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

Challenge 4: Cleaning and personal protective equipment

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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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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

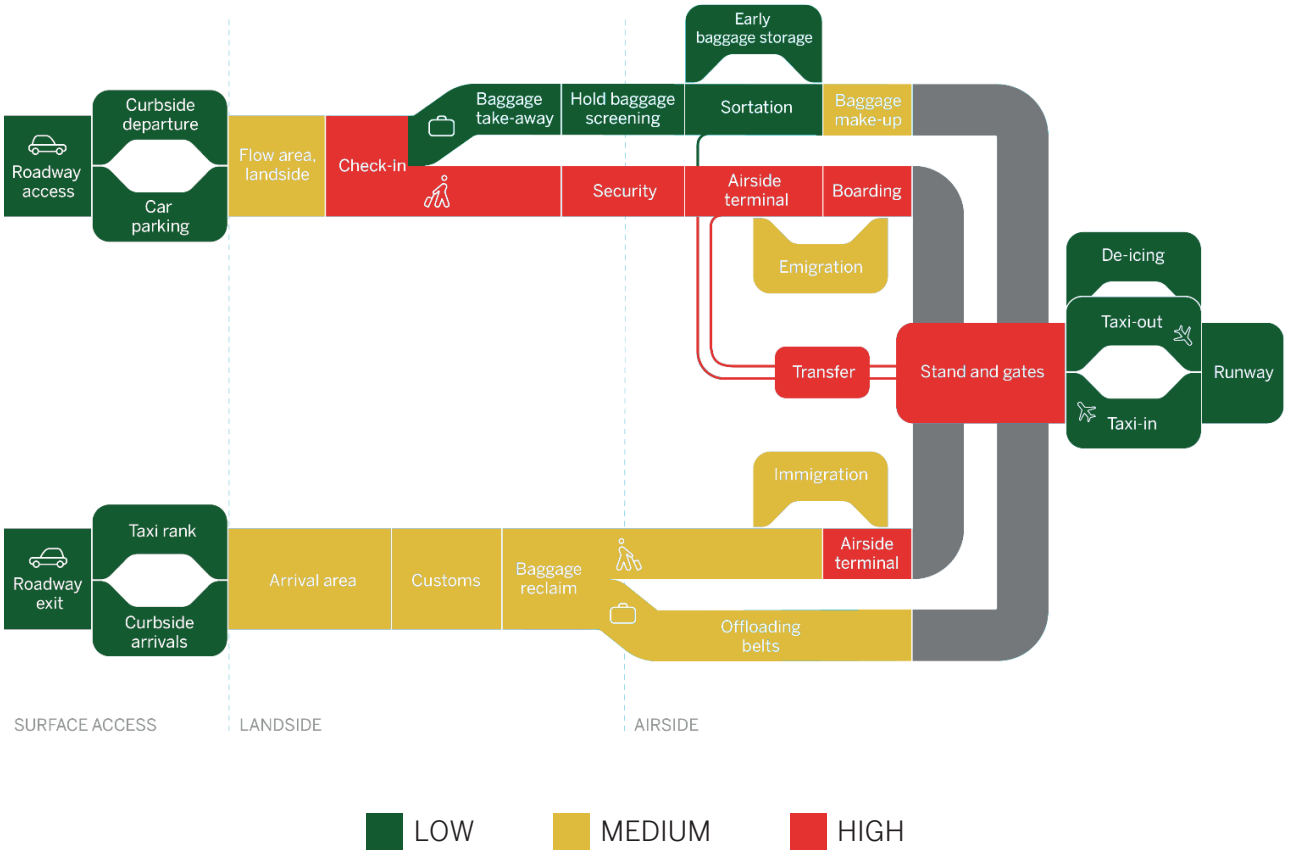
Staff will be required to adopt new measures to ensure their own safety:

- 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:

Impact of cleaning and PPE across operational areas



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.

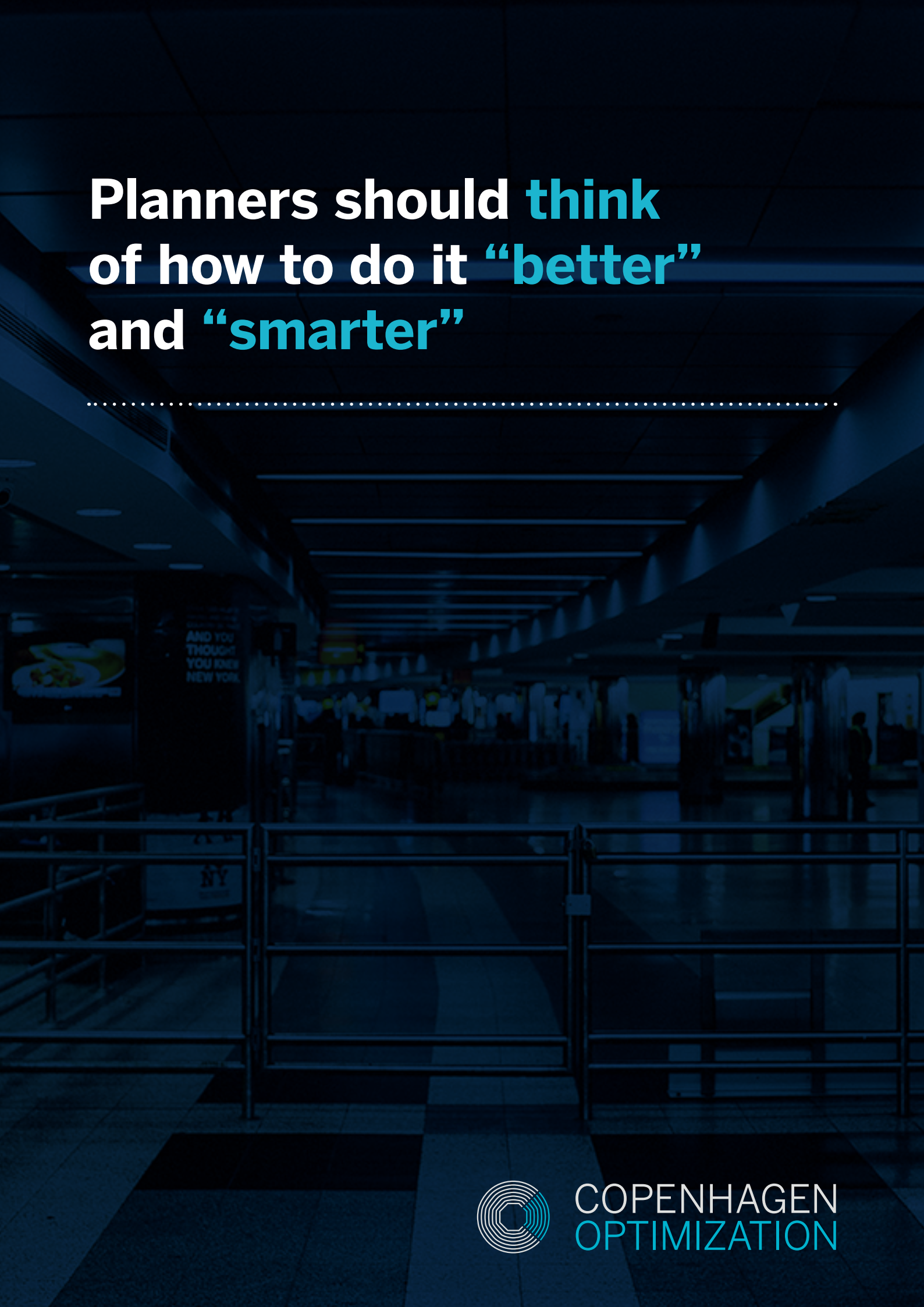
Recommendation 6: Minimize the need for cleaning

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

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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:
contact@copopt.com,
use www.copenhagenoptimization.com
or call us at +45 3091 4679

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contact@copopt.com,
www.copenhagenoptimization.com
+45 3091 4679