Article reading time: 10 minutes

How COVID-19 impacts airport operations planning – Physical distancing, volatile schedules, and limited budgets

Challenge 1: High variance in flight schedules and load factors

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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

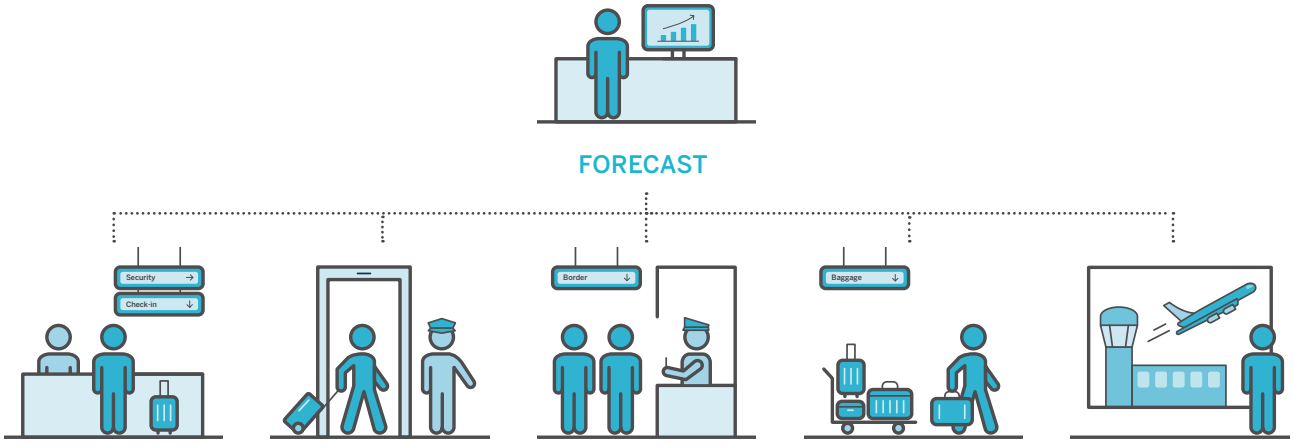
key routes. This will also mean thinking outside the box and coming up with new ideas and new propositions for the passengers. A temporary wave of slot allocation rules in congested airports, as recommended by ACI World, will further increase the variance on flight schedules allowing airlines to update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

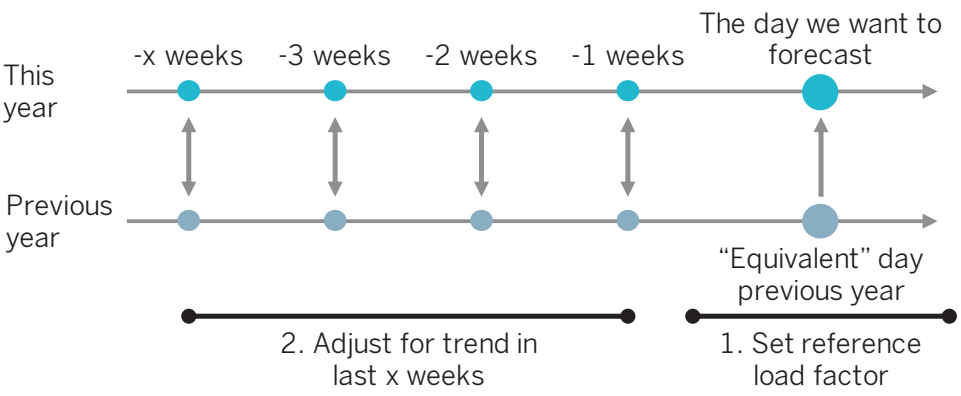
In the current scenario, we expect the accuracy of most medium/long term forecasts (>1 month) to be very low. Hence, we suggest to generally shorten the planning horizon.

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.

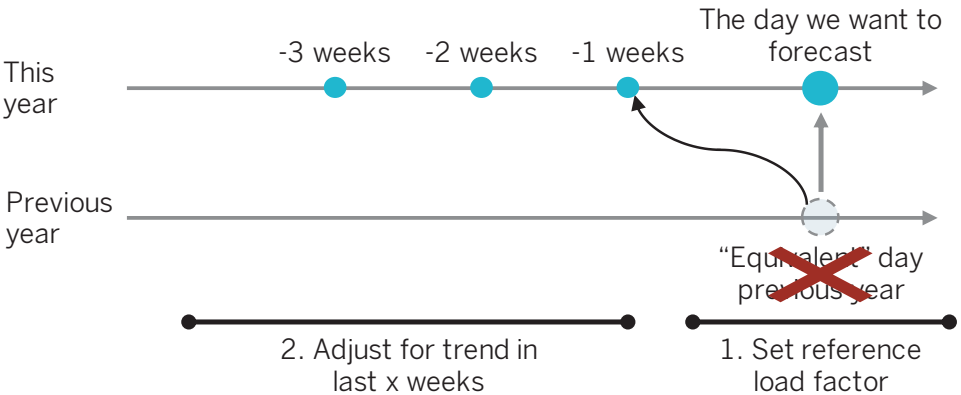
As the ramp-up period approaches its end and traffic nears pre-COVID-19 levels, be prepared to shift back to a more traditional forecasting methodology, where reference load factors are looked up further back in time *(see illustration)*. This could be particularly true of periods with typical and recurring 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.

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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