



COVID-19 impact and solutions on
airport operations:

The complete guide



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CONTENTS

Executive Summary.....	3
Challenge 1: High variance in flight schedules and load factors.....	8
Challenge 2: Lower annual passenger numbers but unchanged or higher peak levels compared ton pre-COVID-19.....	28
Challenge 3: Physical distancing	49
Challenge 4: Cleaning and personal protective equipment.....	69
Challenge 5: COVID-19 measures.....	89
Challenge 6: Financial impact.....	111



EXECUTIVE SUMMARY

COVID-19 brought the worst crisis in the history of aviation. However, we argue that this might be the best opportunity ever for airports, airlines, and all other stakeholders, to rethink business models and adjust operational concepts to improve efficiency and passenger satisfaction.

Taking the focus on the role of airport operations planners, we tackle the six major challenges faced by the industry and elaborate on both foreseeable impacts and recommended solutions.

The document comprises six chapters, one per challenge, originally published as six articles in our newsletter. Each chapter can be read individually and in no specific order to best satisfy your area of interest. Below we provide an action-oriented summary of the key take-aways of each chapter:

1.

High variance in flight schedules and load factors

Reading time: 10 minutes

A high degree of variance in both flight schedules and load factors is expected as traffic ramps up, driven by a constantly evolving travel restrictions, a changing competitive landscape (particularly among airlines), and new health and safety regulations. To navigate these turbulent times, we advise planners to introduce adaptive and self-correcting forecasting methodologies, to increase data intelligence (e.g. on passenger behavior), and to build resilience into plans through scenario analysis.

2.

Lower annual passenger numbers but unchanged or higher peak levels compared to pre-COVID-19

Reading time: 10 minutes

Total and daily peak-time air traffic numbers are lower than before COVID-19. We expect the recovery to come in phases, with peak-time traffic returning to “normality” relatively faster than shoulder-time traffic. On this journey, airports will face challenges of varying intensity: for example, whereas physical distancing poses limited issues while traffic is very low, it will increasingly complicate operations as more passengers crowd the terminals. An early identification of the challenges to come, and of the relevant remedies, provides guidance on how to focus, prioritize and time airport interventions so that the right resources are spent at the right time in the right area.

3.

Physical distancing

Reading time: 10 minutes

Physical distancing has proven effective in limiting the spread of COVID-19. Implementing this successful measure in airports primarily means lower utilization of infrastructure, and increased need for communication and guidance to passengers. To maximize efficiency in infrastructure and staff despite a measure that inevitably bring inefficiency, airports are recommended to develop their understanding and prediction of passenger flows (adapting those to the new measures), to introduce technology, and adapt their communication processes. The key is to not let physical distancing dictate airport operations, but to plan operations with physical distancing.

4.

Cleaning and personal protective equipment (PPE)

Reading time: 10 minutes

Traditionally cleaning in airports is a “hygiene factor”. Today cleaning is pivotal in fighting the spread of COVID-19. The implementation of enhanced cleaning measures and personal protective equipment can challenge general operational efficiency and staff “productivity”. To cope, airports should, on one hand, optimize cleaning plans and process through data and technology (e.g. through devices that count traffic in highly exposed areas such as toilets); on the other hand, minimize the need for cleaning (e.g. by changing passenger flows or shutting down parts of the infrastructure). Finally, we argue that highly sanitized airports can lead the way to regaining passenger trust and traffic recovery.

Going forward we expect hygiene to hold a much higher up place in the relevance hierarchy of operations planning. For airport operations, this means an increase in focus and efforts spent on planning and maintenance of such hygiene measures – so it is highly recommended to start now.

5. COVID-19 measures

Reading time: 10 minutes

As lockdown restrictions are being lifted, airports face requirements to implement measures to identify and isolate passengers with COVID-19 throughout the airport journey. These measures can be grouped in health documentation, thermal screening, on-site testing, and vary in terms of requirements (staff, space, tools/technology) and suitability across operational areas. Airports need to assess measures across these dimensions to decide on their implementation. At the same time, we emphasize the importance of reflecting the operational impact of these measures in the planning methodologies and of coordinating with stakeholders such as airlines and health authorities.

6. Financial impact

Reading time: 10 minutes

Regardless of how timely and effective the actions taken, airports, as any other player in the aviation industry, will face financial challenges. With a potentially long-lasting state of spending review, we argue the criticality of the role of operational planners, who should support key management decisions. In this context, we encourage a transition to Zero-Based Planning: a from-scratch bottom-up approach to plan operations based on “true” demands.

Once again, data is key in assessing what can and cannot be sacrificed. As we advise for a revolution in airport operations under the principles of Zero-Based Planning, demand-driven planning and sustainable spending, data will lead the analytical approach, as quantitative as possible, to evaluate and decide the steps to take in getting airports through COVID-19 resumption.

Across challenges, from managing volatile schedules to spending money more wisely than ever, we highlight a common denominator: data. All articles share a rationally argued emphasis on data-driven operations and planning. An approach that needs to start with structured data gathering and continue through predictive analytics and advanced planning.

Challenge 1:

High variance in flight schedules and load factors

CONTENTS

The reader	10
Article summary	11
Turbulent times	13
 Lever A: Make forecasts adaptive and self-correcting	 18
Recommendation 1	19
Recommendation 2	19
 Lever B: Increase data intelligence	 21
Recommendation 3	21
Recommendation 4	22
 Lever C: Build resilience into your plans	 23
Recommendation 5	23
Recommendation 6	23
 Conclusion	 26

THIS ARTICLE IS AIMED AT READERS WHO ARE LOOKING FOR

- A review of the key reasons to expect turbulent times ahead for airport operations planning
- A panoramic view of the key consequences for the airport operation and customer experience
- A recipe for planners to shield operational plans from turbulence

ONE-MINUTE SUMMARY

A high degree of variance in both flight schedules and load factors is expected as traffic ramps up. Several airlines including Lufthansa, Delta Airlines, and United Airlines have publicly stated that they will emerge from the COVID-19 crisis as changed and smaller airlines.

Reasons for expecting high variance

Lockdowns and travel restrictions	New route development
Domestic vs international traffic pickup	Lack of passenger confidence
Airline economical pressure	New waves of COVID-19
Higher ticket prices	Changed travel behavior

We outline our key recommendations for airport operational planners to navigate the expected high variance in flight schedules and load factors:

Make forecasts adaptive and self-correcting	Increase data intelligence	Build resilience into your plans
1. Revise forecast more frequently and shorten the planning horizon	3. Collect intel through crisis to support your understanding of operations and plan accordingly	5. Analyze worst/best case scenarios and create contingency plans
2. Increase the significance of recent past in your forecasting methodology	4. Leverage the industry's need for transparency (e.g. shared booking figures)	6. Implement more flexible staffing and infrastructure allocation processes

Being more **dynamic and
adapting quickly to changes
will be **key** to **succeed**
on planning the airport
operation**



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Turbulent times ahead for airport operations planning

As countries open their borders after the lockdown, air traffic will slowly ramp up. Domestic sectors will recover earlier, followed by the international short haul and long haul. As not every country applies the same restrictions, the airline industry will need to regularly adapt their flight schedules to follow current regulations and meet demand. Europe relies on international traffic much more than other regions like North America and Asia. The Schengen agreement being reinstated again, partially or totally, between European countries will highly influence the ability for passengers to freely travel across Europe and therefore affect air traffic demand. Furthermore, this will influence passenger's confidence. Uncertainty on when restrictions will be lifted makes passengers fear for their plans, forcing them to cancel or delay this year's holidays. Passenger behavior will also have an impact on the forecasts due to uncertainty and fear of crowded spaces. Passengers may arrive much earlier to airports, or, on the other hand, with just the minimum time required, making the prediction of presentation profiles more difficult.

Airlines will need to be more agile and potentially undergoing internal restructuring and changes to be able to cope with the situation. To begin with, airlines will need to stimulate the market, how to do this will depend on a lot of factors. Airlines will most likely offer fewer routes while cutting non-profitable routes and focusing on the

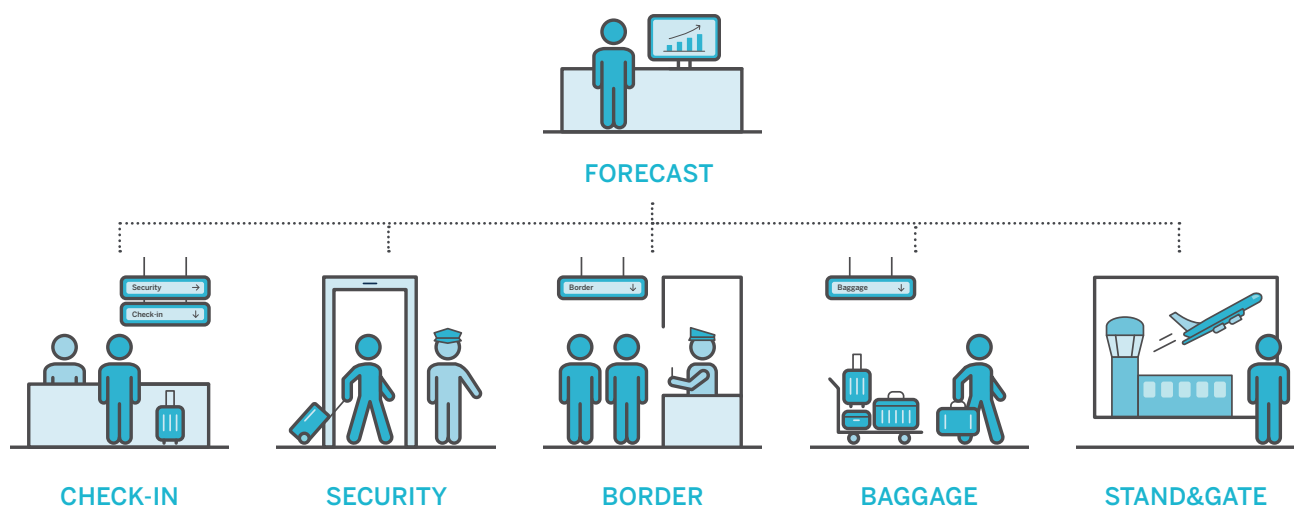
key routes. This will also mean thinking outside the box and coming up with new ideas and new propositions for the passengers. A temporary wave of slot allocation rules in congested airports, as recommended by ACI World, will further increase the variance on flight schedules allowing airlines to update their schedules easily and more often and therefore impacting airport daily plans.

Finally, if we look at the medium and long term, airports need to be prepared for a potential new wave of restrictions if we are hit by a second or third wave of COVID-19 infections. It is important to be prepared to minimize future disruptions. Being more dynamic and adapting quickly to changes will be key to succeed on planning the airport operation. Implementing a good planning strategy today as part of the Business Continuity and Disaster Recovery plan (BCDR) will prepare the airport not only for COVID-19 but for any potential new pandemics or global disasters.

The impact on the airport operation and customer experience

An accurate forecast is the base for a good plan, and this includes having an accurate flight schedule with accurate load factors. Having a high variance in both traffic schedules and load factors will make the forecasting process more difficult than before. This high variance will make every day unique and increase the need for dynamic forecasting and planning. It is more important than ever before that the passenger forecasting process is adaptive and self-correcting.

The schedule forecast sits on top of the planning tree, providing key inputs to all the airport operational areas: check-in, security, border control, baggage and stand and gate allocation.



The impact of an unreliable forecast differs across all operational areas, but it is likely to create the following issues on the operation:

- Crowded spaces
- Long queues
- High waiting times
- Staff surplus or shortage
- Delays in loading bags to plane
- Congestion in baggage belts
- Aircraft turnaround delays
- Low passenger satisfaction

A good example of this is the security operation, which is very reliant on an accurate forecast. First, the forecast is required to plan the staffing levels to provide a good experience to the passengers without incurring high operating costs. The planning needs to be accurate across the day accounting for peaks and valleys to the passenger numbers. Therefore, both load factors and presentation profiles need to be as accurate as possible to understand how many passengers will be going through security across the day. Even when all the plans have been created, the forecast may change again on short notice with new and cancelled flights. Making sure these changes are reflected in the security plans on the day of operation is key to minimize passenger disruption.



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The **keyword** for
forecasting and planning
is “**agility**”

.....

Planners' three levers to shield operational plans

Our experience with forecasting and planning across multiple international airports suggests that planners can take advantage of three levers in order to cope with air traffic volatility.

LEVER A: Make forecasts adaptive and self-correcting

Traditional load factor forecasting methodologies are based on the analysis of historical figures. These are usually filtered and combined with other input and assumptions to predict the future load factor (e.g. by looking up the load factor of similar flights in a similar period the year before).

Recommendation 1: Revise forecast more frequently and shorten the planning horizon

Rapidly evolving healthcare and travel restriction landscapes expose schedules and load factors to constant changes. Therefore, planners are required to revise forecasts more frequently – daily, if possible – in order to incorporate such changes in the forecast.

The yield in terms of accuracy of frequent and thorough forecast updates has never been as high as now. As a consequence, tools and methodologies that make it easy to work with frequently changing input have never been as useful as now – for providing greater accuracy – and profitable – for saving time to analysts and planners.

Although short-term forecast updates (e.g. on the day of operation) may be too late in the planning process to allow for major changes (e.g. staffing of a security checkpoint), they can at least inform about when and where issues may arise throughout the day, and allow to mitigate them accordingly.

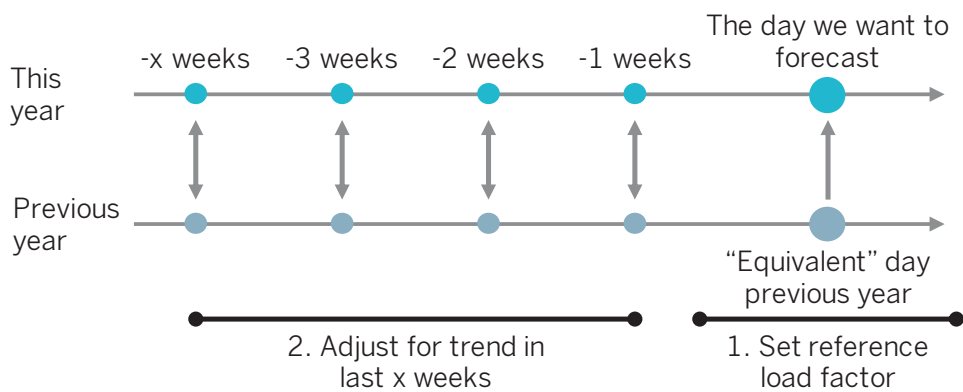
In the current scenario, we expect the accuracy of most medium/long term forecasts (>1 month) to be very low. Hence, we suggest to generally shorten the planning horizon.

Recommendation 2: Increase the significance of recent past in your forecasting methodology

In most cases, the travel industry disruption will undermine the reliability of historical flight patterns and figures to predict future ones. As the forecasted day approaches, we suggest increasing the significance of recent past (i.e. latest 1-2 weeks) in your methodology to forecast future load factors. This allows for a more agile/self-correcting mechanism than when averaging larger periods further in the past.

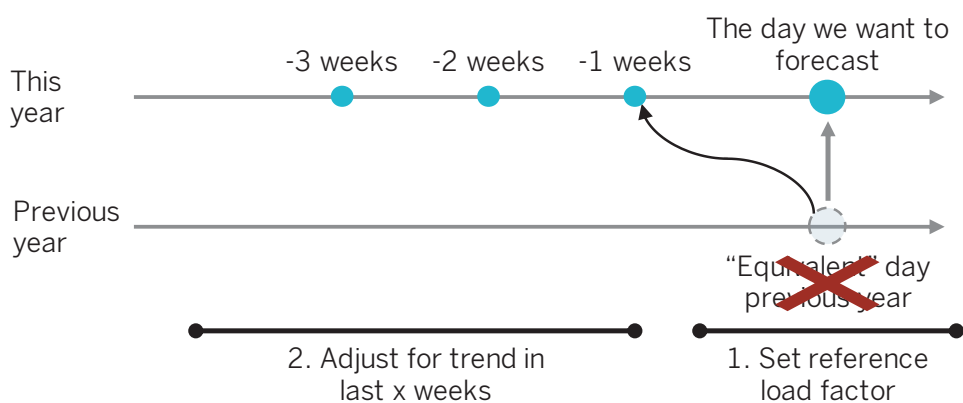
As the ramp-up period approaches its end and traffic nears pre-COVID-19 levels, be prepared to shift back to a more traditional forecasting methodology, where reference load factors are looked up further back in time (*see illustration*). This could be particularly true of periods with typical and recurring travel patterns, such as the week around Christmas. Until then, the keyword for forecasting and planning is “agility”.

Traditional forecasting methodology



- Works well when travel patterns between years resemble each other (e.g. days around Christmas, peak summer holiday weeks)
- Long trend period (2) dampens sporadic volatility in load factors

Contingency forecasting methodology



- Recent changes in load factors are quickly absorbed, as shorter trend period does not average them out
- Reference load factor is set closer in the past, as no “equivalent” day exists in previous year

LEVER B:

Increase data intelligence

Little data is better than no data! The global data experts and advisory firm Gartner distinguish four levels of analytics maturity, each providing increasing value. Already in the first two levels (the least mature and least value-adding), data provides the basis for a description of *what* happened and *why* – ever so important in these uncertain times.

Recommendation 3: Collect intel to support your understanding of operations through crisis and plan accordingly

Collect data consistently throughout the crisis to answer questions such as:

- How many passengers travelled? And when?
- What is happening in the industry?
(e.g. examine relevant industry news and your peers)
- What was the performance of the operational areas?
(e.g. waiting times, queues)
- How were operational areas planned?
(e.g. staffing, allocation of infrastructure)

With the right data intelligence, these “answers” can lead to a precise assessment of *what* happened in the operation during the COVID-19 days, and *why* – e.g. “Did the waiting time at security increase because flights schedules suddenly changed? Or had we understaffing to begin with?”

If your data and intelligence capabilities are mature enough, use data collected during the crisis to predict future days of operations and plan optimally. As we described above, in regards to an *adaptive and self-correcting forecast*, a simple average of load factors in the last few weeks (eventually corrected for the observed trend to avoid under-forecasting) can predict future load factors more accurately than a traditional reference to “equivalent periods” in the past, as no period was ever like the one we are living in right now.

Recommendation 4: Leverage the industry's need for transparency (e.g. shared booking figures)

Last but not least, when working with data think outwards just as much inwards. The whole industry is under extreme pressure. A threat, clearly. But also a great opportunity to leverage the need for increased collaboration, coordination and transparency.

Sharing of booking figures is a clear example of how greater transparency can bring benefits to all stakeholders in the value chain: airports would produce more accurate forecasts (especially when booking figures are made available close to the day of operation); this allows for allocation of infrastructure and staff according to real demand; it also enables data-driven dialogues with airlines and handlers (e.g. sharing information on allocation of check-in desks, MUPs etc.), with improved chances of airports providing fairer and true-to-needs services. Ultimately this can lead to cost efficiency and improved passenger experience.

LEVER C:

Build resilience into your plans

It is likely that not even the most fine-tuned algorithm and database would be able to deliver the level of forecast accuracy airports were used to prior to COVID-19, with the implications on planning outlined earlier in this article. Hence, we advise to build some extra resilience into your plans.

Recommendation 5: Analyze worst/best case scenarios and create contingency plans

We recommend being the more conservative with forecasts and operational planning the further away from the actual day of operations: factor in buffers. As the day of operation approaches, as forecasts become more reliable (with the right “intel”), and as plans need to be locked down, assess a reduction in the extra resilience originally built in (e.g. additional staffing, opening of infrastructure).

Obviously, this should come as a trade-off between passenger experience and operational costs.

Recommendation 6: Implement more flexible staffing and infrastructure allocation processes

As for the sharing of booking figures in *Recommendation 4*, in the wake of COVID-19 we invite once again all stakeholders to consider increasing collaboration and transparency in order to reap mutual benefits and save the highest number of jobs.

Depending on local legislation, flexible staffing processes (e.g. part-time, on-call, overtime, subcontracting) may be implemented to:

- **Long-term** – support contingency planning, by accounting for measures to balance desired passenger experience and financial constraints
- **Short-term** – handle operational emergencies (e.g. on-the-day drop in traffic, delays requiring changes in staffing plan)

Flexible staffing serves a dual purpose: to adapt to a developing situation over the coming months; and to plan efficiently for variance between weekdays and during the day, which will be a constant for the months to come.

Similarly, flexibility should be pursued in regards to the use of infrastructure: “unwritten rules” on the allocation of specific counters, baggage make-up positions, stands, gates, to specific airlines or handlers should be reconsidered. As many airports are required to start their planning “from scratch”, they should use it as an opportunity to re-think plans and processes, e.g. pushing for common-use check-in desks, self-service facilities, etc.



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**Flexible, agile, data-driven,
and resilient**

CONCLUSION

Plan with flexibility, data, and resilience to get through the turbulence

Flexible, agile, data-driven, and resilient. These are the attributes that best describe the recipe for operations planners to navigate volatile schedules and load factors. Our expectations and recommendations are based on the industry knowledge built and continuously updated by collaborating with operations planners across the globe, in airports at all levels of analytics maturity.

This article is part of a series on the challenges of COVID-19 for airport operations planning, and on how to best handle these challenges. Our focus is both short-term and long-term when we refer to the post-COVID-19 situation.

READING MATERIAL MENTIONED IN THIS ARTICLE

“COVID-19: Relief measures to ensure the survival of the airport industry.” Policy Brief Jan. 2020: 10-11.

Challenge 2:
Lower annual passenger numbers but unchanged or higher peak levels compared to pre-COVID-19

CONTENTS

The reader	30
Article summary	31
Air traffic's return to "normality": a phased approach.....	34
Phase 0	35
Phase 1.....	38
Phase 2	42
Phase 3	44
Phase 4	45
Conclusion	47

THIS ARTICLE IS AIMED AT READERS WHO ARE LOOKING FOR

- An outline of the expected phases in air traffic's return to normality after COVID-19
- Expectations on the major operational challenges in the times to come
- Guidance on how, when, and where to act in order to tackle operational challenges

ONE-MINUTE SUMMARY

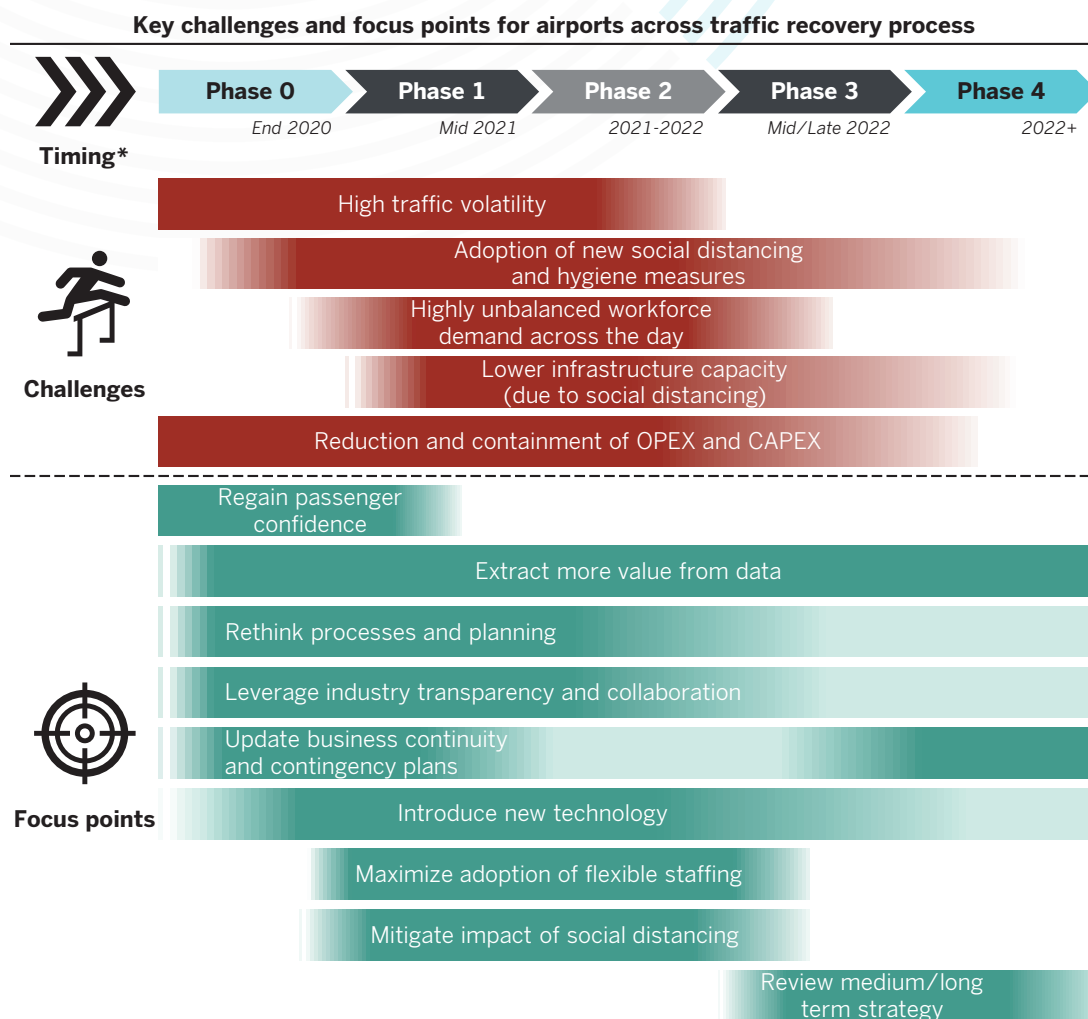
Today total and daily peak-time (i.e. the time of the day where airlines prefer to fly) air traffic numbers are lower than before COVID-19. Annual and peak traffic numbers can each evolve to either be lower, equal, or higher than their pre-COVID-19 levels, as shown in the matrix below.

Annual passenger numbers compared to pre-COVID-19

		Lower	Unchanged	Higher
Peak passenger numbers compared to pre-COVID-19	Lower	<p>0</p> <p>Expected large volatility in the traffic volumes as traffic ramps up - focus on keeping OPEX low with very low CAPEX</p>	<p>While unlikely, some airports may see a less peaky traffic profile leading to a better situation than pre-COVID-19</p>	<p>The ideal but also very unlikely situation with higher annual volumes at a lower peak volume</p>
	Unchanged	<p>1</p> <p>The expected reality for most airports - airlines scrambling to get flights in the peak hours while shoulders are kept at a low level</p>	<p>Back to normal, probably quite unlikely for most airports as airlines will seek new route combinations following COVID-19</p>	<p>This combination seems most likely for slot constrained airports who can keep their peak level unchanged</p>
	Higher	<p>2</p> <p>A challenging situation for airports where focus must be on optimization of processes to avoid building more infrastructure</p>	<p>3</p> <p>This seems a likely scenario to many airports - when they return to pre-COVID-19 passenger volumes, the peak will be higher</p>	<p>4</p> <p>Where most airports will end up - eventually...</p>

We expect that, mostly driven by financial reasons, the recovery will come in phases (of varying length and start time) with peak-time traffic returning to “normality” relatively faster than shoulder-time traffic: from phase 0, the current state, to phase 4.

As we describe this likely scenario for traffic recovery, we outline key challenges and recommended focus points of airport operations. Our goal is to let the assessment of the intensity of each challenge over time provide guidance on how to focus, prioritize, and time airport interventions.



The **recovery** process will happen in **phases**



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Air traffic's return to "normality": a phased approach

The last time airlines generally saw a severe drop in passenger traffic was in 2008 / 2009 during the financial crisis. An interesting observation from 2009 was that while annual traffic numbers dropped significantly – typically between 10% and 15% – the peak traffic levels in airports remained largely unchanged. This was driven by the desire from airlines to consolidate flights during peak times (i.e. the time of the day where the airlines prefers to fly), which is usually defined by parameters such as rotations and passenger needs (e.g. short-haul business should fly in the early morning and later afternoon/evening). While the COVID-19 situation is already far worse than the financial crisis, we expect a similar development for the rebound in traffic after COVID-19: like today, many airlines suffered financial losses during the 2008 crisis, and relied on peak-time traffic, where, we believe, profitability is higher, to invert that trend. There are already examples of similar schedule consolidations: Delta has suspended flights from 10 stations, redirecting passengers to neighboring airports; Lufthansa has announced aircrafts decommissions and schedule cuts for its regional carriers and subsidiaries such as Germanwings, Austrian and Brussels airlines.

As anticipated in the article summary, we expect the recovery process to happen in phases. The length and timing of each phase across airports will vary, influenced by national and international regulations, passenger behavior, and airports' ability to react.

In the following paragraphs we give our perspective on how to best approach such a phased return to "normality".

PHASE 0:

Lower peak and lower annual passenger numbers

Timing

The current average reduction in flight volume of 90% compared to last year leaves no doubt that the total passenger number in 2020 will be far lower than in 2019. Similarly, severely trimmed schedules have eased the operational pressure on the traditional flying peak times. Although lockdown restrictions will be slowly and gradually lifted in the time horizon of this phase, it is fair to assume that air transport will still face a high degree of uncertainty: lacking confidence among passengers, and a drastically changed flight demand and supply, hampering the possibility of an immediate traffic rebound.

Operational implications

Whereas the direct relationship between traffic and infrastructure capacity may be of little concern (fitting 10-15 daily departures when used to fit 200 should not pose capacity challenges), in this phase the major challenges for airport operations planning will be due to:

- Introduction of new physical distancing and cleaning measures
- High traffic volatility
- Reduction of OPEX and CAPEX (in order to minimize financial losses)

Recommended focus points

The response to these challenges should be focused and balanced. Ensuring business continuity and adapting processes to minimize costs should be the main priorities. However, carrying out the right activities in phase 0 can ease operations once traffic volumes increase in later phases.

Hence, we recommend focusing on:

- Regaining passenger confidence by implementing measures to ensure safe separation (e.g. every second check-in desk in use) and high hygiene standards without incurring in high costs (e.g. more frequent cleaning, higher adoption of touchless where already available)
- Extracting more value from data: where possible, collect and analyze data to understand present and predict future load factors, presentation profiles, passenger journeys across the terminal
- Rethinking processes and adapting planning: e.g. adjusting service levels, shortening the planning horizon (to increase accuracy and staff at the right times and places), updating processing times at major checkpoints

- Collaborating with stakeholders to survive the impact of the crisis: COVID-19 is a chance for airports to encourage airlines, handling agents, and other airport stakeholders to move away from legacy habits. Collaboration could come in the form of increased data transparency across the value chain, willingness to staff more flexibly, or redefinition of infrastructure allocation rules. If it has been tried before without success, the current crisis offers a second chance to join forces.
- Updating existing contingency and continuity plans to face the new reality, but also creating new contingency plans to cover any new challenges. Contingencies should have already been implemented and the primary focus should be in the continuity and recovery plans. In a similar way to this article, continuity and recovery plans should unfold the different phases airports will undergo until recovery.

PHASE 1:

Unchanged peak level and lower annual passenger numbers

Timing

Peak passenger numbers are going to increase faster than the annual numbers, potentially returning to the pre-COVID-19 levels already by the end of 2020. This is a consequence of the typical demand dynamics in the industry (and a reality in most non-slot constrained airports): once air traffic ramps up, airlines, dictated by passenger demand, will target the most profitable time slots, leading to a return of pre-COVID-19 peak levels.

Operational implications

As this dynamic unfolds, airports will transition into phase 1, where passengers are acquainted and at ease with the “new way of flying”, while airports and airlines are still financially challenged. Consequently, challenges of phase 0 mix with new ones:

- Highly unbalanced workforce demand across the day
- Reduced infrastructure capacity due to physical distancing measures

Recommended focus points

The efforts started in phase 0 need to be expanded to:

- Increase flexibility, precision and efficiency of staffing. Moving from fixed rosters to variable ones, increasing flex time allowances, and updating overtime policies will make airports agile enough to meet changes in demand while maintaining reduced yearly budgets. Data analytics and planning software can improve the precision of staffing and minimize over/under staffing. Finally, repetitive tasks of low value-add should be automated where possible to increase efficiency (e.g. in the context of planning, for example, these may include forecast generation, resource allocation and staffing, all of which can be greatly sped-up by dedicated software on the market)
- Assess the impact of physical distancing on capacity and optimize around it: from an infrastructural point of view, it is important to quickly identify potential capacity pinch points. Previous capacity declarations might need to be reviewed as physical distancing measures will decrease the airport's total capacity. Optimized processes can improve the airport capacity and therefore balance its impact. For instance, a slot constrained airport needs to make sure all its slots are still valid, and it can guarantee all of them without causing major operational disruption in the terminal operation.

- Manage and contain airlines expectations: to avoid peaks increasing, airports will need to manage airline expectations to fly in the desired times. If possible, a pricing structure and a slot restriction during most demanding times can help avoid a capacity breach and will allow a more effective use of available resources. Similarly, in the context of physical distancing, larger use of common-use check-in (several airlines in the same check-in area) and online check-in are two examples of practices that should be pushed, as they come with potential benefits for all stakeholders. They require less staff, hence lower costs. They are faster and reduce the number of passengers on the floor, thereby allowing better utilization of queue areas and easing the correct adoption of physical distancing measures. This is particularly true of times like this, where schedules and passengers are greatly reduced. Eventually, airports successful in containing airlines' demands for peak slots will skip phase 2.

**Real winners are airports
that can balance the
demand curve across the
day of operation, avoiding
higher peaks until the
airport annual numbers
recover**



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PHASE 2:

Higher peak levels and slightly lower annual passenger numbers

Timing

As we illustrate in the matrix, it is possible that in phase 2 both annual and peak passenger numbers return to “normal”.

However, as we look further ahead, more factors come into predicting the evolution of flight traffic: an eroded competitive landscape for airlines, delayed pick-up of tourism sector, changed and reduced business travel habits are some possible developments that would lead to a continuation of the market dynamic described in phase 1.

In such a scenario, the passenger volume in peak could grow higher than pre-COVID-19 level before total passengers match their pre-crisis number: because more challenging than the “return to normality” abovementioned, this is the phase 2 scenario we will refer to when describing operational implication and recommended focus points.

Operational implications

The operational implications from the previous phase become even more challenging, as airports need to handle even larger amounts of passengers during peak times, while dealing with a continuation of COVID-19 inherited safety measures.

Recommended focus points

Taking for granted that long implementation times and suffering budgets leave little room for CAPEX projects of infrastructure expansion, key focus points in this phase are:

- Continuous improvement of processes and planning introduced in phase 1 (e.g. more accurate forecasts of traffic and passenger journeys based on larger data samples and/or more advanced software, more precise staff planning based on the experience previously acquired, correction to identified process flaws)
- Introduction of low/medium cost technology to minimize time spent in the airport and maximize safety (e.g. luggage pick-up from the airport to hotel to avoid check-in, touch-free kiosks, new bag tag concepts, walk-through security checkpoints, e-gate boarding processes)

However, real winners are airports that, thanks to a clever understanding of the airport capacity and a careful containment of airlines' requests (started in phase 1), can balance the demand curve across the day of operation, avoiding higher peaks until the airport annual numbers recover.

PHASE 3:

Higher peak levels & unchanged annual passenger numbers

Timing and operational implications

Once in phase 3, airports can claim to have survived the worst of the crisis.

Recommended focus points

As financial statements stabilize, airports approach the right time to rethink their medium to long-term strategy. This should include a review of the changes introduced because of COVID-19, so that the positive ones can be kept and improved further. This crisis can be the catalyst to rethinking and improving processes, and it would be a waste to return to old bad habits.

Hence, the focus of phase 3 should be on:

- Developing a new medium/long-term strategy accounting for industry outlook, regulations, airport financial situation and desired service level. Airport management will need to review and agree on the latter ones based on the new status-quo. Having an easy, flexible way to link Service Level Agreements with budgets will support business decisions and support the airport as everything moves forward to the new reality.
- Sustaining the changes introduced during the crisis and making them “the new normal”.

PHASE 4:

Higher peak level & higher annual passenger numbers

Timing

A best-case, but today unlikely, scenario, is one where airports achieve unchanged annual passenger numbers by 2022 and higher from 2023 onwards. Realistically, based on current industry outlooks, it could take 2-4 years before we start seeing similar annual passenger numbers compared to pre-COVID-19.

Operational implications

Phase 4 is the time horizon on which to project the airport vision, the state airports aim for. Some of the challenges arisen in the previous phases might survive, but so will the learnings and improvements, which by then will hopefully have strengthened the airports and the industry as a whole.

Recommended focus points

To maintain the newly acquired strengths and avoid repeating what, in hindsight, will look like mistakes, airports will need to update and enhance their business continuity and contingency plans. Business recovery and continuity plans in an airport can vary from loss of infrastructure, to loss of staff, to loss of systems. These plans are usually forgotten over time if they are not exercised regularly or a major event does not impact the airport. A pandemic response plan is a prime example of this. The last time airports had to deal with a pandemic was in 2014 due to the Ebola outbreak and this only impacted a few airports globally. Once the worst of COVID-19 is past, airports should make treasure of the lessons learnt by incorporating them in their plans and putting into place process that ensure a regular review of such plans.

CONCLUSION

Focus efforts according to specific operational challenges hitting the airport and resource availability

Assessing when each challenge will be most intense is not an exact science, but it can provide guidance on how to focus, prioritize and time airport interventions so that the right resources are spent at the right time in the right area. Similarly, the timing of focus points should be interpreted fluidly: some, such as the introduction of new technology, are greatly welcomed already in phase 0, but require a balance between compliance with regulations and budget availability.

This article is part of a series on the challenges of COVID-19 for airport operations planning, and on how to best handle these challenges. Our focus is both short-term and long-term when we refer to the post-COVID-19 situation.

In this article we touch upon several challenges and recommendations that are treated in greater detail elsewhere in this series. If you want to know more on forecasting and data, please check article 1 “Challenge 1: High variance in flight schedules and load factors”. For more insights on how to cope with physical distancing and cleaning measures, have a look at article 3 “Challenge 3: Physical distancing” and article 4 “Challenge 4: Cleaning and personal protective equipment”.

Challenge 3:

Physical distancing

CONTENTS

The reader	51
Article summary	52
Physical distancing: operational implications	54
Incorporating physical distancing in airport operations.....	61
Recommendation 1	61
Recommendation 2.....	62
Recommendation 3.....	63
Recommendation 4	63
Recommendation 5.....	63
Recommendation 6	64
Recommendation 7.....	65
Conclusion	67

THIS ARTICLE IS AIMED AT READERS WHO ARE LOOKING FOR

- A status on the physical distancing requirements for airports
- An assessment of the implications of physical distancing across airport operational areas
- A guide on how to best plan airport operations in the time of physical distancing

ONE-MINUTE SUMMARY

Physical distancing has proven effective in limiting the spread of COVID-19. For airports, this means operational plans must allow for physical distancing.

Implications of physical distancing on airport operations

Lower utilization of infrastructure

Passenger safety compliance

More demanding communication management

Changed processes and increased processing time

Assurance of employees' safety

In this article, we outline our recommendations to handle the impact of physical distancing:

Planning airport operations in the time of physical distancing measures

1. Understand and predict passenger flows
2. Assess exposure risk and evaluate segmenting passengers and operational areas accordingly
3. Incorporate new flows and processes in your plans
4. Support your suggestions with data to ensure buy-in
5. Make use of state-of-art technology
6. Incorporate physical distancing in your metrics
7. Accommodate physical distancing for staff



COPENHAGEN
OPTIMIZATION

The **real challenge** is to
ensure physical distancing
“tomorrow”, as the search
for extra space intensifies
into a costly affair

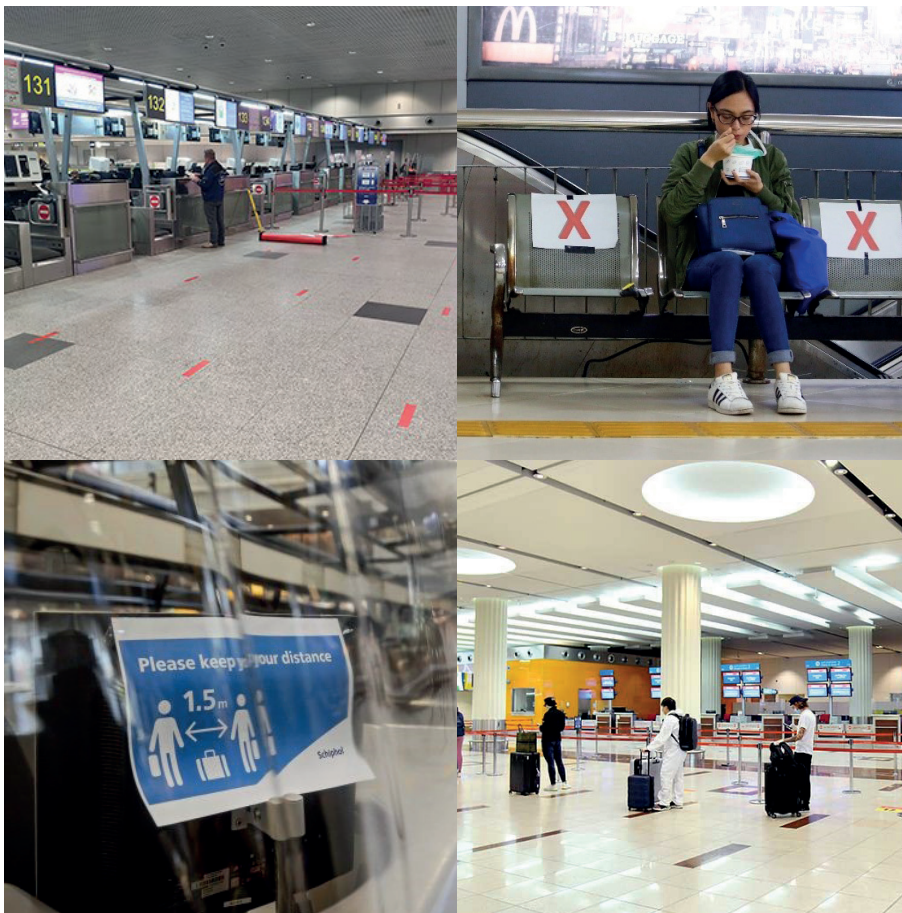
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Physical distancing: already a reality in airport operations

EU Transport Commissioner Adina Valean announced on Apr 22 that “the European Commission will next month [May 2020] present a set of rules for the safe reopening of air travel when coronavirus lockdowns end, including physical distancing in airports and planes”.

Similar statements have already been made by agencies, airports and airlines from all parts of the world. Measures put in place to minimize the risk of infections and satisfy new and evolving safety regulations include:

- Floor markings and other audio-visual channels
- Reshuffled seating arrangements
- Plexiglas separators
- One to two meters distance between passengers



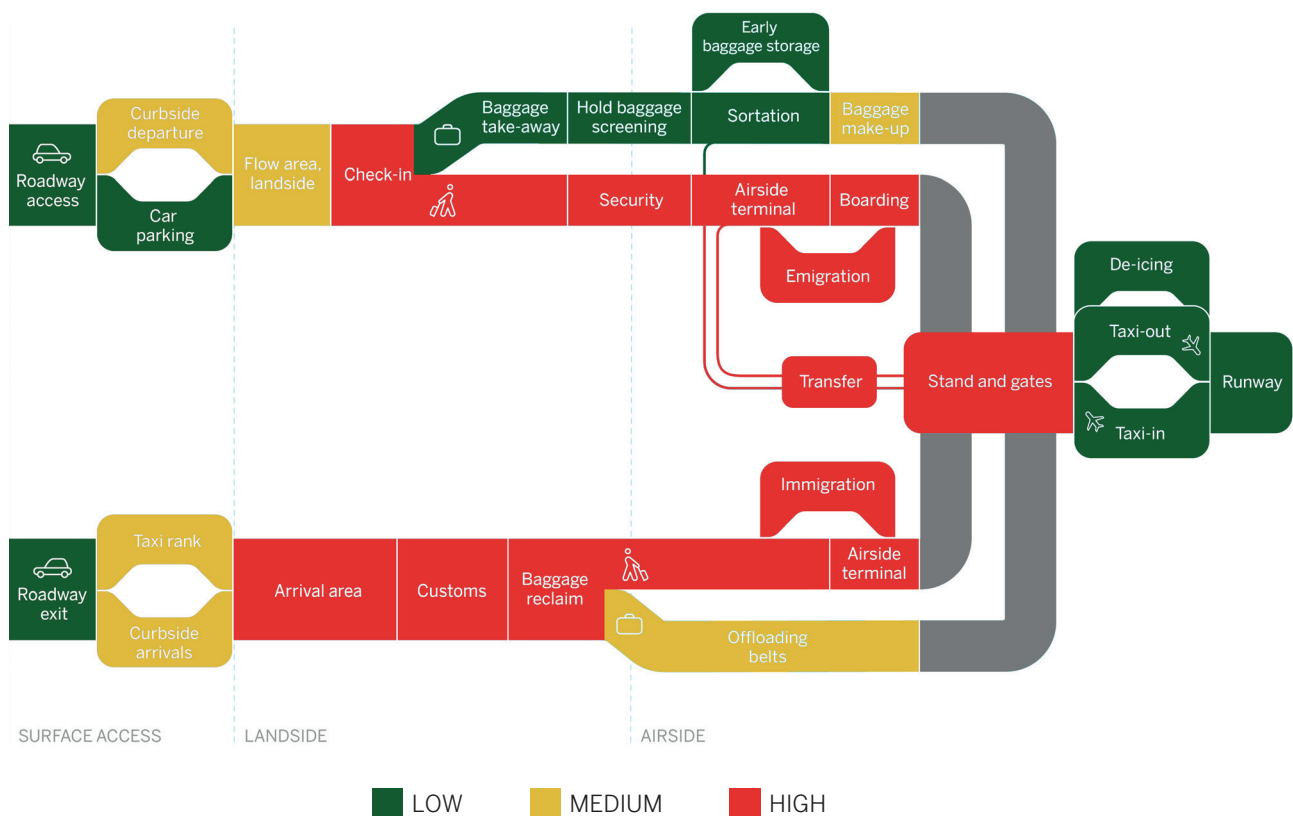
From top-left to bottom-right: DME, Moscow; CGK, Jakarta; AMS, Amsterdam; DXB, Dubai

The term “evolving” is pivotal in understanding the magnitude of the implications on operations and prepare accordingly. As the world learns to cope with the virus, as the aviation industry gradually picks-up, and as the regulatory landscape adapts, so should airports. The real challenge is not to ensure physical distancing today, in semi-deserted airports, but “tomorrow”, as the search for extra space intensifies into a costly affair.

Implications of physical distancing on airport operations

Using the horseshoe diagram introduced in article 2, it is possible to carry out a general assessment of the impact of physical distancing on each operational area based on the density of passengers and staff in the area (we are aware that specific implications will vary from airport to airport depending on local regulations and traffic).

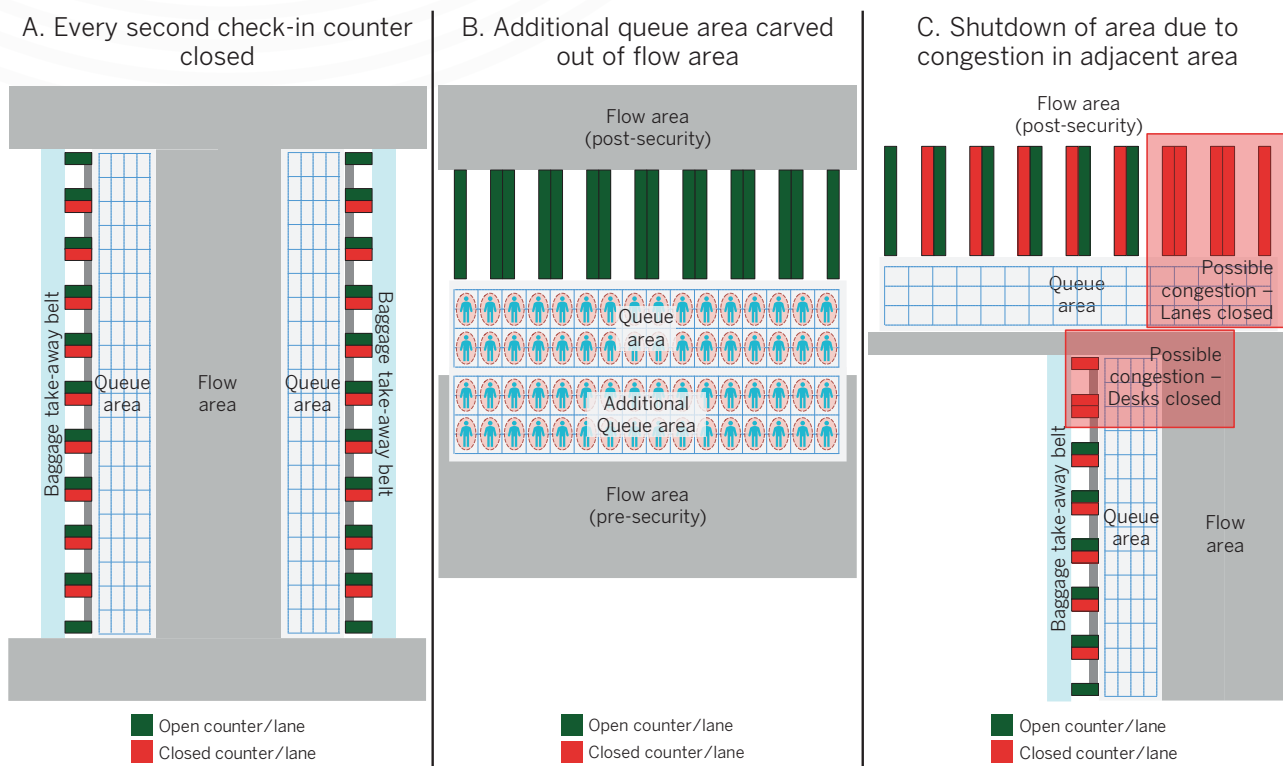
Impact of physical distancing across operational areas



Although the specific measures may vary across operational areas, all airports will generally have to learn to cope with the following implications:

Lower utilization of infrastructure

If one passenger is required to occupy the space that used to be occupied by several passengers, infrastructure utilization inevitably drops. Put in different terms, physical distancing significantly lowers the capacity of terminal areas. Planners will be required to assess capacity on an ongoing basis, as regulations change and terminals populate again. In the following picture we illustrate three cases of how physical distancing will reduce infrastructure capacity.



Passenger safety compliance

Passengers and authorities will expect the airports to be compliant with physical distancing regulations. This will increase the workload necessary for reporting and monitoring activities.

More demanding communication management

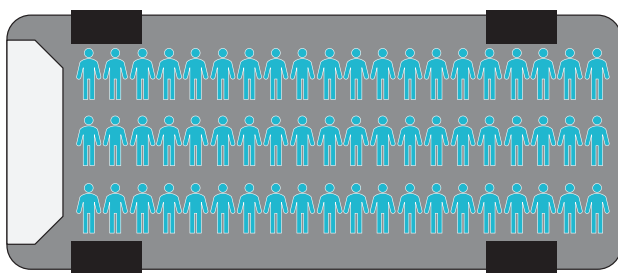
Physical distancing requires clear communication to passengers: posters, leaflets, speaker announcements, floor markings, separators and more. All these audio, visual, physical channels and tools require staff for creation, installation, and maintenance. And, as with any other tasks, staff will need to be planned accordingly. Similarly, staff will also be required to enforce physical distancing measures (i.e. terminal managers on the floor).

Changed processes and increased processing times

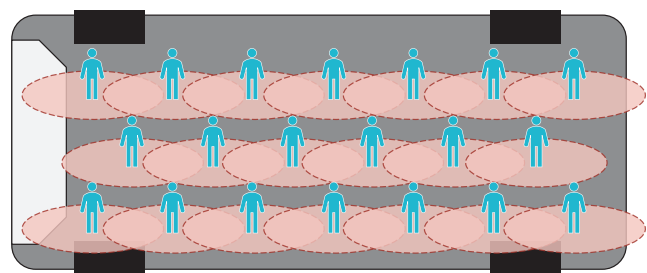
Passenger-intensive processes will change to accommodate the new safety measures, for instance:

- Check-in desks, security lanes, reclaim belts will be allocated to allow increased distances between passengers (e.g. every second asset is utilized, larger queue areas, new flow areas)
- Queue layouts will be adapted to limit the number of neighboring passengers in line
- Boarding and bussing time per passenger will become slower as a result of crowd avoidance in gate holdrooms and buses (in the picture we show half-full bussing activities, but the same will be true of occupancy in gate holdrooms prior to boarding)

Bussing without physical distancing



Bussing with physical distancing



Assurance of employees' safety

Given the daily exposure to hundreds of passengers and colleagues, ensuring the safety of employees is vital. Staff, like passengers, will be subject to measures that ensure distance is kept and/or exposure within the staff is limited (e.g. by grouping staff members).

Understanding and predicting where passengers will be is essential in order to plan and execute physical distancing measures efficiently and effectively

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OPTIMIZATION

Incorporating physical distancing measures into planning airport operations

Physical distancing will challenge airport operations. If handled correctly, though, it might be a chance to welcome new, favorable industry practices and speed-up the penetration of advanced analytics and technologies.

Recommendation 1: Understand and predict passenger flows

It is a better time than ever to put your analytics capability at the service of passenger flow forecasting. Understanding and predicting where passengers were, are, and will be is essential in order to plan and execute physical distancing measures efficiently and effectively. Taking the check-in area as example, a good prediction of show-up profiles enables the airport operator to:

- allocate desks so that passengers are kept distant enough from each other and from other flights
- plan queues and overflows according to physical distancing rules and without bottlenecks
- invest time and resources on deployment of physical distancing measures (e.g. floor staff, visual aids) only when and where really needed
- maximize the usefulness of such measures by deploying them when and where passengers can be affected by them

The same can be done for security lanes, border desks, baggage belts as long as reliable show-up profiles are available. To create such profiles, reliable input data is required. Depending on analytics and technology maturity, this data can be:

- **Manual:** observations or surveys (i.e. “when are passengers showing-up at a processing point?”)
- **Automated:** baggage check-in scans (for show-up at check-in), boarding card scans (for show-up at security), passenger detection systems (i.e. cameras)

For more recommendations on how to forecast in these times of high traffic volatility, take a look at the first article in this series “Challenge 1: High variance in flight schedules and load factors.”

Recommendation 2: Assess exposure risk and evaluate segmenting passengers and operational areas accordingly

Just as with forecasting and planning, risk management needs to become flexible and iterative. Regularly assess the risk profile of passengers and operational areas, and investigate actions to lower risks accordingly.



Assess risk profiles

Expected people density/occupancy

This can be influenced by e.g. queue layout, behavior of passengers in the terminal

Airport layout and operational areas

As we illustrated in the horseshoe, some operational areas are more affected than others; similarly, parts of an area might present more physical limitations in ensuring physical distancing

Origin airport/Country

As countries are hit by the pandemic at different times, some may present higher risks of hosting infected passengers



Investigate mitigating actions

Can a layout that minimizes passengers' proximity to each other be implemented?

E.g. linear queues put passengers in the proximity radius of fewer other passengers than serpentine

Can I positively influence passenger behavior/flow?

E.g. adapt flow to/from toilets to minimize interactions; shut down terminal areas with physical constraints; prevent queue stretches into flow area

Can high risk passengers be channeled into ad-hoc parts of the terminal?

e.g. different border controls for passengers from high risk countries

Recommendation 3: Incorporate new flows and processes in your plans

Ensure the outcomes of the first two recommendations are accounted for in your planning: increasing times to process passengers (if fewer counters/lanes are used), unavailability of terminal areas (e.g. check-in desks, entrance, security lanes), adjusted passenger show-up profiles and more. In doing so, get the most out of your available planning tools or consider switching to some that allow for frequent, dynamic planning with these key input parameters.

If you are interested in reading about how LHR is planning for physical distancing in check-in in their current operation in Terminal 2, please check our case study “Physical distancing at London Heathrow Check-in”.

Recommendation 4: Support your suggestions with data to ensure buy-in

Once again, we highlight the importance of having a strong quantitative foundation in order to get buy-in from stakeholders. Sticking to the check-in allocation as example, creating an optimized counter opening plan based on an analysis of passenger show-up profiles (e.g. based on bag scans or data from passenger tracking solutions) combined with current load factors can be a solid starting point to argue why an airline could do with fewer desks, or why airlines from the same alliance should adopt common-use check-in.

Recommendation 5: Make use of state-of-the-art technology

Technology can provide a great deal of help. Passenger flow measurement systems are even more valuable today thanks to their functions to measure queues, flow density, and passenger counts in zones. This in turn allows the airport

operator to monitor and sustain adoption of physical distancing measures.

Similarly, newer planning software is flexible and allows you to update parameters easily, so that you can test several scenarios and get the best overall results.

These systems are more important than ever, and their use and implementation (where not already available) should be prioritized within budgets.

Recommendation 6: Incorporate physical distancing in your metrics

Airports' performance in achieving physical distancing will be as relevant as security. Consider planning and implementing physical distancing metrics in order to: boost passenger and staff confidence, provide safety evidence to authorities, increase preparedness to future pandemic threats. These metrics will be a mix of new ones and adaptations of traditional ones and will fall under two categories: safe separation and exposure risk metrics. Below we present a few examples:

Safe Separation metrics



- Square meters per pax in a given area
- Queue overspill into a flow area
- Passengers per security lane
- Passenger occupancy per queue area

Exposure Risk metrics



- Risk level of origin airport/country
- Risk level of utilized queue layouts
- Risk level of specific flow through terminal

It is worth stressing that such metrics are proxies of the actual safety and risks experienced by passengers. For instance, the occupancy of an area might be within the desired metric, but the individuals in that area might be squeezed in an angle, hence not far apart from each other. Therefore, metrics need to be supported by floor staff that can ensure compliances with measures.

Recommendation 7: Accommodate physical distancing of staff

As briefly stated above, staff is highly exposed to passengers. This poses higher risks to themselves and others. To accommodate the need for physical distancing of staff we see two levers: digitalization and planning.

The first is about introducing technology (where not yet available) to facilitate no-touch operations instead of manual, for example passport scanning at check-in (rather than visual inspection) or e-gates (to avoid touching tickets).

The second revolves around the introduction of a practice to minimize exposure among staff members: smaller and more stable teams, different break rooms, and different toilets for different teams.

Implementation of thorough cleaning practices and personal protection equipment will boost safety of staff. This will be the focus of the fourth article in this series “Challenge 4: Cleaning and personal protective equipment”.



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OPTIMIZATION

**Do not let
physical distancing (SD)
dictate airport operations,
but plan operations WITH
physical distancing**

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CONCLUSION

Embed physical distancing in your planning cycle

Do not let physical distancing (PD) dictate airport operations, but plan operations WITH physical distancing by leveraging relevant data analytics, risk management and technology, and embedding them in the planning cycle.



This article is part of a series on the challenges of COVID-19 for airport operations planning, and on how to best handle these challenges. Our focus is both short-term and long-term when we refer to the post-COVID-19 situation.

READING MATERIAL MENTIONED IN THIS ARTICLE

Case study: Physical distancing at London Heathrow
Check-in, Copenhagen Optimization

Challenge 4:

Cleaning and personal protective equipment

CONTENTS

The reader	71
Article summary	72
A way back to the sky through higher hygiene standards	74
Welcoming hygiene activities as critical airport operations	79
Recommendation 1	79
Recommendation 2	80
Recommendation 3	81
Recommendation 4	82
Recommendation 5	83
Recommendation 6	83
Conclusion	86

THIS ARTICLE IS AIMED AT READERS WHO ARE LOOKING FOR

- An understanding of today's relevance of cleaning and personal protective equipment in airports
- An assessment of the impact on operations of enhanced hygiene measures
- Recommendations for optimizing hygiene-related processes

ONE-MINUTE SUMMARY

Traditionally, cleaning in airports is a “hygiene factor”. Today, cleaning is becoming pivotal in fighting the spread of COVID-19. The implementation of enhanced cleaning measures and personal protective equipment brings along challenges to airport operations and the airport operations planning: the higher the occupancy and flow of people (passengers and staff) in an area, the higher the requirement to maintain high hygiene standards.

Such requirements will have implications across the airport operational areas. After assessing the degree of these implications, we present our key recommendations to cope with them: on the one hand, we explain how to improve the planning of hygiene measures; on the other, we outline how to minimize the need for cleaning (e.g. through touchless, automated and advanced technology), and thereby reduce the impact on operations.

Last, we argue how highly sanitized airports can lead the way to regaining passenger trust and traffic recovery

Major implications on operations	Key recommendations for planners
Lower operational efficiency (lower infrastructure utilization & higher staff demand)	1. Optimize cleaning plan through passenger data and metrics
Reduced staff productivity	2. Tailor equipment and processes to the local context
	3. Update planning input parameters
	4. Amplify impact of hygiene measures by communicating about them
	5. Consider staff training
	6. Minimize the need for cleaning



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OPTIMIZATION

In the “**new world**” hygiene
is set to become a **critical
minimum** criterion, with
large impact on operations

A way back to the sky through higher hygiene standards

Scientists around the world are working hard to find a vaccine for COVID-19, meanwhile governments and regulators are adapting rules and regulations to ensure business continuity. The air transport industry is no exception and it has been one of the most affected. SARS-CoV-2, the virus responsible for the COVID-19, is a respiratory virus. Its main transmission method is via respiratory droplets spread from an infected host. These droplets can live outside of your body on many surfaces for some time. If another individual gets in contact with it, there is a chance he or she will also be infected by COVID-19. Already in March, WHO's "Operational considerations for managing COVID-19 cases or outbreak in aviation" put emphasis on hygiene, sanitation and cleaning. It is more important than ever, that highly transited areas such as airports are cleaned and disinfected regularly, and that staff and passengers follow basic personal hygiene measures (hand-wash) and are equipped with appropriate personal protective equipment (PPE).

Today, airports are cleaned daily, mostly during low peak operations or nighttime, made exception for areas like toilets, which are cleaned more frequently. Besides compliance with local hygiene regulations, the cleaning processes have traditionally been driven by the desire to improve passenger satisfaction: basically, a nice-to-have. In the "new world" hygiene is set to become a critical minimum criterion, with large impact on operations.

Cleaning and PPE – a potential threat to efficiency

The higher the people occupancy and flow (of passengers and staff), the higher the risk of spreading the virus, hence the higher the impact on operations of implementing and maintaining such high hygiene standards.

Similarly, with masks and other PPE likely to become mandatory in public spaces, airports and airlines will need to be equipped with supplies for passengers who arrive at the airport without. Proactive communication measures will be put in place to best prepare passengers for the airport journey (emails, mobile notifications). On the day of operation, regular reminders using public-announcement systems and continuous staff vigilance will be required.

The increased requirements for cleaning and PPE described above will bring along several implications for airport operations, which fall into two categories:

Lower operational efficiency

More frequent cleaning lowers the utilization of infrastructure: an area being cleaned is most likely unavailable for operation (e.g. if the floor in front of check-in desks is being cleaned, check-in procedures cannot be performed), resulting in a reduction of capacity, even if temporary.

At the same time, the need for more frequent and thorough cleaning increases the demand for staff for such activity, potentially taking away time from other activities the same

staff is required to perform or limiting other staff to perform their own activities (e.g. cleaning a security lane while security staff is deployed on that lane would reduce the actual time spent on security operations).

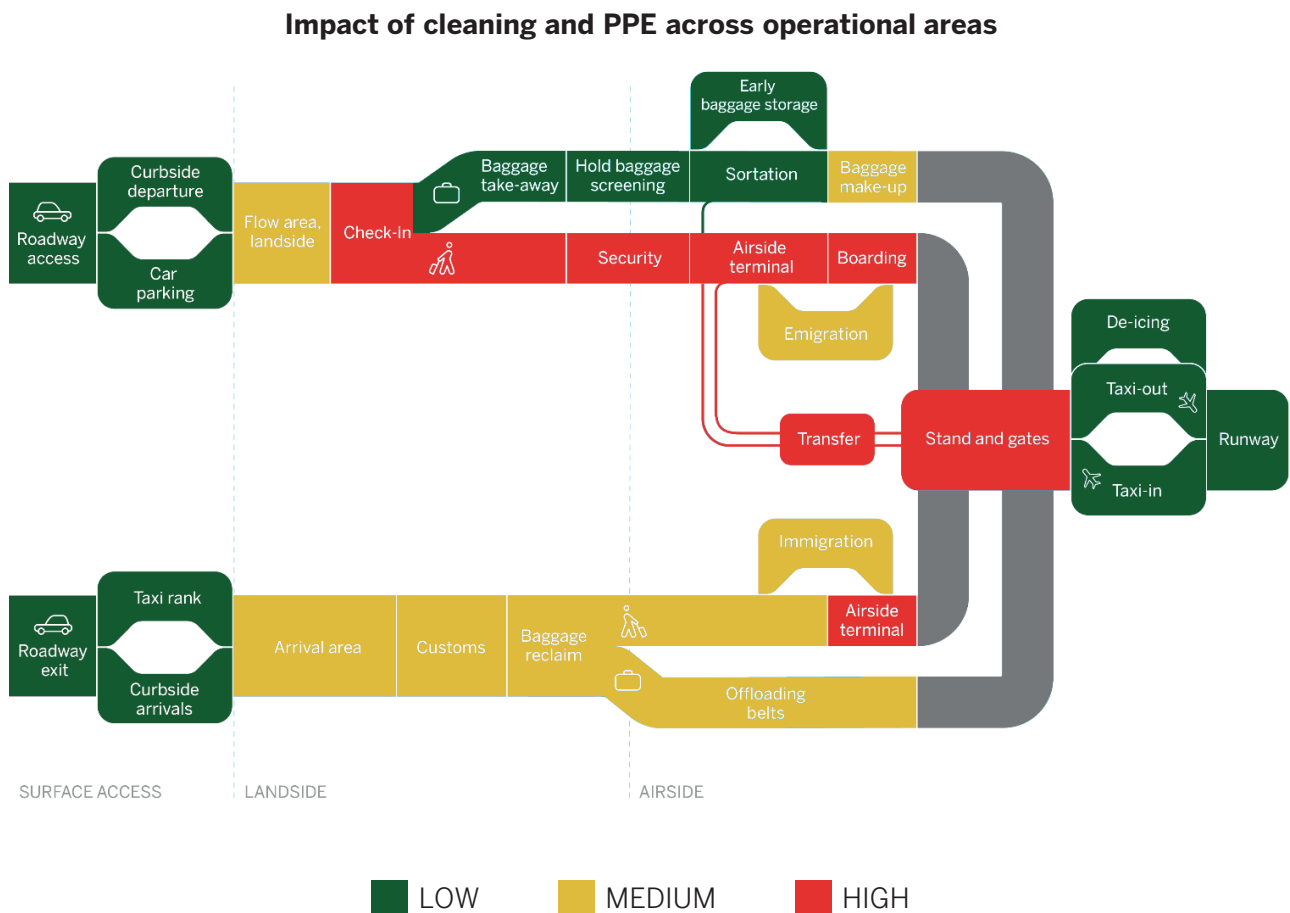
Reduced staff productivity and effectiveness

Staff will be required to adopt new measures to ensure their own safety:

- Separation of staff teams
- Utilization of different breakrooms or reduced capacity in breakrooms
- Ad-hoc training on how to use PPE
- Changes of PPE during shift
- Communication challenges while using masks

These measures take time away from operations, hence potentially reducing productivity. Obviously, it should not be disregarded that higher hygiene can save staff from getting infected and having to take sick-days. However, it is likely that overall productivity will be lower prior to COVID-19.

As previously done for physical distancing, we illustrate the degree of such impacts across operational areas using the horseshoe diagram:



Below we breakdown our impact assessment in the two previously identified categories and outline the key drivers of such impact across the highly impacted areas:

Operational Area	Lower operational efficiency	Reduced staff productivity
Check-in	Higher unavailability of capacity due to cleaning (floors, desks) Higher demand for cleaning staff	Harder communication due to PPE (e.g. Plexiglas barriers, masks) with potential increase to processing times Acquaintance with new hygiene measures
Security	Higher unavailability of capacity due to cleaning Higher demand for cleaning staff Sanitization of trays Adapted/longer hand baggage inspection processes	Change in process with less interaction with passengers could increase processing times Unproductive time while changing PPE
Airside terminal	Higher demand for cleaning staff Increased cleaning of shops and restaurants.	Sanitization of PPE during shift Harder communication due to PPE
Stand&Gate	Higher demand for cleaning staff Longer turnaround time of aircraft caused by increased aircraft cleaning times	
Border Control	Increased process time per passenger due to the use of PPE More challenging communication and removal of PPE for passenger ID	Harder communication due to PPE Sanitization of PPE during shift

Welcoming hygiene activities as critical airport operations

The COVID-19 pandemic is elevating the criticality of hygiene; hence it should be planned as any other critical operational areas.

Recommendation 1: Optimize cleaning plans through passenger data and metrics

An optimized plan is one that considers demand and supply patterns. For example, an optimal security lane opening plan should match the deployment of lanes and staff with the passenger presentation profile at security across the day, so that resources are allocated when necessary.

Similarly, for cleaning the aim should be to minimize the downtime of infrastructure and the disruption of passenger experience, for example:

- Scheduling cleaning of terminal facilities in periods where traffic is low (but set a lower bound such as “clean after every X passengers have passed”)
- Organizing cleaning of check-in surfaces according to check-in plans (i.e. cleaning rows when no check-in procedures are being carried out)
- Complementing cleaning and physical distancing measures: if physical distancing requires some infrastructure to stay unused to allow separation between passengers, alternate the unused infrastructure to allow for cleaning during downtime

Traditional passenger hygiene satisfaction tracking is reactive or based on outdated fixed plans: it relies on passenger feedback once they have used the facilities (e.g. after several negative comments on toilet's cleanliness status, an alert is triggered and staff is sent for cleaning). By then passenger experience and, potentially, health, is already compromised. As part of the data collection activities, consider monitoring the flow of passengers through toilets and other infrastructure across the day. Then implement metrics to define the ratio between cleaning and passengers (e.g. clean the toilets every 100 passenger visits). This secures a proactive approach that supports plan optimization and improves passenger experience.

This example can be extended to all areas of operation ensuring hygiene is maintained across the airport. The metrics can be adapted to each operational area, but all of them can be summarized in one: "Passengers processed since last cleaning".

Recommendation 2: Tailor equipment and processes to the local context

"How often does the search area need to be cleaned? Do trays need disinfection after each use? Do passengers have to use disposable PPE so that less frequent cleaning is needed?"

One-size does not fit-all: each airport will need to assess the equipment and processes better suited to meet local legislation, strategic goals (e.g. experience vs. cost), staff and technology readiness, which may well differ across countries and airports.

Sticking to the abovementioned security-focused questions, several approaches should be assessed:

- Investing in disinfection equipment for trays: each tray will be disinfected after use, but the technology needs to fit with the current tray return process, and it will require a higher initial investment
- Manual disinfection of trays and surfaces after each use: this implies higher processing times or an increase of staff at the security checkpoints to perform the disinfection
- Utilizing disposable PPE equipment for passengers before entering the search hall area: this will reduce the need of cleaning trays and surfaces, but will require higher investment on disposable PPE

What approach caters to your airport?

Recommendation 3: Update planning input parameters

Use monitoring and data to assess if the planning input parameters of critical checkpoints (e.g. security, check-in, border) are influenced by newly introduced PPE and cleaning processes. If so, update them in your planning tools accordingly.

Examples of input parameters that potentially need updates are:

- Higher processing times per passenger at security due to regular change of gloves/masks for staff and increased communication barriers
- Slower check-in procedures due to difficulty of communication caused by masks and Plexiglas barriers at desks

- Longer aircraft turnaround times due to longer cleaning times
- Increased border processing time due to use of PPE and cleaning of automatic checkpoints after use
- Different share of passengers using complementary airport resources due to potential virus-spread hazards (e.g. split between self-service kiosk vs. desks at check-in, border e-gates vs. manned, etc.)

Recommendation 4: Amplify impact of hygiene measures by communicating about them

We have mentioned hygiene's traditional double purpose in airports: compliance with norms and passenger experience improvement. In the wake of COVID-19, these purposes should be on top of airports' agenda. Today the need to regain passengers' (and staff's) trust in going through crowded spaces such as airports adds relevance to the latter.

In this context, communication becomes a tool to both enforce cleaning measures and advertise about them:

- Collaborate and be transparent with airlines around cleaning and PPE measures put into place, and potentially discuss how to communicate about them to passengers in order to increase passenger trust and ultimately gain mutual benefits from the resulting increased traffic
- Communicate cleaning status and plans to passengers via visual and audio aids (e.g. announcements) to guide passengers towards already clean areas and avoid disruption to cleaning process (e.g. if a terminal area is being cleaned, ensure this is communicated to passengers)

- “Advertise” the additional hygiene measures put into place to strengthen sense of trust in the airport from both passengers and staff. As mentioned earlier, the use of metrics will support tracking the airport’s cleanliness performance

Recommendation 5: Consider staff training

To comply with new rules and regulation, staff may need to refresh their training before they work in the operation again. Furthermore, to reinforce passenger trust, staff need to be able to answer any questions passengers might have about the newly introduced safety measures.

As the airport operation is at its lowest traffic numbers, it is the perfect opportunity to prepare and distribute staff training so they are ready when the number of flight operations rise.

Recommendation 6: Minimize the need for cleaning

Last but not least, reduce the need for cleaning and PPE to a minimum by looking into the passenger journey and identifying ways to reduce physical contact and time spent at the airport through:

- Touch-free technologies: check-in from home, mobile check-in, touch-free self-service kiosks, touch-free passport scanning are examples of existing (and often available) technologies that minimize contact and time spent at the airport by passengers and staff.

- Automated sanitization technologies: disinfection channels, antimicrobial coating and autonomous cleaning robots are some of the newest technologies being introduced to improve disinfection capabilities while minimizing the need for cleaning staff. For instance, a chamber, with similar size of a body scanner, where a person is disinfected and sanitized in 40 seconds is being trialed in Hong Kong airport
- Advanced planning software: as for other critical operations, it is now worth considering using advanced planning software, already on the market, to optimize cleaning plans as you would do with security or check-in, two other infrastructure- and workforce-intensive processes where moving from simple Excel calculations to specialized software can bring efficiency improvement of up to 50%
- Lean cleaning processes: for example, by introducing more efficient cleaning patterns, by assessing areas in terms of cleaning frequency and thoroughness need
- Temporary shutdowns: consider consolidating traffic into fewer terminals, which, among many others, has the benefit of reducing utilized space and hence cleaning needs. This should be balanced to the need of increase demand of infrastructure to successfully implement physical distancing measures.

Planners should **think**
of how to do it “**better**”
and “**smarter**”



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CONCLUSION

Consider planning of hygiene measures critical, but do it better and smarter

Going forward we expect hygiene to hold a much higher up place in the relevance hierarchy of operations planning. Because its impact can be easily spotted by passengers, it will likely have a central role in restoring trust in air travel and thereby fueling traffic recovery. For airport operations, this means an increase in focus and efforts spent on planning and maintenance of such hygiene measures. Therefore, planners should think of how to do it “better” and “smarter”.



This article is part of a series on the challenges of COVID-19 for airport operations planning, and on how to best handle these challenges. Our focus is both short-term and long-term when we refer to the post-COVID-19 situation.

READING MATERIAL MENTIONED IN THIS ARTICLE

<https://www.airport-technology.com/news/hong-kong-airport-disinfection-technologies/>

<https://apps.who.int/iris/bitstream/handle/10665/331488/WHO-2019-nCoV-Aviation-2020.1-eng.pdf>

Challenge 5: COVID-19 measures

CONTENTS

The reader	91
Article summary	92
New times, new measures	94
How to implement COVID-19 measures	102
Recommendation 1	102
Recommendation 2	104
Recommendation 3	106
Recommendation 4	107
Conclusion	109

THIS ARTICLE IS AIMED AT READERS WHO ARE LOOKING FOR

- A breakdown of the upcoming COVID-19 related measures aimed at identifying and isolating passengers unfit for flying
- A structured assessment of the operational areas best suited to host such measures
- An outline of the key considerations to make when implementing the measures

ONE-MINUTE SUMMARY

Besides physical distancing, cleaning and PPE, airports face requirements to implement measures to identify and isolate (potentially) passengers with COVID-19 throughout the airport journey: validation of immunity passport, temperature checks, and on-site blood samples are just some examples. In the latest IATA/ACI joint approach statement, they propose some international guidelines to safely restart aviation worldwide. The content of this article is in line with these guidelines and it will focus on how airports can mitigate operational impact after implementation of such measures.

In this article we outline how to assess the impact on operations of such measures, and evaluate how suited they are for implementation across operational areas based on:

- Requirements from measures: space, staff, tools
- Suitability of operational areas for measures: space availability, spread containment, operational continuity

The outcome is a handy qualitative assessment, which is complemented with our recommendations on the key considerations to make when implementing measures related to COVID-19 measures.

Recommendations

1. Identify the measures most suited for your airport, and plan accordingly
2. Some passengers will test positive, so plan for it
3. Coordinate measures and align responsibilities with authorities and airlines
4. Remember to reflect changes in processes in your planning tools

**Besides physical distancing,
cleaning and PPE measures
efforts will be put on
stopping (potentially)
virus-carrying passengers
from departing/arriving**



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OPTIMIZATION

New times, new measures

As air traffic recovers, airports, in coordination with local authorities, will adopt measures to minimize the risk of spreading the virus. Besides physical distancing, cleaning and PPE measures, discussed in the previous two articles of this series, efforts will be put on stopping (potentially) virus-carrying passengers from departing/arriving. This can be achieved through the implementation of testing and/or document control procedures (e.g. “immunity passports” are one of the options being discussed). The duration and extent of such measures is probably even more unclear than measures for physical distancing and cleaning & PPE, but, most likely, they will stay in place until sometime after a vaccine or cure is found and deployed globally.

The range of measures is broad and varying in intrusiveness: from analysis of travel history (to identify stays in high-risk zones) to on-site blood testing.

In this article we distinguish three types of testing measures:

Document validation: control of documentation released by certified authority attesting that the passenger is not infected and/or not capable of infecting others. A concept that has been talked about is the immunity passport, a document that will prove that you are immune to COVID-19. Although, currently there are a lot of unknowns on how long immunity lasts. Also, there are still few people showing immunity to COVID-19. It is likely that Immunity passports will play an important role in the future facilitating air travel, once more medical information is available, and more testing has been carried out to determine the immunity effectiveness.

Thermal screening: temperature check aimed at identifying potentially sick passengers (based on the fact that COVID-19 causes high temperatures). This can be done manually by trained staff using thermometers, through body scanners, or with thermal cameras. Temperature screening has not been proved to be 100% effective and can mislead to false positives, people with fever but no COVID-19; and false negatives, people with COVID-19 that has no fever or any kind of symptoms.

On-site testing: all proven methods to detect the presence and activity of the virus in the passenger (blood sample, throat swabs, etc.). Current testing methods either involve long waiting times for the results, or high degree of false negatives and some degree of false positives. These methodologies are being developed to improve the speed of COVID-19 detection and the degree of success. Until better results are achieved it will be difficult to implement as a validation process for airports.

All methods can be implemented at the same airport in different checkpoints as they can provide different intelligence for airports and authorities. A well-prepared airport will have in their playbook different outcomes for the same operational plan. These plans may require exercising and sharing across the business, so everyone is prepared to afront any situation.

Different measures, different requirements

The measures adopted will vary from airport to airport and will be largely dependent on local and international regulation. To understand the impact on operations planning we assess testing and checking measures across two dimensions:

- Requirements of measures
- Suitability of operational areas for measures

Requirements of measures













Regardless of the measure adopted, the implications and requirements on operations planning will be in terms of:

Space: physical space is required to carry out “testing” procedures: to host equipment and dedicated personnel, to allow waiting and queues (with physical distancing) during tests/checks.

Staff (and processes): as new and additional checking and testing processes are introduced; staff needs to be trained accordingly. For some measures, such as blood sampling, specialized staff will be required. However, we expect local authorities to at least support airports with managing more specialized medical staff.

Tools: some of the measures require equipment not commonly available at airports, such as thermometers, thermal cameras, and body scanners equipped with temperature measurement systems. The investment and implementation of such equipment will most likely be on the airports. For specialized medical equipment, as for staff, we expect local authorities will support and/or coordinate procurement and implementation activities.

Below we assess the requirements for space, staff and tools, across the three types of testing:

Space, staff, tools requirements across type of testing			
	Low requirements	High requirements	
	Space	Staff	Tools
 Immunity passport	 Traditional document control checkpoints can be used	 National differences across documentation may require ad-hoc training	 Traditional document control methods can be used (visual inspection, scan)
 Thermal screening	 Dependent on technology: lower for thermometers and cameras, higher for body scanners	 Training required dependent on technology used	 Investment required in most airports, with cost dependent on technology used
 On-site testing	 Requires dedicated facilities / areas (for testing, awaiting results)	 Requires specialized medical staff (can be provided by health authorities)	 Requires specialized testing equipment (can be provided by health authorities)

Suitability of operational areas for handling measures

Operational areas in the airport have different characteristics that make them more/less suited for deployment of testing measures.




















Provided that each airport has a unique layout that affects how testing measures would impact operations, we believe that a general assessment of “suitability” can be based on:

Containment: the capability of containing the spread of the virus by identifying and isolating (potentially) infected passengers through testing/checking in an operational area. Here we limit our assessment to operational considerations rather than medical. Regardless of the measure, the earlier in the airport journey a sick passenger is identified and isolated, the lower the risk of infecting other passengers.




Operational continuity: deploying testing or document control activities anywhere in the passenger journey poses risk of disrupting or complicating other airport operations. For instance, thermal screening cameras require structured queuing for passengers, hence requiring space to set up new queues or take advantage of current infrastructure, while manual thermic screening processes might increase waiting times on top of the queuing area space. Identification after check-in (e.g. at border control or gate) might require the unloading of checked bags. Hence, under this criterion we evaluate the likelihood that setting up testing/checking procedure in an operational area will ensure continuity of other operations.

Finally, to fully understand the impact on airport operations, it is worth pointing out the difference between testing of departing and arriving passengers (ultimately, testing/checking at one end of the journey or both will depend on authorities and airport internal policies).

Pre-departure testing means that the passenger is tested before boarding the plane. This can happen at any point between the arrival at the airport and boarding the plane. Most likely, it will happen as early as possible to mitigate virus spread.

 Suitability of operational areas for measures - DEPARTURES					
	Spread containment 	 Health passport	 Thermal screening	 On-site testing	
Forecourt and entrance	HIGH	 Requires new structured flows and control mechanisms	 Requires structured flows (today not existing); thermal cameras hindered by difficult pax isolation	 Requires structures and flows currently not available, but space is available	
Check-in hall	MED	 Can be integrated to current document control process and/or digitalized	 Can be integrated to current check-in process	 Likely lacking space for facilities set-up and obstruction to pax flow	
Security	MED	 Can be integrated to current control process and/or digitalized, but requires unloading of checked bags	 Best integration possibility with current processes and technology, but requires unloading of checked bags	 Limited space availability and creation of additional queues; requires unloading of checked bags	
Airside (border, gates)	LOW	 Can be integrated to current process, but requires unloading of checked bags	 Can be integrated to current process / technology, but requires unloading of checked bags	 Very late separation of sick pax (e.g. requires unloading of checked bags)	
					Not suited  Very suited 

Post-arrival testing means checking the passenger at the destination airport, implying the passenger could already be infected in the arriving country and the passenger could have infected others during the flight. If then the passenger is not allowed in the country of arrival, repatriation is an added cost for the airline or passenger.

Suitability of operational areas for measures - ARRIVALS				
	Spread containment	Health passport	Thermal screening	On-site testing
In aircraft / Disembarking gate	 HIGH	Requires new set-up for control at arrival, but avoids pax mixing with the flow	Cameras and manual tests can be set-up at the exit of gate and provide early identification	No space availability and complex set-up
Immigration	 MED	Can be integrated to current passport control, but risk of increasing queues and wait times	Can be integrated to current passport control, but risk of increasing queues and wait times	Likely lacking space for facilities set-up; high risk of extreme increase in queues and wait times
Arrivals forecourt	 LOW	No similar process today, but available space to set-up areas for separation after identification	Very unstructured flows complicate manual control or identification through cameras	Space availability, and possibility to block pax before leaving airport
<div>Not suited</div> <div>Very suited</div>				



COPENHAGEN
OPTIMIZATION

**Some passengers will test
positive, so plan for it**

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How to implement COVID-19 measures

We expect that most airports will implement several of the measures described in this article in the attempt to ensure safety of passengers and staff (and compliance with regulation). The assessment of different measures and their operational suitability is an initial guidance in planning future airport operations with COVID-19. Below we complement it with our key recommendations.

Recommendation 1: Identify the measures best suited for your airport, and plan accordingly

No matter the specific measures that will be implemented, they will bring new processes and technology. In deciding the measures to implement, airports should answer questions such as:

- Where in the passenger journey should testing and checking measures be implemented to minimize the risk of spreading the virus and the disruption or other airport operations?
- Given the airport layout, where is the best place to implement a testing checkpoint?
- What equipment do we already have? And what equipment would we need? Can current facilities and tools be “reused”?
- What staff capabilities and availability are required?

Answers are region-specific, as each government, authority and the current COVID-19 spread will dictate the approach. ACI and IATA released a joint approach to influence governments and industry to have a similar approach

implementing new measures. For instance, one of their guidelines recommends the implementation of screening measures as upstream as possible in the passenger journey:

"Should health screening measures be necessary, it should be introduced as upstream as possible in the passenger process while minimizing impact on operations. It is preferable for passengers to arrive at the airport "ready to fly". Likewise, and for international travel, it is preferable for admissibility"

Nonetheless, the examples given below can provide an idea of what to consider and its impact to the operation.

For instance, the terminal entrance is a good spot to implement a testing checkpoint, as it allows to identify sick passengers before they enter the terminal building. Obviously, this requires the right space (covered, large enough to contain necessary medical equipment and staff) – if not readily available, what time and costs would occur for its construction? Another option will be using part of the airport car parks, although this will reduce its capacity and revenue. An important thing to keep in mind is not to create bottlenecks implementing these new processes, there is no point of creating queues outside the terminal building and having spare capacity inside.

Similarly, thermal screening can be an efficient and precise method to spot high temperature passengers, although is not a very effective method to detect COVID-19 passengers due to its high rates of false negatives and false positives. Nevertheless, this method can help reassuring passenger travel and it should be implemented early enough in the passenger journey to allow that feverish passengers can be identified and isolated for further testing, before mixing with other passengers or being quarantined.

As new technologies and processes are introduced, assess the need for ad-hoc staff training and plan for it.

In terms of equipment, any specialized technology may be provided from the government or health agencies for those airports considered critical infrastructure. Some less specialized equipment like thermal screening will most likely be privately funded. There is a vast number of new providers supplying thermal camera technology, it is worth verifying how reliable these sources are and how likely are they to be integrated with the current CCTV software. Usually the implementation times are not long if it fits with the current airport infrastructure.

Any kind of document validation (immunity passport) will fit well with the check-in process for departing flights, and with the border control process for arriving flights: infrastructure and similar processes are already in place, although, most likely, the extra checks are bound to increase process times and queues. Furthermore, border control will be conditioned by Government policies and agreements of movement freedom being reinstated.

Recommendation 2: Some passengers will test positive, so plan for it

Most passengers will prove “fit-for-flight”, but a few will not. mishandling these cases can be disastrous for the passenger itself, and the airport: reimbursement costs, spread of virus among passengers, operational disruption is only some of the potential consequences. Hence, processes dedicated to passengers proving unable to fly should be planned for. Such processes include considerations on:

- Need for temporary quarantine facility
- Special flows through airport for passengers proved “unable to fly”
- Rebooking processes for passengers delayed/denied by testing

The responsibility for the need of a temporary quarantine facility should be shared between the airport authority and the government and health agencies. Most airports already have contingency plans for quarantining an airplane on arrival but providing a temporary quarantine facility is not part of the airport expertise and will most likely be led and coordinated by health agencies.

As mentioned in recommendation 1, early identification of passengers will make it easier to separate healthy passenger from risky ones. Any testing checkpoint should allow two channels to separate the flows: healthy passengers will continue the journey through the airport, passengers at risk will be redirected to a secondary testing facility or towards a quarantine facility. Any kind of rebooking process with the airlines should be handled remotely from home if possible, this will avoid crowded areas in the terminal and a better service for passengers.

Finally, all cases and situation should be considered. Local passengers departing the country or coming back can easily be quarantined home. But who is responsible to quarantine a passenger that was healthy arriving to the country but has been infected after? If the airline does not allow them to travel back to their origin country, is the passenger responsibility to quarantine at his expenses? All these questions should be agreed beforehand between governments, airport authorities and airlines and be shared amongst passengers.

Recommendation 3: Coordinate measures and align responsibilities with authorities and airlines

COVID-19 testing and document control measures involve authorities and airlines, hence, where not already happening, it is essential to coordinate measures and communication with passengers. Below we outline a suggested split on responsibilities across some of the key processes we expect airports will be involved in within the COVID-19 testing context:

Process	Authorities	Airport	Airlines
COVID-19 testing	Provide guidelines and minimum requirements	Define and implement exact measures	Communicate measures to passengers
Handling of positive passengers	Provide guidelines and receives passengers	Defines and implements processes, and hand-over passengers to authorities	Communicate regulation of destination
COVID-19 Document validation (e.g. immunity passport)	Provides guidelines and resources for border control	Provides facilities for document control	Control documents and informs passengers
Rebooking of delayed/denied passengers	Provides guidelines	Provides facilities	Handle rebooking process and costs

Recommendation 4: Remember to reflect changes in processes in your planning tools

Most of the changes to processes outlined in this article may well affect processing times, airport flow and queue layouts, passenger presentation profiles and other critical planning input parameters. Remember to reflect these changes in your planning tools on an ongoing basis so that these can support the measures implementation. For example, if a testing facility is implemented at the departures forecourt it will act as a flow bottleneck influencing the check-in and security show up profiles. Further checks, like an immunity passport, at check-in and border will increase the passenger process times.

Most importantly these tools, with the updated parameters, should be the base for any decision from management. Making sure the final decision has the right balance between effectiveness, disruption, and cost.



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OPTIMIZATION

Business recovery
will come through the
implementation of a mix
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CONCLUSION

Plan for the right measures in the right place

It is unclear how long airports will face the consequences of the pandemic. It is clear, though, that business recovery will come through the implementation of a mix of measures: physical distancing, cleaning, PPE, on-site testing, and internationally recognized documentation of health. This will bring along massive changes, which it is important to plan carefully and according to each airport's characteristics: routes and traffic, infrastructure layout, capacity, available equipment.

As we have done for testing and document validation measures, evaluate where and how measures are best suited and offer the best chances to be effective. Then plan accordingly.

This article is part of a series on the challenges of COVID-19 for airport operations planning, and on how to best handle these challenges. Our focus is both short-term and long-term when we refer to the post-COVID-19 situation.

READING MATERIAL MENTIONED IN THIS ARTICLE

<https://www.who.int/news-room/commentaries/detail/advice-on-the-use-of-point-of-care-immunodiagnostic-tests-for-covid-19>

<https://www.iata.org/contentassets/5c8786230ff34e2da406c72a52030e95/safely-restart-aviation-joint-aci-iata-approach.pdf>

Challenge 6: Financial impact

CONTENTS

The reader	113
Article summary	114
Financial challenges and a call for project reprioritization	117
Now is the time for an operational turnaround	123
Recommendation 1	123
Recommendation 2	125
Recommendation 3	127
Conclusion	130

THIS ARTICLE IS AIMED AT READERS WHO ARE LOOKING FOR

- An outlook on the main financial challenges ahead for airport
- An outline of the impact of such challenges on airport operational planners
- Recommendations on how to adapt planning to the upcoming financial context and turn it into an opportunity for an operational resumption through Zero-Based Planning

ONE-MINUTE SUMMARY

Airports, as any other player in the aviation industry, are facing financial challenges that require fast and severe actions. Deciding upon these is complicated by the huge degree of uncertainty on the timing of industry resumption: too harsh cuts now might hinder the possibility to rapidly ramp-up operations once traffic resumes; on the other hand, no or very limited cuts could not be affordable.

Our expectation is that CAPEX projects will generally be reprioritized, postponed, or eventually cancelled, whereas OPEX are being reviewed to identify pools to reduce costs according to the drastic traffic reduction.

Operational planners will play a key role in supporting management decisions as they are required to evaluate how to “do less with even lesser”.

Operational planner's contribution to management cost-cutting decisions

Assumptions and quantitative input to budget

Quantification of investment needs and new technology applicability

Optimization of operational processes

Contingency planning and scenario analysis

After outlining how traditional planner tasks should support management in taking critical financial decisions, we zoom in on how embracing a new planning philosophy can turn the COVID-19 “crisis” into an opportunity for great operational improvements. To do that, we introduce the concept of Zero-Based Planning, where we recommend a from-scratch and bottom-up approach to the future of airport operations. That is supported by our methodology for “true” demand-driven planning and recommendations for sustainable spend short and long term.

How to secure operational resumption in airports

1. Zero-Based Planning
2. Demand-driven Planning
3. Sustainable spend



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OPTIMIZATION

**One of the most difficult
decisions airport
management will face
is how to plan for the
upcoming seasons**

Financial challenges and a call for project reprioritization

During April 2020 global air traffic registered an approximate 80% drop, and an overall reduction of air passengers (both international and domestic) ranging from 35% to 65% is expected in 2020 compared to 2019 (according to ICAO). Inevitably, the financial impact on the industry and airports is massive, and it will take several years to regain what was lost during the COVID-19 standstill period.

One of the most difficult decisions airport management will face is how to plan for the upcoming seasons. There are many forecasts of air traffic recovery but all of them carry a high degree of uncertainty. To simplify, airports have two options:

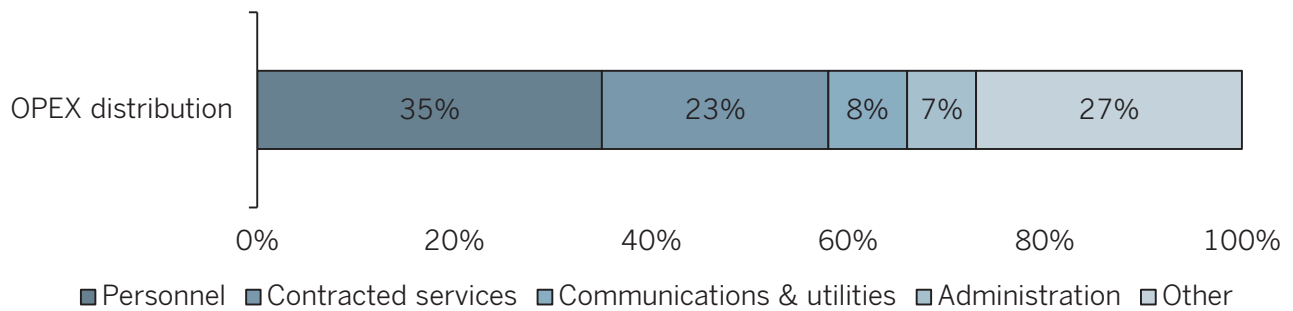
- Planning “low”, i.e. cutting staff and services, will reduce the financial risk in the short term. This strategy could work if the airport follows a slow but constant recovery in passenger numbers as resources can be ramped up as they become needed. On the other hand, it leaves planners exposed to sudden or steep recovery, which can reflect in capacity issues and operational risks with little time available to react

- Planning “high”, i.e. keeping most of the staff and services, will increase the financial risk in the short term as cost will remain high with very low income. Financial consequences for airports could be dramatic if traffic does not recover soon enough. However, with a relatively quick traffic recovery (i.e. within the next 3-6 months) this strategy would ensure operational continuity to the airport

Realistically we expect spend strategies to be a tradeoff between these two approaches, with changes in both Capital Expenses (CAPEX) and Operational Expenses (OPEX).

For CAPEX, we believe that multiple infrastructural investments will be postponed or even eliminated. In the short term, the need for investment will most likely be limited as traffic is lower than pre-COVID-19. As traffic levels return to their pre-COVID-19 levels, we expect CAPEX budgets to continue being impacted by COVID-19. For those areas where CAPEX cannot be eliminated, for instance maintenance of infrastructure, it is important to explore smarter ways to spend it. Longer-term, this means that the current available infrastructure needs to last for longer, thereby driving the need for optimization.

For OPEX, the main short-term challenge will be to balance costs to an unstable developing demand. The increase in cleaning costs are expected to continue well into the future and may find a structurally higher level compared to pre-COVID-19. Also, we expect airports to have an increased focus on reducing OPEX costs. We foresee airports thoroughly reviewing their current OPEX budget with a focus on the reduction of staffing costs (both internal and external staff costs), which make up ~60% of the average yearly OPEX, but it is fair to expect that cost saving initiatives will target other cost pools as well.



Distribution of Operational Expenses in airports, ACI Airports Economics Survey 2014

We have summarized our expectations on airports' strategic approach to spending in the short, medium and long term:

Expected spend strategy	Short-term <i>Today</i>	Mid-term <i>Recovery to pre-COVID 19 traffic</i>	Long-term <i>After return to pre-COVID-19 traffic</i>
CAPEX	Pause, postpone, cancel projects	(Re) prioritize projects worth (re) starting	Extend infrastructure lifetime through optimization
OPEX	Review and reduce costs (staff)	Adapt supply to demand (increase staff flexibility)	Optimize (sustainably) and stabilize

Do less with even lesser

Constraints on OPEX and CAPEX will require airport managers and planners to “do less with even lesser”: the need to maintain high passenger satisfaction, to meet airlines’ requirements, to optimize infrastructure utilization, to ensure continuity in operations across the airport journey, are not expendable. Moreover, physical distancing and enhanced hygiene and health measures will put extra demand on current infrastructure and staff.

As airport management is required to make critical decisions to sustain the viability of operations short and long-term, planners will be asked to provide key input on how future operations will look. In the following table we highlight the most relevant management activities/decisions in relation to CAPEX and OPEX reduction, and the expected impact on planners.

	Management activities and decisions	Impact on planners
CAPEX	<ul style="list-style-type: none"> — Review of capital projects portfolio: continue, postpone, cancel — Identification of key projects/activities to support long-term strategy and operations — Continuation vs. termination of cost-saving actions (e.g. partial closure) ahead of traffic resumption — Maximization of mid to long-term traffic capacity without infrastructure expansion 	<ul style="list-style-type: none"> — More frequent and thorough contingency planning and scenario analysis, including evaluation of temporary facilities closure — Review of maintenance needs for physical assets and software according to expected use — Input on investment prioritization and quantification (e.g. new technology such as thermal cameras) — Optimization of operational processes to allow handling more traffic within the same infrastructure (e.g. new rules for allocation of assets to airports and handlers)
OPEX	<ul style="list-style-type: none"> — Frequent expenses vs. budget review and monitoring — Reduction of staff (operations) — Management of staff and passenger health & safety measures 	<ul style="list-style-type: none"> — Assumptions and quantitative input to budget reviews and tracking — Optimization of operational processes to maximize utilization of staff (e.g. more accurate forecast of staff demand, process redesign)

**We advise operations
planners to **challenge** and
rethink current planning
processes**

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**COPENHAGEN
OPTIMIZATION**

Now is the time for an operational turnaround

To succeed in this financially constrained context, complicated by the introduction of new health measures (physical distancing, PPE, cleaning, etc.), we advise operations planners to challenge and rethink current planning processes.

Recommendation 1: Question status-quo with Zero-Based Planning to define new optimized operations

The method of Zero-Based Budgeting (ZBB) is about building all expenses bottom-up in each new period by asking “what is essential to run the business?” or “how would I run the business if I had no previous knowledge of it?”.

If airports today were to define their operations from scratch, how would they do it?

As for budgeting, Zero-Based Planning (ZBP) is about designing operations and their requirements bottom-up, as if starting from a blank canvas, identifying the minimum yet optimal requirements to run processes, for example: “What are the essential steps in the security process?”, “What is the minimum staff I would need to cover demand at security at a specific time?”, “How many check-in desks would I allocate to each airline if no commercial agreement or rule was in place?”.

This will lead to questioning the need to carry out operations as done today, and to redefining optimal operational processes that satisfy demand and passenger experience while minimizing costs.

By embracing ZBP, planners can turn the current period into an opportunity to change operational rules, adjust internal and external stakeholders' contracts, including terms of use to operate at the airport, redistribute insourced/outsourced activities, while thinking of new ways to do things better and more efficiently (e.g. through digitalization).

Below we outline some of the opportunities that may arise from challenging status-quo with Zero-Based Planning, and improve capacity and reduce staff costs within each operational area:

Operational Area	Opportunities to improve capacity
Surface Access	Time limit restrictions, incentivize the use of public transport
Check-in	Counters allocated based on passenger presentation demand (instead of rule based like 2 counters per flight/airline), flexible allocations, check-in areas with multiple airlines, increase use of self-service infrastructure, push for off-airport check-in.
Outbound Baggage	Infrastructure allocated based on passenger demand, flexible allocations, implementation of new processes.
Security	Introduce peak shaving with for instance, a time slot booking process for passengers. Implement flexible rosters and breaks.
Stand&Gate	Flexible allocation, ground equipment pooling, standardization of processes, real time optimized reallocation, increase number of remote stand operations to shave the peak
Border Control	Coordination with stand and gate allocation to minimize passenger overflow in the hall, introduce flexible rosters and breaks
Baggage reclaim	Balanced allocation based on passenger and baggage demand, linkage with border and stand and gate processes.

Early identification and implementation of existing opportunities (among the ones outline in the table) will allow airports better management of operations once traffic recovers to a level that challenges capacity.

Recommendation 2: Implement a demand driven approach

It is more important than ever to invest resources when and where they are needed: this applies to both staff and physical assets, e.g.

- Allocating check-in desks to airlines according to the expected show-up of passengers, throughput levels and wait time targets
- Assigning staff to security lanes according to the expected arrival of passengers at the security processing point
- Allocating baggage make-up positions according to the expected presentation profiles of bags

Data should drive decision-making as much as possible. Depending on data maturity and available technology, the quality and granularity of available data (and, with it, planning accuracy) may vary, but generally planners and analysts should aim to answer the following:

- **Passenger/Bag load factor forecast:** how many passengers / bags are expected on each flight?
- **Passenger/Bag show-up at operational area:** when will the expected passengers / bags show-up at each relevant operational area?
- **Passenger/Bag processing time:** how long does it take to process a passenger / bag at an operational area? (e.g. time to check-in a passenger, time check a passenger at security, time to take-away a bag from a make-up position)
- **Service level target:** how long waiting times / queues are accepted?

As traffic resumes, the uncertainty around these parameters will be high and it is important to carry sensitivity analysis around the key parameters. We recommend a scenario driven approach to support the needed decision making on CAPEX and OPEX. This could be a baseline scenario using conservative estimates on input parameters and then the ability to produce several add-on scenarios.

The combination of the answers should provide a picture of “true demand”, and not one based on legacy requests from airlines and handlers. Provided that contractual agreements might pose a constraint to the full implementation of demand-driven planning, this “true demand” is what we advise planners to base their work on. Even when data is scarce, our experience across airports worldwide is that such an approach can yield significant improvements in infrastructure and staff utilization, with obvious cost benefits.

The need to understand the impact of the changes to the operations caused by COVID-19, makes this a better time than ever to consider how to collect and use more data, and with it mature the analytical mindset in the organization.

Recommendation 3: Reduce spending and spend sustainably

Even in financial dire straits, we believe airports should keep a mid/long-term focus. Rather than cutting all spend indiscriminately, assess the sustainability of the expenses: today's investments should still be relevant in 5-10-15 years.

Technology such as thermal cameras is rather inexpensive. At the same time, it is easy to imagine that such technology will be part of future pandemic contingency plans, which makes such cameras a sustainable expense, worth investing in now as it will stay relevant for the foreseeable future.

Similarly, advanced planning and forecasting tools can help to right-size staff supply and to increase infrastructure utilization (as we describe under the recommendation on demand-driven planning). Ultimately, the right planning tools will help with scenario analysis and continuous tracking of expenses, a great value-add in times where a frequent reassessment of finances and spend is to be expected.

Finally, planners are a key input provider in decisions about outsourcing of tasks: this can be done to reduce cost or to increase the degree of specialization in a process (e.g. outsourcing canteen operations to a canteen service provider). In a period where airports are cash-drained, it is worth considering how the use of third-party providers can support finances and airport operations sustainability in the long run.



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OPTIMIZATION

COVID-19 is a **unique opportunity for airports to adapt their current operation with a focus on **improved processes** and planning and it could **ease** the change management effort**

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CONCLUSION

At the forefront of a data revolution

This concludes our articles series on how to handle the challenges of COVID-19 for airport operations planning.

Data, and a more consistent collection and use of it, has been the main theme of this article series. In providing recommendations to overcome “Challenge 6: Financial impact”, data once again came out as the pillar of what we believe future operational structure will be like, and the main lever in getting there.

With squeezed budgets and a pressing need for project pipeline reviews, data is key in assessing what can and cannot be sacrificed. As we advise for a revolution in airport operations under the principles of Zero-Based Planning, demand-driven planning and sustainable spending, data will lead the analytical approach, as quantitative as possible, to evaluate and decide the steps to take in getting airports through COVID-19 resumption.

The optimization effort should start now, before traffic ramps up, as the COVID-19 standstill has provided an option to start from scratch. Even with all the uncertainties airports will face regarding how the new normal looks like, COVID-19 is a unique opportunity for airports to adapt their current operation with a focus on improved processes and planning and it could ease the change management effort.

This article is part of a series on the challenges of COVID-19 for airport operations planning, and on how to best handle these challenges. Our focus is both short-term and long-term when we refer to the post-COVID-19 situation.

READING MATERIAL MENTIONED IN THIS ARTICLE

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Distribution of Operational and Capital expenses in airports,
ACI Airports Economics Survey 2014

ABOUT Copenhagen Optimization

Copenhagen Optimization is a combined consultancy and software company specializing in analyzing and planning any operation on a strategic, tactical, and operational level. We improve your airport operation through data-driven analytics and strategic consultancy in combination with our Better Airport® software suite to support you all the way. Working with more than 50 airports globally, we offer our unique services and technology to support airports of all sizes.

If you would like to learn how we can help your airport navigate through the COVID-19 aftermath, reach out to us for a personal talk via:

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