE AND DELIVER HIGH QUALITY OF SERVICE

Single airports, airport systems and airport networks provide significant value creation for airlines, passengers and the communities they serve. Economies of scope and scale enable airport networks to generate significant efficiencies in terms of costs and charges to airlines, while providing customers with a high quality of service.

2.1 Cost-efficiency

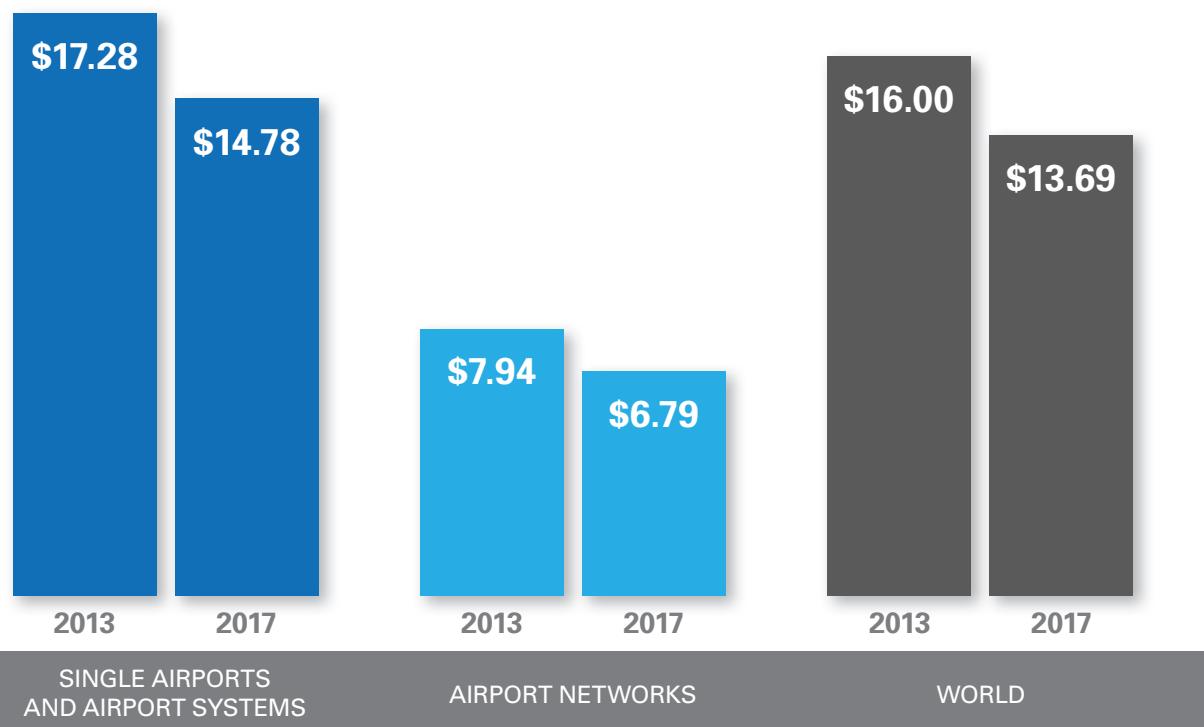
It is not more costly to operate a network of airports than to operate single airports or airport systems. Conversely, ACI's analyses show that, in terms of total costs, accommodating a single passenger at network airports costs less than half (46%) of the amount it costs single airport operators, as shown in Chart 7 below.

Among other reasons, this finding is related to the fact that among the 151 States with networks, only 19 States are advanced economies, while the remaining 132 are emerging markets and developing economies. These States' general price levels and the values of their national currencies are generally lower than those in the advanced economies.

Moreover, the vast majority of the busiest and most congested airports with scarce infrastructure are single airports or they belong to airport systems. They are located in global cities, while airport networks operate large numbers of small, under-used airports.

More importantly, however, operating a network inherently generates efficiencies in operating and capital costs.

CHART 7: AIRPORT TOTAL COSTS PER PASSENGER
(US\$, INFLATION-ADJUSTED, 2013–2017)



Source: ACI Airport Economics Database 2019



- Management of several airports by a single entity avoids costly duplication of functions at each airport (e.g., marketing, procurement, finance, administration and overall management). Operating expenses per passenger for airport-network operators are US\$5.54; whereas, they are US\$10.64 for single-airport operators. That is to say, operating costs on a per-passenger basis for airport networks are a little over half of what they are for single-airport operators.
- Airport networks benefit from easier access to capital markets, because financing costs are usually lower for larger organizations that mutualize risks. Comparing airport networks and single airports, the percentage difference in capital costs per passenger is even more pronounced than it is for operating costs—US\$2.17 versus US\$6.15, respectively.

Hence, cross-subsidies from larger to smaller airports within a network do not, in any way, increase the overall costs of providing airport facilities and services. Efficiencies in operating costs and in capital costs largely offset cross-subsidies and generate significant value both for airlines and passengers using airport networks.

2.2 Airport networks have cost-effective and competitive charges

It is misleading to suggest that airport networks operating under the principle of cross subsidization from larger to smaller airports generate higher user charges for airlines. Evidence shows that, because airport networks benefit from economies of scope and of scale, they do not have higher charges than airport systems and single airports which do not engage in cross subsidization. Efficiencies in operating costs and in capital costs are passed on to passengers and airlines through competitive charges which ultimately benefit passengers, airlines and States' wider economies.

The independent study contained in *LeighFisher 2018 Review of Airport Charges* details aeronautical charges (landing, parking, infrastructure, passenger service and security, and terminal navigation charges) that would be imposed on a sample of eight different aircraft types, making one landing and one departure at each of the 50 major international airports. Collectively, these 50 airports handled 2.3 billion passengers in 2018 and represented 25.8% of all global passenger traffic.

In the review's sample, 10 out of 50 airports belong to airport networks. In the charges benchmarked in Chart 8, ACI anonymized the airports and colored stand-alone airports in blue and airports which belong to a network in red. The benchmark clearly indicates that for the sample there is no correlation between a high level of charges and an airport that is a large hub as well as a member of an airport network.

2.3 Airport networks provide high levels of customer experience

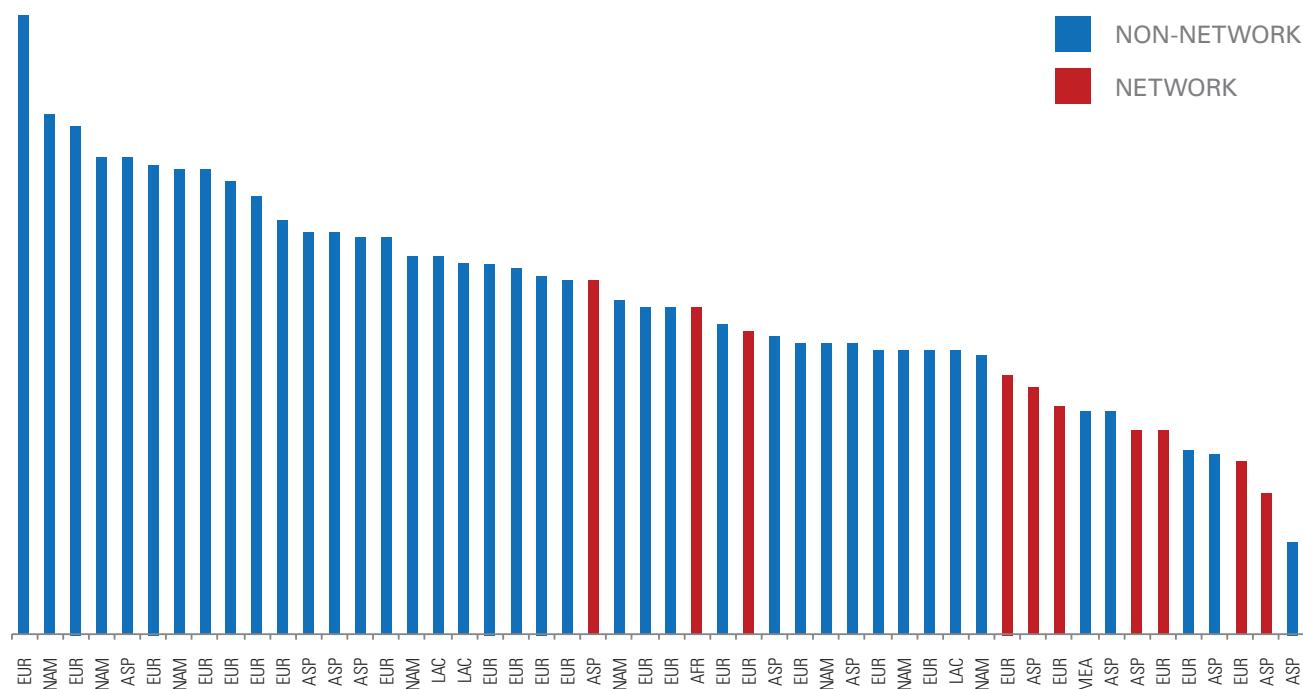
Whether airports are large or small, or whether they are single airports or belong to airport systems or networks, they are committed to giving passengers an excellent customer experience. Not only do continuous service improvement and distinctive customer experience create value for the travelling public but they also give airports a distinct competitive advantage. Managing a network of airports can facilitate sharing of best practices in customer experience among airports within the network.

ACI's Airport Service Quality (ASQ) administers surveys to passengers at airports on their day of travel and measures passengers' satisfaction. When looking at airports that received the highest ratings from customers, in 2018, airports which are members of networks are recognized as providing excellent passenger experience. For instance, some of the selected airports are listed as they received the ASQ award in 2018:



1. Among airports handling between 2 and 5 million passengers per annum, the awarded airports in 2018 were:
 - a) Aeropuerto Internacional de los Cabos, part of Grupo Aeroportuario del Pacífico; and
 - b) SS Kasim II Airport, part of PT Angkasa Pura II.
 2. Among airports handling between 5 and 15 million passengers per annum, the awarded airports were:
 - a) Hohhot Baita International Airport, part of Inner Mongolia Airport Group Company Limited;
 3. Among airports handling between 15 and 25 million passengers per annum, the awarded airport was Helsinki Vantaa Airport, part of Finavia Oyj. airport network.
 - b) Changchun Longjia International Airport, part of Jilin Province Civil Aviation Airport Group;
 - c) Aeropuerto de Alicante-Elche, part of Aena SME, S.A.;
 - d) Bergen Airport, part of Avinor AS; and
 - e) Keflavik International Airport, part of Isavia ohf.

CHART 8: LEVEL OF AIRPORT CHARGES AT SELECTED MAJOR INTERNATIONAL AIRPORTS (SPECIAL DRAWING RIGHT (SDR) PER PASSENGER, INDEXED, 2018)



Source: Adapted from LeighFisher Review of Airport Charges 2018





3. REGULATORY FRAMEWORKS FOR AIRPORT NETWORKS

3.1 Recovery of aeronautical costs through charges

Like any other businesses, airports need to cover their costs and achieve a reasonable rate of return to allow reinvestment in airport operations and infrastructure development, as well as to remunerate their shareholders, whether those are public or private.

Aeronautical costs incurred by airport operators are recovered both from airlines and from passengers, through charges. The most logical common recovery method for airport networks is to pool the costs of providing aeronautical services at the network level, and then to recover these costs from the airlines and passengers using the network.

For operators managing airport networks, an airport site-specific recovery of aeronautical costs through charges at the airport level is impracticable to implement.

- Airport operators typically measure their direct operating costs—such as personnel expenses, contractual services, procurement, utilities and maintenance—very precisely at the aggregated network level because the costs are incurred at the network level. Most expenses are either mutualized (e.g., providing one marketing team for all airports) or benefit from economies of scale and scope: streamlined procurement for all airports in a network is less expensive and more efficient than individual procurement at the same airports.
- Often, a significant proportion of the cost of airport operations is lumped under general and administrative overheads and cannot be allocated to any airport in particular. These overheads often include services such as legal fees, payroll administration and provision of information and communication technology, among other costs. While it is difficult to allocate overhead costs to each of the airports within a network, often it is also challenging to allocate other operating costs precisely.

- Access to capital markets is usually easier for airport networks, which then benefit from lower costs of capital. Lenders and investors in airports often estimate the cost of raising debt or equity funds, assess the subsequent returns, and mutualize the risk at the airport network level. This makes it impracticable to assess the cost of capital at each individual airport within a network.
- In most cases, recovering costs on an airport site-specific basis would not make sense economically. Since most airports that belong to networks are small: 78% of them handle less than one million passengers a year, strict recovery of aeronautical costs from airlines and passengers at these airports would make user costs prohibitive and would deter sustainable air traffic operation and traffic development.

Consequently, pooling aeronautical costs at the network level and recovering the costs of the network from its users through a common charging scheme by pooling aeronautical revenues is the most logical and coherent method for recovering operations and development costs. Depending on local circumstances, common charging schemes can then take several forms including:

- a uniform level and structure of charges at all airports in a network; and,
- a tiered level and structure of charges at sub-groups of airports within a network, based on geography, traffic size, or other factors.

In using common charging schemes, profitable larger airports that typically have much higher throughput levels tend to cross-subsidize or compensate the net losses of the smaller airports within their networks, thereby ensuring the overall sustainability of the network. Consequently, airport-network operators should have the flexibility to determine the most appropriate charging system to help them recover their costs, generate a return for their shareholders and through cross-subsidies ensure the sustainable operation of smaller airports in the network.



3.2 Common charging schemes: a practice in line with the ICAO framework

Complying with ICAO's key charging principles of non-discrimination, cost-relatedness, transparency and consultation with users provides passengers and airlines with safeguards. It guarantees alignment of the practice of cross-subsidization with ICAO's policies on charges and ensures the sustainable operation of smaller airports. ICAO's charging principles require:

1. Non-discrimination between airlines engaged in similar air services and irrespective of their nationality.
2. Cost-relatedness of airport charges with the overall provision of airport facilities and services at the network level:
 - ICAO's policies on charges (Doc 9082) state that: a) the cost to be recovered through charges is the full cost of providing airport and essential ancillary services; and b) airlines and passengers should not be charged for facilities and services they do not use. In no instances do ICAO's policies on charges disapprove cross-subsidies within airport networks from profitable to non-profitable airports. Rather, common charging schemes at the network level and the inducing of some level of cross-subsidization from larger to smaller airports is fully consistent with the ICAO framework, because users of the network are charged for the cost of using the network.
 - Recovering the overall costs of providing airport network facilities and services through a common charging scheme is aligned with ICAO's key charging principle of cost-relatedness. Costs and revenues are related at the network level, in line with ICAO's policies, which emphasize that revenues must be related to costs without requiring this cost-relatedness to be airport site-specific.
3. Transparency and consultation with airlines to reach a consensus with users on airport charges whenever possible. ACI's *Recommended Practice on transparency and consultation with airlines* advocates that airlines be charged in accordance with the overall cost base and a breakdown of aeronautical revenues at the network level—and that this provision also applies to the main airports belonging to the network, as long as required by relevant legislative frameworks and local circumstances. When consultations are held on common charging systems and an integrated cost base for charges at the network level, reciprocity becomes a key enabler for success. Airport operators and airline users alike should be committed to providing relevant information.
4. Additional safeguards contained in the ICAO *Airport Economics Manual* (Doc 9562, 4th ed., para 2.39 refers) allude to ensuring that airports benefiting from cross-subsidies: "1) have the same operator; 2) are currently in use; and 3) the costs to be shared between one airport and another be reasonably related to the aviation benefits that accrue to the users of the primary or larger airport."



3.3 The most effective oversight framework is proportionate and intervenes only when necessary

Like single-airport operators and airport systems, airport-network operators are subject to increasing competitive pressure. Airports used to be considered as being akin to natural monopolies, but this is no longer the case. Airports now must compete with each other for passengers and airlines and these customers have significantly more choice and market power than in the past. Airports have also had to become more commercially focused, deriving a large share of their revenue from commercial and retail business that is reliant on passenger volume.

The accumulation of competitive constraints affects airport networks, single airports and airport systems alike: local departure choice; airline route switching; transfer choice; buyer power of the largest carrier; and high volatility of passengers. Airports are competing with other airports to gain new routes and based aircraft; and this competition for the marginal route sets the level of charges that an airport can seek. The result is a more competitive and dynamic airport market, which leads to efficient determination of the prices airport operators can charge their customers.

Competitive constraints should always be taken into account, and oversight processes should be proportionate to the above-mentioned factors. Therefore, a proportionate regulatory framework, if needed, should facilitate and incentivize commercial agreements between airports and airlines in a flexible manner, rather than burdening stakeholders with unnecessarily strict rules and procedures. Similarly, the degree of transparency regarding airport costs and charges should be proportionate to the market power and the market situation of the airport. The role of the regulator is to facilitate this commercial engagement and intervene in the case of market failure.

